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ARTICLE 12 ENACTMENT

Article 1

title, scope and jurisdiction

SECTION 101 **TITLE**

These regulations shall be known and may be cited and referred to as the ASubdivision Regulations for Montgomery County, Ohio,@ and shall hereinafter be referred to as Athese regulations.@

SECTION 102 **PURPOSE**

The foregoing rules and regulations are adopted to secure and provide for:

A. The proper arrangement of streets or highways in relation to existing or planned streets or highways, or to the Official Thoroughfare Plan.

B. Adequate and convenient open spaces for vehicular and pedestrian traffic, utilities, access of fire fighting apparatus, recreation, light and air.

C. The avoidance of congestion of population.

D. To facilitate the orderly and efficient layout and the appropriate use of the land.

E. To provide for the accurate surveying of land, preparing and recording of plats and the equitable handling of all subdivision plats by providing uniform procedures and standards for observance by both the approving authority and subdividers.

F. Protection against floodplain encroachment and possible future flood damage.

SECTION 103 **AUTHORITY**

The Ohio Revised Code, Section 711.001 et seq., enables the Board of County Commissioners and the County Planning Commission to adopt regulations governing plats and subdivisions of land within their jurisdictions. The Montgomery County Planning Commission has adopted a plan for major streets or highways of the County, a statutory requirement for reviewing plats or subdivisions.

SECTION 104 **ADMINISTRATION**

These regulations shall be administered by the Montgomery County Planning Commission.

SECTION 105 **JURISDICTION**

These regulations shall be applicable to all subdivisions of land within the unincorporated area of the County other than land within three miles of a city as provided in Section 711.09 of the Ohio Revised Code. The County Planning Commission shall have the power of final approval of the plats. Whenever a city within Montgomery |County has adopted a Major Thoroughfare Plan, Parks and Public Open Space Plan for the territory within the city limits and for the territory within the three mile limit of the city, has adopted subdivision regulations, and is exercising extraterritorial jurisdiction, the City Planning Commission may receive advice from the County Planning Commission upon all subdivision plats located within three miles of the corporate limits. The City Planning Commission shall have the final approval of the plat, except for the provisions in Article 6 of these regulations.

SECTION 106 **RELATION TO OTHER LAWS**

The provisions of these regulations shall supplement any and all laws of the State of Ohio, resolutions of the County or any and all rules and regulations promulgated by authority of such law or resolutions relating to the purpose and scope of these regulations. Whenever the requirements of these regulations are at variance with the requirements of any other lawfully adopted rules, regulations, ordinances, or resolutions, the most restrictive or that imposing the higher standards shall govern except as provided in Section 108 of these regulations.

SECTION 107 **COOPERATION**

The Montgomery County Planning Commission may cooperate with any municipality located in Montgomery County in the review of subdivision plats occurring in lands adjoining the corporation lines of said municipality or within a reasonable distance of same. The Commission may, as a condition for such cooperation, and in order to carry out the regulations more effectively, seek an agreement with any municipality. The terms of the agreement may permit joint review by the Planning Commission and the municipality of subdivisions occurring next to the corporate limits of said municipality or within the corporate limits of the municipality.

SECTION 108 **PLANNED UNIT DEVELOPMENTS ENCOURAGED; REGULATIONS MAY BE MODIFIED**

The planned unit development approach to development is greatly encouraged. These regulations may be modified by the degree necessary to accomplish the objectives and standards required for the planned unit development of residential, commercial, or industrial subdivisions, or a mixture thereof, in accordance with the Zoning Resolution. Nothing within this section, however, shall exempt the developer from the requirements of subdivision plat approval as specified in Articles 3 or 4 of these regulations.

SECTION 109 **AMENDMENT**

The Montgomery County Planning Commission may, on its own motion and after public hearing, amend, supplement or change these regulations. This motion may be at the request of the Planning Commission or its staff, and/or an individual, organization or other governmental agency. However, the Planning Commission may only amend, supplement, or change the regulations requiring the actual construction of streets or other improvements or facilities or performance guarantees after review and adoption by the Board of County Commission. Notice shall be given of the time and place of such public hearing by publication in at least one newspaper of general circulation published in Montgomery County, Ohio, thirty (30) days prior to holding of said hearing. The amendment or amendments shall be on file in the office of the Commission for public examination during said thirty (30) days.

SECTION 110 **SEPARABILITY**

If, for any reason, any clause, sentence, paragraph, section or other part of these regulations should be decided by a court of competent jurisdiction to be invalid, such judgement shall not affect the validity of these regulations as a whole, or any part thereof, other than the part so held to be invalid.

Article 2

definitions

Interpretation of Terms or Words: 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, organization, partnership, 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 plural number includes the singular.

C. The word "shall" is a mandatory requirement, the word "may" is a permissive requirement, and the word "should" is a preferred requirement.

D. The words "used" or "occupied" include the words "intended, designed, or arranged to be used or occupied."

E. The word "lot" includes the words "plot" or "parcel."

AGRICULTURAL SOILS, PRIME
Those soils which are best suited for the production of food, fiber and other crops. These soils have been determined by Montgomery County to be based upon average yields per acre of principle crops and the capability grouping of each soil type. Prime soils fall within capability Class I and II as they are described in the Soil Survey of Montgomery County, Ohio published by the United States Department of Agriculture, Soil Conservation Service, issued June, 1976.

ALLEY (See Thoroughfare)

APPROVING AGENCY
The Montgomery County Planning Commission or its duly appointed representative.

BASE FLOOD
The flood having a one percent chance of being equaled or exceeded in any given year, also known as the 100 Year Frequency Flood.

BLOCK
A parcel of land bounded on all sides by a street or streets.

BRIDGE
A structure, 20 feet or greater in width (span), built over a depression, drainageway, river, or other obstacle to vehicular or pedestrian travel.

BUILDING LINE (See Setback Line)

CHANNEL
A natural stream that conveys water; a ditch or channel excavated for the flow of water.

COMPREHENSIVE DEVELOPMENT PLAN
A plan, or any portion thereof, adopted by the Planning Commission and the Board of County Commissioners of Montgomery County, Ohio, showing the general location and extent of present and proposed physical facilities including housing, industrial and commercial uses, major thoroughfares, parks, schools, and other community facilities. This plan establishes the goals, objectives, and policies of Montgomery County.

CORNER LOT (See Lot Types)

COVENANT
A written promise or pledge.

CROSSWALK
A specially marked path for pedestrians crossing a street or road.

CUL-DE-SAC (See Thoroughfare)

CULVERT
A drainage structure less than 20 feet in width (span) that channels water under a street or driveway.

DEAD-END STREET (See Thoroughfare)

DENSITY
A unit of measurement, the number of dwelling units per acre of land, to be used in road design and not to be confused with sanitary sewer and water design density.

DENSITY, LOW RESIDENTIAL
Land to be utilized for residential purposes, including public housing and industrialized units, which does not exceed five (5) dwelling units per gross acre.

DENSITY, MEDIUM RESIDENTIAL
Land to be utilized for residential purposes, including public housing and industrialized units, which does not exceed eight (8) dwelling units per gross acre.

DENSITY, HIGH RESIDENTIAL
Land to be utilized for residential purposes, including public housing and industrialized units, which exceeds eight (8) dwelling units per gross acre.

DETENTION/RETENTION
The term detention/retention basins refers to the use of a storm water storage facility which will store storm water and release it at a given rate.

The objective of a detention/retention facility is to regulate the rate of runoff and control the peak discharges to reduce the impact on the downstream drainage system.

Type of Storm Water Storage Facilities:

A. Detention Basin or Dry Basin
Dry basins are surface storage areas created by constructing a typical excavated or embankment basin. A detention basin may be designed for multi-uses such as parks or playgrounds.

B. Retention Basins or Ponds
Retention basins are permanent ponds where additional storage capacity is provided above the normal water level.

C. Parking Lot Storage
Parking lot storage is a surface storage facility where an inlet is undersized causing shallow ponding to occur in specific graded areas of the parking lot.

D. Subsurface Storage
Subsurface storage is a structure constructed below grade for the specific purpose of detaining storm water runoff.

DEVELOPER
Any individual, subdivider, firm, association, syndicate, partnership, corporation, trust, or any other legal entity commencing proceedings under these regulations to effect a subdivision of land hereunder for himself or for another.

DEVELOPMENT
For the purpose of Section 521, Development shall mean a subdivision of the kind known as a planned development or planned unit development.

DEVELOPMENT AREA
Any contiguous (abutting) area owned by one person or operated as one development unit and used or being developed for non-farm commercial, industrial, residential, or other non-farm purposes upon which earth-disturbing activities are planned or underway.

DISTRICT
A soil and water conservation district, organized under Chapter 1515 of the Ohio Revised Code.

DITCH
An excavation either dug or natural for the purpose of drainage or irrigation with intermittent flow.

DRAINAGEWAY
An area of concentrated water flow other than a river, stream, ditch, or grassed waterway.

DUMPING
Grading, pushing, piling, throwing, unloading, or placing.

DWELLING
Any building or portion thereof occupied or intended to be occupied exclusively for residential purposes, but not including a tent, cabin, trailer or trailer coach or other temporary or transient structure or facility.

A. Single Family
A building occupied or constructed to be occupied exclusively for residential purposes by one family.

B. Two Family
A building occupied or constructed to be occupied exclusively by not more than two (2) families.

C. Multiple Family
A building or portion thereof occupied or constructed to be occupied by more than two (2) families.

DWELLING GROUP
A group of two (2) or more detached dwellings located on a parcel of land in one ownership and having any yard or court in common.

DWELLING UNITS
One room, or a suite of two (2) or more rooms, designed for or used by one family for living and sleeping purposes and which includes permanently installed cooking and lawfully required sanitary facilities.

EARTH-DISTURBING ACTIVITY
Any grading, excavating, fitting or other alteration of the earth's surface where natural or man-made ground cover is destroyed and which may result in or contribute to erosion and sediment pollution.

EARTH MATERIAL
Soil, sediment, rock, sand, gravel, and organic material or residue associated with or attached to the soil.

EASEMENT
Authorization by a property owner for the use by another, and for a specified purpose, of any designated part of his property.

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.

EROSION

A. The wearing away of the land surface by running water, wind, ice or other geological agents, including such processes as gravitational creep.

B. Detachment and movement of soil or rock fragments by wind, water, ice, or gravity.

C. Erosion includes:

1. Accelerated erosion: Erosion much more rapid than normal, natural or geologic erosion, primarily as a result of the influence of the activities of man.

2. Floodplain erosion: Abrading and wearing away of the nearly level land situated on either side of a channel due to overflow flooding.

3. Gully erosion: The erosion process whereby water accumulates in narrow channels during and immediately after rainfall or snow or ice melt and actively removes the soil from this narrow area to considerable depths such that the channel would not be obliterated by normal smoothing or tillage operations.

4. Natural erosion (geologic erosion): Wearing away of the earth's surface by water, ice or other natural environmental conditions of climate, vegetation, etc., undisturbed by man.

5. Normal erosion: The gradual erosion of land used by man which does not greatly exceed natural erosion.

6. Rill erosion: An erosion process in which numerous small channels only several inches deep are formed; occurs mainly on recently disturbed soils.

7. Sheet erosion: The removal of a fairly uniform layer of soil from the land surface by wind or runoff water.

FLOOD OR FLOODING
A general and temporary condition of partial or complete inundation of normally dry land areas from:

A. The overflow of inland or tidal waters; and/or

B. The unusual and rapid accumulation or runoff of surface waters from any source.

FLOODWAY
The channel of the watercourse and those portions of the adjoining floodplains which are reasonably required to carry and discharge the regional flood.

FLOODWAY FRINGE
That portion of the regional floodplain located outside of the floodway.

GRASSED WATERWAY
A broad or shallow natural course or constructed channel covered with erosion-resistant grasses or similar vegetative cover and used to conduct surface water.

HIGHWAY DIRECTOR
The Director of the Ohio Department of Highways.

IMPROVEMENTS
Street pavement or resurfacing, curbs, gutters, sidewalks, water lines, sewer lines, storm drains, street lights, flood control and drainage facilities, utility lines, landscaping, and other related matters.

LANDSLIDE
The rapid downward and outward movement of large rock material and/or soil mass under the influence of gravity in which the movement of the soil mass occurs along an interior surface of sliding.

LOCATION MAP (See Vicinity Map)

LOT
A piece or parcel of land occupied or intended to be occupied by a principal building or a group of such buildings and its accessory buildings and uses, and having frontage on an improved public or private street.

A. Corner
A lot abutting upon two (2) or more streets at their intersection or upon two parts of the same street, and in either case forming an interior angle of one hundred thirty-five (135) degrees or less.

B. Double Frontage
A lot having a frontage on two (2) nonintersecting streets, as distinguished from a corner lot.

C. Interior
A lot other than a corner lot.

LOT AREA
The computed area contained within the lot lines.

LOT COVERAGE
That percentage of a lot which, when viewed directly from above, would be covered by a structure or structures, or any part thereof, excluding projecting roof eaves.

LOT FRONTAGE
The distance between the side lot lines, measured by a line drawn parallel with the front lot line at a point of required minimum front yard depth.

LOT LINES

A. Front

A street right-of-way line forming the boundary of a lot. On a corner lot, the street right-of-way line with the least amount of street frontage shall be the front lot line.

B. Rear

The lot line that is most distant from, and is, or is most nearly parallel to, the front lot line. If a rear lot line is less than fifteen (15) feet long, or if the lot comes to a point at the rear, the rear lot line shall be a line at least fifteen (15) feet long, lying wholly within the lot, parallel to the front lot line.

C. Side

A lot line which is neither a front lot line nor a rear lot line. On a corner lot, the street right-of-way line with the greatest amount of street frontage shall be a side lot line.

LOT OF RECORD

A lot which is part of a subdivision, the plot of which has been recorded in the office of the Recorder of Montgomery County; or a parcel of land, the deed to which was of record as of the effective date of these regulations.

MINOR SUBDIVISION

A division of a parcel of land that does not require a plat to be approved by a planning authority according to Section 711.131, of the Ohio Revised Code and of Section 410 of these regulations. Also known as Lot Split.

MONUMENTS

Permanent concrete or iron markers used to establish definitely all lines of the plat of a subdivision, including all lot corners, and points of change in street alignment.

OFFICIAL THOROUGHFARE PLAN

The Official Thoroughfare Plan for Montgomery County, Ohio, establishing the official right-of-way width of major streets, on file in the office of the Recorder of Montgomery County, Ohio, and in the office of the Montgomery County Planning Commission, together with all amendments thereto subsequently adopted.

OPEN SPACE

An area open to the sky which may be on the same lot with a building. The area may include, along with the natural environmental features, swimming pools, tennis courts, any other recreational facilities that the Planning Commission deems permissive. Streets, structures for habitation, and the like shall not be included.

OUT LOT
Property shown on a subdivision plat outside of the boundaries of the land which is to be developed and which is to be excluded from the development of the subdivision.

PAD
A building site prepared by artificial means, including, but not limited to, grading, excavation, or filling, or any combination thereof.

PARKING SPACE, OFF-STREET
For the purpose of these regulations, an off-street parking space shall consist of an area adequate for parking an automobile with room for opening doors on both sides together with properly related access to a public street or alley and maneuvering room, but shall be located totally outside of any street or alley right-of-way.

PERFORMANCE BOND OR SURETY BOND
An agreement by a subdivider or developer with the County for the amount of the estimated construction cost guaranteeing the completion of physical improvements according to plans and specification within the time prescribed by the subdivider's agreement.

PERSON
Any natural person, firm, partnership, association, or corporation, but this definition does not include governmental units.

PLANNED DEVELOPMENT
Planned Development is:

A. Land under unified control, planned and developed as a whole, and

B. In a single development operation or a definitely programmed series of development operations including all lands and buildings, and

C. According to comprehensive and detailed plans which include not only streets, utilities, lots, or building sites and the like, but also site plans and design principles for all buildings as intended to be located, constructed, used, and related to each other; and detailed plans for other uses and improvements on the land as related to buildings; and

D. With a program for provision, operation, and maintenance of such areas, improvements, and facilities necessary for common use by some or all of the occupants of the development, but which will not be provided, operated, or maintained at general public expense.

PLANNING COMMISSION
The Planning Commission of Montgomery County, Ohio.

PLAT
The map, drawing, or chart on which the developer's plan of subdivision (preliminary) is presented to the Planning Commission for approval and, after such approval, to the County Recorder (final) for recording.

PUBLIC WAY
An alley, avenue, boulevard,bridge, easement, expressway, freeway, highway, land, parkway, right-of-way, road, sidewalk, street, subway, tunnel, viaduct, walk, or other ways in which the general public or a public entity have a right, or which are dedicated, whether improved or not.

PUBLIC WATERS
Water within rivers, streams, ditches, and lakes except private ponds and lakes wholly within single properties, or waters leaving property on which surface water originates.

REGIONAL FLOOD
The flood which is representative of large floods known to have occurred generally in the area and reasonably characteristics of what can be expected to occur on a particular stream. The regional flood generally has a flood frequency of approximately 100 years as determined by an analysis of floods on a particular stream and other streams in the same general region.

REGIONAL FLOODPLAIN OR FLOODPLAIN
The area inundated by the regional flood (100 Year Frequency Flood). This is the floodplain area which shall be regulated by the standards and criteria of these regulations.

REGIONAL FLOOD PROTECTION ELEVATION
The elevation of regional flood plus one foot of freeboard to provide a safety factor.

RIGHT-OF-WAY
A strip of land taken or dedicated for use as a public way. In addition to the roadway, it normally incorporates the curbs, lawn strips, sidewalks, lighting, and drainage facilities, and may include special features (required by the topography or treatment) such as grade separation, landscaped areas, viaducts, and bridges.

SEDIMENT
Solid material both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by wind, water, gravity, or ice, and has come to rest on the earth's surface above or below sea level.

SEDIMENT BASIN
A barrier, dam, or other suitable detention facility built across an area of waterflow to settle and retain sediment carried by the runoff waters.

SEDIMENT CONTROL PLAN
A written description, acceptable to the approving agency, of methods for controlling sediment pollution from accelerated erosion on a development area of five or more contiguous acres or from erosion caused by accelerated runoff from a development area of five or more contiguous acres.

SEDIMENT POLLUTION
Failure to use management or conservation practices to abate wind or water erosion of the soil or to abate the degradation of the waters of the state by soil sediment in conjunction with land grading, excavating, filling, or other soil-disturbing activities on land used or being developed for non-farm commercial, industrial, residential, or other non-farm purposes.

SETBACK LINE
A line parallel to the street right-of-way line at any story level of a building and representing the distance which all or any part of the building is to be set back from said right-of-way.

SEWERS, SANITARY, CENTRAL OR GROUP
An approved sewage disposal system which provides a collection network and disposal system and central sewage treatment facility for a single development, community, or region.

SEWERS, SANITARY, ON-SITE
A septic tank or similar installation on an individual lot which utilizes an aerobic bacteriological process or equally satisfactory process for the elimination of sewage and provides for the proper and safe disposal of the effluent, subject to the approval of health and sanitation officials having jurisdiction.

SEWERS, STORM
A sewer that carries storm water and surface water, street wash and other wash waters, or drainage, but excludes domestic waste water and industrial wastes. Also called a storm drain.

SIDEWALK
That portion of the road right-of-way outside the roadway, which is improved for the use of pedestrian traffic. (See Walkway)

SLIP
Landslide as defined above.

SLOUGHING
A slip or downward movement of an extended layer of soil resulting from the undermining action of water or the earth-disturbing activity of man.

SOIL LOSS
Soil relocated on or removed from a given site by the forces of erosion and the redeposit of the soil at another site on land or in a body of water.

STORM FREQUENCY
The average period of time within which a storm of a given duration and intensity can be expected to be equaled or exceeded.

STREAM
A body of water running or flowing on the earth's surface or channel in which such flow occurs. Flow may be seasonally intermittent.

STREET, PRIVATE
A paved street a minimum of 24 feet in width which is maintained by a homeowner's association or a similar private organization.

SUBDIVIDER (See Developer)

SUBDIVISION

A. The division of any parcel of land shown as a unit or as contiguous units on the last preceding tax list and duplicate of real and public utility property, into two (2) or more parcels, sites, or lots any one of which is less than twenty (20) acres for the purpose, whether immediate or future, of transfer of ownership, provided, however, that the following are exempt:

    1. A division or partition of land into parcels of more than 20 acres not involving any new streets or easements of access.

2. The sale or exchange of parcels between adjoining lot owners, where that sale or exchange does not create additional building sites.

3. Parcels of land to be used only for agricultural or personal recreational purposes. On the presentation of a conveyance of such a parcel, the Planning Commission=s designated representative shall stamp the conveyance Ano approval of plat required under R.C. 711.133; for agricultural or personal recreational use only.@

B. The improvement of one or more parcels of land for residential, commercial, or industrial structures or groups of structures involving the division or allocation of land for the opening, widening, or extension of any public or private street or streets except private streets serving industrial structures; or involving the division or allocation of land as open spaces for common use by owners, occupants, or lease holders, or as easements for the extension and maintenance of public or private sewer, water, storm drainage or other similar facilities. (See Minor Subdivision)

SURVEYOR
A registered land surveyor in the State of Ohio.

TERRAIN CLASSIFICATION
Terrain within the entire area of the preliminary plat is classified as level, rolling, hilly, or hillside for street design purposes. The classifications are as follows:

A. "Level" is that land which has a cross slope range of four (4) percent or less.

B. "Rolling" is that land which has a cross slope range of more than four (4) percent but not more than eight (8) percent.

C. "Hilly" is that land which has a cross slope range of more than eight (8) percent but not more than fifteen (15) percent.

D. "Hillside" is that land which has a cross slope range of more than fifteen (15) percent.

THOROUGHFARE, STREET, OR ROAD
The full width between property lines bounding every public way of whatever nature, with a part thereof to be used for vehicular traffic and designated as follows:

A. Alley: A minor street used primarily for vehicular service access to the back or side of properties abutting on another street.

B. Arterial Street: A general term denoting a highway primarily for through traffic, carrying heavy loads and large volume of traffic, usually on a continuous route.

C. Collector Street: A thoroughfare,whether within a residential, industrial, commercial, or other type of development, which primarily carries traffic from local streets to arterial streets, including the principal entrance and circulation routes within residential subdivisions.

D. Cul-de-sac: A local street with one end open to traffic and the other end terminating in a vehicular turnaround.

E. Dead-end Street: A street temporarily having only one outlet for vehicular traffic and intended to be extended or continued in the future.

F. Local Street: A street primarily for providing access to residential, commercial, or other abutting property.

G. Loop Street: A type of local street, each end of which terminates at an intersection with the same arterial or collector street, and whose principal radius points of the one hundred and eighty (180) degree system of turns are not more than one thousand (1 ,000) feet from said arterial or collector street, nor normally more than six hundred (600) feet from each other.

H. Marginal Access Street: A local or collector street, parallel and adjacent to an arterial or collector street, providing access to abutting properties and protection from arterial or collector streets. (Also called Frontage Street)

TOPSOIL
Surface and upper surface soils which presumably are darker colored, fertile soil materials, ordinarily rich in organic matter or humus debris.

VARIANCE
A variance is a modification of the strict terms of the relevant regulations where such modification will not be contrary to the public interest and where owing to conditions peculiar to the property and not the result of the action of the applicant, a literal enforcement of the regulations would result in unnecessary and undue hardship.

VICINITY MAP
A drawing located on the plat which sets forth by dimensions or other means, the relationship of the proposed subdivision or use to other nearby developments or landmarks and community facilities and services within Montgomery County in order to better locate and orient the area in question.

WALKWAY
A dedicated public way, for pedestrian use only, whether along the side of a road or not.

WATER RESOURCE:
All streams, lakes, ponds, wetlands, drainage systems, and all other water bodies or accumulations of surface water, natural or artificial, which are situated wholly or partially or borders upon the jurisdiction, except those private waters which do not combine or affect or junction with natural surface waters.

YARD, FRONT

A. Front Yard
An open space extending the full width of the lot between a building and the front lot line, unoccupied and unobstructed from the ground upward except as hereinafter specified.

B. Front Yard (Least Depth)
The shortest distance, measured horizontally, between any part of the building, and the front lot line.

C. Front Yard (Least Depth, How Measured)
Such depth shall be measured from the right-of-way line of the existing street on which the lot fronts; provided, however, that if the proposed location of the right-of-way line of such street as established on the Thoroughfare Plan differs from that of the existing street, then the required front yard least depth shall be measured from the right-of-way line of such street as designated on said Thoroughfare Plan.

YARD, REAR

A. Rear Yard
An open space extending the full width of the lot between a building and the rear lot line.

B. Rear Yard (Least Depth)
The average distance measured horizontally between any part of a building and the nearest rear lot line.

YARD, SIDE

A. Side Yard
An open space extending from the front yard to the rear yard between a building and the nearest side lot line.

B. Side Yard (Least Width)
The shortest distance, measured horizontally, between any part of a building, other than such parts hereinafter excepted, and the nearest side lot line.

C. Side Yard (Least Width, How Measured)

Such width shall be measured from the nearest side lot line.On a corner lot when the side lot line is a side street lot line, the required side yard shall be the same as the required front yard of the lot adjacent thereto.

Article 3

the preliminary plan

SECTION 301 **GENERAL**

Prior to the preparation of the preliminary plan, the subdivider should seek the assistance of the Commission in order that he may become familiar with subdivision requirements and with the proposals of the Official Thoroughfare Plan for Montgomery County, Ohio, affecting the territory in which the proposed subdivision is located.

The purpose of the preliminary plan is to show, all the facts which may enable the Commission to determine whether the proposed layout of the land is satisfactory from the standpoint of public interest. The plan shall be prepared by a registered surveyor or engineer and shall conform to the "Minimum Standards for Boundary Surveys in the State of Ohio."

SECTION 302 **SUBMISSION TO STATE HIGHWAY DIRECTOR**

Before any plat is approved affecting any land within three hundred (300) feet of the centerline of a proposed new highway or a highway for which changes are proposed as described in the certification to local officials by the State Highway Director of any land within a radius of five hundred (500) feet from the point of intersection of said centerline with any public road or highway, the Commission shall give notice, by registered or certified mail to the Highway Director. The Commission shall not approve the plat for one hundred and twenty (120) days from the date the notice is received by the Highway Director. If the Highway Director notifies the Commission that he shall proceed to acquire the land needed, then the Commission shall refuse to approve the plat. If the Highway Director notifies the Commission that acquisition at this time is not in the public interest or upon the expiration of the one hundred and twenty (120) day period or any extension thereof agreed upon by the Highway Director and the property owner, the Commission shall, if the plat is in conformance with all provisions of these regulations, approve the plat.

SECTION 303 **APPLICATION FOR PRELIMINARY APPROVAL**

An application on approved forms for the approval of the preliminary plat, together with copies, as determined by the Planning Commission of the preliminary plat and the supplementary information shall be submitted to the Planning Commission.

SECTION 304 **PRELIMINARY PLAT FORM**

The preliminary plat shall be drawn at a scale not less than one hundred (100) feet to the inch.

SECTION 305 **PRELIMINARY PLAT CONTENTS**

The preliminary plat shall contain the following information:

A. Proposed name of the subdivision, which shall not duplicate or closely approximate the name of any other subdivision in the County.

B. Location by section, range, and township or other surveys.

C. Names, addresses and phone numbers of the owner, subdivider, and professional engineer and registered surveyor who prepared the plat, and appropriate registration numbers and seals.

D. Date of survey.

E. Scale of the plat, north point.

F. Boundaries of the subdivision and its acreage.

G. Names of adjacent subdivisions, owners of adjoining parcels of unsubdivided land, and the location of their boundary lines.

H. Locations, widths, and names of existing streets, railroad rights-of-way, easements, parks, permanent buildings, and corporation and township lines; location of wooded areas and other significant topographic and natural features within and adjacent to the plat for a minimum distance of two hundred (200) feet.

I. Zoning classification of the tract and adjoining properties and a description of proposed zoning changes, if any.

J. Existing contours at two (2) foot intervals for predominant ground slopes within the subdivision between level and ten (10) percent grade and five (5) foot intervals for predominate ground slopes within the subdivision over ten (10) percent grade.

K. Location and size of existing sewers, water lines, culverts, bridges and other underground structures, and power transmission poles and lines within and adjacent to the tract.

L. Location, names, and widths of proposed streets (including pavement width) and easements.

M. Building setback lines with dimensions.

N. Location and dimensions of all proposed utility and sewer lines, showing their connections with the existing system.

O. All thoroughfares as shown on the Official Thoroughfare Plan wherever they traverse the plat.

P. Layout, numbers, and approximate dimensions of each lot. When a lot is located on a curved street or when side lot lines are not at ninety (90) degree angles, the width at the property line shall be shown.

Q. Parcels of land in acres to be reserved for public use or to be reserved by covenant for residents of the subdivision.

R. A vicinity map at a scale of not less than one thousand (1,000) feet to the inch shall be shown on, or accompany, the preliminary plat. This map shall show all existing subdivisions, roads, and tract lines and the nearest existing thoroughfares. It shall also show the most advantageous connections between the roads in the proposed subdivision and those of the neighboring areas.

S. A supplemental sheet containing the following:

1. Any anticipated exceptions to the subdivision design standards.

2. Sight distance from the intersection of any new road with an existing road.

3. A statement of which of the following drainage runoff conditions will be present with development of the site.

a. The rate of post development runoff less than or equal to the rate of pre-development runoff. In this case reference shall be made as to how the drainage structures (retention pond, detention basin, etc), if any, are to be

maintained, that is, Homeowner's Association, ditch petition, park district, etc.

b. The rate of post development runoff greater than the rate of pre-development runoff. In this case a statement shall be included to indicate whether or not any downstream improvement to increase capacity, prevent erosion, etc., are anticipated.

SECTION 306 **SUPPLEMENTARY INFORMATION**

The following information shall be supplied in addition to the requirements in Section 305:

A. Statement of the proposed use of the lots, giving type and number of dwelling units and type of business or industry.

B. Location and approximate dimensions of all existing buildings.

C. For office, commercial and industrial developments the points of vehicular ingress and egress to the development along any street shown on the thoroughfare plan.

D. Description of proposed covenants and restrictions.

E. In a letter accompanying the request for approval of the preliminary plat, the subdivider shall state the type of sewage disposal he proposes to use.

F. Flood Prone Areas:

1. Regional flood elevations and boundaries of flood prone areas as defined in Section 702 including floodways if known. Base flood elevation data shall be provided for subdivision proposals and other proposed development which contain at least 50 lots or 5 acres (whichever is less).

2. Layout of and elevation of proposed roads, alleys, and public crosswalks, and widths noted; road grades and cross sections.

3. Preliminary plan of on-site waste disposal systems or sanitary sewers with grade, pipe size and points of discharge.

4. Proposed fill or other structure elevating techniques, levees, channel modifications, sea walls, and other methods to overcome flood or erosion-related hazards.

SECTION 307 FILING

The preliminary plan shall be considered officially filed after it is examined by the Executive Director of the Commission and is found to be in full compliance with the formal provisions of these regulations. Any variation from this requirement must be approved in writing by the Executive Director.

SECTION 308 PUBLIC HEARING

The Planning Commission on its own initiative prior to acting on a preliminary plat of a subdivision, may hold a public hearing thereon at such time and upon such notice as the Commission may designate.

SECTION 309 APPROVAL OF PRELIMINARY PLAT

The Planning Commission shall forward copies of the preliminary plat to such officials and agencies as may be necessary for the purpose of study and recommendation. These shall include at least the County Engineer, County Sanitary Engineer, and the Montgomery County Combined General Health District. After receipt of reports from such officials and agencies, the Planning Commission shall determine whether the preliminary plat shall be approved, approved with modifications or disapproved. The Commission decision shall be in writing and shall be issued within 35 business days after the submission of the preliminary plan to the Commission. The decision of the Commission is preliminary to and separate from the Commission=s decision on the final plat as required in Article 4.

SECTION 310 APPROVAL PERIOD

The approval of the preliminary plat shall be effective for a maximum period of twelve (12) months unless the first section has been filed for final approval. If no subsequent sections are filed within three (3) years from the recording of the previous sections, the approval of the remainder of the Preliminary Plat is no longer effective.

Article 4

the final plan

SECTION 401 **FINAL PLAT REQUIRED**

The subdivider, having received approval of the preliminary plat of the proposed subdivision shall submit a final plat of the subdivision and drawings and specifications of the improvements required therein. The final plat shall have incorporated all changes in the preliminary plat required by the Planning Commission. Otherwise It shall conform to the preliminary plat, and it may constitute only that portion of the approved preliminary plat which the subdivider proposes to record and develop at the time. The final plat and the supplementary information shall be prepared by a qualified registered engineer or surveyor and shall conform to the minimum standards for boundary surveys in the State of Ohio.

SECTION 402 **APPLICATION FOR APPROVAL OF FINAL PLAT**

An application for approval for the final plat shall be submitted on forms provided by the Planning Commission, together with copies of the plat as specified and the supplementary information shall be submitted to the Planning Commission.

SECTION 403 **REGULATIONS GOVERNING IMPROVEMENTS**

The following rules apply to subdivision improvements and performance guarantees:

A. The final plat drawings and specifications of improvements shall be a set of construction drawings, general block grading plans, utility plans and drainage plans prepared by a registered professional engineer licensed to practice in the State of Ohio. The Construction drawings shall be on 24" x 36" plan sheets with 1" = 40' horizontal and 1" = 6' vertical scales.

B. The plans shall indicate typical sections, plans and profile views, construction details and estimates of quantities. All typical sections and major engineering details to be used on any particular street shall be approved in advance by the County Engineer before completion of the plans.

C. Prior to the granting of approval of the final plat, the subdivider shall have installed the minimum required

improvements, or shall have furnished a bond, certified check or irrevocable letter of credit for the amount of the estimated construction cost of the ultimate installation.

D. Before the surety is accepted, it shall be approved by the proper administrative officials.

E. The improvements shall be constructed within a reasonable time as determined by the County Engineer, but not to exceed two (2) years.

F. All required subdivision improvements shall be maintained in a satisfactory condition by the subdivider during any interim period between this construction and final approval and acceptance of the subdivision by the County.

G. Approval by the County Engineer and/or the County Planning Commission does not relieve the developer and his design engineer from full responsibility of their design.

SECTION 404 **FINAL PLAT FORM**

The final plat shall be legibly drawn in waterproof ink on tracing cloth or other material of equal permanence. It shall be drawn at a scale not less than one hundred (100) feet to the inch, shown both written and graphics, and shall be one or more sheets 24 x 36 inches in size (Polyester Film, Single Matte, sheet thickness 3 mil.). If more than one sheet is needed, each sheet shall be numbered and the relation of one sheet to another clearly shown. The minimum lettering height shall be 3/32 in. and all lot dimensions shall be 1/8 in. or larger. Lot number lettering height shall be 1/4 in. or larger and underlined or circled.

SECTION 405 **FINAL PLAT CONTENTS**

The final plat shall contain the following information:

A. Name of the subdivision (shall not duplicate or closely resemble the name of any other subdivision in the County), location by section, town, range and township, or by other survey number, date, north arrow and basis of bearing, acreage to hundredths of an acre (total lot acreage and total street acreage) and deed book and page reference.

B. Name and address of the subdividers, and the professional engineer and/or registered surveyor who prepared the plat and appropriate registration numbers and seals.

C. The total area being platted shall include all perimeter courses and be outlined by a red lined border. Courses are to be listed in a clockwise direction. All dimensions, both lineal and angular shall be determined by an accurate control survey in the field. The error of closure shall conform to Rule 4733-37-04 of the Ohio Administrative Code.

D. Bearings and distances to the nearest centerline of intersecting roads or the intersection of right of way lines; lot corners of recorded plat with plat reference; or Section Corner or Quarter Section Corner.

E. Names, exact location, dimensions and right-of-way width of all streets and railroads within and adjoining the plat and building set back lines. Street names shall be approved by the Montgomery County Planning Commission.

F. Radii, internal angles, points of curvature, tangent bearings, lengths of arcs, of all applicable streets within the plat area.

G. The exact locations, dimensions and uses of all easements shall be illustrated on the plat.

H. All lots accurately dimensioned in feet and hundredths with lot numbers and acreage. The lot numbers shall be consecutive for each platted section and shall be placed in the center of the lot with acreage under the lot number. Replatted lots shall illustrate old lot numbers and lot lines dotted on the map.

I. Accurate location and a description of all monuments as to type, size, and whether the monument was found or set. If a monument has been omitted or offset, a notation shall appear on the plat indicating the reason for the omission; or if it has been offset, its true location in relation to the property corner or lot corner shall be noted.

J. Accurate outlines of areas to be dedicated or reserved for public use, or any area to be reserved for the common use of all property owners. The use and accurate boundary locations shall be shown for each parcel of land to be dedicated.

K. Any restrictions and covenants shall be shown on the final plat.

L. Certification shall contain the following:

1. The total acres being subdivided;
2. Current ownership; and
3. Deed reference.

M. Acknowledgment of the owner or owners to the plat and restrictions, including dedications to public use of all public streets, alleys, parks or other open spaces shown thereon and the granting of the required easements, as shall be indicated by, the following statement on the plat tracing: "Easements shown on this plat are for the construction, operation, maintenance, repair, replacement or removal of water, gas, sewer, electric, telephone, or other utilities or services, and for the express privilege of removing any and all trees or other obstructions to the free use of said utilities and for providing of ingress and egress to the property for said purposes, and are to be maintained as such forever."

N. The names of record of all abutting parcels with deed reference, acreage and survey record reference (if applicable). Platted land shall show the name of the subdivision, lot numbers, plat book and page reference.

O. Any section lines, corporation limits, township and county lines shall be accurately documented and located on the plat and their names lettered thereon.

P. Location of permanent facilities and easements for same used for drainage control such as detention ponds, retention ponds, infiltration beds, etc., and a statement of the provisions for the maintenance of these facilities.

Q. Every plat shall be superimposed on a survey of the lands of the dedicators from which such plat is drawn, and shall contain an accurate background drawing of any metes and bounds descriptions of the lands of the dedicators from which such plat is drawn.

SECTION 406 SUPPLEMENTARY INFORMATION

The following information shall be supplied in addition to the requirements in Section 405:

A. If a zoning change is involved, certification from the County or Township Zoning Inspector shall be required indicating that the change has been approved and is in effect.

B. Certification shall be required showing that all required improvements have been either installed and approved by the proper officials or agencies, or that a bond or other surety has been furnished assuring installation and initial maintenance of the required improvements.

C. In flood prone areas the subdivider shall provide information detailing how the structures will be protected from flood hazard.

D. The Planning Commission may require the applicant to submit additional topographic information, detailed plans for proposed uses and other information to determine possible flood or erosion hazards, the effect of the subdivision uses upon flood flows, and the adequacy of proposed flood protection measures. The Planning Commission may consult with expert persons or agencies for technical assistance and advice.

SECTION 407 **FILING**

The final plat shall be filed with the Planning Commission not later than twelve (12) months after the date of approval of the preliminary plat; otherwise it will be considered void unless an extension is requested by the developer and granted in writing by the Planning Commission.

SECTION 408 **APPROVAL OF FINAL PLAT**

The Planning Commission shall approve, grant conditional approval, or disapprove the final plat within thirty (30) calendar days after the submission of the Final Plat, or within such further time as the applicant may agree to in writing. Failure of the Commission to act upon the final plat within such time shall be deemed as approval of the plat.

The Planning Commission may grant conditional approval to a plat by requiring the applicant to alter the plat or any part of it,within one hundred twenty days after the end of the thirty calendar days as a condition for final approval. Once all the conditions have been met, the Commission shall endorse its final approval on the plat.

No plat shall be recorded until it is endorsed with the Planning Commission=s final approval.

The ground of refusal of approval of any plat, including citation of or reference to the rule violated by the plat, shall be stated upon the record of the Planning Commission. Within sixty calendar days after the refusal, the applicant may fill a petition in the court of Common Pleas of Montgomery County.

SECTION 409 **TRANSMITTAL OF PLAT AND RECORDING**

When the final plat has been approved by the Planning Commission and signed by the Executive Director, or his designee, the original tracing shall be recorded in the office of the Recorder of Montgomery County, Ohio. The recording shall take place within sixty (60) days after the date of approval, otherwise the plat approval shall be void unless an extension is granted. At the request of the subdivider, the Executive Director or his designee may extend the approved period for an additional sixty (60) days beyond the original sixty (60) day expiration date if he finds that there are reasonable circumstances for the delay in recording and that the applicable Subdivision Regulations have not changed since the original approval. Plats that must be changed or plats that are not recorded within one hundred and twenty (120) days of the approval date will be kept in the active file for one (1) year after the original approval date and may be considered for reapproval by the Planning Commission at the request of the subdivider. Plats not recorded within one (1) year of the original approval date will be removed from the active file and must be resubmitted for approval as a new plat including appropriate fees. The Planning Commission may waive this requirement and reapprove plats not recorded within one year if the construction drawings have been approved and construction has begun within one year of the original approval.

SECTION 410 **MINOR SUBDIVISION (Lot Split)**

Approval without a plat of a minor subdivision may be granted by the Planning Commission or its designated agent if the proposed division of a parcel of land meets all of the following conditions:

A. Lots less than 5 acres.

1. The proposed subdivision is located along an existing public road and involves no opening, widening or extension of any street or road, and in the case of residential lots, does not involve an easement of access.

2. There are no more than five (5) lots approved without a plat from the original tract as that original tract exists on the effective date of this amendment to the Regulations (BCC . No. 05-2216, December 15, 2005, and P.C. Res. No. 1, January 27, 2006.

3. The proposed subdivision is not contrary to applicable subdivision, zoning, health, sanitary, access management, flood damage prevention regulations, or rules governing household sewage disposal systems.

4. The physical characteristics of the property are suitable for building sites.

5. There is no division or allocation of land for parks and open spaces as required by Section 521 of these regulations.

6. The division of land does not require easements for the extension and maintenance of public sewer, water, storm drainage or other public facilities.

B. Lots containing at least 5 acres but no more than 20 acres.

1. The proposed subdivision is located along an existing road and involves no opening, widening or extension of any street or road, and in the case of agricultural or residential lots, does not involve an easement of access.

2. The proposed subdivision is not contrary to applicable zoning, health, sanitary, access management regulations, surface or subsurface drainage, including, but not limited to rules governing household sewage disposal systems.

3. The lot depth shall not be greater than 5 times the lot width.

SECTION 411 APPLICATION FOR APPROVAL OF A MINOR SUBDIVISION

An application for approval of the Minor Subdivision shall be submitted on forms provided by the Planning Commission, together with copies of the Minor Subdivision Plan and any required supplementary information.

SECTION 412 MINOR SUBDIVISION PLAN

Prior to receiving consideration for a Minor Subdivision, the subdivider shall prepare and submit a Minor Subdivision Plan consisting of the following elements:

A. A survey drawn by a registered professional surveyor; and

B. Deeds for the proposed minor subdivision with a legal description.

SECTION 413 MINOR SUBDIVISION PLAN CONTENTS

A. Name of the subdivider, location by section, range and township or by other survey number, date, north point, scale, and acreage to hundredths of acre.

B. Abutting streets.

C. Existing buildings, septic facilities and wells if applicable.

SECTION 414 SUPPLEMENTARY INFORMATION

Any of the following information may be required by the Commission on the basis of the characteristics of the subject property.

A. Lot grading and drainage plan, illustrating a plan for the handling of surface and subsurface

drainage, showing proposed finished grade elevations, the type, size, location and outlet of all existing and proposed drainage systems, swales, easements, and the proposed ground cover.

B. Approval by the Health Department if on-site sewage disposal systems are being proposed.

C. Evidence that adequate potable ground water is available if the property is not served by sewer and water. This will require a well on each lot that generate at least five gallons a minute for six continuous hours of pumping.

D. A statement from the proper authorities that a tap-in is permitted if the property is served by public sewer and water.

E. 100 Year floodplain elevations and delineations.

F. Other information as deemed necessary by staff in order to create building sites and promote the public health, safety and welfare.

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SECTION 415 APPROVAL OF A MINOR SUBDIVISION CONTAINING LOTS LESS THAN 5 ACRES

If approval is given under these provisions, the Planning Commission shall, within seven (7) working days after submission, approve such proposed division and, upon presentation of a conveyance for said parcel, shall stamp "Approved by the Montgomery County Planning Commission: No Plat Required" and the authorized representative of the Commission shall sign the Conveyance.

If the proposed division is disapproved the subdivider shall be notified in writing within seven (7) working days after the submission.

SECTION 416 APPROVAL OF A MINOR SUBDIVISION HAVING LOTS CONTAINING A LEAST 5 ACRES BUT NOT MORE THAN 20 ACRES

A. For proposed divisions into not more than six separate parcels, approval shall be within seven calendar days after submission of all required documentation.

B. For proposed divisions into more than six separate parcels but less than 15 separate parcels, approval shall be within fourteen calendar days after submission of all required documentation.

C. For proposed divisions into fifteen parcels or more, approval shall be within twenty-one calendar days after submission of all required documentation.

Article 5

subdivision design standards

SECTION 501 **GENERAL STATEMENT**

The regulations in Sections 502 to 521, inclusive, shall control the manner in which streets, lots, and other elements of a subdivision are arranged on the land. These design controls shall help insure convenient and safe streets, creation of usable lots, provision of space for public utilities, and reservation of land for recreational uses. For design elements not specifically addressed in these regulations, refer to The Ohio Department of Transportation, Location and Design Manual, Volume One Roadway Design. The planning of attractive and functional neighborhoods shall be promoted, minimizing the undesirable features of unplanned, haphazard growth.

The Planning Commission has the responsibility for reviewing the design of each future subdivision early in its design development. The Commission shall insure that all of the requirements of Sections 502 to 521, inclusive, are met.

SECTION 502 **CONFORMITY TO DEVELOPMENT PLANS AND ZONING**

The arrangement, character, width, and location of all thoroughfares or extensions thereof shall conform with the County's Major Thoroughfare Plan. Thoroughfares not contained in the aforementioned plan shall conform to the recommendation of the Planning Commission based upon the design standards set forth in Sections 503 to 514, inclusive. In addition, no final plat of land within the area in which an existing zoning resolution is in effect shall be approved unless it conforms with such resolution.

SECTION 503 **SUITABILITY OF LAND**

If the Planning Commission finds that land proposed to be subdivided is unsuitable for subdivision development due to flooding, bad drainage, topography, inadequate water supply, schools, transportation facilities, and other such conditions which may endanger health, life, or property; and, if from investigations conducted by the public agencies concerned, it is determined that in the best interest of the public the land should not be developed for the purpose proposed, the Commission shall not approve the land for subdivision unless adequate methods are advanced by the subdivider for solving the problems that will be created by the development of the land.

SECTION 504 **STREET DESIGN**

The arrangement, character, extent, width, grade construction, and location of all streets shall conform to the Official Major Thoroughfare Plan for Montgomery County, or subsequent amendments thereto, and shall be considered in their relation to existing and planned streets, topographical conditions, and public convenience and safety; and in their appropriate relation to the proposed uses of the land to be served by such streets. The street pattern shall discourage through traffic in the interior of a subdivision. The subdivider shall provide within the boundaries of the subdivision plat, the necessary right-of-way for the widening, continuance, or alignment of such streets in conformity with the Official Thoroughfare Plan.

SECTION 505 **STREET DESIGN STANDARDS FOR CUL-DE-SACS AND LOOP TYPE LOCAL STREETS**

The design and improvement standards contained herein are suggested minimums for cul-de-sacs and loop type local streets in residential subdivisions. All such streets shall be designed and constructed in accordance with standards as specified in Table 1.

SECTION 506 **STREET DESIGN STANDARDS FOR ALL LOCAL STREETS EXCEPT CUL-DE-SACS AND LOOP TYPE STREETS**

The design and improvement standards contained herein are suggested minimums for all local type streets, except cul-de-sacs and loop type streets, in residential subdivisions. All such streets shall be designed and constructed in accordance with the standards as specified in Table 2.

SECTION 507 **COLLECTOR STREET DESIGN STANDARDS**

The design and improvement standards contained herein are suggested minimums for all collector streets. All such streets shall be designed and constructed in accordance with the standards as specified in Table 3. Minimum design speed for such streets shall be 35 mph and may be higher if so determined by the County Engineer's Office.

SECTION 508 **OFFICIAL THOROUGHFARE DESIGN STANDARDS**

A. The design standards of and the required improvements to streets and roads, as shown on the Official Thoroughfare Plan are contained in Tables 1 thru 4. Construction design criteria on these streets are not specified in these regulations but are to be determined by the County Engineer when and if such a street abuts or crosses the proposed subdivision. Certain

improvements may be waived after review and approval by the Planning Commission. In all cases right-of-way dedications shall be required.

B. The subdivider shall be responsible for all required improvements including sidewalk, curb, storm drainage, traffic control devices and the required pavement width when the streets lie within the subdivision. On divided streets, left turn lanes shall be provided at all median openings.

C. When developing along one side of an existing street or roadway which is included in the Official Thoroughfare Plan, the subdivider shall be responsible for one sidewalk, one curb, pavement widening to thoroughfare width of his side, all necessary adjustments to existing pavement, and storm drainage for the street in accordance with an agreement with the County Engineer. Where sight distance or other engineering requirements make it imperative, the pavement adjustment responsibility shall include the replacement of up to the entire existing pavement.

SECTION 509 HORIZONTAL ALIGNMENT

When there is an angle between two (2) centerline tangent sections of a street, a curve of adequate radius and proper super elevation shall connect them. Between reverse curves, a minimum tangent of one hundred (100) feet shall be introduced for local street design. For streets other than local streets, the minimum tangent between reverse curves shall be determined by the County Engineer in accordance with the latest recommendations of the American Association of State Highway and Transportation Officials (AASHTO) in effect on the date of the approval of the preliminary plat. Adequate safe stopping sight distance shall be provided for in accordance with Table 6.

SECTION 510 VERTICAL ALIGNMENT

A. The minimum vertical sight distance shall conform to Table 6.

B. No street grade shall be less than 0.5 percent and on stop streets grades shall not exceed 2 percent positive or 3 percent negative within a distance from the intersection of one hundred (100) feet plus one-half (1/2) of the intersecting street right-of-way width, unless otherwise approved by the County Engineer.

TABLE 1

STREET DESIGN STANDARDS FOR CUL-DE-SACS AND LOOP TYPE STREETS IN RESIDENTIAL SUBDIVISIONS

TERRAIN CLASSIFICATION	Level			Rolling			Hilly		
Development Density	**Low**	**Med**	**High**	**Low**	**Med**	**High**	**Low**	**Med**	**High**
Right-of-Way Width (ft)	50	50	60	50	50	60	50	50	60
Pavement Width (ft) *	27	27	37	27	27	37	27	27	37
Sidewalk Width (ft)	4	4	4	4	4	4	4	4	4
Maximum Grade	4%	4%	4%	8%	8%	8%	10%	10%	10%
Maximum Cul-de-Sac Length	700	500	500	600	500	500	500	500	500
Minimum Cul-de-Sac Radius (ROW)	50	50	50	50	50	50	50	50	50
Minimum Cul-de-Sac Radius (Pavement)	38½	38½	38½	38½	38½	38½	38½	38½	38½
Minimum Centerline Radius of Streets with an Angle of Turn of:									
1. Between 80 and 100	90	90	90	90	90	90	90	90	90
2. Less than 80 or More than 100	200	200	200	200	200	200	150	150	150

* Pavement from back of curb to back of curb.

TABLE 2

STREET DESIGN STANDARDS FOR ALL LOCAL STREETS EXCEPT CUL-DE-SACS AND LOOP TYPE STREETS IN RESIDENTIAL SUBDIVISIONS

TERRAIN CLASSIFICATION	Level			Rolling			Hilly		
Development Density	**Low**	**Med**	**High**	**Low**	**Med**	**High**	**Low**	**Med**	**High**
Right-of-Way Width (ft)	50	50	60	50	60	60	50	50	60
Pavement Width (ft) *	29	29	37	29	37	37	27	27	37
Sidewalk Width (ft)	4	4	4	4	4	4	4	4	4
Maximum Grade	4%	4%	4%	8%	8%	8%	10%	10%	10%
Minimum Centerline Radius of Streets with an Angle of Turn of:									
1. Between 80 and 100	90	90	90	90	90	90	90	90	90
2. Less than 80 or More than 100	200	200	200	200	200	200	150	150	150

* Pavement from back of curb to back of curb.

TABLE 3

COLLECTOR STREET DESIGN STANDARDS

TERRAIN CLASSIFICATION	**Level**			**Rolling**			**Hilly**		
Development Density	**Low**	**Med**	**High**	**Low**	**Med**	**High**	**Low**	**Med**	**High**
Right-of-Way Width (ft)	60	60	60	60	60	60	60	60	60
Pavement Width (ft) *	37	37	37	37	37	37	37	37	37
Sidewalk Width (ft)	5	5	5	5	5	5	5	5	5
Maximum Grade	4%	4%	4%	8%	8%	8%	10%	10%	10%
Minimum Centerline Radius	350	350	350	350	350	350	350	350	350

***** Pavement from back of curb to back of curb.

TABLE 4

THOROUGHFARE STREET DESIGN STANDARDS*

R/W Width (Ft)	**Sidewalks (Ft)**	**Planting Strip (Ft)**	**Median (Ft)**	**Total Pavement Width (Ft)**
70	5	10	None	40
82	5	4.5	14	63
90	5	7.5	16	65
110	5/10	10.25	14	69.5
120	5	10.5	16	89

***** Pavement widths and other dimensions in this table based on back-to-back curb measurements.

NOTE: All medians 4 ft. or less in width must be concrete.

TABLE 5

INTERSECTION DESIGN STANDARDS

TERRAIN CLASSIFICATION Development Density	Level All Densities	Rolling All Densities	Hilly All Densities
Vertical Alignment with Intersection	Flat	2% (max)	4% (max)
Minimum Angle of Intersection Streets shall remain in the angle of intersection for a distance from the intersection of 100 ft. plus ½ of the intersecting street right-of-way	75 degrees (90 degrees preferred)		
Minimum Curb Radius (ft) a. Local - local b. Local - collector c. Collector - collector d. Collector, marginal access - arterial	 20 - all cases 25 - all cases 30 - all cases 35 - all cases		

Minimum Centerline Offset:

	BASE STREET		
	LOCAL	**COLLECTOR**	**ARTERIAL**
Arterial to Local	200	400	500
Arterial to Collector	1320	1320	1320
Arterial to Arterial	2640	2640	2640
Collector to Local	200	300	500
Collector to Collector	400	500	1320
Local to Local	150	400	500

TABLE 6

SIGHT DISTANCE CRITERIA

Speed*	Minimum Stopping Sight Distance (Feet)	Minimum Intersection Sight Distance (Feet)	Minimum Rate of Vertical Curvature, K	
			Crest Vertical Curve**	Sag Vertical Curve**
25	155	280	12	26
30	200	335	19	37
35	250	390	29	49
40	305	445	44	64
45	360	500	61	79
50	425	555	84	96
55	495	610	114	115
60	570	665	151	136
65	645	720	193	157
70	730	775	247	181

***** 85th Percentile Speed
** Minimum lengths of vertical curves required per location and design manual - Ohio Department of Transportation.

REFERENCES: American Association of State Highway and Transportation Officials
Location and Design Manual - Ohio Department of Transportation

SECTION 511 INTERSECTION AND DRIVEWAY DESIGN STANDARDS

A. Intersection Design Standards

1. The design and improvement standards for intersections are suggested minimums for all street intersections in subdivisions.

   All such intersections shall be designed and constructed in accordance with the standards as specified in Table 5. Intersection sight distance requirements shall be as specified in Paragraph 6 of this Section.

2. Multiple intersections involving junctions of more than two (2) streets shall not be permitted.

3. Four-way intersections of local streets shall be avoided and three-way or T-intersections should be encouraged wherever possible.

4. Individual grades for each curb shall be provided on a Stop street when the grade on the through street exceeds two (2) percent.

5. Low points which would result in water ponding or poor sight distance shall not be permitted.

6. Adequate intersection sight distance shall be provided according to Table 6.

7. The centerline bearing for any street must be a straight line through any intersection for a distance of one hundred (100) feet plus one-half (112) of the intersecting street's right-of-way on each side of the intersecting street (no angle points in an intersection).

B. Driveway Design Standards

1. All driveways shall be designed and constructed in accordance with the standards as specified in Table 7 and the Ohio Department of Transportation Location and Design Manual.

2. No new subdivision shall create any parcels zoned for single-family or two-family residential uses fronting on an arterial street (82-120 ROW). Subdividers are encouraged to have all of these lots front on local streets. To the extent possible, lots abutting arterial street rights-of-way should have their back yards face the arterial. This section does not apply to minor subdivisions located outside the Urban Service Boundary as shown on the Montgomery County Comprehensive Plan.

TABLE 7

DRIVEWAY DIMENSIONS

	Residential	Commercial	Industrial
Width[1]			
Minimum[2]	10	15	20
Maximum	30	35	40
Right Turn Radius			
Minimum	5	10	15
Maximum	15	25	35

[1] Maintain for a minimum of 65 feet beyond right-of-way.
[2] The minimum width of commercial driveways is intended to apply to one-way operation.

SECTION 512 SPECIAL STREET TYPES

The following requirements shall apply to special street types:

A. Permanent dead-end streets shall not be permitted. Temporary dead-end streets shall be permitted only as part of a continuing street plan.

B. Dedication of new half-streets shall not be permitted. Where a dedicated or platted half-street exists adjacent to the tract being subdivided, the other half shall be platted.

C. Where a subdivision abuts or contains an existing or proposed arterial street (82-120 ROW) the Planning Commission may require marginal access streets, reverse frontage with screen planting contained in a non-access reservation along the rear property line, or other such treatment as may be necessary for adequate protection Of residential properties and to afford separation of through and local traffic. There shall be no direct vehicular access from residential lots to such arterial streets or highways.

D. Alleys shall not be approved in residential subdivisions, except where justified by extreme conditions. Alleys may be required in commercial and industrial districts if other provisions cannot be made for adequate service access. The minimum widths for alleys shall be twenty (20) feet for the right-of-way and eighteen (18) feet for the pavement width.

SECTION 513 **STREETS FOR COMMERCIAL SUBDIVISIONS**

Streets serving business developments and accessory parking areas shall be planned to connect with arterial streets so as not to generate traffic On local streets. The intersections of driveways from parking areas shall be located so as to cause the least possible interference with traffic movement on the streets, and shall have a driveway throat length of at least 75 feet. Driveways along these streets shall be spaced not less than two hundred (200) feet from each other. Adequate provisions shall be made for the separation of left turn traffic from other traffic. The Commission may require marginal access streets to provide maximum safety and convenience.

SECTION 514 **STREETS FOR INDUSTRIAL SUBDIVISIONS**

Collector streets for industrial subdivisions shall be planned to serve industrial areas exclusively and shall connect with arterial streets so that no industrial traffic will be directed into any residential streets. The intersections of service streets from parking areas shall be located so as to cause the least possible interference with traffic movement on the streets and shall have a driveway throat length of at least 75 feet. Driveways along these streets shall be spaced not less than two hundred (200) feet from each other. Adequate provisions shall be made for the separation of left turn traffic from other traffic.

Streets shall be planned to be extended to the boundaries of any adjoining land planned for industry, except for severe physical conditions or if the Commission finds such extension is not in accord with the approved plan of the area.

SECTION 515 **SIDEWALKS**

A. Sidewalks shall be required along both sides of arterial and collector streets and along both sides of the street in all single-family and two-family residential subdivisions where the predominate lot width is less than eighty (80) feet. In plats having a predominate lot width between eighty (80) feet and one hundred (100) feet, sidewalks shall be required along one side of the street. Sidewalks will not generally be required on cul-de-sac streets less than three hundred (300) feet long unless needed to serve high pedestrian movements. Sidewalks shall be required along both sides of all streets in multi-family subdivisions. In other instances, the Planning Commission may require sidewalks as it deems necessary to provide for the safety of pedestrians.

B. Public sidewalks shall be required for all commercial lots.

C. Public sidewalks may be required for industrial lots, subject to the approval of the Planning Commission.

SECTION 516 BLOCKS

The following regulations shall govern the design and layout of blocks:

A. The arrangement of blocks shall be such as to conform to the street planning criteria set forth in Sections 504 to 515, inclusive, and shall be arranged to accommodate lots and building sites of the size and character required for the district as set forth in these subdivision regulations or the zoning resolution and to provide for the required community facilities.

B. Irregularly shaped blocks, those intended for cul-de-sacs or loop streets, and those containing interior parks or playgrounds, may be approved by the Commission if properly designed and located and if the maintenance of interior public spaces is covered by agreements.

C. No block shall be longer than fifteen hundred (1500) feet and the block width shall accommodate two (2) tiers of lots, except where unusual topography or other exceptional physical circumstances exist.

D. Where blocks are over nine hundred (900) feet in length a crosswalk easement not less than ten (10) feet in width at or near the halfway point may be required, if necessary, to provide proper access to schools, recreational areas, shopping centers, and other facilities.

SECTION 517 LOTS

The following regulations shall govern the design and layout of lots:

A. The lot arrangement and design shall be such that all lots will provide satisfactory building sites, properly related to topography and the character of surrounding development.

B. All lots shall conform to or exceed the requirements of these subdivision regulations and the zoning district requirements for the district in which they are located and the use for which they are intended.

C. Each lot shall have its full frontage on a dedicated and improved street.

D. All side lot lines shall be at right angles to street lines and radial to curved street lines, except where the Commission determines that a variation to this rule would provide a better layout.

E. Lots with double frontage shall be avoided except where the Commission determines that it is essential to provide separation of residential development from arterial streets.

F. No corner lot shall have a width at the building line of less than seventy-five (75) feet.

G. The maximum depth of a lot shall not be greater than three times the width of the lot, except lots which contain an area of five (5) acres or more. Lots containing over five (5) acres shall not be less than three hundred (300) feet in width at any location; they should be of such shape and dimensions as to render the possible resubdivision of any such parcels at some later date into lots and streets which meet the requirements of these regulations.

H. Additional lot depth may be required where a residential lot in a subdivision backs up to a railroad right-of-way, a high pressure gasoline or gas line, open drainage ditch, an arterial street, an industrial area or other existing land use which may have a detrimental effect on the residential use of the property, and where no street is provided at the rear of such lot. Where a residential lot has its side lot line adjacent to any of the aforementioned, an appropriate additional width may also be required.

I. The minimum lot size where public sewer or water is not available shall be one (1) acre with a minimum frontage of two hundred (200) feet.

Where soil conditions are of such nature that proper operation of wells and septic systems may be impaired, the Planning Commission may increase the size of any or all lots in the subdivision.

Where soils are classified as prime agricultural soils as defined in these regulations, or are adjacent to prime agricultural soils, the Planning Commission may permit the alteration of these requirements where the subdivider demonstrates that such alteration is necessary and desirable in order to preserve the prime agricultural soils, provided that the subdivision is not contrary to applicable zoning regulations.

SECTION 518 **EASEMENTS**

A. Utility Easements: Public utility easements at least ten (10) feet in total width may be required along the rear and sides of lots where needed for the accommodation of a public utility, drainage or sanitary structures or any combination of the foregoing. Where deemed necessary by the Planning Commission an additional easement width shall be provided.

B. Watercourses: The subdivider shall dedicate rights-of-way or provide easements for storm drainage purposes which conform substantially with the lines of any natural water-courses, channels, streams, or creeks which traverse the subdivision or for any new channel which is established to substitute for a natural watercourse, channel, stream or creek. Such rights-of-way or easements shall be of a width which will provide for the maintenance needs of the channel and incidental structures as determined by the Planning Commission.

SECTION 519 **PHYSICAL CONDITION**

Natural Land Uses: Subdivisions should be planned to take advantage of the topography of the land, to economize in the construction of drainage facilities, to protect existing field drainage systems, to reduce the amount of danger, to minimize destruction of trees and topsoil and to preserve such natural features as watercourses, unusual rock formations, large trees, sites for historical significance and other assets which, if preserved, will add attractiveness and value to the subdivision and the community. Subdivision designers and developers should coordinate the site layout with the drainage system. The planning of a subdivision should incorporate natural waterways, artificial channels, storm sewers, runoff storage facilities and other drainage works. For design elements not specifically addressed in these regulations, refer to the current Ohio Environmental Protection Agency Construction Permit and the Ohio Department of Natural Resources Rainwater and Land Development book.

SECTION 520 **FLOODPLAIN**

A. As a safety measure for the protection of the health and welfare of the people of Montgomery County, Ohio the Commission shall not approve any subdivision located in areas subject to periodic flooding. If the subdivision is located in said area or an area having other physical impairment, the Commission may approve the subdivision provided the

developer or subdivider agrees to perform such improvements as will render the area substantially safe for development; and further, provide that in lieu of the improvements, the subdivider shall furnish a surety bond or a certified check covering the cost of the required improvement. Prior to acting on a proposed subdivision located in a flood hazard area, the Commission shall secure advice from the Federal Insurance Administration, the Ohio Department of Natural Resources, the Miami Conservancy District or other appropriate agencies.

B. Stream Easement: If a stream flows through, or adjacent to, the proposed subdivision, the plat shall provide for a storm water easement or drainage right-of-way along the stream for a floodway of at least ten (10) feet. For the smaller streams, the plat shall provide for channel improvement to enable them to carry all reasonable floods within banks. The floodway easement shall be wide enough to provide for future enlargement of the stream channels as adjacent areas become more highly developed and runoff rates are increased.

C. Streets: Approval shall not be given for streets within a subdivision which would be subject to flooding. All streets must be located at elevations which will make them flood-free in order that no portion of the subdivision would become isolated by floods.

D. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.

SECTION 521 PUBLIC OPEN SPACES AND SITES

Consideration shall be given to the allocation of areas suitably located and of adequate size for playgrounds, school sites and parks as indicated on the adopted master plan for parks, schools and recreational facilities, and to be made available by one of the following methods:

A. Dedication to Montgomery County, or other public agency duly qualified to accept ownership and maintenance of area.

B. Reservation of land for the use of property owners by deed or covenants.

C. Reservations for acquisition by Montgomery County or other public agency within a period of two (2) years from the approval of the preliminary plan. Said reservation shall be

made in such a manner as to provide for a release of the land to the subdivider in the event Montgomery County, or other public agency duly qualified to accept ownership and maintenance does not proceed with the purchase.

Due regard shall be shown for preserving outstanding natural features such as scenic spots, watercourses or exceptionally fine groves of trees. Dedication to and acceptance by a public agency is usually the best means of assuring their preservation.

SECTION 522 **STORM DRAINAGE CHANNELS**

Any storm drainage channel requiring a capacity greater than that accommodated by a seventy-two (72) inch diameter pipe shall remain as an open channel, except where conditions justify a closed channel. The cross section and profile of said channel and its banks, which shall be paved on the bottom and sides, shall be approved by the County Engineer. At the request of the applicant and their design engineer these requirements may be waived. The reason for this waiver shall be to meet the requirements of the Ohio Environmental Protection Agency Construction Permit, see Section 519. Upon completion of the construction of said drainage channel, an easement for the channel, its banks and an area of adequate width to permit proper maintenance of the channel shall be established and recorded in the office of the County Recorder.

Article 6

requirements for planned development

SECTION 601 **GENERAL**

Planned Developments are separate entities with a distinct character which is intended to be in harmony with surrounding developments. Projects which are designed solely to circumvent these regulations or other applicable zoning resolutions shall not be approved. The project must clearly demonstrate that natural features are being preserved, that amenities are being provided which would enhance the livability of the project and that such attributes of the project could not be achieved with strict adherence to these regulations.

Zoning approval of a Planned Development does not constitute either preliminary or final subdivision approval.

SECTION 602 **STANDARDS**

A major element of the Planned Development is privately owned or publicly owned common property within the development. These developments usually contain such features as an internal park network abutting home sites, recreational facilities, and preservation of natural amenities. A Homeowner's Association should be established to provide for the maintenance of all properties held in common.

Planned Unit Developments may be exempt from the conventional development standards of this resolution only upon proper justification.

The design of internal circulation systems shall be sensitive to such points of safety, convenience, access to dwelling units and nonresidential facilities, separation of vehicular and pedestrian-bicycle traffic, and general attractiveness. Internal streets shall be adequate to carry anticipated traffic and yet provide convenient and safe access. Access for emergency vehicles must be considered.

SECTION 603 **CONFORMITY TO EXISTING STREETS AND THOROUGHFARE PLAN**

Whenever a Planned Development abuts or contains an existing or proposed major thoroughfare the ROW standards as contained in these regulations shall be applicable. If a Planned Development abuts or contains an existing minor residential street it must meet the requirements of these regulations.

SECTION 604 **PRIVATE STREETS**

Private streets maybe permitted in Planned Developments provided they meet the following requirements:

A. A minimum street pavement width of twenty-four (24) feet or of such width the Planning Commission deems necessary for the type of development. The pavement width may be reduced to 18 ft. for small developments consisting of no more than five (5) single family detached residential lots.

   All dead end streets shall have a paved turn-around with a minimum radius of 382 ft. and shall not exceed 800 ft. in length.

B. The minimum access easement shall be 50 feet. This can include easements for utilities.

C. A Homeowner's Association or other appropriate method is established to maintain the street system.

D. Private streets that are subject to the provisions of Section 604E shall comply with the design standards of Article 5 where applicable.

E. Private streets that may become public in the future and any streets that are to be maintained by individual land or unit owners, or by an association of land or unit owners, must be constructed with a crown, to public street standards for base and thickness of pavement. In lieu of completion of such streets prior to the recording of the plat, the developer must furnish a bond, letter of credit or certified check equal to the cost of construction of these

streets as provided for in Article 8, Section 801 A thru D and F.

F. The Planning Commission shall make the final determination, within their sole discretion, as to which streets are subject to Section 604E. Such streets may include, but are not limited to, 1) private streets serving single family detached residences and two family residences, and 2) private streets in condominium or landominium developments where the design of the streets is suitable for future dedication as public streets, e.g. the parking areas are distinctly separate from the travel portion of the road and the vertical and horizontal alignment is acceptable for public streets. Such streets shall not include private driveways in apartment complexes which are clearly not intended for future dedication as public streets because they do not meet minimum standards for vertical and horizontal alignment and/or because parking spaces are an integral part of the pavement.

SECTION 605 **PUBLIC STREETS**

The Planning Commission may require certain streets within Planned Developments to be public if it determines that the project density necessitates the use of public streets and that traffic connections are required to adjacent plats or developments for adequate circulation.

SECTION 606 **STAGING OF RESIDENTIAL PLANNED DEVELOPMENT**

Each stage of a Planned Development must be so designed so as to stand independently of future related stages in the event future stages are not constructed. The construction and provision of all of the common open spaces and public and recreational facilities which are shown on the Final Development Plan must proceed at the same rate as the construction of dwelling units.The Planning Commission shall not approve the Final Development Plan for any stage of the Planned Development unless the average of the allowable dwelling units per stage, up to and including the stage which is to be approved, does not exceed by more than ten (10) percent the average number of dwelling units per stage which is allowable for the entire Planned Development.

SECTION 607 **COMMON OPEN SPACE GUARANTEE**

The Planning Commission may require adequate assurance, in a form and manner which it approves, that the common open space shown in the Final Development Plan will be provided and that designated trees are preserved. The following methods of assurance may be used singularly or in combinations:

A. A bond, corporate surety, or other acceptable financial guarantee in a form which complies with the provision of these regulations and in an amount sufficient to purchase the common open space shown or trees shown on the Final Development Plan or alternative acreage which is equivalent in size and character.

B. The land shown as common open space may be put in escrow, the escrow agreement to provide that the land is to be held in escrow until the Planning Commission has certified to the escrow agent that the Planned Development has been completed.

C. If any of the Planned Development which includes common open space is held by the developer in option,the developer may assign to the applicable governmental entity the right to exercise the option to acquire the common open space.

SECTION 608 STAGING OF NONRESIDENTIAL CONSTRUCTION

If a Planned Development contains nonresidential uses, these uses may be constructed first, but only if the Planning Commission finds C and records its finding on the Final Development Plan C that the nonresidential uses are consistent with the Comprehensive Plan for the community even though the residential area of the Planned Development is not built or not completed.

SECTION 609 CONDOMINIUMS

Chapter 5311 of the Ohio Revised Code provides for the recording of ownership of condominiums. Condominium ownership does not excuse compliance with these regulations whenever appropriate.

SECTION 610 OPEN SPACE DESIGN

Where approved by the Local Zoning Authority, Open Space Design also known as conservation development or cluster housing may be used to meet the requirements of the Ohio Environmental Agency Construction Permit. This site design technique concentrates dwelling units in a compact area in one portion of the development site in exchange for providing open space and natural areas elsewhere on the site.

Article 7

flood hazard areas

SECTION 701 STATEMENT OF PURPOSE

It is the purpose of these regulations to promote the public health, safety and general welfare and to minimize flood losses resulting from periodic inundation by provisions designed to:

A. Restrict or prohibit subdivision of lands for uses which are dangerous to health, safety or property in times of flood or which, with reasonably anticipated improvements, will cause excessive increases in flood heights or velocities.

B. Require that each subdivision lot in an area vulnerable to floods be provided with a safe building site with adequate access and that public facilities which serve such uses be installed with protection against flood damage at the time of initial construction.

C. Protect individuals from buying lands which are unsuited for intended purposes because of flood hazard by prohibiting the subdivision of unprotected flood hazard lands, requiring that flood hazard areas be delineated on the final plat, and areas not suitable for development be subject to deed restrictions.

D. Ensure compliance with the Flood Damage Prevention Regulations adopted by Montgomery County.

SECTION 702 GENERAL PROVISIONS

702.1 Land to Which These Regulations Apply

These regulations shall apply to all areas of special flood hazard within the jurisdiction of unincorporated territory of Montgomery County, Ohio.

702.2 Basis for Establishing the Area of Special Flood Hazard

The areas of special flood hazard have been identified by the Federal Emergency Management Agency (FEMA) in a scientific and engineering report entitled "Flood Insurance Study for the Unincorporated Territory of Montgomery County, Ohio." This study with accompanying Flood Boundary and Floodway Maps and Flood Insurance Rate Maps dated December 15, 1981 and any revisions

thereto is hereby adopted by reference and declared to be a part of these regulations.

702.3 Compliance

No land shall hereafter be subdivided or used without full compliance with the terms of these regulations and other applicable regulations including zoning, official maps, health codes, and other regulations which apply to uses within the jurisdiction of these regulations.

SECTION 703 WARNING AND DISCLAIMER OF LIABILITY

The degree of flood protection required by these regulations is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. These regulations do not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. These regulations shall not create liability on the part of Montgomery County, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on these regulations or any administrative decision lawfully made thereunder.

SECTION 704 LAND SUITABILITY

No land shall be subdivided which is unsuitable for its intended use for reason of flooding, inadequate drainage, susceptibility to mud slides or earth slides, or severe erosion potential. However, the subdivision may be approved if the subdivider improves the land consistent with the standards of this and other applicable regulations to make the area suitable for its intended use. In determining the appropriateness of the land subdivision at the site, the Planning Commission shall consider the objective of these regulations; and

A. The danger to life and property due to the increased flood heights or velocities caused by subdivision fill, roads, and intended uses.

B. The danger that intended uses may be swept onto other lands or downstream to the injury of others.

C. The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination and unsanitary conditions under flood conditions.

D. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner.

E. The importance of the services provided by the proposed facility to the community.

F. The requirements of the subdivision for a waterfront location.

G. The availability of alternative locations not subject to flooding for the proposed subdivision and land uses.

H. The relationship of the proposed subdivision to the comprehensive plan and floodplain management program for the area.

I. The safety of access to the property in times of flood for emergency vehicles.

J. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters expected at the site.

SECTION 705 BUILDING SITE IMPROVEMENTS

A. No subdivision or part thereof shall be approved if proposed subdivision development in a floodway will, individually or collectively, significantly increase floodflows, heights, or damages.

B. No subdivision or part thereof shall be approved for floodway or floodway fringe areas which will, substantially affect the storage capacity of the floodplain.

C. Building sites, residences, motels, resorts and similar uses for human occupation shall not be permitted in floodway areas. Sites for these uses may be permitted outside the floodway if the sites are elevated to a height at least one (1) foot above the elevation of the regional flood or provisions otherwise made for elevating or adapting structures to achieve the same result. Required fill areas must extend fifteen (15) feet beyond the limits of intended structures and, if the subdivision is not to be sewered, must include areas for waste disposal.

D. Building sites for structures other than residences outside of floodway areas shall ordinarily be filled as provided in (C). However, the Planning Commission may allow subdivisions of

areas for commercial and industrial use at a lower elevation if the subdivider agrees to protect the uses through structural floodproofing as specified in Section 710.

E. When the Planning Commission determines that only part of a proposed plat can be safely developed, it shall limit development to that part and shall require that the method of development is consistent with its determination.

F. When the subdivider does not intend to develop the plat himself, and the Planning Commission determines that limitations are required to insure safe development, it may require the subdivider to impose appropriate deed restrictions on the land. Such deed restrictions shall be inserted in every deed and noted on the face of the final recorded plat.

SECTION 706 DRAINAGE FACILITIES

Storm drainage facilities shall be designed to convey the flow of surface waters without damage to persons or property. The system shall insure drainage at all points along streets, and provide positive drainage away from buildings and onsite waste disposal sites. Plans shall be subject to the approval of the Montgomery County Engineer. The County Engineer may require a primary underground system to accommodate frequent floods and a secondary surface system to accommodate larger, less frequent floods. Drainage plans shall be consistent with local and regional drainage plans. The facilities shall be designed to prevent the discharge of excess runoff onto adjacent properties.

SECTION 707 ROADS

The finished elevation of proposed streets shall be no more than one (1) foot below the regional flood. The Planning Commission may require, where necessary, profiles and elevations of streets to determine compliance with this requirement. Drainage openings shall be sufficient to discharge flood flows without unduly increasing flood heights.

SECTION 708 SEWER FACILITIES

A. The Planning Commission may prohibit installation of sewage disposal facilities requiring soil absorption systems where such systems will not function due to high groundwater, flooding, or

unsuitable soil characteristics. The Planning Commission may require that the subdivider note on the face of the plat and in any deed of conveyance that soil absorption fields are prohibited in designated areas.

B. The Planning Commission may prescribe adequate methods for waste disposal. If a sanitary sewer system is located on or near the proposed subdivision, the Planning Commission shall require the subdivider to provide sewage facilities to connect to this system where practical, and shall prescribe the procedures to be followed by the subdivider in connecting to the system.

SECTION 709 WATER FACILITIES

All water systems located in flood prone areas, whether public or private, shall be floodproofed to above the regional flood protection elevation. If there is an existing public water supply system on or near the subdivision, the Planning Commission may require the subdivider to connect to this system.

SECTION 710 CONDITIONS ATTACHED TO PLAT APPROVAL

The Planning Commission may attach conditions, including but not limited to the following, to the approval of plats for areas subject to development hazards:

A. Construction and modification of sewage, water supply and drainage facilities to meet the standards of this resolution and to promote the health, safety, and general welfare.

B. Requirements for construction or channel modification, dikes, levees, and other protective measures.

C. Installation of flood-warning systems.

D. Imposition of operational controls, sureties, and restrictions enforceable by the Planning Commission to restrict the types and design of uses. Such restrictions may include flood-proofing of intended uses, subject to the individual approval of the appropriate agency at the time such uses are constructed, through:

1. Anchorage to resist flotation and lateral movement.

2. Installation of watertight doors, bulkheads, and shutters, or similar methods of construction.

3. Reinforcement of walls to resist water pressures.

4. Use of paints, membranes, or mortars to reduce seepage of water through walls.

5. Addition of mass or weight to structures to resist flotation.

6. Installation of pumps to lower water levels in structures.

7. Construction of water supply and waste treatment systems so as to prevent the entrance of flood waters.

8. Pumping facilities or comparable practices for subsurface drainage systems for buildings to relieve external foundation wall and basement flood pressures.

9. Construction to resist rupture or collapse caused by water pressure of floating debris.

10. Installation of valves or controls on sanitary and storm drains which will permit the drains to be closed to prevent backup of sewage and storm waters into the buildings or structures. Gravity drainage of basements may be eliminated by mechanical devices.

11. Location of all electrical equipment, circuits and installed electrical appliances in a manner which will assure they are not subject to flooding and to provide protection from inundation by the regional flood.

12. Location of any structural storage facilities for chemicals, explosives, buoyant materials, flammable liquids or other toxic materials which could be hazardous to public health, safety and welfare in a manner which will assure that the facilities are situated at elevations above the height associated with the flood protection elevation or are adequately floodproofed to prevent flotation of storage containers, or damage to storage containers which could result in the escape of toxic materials into flood waters.

Article 8

requirements for construction of improvements

SECTION 801 BOND FOR INSTALLATION OF IMPROVEMENTS

A. **General**

1. **Streets and Storm Sewers**
In order that the County has the assurance that the construction and installation of such improvements as street surfacing, curbs, gutters, storm sewers, sidewalks, and street signs will be constructed, the subdivider shall enter into one of the following agreements:

   a. To construct all improvements directly affecting the subdivision, as required by the Commission, prior to the final approval of the plat; or

   b. In lieu of the completion of the improvement, furnish bond executed by a surety company, cash deposit (certified check) or Irrevocable Letter of Credit (form must be approved by the Planning Commission) equal to the cost of construction of such improvements as shown on plans, and based on an estimate approved by the County Engineer.

2. **Sanitary Sewer and Water**
In order that the County has the assurance that the construction and installation of sanitary sewers and public water supply will be completed, the subdivider shall enter into a subdividers agreement and surety in accordance with the Montgomery County Sanitary Department Rules and Regulations.

3. **Flood Hazard Areas**
Guarantee that no lot will be sold or building constructed in an area subject to flood prior to completion of all flood protective works or measures planned for such lot and necessary access facilities.

B. **Conditions**

Before the final plan is given final approval, the developer shall have executed the Subdivider's Contract and a Performance Bond, cash deposit (certified check) or Irrevocable Letter of Credit with the Board of County Commissioners covering the estimated cost of required improvements.

The performance bond, cash deposit (certified check) or Irrevocable Letter of Credit shall run to Montgomery County for a period of two (2) years from date of execution, and shall provide that the subdivider, his heirs, successors and assigns, their agent or servants, will comply with all applicable terms, conditions, provisions and requirements of these regulations, and will faithfully perform and complete the work of constructing and installing such facilities or improvements in accordance with such laws and regulations.

Before said bond is accepted it shall be approved by the proper administrative officials.

Whenever a cash deposit (certified check) is made, the same shall be made to the County Treasurer of Montgomery County.

C. **Extension of Time**

If the construction or installation of any improvement or facility, for which guarantee has been made by the developer in the form of bond or cash deposit, is not completed within two (2) years from the date of final approval of the record map, the developer may request the Board of County Commissioners to grant an extension, provided he can show reasonable cause for inability to complete said improvements within the required two (2) years. At the expiration of the extension Montgomery County will use as much of the bond or cash deposit as necessary to complete the construction of the improvements.

The same shall apply whenever construction of improvements is not performed in accordance with applicable standards and specifications.

D. **Inspections**

Periodic inspections during the installation of improvements shall be made by Montgomery County to insure conformity with the approved plans and specifications as required by these regulations.

The subdivider shall notify proper administrative officials at least twenty-four (24) hours before each phase of the improvements is ready for inspections.

Upon acceptable completion of the required improvements, other than those administered by the County Sanitary Department, the County Engineer shall recommend acceptance of the improvements and release of the bond. Verification of subdivision conformance with the approved grading plan shall be part of the required improvements.

Recommendation of acceptance and notification of release of sanitary sewer, water and erosion control shall originate with the County Sanitary Department.

E. **Acceptance**

When the proper administrative officials, following final inspection of a subdivision, certify to the Board of County Commissioners that all improvements have been constructed in accordance with County specifications, the Board of County Commissioners may proceed to accept the facilities for which bond has been posted.

Prior to the certification to the Board of County Commissioners the subdivider shall furnish a maintenance bond in the amount of 10 percent of the original bond. Said maintenance bond shall run for a period of one (1) year.

F. **Failure to Comply**

Whenever public improvements have not been constructed in accordance with the agreement and with specifications as established, the Board of County Commissioners may exercise its rights of foreclosure under the bond.

SECTION 802 CONSTRUCTION PROCEDURE AND MATERIALS

The subdivider shall design and construct improvements not less than the standards outlined in these regulations. The work shall be done under County supervision and inspection and shall be completed within the time fixed or agreed upon by the County Engineer and/or Sanitary Engineer. The minimum requirements for materials shall be in accordance with the standards of the current volume of "Construction and Material Specifications" of the State of Ohio Department of Transportation or as amended by the County Engineer, the requirements of the Sanitary Engineer, and the requirements of the Ohio Department of Health. All inspection costs shall be paid by the subdivider.

SECTION 803 SURVEY MONUMENTS

A complete survey shall be made by a registered surveyor and shall conform to the "minimum standards for boundary surveys in the State of Ohio."

Additionally two permanent reference monuments, conforming to Montgomery County Engineer=s requirements and made of stone or concrete, at least thirty-six (36) inches in length and six (6) inches

square or round with suitable center point, shall be located and placed within each recorded section of the subdivision, and their location noted on the record plan. These monuments shall be placed immediately after final grading of lots is completed and the cost of the monuments will be included in the cost of improvements. There shall be no release of performance bond until after monuments have been placed.

Destruction of Montgomery County GPS monuments during construction shall require replacement of the monument to the original order of accuracy. There shall be no release of performance bond until replaced monuments have been verified by the Montgomery County Engineer=s Office.

Boundary lines shall be monumented at all points where there is a change of direction and at all lot corners by suitable monuments as specified in the "minimum standards for boundary surveys in the State of Ohio."

SECTION 804 STREET IMPROVEMENTS

All streets shall be graded to their full width, including side slopes, and improved in conformance with the standards given or referred to in these regulations.

A. **Plans and Profiles**

A centerline profile of proposed streets or roads with typical cross sections indicating proposed crowns and slopes anticipated in meeting required street improvements, shall be a part of, or accompany, the construction plan. Profiles of existing roadways or streets shall be extended a sufficient distance beyond the plat boundary to determine adequate sight distance and a suitable transition with existing pavements. All drainage and drainage structures shall be indicated on the profile and all profiles shall be submitted to the County Engineer for approval before construction begins.

SECTION 805 STREET WIDTH

Minimum street pavement widths shall conform to the standards given in Section 505 to 508, inclusive.

SECTION 806 STREET SUBGRADE

The subgrade shall be free of sod, vegetative or organic matter, soft clay, and other objectional materials for a depth of at least two (2) feet below the finished surface. The subgrade shall be properly rolled, shaped, compacted and drained and shall be subject to the approval of the County Engineer. Curb underdrains shall be required where subgrade conditions warrant.

SECTION 807 STREET BASE COURSE

The developer has the option of using any of the following base courses, based upon recommendations of the County Engineer as to soil and traffic conditions: aggregate, bituminous aggregate, asphaltic concrete, water-bound macadam, portland cement concrete, or equally suitable base course. Thickness shall be determined by the County Engineer, based upon the physical properties of the base course used and the physical properties of the roadbed.

SECTION 808 **STREET SURFACE COURSE**

Upon the expiration of the established maintenance period for the base course, the surface course shall be constructed using either asphaltic concrete, bituminous mix, or portland cement concrete. Specific material and thickness recommendation shall be determined by the County Engineer, based upon traffic conditions.

SECTION 809 **PORTLAND CEMENT CONCRETE PAVEMENT**

If the subdivider elects to construct streets totally out of portland cement concrete or if pavement is required by the County Engineer, thickness of seven (7) inches for local and collector streets and nine (9) inches for arterial, commercial, and industrial streets shall be required. The Planning Commission may require pavement or base of greater thickness, upon the recommendation of the County Engineer, based upon his evaluation of the subgrade, traffic, and wheel load conditions.

SECTION 810 **FULL-DEPTH ASPHALT PAVEMENT**

If streets are to be constructed out of "full-depth" asphalt, an asphalt pavement in which asphalt-aggregate mixture are used for all courses above the subgrade, careful inspection of the subgrade may be necessary, to determine pavement thicknesses. Thickness shall be as determined by the County Engineer.

SECTION 811 **STREET CURBS AND GUTTERS**

The requirements for curbs and gutters will vary according to the character of the area and the density of development. Curbs shall be required on all streets.

SECTION 812 **SIDEWALKS**

All sidewalks shall be constructed of portland cement concrete or other acceptable material to the minimum width specified in Sections 505 through 508 and a minimum depth of four (4) inches.

SECTION 813 **STREET NAME SIGNS AND STREET NAMING**

A. Street name signs, of a type in use throughout the County, shall be erected by the subdivider at all intersections.

B. For purposes of street naming, the following is recommended:

1. Circle, Place or Court should be used only for cul-de-sac type streets.

2. The words north, south, east or west should be avoided as part of a street name whenever possible.

C. Whenever a new street is constructed along the approximate alignment or extension of an existing street, its name shall be the same as that of the existing one.

D. To avoid duplication and confusion, the proposed names of all streets shall be approved by the Planning Commission prior to such names being assigned or used.

House numbers shall be assigned in accordance with the current house numbering system in effect in Montgomery County, Ohio.

SECTION 814 STREET AND WALKWAY LIGHTING

The subdivider shall install street lights in each residential subdivision which contains a majority of lots with an individual lot width of one hundred (100) feet or less at the front property line. Such lights shall be located at each entrance (streets and walkways) to the subdivision and in each street intersection within the subdivision. In addition, wherever the distance between the two (2) adjacent street (walkway) lights would exceed three hundred (300) feet, then additional street lights shall be installed in such a manner that proper light intensity shall be provided and maintained.

SECTION 815 WATER SUPPLY IMPROVEMENTS

The following requirements shall govern water supply improvements:

A. **Public Water Supply**

Where public water supply is within reasonable distance, as determined by the County Sanitary Engineer, the subdivider or developer shall construct a system of water mains and connect with such public water supply and provide a connection for each lot.

Where public water supply is not available, the subdivider or developer shall provide for individual wells for each lot in the subdivision.

All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood water in the system.

B. **Test Wells**

In areas where a public water supply is not available, and prior to approval of the preliminary plan, at least one test well shall be made in the area being platted. Prior to the approval of the final plat or minor subdivision (lot split) a test well shall be made on each building lot.

Test wells shall be at least twenty-five (25) feet in depth and shall produce safe potable drinking water at a rate of not less than five (5) gallons per minute for a period of not less than six (6) continuous hours of pumping.

A copy of the well log which will include the name and address of the well driller, shall be submitted with the plat to the Montgomery County Planning Commission.

C. **Location and Construction of Individual Private Wells**
The location of individual private wells shall comply with the requirements of the Montgomery County Combined Health District.

A watertight seal shall be installed and properly maintained around the pump mounting.
All abandoned wells shall be sealed in a manner that will render them watertight.

In all cases where it has been determined that an adequate quantity of safe potable water cannot be obtained from individual wells, a public water distribution system will be required.

D. **Public Water Distribution Systems**
Public wells and other public water distribution systems shall meet the requirements of the State Department of Health as cited in Sections 3701.18 to 3701.21, inclusive, of the Ohio Revised Code.

Private wells and other private water distribution systems may be accepted for maintenance and operation by the Montgomery County Sanitary Engineer if the ownership is vested to Montgomery County and if the water distribution system has been constructed according to specifications, and if it has been approved by the Sanitary Engineer.

SECTION 816 **FIRE PROTECTION**

Fire hydrants with two and one-half (2$\frac{2}{2}$) inch outlets and one large pumping connection shall be provided by the subdivider in all subdivisions with public water supplies. The hydrants should be located between property lines and curbs with all outlets facing or parallel to the street. Hydrants shall be placed at the corners of all

blocks and at mid-block for blocks exceeding five hundred (500) feet in length. Hydrants shall also be required at the entrance and end of all cul-de-sacs exceeding four hundred (400) feet in lengths in no case shall hydrants be spaced more than five hundred (500) feet apart in residential plats and three hundred (300) feet apart in commercial and industrial plats.

The type of hydrant and control valves and the location of the hydrant shall be approved by the Sanitary Engineer. The minimum size of any waterline serving any hydrant shall not be less than six (6) inches in diameter and should be circulating water lines. The size and location of water lines shall be approved by the Sanitary Engineer, and the Ohio Inspection Bureau for commercial and industrial subdivisions.

SECTION 817 SANITARY SEWER IMPROVEMENTS

The following requirements shall govern sanitary sewer improvements:

A. Where an adequate public sanitary sewer system is reasonably accessible, in the determination of the Planning Commission, public sanitary sewers shall be installed to adequately serve all lots, including lateral connections to the public system. Public sewer system extensions shall meet the requirements of the Ohio Department of Health and County standards. Combinations of sanitary sewers and storm sewers shall be prohibited.

B. Where a public sanitary sewer system is not reasonably accessible, the subdivider may provide:

1. A central treatment plant for the group, provided that such central treatment plant is installed in accordance with State and the Montgomery County Combined General Health District requirements; or

2. Lots may be served by individual disposal systems if the following provisions are met:

a. Where the installation of individual disposal systems is considered the suitability of the soil for individual systems, the absorptive ability of the soil, surface drainage, ground water level, and topography shall be the criteria for determining whether or not the installation of individual systems is permissible. Criteria shall be in accordance with the requirements of the Montgomery County Combined General Health District and the requirements of the Ohio Department of Health.

b. Each lot so served shall be of a size and shape to accommodate the necessary length of tile

field at a safe distance from and at a lower elevation than the proposed building(s). Such lot size and shape shall conform to the requirements of the zoning district in which they are located. If no zoning is in effect, the standards set forth in Section 517 of these regulations shall be met.

c. At least one percolation test shall be made for each lot area being platted, and each test shall be located in close proximity to the proposed individual sewage disposal unit, be numbered and its location shown on the preliminary plat. All percolation tests shall be performed in accordance with the requirements of the Planning Commission and the Montgomery County Combined General Health District.

d. Where the installation of individual disposal units is considered and where the average natural ground slope exceeds ten (10) percent, the installation of a step-up disposal system may be required subject to specifications by the Montgomery County Combined General Health District.

SECTION 818 **DRAINAGE IMPROVEMENTS**

The subdivider shall construct all necessary facilities including underground pipes, inlets, catch basins, or open drainage ditches, as determined by the County Engineer, to provide for the adequate collection of surface water and maintenance of natural drainage courses. Sediment and erosion control items, utilized during active construction, shall be approved and inspected by the Montgomery County Sanitary Engineer.

Whichever runoff condition is present, pursuant to Article 3, Section 305 S, the analysis must be approved by the County Engineer. All drainage structures built must be in conformance with the Montgomery County Engineer's Subdivision Drainage Regulations and approved by the County Engineer.

Storm drainage, including drain tile around basements, shall not be permitted to discharge into any sanitary sewer facility but shall connect to an adequate drainage outlet. All downspouts and sump pumps shall not be discharged through the curb.

Storm drainage, including drain tile around basements, shall not be permitted to discharge into any sanitary sewer facility but shall connect to an adequate drainage outlet. All downspouts and sump pumps shall not be discharged through the curb.

SECTION 819 **CULVERTS AND BRIDGES**

Where natural drainage channels intersect any street right-of-way, it shall be the responsibility of the subdivider to have satisfactory bridges and/or culverts constructed.

A. All culverts shall extend across the entire right-of-way width of the proposed street. The cover over the culvert and its capacity shall be determined by the County Engineer. The minimum diameter of a culvert pipe shall be eighteen (18) inches. Depending on existing drainage conditions, headwalls may be required.

B. This requirement shall not apply to existing bridges that comply with the term bridge as defined in these regulations.

SECTION 820 **ELECTRIC, GAS AND TELEPHONE IMPROVEMENTS**

A. Electric service and telephone service shall be provided within each subdivision. Gas service may be required where reasonably accessible. Whenever such facilities are reasonably accessible and available, they may be required to be installed within the area prior to the approval of the final plat. Telephone, electric, and street lighting wires, conduits and cables may be constructed underground.

B. Overhead utility lines, where feasible, shall be located at the rear of all lots. The width of the easement per lot shall be not less than five (5) feet and the total easement width shall be not less than ten (10) feet.

SECTION 821 **OVERSIZE AND OFF-SITE IMPROVEMENTS**

The utilities, pavements, and other land improvements required for the proposed subdivision shall be designed of oversize and/or with extensions provided to serve nearby land which is an integral part of the neighborhood service or drainage areas as determined by the County Engineer.

SECTION 822 **COST OF OVERSIZE IMPROVEMENTS**

The subdivider shall be required to pay for only that part of the construction costs of major arterial streets as specified in Section 508 unless otherwise determined by the County Engineer. The subdivider shall be required to pay for all other oversize improvements that pertain to trunk sanitary sewers and water mains and storm drainage requirements inherent to the plat. Oversize reimbursement for trunk sanitary sewers and water mains may be authorized in accordance with Sanitary Engineering Department Rules and Regulations.

SECTION 823 **EXTENSIONS TO BOUNDARIES**

The subdivider may be required to extend the necessary improvements to the boundary of the proposed subdivision to serve adjoining unsubdivided land, as determined by the Planning Commission.

SECTION 824 **OFF-SITE EXTENSIONS**

If streets or utilities are not available at the boundary of a proposed subdivision, and if the Planning Commission finds the extensions across undeveloped areas would not be warranted as a special assessment to the intervening properties or as a County expense until some future time, the subdivider may be required, prior to approval of the final plat, to obtain necessary easements or rights-of-way and construct and pay for such extensions. Such improvements shall be available for connections by subdividers of adjoining land.

SECTION 825 **FINAL INSPECTION**

Upon completion of all the improvements, the subdivider shall request, in writing, a final inspection by the County Engineer as required under Section 711.091 of the Ohio Revised Code.

Article 9

revisions, enforcement

SECTION 901 **RECORDING OF PLAT**

No plat of any subdivision shall be recorded by the County Recorder of Montgomery County or have any validity until said plat has received final approval in the manner prescribed in these regulations.

SECTION 902 **REVISION OF PLAT AFTER APPROVAL**

No changes, erasures, modifications, or revisions shall be made in any plat of a subdivision after approval has been given by the Planning Commission, and endorsed in writing on the plat, unless said plat is first resubmitted to the Commission.

SECTION 903 **SALE OF LAND WITHIN SUBDIVISIONS**

No owner or agent of the owner of any land located within a subdivision shall transfer or sell any land by reference to, exhibition of, or by the use of a plat of the subdivision before such plat has been approved and recorded in the manner prescribed in these regulations. The description of such lot or parcel by metes and bounds in the instrument of transfer or other documents used in the process of selling or transferring shall not exempt the transaction from the provisions of these regulations.

SECTION 904 **SCHEDULE OF FEES, CHARGES, AND EXPENSES**

The Board of County Commissioners shall establish a schedule of fees, charges and expenses, and a collection procedure for same, and other matters pertaining to these regulations. The schedule of fees shall be posted in the office of the Planning Commission. Until all applicable fees, charges, and expenses have been paid in full, no action shall be taken on any application or appeal.

SECTION 905 **PENALTIES**

The following penalties shall apply to the violations of these regulations:

A. Whoever violates any rule or regulation adopted by the Board of County Commissioners for the purpose of setting standards and requiring and securing the construction of improvements

within a subdivision or fails to comply with any order pursuant thereto is creating a public nuisance and the creation thereof may be enjoined and maintenance thereof may be abated by action at suit of the County or any citizen thereof. Whoever violates these regulations shall forfeit and pay not less than one hundred (100) dollars nor more than one thousand (1,000) dollars for each offense. Each day such violation continues shall be considered a separate offense. Such sum may be recovered with costs in a civil action brought in the Court of Common Pleas of Montgomery County.

B. A County Recorder who records a plat contrary to the provisions of these regulations shall forfeit and pay not less than one hundred (100) dollars nor more than five hundred (500) dollars, to be recovered with costs in a civil action by the Prosecuting Attorney in the name and for the use of Montgomery County.

C. Whoever, being the owner or agent of the owner of any land within or without a municipal corporation, transfers any lot, parcel or tract of such land from or in accordance with a plat of a subdivision before such plat has been recorded in the office of the County Recorder, shall forfeit and pay the sum of not less than one hundred (100) dollars nor more than five hundred (500) dollars for each lot parcel, or tract of land so sold. The description of such lot, parcel, or tract by metes and bounds in the deed or transfer shall not serve to exempt the seller from the forfeiture provided in this section.

D. Any person who disposes of, offers for sale or lease for a time exceeding five (5) years any lot or any part of a lot in a subdivision before provisions of these regulations are complied with shall forfeit and pay the sum of not less than one hundred (100) dollars nor more than five hundred (500) dollars for each lot or part of a lot so sold, offered for sale or leased, to be recovered with costs in a civil action, in the name of the County Treasurer for the use of the County.

SECTION 906 VARIANCES

The following regulations shall govern the granting of variances:

A. Where the Planning Commission finds that extraordinary and unnecessary hardship may result from strict compliance with these regulations, due to exceptional topographic or other physical conditions, it may vary the regulations so as to relieve such hardship, provided such relief may be granted without

detriment to the public interest and without impairing the intent and purpose of these regulations or the desirable development of the neighborhood and community. Such variation shall not have the effect of nullifying the intent and purpose of these regulations, the comprehensive plan, or the zoning resolution, if such exists.

B. In granting variances or modifications, the Planning Commission may require such conditions as will, in its judgement, secure substantially the objective of the standards or requirements so varied or modified.

SECTION 907 APPEAL

Any person who believes he has been aggrieved by the regulations or the action of the Planning Commission, has all the rights of appeal as set forth in Chapter 711 of the Ohio Revised Code or any other applicable section of the Ohio Revised Code.

Article 10

county engineer's standards

Nature has carved an effective and functional drainage system from the unique topographic features of Montgomery County. The Miami River, its tributary rivers, and creeks and streams which flow into these are the more apparent parts of this drainage system. Less obvious are the shallow gullies and sloping, rolling land features which collect, concentrate, and direct storm runoff to the larger watercourses.

To accommodate construction of houses and streets, subdivisions must change the surface of the land. The rolling land is graded to eliminate the high and low areas.

Buildings, streets and parking areas replace meadows and forest land. Changes like these cause the storm runoff to behave differently. Where formerly water would soak into the earth or runoff slowly, the impenetrable surface of the roof or pavement area causes more water to runoff and to flow at a faster rate.

The increased water and rate of flow places a stress on the existing natural drainage system. Because the system does not have the necessary capacity for the demand placed on it, the system will flood its banks. Backups occur and water remains standing in the street or finds alternate paths into the basement of homes.

NOTE: The enclosed Subdivision Drainage Regulations are not intended to establish a rigid set of rules to be adhered to at all costs. They are intended as a tool to be used by the creative and innovative engineer in the design of the storm water system. These regulations are based on the assumption that the user has an understanding of hydrology and hydraulic engineering.

GENERAL DRAINAGE

Of primary importance is the protection of existing and proposed developments from damage and/or inundation resulting from an overflowing watercourse. Provisions must be made to convey storm waters, both those originating from outside as well as inside the tract, through the development with facilities of sufficient capacity to permit the ultimate development of the upstream tributary area.

Of equal importance is the responsibility of the developer to discharge storm waters, originating within the subdivision or conveyed through the subdivision, on the downstream adjacent lands or properties and to return the flow to as near predevelopment conditions as possible. For example, a prior sheet flow condition should be returned to sheet flow condition prior to leaving the development area, or provisions made for channelization downstream to
an adequate channel or watercourse. This does not imply that the developer be required to make extensive or unreasonable downstream improvements to existing inadequate drainage facilities. It does, however, require the developer to investigate the effect of his proposal on the downstream drainage system. If the work required downstream proves to be prohibitive, the developer may choose to reduce the outflow from his development by including detention and/or retention basin designs in his proposed drainage system.

The design storm with an average recurrence interval of 10 years should be contained within the gutter and parking lane area of the adopted street cross section.

Lot grading, in-tract drainage, and street improvements for all subdivisions should be designed so that floods having an average recurrence interval of 100 years or less will not cause inundation or damage to any dwellings. A grading plan for each subdivision will be required to define the lot grading and in-tract drainage.

All drainage channels, conduits, and other structures located outside the road right-of-way should be contained in suitable public easements. Easements for open channels should include sufficient area along the channel banks to permit access for maintenance equipment. Open channels may be fenced along both sides through urban areas and where necessary to protect the public as well as preventing encroachment upon needed access area.

SECTION I

PLANNING AND URBAN DRAINAGE

The development of an urban drainage plan requires the consideration of three drainage elements. These are initial drainage, major drainage and storm water storage.

Planning and design must consider the regular, frequently occurring storm; that is, the initial storm, and the less frequent but more extensive major storm occurrence. Planning for storage is essential to ensure water will go where it will not create a problem. Erosion controls must be considered before the earth is disturbed and significant losses and damage occur.

1. **The Initial Drainage System**

   The initial drainage system collects and transports storm runoff from frequently occurring storms.

   The initial system includes street curbs and gutters, underground storm sewer pipes, manholes, culverts, and open channels or drainageways. Its purpose is to prevent health hazards associated with low areas where water might ordinarily stand.

   It should be noted that the preliminary layout of the drainage system will have more effect on the cost of the storm drainage system than the combined effect of the final hydraulic design, preparation of the specifications, and choice of materials. The ideal time to undertake the layout of the storm sewer system is prior to finalization of the street layout in a new development. Once the street layout is set, the options open to the drainage engineer are greatly reduced.

   Streets serve an important and necessary drainage service, even though their primary function is for the movement of traffic. Traffic and drainage uses are compatible up to the point at which drainage must be subservient to traffic needs.

2. **The Major Drainage System**

It is not economically feasible to size a storm sewer system to collect and convey more than the frequent storm runoff. However, runoff which exceeds the capacity of the storm sewer system must have a route to follow. Essentially, the complete drainage system of an urban area contains two separate drainage elements. While the storm sewers belong to the initial system, surface drainageways must be provided for the major flows resulting from more intense storms.

The intent of planning for the major drainage element is to ensure storm water runoff, which exceeds the capacity of the initial drainage system, has a route to follow which will not cause a major loss of property or any loss of life. Street right-of-way is a common choice for conveying major drainage flows as well as side and rear lot lines.

3. **Storage**

The intention of these guidelines is to control the increases of runoff resulting from development with various storage mechanisms. While considerable storage can be achieved within channels and storm sewers, special storage facilities, either single or multipurpose, may have to be established for new developments. Like the rest of the drainage system, both the location and type of storage facilities should be determined as part of the overall site layout.

Parkland presents an excellent opportunity for the temporary detention of runoff from adjacent areas. In many cases, the use of parkland for this purpose allows storm drainage, which is often considered both a nuisance and a hazard, to be used productively in permanent ponds. Such detention storage areas may be established as an integral part of the open space areas of a development.

SECTION 2

GENERAL REQUIREMENTS

Subdivisions shall be protected from flood damage and inundation by storm water, springs and other surface waters. The design and construction of drainage facilities shall be such that watercourses passing through the subdivision and storm water originating from within the subdivision will be carried through and away from the subdivision without causing inundation or damage to any dwelling. Drainage water entering the subdivision shall be received and discharged from the subdivision at the locations and, as nearly as possible, in the same manner that existed prior to the construction of the subdivision drainage facilities. Design of the drainage facilities within the subdivision shall be such that they will not divert drainage area from one watershed to another.

SECTION 3

DESIGN OF DRAINAGE FACILITIES

A. Hydrologic Design

All drainage ways shall be designed in accordance with the following criteria:

1. **Major Waterways:** Major waterways are defined as those with a tributary area in excess of 4 square miles. Such major waterways shall be designed for an average recurrence interval of 100 years.

2. **Secondary Waterways:** Secondary waterways are defined as those with a tributary area of between 1 and 4 square miles. Such secondary waterways shall be designed for an average recurrence interval of 50 years.

3. **Minor Waterways:** Minor waterways are defined as those with 1 square mile or less of tributary area. Such minor waterways shall be designed for an average recurrence interval of 25 years for open channels and culverts. See storm sewer design criteria for closed conduits.

Design flows for major and secondary drainage facilities may be computed by the subdivider's engineer by using U.S. Geological Survey (U.S.G.S.) Report 89-4126, "Techniques for Estimating Flood-Peak Discharges of Rural, Unregulated Streams in Ohio," or U.S.G.S. Report 86-4197, "Estimating Peak Discharges, Flood Volumes, and Hydrograph Shapes of Small Ungaged Urban Streams in Ohio," as defined by the limits of those reports. Basic data for determining parameter values may be found within the reports.

The peak rate of runoff for minor drainage facilities may be computed using the Rational Method for areas up to 200 acres. Basic data for the determination of rainfall intensity and runoff coefficients will be found in Exhibits A and D, respectively. U.S.G.S. Reports 89-4126 and 86-4197 are alternate methods for determining the runoff for stream flows with over approximately 20 tributary acres. When it is necessary to know the volume of water discharged, in addition to the peak rate of discharge, the Rational Method is not adequate. The Unit Hydrograph Method, as outlined in "Urban Hydrology for Small Watersheds," Technical Release TR No. 55, published by the Soil Conservation Service, will provide both the peak discharge and the volume of discharge for a given drainage area. The design engineer shall select the appropriate method depending on the information needed and the size of the area under study.

B. Hydraulic Design

The hydraulic design of the subdivision shall be such that after accumulating all energy losses, such as pipe friction, manhole losses, losses at bends, etc., along the various drainage transmission lines within the subdivision, the depth of flow in the streets shall not exceed the curb heights for a storm with a 10 year average recurrence interval. The depth of flow or ponding for a 100 year average recurrence interval storm shall not exceed a level which would cause inundation or damage to any dwelling constructed within the subdivision. The developer may be required to provide field verification that the subdivision was graded per the construction drawings.

The design hydraulic grade line for any closed or open waterway, bridges, or culverts shall be two (2) feet or more below ground level. Storm sewers designed as part of a road system with curb shall be designed so that the hydraulic grade line when plotted after accumulating all energy losses, shall be no higher than the inlet grates for a design discharge (Q) of 110 percent of the 10 year design discharge (Q). Roadside ditches shall be designed so that the hydraulic grade line when plotted after accumulating all energy losses, shall be no higher than the edge of pavement for a design discharge (Q) of 110 percent of the ten year discharge.

Within the subdivision, catch basins shall be so placed along the streets that the width of flow in the gutter will not exceed 8 feet for a 2 year recurrence interval, and will not exceed the top of curb for a 10 year average recurrence interval.

Site grading within the subdivision shall be such that all lots will readily drain. Lots shall have a 1.0% minimum slope in grass areas. Overland flow on lots shall be limited to a maximum distance of three hundred (300) feet unless approved by the office of the county engineer.

Bridges spanning open waterways shall have minimum freeboard above water surface of 2 feet.

The minimum velocity for any closed or open conduit shall be 2.5 feet per second under gravity flow conditions.

C. Structural Design

Insofar as practicable, catch basins, manholes, inlet structures, etc., placed within the subdivision shall conform to standard plans on file with the County Engineer's Office. Structural design of all drainage facilities shall be subject to the approval of the County Engineer.

1. **Channels:** Minimum centerline radius of constructed channels shall be 5 times the top width of the channel. Minimum bottom width of constructed channels shall be 2 feet.

   Each channel constructed within the subdivision shall have side slopes of 2:1 or flatter. Bank stabilization and stream bed stabilization, along constructed or natural channels, will be required if the channel velocities are sufficient to cause bank or invert erosion.

   The top of bank shall be so graded that side drainage will enter channels only at points where structures are provided to prevent bank erosion. Side drainage flow shall enter the channel as nearly parallel with stream flow as possible. Earth channels constructed within the subdivision shall be seeded or sodded depending on the velocity of flow within the channel.

2. **Closed Conduits:** All storm drainage within the subdivision which is capable of being transmitted in a concrete pipe 72" or less in diameter, shall be carried in a closed conduit. At the request of the applicant and their design engineer, this requirement may be waived. The reason for this waiver shall be to meet the requirements of the Ohio Environmental Protection Agency Construction Permit. The minimal conduit size shall be 12" concrete pipe.

Minimum clearance between top of pipe and top of surface should be 2 feet. The alignment of closed conduits shall be as nearly straight as practicable without undue bends and angle points; manholes shall be provided at all angle points and at intervals not to exceed 300 feet along the conduit unless submitted for approval with proper documentation. Inverted siphons shall not be permitted except for temporary structures.

All pipes under pavement located in the public right-of-way, located in a FEMA identified floodplain or floodway, or located below the maximum pool elevation of a retention or detention basin shall be reinforced concrete pipe (C-76).

Non-reinforced concrete or alternative material pipe may be used outside of road right-of-way provided the strength of such pipe is sufficient to withstand the loads imposed upon it.

All pipe, bedding, and backfill shall be designed in accordance with the Ohio Department of Transportation design manual.

Ditch protection shall be required if the 10 year flow velocities of flow in a channel or waterway exceed four (4) feet per second for soil ditches or six (6) feet per second in sodded ditches. If the exit velocity from a storm sewer exceeds the allowable velocities, an energy dissipating device, i.e., stilling basing, dumped rock, may be necessary.

D. Storm water Runoff Control Criteria for Retention/Detention Basins

The basic premise is that land uses and developments which increase the runoff rate and volume shall be required to control the discharge rate of runoff prior to its release to its off-site outlet.

1. Any increase in the volume of site surface drainage water resulting from accelerated runoff caused by site development shall be controlled so that the post development peak discharge rate does not exceed that of the pre-development peak discharge rate, for all 24 hour storms between a one year frequency and the critical storm frequency as determined below. The method by which an applicant shall determine changes in rates and volumes of runoff is presented in the U.S. Department of Agriculture, Engineering Division of the Soil Conservation Service, ***Urban Hydrology for Small Watersheds***, Technical Release No. 55, June 1986 or most current edition.

To find the critical storm frequency for which additional control will be needed, the applicant shall:

a. Determine the percent increase in runoff volume for a one year frequency, 24 hour storm occurring on the development area.

TABLE 1

DETERMINING STORM FREQUENCY FOR WHICH CONTROL IS NEEDED

Percent Increase in Runoff Volume From a 1 Year Frequency 24 Hour Storm		
equal or greater than (percent)	**less than (percent)**	**Storm Frequency (years)**
-	10	1
10	20	2
20	50	5
50	100	10
100	250	25
250	500	50
500	-	100

b. Determine the critical storm frequency for which additional control is needed by using the percent increase in runoff volume, derived in (a), in Table 1.

c. Control the post development storms of a frequency between one year and the critical storm determined in (b), so as to be equal to or less than the pre-development peak runoff rate for a 24 hour one year frequency storm.

2. Storms of less frequent occurrence (longer return periods) than the critical storm up to the one hundred year storm have peak runoff rates no greater than the peak runoff rates from equivalent size storms under pre-development conditions. Consideration of the one-, two-, five-, ten-, twenty-five-, fifty-, and one hundred year storms shall be considered adequate in designing and developing to meet this standard.

E. Post Construction Runoff Control

In order to:

a. Reduce increases in non-point pollution caused by storm water runoff.

b. Minimize the total runoff volume which flows from a site following increases in impervious area by development.

c. Minimize changes in the watershed hydrology inherent with development.

The drainage design shall incorporate post construction storm water management requirements.

1. The post construction requirements of the Ohio Environmental Protection Agency Construction Permit, OHC000002 shall be made part of these regulations. The Montgomery County Engineer's Office shall be responsible for reviewing Part III.G.2.e of the current permit. Please note, the current OHC000002 permit is effective for five years. In subsequent OEPA Construction Permits or if the current Permit is revised, the applicable Post Construction Parts of the reissued or revised Permit shall take precedence.

2. The site specific characteristics shall be considered in the design.

    a. Minimum orifice sizes should be considered in areas of soils with low permeability rates.

    b. Infiltration systems in sites over Well Field areas shall require the approval of the Health Department.

SECTION 4

DRAINAGE PLAN

The subdivision map shall include sufficient data for the County to check the feasibility of the drainage system as proposed by the subdivider. The following data shall be provided:

A. Hydrologic Calculation

(At all critical points within the subdivision):

1. Tributary drainage areas delineated on the map.
2. Times of concentration.
3. Intensity.
4. Runoff coefficients.
5. Design flow.

B. Hydraulic Calculations

1. Sufficient documentation to indicate the results of the investigation into the adequacy of the downstream drainage system to handle the runoff from the proposed development. This will determine the maximum allowable release rate for the proposed development and, in turn, the amount of storm water storage that will be required.

2. The plan and profile of all drainageways shall be provided, imposed upon which shall be the design energy and hydraulic grade lines.

3. Sizes and types of drainage improvements, including special structures, typical sections, right-of-way width and fencing.

4. Supporting calculations for upstream and downstream channel capacities as they affect overflow, erosion or backwater within the subdivision. Such calculations shall be substantiated by such additional information as is required to determine profile and cross section of the upstream and downstream channel reaches under consideration.

5. Sufficient contours and grading details to indicate proposed street grades and elevations throughout the subdivision.

SECTION 5

CONSTRUCTION PLANS

The final construction plans for drainage within the subdivision shall conform to the above provisions and to any special conditions as required by the County Engineer in approving the tentative map. Such construction plans for drainage shall be approved by the County Engineer prior to construction of any drainage facilities within the subdivision. A grading plan shall be submitted along with the construction plans to identify the lot grading and in-tract drainage planned for the subdivision.

The final construction drawings shall contain the locations, widths, names of existing streets, railroad rights-of-way, easements, parks, permanent buildings, and corporation and township lines; location of wooded areas and other significant topographic and natural features within and adjacent to the development property for a minimum distance of two hundred (200) feet.

Runoff coefficients shall be 0.4 for residential use, 0.6 for apartment and multi-family use, and 0.9 for commercial and industrial use. The minimum runoff coefficient shall be 0.4. The assigning of runoff coefficients to areas tributary to the drainage area shall be based on the present use of the land, or, the present zoning of the land, whichever is the higher figure.

The designer should investigate the capacity of the downstream drainage facilities to determine if they will be adequate to handle the design flow from this particular subdivision. If the downstream facilities are inadequate, it may be necessary to provide on-site retention or ponding basins to limit the flow to an amount which the downstream system can accept.

SECTION 6

STORM WATER RUNOFF POLICY

This design manual is premised on the policy that land uses and developments which increase the runoff rate or volume shall be required to control the discharge rate of runoff prior to its release of off-site land. The purposes of this policy are to:

1. Permit development without increasing the flooding of other lands.

2. Reduce damage to receiving streams and impairment of their capacity which may be caused by increases in the quantity and rate of water discharged.

3. Establish a basis for design of a storm drainage system on lands below undeveloped areas which will preserve the rights of property owners and assure the long-term adequacy of storm drainage systems.

This runoff control policy applies to all land developments not specifically exempted below.

Exemptions are appropriate for certain land use activities which clearly do not generate significant increases in storm water runoff. The following land uses and developments are within this exemption category:

1. Land preparation for agricultural crops, orchards, woodlots, sod farms and nursery operations.

2. Land grading or leveling for erosion control under direction of the local soil conservation district.

3. Land subdivisions for residential purposes with minimum lot size of five acres or more.

SECTION 7

PROPOSED GUIDELINES FOR DETENTION BASINS

STATEMENT OR PURPOSE

As urban development continues to transform previous watersheds into highly impervious urban areas, the problem of handling the ever increasing storm water runoff on these watersheds is becoming more pronounced. In recent years, much attention has been focused on detention basins as a means of controlling the storm water runoff by detaining the water in the basin and releasing it at a rate compatible with downstream conditions. Some basins have a multi-purpose function, containing sport facilities, lakes and a park-like atmosphere during dry periods.

The recommendations presented in this report are intended to serve this function. By following the recommendations, the detention basin can be designed so as to obtain the maximum recreational aesthetic benefits for the surrounding community while serving as an effective flood control mechanism.

A. Planning Guidelines

1. Detention basins serve to capture and temporarily store the surface water runoffs which result from urban development. This temporary storage allows for the release of the storm runoff at discharge rates which are acceptable to the receiving waterway.

. On-site provision for detention storage would follow these approaches:

   a. The release rate and volume of detention storage would be based on the Montgomery County Subdivision Regulations.

   b. Recreational uses should be maximized where possible and feasible.

B. Detention Basins

1. The bottom of the basin shall have a minimum slope of 1.0 percent.

2. All inlets to the basin shall be connected to the outlet by a concrete low flow channel. The minimum slope on this channel shall be 0.5 percent.

C. Retention Basins

1. In order to provide for better management of the water, retention basins shall have a permanent water area of at least one-half acre. The permanent water area shall have an average water depth of four feet and no extensive shallow areas.

2. In excavated lakes, the underwater side slopes shall be stable.

3. A two foot deep, five feet wide safety ledge is required around the perimeter of the basin (see attached sketch).

D. Detention and Retention Basins

1. There shall be a minimum three foot wide berm at a two percent slope between the right-of-way and the top of the basin slope.

2. Slopes on the sides of the basin shall have a maximum slope of 3 to 1. This includes both sides of any constructed levy.

3. When conduits are used for the outlet of the basin they shall be protected by bar screens or other suitable provisions to prevent blockage of the outlet.

4. The minimum diameter of any outlet conduit shall be one foot.

5. Safety measures shall be provided for any pipe or opening to prevent children or large animals from crawling into structures. For safety, a suggested maximum opening is six inches.

6. Danger signs should be mounted at appropriate locations to warn of deep water, possible flood conditions that exist during storm periods and other dangers that exist.

7. Grass or other suitable vegetative cover shall be maintained throughout the entire basin area. Grass shall be cut regularly, no less than five times a year.

8. Debris, trash removal and other necessary maintenance shall be performed after each storm to assure continued operation in conformance with the design.

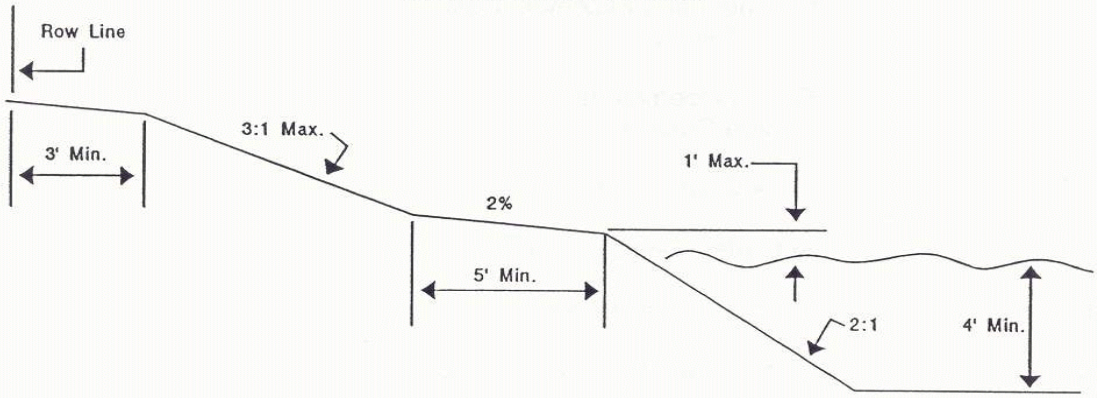
9. There shall be a minimum of one foot freeboard between the one hundred year storm elevations and the top of the levy or embankment containing the basin.

10. All basins shall have an emergency overflow

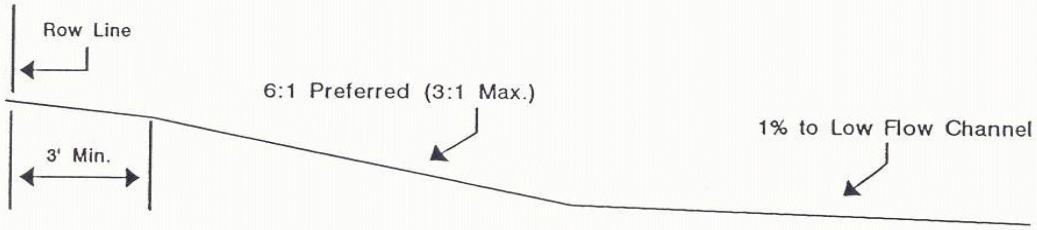
E. "As-built" drawings will be required for all basins to assures compliance with all applicable requirements. This requirement shall include calculations to confirm that the basin and outlet were constructed to function as designed.

SLOPE DESIGN FOR STORM WATER STORAGE FACILITIES

RETENTION BASIN



DETENTION BASIN OR DRY BASIN



Low Flow Channel - Paved 1/2% Grade
Alternate - Underdrains With Sod Stabilizer in
Low Flow Channel 1% Grade
As-Builts Are Required.

EXHIBITS

Exhibit A	Rainfall Frequency Curves Intensity vs. Duration
Exhibit B	Duration — Intensity Table 10 Year Storm
Exhibit C	Minimum and Maximum Cover Over Sewers
Exhibit D	Runoff Coefficients plus Miscellaneous Design Criteria
Exhibit E	Rock Channel Protection
Exhibit F	Accepted General Notes
Exhibit G	Overland Flow Chart
Exhibit H	Montgomery County Pave Sections
Exhibit I	MC-269 Modified Type-3 & Type-3A Catch Basins
Exhibit J	MC-117 Roadway Marker Detail

EXHIBIT A

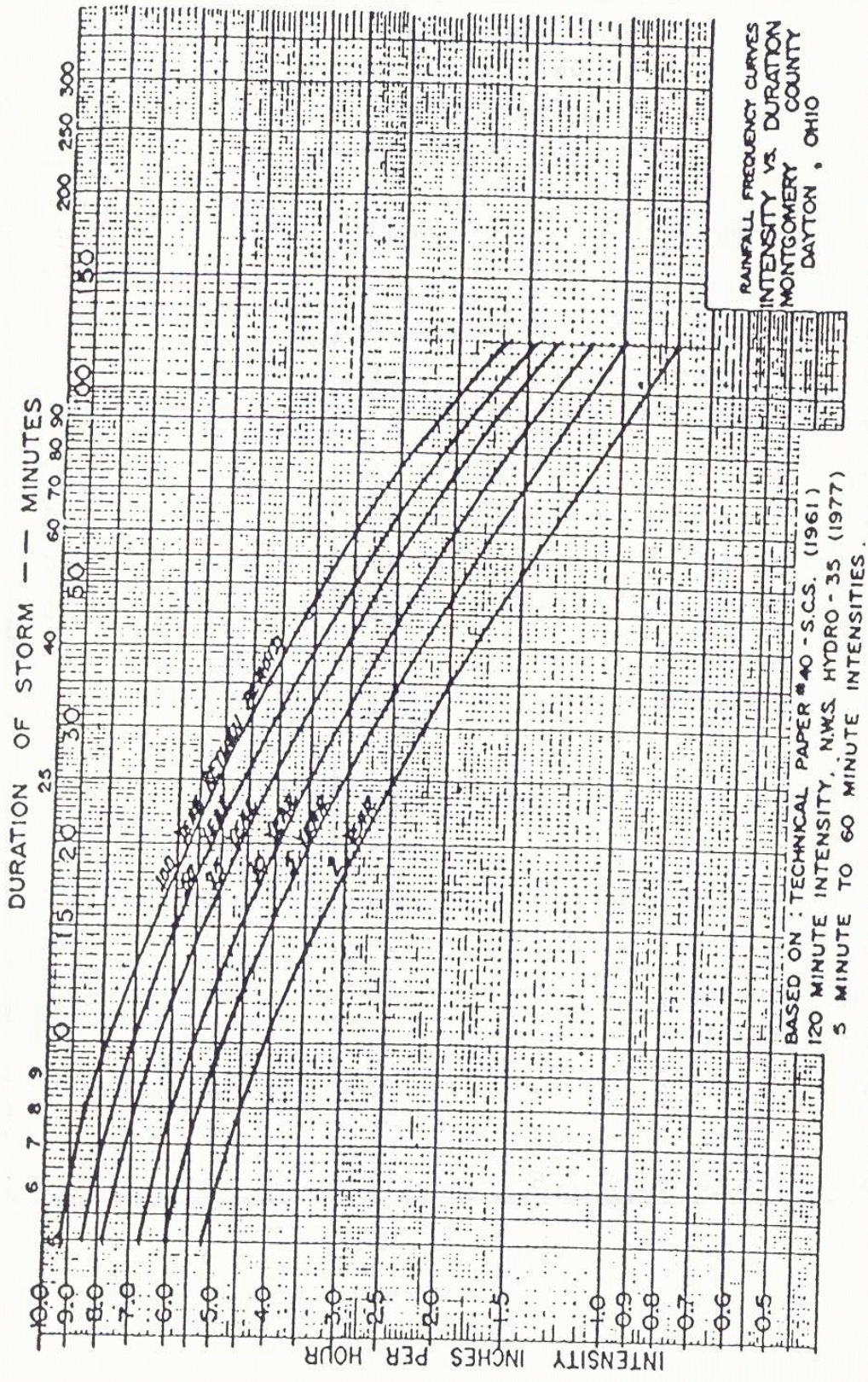

RAINFALL FREQUENCY CURVES
INTENSITY VS. DURATION
MONTGOMERY COUNTY
DAYTON, OHIO
BASED ON: TECHNICAL PAPER #40 - S.C.S. (1961)
120 MINUTE INTENSITY, N.W.S. HYDRO-35 (1977)
5 MINUTE TO 60 MINUTE INTENSITIES.
100 YEAR
50 YEAR
25 YEAR
10 YEAR
5 YEAR
2 YEAR
DURATION OF STORM — MINUTES
INTENSITY INCHES PER HOUR

EXHIBIT B

MONTGOMERY COUNTY
DURATION - INTENSITY TABLE

10 YEAR STORM
Based on USWB Records - Exhibit A

Time Min.	I in/hr	Time Min.	I in/hr	Time Min.	I in/hr
10.0	5.5	20.0	4.0	30.0	3.2
.5	5.4	.5	3.9	.5	3.1
11.0	5.3	21.0	3.9	31.0	3.1
.5	5.2	.5	3.8	.5	3.1
12.0	5.1	22.0	3.8	32.0	3.0
.5	5.0	.5	3.7	.5	3.0
13.0	5.0	23.0	3.7	33.0	3.0
.5	4.9	.5	3.6	.5	2.9
14.0	4.8	24.0	3.6	34.0	2.9
.5	4.7	.5	3.5	.5	2.9
15.0	4.6	25.0	3.5	35.0	2.8
.5	4.5	.5	3.5	.5	2.8
16.0	4.5	26.0	3.4	36.0	2.8
.5	4.4	.5	3.4	.5	2.8
17.0	4.3	27.0	3.4	37.0	2.7
.5	4.2	.5	3.3	.5	2.7
18.0	4.2	28.0	3.3	38.0	2.7
.5	4.1	.5	3.3	.5	2.7
19.0	4.1	29.0	3.2	39.0	2.7
.5	4.0	.5	3.2	.5	2.7

EXHIBIT C

MONTGOMERY COUNTY

STORM SEWERS
MINIMUM AND MAXIMUM COVER OVER SEWERS

SIZE	ASTM SPEC. NO.				
	C-76 CL. 1 (FT.)	C-76 CL. 2 (FT.)	C-76 CL. 3 (FT.)	C-76 CL. 4 (FT.)	C-76 CL. 5 (FT.)
12"		4-8	3-14	2-30	2-40
15"		3.5-8	3-14	2-30	2-40
18"		3.5-8	3-13	2-30	2-40
21"		3.5-9	2.5-15	2-30	2-40
24"		3-10	2.5-16	2-30	1.5-40
27"		3-10	2.5-17	2-30	1.5-40
30"		3-11	2.5-17	1.5-30	1.5-40
36"		2.5-11	2.0-17	1.5-30	1.0-40
42"		2.5-10	2.0-15	1.0-30	1.0-40
48"		2.5-10	2.0-15	1.0-30	1.0-40
54"		2.0-10	1.5-15	1.0-30	1.0-40
60"	2.5-8	2.0-11	1.5-15	1.0-30	1.0-40
66"	2.5-8	2.0-11	1.0-16	1.0-30	1.0-40
72"	2.0-8	1.5-11	1.0-16	1.0-30	1.0-40
78"	2.0-9	1.5-11	1.0-17	1.0-30	1.0-40
84"	2.0-9	1.5-11	1.0-17	1.0-30	1.0-40
90"	2.0-9	1.5-12	1.0-17	1.0-30	1.0-40
96"	1.5-9	1.0-12	1.0-17	1.0-30	1.0-40
102"	1.5-9	1.0-12	1.0-17	1.0-30	1.0-40

EXHIBIT D

MONTGOMERY COUNTY
MISCELLANEOUS DESIGN CRITERIA GUIDELINES

1. Standard County Catch Basins

Type 3A All slopes

Type 3 Low Location

2. Maximum catch basin spacing is 300 feet.

3. Minimum allowable runoff coefficient - Rational Formula:
C - .4 Residential
C - .6 Apartment
C - .9 Commercial

4. Time of concentration - Overland Flow Chart

5. The 24 hour storm - SCS Method:
The 24 hour total rainfall for Montgomery County is:

RECURRENCE INTERVAL Years	24 HOUR RAINFALL Total Inches
1	2.5
2	2.8
5	3.5
10	4.0
25	4.6
50	5.0
100	5.5

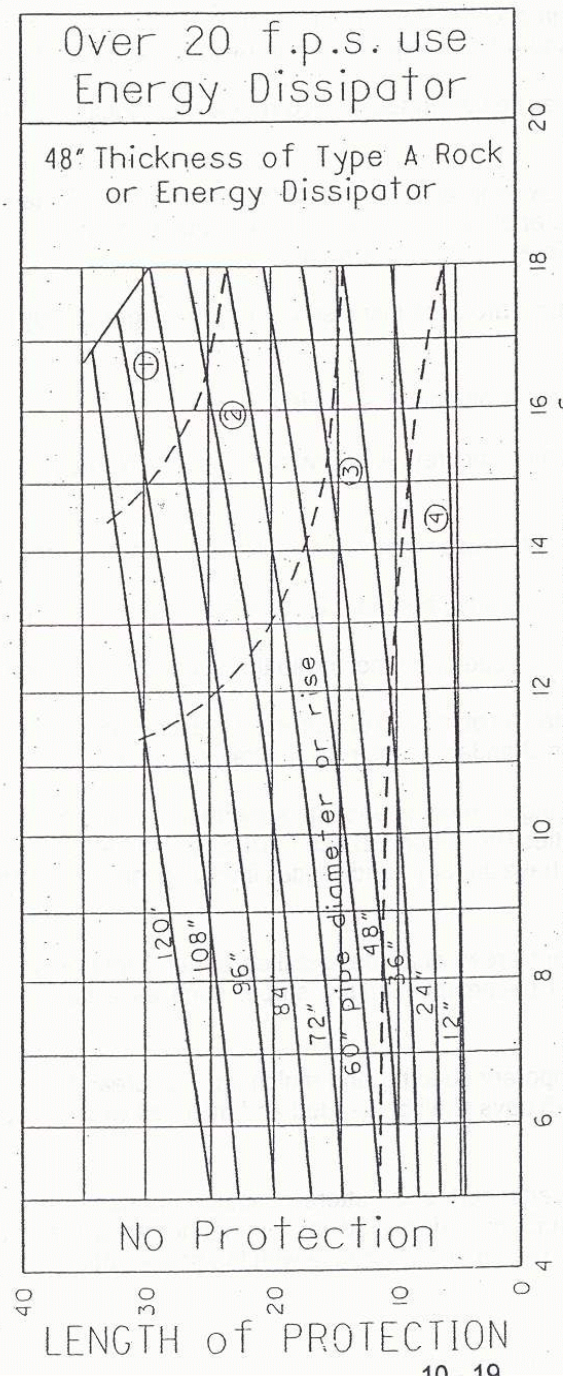
NOTE: Alternate design consideration may be submitted for approval with proper documentation.

EXHIBIT E

ROCK CHANNEL PROTECTION AT CULVERT AND STORM SEWER OUTLETS

1107-1

REFERENCE SECTION
1107.2



ROCK TYPE

LEGEND
①48" of 18" rock A
②36" of 18" rock A
③30" of 12" rock B
④18" of 6" rock C

NOTES

Rock size (6", 12", 18") indicates the square opening on which 85% of the material, by weight, will be retained.

The width of protection shall be the width of the headwall, with 4' being the minimum.

(Where a stream bed will withstand the calculated velocity without erosion, no rock channel protection will be required.)

EXHIBIT F

MONTGOMERY COUNTY
STANDARD GENERAL NOTES FOR SUBDIVISIONS

Standard Notes for all Roadway and Storm Drainage

1. All road work shall be performed in accordance with the January 1, 1997 copy of the State of Ohio, Department of Transportation "Construction and Material Specifications."

2. All storm drainage construction shall be performed in accordance Montgomery County standards.

3. All trench excavation within the existing and proposed street right-of-way shall be backfilled with granular fill material in accordance with Montgomery County specifications and compacted before subgrade approval.

4. All underground utility service laterals are to be installed from main to right-of-way line before streets are surfaced.

5. All catch basins to be type "3A" unless otherwise specified.

6. All catch basin laterals to be reinforced concrete A.S.T.M. Specification Number C-76, Class 4, unless otherwise noted.

7. All manholes to be Type "A" unless otherwise noted. Channel bottoms of all manholes.

8. Radius of back of curb at intersections shall be 25.00 feet, unless otherwise shown.

9. All field tile encountered shall be replaced or connected to the storm sewer system.

10. Curb ramps to be located as indicated on plans and constructed in accordance with the Ohio Department of Transportation Standard Construction Drawing BP-7.1.

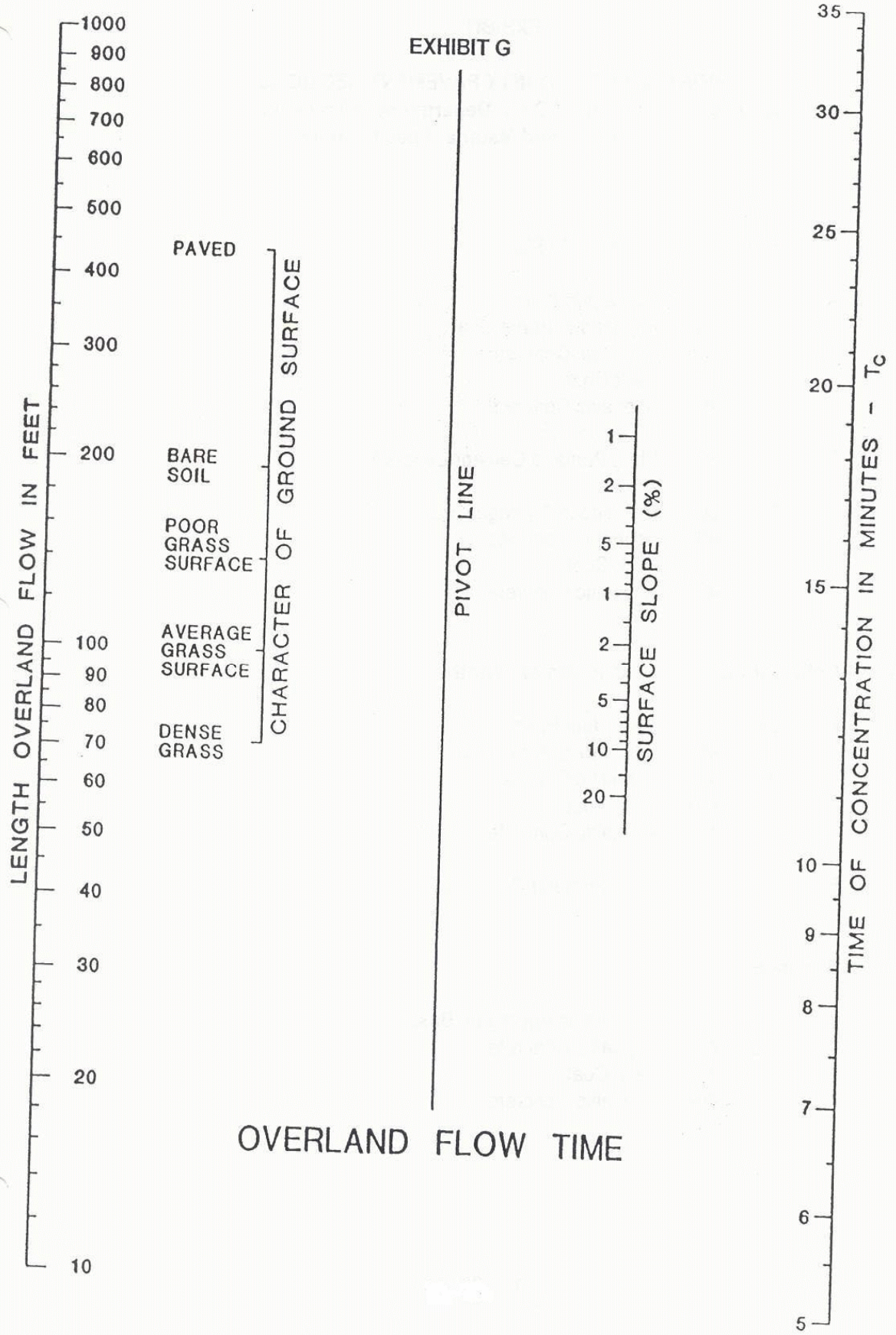
11. Forty-Eight (48) hours before digging is to commence, the contractor shall notify the following agencies: The Ohio Utilities Protection Service (OUPS) at 1-800-362-2764; and all other agencies which might have underground utilities involving this project and are non-members of OUPS.

12. All manholes installed in pavement areas shall be installed either centered on a traveled lane or on a longitudinal pavement marking stripe, such as a lane line, channelizing line or centerline.

13. All disturbed areas shall have temporary seeding and mulching. All areas that are planned to be bare for more than 45 days shall be seeded and mulched within seven (7) days.

14. All street surfaces, driveways, culverts, curb and gutters, roadside drainage ditches and other structures that are disturbed or damaged in any manner as a result of construction shall be replaced or repaired in accordance with the specifications.

EXHIBIT G



OVERLAND FLOW TIME

EXHIBIT H

MONTGOMERY COUNTY PAVEMENT SECTIONS
January 1, 2002 State of Ohio, Department of Transportation,
Construction and Material Specifications

I. Local Street 29' Pavement - 50'RW

A.	10"	304	Aggregate Base
		408	Bituminous Prime Coat
	1.5"	448	Asphalt Concrete
		407	Tack Coat
	1.5"	448	Asphalt Concrete
B.	7"	452	Non Reinforced Portland Cement Concrete
C.	5"	301	Asphalt Concrete Base
	1.5"	448	Asphalt Concrete
		407	Tack Coat
	1.5"	448	Asphalt Concrete

II. Collector Street 37' - 40' Pavement Width

A.	2-6"	304	Aggregate Base
		408	Bituminous Prime Coat
	1.5"	448	Asphalt Concrete
		407	Tack Coat
	1.5"	448	Asphalt Concrete
B.	7"	452	Non Reinforced Portland Cement Concrete

Alternate

C.	5.5"	301	Asphalt Concrete Base
	1.5"	448	Asphalt Concrete
		407	Tack Coat
	1.5"	448	Asphalt Concrete
D.	6"	304	Aggregate Base
		408	Prime Coat
	3"	301	Asphalt Concrete Base
	1.5"	448	Asphalt Concrete
		407	Tack Coat
	1.5"	448	Asphalt Concrete

III. Arterial Street Variable Width

A.	6"	304	Aggregate Base
	10"	304	Aggregate Base
		408	Prime Coat
	2"	448	Asphalt Concrete
	1.25"	448	Asphalt Concrete
		407	Tack Coat
	1.25"	448	Asphalt Concrete
B.	9"	452	Non Reinforced Portland Cement Concrete

Alternate

C.	7.5"	301	Asphalt Concrete Base
	2"	448	Asphalt Concrete
		407	Tack Coat
	1.5"	448	Asphalt Concrete
D.	6"	304	Aggregate Base
		408	Prime Coat
	6"	301	Asphalt Concrete Base
	1.5"	448	Asphalt Concrete
		408	Tack Coat
	1.5"	448	Asphalt Base

All Sections will contain these notes:

1. 204 Subgrade Preparation

2. 304 - 12" Behind Back of Curb

3. The final course of 448 Asphalt Concrete shall not be applied until the initial course of 448 Asphalt Concrete has been in place at least 9 months. Any item 448 deterioration or settlement that has developed during this period shall be removed and replaced before the Item 448 final course is applied. Item 407 Tack Coat shall be applied before placement of the final course of 448.

4. All construction methods and materials shall be in conformance with the current edition of the State of Ohio, Department of Transportation, Construction and Material Specs.

5. All trenches within the right-of-way must be backfilled with compacted granular material.

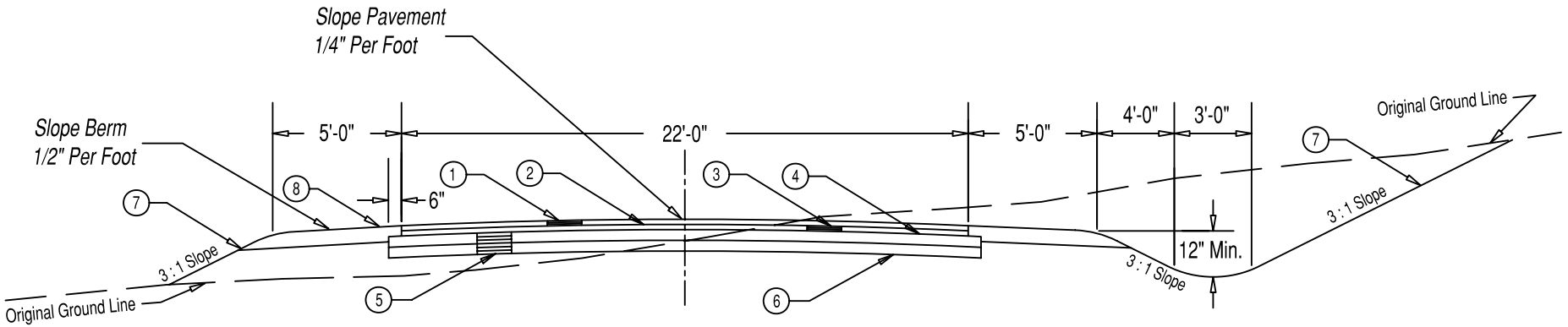
6. Geotextile fabrics may be used for subbase stabilization with proper documentation and approval.

7. All 448 Asphalt shall contain all new materials.

8. Apply a 4" ribbon of liquid asphalt where the item 448 meets the curb within five (5) days after paving.

Standard Drawings

4-H-1-2	Street Section without curb and gutter
4-H-1-3	Street Section with curb and gutter
4-H-1-4	Curb and Gutter
4-H-1-8A	Standard Manhole
4-H-1-9	2-2A and 2-2B Catch Basins (2 pages)
4-H-1-10	2-3 and 2-4 Catch Basins
4-H-1-10A	2-5 and 2-6 Catch Basins
4-H-1-11	No. 3A Catch Basins
4-H-1-12	No. 3 Catch Basins
4-H-1-16	Pipe Culvert End
4-H-1-16A	Half Height Headwall, Concrete Pipe (2 pages)
4-H-1-16B	Half Height Headwall, Plastic and CMP Pipe (2 pages)_
4-H-1-17	Full Head
4-H-1-18	Shewed Headwell
4-H-1-19	Full Headwall with Wingwalls (2 pages)
4-H-1-20	ODOT Manhole No. 5
4-H-1-22	Concrete Low Flow Channel
4-H-1-24	Street Sign
4-H-1-26	End of Roadway Markers
4-H-1-28	Concrete Flared End Section



TYPICAL SECTION WITHOUT CURB & GUTTER

1. ITEM 448 ASHALT CONCRETE (1.5" COURSE) TO BE APPLIED 9 MONTHS AFTER 1.5" 448 COURSE IS APPLIED
2. ITEM 407 TACK COAT 0.10 GAL. PER SQUARE YARD
3. ITEM 448 ASPHALT CONCRETE (1.5" COURSE) AT THE END OF 5 DAYS AFTER 408
4. ITEM 408 PRIME COAT 0.50 GAL. PER SUARE YARD
5. ITEM 304 AGGREGATE BASE (2 - 5" COURSES)
6. ITEM 204 SUBGRADE COMPACTION
7. ITEM 659 SEEDING AND MULCHING
8. ITEM 304 AGGREGATE BASE (6" COURSE)

NOTES

1. THE FINAL COURSE OF ITEM 448 ASPHALT CONCRETE SHALL NOT BE APPLIED UNTIL THE FIRST COURSE OF ITEM 448 ASPHALT CONCRETE HAS BEEN IN PLACE AT LEAST 9 MONTHS. ANY ITEM 448 DETERIORATION OR SETTLEMENT THAT HAS DEVELOPED DURING THIS PERIOD SHALL BE REMOVED AND REPLACED BEFORE THE FINAL COURSE OF ITEM 448 IS APPLIED.

2. ALL CONSTRUCTION METHODS AND MATERIALS SHALL BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECS.

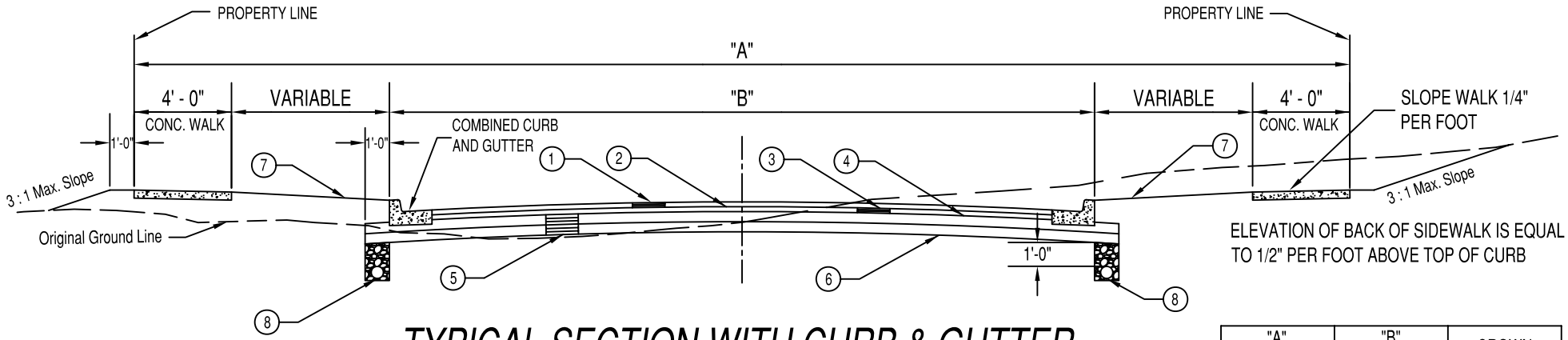
3. ALL TRENCHES WITHIN THE RIGHT OF WAY MUST BE BACKFILLED WITH COMPACTED GRANULAR MATERIAL.

4. ALL 448 ASPHALT SHALL CONATIN NEW MATERIALS.

MINIMUM REQUIREMENTS
FOR NEW STREETS
WITHOUT CURB & GUTTER

MONTGOMERY COUNTY ENGINEER'S OFFICE
451 WEST THIRD STREET
DAYTON, OHIO 45422

Montgomery County Subdivision
Regulations Drawing # 4-H-1-2
Sheet 1 of 1 Date 9-08-04



ELEVATION OF BACK OF SIDEWALK IS EQUAL TO 1/2" PER FOOT ABOVE TOP OF CURB

TYPICAL SECTION WITH CURB & GUTTER
LOCAL - RESIDENTIAL STREET

"A" R/W	"B" B/C - B/C	CROWN
50'	29 FT. MIN.	1/4" PER FOOT
60'	37 FT. MIN.	1/4" PER FOOT

(1) ITEM 448 ASHALT CONCRETE (1.5" COURSE) TO BE APPLIED 9 MONTHS AFTER 1.5" 448 COURSE IS APPLIED

(2) ITEM 407 TACK COAT 0.10 GAL. PER SQUARE YARD

(3) ITEM 448 ASPHALT CONCRETE (1.5" COURSE) AT THE END OF 5 DAYS AFTER 408

(4) ITEM 408 PRIME COAT 0.50 GAL. PER SUARE YARD

(5) ITEM 304 AGGREGATE BASE (2 - 5" COURSES)

(6) ITEM 204 SUBGRADE COMPACTION

(7) ITEM 659 SEEDING AND MULCHING

(8) ITEM 605 6" PIPE UNDER DRAIN

NOTES

1. THE FINAL COURSE OF ITEM 448 ASPHALT CONCRETE SHALL NOT BE APPLIED UNTIL THE FIRST COURSE OF ITEM 448 ASPHALT CONCRETE HAS BEEN IN PLACE AT LEAST 9 MONTHS. ANY ITEM 448 DETERIORATION OR SETTLEMENT THAT HAS DEVELOPED DURING THIS PERIOD SHALL BE REMOVED AND REPLACED BEFORE THE FINAL COURSE OF ITEM 448 IS APPLIED.

2. ALL CONSTRUCTION METHODS AND MATERIALS SHALL BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECS.

3. ALL TRENCHES WITHIN THE RIGHT OF WAY MUST BE BACKFILLED WITH COMPACTED GRANULAR MATERIAL.

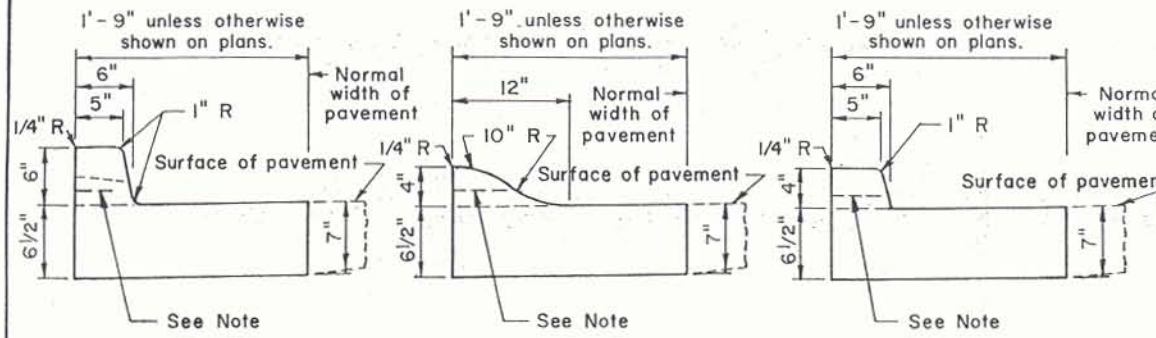
4. ALL 448 ASPHALT SHALL CONTAIN NEW MATERIALS.

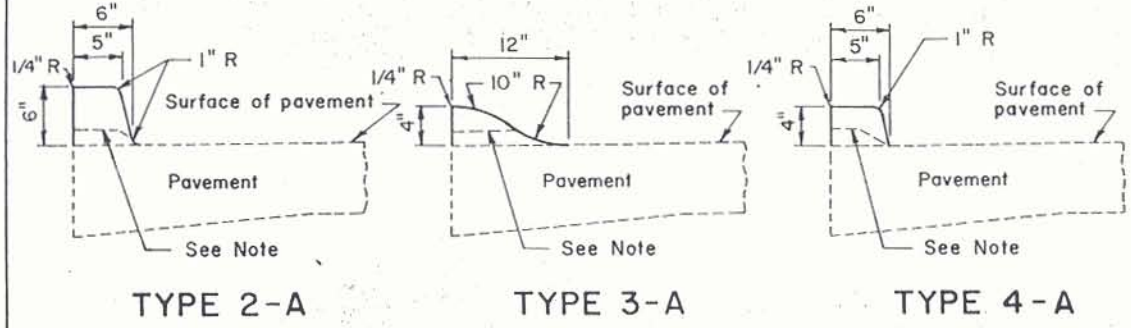
5. APPLY A 4" RIBBON OF LIQUID ASPHALT WHERE THE FINAL COURSE OF ITEM 448 MEETS THE CURB WITHIN FIVE (5) DAYS AFTER PAVING.

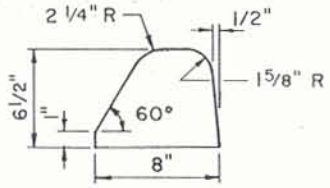
MINIMUM REQUIREMENTS
FOR NEW STREETS WITH
CURB & GUTTER

MONTGOMERY COUNTY ENGINEER'S OFFICE
451 WEST THIRD STREET
DAYTON, OHIO 45422

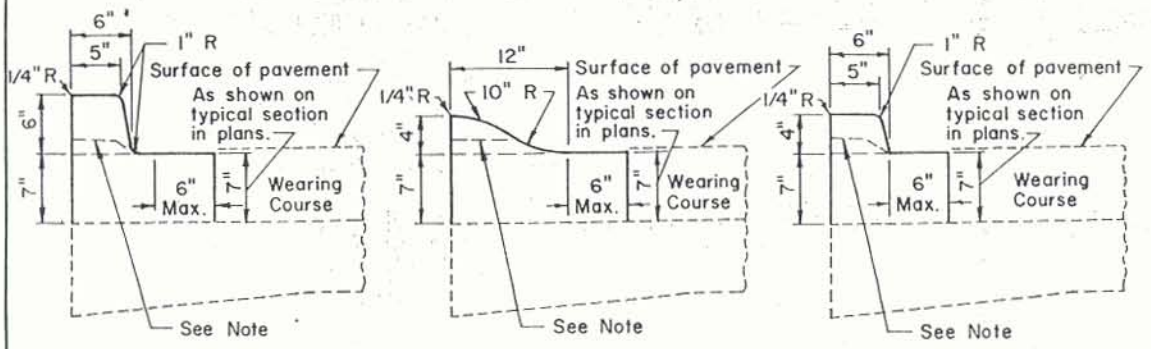
Montgomery County Subdivision Regulations Drawing # 4-H-1-3
Sheet 1 of 1 Date 9-08-04







ASPHALTIC CONCRETE MACHINE MADE CURB



NOTES

General: This drawing shows alternate types of curb that may be used on various types of pavement. Typical section of project shows the type to be used, also the thickness of the edge of the pavement.

Design: Types 2, 3, or 4 combined curbs and gutters, may be used when the width or half-width between curbs is more than the standard widths of finishing machine, with the variation in width of pavement being taken up in the variable width of the gutter. These types may be used with any type of pavement, whether of one, two, or three course construction.

Types 2-A, 3-A, and 4-A are for use with concrete pavements of normal widths.

Types 2-B, 3-B, and 4-B are for use with concrete bases of normal widths.

Type 5, straight or barrier curb, may be used with all types of pavements.

The width of openings for driveways, by depressing the top of the curb, shall not be less than 12 feet.

Curb and gutter reinforcing is not required unless specified on the plans.

Note: Depress curb at driveways to 2" above gutter line

Joints: Transverse joints in pavements or bases shall be extended through curbs or combined curb and gutters built integral with or tied to the pavement or base.

In combined curb and gutter not tied to the base or pavement, one inch thick premolded expansion joints shall be constructed at the beginning and end of intersection radius curb and at intervals not to exceed 300 feet. Premolded joints constructed with catch basins shall be considered as effective in meeting the requirement.

DATE	REVISION	BY
7-27-82	REVISION OF JOINTS NOTE	O.R.A.

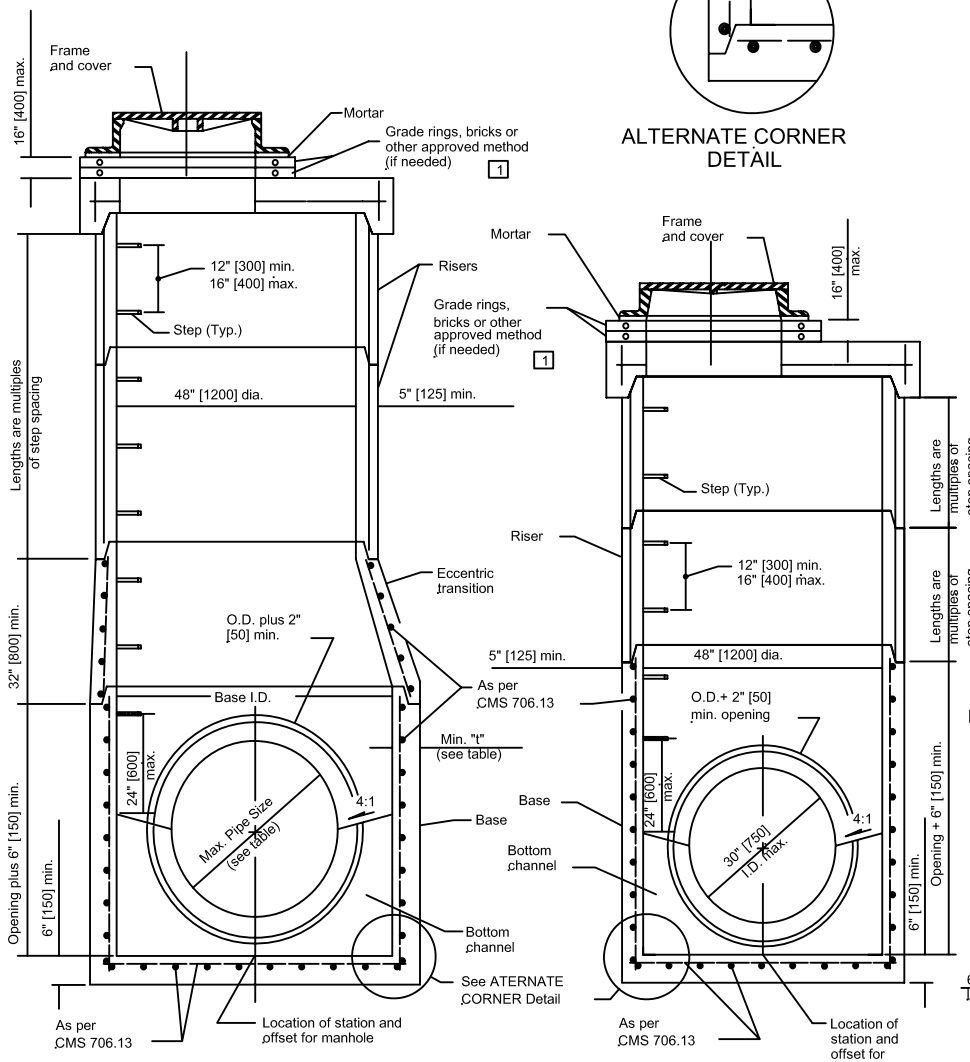
STANDARD CONCRETE CURBS AND COMBINED CURB AND GUTTER

COUNTY ENGINEER'S OFFICE
MONTGOMERY CO. OHIO

APPROVED Rex A. Dickey
REX A. DICKEY CO. ENG'R.

DRAWN - R.G.J.
CH'K'D.

FILE NO
4-H-1-4



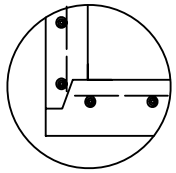
60" to 108" [1500 to 2750] PRECAST BASE

SEE TABLE FOR MAXIMUM PIPE SIZES

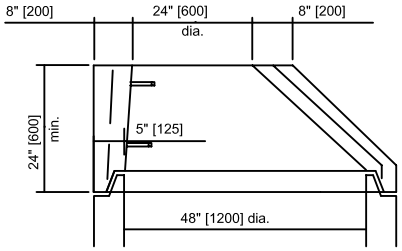
48" [1200] PRECAST BASE

FOR 30" [750] AND SMALLER PIPE

SECTION VIEWS OF REINFORCED PRECAST MANHOLES

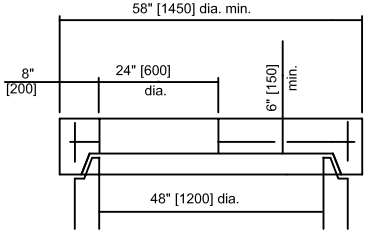


ALTERNATE CORNER DETAIL

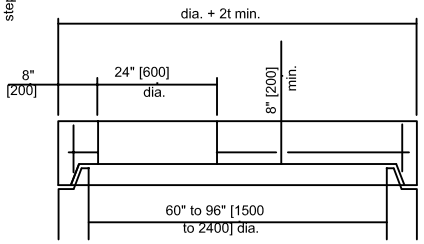


ALTERNATE ECCENTRIC CONE TOP

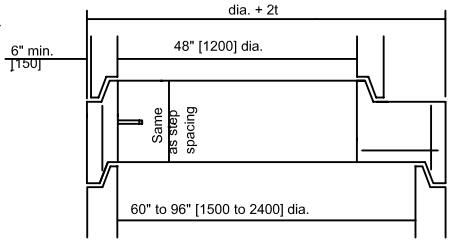
(Only if specified)



FLAT SLAB TOP



FLAT SLAB TOP



FLAT SLAB TRANSITION

NOTES

GENERAL: With normal soil and site conditions this standard precast manhole may be used for any required manhole depth. assembled with either all tongue or all groove ends up.

Sections of the precast manhole shall be cast and assembled with either all tongue or all groove ends up. Lift holes may be provided in each section for handling.

Handling device for the flat slab shall be left in place.

TOP: This section shall be a flat slab unless an eccentric cone is specified.

TRANSITION (OR REDUCER): This section can be either eccentric cone or flat slab.

BASE: Manhole No. 3 is shown with a monolithic floor and riser which may be cast in one or two operations. A permissible alternate is to cast and ship the floor and barrel separately. Openings for inlet and outlet pipes shall be provided, either when the unit is cast or later, to meet project requirements. Bottom channels may be formed of concrete, precast in the base or field constructed as shown on **SCD MH-1.1** and **MH-3.1**.

RISER SECTIONS: Openings for 18" [450] and smaller inlet pipes may be either prefabricated, or cut in the field provided the sides of the pipe at the springline do not project into the manhole.

CONNECTIONS: Connections between precast manhole sections and pipes on sanitary sewers may be sealed with resilient connectors conforming to ASTM C 923.

JOINT SEAL: Seal between precast manhole sections on sanitary sewers hsall be resilient and flexible gasket joints per CMS 706.11.

OPENINGS: The maximum pipe opening shall be the O.D. of the pipe being supplied plus 2" [50] when fabricated or field cut. Fill any voids per CMS 601.

MATERIALS: Materials for bases and other precast sections, including reinforcement no specified hereon, shall comply with the requirements of CMS 706.13.

DROP PIPE: When specified on the plans, drop pipe shall be constructed as shown on **SCD MH-1.1**.

STEPS, FRAMES AND COVERS: Shall comply with the requirements set forth on **SCD MH-1.1**.

TOP SLAB REBAR: Reinforcing steel used within the top slab shall be epoxy coated.

LEGEND

1 Reconstruction to grade only. Approved materials are kept on file by the Office of Materials Management.

MAXIMUM PIPE SIZES

BASE I.D.	MIN. "t"	MAX. PIPE SIZE
60" [1500]	5" [125]	36" [900]
72" [1800]	6" [150]	48" [1200]
84" [2100]	7" [175]	54" [1350]
90" [2250]	7 1/2" [190]	60" [1500]
96" [2400]	8" [200]	66" [1650]
108" [2750]	9" [230]	72" [1800]

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
J. Syar

All metric dimensions (in brackets [] are in millimeters unless otherwise noted.

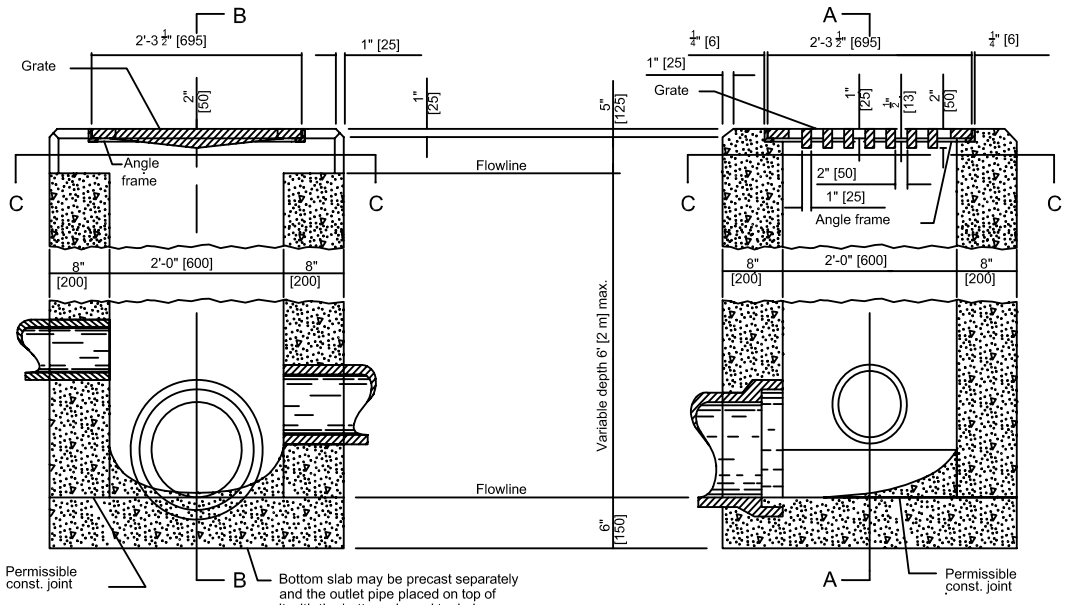
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
MANHOLE No. 3

NUMBER
MH-1.2

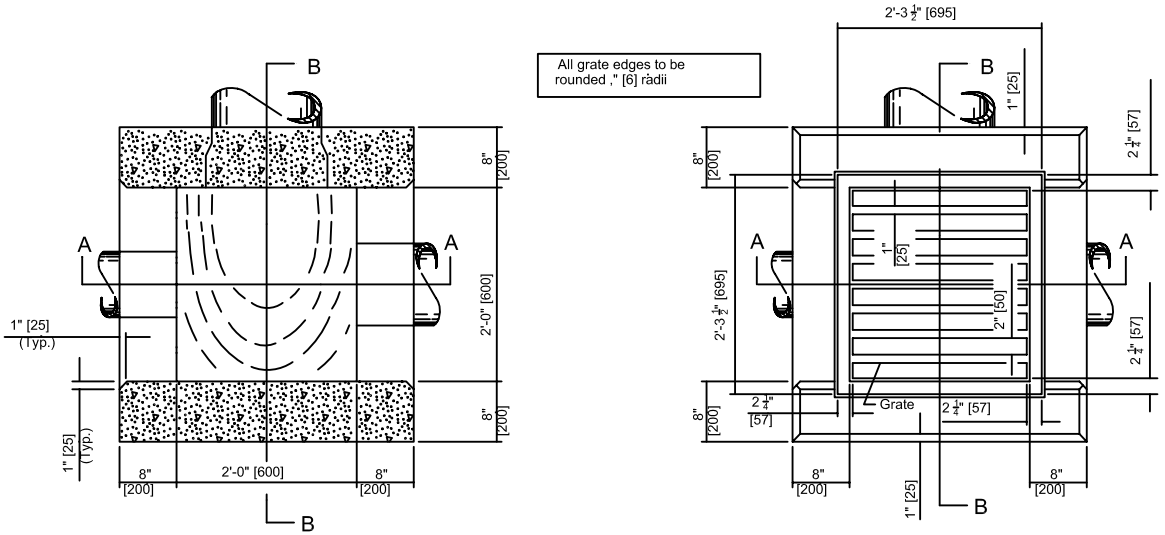
1 / 1

Montgomery County Subdivision Regulations Drawing #4-H-1-8A Sheet 1 of 1 Date 9-08-04



SECTION A-A

SECTION B-B



SECTION C-C

PLAN

CATCH BASIN No. 2-2A

NOTES

GENERAL: Catch Basins 2-2A and 2-2B are not intended for traffic bearing applications.

CATCH BASINS 2-2A & B: This sheet depicts Catch Basin 2-2A. See Sheet 2 of 2 for Catch Basin 2-2B.

GRATE AND FRAME: The design shall be essentially the same and equally as strong as the one shown (see Construction Information table), or meet the requirements of CMS 711.14. Grate openings and dimensions shall not differ from those shown here unless otherwise shown in the plans.

As of January 1, 2003, the following text shall be cast into the top of the grate:

"DUMP NO WASTE" and **"DRAINS TO WATERWAY"**

Text shall be printed in bold, capital letters with a minimum height of 1/2". "WATERWAY" may be substituted with "STREAM","RIVER","LAKE", etc. Actual placement and logo may vary per manufacturer.

WALLS: Brick or cast-in-place walls have a nominal thickness of 8" [200]. Precast walls shall have a minimum thickness of 6" [150] and be reinforced sufficiently to permit shipping and handling without damage. Brick shall not be used above the flow line of the side opening for Type 2-2A.

CONCRETE: Cast-in-place concrete is to be Class C. All precast concrete shall meet the requirements of CMS 706.13 and marked with the catch basin number.

PRECAST BASE: If a precast base is used, it shall be set deep enough so that the top can be placed on the base to provide the grate elevation specified in the plans. Layers of brick shall not be used to adjust the top elevation.

LOCATION AND ELEVATION: When given on the plans, location is the top center of the grate and the elevation is the flow line of the side inlet.

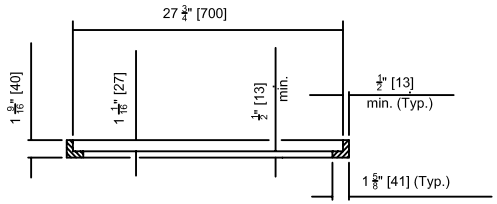
MINIMUM DEPTH: The minimum depth of CB No. 2-2A shall be the outside diameter (O.D.) of the outlet pipe plus 7" [175].

OPENINGS: Pipe openings shall be the O.D. of the pipe being supplied plus 2" [50] when fabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

2-2A SIDE INLETS: Inlets shall be provided on both sides of the No. 2-2A catch basin in sags and on upstream side only where the ditch has a continuous down grade past the catch basin. CB 2-2A's shall not be used within the Clear Zone. The flow line should be 4" to 6" [100 to 150] below normal ditch returning to normal 10' to 15' [3 m to 5 m] each side of the inlet.

PAYMENT: All materials and labor, including excavation and backfilling, shall be paid for under **Item 604 - Catch Basin, No. 2-2A.**

CONSTRUCTION INFORMATION
Minimum weight [mass] of grate, 120 lbs. [54 kg]
Minimum weight [mass] of frame, 40 lbs. [18 kg]



SECTION THRU ANGLE FRAME FOR STANDARD No. 2-2A CATCH BASIN

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

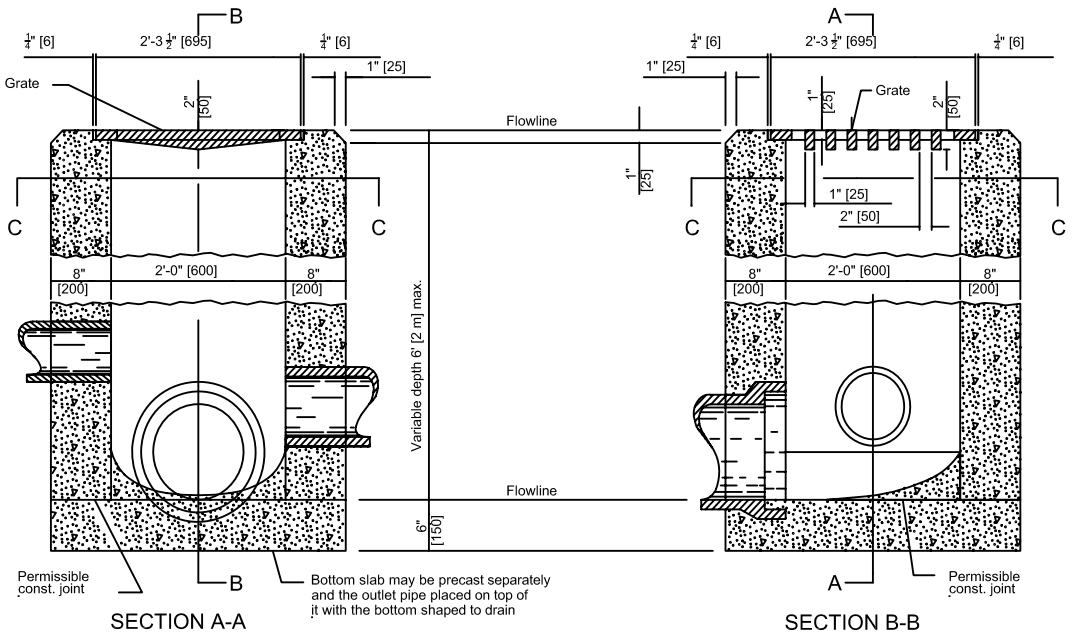
OFFICE OF STRUCTURAL ENGINEERING

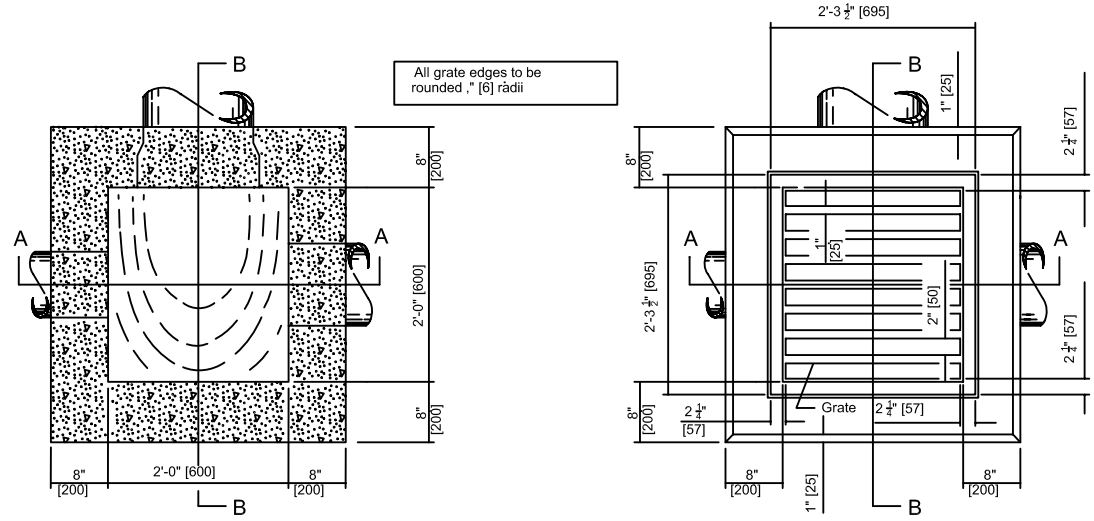
STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASINS No's 2-2A & B

NUMBER
CB-1.1

1 / 2

Montgomery County Subdivision Regulations Drawing # 4-H-1-9
Sheet 1 of 2 Date 9-08-04





CATCH BASIN No. 2-2B

NOTES

CATCH BASINS 2-2A & B: This sheet depicts Catch Basin 2-2B. See Sheet 1 of 2 for Catch Basin 2-2A.

GRATE: The design shall be essentially the same and equally as strong as the one shown (see construction information table), or meet the requirements of CMS 711.14. Grate openings and dimensions shall not differ from those shown unless otherwise shown in the plans.

If necessary, bicycle safe grates shall be specifed in the plans. Bicycle safe grates shall be Neenah No. R-4859-C or East Jordan No. 5110 Type M3 or approved equals.

As of January 1, 2003, the following text shall be cast into the top of the grate:

"DUMP NO WASTE" and **"DRAINS TO WATERWAY"**

Text shall be printed in bold, capital letters with a minimum height of 1/2". "WATERWAY" may be substituted with "STREAM","RIVER","LAKE", etc. Actual placement and logo may vary per manufacturer.

WALLS: Brick or cast-in-place walls have a nominal thickness of 8" [200]. Precast walls shall have a minimum thickness of 6" [150] and be reinforced sufficiently to permit shipping and handling without damage.

CONCRETE: Cast-in-place concrete is to be Class C. All precast concrete shall meet the requirements of CMS 706.13 and be marked with the catch basin number.

PRECAST BASE: If a precast base is used, it shall be set deep enough so that the top can be placed on the base to provide the grate elevation specified in the plans. Layers of brick shall not be used to adjust the top elevation.

LOCATION AND ELEVATION: When given on the plans, location and elevation are at the top center of the grate. When side openings are provided, the elevation shall be at the flow line of the side inlet.

MINIMUM DEPTH: The minimum depth for CB No. 2-2B shall be the O.D. of the outlet pipe plus 4" [100].

2-2B GRATE ELEVATION: Grate elevation is to be placed 4" to 6" [100 to 150] below normal ditch returning to normal 10' to 15' [3 m to 5 m] each side of inlet.

OPENINGS: Pipe openings shall be the O.D. of the pipe being supplied plus 2" [50] when fabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

PAYMENT: All materials and labor, including excavation and backfilling, shall be paid for under **Item 604 - Catch Basin, No. 2-2B.**

CONSTRUCTION INFORMATION
Minimum weight [mass] of grate, 120 lbs. [54 kg]

CATCH BASIN	OUTLET PIPE SIZE
2-2A	12" to 21" [300 to 525]
2-2B	12" to 21" [300 to 525]

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions in brackets are in millimeters Unless otherwise noted.

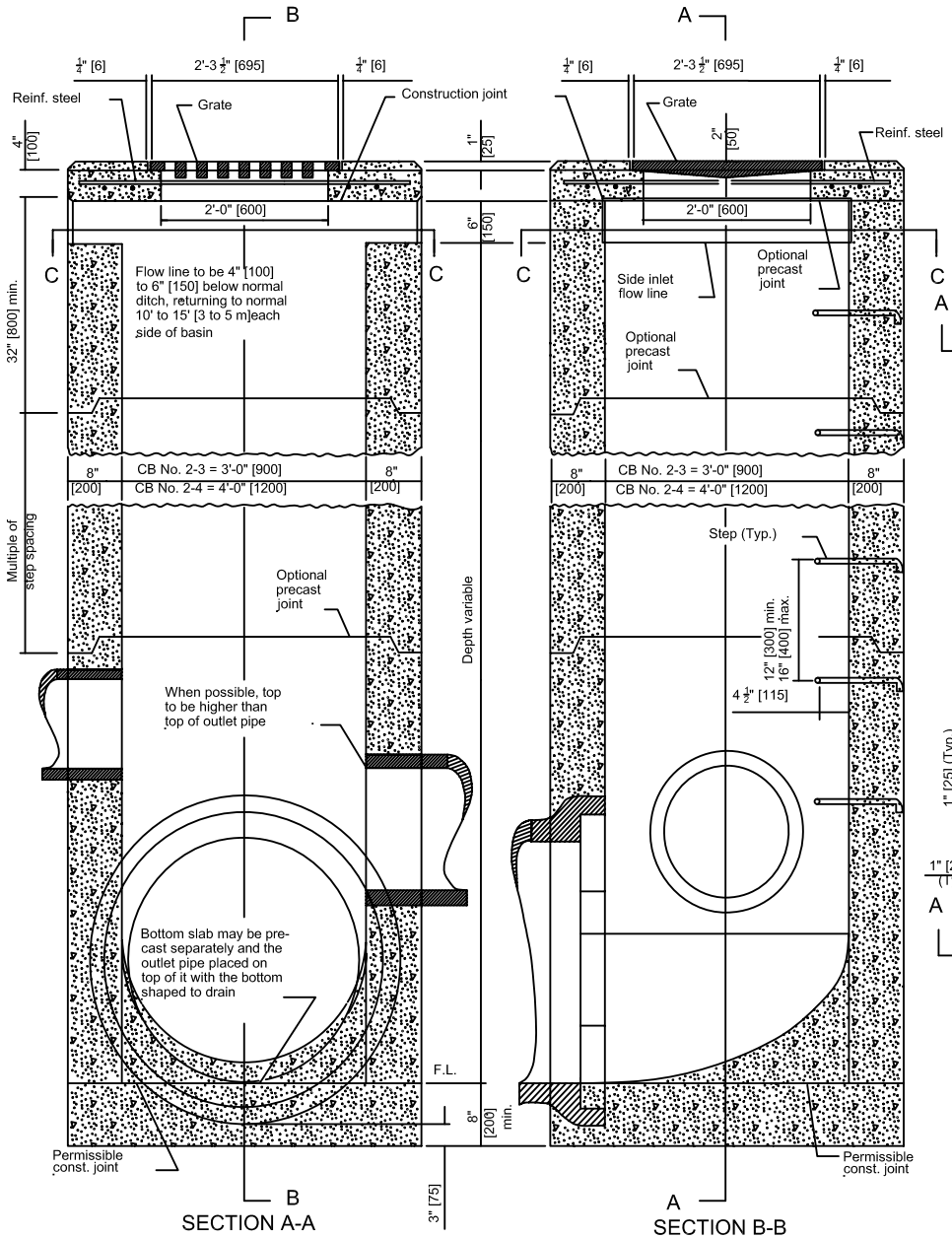
OFFICE OF STRUCTURAL ENGINEERING

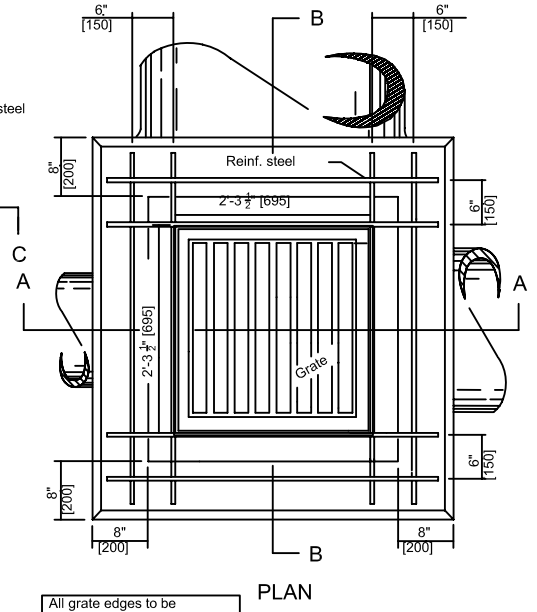
STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASINS No's 2-2A & B

NUMBER
CB-1.1

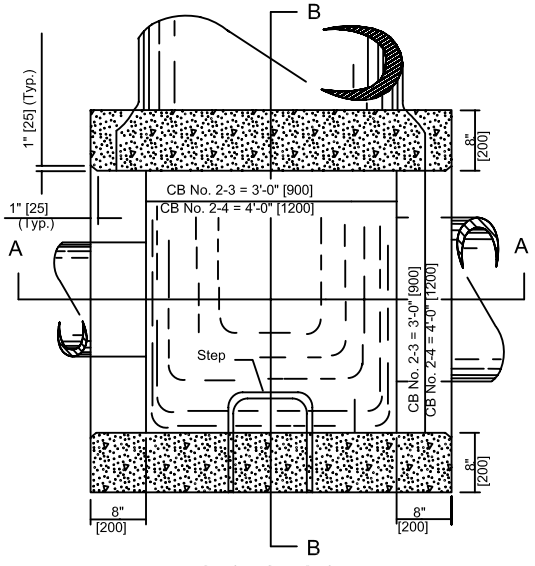
2 / 2

Montgomery County Subdivision Regulations Drawing # 4-H-1-9 Sheet 2 of 2 Date 9-08-04





All grate edges to be rounded ," [6] rádii



NOTES

GRATE: See details on **SCD CB-1.1**.
If necessary, bicycle safe grates shall be specified in the plans. Bicycle safe grates shall be Neenah No. R-4859-C or East Jordan No. 5110 Type M3 or approved equals.

As of January 1, 2003, the following text shall be cast into the top of the grate:

"DUMP NO WASTE" and **"DRAINS TO WATERWAY"**

Text shall be printed in bold, capital letters with a minimum height of ½". "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

WALLS: Brick or cast-in-place walls shall have a nominal thickness of 8" [200]. Precast walls shall have a minimum thickness of 6" [150] and be reinforced sufficiently to permit shipping and handling without damage. Precast tops shall be 8" [200] thick.

STEPS: Steps shall be provided where the depth exceeds 6' [1.8 m] and shall meet the requirements of **SCD-MH1.1**.

CONCRETE: Cast-in-place concrete is to be Class C. All precast concrete shall meet the requirements of CMS 706.13 and be marked with the catch basin number.

REINFORCEMENT: Reinforcing in the top is to be #4 [#13M] bars spaced at 6" [150] center to center. For Catch Basin No. 2-3 use eight bars and for Catch Basin No. 2-4 use twelve bars.

INLETS OVER 12 FEET [3.5 m] IN DEPTH: Shall be precast of cast-in-place concrete; reinforced with #4 [#13M] bars on 12" [300] clearance from the inside wall face.

PRECAST BASE: If a precast base is used, it shall be set deep enough so that the to can be placed on the base to provide the grate elevation specified in the plans. Layers of brick shall not be used to adjust the top elevation.

LOCATION AND ELEVATION: When given on the plans, the location and the elevation are at the to center of the grate. When side openings are provided, the elevation shall be at the flow line of the side inlet.

MINIMUM DEPTH: The minimum depth of CB No. 2-3 and CB No. 2-4 shall be the outside diameter (O.D.) of the outlet pipe plus 7" [175].

OPENINGS: Pipe openings shall be the O.D. of the pipe being supplied plus 2" [50] when prefabricated or field cut. Fill any voids per CMS 601.

SIDE INLETS: Inlets shall be provided on both sides of the No. 2-3 and 2-4 catch basin in sags and on upstream side only where the ditch has continuous down grade past the catch basin. Catch basins with side inlets shall not be used within the Clear Zone.

PAYMENT: All materials and labor, including excavation and backfill, shall be paid for under **Item 604 - Catch Basin, No. 2-3** or **Item 604 - Catch Basin No. 2-4**.

CATCH BASIN	OUTLET PIPE SIZE
2-3	12" to 33" [300 to 825]
2-4	36" to 42" [900 to 1050]

CATCH BASINS No. 2-3 & No. 2-4

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets [] are in millimeters unless otherwise noted.

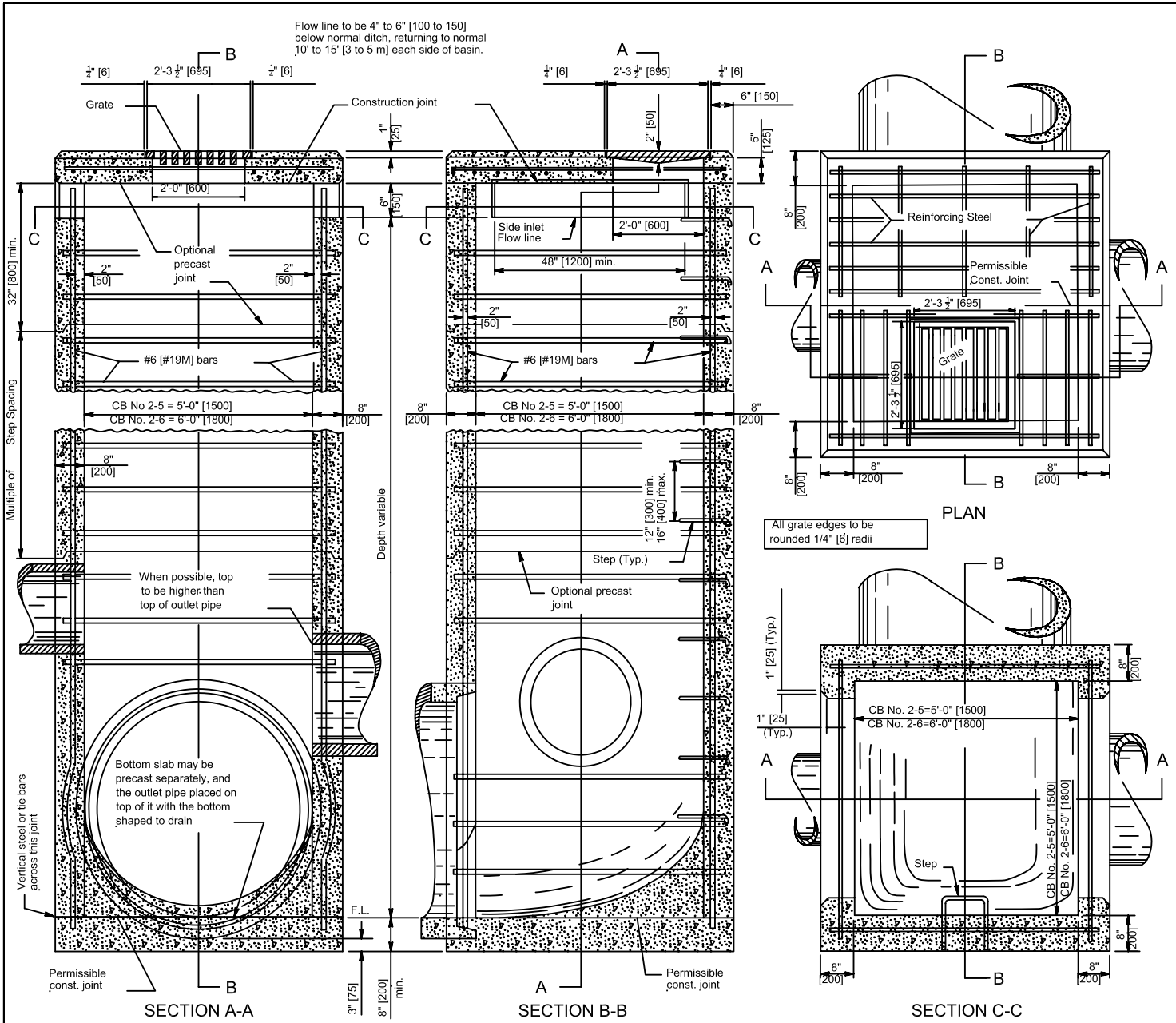
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASINS No's 2-3 & 2-4

NUMBER
CB-1.2

1 / 1

Montgomery County Subdivision Regulations Drawing # 4-H-1-10
Sheet 1 of 1 Date 9-08-04



CATCH BASINS No. 2-5 & No. 2-6

NOTES

GRATE: See details on **SCD CB-1.1**. Minimum weight [mass] of grate: 120 lbs. [54 kg], or meets the requirements of CMS 711.14. Grate openings and dimensions shall not differ from those shown unless otherwise shown in the plans.

If necessary, bicycle safe grates shall be specified in the plans. Bicycle safe grates shall be Neenah No. R-4859-C or East Jordan No. 5110 Type M3 or approved equals.

AS of January 1, 2003, the following text shall be cast into the top of the grate:

"DUMP NO WASTE" and **"DRAINS TO WATERWAY"**

Text shall be printed in bold, capital letters with a minimum height of 1/2". "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

WALLS: Shall be 8" [200] thick when reinforced, as shown. Brick walls, when used in place of reinforced concrete, hsall have a nominal thickness of 6" [300]. Precast walls shall have a minimum thickness of 6" [150] and be reinforced cas-in-place construction. Precast tops shall meet cast-in-place tops for dimensions and reinforcement.

STEPS: Steps shall be provided where the depth exceeds 6' [1.8 m] and shall meet the requirements **SCD MH-1.1**.

CONCRETE: Cast-in-place concrete is to be Class C. all precast concrete shall meet the requirements of CMS 706.13 and be marked with catch basin number.

REINFORCEMENT: Reinforcing in the to is to be #6 [#19M] bars spaced 6" [150] cener to center and #6 [#19M] tie bars spaced as shown. Main bars to clear bottom of slab by 1 1/4" [32]. Side wall to be reinforced with #6 [#19M] bars horizontal in each side, 6' [1800] long for CB No. 2-5 and 7' [2100] long for CB 2-6, spaced at 1' [300] cener to center and #6 [#19M] bars in each corner length equals depth plus 1' [300].

PRECAST BASE: If a precast base is used, it shall be set deep enough so that the top can be placed on the base to provide the grate elevation specified in plans. Layers of brick shall not be used to adjust the to elevation.

LOCATION AND ELEVATION: When given on the plans, the location and the elevation are at the top center of the grate. When side openings are provided, the elevation shall be at the flow line of the side inlet.

MINIMUM DEPTH: The minimum depth of CB No. 2-5 and CB No. 2-6 shall be the ouside diameter (O.D.) of the outlet pipe plus 7" [175].

OPENINGS: Pipe openings shall be the O.D. of the pipe being supplies plus 2" [50] when fabriaged or field cut. Fill any voids per CMS 601.

SIDE INLETS: Inlets shall be provided on both sides of the No. 2-5 and 2-6 catch basin in sags and upstream side only where the ditch has a continuous down drade past the catch basin. Catch basins with side inlets shall not be used within the Clear Zone.

PAYMENT: All materials and labor, including excavation and backfilling, shall be paid under **Item 604 - Catch Basin, No. 2-5** or **Item 604 - Catch Basin, No. 2-6.**

CATCH BASIN	OUTLET PIPE SIZE
2-5	48" to 54" [1200 to 1350]
2-6	60" to 72" [1500 to 1800]

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets [] are in millimeters unless otherwise noted.

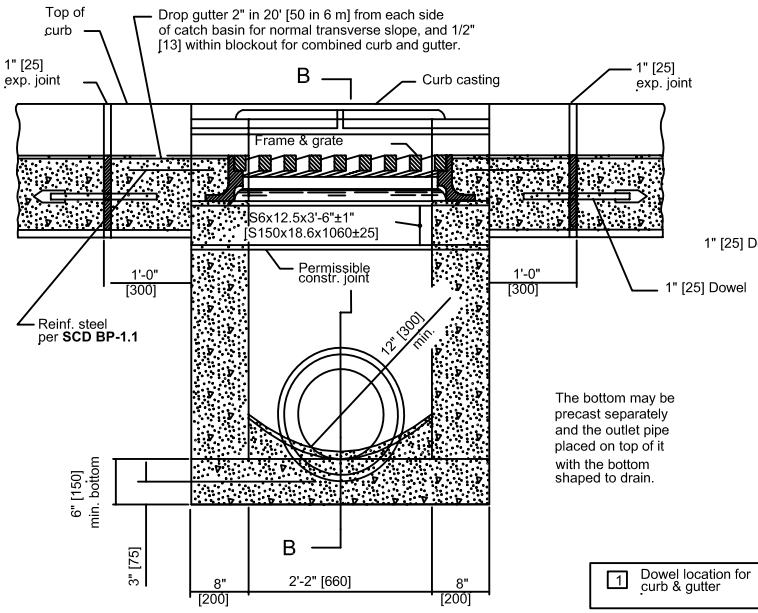
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASINS No's 2-5 & 2-6

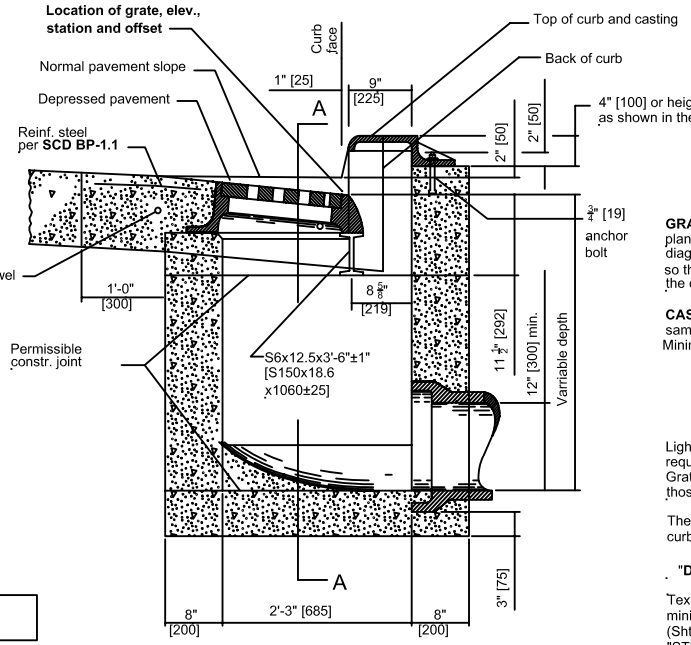
NUMBER
CB-1.3

1 / 1

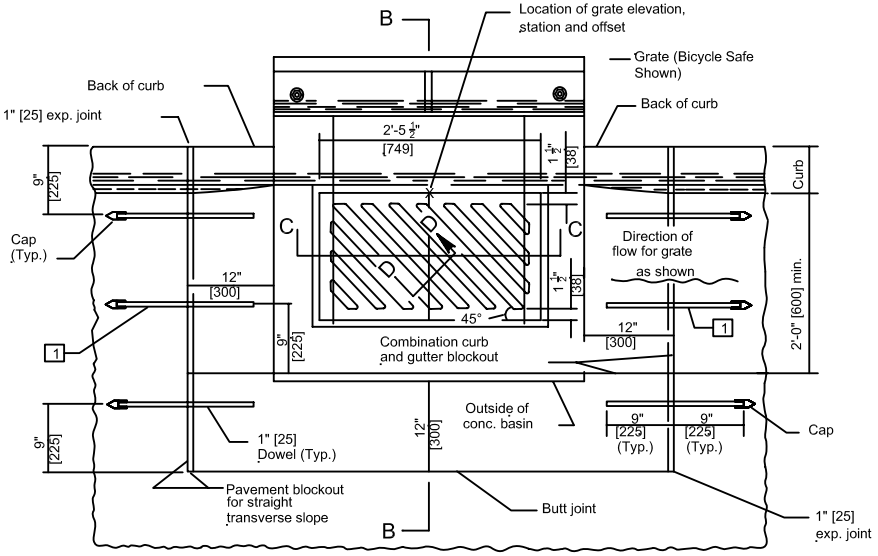
Montgomery County Subdivision Regulations Drawing #4-H-1-10A Sheet 1 of 1 Date 9-08-04



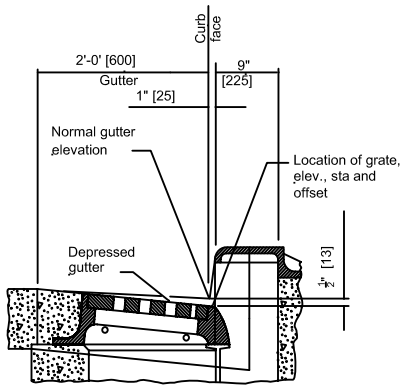
SECTION A-A



SECTION B-B
WITH CURB
(2" [50] DEPRESSION)



PLAN OF CATCH BASIN AND PAVEMENT JOINTS
(For SECTIONS C-C and D-D, see Sht. 2/2)



SECTION B-B
WITH CURB & GUTTER
(1/2" [13] DEPRESSION)

CATCH BASIN No. 3A

NOTES

GRATE: The Grate "V" shall be provided unless the plans specifically require the diagonal grate. If the diagonal grate is specified, it shall be placed so that the diagonal bars direct drainage flow toward the curb. (See Sht. 2/2.)

CASTINGS: The design shall be essentially the same and equally as strong as those shown. Minimum weight [mass]:

Curb Casting . . . . . 170 lbs. [77 kg]
Standard Grate . . . . 127 lbs. [57 kg],
Frame . . . . . 320 lbs. [145 kg], and
Grate "V" . . . . . 105 lbs. [47 kg].

Lighter weight frames and grates that meet the requirements of CMS 711.14 may also be provided. Grate openings and dimensions shall not differ from those shown unless otherwise shown in the plans.

The following text shall be cast into the top of the curb casting:

. **"DUMP NO WASTE"** AND **"DRAINS TO WATERWAY"**

Text shall be printed in bold, capital letters with a minimum height of *f*". See example on Plan (Sht. 2/2). "WATERWAY" may be substituted with "STREAM","RIVER","LAKE", etc. Actual placement and logo may vary per manufacturer.

BEARING AREAS: The frame and grate shall be so fitted and finished as to provide a firm and even seat. No projections shall exist on bearing areas of either casting and the grate shall seat in its frame without rocking.

WALLS: When used in place of concrete, brick side walls shall be 8" [200] nominal thickness.

PRECAST CONSTRUCTION: Permitted, except for the apron. Concrete shall meet the requirements of CMS 706.13. Precast walls shall have a minimum thickness of 6" [150] and reinforcing shall be sufficient to permit shipping and placement without damage. The wall thickness reduction shall be from the outside.

MINIMUM DEPTH: The minimum depth is per the cover requirements for that pipe type.

OPENINGS: Pipe openings shall be the O.D. of the pipe being supplied plus 2" [50] when fabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

DOWELS: Four 1"x18" [25x450] dowels are required for concrete pavement or gutter blockout. See **SCD BP-2.2** for dowel details.

BLOCKOUT: Blockouts shall be paved with Class C concrete in PCC pavement or gutter and paid for as a part of the pavement or gutter with no deduction in pavement, curb or gutter quanitities because of the castings. A Class C concrete apron the size of the 2'-0" [600] gutter shall be cast-in-place in asphalt pavement (no dowels required) with the cost included in the catch basin bid price. No deduction to be made in curb quantities.

PAYMENT: All materials and labor, including excavation and backfilling, shall be paid for under **Item 604 - Catch Basin, No. 3A**.

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

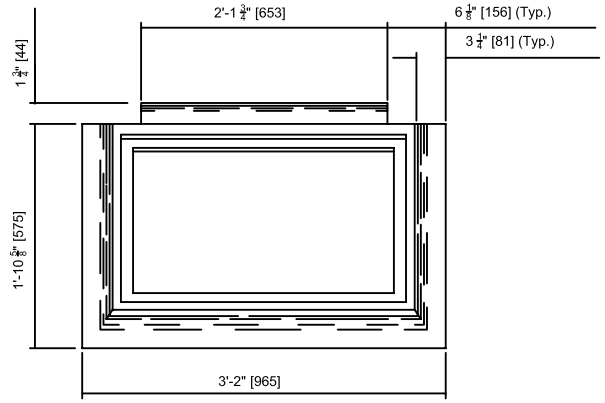
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

OFFICE OF STRUCTURAL ENGINEERING

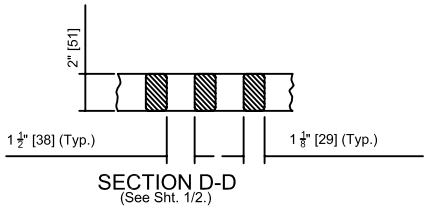
STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASIN No. 3A

NUMBER
CB-2.2

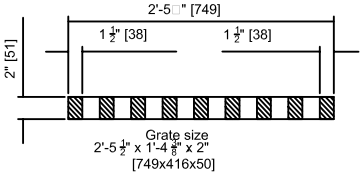
Montgomery County Subdivision Regulations Drawing # 4-H-1-11 Sheet 1 of 2 Date 9-08-04



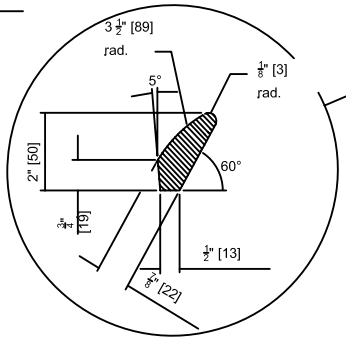
PLAN

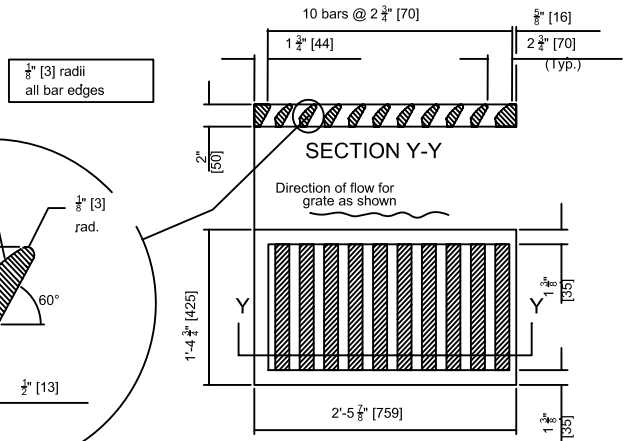


SECTION D-D
(See Sht. 1/2.)

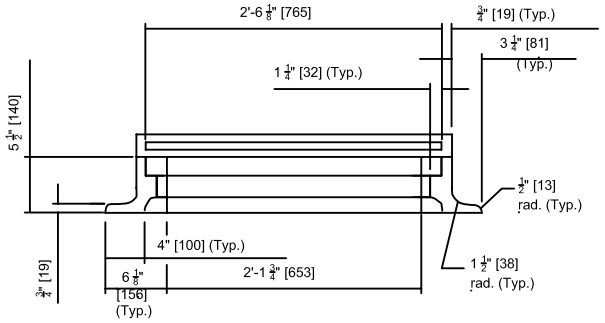


SECTION C-C
DIAGONAL GRATE
(See Sht. 1/2.)

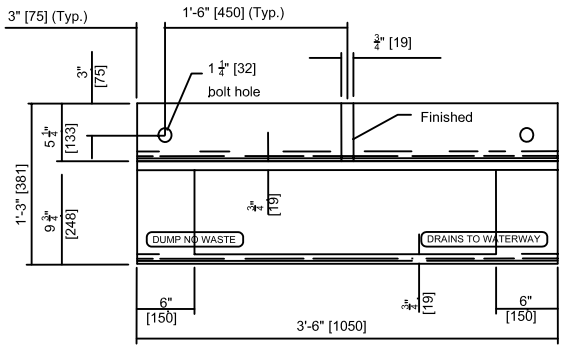




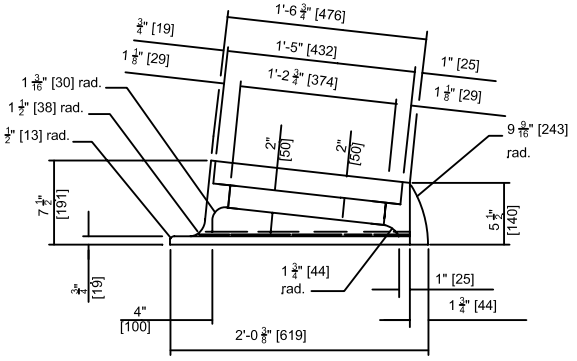
PLAN
GRATE "V"



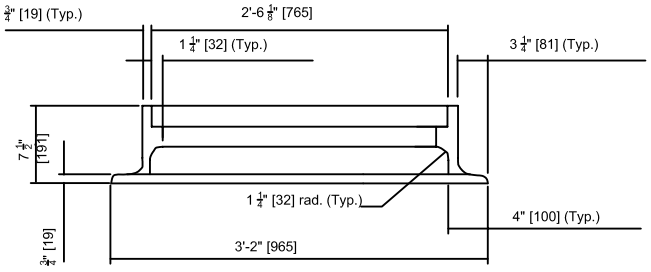
BACK VIEW



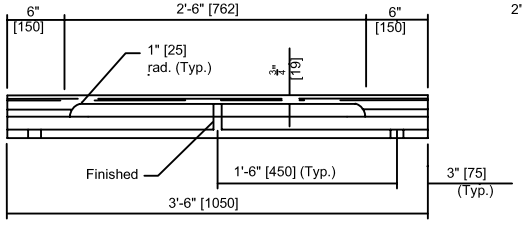
PLAN



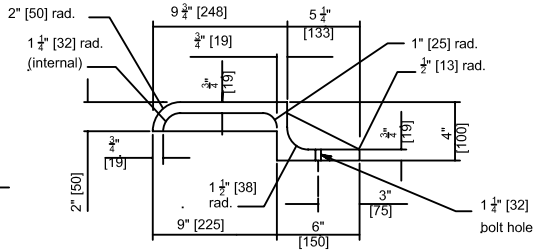
END VIEW FRAME



FRONT VIEW
FRAME



FRONT VIEW
CURB CASTING



END VIEW
CURB CASTING

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets []) are in millimeters unless otherwise noted.

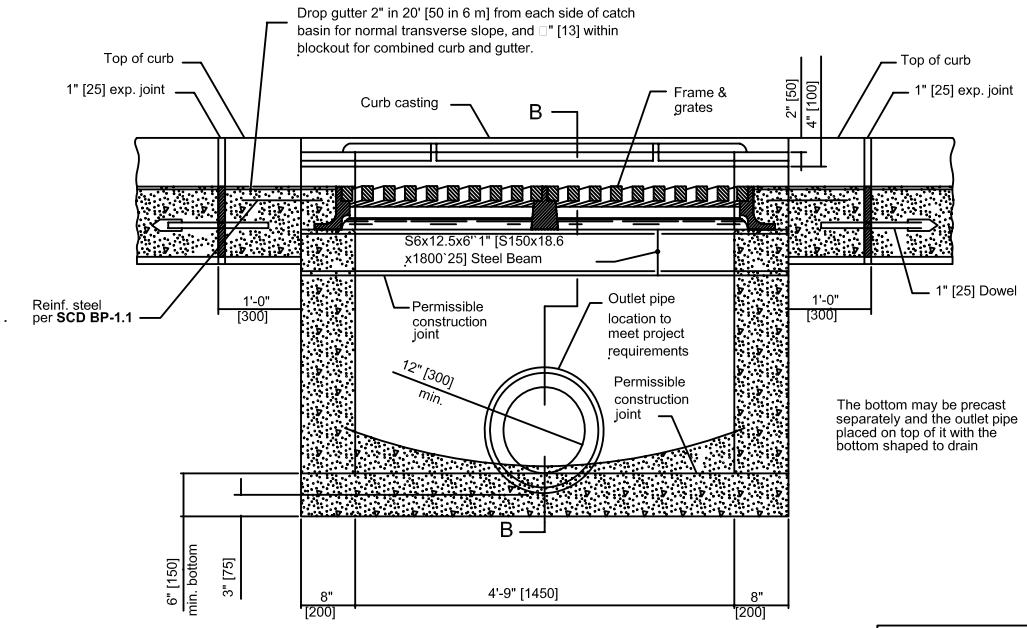
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASIN No. 3A

NUMBER
CB-2.2

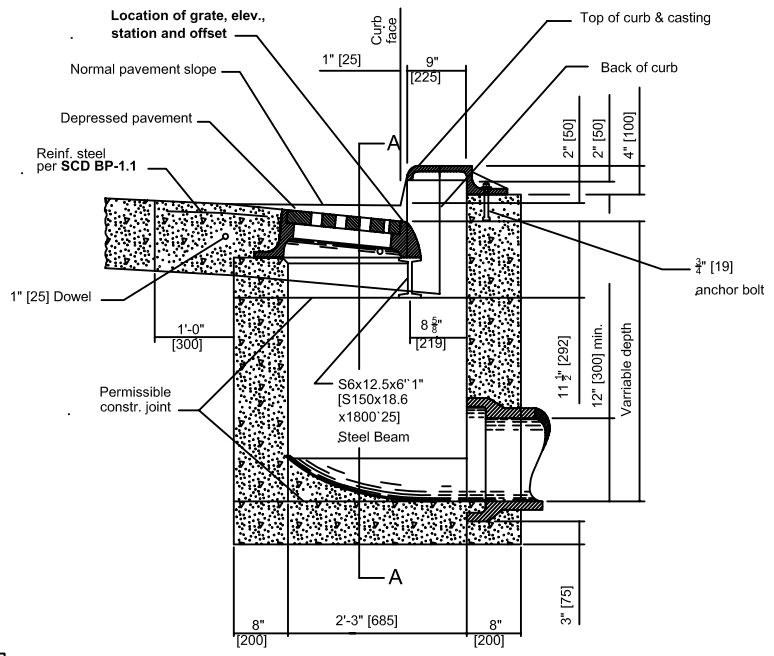
2 / 2

Montgomery County Subdivision Regulations Drawing # 4-H-1-11
Sheet 2 of 2 Date 9-08-04

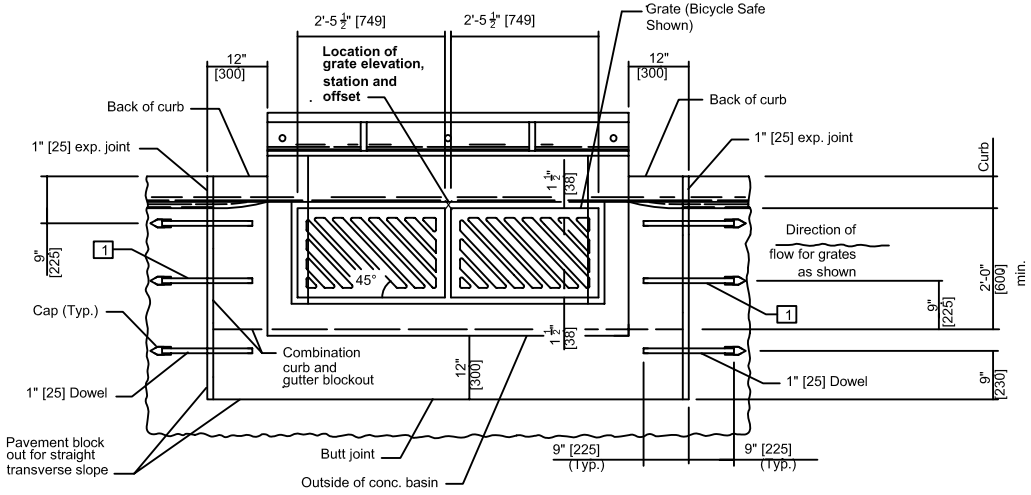


SECTION A-A

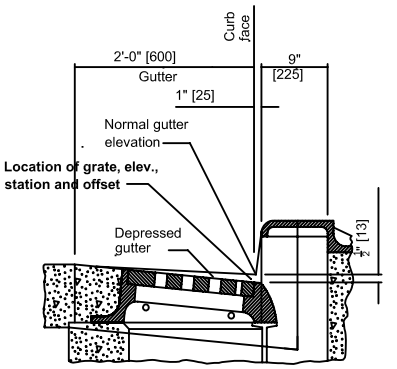
1 Dowel location for curb & gutter



SECTION B-B
WITH CURB
(2" [50] DEPRESSION)



PLAN OF CATCH BASIN AND PAVEMENT JOINTS



SECTION B-B
WITH CURB & GUTTER
(1/2" [13] DEPRESSION)

See Sht. 2/2 for NOTES

CATCH BASIN No. 3

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets []) are in millimeters unless otherwise noted.

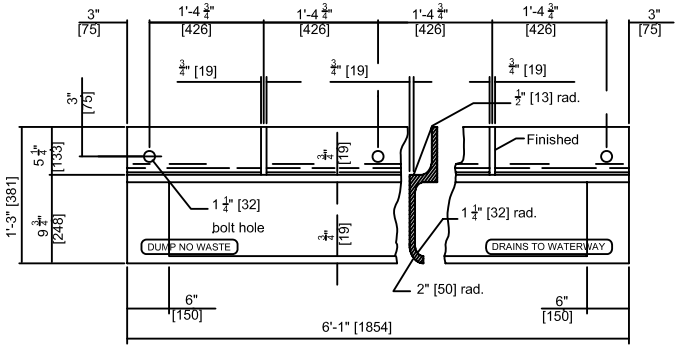
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASIN No. 3

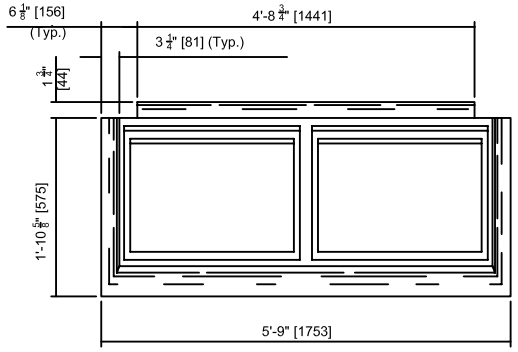
NUMBER
CB-2.1

1 / 2

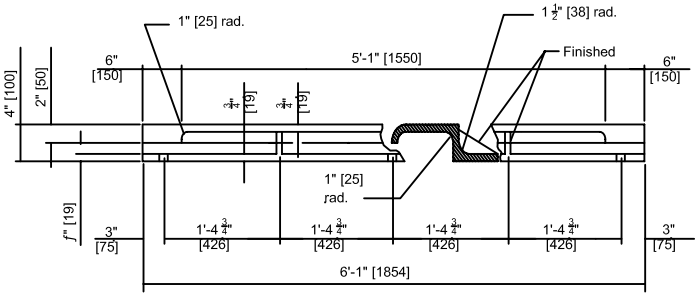
Montgomery County Subdivision Regulations Drawing # 4-H-1-12 Sheet 1 of 2 Date 9-08-04



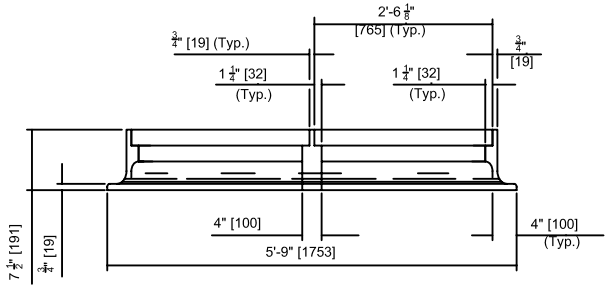
PLAN & SECTION



PLAN

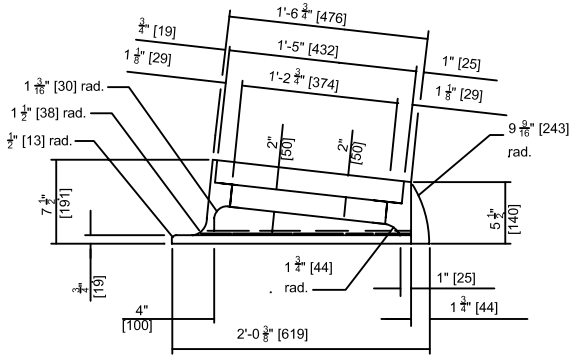


FRONT VIEW & SECTION



FRONT VIEW

CURB CASTING



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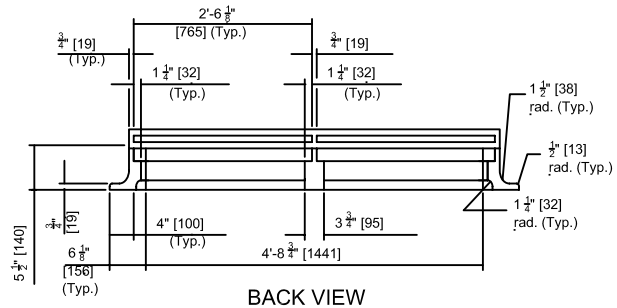


BACK VIEW

FRAME

NOTES

GRATES: Two required. For details, see **SCD CB-2.2**
Grate "V" shall be provided unless the plans specifically require the diagonal grate. If the diagonal grate is specified, it shall be placed so that the diagonal bars direct drainage flow toward the curb.

CASTINGS: The design shall be essentially the same and equally as strong as shown.
Minimum weight [mass]:

Curb Casting . . . . . 305 lbs. [138 kg]
Two Grates . . . . . 254 lbs. [115 kg],
Frame . . . . . 590 lbs. [267 kg], and
Two Grate "V" . . . . 210 lbs. [95 kg].

Lighter weight frames and grates that meet the requirements of CMS 711.14 may also be provided. Grate openings and dimensions shall not differ from those shown unless otherwise shown in the plans.

The following text shall be cast into the top of the curb casting:

"**DUMP NO WASTE**" and "**DRAINS TO WATERWAY**"

Text shall be printed in bold, capital letters with a minimum height of 3/4". See example on Plan & Section. "WATERWAY" may be substituted with "STREAM","RIVER","LAKE", etc. Actual placement and logo may vary per manufacturer.

BEARING AREAS: The frame and grate shall be so fitted and finished as to provide a firm and even seat. No projections shall exist on bearing areas and the grate shall seat in its frame without rocking.

WALLS: When used in place of concrete, brick side walls shall be 8" [200] nominal thickness.

PRECAST CONSTRUCTION: Permitted, except for the apron. Concrete shall meet requirements of CMS 706.13. Precast walls shall have a minimum thickness of 6" [150] and reinforcing shall be sufficient to permit shipping and placement without damage. The wall thickness reduction shall be from the outside.

MINIMUM DEPTH: The minimum depth is per the cover requirements for that pipe type.

OPENINGS: The maximum pipe opening shall be the O.D. of the pipe being supplied plus 2" [50] when fabricated or field cut. The interstitial space shall be filled with grout per CMS 601.

DOWELS: Four 1"x18" [25x450] dowels are required for concrete pavement or gutter blockout. See **SCD BP-2.2** for dowel details.

BLOCKOUT: Blockouts shall be paved with Class C concrete in PCC pavement or gutter and paid for as part of the pavement or gutter with no deduction in pavement, curb or gutter quantities because of castings. A Class C concrete apron the size of the 2'-0" [600] gutter blockout shall be cast-in-place in asphalt pavement (no dowels required) with the cost included in the catch basin bid price. No deduction to be made in curb quantities.

PAYMENT: All materials and labor, including excavation and backfilling, shall be paid for under **Item 604 - Catch Basin, No. 3**.

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

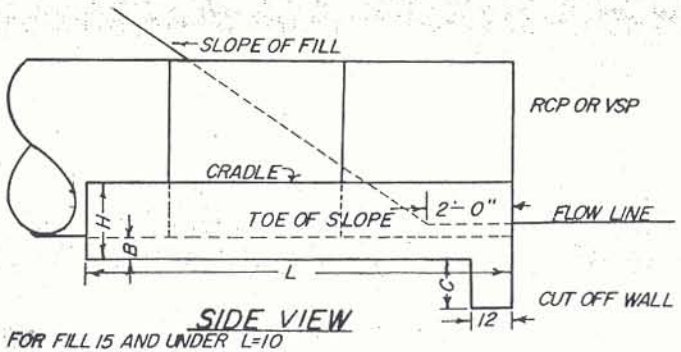
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASIN No. 3

NUMBER
CB-2.1

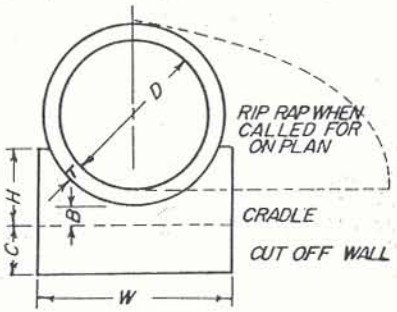
Montgomery County Subdivision Regulations Drawing # 4-H-1-12 Sheet 2 of 2 Date 9-08-04

PIPE CULVERT ENDS

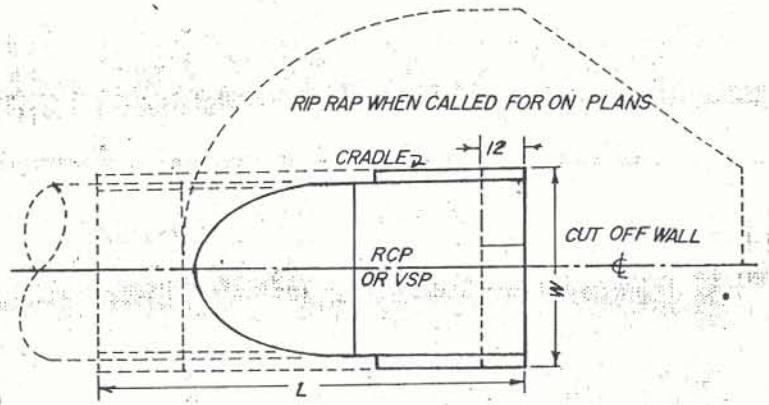


SIDE VIEW

FOR FILL 15 AND UNDER L=10
FOR FILL OVER 15 L=FILL



END VIEW



PLAN

D	B	C	H	W	Cubic Yards Class C Conc. Two Cut-Off Walls	Cubic Yards Class C Conc. Per Lin. Ft. Of Cradle
12"	6"	1'4"	0'11"	11'0"	.2	.0476
15"	6"	1'4"	1'0"	2'1"	.2	.0580
18"	6"	1'4"	1'2"	2'5"	.2	.0801
24"	6"	1'3"	1'4"	2'11"	.3	.0824
27"	6"	1'3"	1'5"	3'3"	.3	.1044
30"	6"	1'3"	1'6"	3'6"	.3	.1181
33"	6"	1'3"	1'7"	3'10"	.3	.1323
36"	6"	1'3"	1'8"	4'1"	.4	.1462
39"	6"	1'3"	1'9"	4'4"	.4	.1606
42"	6"	2'2"	1'11"	4'8"	.7	.1768
48"	6"	2'2"	2'1"	5'3"	.8	.2110
54"	8"	1'11"	2'4"	5'11"	.9	.2972
60"	8"	1'11"	2'9"	6'6"	.9	.3398
66"	10"	1'9"	3'0"	7'3"	.9	.4468
72"	10"	1'8"	3'2"	7'10"	1.0	.4989
84"	10"	1'7"	3'6"	8'11"	1.1	.6126

NOTES

CRADLE The length (L) of the cradle under pipe culvert to be 10 feet for fills 15 feet and under over the top of the pipe measured from the center line grade and for fill over 15 feet the length (L) of the cradle should equal the fill.

The length (L) of the cradle under the pipe culvert and the dimensions of the cut-off wall may be varied if deemed advisable by the Designing Engineer and shall be detailed on the project plans as a special design.

CUT OFF WALL For pipe culvert to be of the dimensions as shown on the table.

CONCRETE shall be class C

RIP RAP May be placed on both inlet and outlet ends if deemed necessity. The engineer will determine the necessity and amount of rip rap for each structure. Rip rap may be composed of field boulders quarried stone broken concrete pavement old paving bricks or bagged concrete to be laid or grouted. May also include streambed and slope rip rap

ESTIMATED QUANTITIES The detail of each structure shall show the cut off walls the length of the cradle and the amount of rip rap laid loose or grouted to be used on each structure. The excavation for the cut off wall and cradle to be included in the excavation for the structure proper.

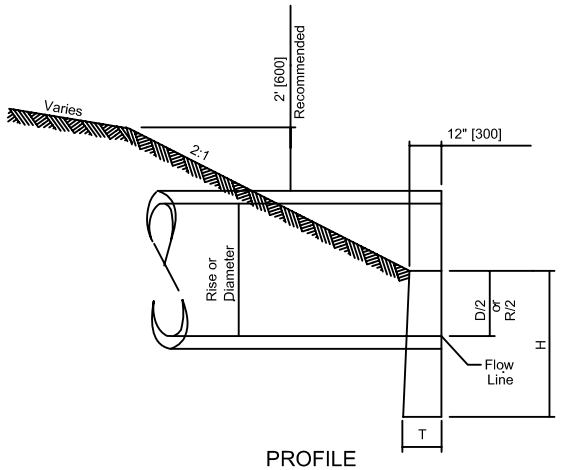
PIPE CULVERT ENDS

COUNTY ENGINEER OFFICE
MONTGOMERY CO., OHIO

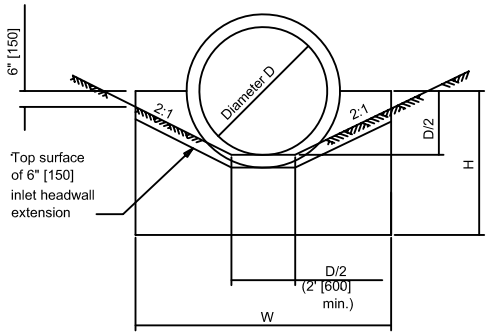
APPROVED Rex A. Dickey
REX A. DICKEY CO. ENGR.

DATE 7-64
DRAWN CAH
CHK'D

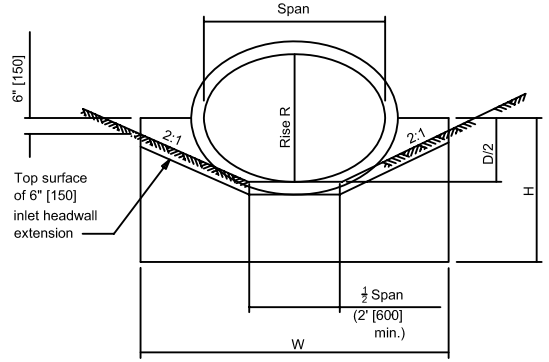
FILE NO. 4-H-1-16



PROFILE



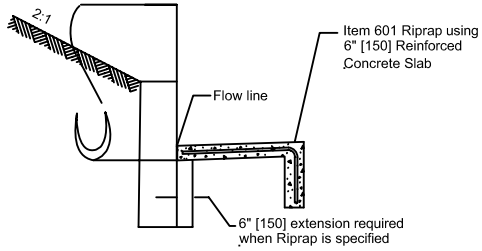
CIRCULAR



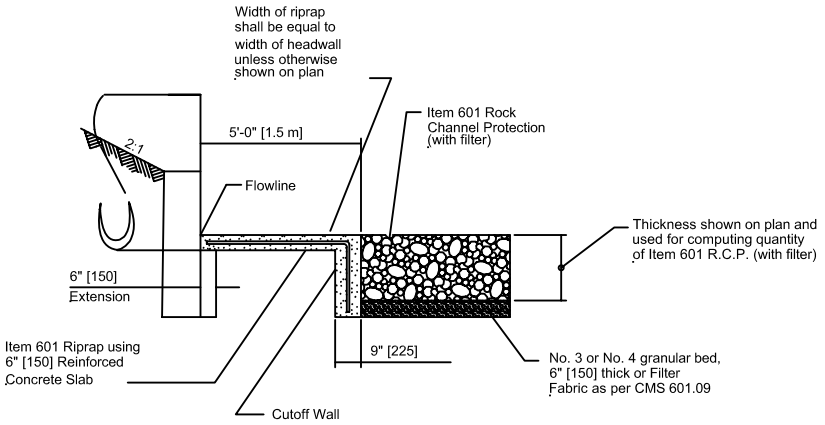
ELLIPTICAL

CONCRETE PIPE

See Sheet 2 of 2 for
Pipe Tables and NOTES.



INLET CHANNEL PROTECTION DETAIL



OUTLET CHANNEL PROTECTION DETAIL

The depth of the riprap cutoff wall (2'-6" [750] min.)
shall match the thickness of the rock channel
proctection shown on the plan plus 6" [150].

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets []) are in millimeters unless otherwise noted.

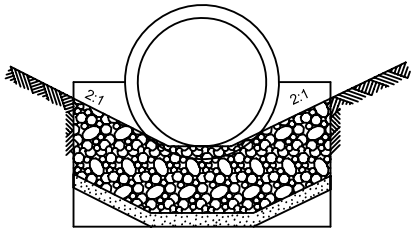
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
HALF-HEIGHT HEADWALLS
FOR CONCRETE PIPE

NUMBER
HW-2.2

1 / 2

Montgomery County Subdivision
Regulations Drawing # 4-H-1-16A
Sheet 1 of 2 Date 9-08-04



Width of riprap and rock channel protection shall be equal to the width of headwall unless otherwise shown on the plans. (Minimum width 4'-0" [1.2 m].)

NOTES

GENERAL: If the pipe is depressed, a riprap reinforced concrete slab shall slope up to the channel bottom at a slope of 6 to 1 and terminate with a cutoff wall that has a depth of 6" [150] below the depression depth. Payment for the slab shall be made per square yard of **Item 601 Riprap using 6" Reinforced Concrete Slab** and shall include the cost of the cutoff wall. Reinforcing for the 6" reinforced concrete slab and cutoff wall shall be as shown on Standard Hydraulic Construction Drawing CB-3.1.

CONCRETE: Concrete for headwalls shall be Class C.

Concrete quantities are based on headwalls without the 6" [150] extension under the channel protection.

HEADWALL FOR CONCRETE PIPE (English)

CIRCULAR					ELLIPTICAL					
D	W	H	T	Conc. cu. yds.	Span	Rise	W	H	T	Conc. cu. yds.
12"	2'-0"	3'-0"	12"	0.20	23"	14"	3'-0"	3'-2"	12"	0.29
15"	2'-6"	3'-2"	12"	0.25	30"	19"	3'-7"	3'-4"	12"	0.35
18"	3'-0"	3'-3"	12"	0.31	34"	22"	3'-11"	3'-5"	12"	0.38
21"	3'-6"	3'-4"	12"	0.37	38"	24"	4'-6"	3'-6"	12"	0.44
24"	4'-0"	3'-6"	12"	0.43	42"	27"	4'-8"	3'-7"	12"	0.45
27"	4'-6"	3'-8"	12"	0.49	45"	29"	5'-2"	3'-8"	12"	0.49
30"	5'-0"	3'-9"	12"	0.56	49"	32"	5'-5"	3'-10"	12"	0.52
33"	5'-6"	3'-10"	12"	0.62	53"	34"	5'-11"	4'-0"	14"	0.66
36"	6'-0"	4'-0"	12"	0.69	60"	38"	6'-10"	4'-2"	14"	0.82
39"	6'-6"	4'-2"	12"	0.77	68"	43"	8'-0"	4'-4"	16"	1.01
42"	7'-0"	4'-3"	12"	0.84	76"	48"	9'-2"	5'-0"	16"	1.34
48"	8'-0"	4'-6"	14"	1.09	83"	53"	10'-4"	5'-2"	18"	1.65
54"	9'-3"	4'-9"	14"	1.32	91"	58"	11'-6"	5'-5"	18"	1.97
60"	10'-6"	5'-6"	16"	1.93	98"	63"	12'-7"	5'-7"	20"	2.38
66"	11'-9"	5'-9"	18"	2.42	106"	68"	13'-9"	5'-10"	20"	2.69
72"	13'-0"	6'-0"	18"	2.77	113"	72"	14'-9"	6'-0"	22"	3.14
78"	14'-3"	6'-3"	20"	3.37	121"	77"	15'-11"	6'-3"	22"	3.49
84"	15'-6"	6'-6"	22"	4.05	128"	82"	17'-0"	6'-5"	24"	4.04
90"	16'-9"	6'-9"	22"	4.51	136"	87"	18'-2"	6'-8"	24"	4.84
96"	18'-0"	7'-0"	24"	5.31	143"	92"	19'-4"	6'-10"	26"	5.12
102"	19'-3"	7'-3"	26"	6.20	151"	97"	20'-6"	7'-1"	26"	5.42
108"	20'-6"	7'-6"	26"	6.78	166"	106"	22'-7"	7'-5"	28"	6.60
114"	21'-9"	7'-9"	28"	7.81	180"	116"	24'-10"	7'-10"	30"	7.99
120"	23'-0"	8'-0"	30"	8.93	--	--	--	--	--	--
126"	24'-3"	8'-3"	30"	9.57	--	--	--	--	--	--
132"	25'-6"	8'-6"	32"	10.84	--	--	--	--	--	--
144"	28'-8"	9'-0"	34"	13.00	--	--	--	--	--	--

HEADWALL FOR CONCRETE PIPE (Metric)

CIRCULAR					ELLIPTICAL					
D (mm)	W (mm)	H (mm)	T (mm)	Conc. (m^3)	Span (mm)	Rise (mm)	W (mm)	H (mm)	T (mm)	Conc. (m^3)
300	600	925	300	0.15	575	365	925	975	300	0.22
375	750	975	300	0.19	770	490	1100	1025	300	0.27
450	900	1000	300	0.24	865	550	1200	1050	300	0.29
525	1050	1025	300	0.28	960	610	1375	1075	300	0.34
600	1200	1075	300	0.33	1055	670	1425	1100	300	0.34
675	1350	1125	300	0.37	1150	730	1575	1125	300	0.37
750	1500	1150	300	0.43	1250	795	1650	1175	300	0.40
825	1650	1175	300	0.47	1345	855	1800	1225	375	0.50
900	1800	1225	300	0.53	1535	975	2075	1275	375	0.63
975	1950	1275	300	0.59	1730	1095	2450	1325	400	0.77
1050	2100	1300	300	0.64	1920	1220	2800	1525	400	1.02
1200	2400	1375	350	0.83	2110	1340	3150	1575	450	1.26
1350	2775	1450	350	1.01	2305	1465	3500	1650	450	1.51
1500	3150	1675	400	1.48	2495	1585	3825	1700	500	1.82
1650	3525	1750	450	1.85	2690	1705	4200	1775	500	2.06
1800	3900	1825	450	2.12	2880	1830	4500	1825	550	2.40
1950	4275	1900	500	2.58	3070	1950	4850	1900	550	2.67
2100	4650	1975	550	3.10	3265	2075	5175	1950	600	3.09
2250	5025	2050	550	3.45	3455	2195	5525	2025	600	3.70
2400	5400	2125	600	4.06	3648	2315	5900	2075	650	3.91
2550	5775	2200	650	4.74	3840	2440	6250	2150	650	4.14
2700	6150	2275	650	5.18	4225	2680	6875	2250	700	5.05
2850	6525	2350	700	5.97	4610	2925	7575	2400	750	6.11
3000	6900	2450	750	6.83	--	--	--	--	--	--
3150	7275	2525	750	7.32	--	--	--	--	--	--
3300	7650	2600	825	8.29	--	--	--	--	--	--
3600	8400	2750	875	9.94	--	--	--	--	--	--

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets [] are in millimeters unless otherwise noted.

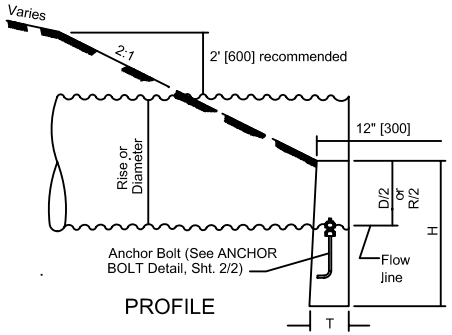
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
HALF-HEIGHT HEADWALLS FOR CONCRETE PIPE

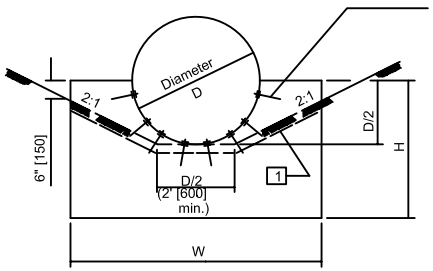
NUMBER
HW-2.2

2 / 2

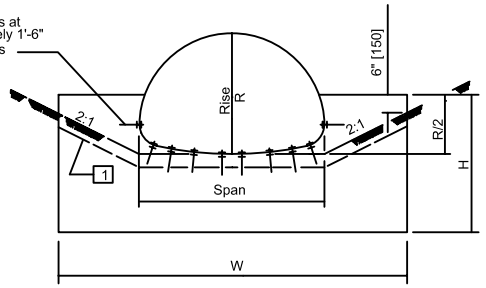
Montgomery County Subdivision Regulations Drawing # 4-H-1-16A Sheet 2 of 2 Date 9-08-04



PROFILE



CIRCULAR



PIPE-ARCH

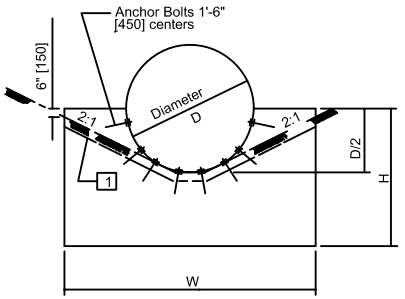
END TREATMENT "A"

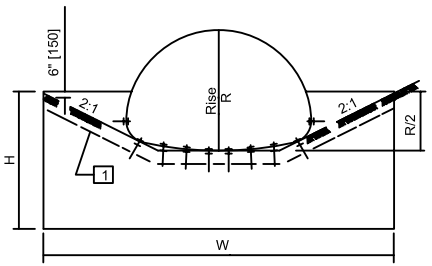
HEADWALL FOR CORRUGATED METAL PIPE & PLASTIC PIPE (English)

CIRCULAR					PIPE ARCH						PIPE ARCH					
D	W	H	T	CONC. cu. yds.	SPAN	RISE	W	H	T	CONC. cu. yds.	SPAN	RISE	W	H	T	CONC. cu. yds.
12"	2'-0"	3'-0"	12"	0.21	2.67"x ½" Corrugations						*81"	59"	12'-4"	5'-5"	15"	2.14
15"	2'-6"	3'-2"	12"	0.27	17"	13"	3'-0"	3'-0"	12"	0.31	87"	63"	13'-0"	5'-7"	17"	2.50
18"	3'-0"	3'-3"	12"	0.33	21"	15"	3'-6"	3'-0"	12"	0.35	95"	67"	14'-0"	5'-9"	20"	3.14
21"	3'-6"	3'-4"	12"	0.39	24"	18"	4'-0"	3'-2"	12"	0.43	103"	71"	15'-0"	5'-11"	22"	3.54
24"	4'-0"	3'-6"	12"	0.46	28"	20"	4'-6"	3'-3"	12"	0.48	112"	75"	16'-0"	6'-1"	24"	3.96
27"	4'-6"	3'-8"	12"	0.53	35"	24"	5'-6"	3'-5"	12"	0.61	117"	79"	17'-9"	6'-3"	25"	4.89
30"	5'-0"	3'-9"	12"	0.60	42"	29"	6'-6"	3'-7"	12"	0.73	128"	83"	18'-0"	6'-5"	26"	5.01
33"	5'-6"	3'-10"	12"	0.68	49"	33"	7'-8"	3'-9"	12"	0.90	137"	87"	19'-0"	6'-7"	27"	5.45
36"	6'-0"	4'-0"	12"	0.76	57"	38"	9'-0"	4'-0"	12"	1.10	142"	91"	20'-9"	6'-9"	27"	6.31
39"	6'-6"	4'-2"	12"	0.84	64"	43"	10'-0"	4'-4"	12"	1.31	6"x2" Corrugations (18" Corner Radius)					
42"	7'-0"	4'-3"	12"	0.92	71"	47"	11'-0"	4'-8"	12"	1.54						
48"	8'-0"	4'-6"	12"	1.10	*77"	52"	11'-8"	5'-3"	12"	1.84	*6'-1"	4'-7"	11'-8"	5'-7"	12"	1.89
54"	9'-3"	4'-9"	12"	1.33	*83"	57"	12'-4"	5'-5"	15"	2.46	*6'-4"	4'-9"	12'-0"	5'-8"	14"	2.12
60"	10'-6"	5'-6"	12"	1.78	6"x2" Corrugations (31" Corner Radius)						*6'-9"	4'-11"	12'-4"	5'-9"	15"	2.42
66"	11'-9"	5'-9"	12"	2.06							*7'-0"	5'-1"	12'-8"	5'-10"	16"	2.44
72"	13'-0"	6'-0"	12"	2.37	13'-3"	9'-4"	23'-11"	7'-11"	32"	9.63	7'-3"	5'-3"	12'-11"	5'-11"	17"	2.69
78"	14'-3"	6'-3"	14"	2.94	13'-6"	9'-6"	24'-9"	8'-0"	32"	10.12	7'-8"	5'-5"	13'-2"	6'-0"	18"	2.77
84"	15'-6"	6'-6"	14"	3.30	14'-0"	9'-8"	24'-10"	8'-1"	33"	10.33	7'-11"	5'-7"	14'-0"	6'-1"	20"	3.15
90"	16'-9"	6'-9"	16"	4.00	14'-2"	9'-10"	25'-9"	8'-2"	33"	10.87	8'-2"	5'-9"	14'-8"	6'-2"	21"	3.45
96"	18'-0"	7'-0"	16"	4.40	14'-5"	10'-0"	26'-7"	8'-3"	33"	11.39	8'-7"	5'-11"	15'-0"	6'-3"	22"	3.75
102"	19'-3"	7'-3"	18"	5.28	14'-11"	10'-2"	26'-9"	8'-4"	34"	11.68	8'-10"	6'-1"	15'-10"	6'-4"	23"	4.15
108"	20'-6"	7'-6"	20"	6.21	15'-4"	10'-4"	26'-11"	8'-5"	34"	11.96	9'-4"	6'-3"	16'-0"	6'-5"	24"	4.65
114"	21'-9"	7'-9"	22"	7.25	15'-7"	10'-6"	27'-9"	8'-6"	34"	12.51	9'-6"	6'-5"	16'-10"	6'-6"	26"	4.93
120"	23'-0"	8'-0"	24"	8.38	15'-10"	10'-8"	28'-7"	8'-7"	35"	13.06	9'-9"	6'-7"	17'-9"	6'-7"	27"	5.41
*126"	23'-0"	8'-3"	26"	8.64	16'-3"	10'-10"	28'-8"	8'-8"	35"	13.34	10'-3"	6'-9"	17'-10"	6'-8"	27"	5.45
132"	23'-0"	8'-6"	28"	9.23	16'-6"	11'-0"	29'-7"	8'-9"	35"	13.94	10'-8"	6'-11"	17'-11"	6'-9"	27"	5.59
138"	24'-1"	8'-9"	30"	10.50	17'-0"	11'-2"	29'-8"	8'-10"	36"	14.24	10'-11"	7'-1"	18'-10"	6'-10"	28"	5.97
144"	25'-2"	9'-0"	32"	11.89	17'-2"	11'-4"	30'-7"	8'-11"	36"	14.84	11'-5"	7'-3"	18'-11"	6'-11"	28"	6.12
150"	26'-4"	9'-3"	34"	13.38	17'-5"	11'-6"	31'-5"	9'-0"	36"	15.42	11'-7"	7'-5"	19'-9"	7'-0"	28"	6.52
156"	27'-5"	9'-6"	36"	15.01	17'-11"	11'-8"	31'-7"	9'-1"	37"	15.83	11'-10"	7'-7"	20'-9"	7'-1"	29"	6.94
162"	28'-7"	9'-9"	38"	16.75	18'-1"	11'-10"	32'-5"	9'-2"	37"	16.43	12'-4"	7'-9"	20'-10"	7'-2"	29"	7.12
168"	29'-8"	10'-0"	40"	18.61	18'-7"	12'-0"	32'-6"	9'-3"	37"	16.78	12'-6"	7'-11"	21'-8"	7'-3"	29"	7.53
174"	30'-9"	10'-3"	42"	20.28	18'-9"	12'-2"	33'-4"	9'-4"	38"	17.43	12'-8"	8'-1"	22'-7"	7'-4"	30"	7.95
180"	31'-11"	10'-6"	43"	21.87	19'-3"	12'-4"	33'-5"	9'-5"	38"	17.78	12'-10"	8'-4"	23'-7"	7'-5"	30"	8.48
186"	33'-0"	10'-9"	44"	23.54	19'-6"	12'-6"	34'-5"	9'-6"	38"	18.49	13'-5"	8'-5"	23'-7"	7'-6"	30"	8.63
192"	34'-2"	11'-0"	45"	25.30	19'-8"	12'-8"	35'-3"	9'-7"	39"	19.19	13'-11"	8'-7"	23'-7"	7'-7"	31"	8.81
198"	35'-3"	11'-3"	46"	27.12	19'-11"	12'-10"	36'-3"	9'-8"	39"	19.95	14'-1"	8'-9"	25'-1"	7'-8"	31"	9.29
204"	36'-4"	11'-6"	47"	29.15	20'-5"	13'-0"	36'-3"	9'-9"	39"	20.30	14'-3"	8'-11"	25'-6"	7'-9"	31"	9.78
210"	37'-6"	11'-9"	48"	31.03	20'-7"	13'-2"	37'-2"	9'-10"	40"	21.05	14'-10"	9'-1"	25'-6"	7'-10"	32"	10.25
216"	38'-7"	12'-0"	49"	33.43	3"x1" Corrugations						15'-4"	9'-3"	25'-6"	7'-11"	32"	10.25
222"	39'-9"	12'-3"	50"	36.26	40"	31"	6'-6"	3'-7"	12"	0.70	15'-6"	9'-5"	26'-5"	8'-0"	32"	10.74
228"	40'-10"	12'-6"	51"	37.52	46"	36"	7'-8"	3'-9"	12"	0.85	15'-8"	9'-7"	27'-5"	8'-1"	33"	11.28
234"	42'-0"	12'-9"	52"	39.86	53"	41"	9'-0"	4'-0"	12"	1.06	15'-10"	9'-10"	28'-5"	8'-2"	33"	12.00
240"	43'-1"	13'-0"	53"	42.28	60"	46"	10'-0"	4'-4"	12"	1.27	16'-5"	9'-11"	28'-5"	8'-3"	33"	12.09
246"	44'-2"	13'-3"	54"	44.83	66"	51"	11'-0"	4'-8"	12"	1.54	16'-7"	10'-1"	29'-4"	8'-4"	34"	12.64
252"	45'-4"	13'-6"	55"	47.44	*73"	55"	11'-8"	5'-3"	12"	1.81	--	--	--	--	--	--

* Channel configuration for pipe sizes between end treatment "A" and end treatment "B" is determined by 2:1 slopes passing through a point 6" [150] below the top and at each side of the headwall. For end treatment "B", 2:1 slopes are tangent to pipe.

1 Top surface of 6" [150] inlet headwall extension





END TREATMENT "B"

See Sht. 2/2 for NOTES and Metric Pipe Table

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets [] are in millimeters unless otherwise noted.

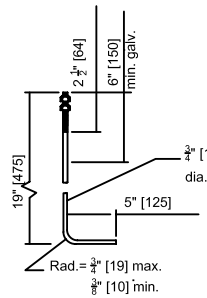
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
HALF-HEIGHT HEADWALLS FOR CORRUGATED METAL PIPE & PLASTIC PIPE

NUMBER
HW-2.1

1 / 2

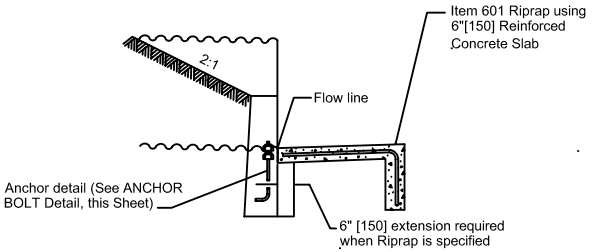
Montgomery County Subdivision Regulations Drawing # 4-H-1-16B
Sheet 1 of 2 Date 9-08-04



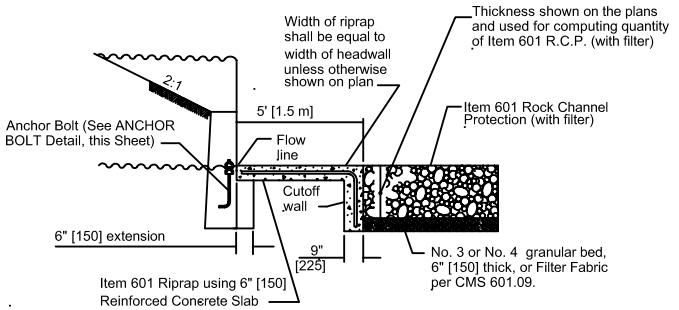
ANCHOR BOLT

NUT

(ASTM A 325 and A 153)



INLET CHANNEL PROTECTION DETAIL



OUTLET CHANNEL PROTECTION DETAIL

The depth of the riprap cutoff wall (2'-6" [760] min.) shall match the thickness of the rock channel protection shown on the plan plus 6" [150].

HEADWALL FOR CORRUGATED METAL PIPE & PLASTIC PIPE (Metric)

CIRCULAR					PIPE ARCH						PIPE ARCH					
D	W	H	T	CONC. m 3	SPAN	RISE	W	H	T	CONC. m 3	SPAN	RISE	W	H	T	CONC. m 3
300	600	925	300	0.16	68x13 mm Corrugations						*2025	1475	3750	1650	375	1.64
375	750	975	300	0.21	425	325	925	925	300	0.24	2175	1575	3950	1700	425	1.91
450	925	1000	300	0.25	525	375	1075	925	300	0.27	2450	1675	4275	1750	500	2.40
525	1075	1025	300	0.30	600	450	1225	975	300	0.33	2575	1775	4575	1800	550	2.71
600	1225	1075	300	0.35	700	500	1375	1000	300	0.37	2800	1875	4875	1850	600	3.03
675	1375	1125	300	0.41	875	600	1675	1050	300	0.47	2925	1975	5400	1900	625	3.74
750	1525	1150	300	0.46	1050	725	1975	1100	300	0.56	3200	2075	5475	1950	650	3.83
825	1675	1175	300	0.52	1225	825	2325	1150	300	0.69	3425	2175	5800	2000	675	4.17
900	1825	1225	300	0.58	1425	950	2750	1225	300	0.84	3550	2275	6325	2050	675	4.82
975	1975	1275	300	0.64	1600	1075	3050	1325	300	1.00	150x50 mm Corrugations (450 mm Corner Radius)					
1050	2125	1300	300	0.70	1775	1175	3350	1425	300	1.18						
1200	2450	1375	300	0.84	*1925	1300	3550	1600	300	1.41	*1825	1375	3550	1700	300	1.45
1350	2825	1450	300	1.02	*2075	1425	3750	1650	375	1.88	*1900	1425	3650	1725	350	1.62
1500	3200	1675	300	1.36	150x50 mm Corrugations (775 mm Corner Radius)						*2025	1475	3750	1750	375	1.85
1650	3575	1750	300	1.57							*2100	1525	3850	1775	400	1.87
1800	3950	1825	300	1.81	3975	2800	7300	2425	825	7.36	2175	1575	3925	1800	425	2.06
1950	4350	1900	350	2.25	4050	2850	7550	2450	825	7.74	2300	1625	4025	1825	450	2.12
2100	4725	1975	350	2.52	4200	2900	7575	2475	850	7.90	2375	1675	4275	1850	500	2.41
2250	5100	2050	400	3.06	4250	2950	7850	2500	850	8.31	2450	1725	4475	1875	525	2.64
2400	5475	2125	400	3.36	4325	3000	8100	2525	850	8.71	2575	1775	4575	1900	550	2.87
2550	5875	2200	450	4.04	4475	3050	8150	2550	875	8.93	2650	1825	4825	1925	575	3.17
2700	6250	2275	500	4.75	4600	3100	8200	2575	875	9.14	2800	1875	4875	1950	600	3.56
2850	6625	2350	550	5.54	4675	3150	8450	2600	875	9.56	2850	1925	5125	1975	650	3.77
3000	7000	2450	600	6.41	4750	3200	8700	2625	900	9.99	2925	1975	5400	2000	675	4.14
*3150	7000	2525	650	6.61	4875	3250	8750	2650	900	10.20	3075	2025	5425	2025	675	4.17
3300	7000	2600	700	7.06	4950	3300	9025	2675	900	10.66	3200	2075	5450	2050	675	4.27
3450	7350	2675	750	8.03	5100	3350	9050	2700	925	10.89	3275	2125	5750	2075	700	4.56
3600	7675	2750	825	9.09	5150	3400	9325	2725	925	11.35	3425	2175	5775	2100	700	4.68
3750	8025	2825	875	10.23	5225	3450	9575	2750	925	11.79	3475	2225	6025	2125	700	4.98
3900	8350	2900	925	11.48	5375	3500	9625	2775	950	12.10	3550	2275	6325	2150	725	5.31
4050	8700	2975	975	12.81	5425	3550	9875	2800	950	12.56	3700	2325	6350	2175	725	5.44
4200	9050	3050	1025	14.23	5575	3600	9900	2825	950	12.83	3750	2375	6600	2200	725	5.76
4350	9375	3125	1075	15.51	5625	3650	10 150	2850	975	13.33	3800	2425	6875	2225	750	6.08
4500	9725	3200	1100	16.72	5775	3700	10 175	2875	975	13.59	3850	2500	7200	2250	750	6.48
4650	10 050	3275	1125	18.00	5850	3750	10 500	2900	975	14.14	4025	2525	7200	2275	750	6.60
4800	10 425	3350	1150	19.34	5900	3800	10 750	2925	1000	14.67	4175	2575	7200	2300	775	6.74
4950	10 750	3425	1175	20.73	5975	3850	11 050	2950	1000	15.25	4225	2625	7650	2325	775	7.10
5100	11 075	3500	1200	22.29	6125	3900	11 050	2975	1000	15.52	4275	2675	7775	2350	775	7.48
5250	11 425	3575	1225	23.72	6175	3950	11 325	3000	1025	16.09	4450	2725	7775	2400	825	7.84
5400	11 750	3650	1250	25.56	75x25 mm Corrugations						4600	2775	7775	2425	825	7.84
5550	12 125	3725	1275	27.72	1000	775	1975	1100	300	0.54	4650	2825	8050	2450	825	8.21
5700	12 450	3800	1300	28.69	1150	900	2325	1150	300	0.65	4700	2875	8350	2475	850	8.62
5850	12 800	3875	1325	30.48	1325	1025	2750	1225	300	0.81	4750	2950	8650	2500	850	9.17
6000	13 125	3950	1350	32.33	1500	1150	3050	1325	300	0.97	4925	2975	8650	2525	850	9.24
6150	13 450	4050	1375	34.27	1650	1275	3350	1425	300	1.18	4975	3025	8950	2550	875	9.66
6300	13 825	4125	1400	36.27	*1825	1375	3550	1600	300	1.38	--	--	--	--	--	--

* Channel configuration for pipe sizes between end treatment "A" and end treatment "B" is determined by 2:1 slopes passing through a point 6" [150] below the top and at each side of the headwall. For end treatment "B", 2:1 slopes are tangent to pipe.

NOTES

GENERAL: If the pipe is depressed, a riprap reinforced concrete slab shall slope up to the channel bottom at a slope of 6 to 1 and terminate with a cutoff wall that has a depth of 6" [150] below the depression depth. Payment for the slab shall be made per square yard of **Item 601 Riprap using 6" Reinforced Concrete Slab** and shall include the cost of the cutoff wall. Reinforcing for the 6" reinforced concrete slab and cutoff wall shall be as shown on Standard Hydraulic Construction Drawing CB-3.1.

CONCRETE: Headwall concrete shall be Class C. Concrete quantities are based on headwalls without the 6" [150] extension under the channel protection.

ANCHOR BOLTS: Bolts (as detailed) for anchoring both ends of metal pipe shall meet ASTM A 307. The top 6" [150] min. of bolt shall be galvanized according to ASTM A 153. Cost of anchors shall be included in the unit price bid per Foot [Meter] of Item 603.

Headwall dimensions are based on end treatment "A" for pipe sizes up to and including 120" [3000], 71"x47" [1775x1175], and 66"x51" [1650x1275], and on end treatment "B" for sizes over and including 132" [3300], 13'-3"x9'-4" [3975x2800], and 7'-3"x5'-3" [2175x1575].

PLASTIC PIPE: Plastic pipe may not be available in all the sizes specified on this drawing.

See Sht. 1/2 for End Treatment "A," End Treatment "B," and English Pipe Table

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE
7-20-01
7-19-02

HYDRAULIC ENGINEER
D. Gruver

All metric dimensions (in brackets []) are in millimeters unless otherwise noted.

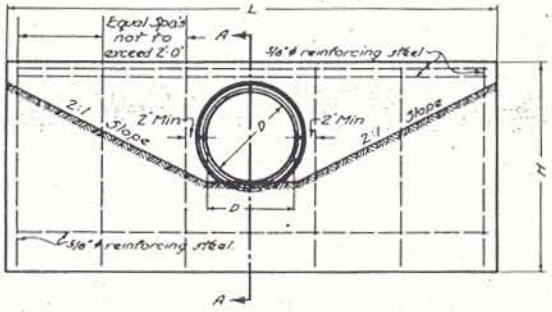
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
HALF-HEIGHT HEADWALLS FOR CORRUGATED METAL PIPE & PLASTIC PIPE

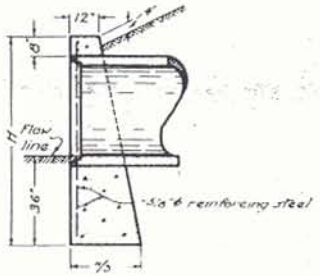
NUMBER
HW-2.1

Montgomery County Subdivision Regulations Drawing # 4-H-1-16B Sheet 2 of 2 Date 9-08-04

HEADWALLS



ELEVATION



SECTION A-A

STANDARD Nº. 1 HEADWALL

NOTES

Nº 1 HEADWALL where required will be provided for nonskewed culverts having a diameter or rise of 36 inches or less.

CONCRETE shall be Class "C".

REINFORCING STEEL BARS shall be 5/8 inch round. Minimum cover for all bars shall be 2 inches unless otherwise shown.

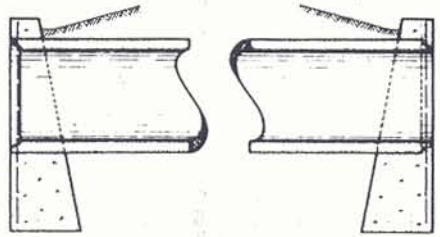
DIMENSIONS AND QUANTITIES are shown for circular sections only. It will be necessary to determine dimensions for the Nº 1 headwall required for reinforced elliptical concrete pipe or corrugated metal pipe arches in accordance with the equations listed on this drawing.

Chamfer all exposed corners 3/4 of an inch.

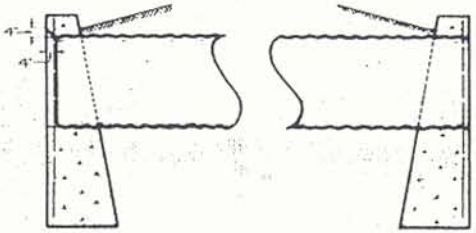
FOUNDATION. Where the soil borings indicate a bearing capacity of less than 2600 pounds per square foot it will be necessary to increase the width of the base.

DIMENSIONS			QUANTITIES ONE HEADWALL	
DIAMETER	H	L	CONCRETE CU. YDS.	REINFORCING STEEL LBS.
15"	5'-2"	7'-0"	1.7	41
18"	5'-5"	8'-4"	2.2	57
21"	5'-8"	9'-8"	2.8	62
24"	5'-11"	11'-0"	3.3	69
30"	6'-5"	13'-8"	4.7	92
36"	7'-0"	16'-4"	6.5	105

L CIRCULAR SECTIONS = 3D + 4t
L ELLIPTICAL OR PIPE-ARCH = 4R + 4t + S
H CIRCULAR SECTIONS = D + t + 44"
H ELLIPTICAL OR PIPE-ARCH = R + t + 44"
D = DIAMETER OF PIPE
R = RISE OF PIPE
S = SPAN OF PIPE
t = THICKNESS OF BARREL
L = LENGTH OF HEADWALL
H = HEIGHT OF HEADWALL



RIGID PIPE



CORRUGATED PIPE

END TREATMENT AT HEADWALL

COUNTY ENGINEERS OFFICE
MONTGOMERY CO. OHIO

APPROVED: Rex A. Dickey

REX A. DICKEY — CO. ENGR.

DATE 9-11-63 | FILE NO. 4-H-1-17

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

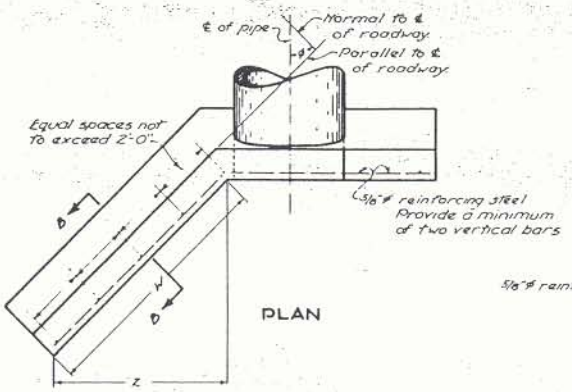
DATE 8-1-63

HEADWALLS

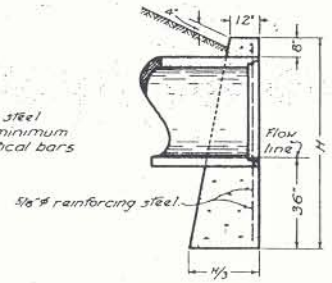
STANDARD CONSTRUCTION DRAWING HW Nº 1

APPROVED [illegible] ENGR. L. & D.

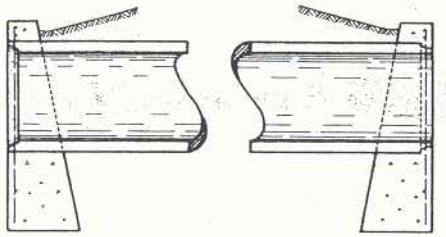
HEADWALLS



PLAN



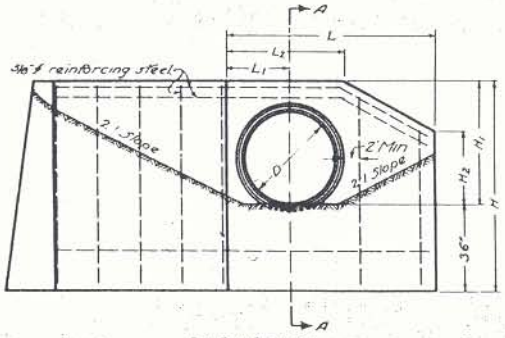
SECTION A-A



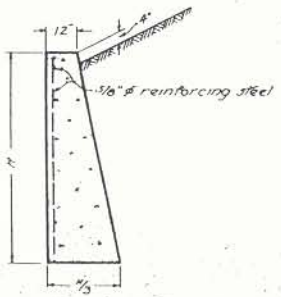
INLET END
GROOVE OR BELL UPSTREAM

OUTLET END
TONGUE OR SPIGOT DOWNSTREAM

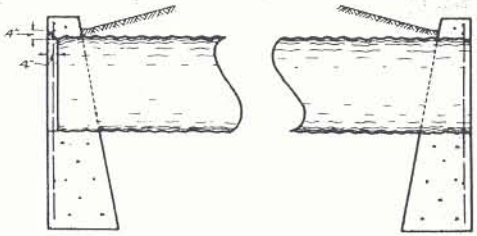
RIGID PIPE



ELEVATION



SECTION B-B



INLET END

OUTLET END

CORRUGATED PIPE

END TREATMENT AT HEADWALL

NOTES

No 2 HEADWALL where required will be provided for skewed culverts having a diameter or rise of 36 inches or less.

CONCRETE shall be Class "C".

REINFORCING STEEL BARS shall be 5/8 inch round. Minimum cover for all bars shall be 2 inches unless otherwise shown.

DIMENSIONS AND QUANTITIES are shown for circular sections only. When used with reinforced elliptical concrete pipe or corrugated metal pipe arches it will be necessary to determine such dimensions and quantities which shall generally conform with those listed for the nearest size circular pipe. The dimensions established by vertical diameter shall apply to rise and the dimensions established by horizontal diameter shall apply to span.

Chamfer all exposed corners 3/4 of an inch.

FOUNDATION. Where the soil borings indicate a bearing capacity of less than 2600 pounds per square foot it will be necessary to increase the width of the footing.

	ϕ=15°											ϕ=30°										
	PIPE DIAM	L	L_1	L_2	W	Z	H	H_1	H_2	CONC C.Y.	STEEL LBS	PIPE DIAM	L	L_1	L_2	W	Z	H	H_1	H_2	CONC C.Y.	STEEL LBS
SLOPE 2:1	15"	2'-11"	0'-11"	1'-7"	2'-9"	2'-8"	5'-2"	2'-2"	1'-5"	1.4	41	15"	2'-11"	0'-11"	1'-7"	3'-1"	2'-8"	5'-2"	2'-2"	1'-5"	1.6	42
	18"	3'-7"	1'-1"	1'-10"	3'-4"	3'-2"	5'-5"	2'-5"	1'-7"	1.8	46	18"	3'-7"	1'-1"	1'-10"	3'-8"	3'-2"	5'-5"	2'-5"	1'-7"	2.0	48
	21"	4'-1"	1'-3"	2'-2"	3'-10"	3'-8"	5'-8"	2'-8"	1'-8"	2.2	50	21"	4'-1"	1'-3"	2'-2"	4'-3"	3'-8"	5'-8"	2'-8"	1'-8"	2.4	52
	24"	4'-9"	1'-5"	2'-6"	4'-4"	4'-2"	5'-11"	2'-11"	1'-10"	2.7	61	24"	4'-9"	1'-5"	2'-6"	4'-10"	4'-2"	5'-11"	2'-11"	1'-10"	3.0	65
	30"	5'-11"	1'-7"	2'-10"	5'-4"	5'-2"	6'-5"	3'-5"	2'-2"	3.8	76	30"	5'-11"	1'-7"	2'-10"	6'-0"	5'-2"	6'-5"	3'-5"	2'-2"	4.2	78
	36"	7'-0"	1'-10"	3'-4"	6'-7"	6'-4"	7'-0"	4'-0"	2'-6"	5.4	87	36"	7'-0"	1'-10"	3'-4"	7'-4"	6'-4"	7'-0"	4'-0"	2'-6"	5.8	97
SLOPE 4:1	15"	4'-1"	0'-11"	1'-7"	3'-3"	3'-2"	5'-2"	2'-2"	1'-10"	1.9	47	15"	3'-9"	0'-11"	1'-7"	3'-6"	3'-2"	5'-2"	2'-2"	1'-7"	1.9	47
	18"	4'-10"	1'-1"	1'-10"	3'-10"	3'-8"	5'-5"	2'-5"	2'-0"	2.4	57	18"	4'-6"	1'-1"	1'-10"	4'-3"	3'-8"	5'-5"	2'-5"	1'-10"	2.4	57
	21"	5'-8"	1'-3"	2'-2"	4'-4"	4'-2"	5'-8"	2'-8"	2'-3"	2.9	63	21"	5'-2"	1'-3"	2'-2"	4'-10"	4'-2"	5'-8"	2'-8"	2'-0"	3.0	68
	24"	6'-5"	1'-5"	2'-6"	4'-10"	4'-8"	5'-11"	2'-11"	2'-6"	3.5	74	24"	5'-11"	1'-5"	2'-6"	5'-5"	4'-8"	5'-11"	2'-11"	2'-2"	3.6	74
	30"	7'-9"	1'-7"	2'-10"	5'-10"	5'-8"	6'-5"	3'-5"	3'-0"	4.8	92	30"	7'-2"	1'-7"	2'-10"	6'-7"	5'-8"	6'-5"	3'-5"	2'-8"	4.9	92
	36"	9'-3"	1'-10"	3'-4"	7'-1"	6'-10"	7'-0"	4'-0"	3'-5"	6.6	112	36"	8'-6"	1'-10"	3'-4"	7'-11"	6'-10"	7'-0"	4'-0"	3'-0"	6.7	111

	ϕ=45°											ϕ=60°										
	PIPE DIAM	L	L_1	L_2	W	Z	H	H_1	H_2	CONC C.Y.	STEEL LBS	PIPE DIAM	L	L_1	L_2	W	Z	H	H_1	H_2	CONC C.Y.	STEEL LBS
SLOPE 2:1	15"	2'-11"	0'-11"	1'-7"	3'-1"	2'-8"	5'-2"	2'-2"	1'-5"	1.6	44	15"	2'-11"	0'-11"	1'-7"	3'-4"	2'-8"	5'-2"	2'-2"	1'-5"	2.3	54
	18"	3'-7"	1'-1"	1'-10"	4'-6"	3'-2"	5'-5"	2'-5"	1'-7"	2.3	56	18"	3'-7"	1'-1"	1'-10"	6'-4"	3'-2"	5'-5"	2'-5"	1'-7"	2.9	61
	21"	4'-1"	1'-3"	2'-2"	5'-2"	3'-8"	5'-8"	2'-8"	1'-8"	2.8	61	21"	4'-1"	1'-3"	2'-2"	7'-4"	3'-8"	5'-8"	2'-8"	1'-8"	3.5	73
	24"	4'-9"	1'-5"	2'-6"	5'-11"	4'-2"	5'-11"	2'-11"	1'-10"	3.4	67	24"	4'-9"	1'-5"	2'-6"	8'-4"	4'-2"	5'-11"	2'-11"	1'-10"	4.3	80
	30"	5'-11"	1'-7"	2'-10"	7'-4"	5'-2"	6'-5"	3'-5"	2'-2"	4.8	90	30"	5'-11"	1'-7"	2'-10"	10'-4"	5'-2"	6'-5"	3'-5"	2'-2"	6.0	105
	36"	7'-0"	1'-10"	3'-4"	8'-11"	6'-4"	7'-0"	4'-0"	2'-6"	6.6	110	36"	7'-0"	1'-10"	3'-4"	12'-8"	6'-4"	7'-0"	4'-0"	2'-6"	8.3	128
SLOPE 4:1	15"	3'-7"	0'-11"	1'-7"	4'-6"	3'-2"	5'-2"	2'-2"	1'-5"	2.1	50	15"	3'-4"	0'-11"	1'-7"	6'-4"	3'-2"	5'-2"	2'-2"	1'-4"	2.6	59
	18"	4'-2"	1'-1"	1'-10"	5'-2"	3'-8"	5'-5"	2'-5"	1'-7"	2.6	60	18"	3'-11"	1'-1"	1'-10"	7'-4"	3'-8"	5'-5"	2'-5"	1'-5"	3.3	70
	21"	4'-10"	1'-3"	2'-2"	5'-11"	4'-2"	5'-8"	2'-8"	1'-9"	3.2	71	21"	4'-7"	1'-3"	2'-2"	8'-4"	4'-2"	5'-8"	2'-8"	1'-7"	4.0	77
	24"	5'-6"	1'-5"	2'-6"	6'-7"	4'-8"	5'-11"	2'-11"	1'-11"	3.8	83	24"	5'-2"	1'-5"	2'-6"	9'-4"	4'-8"	5'-11"	2'-11"	1'-9"	4.7	95
	30"	6'-8"	1'-7"	2'-10"	8'-0"	5'-8"	6'-5"	3'-5"	2'-4"	5.3	95	30"	6'-3"	1'-7"	2'-10"	11'-4"	5'-8"	6'-5"	3'-5"	2'-1"	6.5	116
	36"	7'-11"	1'-10"	3'-4"	9'-8"	6'-10"	7'-0"	4'-0"	2'-7"	7.3	116	36"	7'-5"	1'-10"	3'-4"	13'-8"	6'-10"	7'-0"	4'-0"	2'-4"	8.9	139

COUNTY ENGINEERS OFFICE
MONTGOMERY CO. OHIO

APPROVED: Rex A. Dickey

REX A. DICKEY CO. ENGR

DATE 9-11-63 | FILE NO. 4-H-1-18

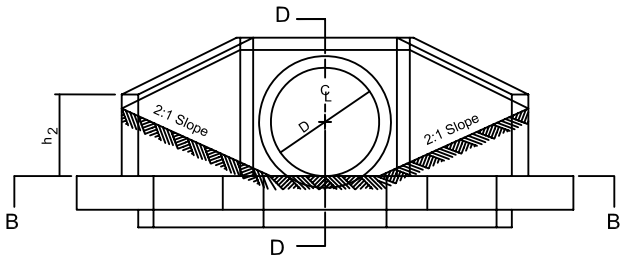
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

HEADWALLS

DATE 8-1-63

STANDARD CONSTRUCTION DRAWING HW No 2

APPROVED [illegible] ENGR. L & D



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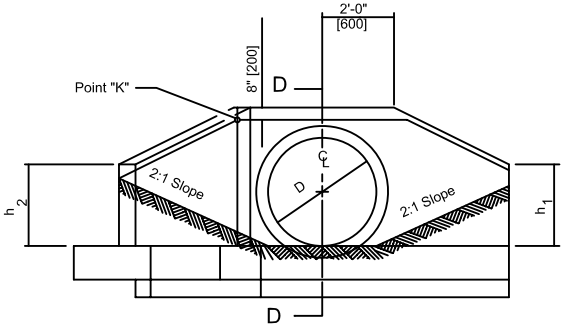

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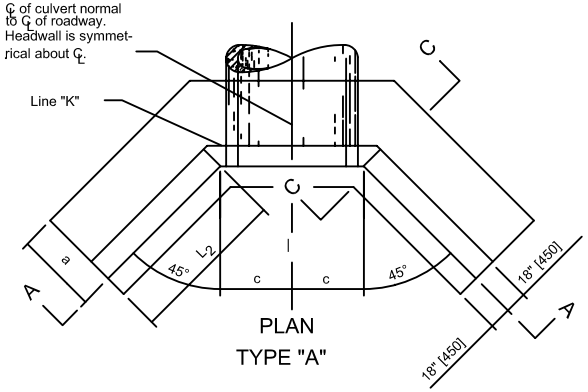
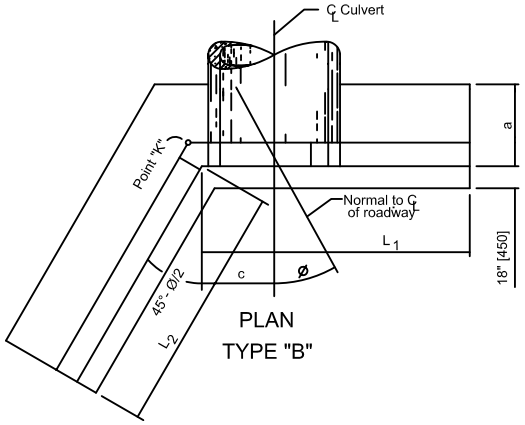


PLAN

TYPE "A"



PLAN

TYPE "B"

NOTES

APPLICATION: Full-Height Headwalls shall be provided for skewed and non-skewed culverts having a diameter or rise of 42" [1050] to 84" [2100] inclusive. Type "A" is used when the skew angle (Ø) is ten degrees or less and Type "B" when the skew angle is over ten degrees.

CONCRETE: Concrete shall be Class C.

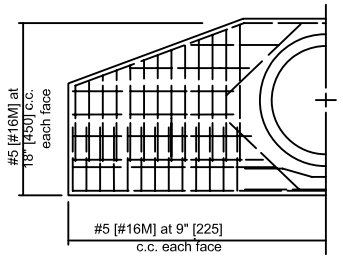
REINFORCING STEEL: Bars shall be #5 [#16M] and epoxy coated.

DETAILS AND QUANTITIES: Are shown for circular sections only. When used with reinforced elliptical concrete pipe or corrugated metal pipe arches, it will be necessary to adjust dimensions and quantities to conform to those listed for the nearest size circular pipe. The dimensions established by vertical diameter shall apply to rise, and dimensions established by horizontal diameter shall apply to span. All calculated dimensions shall be rounded to the nearest 1" [25]. Chamfer all exposed corners ¾" [19].

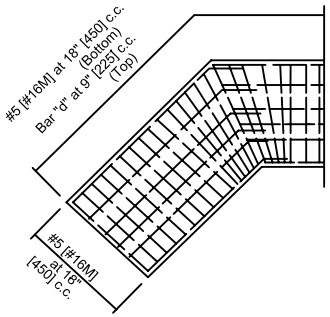
FOUNDATION: Where the soil borings indicate a bearing capacity of less than 2,600 pounds per square foot [125 kPa], it will be necessary to increase the width of the footing.

HEADWALL LOCATION: To be determined by the intersection of the embankment slope at the back of the headwall at Point "K". The slopes adjacent to the headwall shall be 2:1.

PAYMENT: Item 602 Concrete Masonry includes reinforcing.



HALF-SECTION A-A



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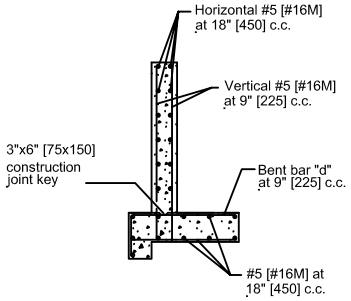
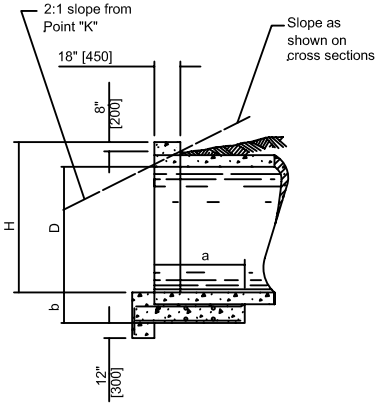


SECTION C-C



SECTION D-D

OHIO DEPARTMENT OF TRANSPORTATION — DATE 1-21-05

STATE HYDRAULIC ENGINEER

REVISIONS 1-21-05

HYDR. ENGR. J. Syar — DRAWN D. Focke

All metric dimensions (in brackets []) are in millimeters unless otherwise noted.

OFFICE OF STRUCTURAL ENGINEERING

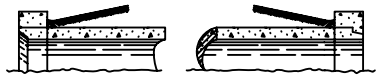
STANDARD HYDRAULIC CONSTRUCTION DRAWING

FULL-HEIGHT HEADWALLS

NUMBER HW-1.1

1 / 2

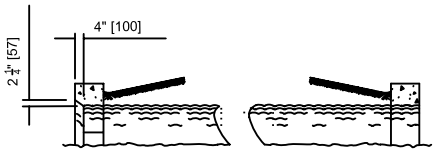
Montgomery County Subdivision Regulations Drawing # 4-H-1-19
Sheet 1 of 2 Date 9-08-04



INLET END
GROOVE OR BELL UPSTREAM

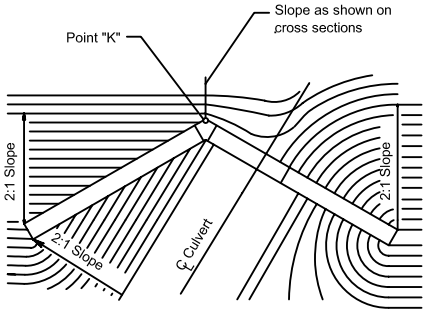
OUTLET END

RIGID PIPE



INLET END OUTLET END

CORRUGATED PIPE
END TREATMENT OF HEADWALL



LOCATION AND GRADING PLAN FOR
SKEWED PIPE CULVERT - TYPE B

FULL-HEIGHT HEADWALLS (English)

PIPE DIA. D	H	a	b	c	Bar# d	Ø ≈ 0°					Ø ≈ 15°							Ø ≈ 30°							Ø ≈ 45°							PIPE DIA. D
						L_2	h_2	Conc. CMP (cy)	Conc. RCP (cy)	Steel (lbs.)	L_1	L_2	h_1	h_2	Conc. CMP (cy)	Conc. RCP (cy)	Steel (lbs.)	L_1	L_2	h_1	h_2	Conc. CMP (cy)	Conc. RCP (cy)	Steel (lbs.)	L_1	L_2	h_1	h_2	Conc. CMP (cy)	Conc. RCP (cy)	Steel (lbs.)	
42"	4'-11"	3'-3"	1'-6"	2'-6"	#5	3'-7"	3'-1"	7.0	6.7	598	8'-9"	4'-6"	3'-8"	3'-2"	7.3	7.1	619	7'-10"	5'-9"	3'-2"	3'-3"	7.5	7.3	633	7'-10"	7'-9"	3'-2"	3'-3"	8.7	8.5	718	42"
48"	5'-5"	3'-6"	1'-6"	2'-9"	#5	4'-4"	3'-4"	8.5	8.2	793	10'-0"	5'-4"	4'-1"	3'-5"	9.0	8.7	776	8'-9"	6'-10"	3'-5"	3'-6"	9.1	8.8	801	8'-9"	9'-2"	3'-5"	3'-7"	10.6	10.3	925	48"
54"	5'-11"	3'-9"	1'-6"	3'-0"	#5	5'-2"	3'-8"	10.3	10.0	1,069	11'-4"	6'-3"	4'-6"	3'-8"	10.9	10.5	1,026	9'-8"	7'-11"	3'-8"	3'-9"	10.8	10.5	1,024	9'-8"	10'-7"	3'-8"	3'-10"	12.6	12.2	1,188	54"
60"	6'-6"	4'-0"	1'-6"	3'-3"	#5	5'-11"	3'-11"	12.3	11.8	1,149	12'-7"	7'-2"	4'-10"	4'-0"	12.9	12.4	1,174	10'-7"	9'-0"	3'-10"	4'-1"	12.7	12.3	1,157	10'-7"	12'-0"	3'-10"	4'-1"	14.8	14.3	1,354	60"
72"	7'-7"	4'-6"	1'-7"	3'-9"	#7	7'-5"	4'-5"	17.0	16.2	1,783	15'-1"	8'-11"	5'-7"	4'-6"	17.8	17.1	1,811	12'-5"	11'-2"	4'-3"	4'-7"	17.3	16.6	1,788	12'-5"	14'-10"	4'-3"	4'-8"	20.2	19.6	2,076	72"
84"	8'-8"	5'-0"	1'-10"	4'-3"	#8	9'-0"	5'-0"	23.7	22.8	2,595	17'-7"	10'-9"	6'-4"	5'-1"	24.8	23.9	2,596	14'-7"	13'-4"	4'-10"	5'-2"	24.1	23.3	2,511	14'-3"	17'-8"	4'-8"	5'-2"	27.9	27.0	2,990	84"

FULL-HEIGHT HEADWALLS (Metric)

PIPE DIA. D	H	a	b	c	Bar# d	Ø ≈ 0°					Ø ≈ 15°							Ø ≈ 30°							Ø ≈ 45°							PIPE DIA. D
(mm)	(mm)	(mm)	(mm)	(mm)		L_2 (mm)	h_2 (mm)	Conc. CMP (m^3)	Conc. RCP (m^3)	Steel (kg)	L_1 (mm)	L_2 (mm)	h_1 (mm)	h_2 (mm)	Conc. CMP (m^3)	Conc. RCP (m^3)	Steel (kg)	L_1 (mm)	L_2 (mm)	h_1 (mm)	h_2 (mm)	Conc. CMP (m^3)	Conc. RCP (m^3)	Steel (kg)	L_1 (mm)	L_2 (mm)	h_1 (mm)	h_2 (mm)	Conc. CMP (m^3)	Conc. RCP (m^3)	Steel (kg)	(mm)
1050	1500	1000	450	750	#16M	1100	950	5.73	5.12	271	2675	1375	1125	975	5.58	5.43	281	2400	1750	975	1000	5.73	5.58	287	2400	2350	975	1000	6.65	6.5	326	1050
1200	1650	1075	450	850	#16M	1325	1025	6.5	6.27	360	3050	1625	1250	1050	6.88	6.65	352	2675	2075	1050	1075	6.96	6.73	363	2675	2800	1050	1100	8.1	7.87	420	1200
1350	1800	1150	450	925	#16M	1575	1125	7.87	7.65	485	3450	1900	1375	1125	8.33	8.03	465	2950	2425	1125	1150	8.26	8.03	464	2950	3225	1125	1175	9.63	9.33	539	1350
1500	1975	1225	450	1000	#16M	1800	1200	9.4	9.02	521	3825	2175	1475	1225	9.86	9.48	533	3225	2750	1175	1250	9.71	9.4	525	3225	3650	1175	1250	11.3	10.9	614	1500
1800	2300	1375	475	1075	#22M	2250	1350	13	12.4	809	4600	2725	1700	1375	13.6	13.1	821	3775	3400	1300	1400	13.2	12.7	811	3775	4525	1300	1425	15.4	15.0	942	1800
2100	2650	1525	550	1300	#25M	2750	1525	18.1	17.4	1177	5350	3275	1925	1550	19	18.3	1178	4450	4075	1475	1575	18.4	17.8	1139	4350	5375	1425	1575	21.3	20.6	1356	2100

OHIO DEPARTMENT OF TRANSPORTATION — DATE 1-21-05
STATE HYDRAULIC ENGINEER

REVISIONS 1-21-05

HYDR. ENGR. J. Syar
DRAWN D. Focke

All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

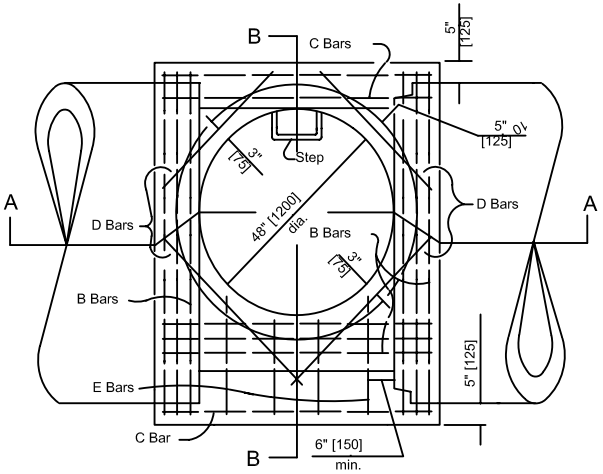
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
FULL-HEIGHT HEADWALLS

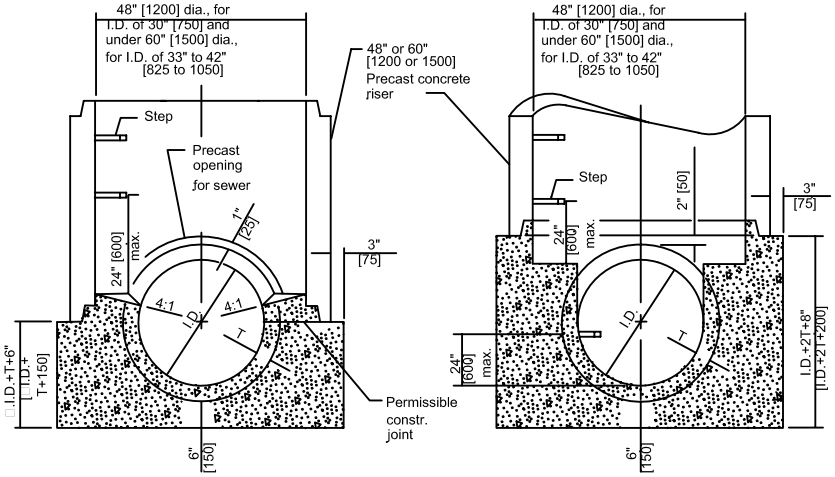
NUMBER HW-1.1

2 / 2

Montgomery County Subdivision
Regulations Drawing # 4-H-1-19
Sheet 2 of 2 Date 9-08-04



PLAN VIEW



MANHOLE BASE ON SEWER 42" [1050] AND UNDER

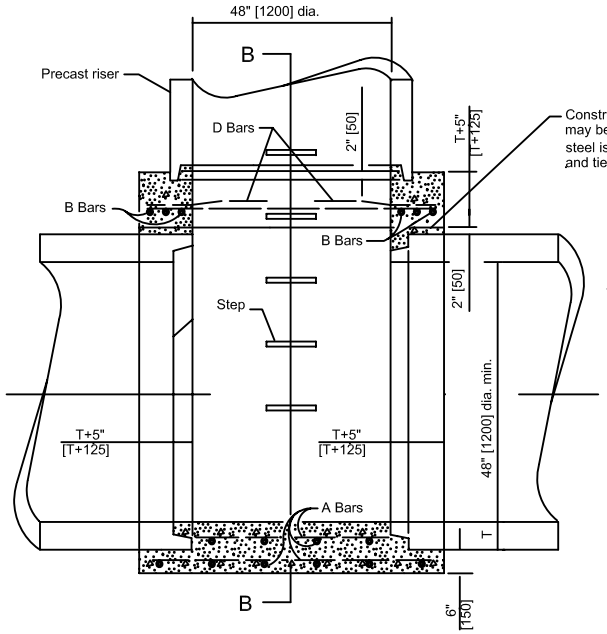
NOTES

MANHOLE: Manhole No. 5 shall consist of a base or bottom as detailed hereon and other manhole components as detailed or specified on **SCD MH-1.2**
In lieu of the tongue and groove junction between the riser and the base, the base may have a flat surface and the riser may have a square end set in a bed of mortar on the base.

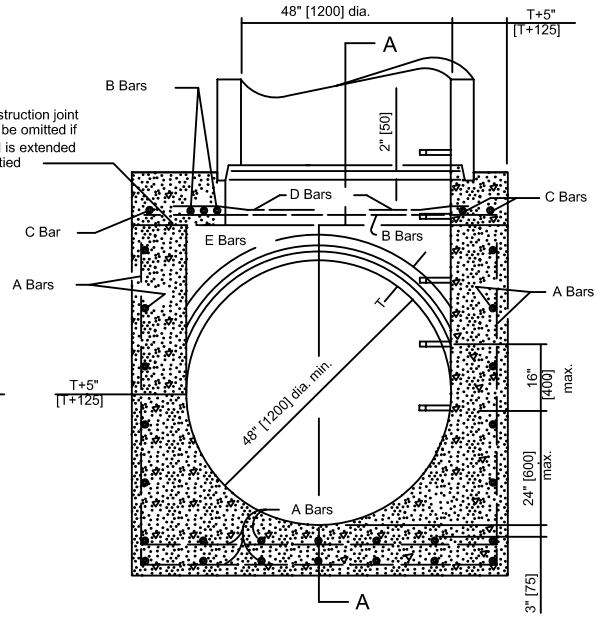
OPENINGS: Openings for 42" [1050] and under inlet and outlet sewer pipes shall be prefabricated in the riser section unless the base is built to an elevation 2" [50] above the manhole top of the inlet and outlet pipes.

CONCRETE: Concrete for the bases may be Class C or meet the requirements of CMS 706.13. The bases may be precast or cast in place. If precast, the base on sewers 42" [1050] and under shall have sufficient steel reinforcement to permit shipping and placement without damage to the base. The base on sewers 48" [1200] and over shall be reinforced as shown.

STEPS: Steps shall comply with the requirements set forth on **SCD MH-1.1.**



SECTION A-A



SECTION B-B

MANHOLE BASE ON SEWER 42" [1200] AND OVER

T = Wall thickness of intercepting sewer pipe

REINFORCING STEEL LIST

BAR	SPACING	BAR SIZES FOR SEWERS 48" to 60" [1200 to 1500]	66" to 78" [1650 to 1950]	84" to 96" [2100 to 2400]
A	12" [300] c/c bothways	#5 [#16M]	#6 [#19M]	#7 [#22M]
B	3" [75] c/c bothways	#5 [#16M]	#6 [#19M]	#7 [#22M]
C	as shown	#5 [#16M]	#6 [#19M]	#7 [#22M]
D	as shown	#5 [#16M]	#5 [#16M]	#5 [#16M]
E	12" [300] c/c	#5 [#16M]	#5 [#16M]	#5 [#16M]

Included for estimating purposes only. The cost of furnishing and placing all reinforcing steel shall be included in Item 604 for payment.

THIS DRAWING REPLACES MH-1.3M DATED 9-6-95.

OHIO DEPARTMENT OF TRANSPORTATION
ENGINEER OF BRIDGES

DATE 7-20-01

HYDRAULIC ENGINEER D. Gruver

All metric dimensions (in brackets []) are in millimeters unless otherwise noted.

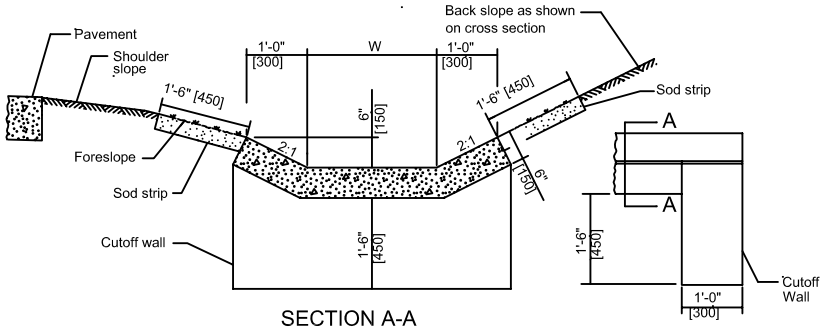
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
MANHOLE No. 5

NUMBER MH-1.3

1 / 1

Montgomery County Subdivision Regulations Drawing # 4-H-1-20 Sheet 1 of 1 Date 9-08-04



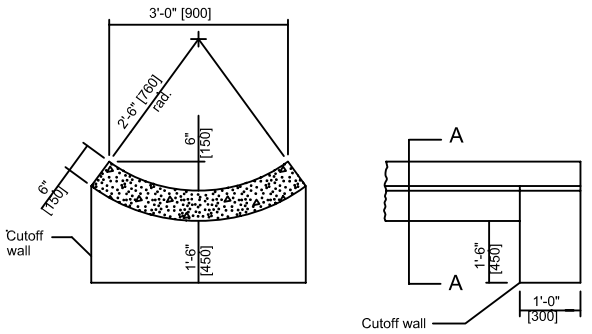
SECTION A-A

SIDE VIEW

TYPE 1-2 W=2'-0" [0.6 m]

TYPE 1-4 W=4'-0" [1.2 m]

TYPE 1-6 W=6'-0" [1.8 m]



SECTION A-A

SIDE VIEW

TYPE 2

NOTES

GENERAL: Gutters shall be constructed of Class C concrete, stone or brick.

The thickness of the gutter shown is for concrete construction. If stone or brick is used it shall be grout-filled and the thickness of the gutter shall be increased to 8" [200] minimum.

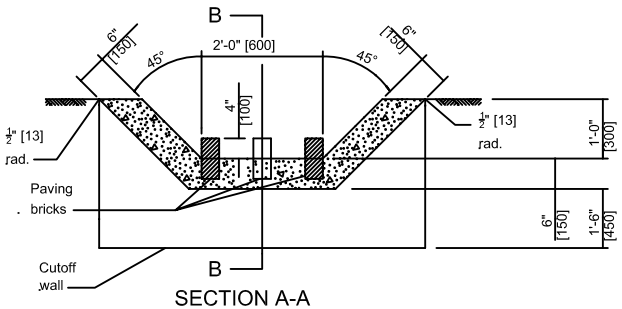
Type 3 Gutter with baffles may be used for steep slopes. Gutter blocks shall be new or used paving brick or precast concrete blocks of similar dimension and shall be placed with the outside blocks in one row staggered with the center blocks at 12" [300] on center longitudinally or as shown on the plan.

CONSTRUCTION: Concrete gutters shall have impressed contraction joints spaced at 10 feet [3.0 m] intervals, unless otherwise specified.

Concrete cutoff walls shall be constructed at the beginning and end of a gutter run except where the gutter connects with at catch basin or inlet.

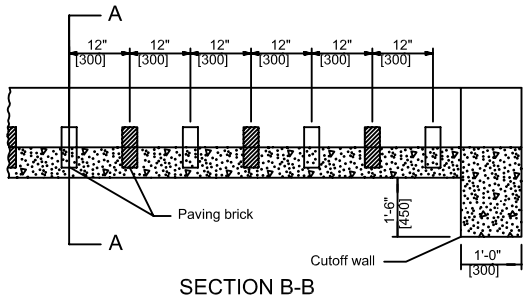
The cost of cutoff walls shall be included in the unit price bid for the gutter.

SOD: Installation and payment for sod shall be in accordance with CMS 660.

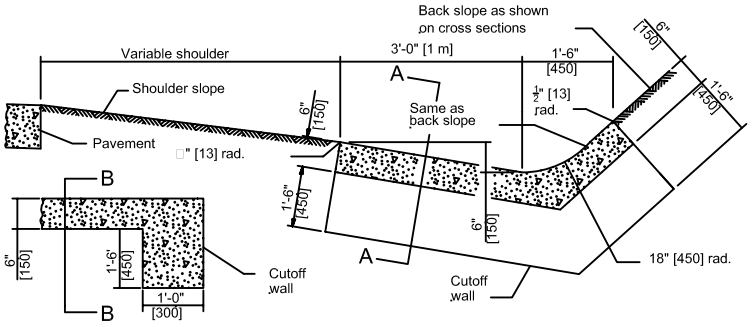


SECTION A-A

TYPE 3



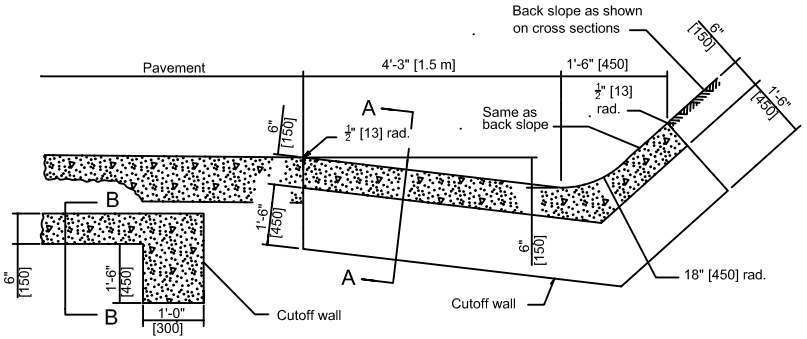
SECTION B-B



SECTION A-A

SECTION B-B

TYPE 4



SECTION A-A

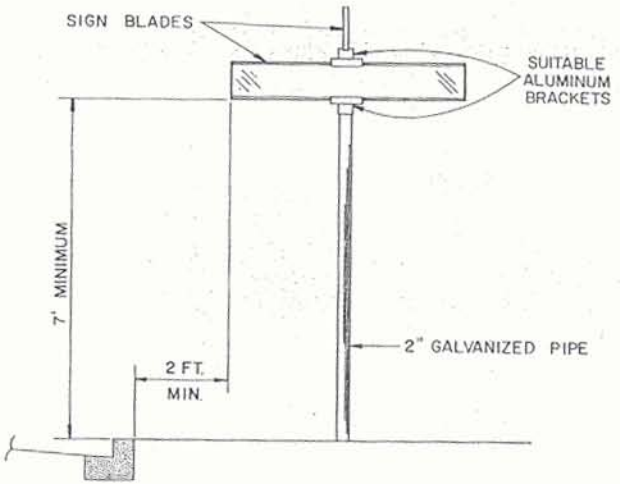
SECTION B-B

TYPE 5

STANDARD PAVED GUTTERS

OHIO DEPARTMENT OF TRANSPORTATION
DATE 7-20-01
ENGINEER OF BRIDGES
REVISIONS
HYDR. ENGR. D. Gruver
DRAWN D. Focke
All metric dimensions (in brackets []) are in millimeters unless otherwise noted.
OFFICE OF STRUCTURAL ENGINEERING
STANDARD HYDRAULIC CONSTRUCTION DRAWING
PAVED GUTTERS
NUMBER DM-2.1
1 / 1

Montgomery County Subdivision Regulations Drawing # 4-H-1-22 Sheet 1 of 1 Date 9-08-04



(1.) THE SIGN FACES SHALL BE MADE OF REFLECTORIZED WHITE LETTERS ON REFLECTORIZED GREEN BACKGROUND.

(2.) TYPE "C" SERIES LETTERS ARE RECOMMENDED, HOWEVER, TYPE "B" SERIES LETTERS WILL BE PERMITTED.
REFERENCE: OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

(3.) SIGN BLADES SHALL HAVE A NOMINAL THICKNESS OF 0.080 INCHES AND SHALL BE OF 6061-T6 ALUMINUM ALLOY.

(4.) THE STANDARD 30 INCH BLADE MAY BE MADE OF SHEET ALUMINUM OR EXTRUDED ALUMINUM. BLADES EXCEEDING 30 INCHES SHALL BE EXTRUDED.

(5.) ALL BLADES SHALL BE BONDERIZED OR ANODIZED PRIOR TO APPLYING THE REFLECTIVE SHEETING.

INSTALLATION DETAILS

POST SHALL BE LOCATED AT THE INTERSECTION SO AS TO PROVIDE GOOD VISIBILITY OF STREET NAME SIGN FROM ALL APPROACHES.

REVISIONS	DATE

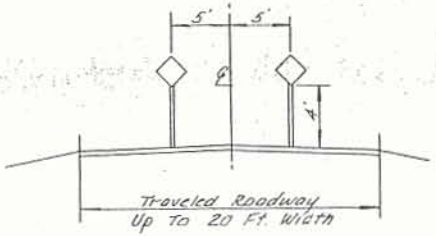
STREET NAME SIGN STANDARD DRAWING

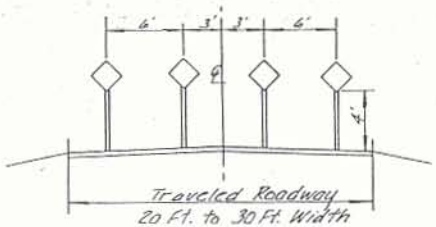
COUNTY ENGINEER'S OFFICE
MONTGOMERY COUNTY OHIO

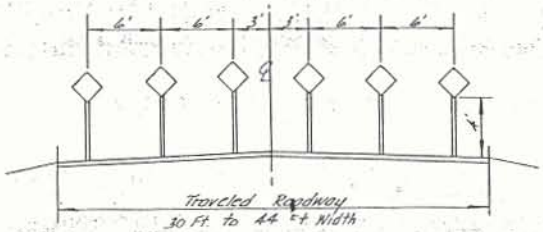
APPROVED: Rex A. Dickey
REX A. DICKEY — COUNTY ENGINEER

DATE 10-14-76
DRAWN BY C. KUNK

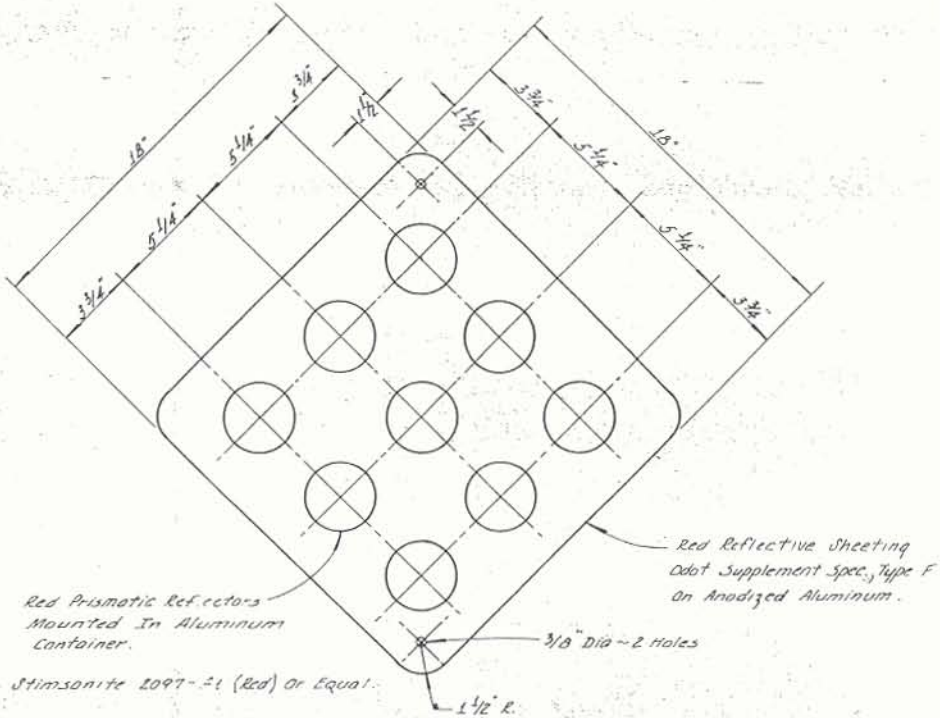
4-H-1-24







INSTALLATION DETAILS



X-4 END OF ROADWAY MARKER DETAIL
Scale 3/16" = 1'-0"

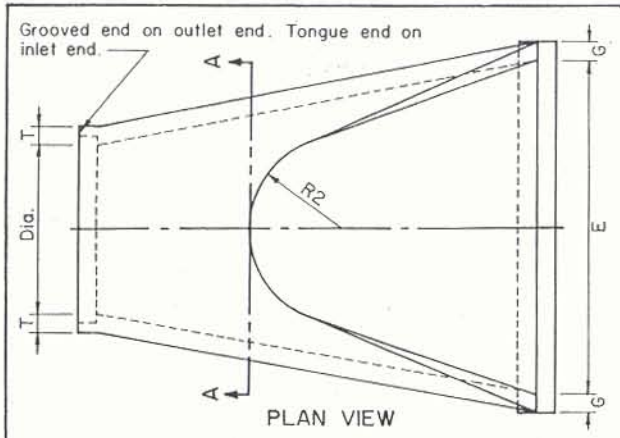
TYPICAL DRAWING
END OF ROADWAY MARKERS

COUNTY ENGINEER OFFICE
MONTGOMERY COUNTY, OHIO

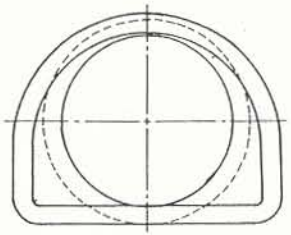
APPROVED Rex A. Dickey
REX A. DICKEY, CO. ENGR.

DATE 4-23-79
DRAWN BY Weidner
CHECKED BY DTS

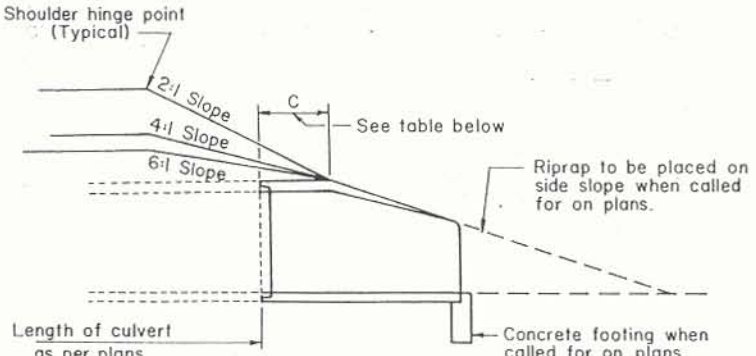
FILE NO.
4-H-1-26



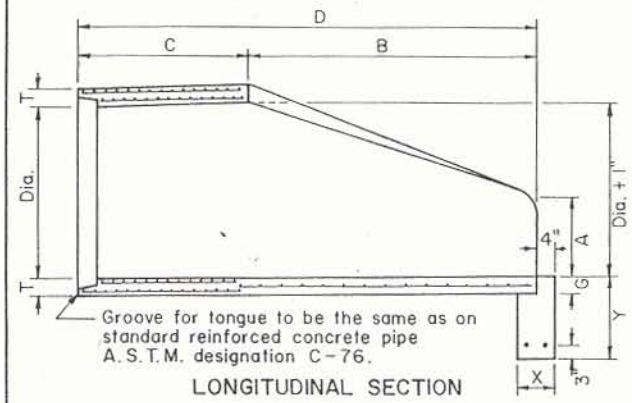
PLAN VIEW



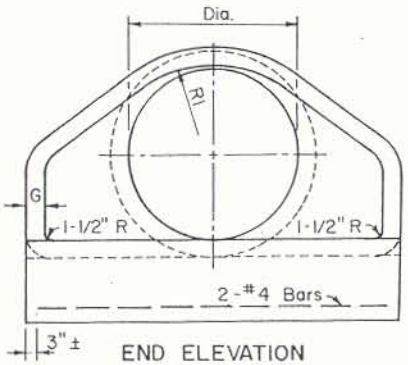
SECTION A - A



SLOPE DETAIL



LONGITUDINAL SECTION



END ELEVATION

Dia.	T(Min.)	A(Min.)	B*	C*	D*	E*	G	R1	R2	X	Y	Approx. Wt. Lbs.
12"	2"	5"	23"	51"	74"	24"	2"	10 1/8"	9"	8"	18"	800
15"	2 1/4"	7"	27"	48"	75"	30"	2 1/4"	12 1/2"	11"	8"	18"	1100
18"	2 1/2"	11"	25"	49"	74"	36"	2 1/2"	15 1/2"	12"	8"	18"	1300
24"	3"	12"	43"	32"	75"	48"	3"	16 3/16"	14"	8"	18"	1800
30"	3 1/2"	14"	53"	22"	75"	60"	3 1/2"	18 1/2"	15"	8"	18"	2400
36"	4"	17"	62"	37"	99"	72"	4"	24 5/16"	20"	8"	18"	4200
42"	4 1/2"	22"	62"	37"	99"	78"	4 1/2"	27 1/2"	22"	10"	24"	5600
48"	5"	24"	72"	26"	98"	84"	5"	28 1/2"	22"	10"	24"	7400
54"	5 1/2"	27"	65"	33 1/4-35	98 1/4-100	90"	5"	□	□	10"	24"	8040
60"	6"	30"	60"	39"	99"	96"	5"	□	□	12"	24"	8730
66"	6 1/2"	24"	72"-78"	21"-27"	99"	102"	5 1/2"	□	□	12"	24"	10,630
72"	7"	24"	78"	21"	99"	108"	6"	□	□	12"	24"	12,520
78"	7 1/2"	24"	78"	21"	99"	114"	6 1/2"	□	□	12"	24"	14,430
84"	8"	36"	90 1/2"	21"	111 1/2"	120"	6 1/2"	□	□	12"	24"	18,160

Notes:

Concrete in these end sections shall be the same grade and strength as specified for reinforced concrete pipe A.S.T.M. designation C-76 Class II, except as modified by the standard specifications.

Reinforcement in the "C" portion shall be the same as specified for reinforced concrete, A.S.T.M. designation C-76 Class II, for the size of connecting pipe.

Reinforcement in the "B" portion shall have a cross-sectional area equal to that of one layer of steel in the "C" portion.

The end of the pipe culvert shall be placed in the concrete end section so that the flow lines are flush. The joint shall be completely filled with mortar.

To change the fill slope to the slope of the end section, use a transition slope of approximately 10 feet in length to provide a pleasing appearance.

* Tolerance ±1"

□ Radius as furnished by the manufacturer
Weight shown does not include concrete footing.

Variations in dimensions - the thickness of the concrete, the position of steel, and the internal diameter of the pipe shall conform with the variations in dimensions as provided in the specifications for reinforced concrete culvert, storm drains, and sewer pipe, A.S.T.M. designation C-76.

Place concrete footing when culvert grade is 4% or more, or when called for on road plans.

Date	Revision	By

PRECAST CONCRETE END SECTION FOR PIPE CULVERT

MONTGOMERY COUNTY ENGINEER'S OFFICE

Approved Rex A. Dickey
Rex A. Dickey, County Engineer

Drawn: R.A.A.
Checked:

File No. 4-H-1-28

Article 11
urban soil sediment pollution control regulations

SECTION 1101 **PURPOSE**

The purpose of the regulation is to control the pollution of public waters by sediment from accelerated soil erosion and accelerated stormwater runoff caused by earth-disturbing activities and land use changes connected with developing urban areas. Control of such pollution will promote and maintain the health, safety and general well-being of all life and inhabitants within Montgomery County.

SECTION 1102 **SCOPE**

1102.1 This resolution shall apply to earth-disturbing activities on areas designated below which are within the unincorporated areas of Montgomery County unless otherwise excluded within this resolution or unless expressly excluded by state law:

A. Land used or being developed for commercial, industrial, residential, recreational, public service or other non-farm purposes.

1102.2 This resolution shall not apply to:

A. Strip mining operations regulated by Section 1513 of the Ohio Revised Code; or

B. Surface mining operations regulated by Section 1514.01 of the Ohio Revised Code.

SECTION 1103 **DISCLAIMER OF LIABILITY**

Neither submission of a plan under provisions of this article nor compliance with provisions of these regulations shall relieve any person from responsibility for damage to any person or property otherwise imposed by law, nor impose any liability upon the Montgomery County Board of County Commissioners or its appointed representative for damage to any person or property.

SECTION 1104 **SEVERABILITY**

If any clause, section, or provision of this resolution is declared invalid or unconstitutional by a court of competent jurisdiction, validity of the remainder shall not be affected thereby.

SECTION 1105 REQUIREMENTS

The requirements of the Ohio Environmental Protection Agency, OEPA Stormwater Discharge Construction Permit shall be made part of these regulations. The Developer shall be responsible for submittal of the Notice of Intent (NOI) to the OEPA, being approved for coverage under this General Permit and applying for OEPA Notice of Termination of Coverage (NOI). The developer shall provide proof of permit submittals to the approving agency. With the exception of post construction runoff control items, the Montgomery County Sanitary Engineer's Office Shall be responsible for reviewing and inspecting the requirements of this OEPA permit.

SECTION 1106 EXCEPTIONS

Montgomery County Engineer projects and Montgomery County Sanitary projects shall be the responsibility of the respective department.

SECTION 1107 DELETED

SECTION 1108 PLAN REVIEW

The approving agency shall indicate its approval or disapproval (status of compliance or non-compliance) of a sediment control plan, to the person who filed the plan. Indication of disapproval (non-compliance) shall include the plan deficiencies and the procedures for filing a revised plan. Pending preparation and approval (determination of a status of compliance) of a revised plan, earth-disturbing activities shall proceed only in accordance with conditions outlined by the approving agency.

SECTION 1109 INSPECTION TO ENSURE COMPLIANCE

Montgomery County Board of County Commissioners or its approved representative may inspect development areas to determine compliance with these regulations. If it is determined that a violation of these regulations exists, the responsible person will be notified of the deficiencies or non-compliance. After a reasonable time for voluntary compliance, the inspector or inspecting agency shall report the deficiency or non-compliance to Montgomery County. Montgomery County, upon determination that a person is not complying with these regulations, may issue by certified mail an order to comply. The order shall describe the problem and the work needed, and specify a date whereby the work must be completed.

SECTION 1110 **MAINTENANCE**

The property owner shall assume responsibility for maintenance of structures and other facilities designed to control erosion.

Appendix A

table of permissible velocities for flowing water

MAXIMUM VELOCITIES FOR GRASSED WATERWAYS

Cover	Slope Range[1] (percent)	Permissible Velocity [2] Erosion Resistant Soils (Ft. Per. Sec.)	Easily Eroded Soils (Ft. Per. Sec.)
Kentucky bluegrass **Tall fescue** **Smooth brome**	0 - 5 5 - 10 over 10	7 6 5	5 4 3
Grass mixtures **Reed canary**	0○ - 5 5 - 10	5 6	4 3
Redtop Red fescue	0[3] - 5	3.5	2.5

DRAINAGE FIELD DITCHES

Drainage field ditches are shallow graded ditches with flat side slopes which do not interfere with tillage operations. Generally, the side slopes range from 8:1 to 15:1. The purpose of drainage field ditches is to collect water from depressional or nearly flat areas within a field and remove it to a stable outlet.

Generally, erosive velocities will not be a problem because of the low gradient of fields in which drainage field ditches are used and because of the shallow side slopes. Maximum velocities shall

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[1] Do not use slopes steeper than 10 percent except for vegetated side slopes in combination with a stone, concrete, or highly resistant vegetative center section.

[2] Use velocities exceeding 5 feet per second only where good cover and proper maintenance can be obtained.

[3] Do not use on slopes steeper than 5 percent except for vegetated side slopes in combination with a stone, concrete, or highly resistant vegetative center section.

be limited to 2.5 feet per second unless on-site studies show that higher velocities will not result in erosive conditions.

MAXIMUM VELOCITIES FOR VEGETATED STREAM CHANNELS

Drainage Areas Less Than One Square Mile

The Maximum permissible design velocity shall be based on site conditions and shall be such as to result in stability of the ditch bottoms and side slopes. Maximum permissible velocities will be computed using bank-full stage of 10-year frequency stage whichever is lower. The following table will be used as maximum velocity for all drainage main or lateral designs. Vegetation will be established immediately after construction.

SUBSOIL TEXTURE	MAXIMUM VELOCITY[4] (Ft. per Sec.)
Sand and sandy loam (non-colloidal)	2.5
Silt loam (also high lime clay)	3.0
Sandy clay loam	3.5
Clay loam	4.0
Stiff clay, fine gravel and graded loam to gravels	5.0
Graded silt to cobbles (colloidal)	5.5
Shale, hardpan, coarse gravel	6.0

DRAINAGE AREAS GREATER THAN ONE SQUARE MILE

Channel velocities for newly constructed channels with drainage areas in excess of one (1) square mile shall meet special stability requirements contained in U.S. Soil Conservation Service Technical Guide (Technical Release 25, Planning and Design of Open Channels).

[4] Channels that cannot be designed to meet the maximum velocity limitation must be stabilized with materials other than vegetation. Such materials include crushed rock, concrete, gabions, etc.

Article 12

enactment

SECTION 1201 **EFFECTIVE DATE**

These regulations as amended shall become effective from and after the date of its approval and adoption by the County Planning Commission and/or Board of County Commissioners after public hearing and certification to the Montgomery County Recorder. Henceforth, any other regulations previously adopted by the Board of County Commissioners or the County Planning Commission shall be deemed to be repealed. These regulations shall in no way affect any subdivision having received preliminary approval prior to the effective date, provided however, that no changes to the preliminary plat, as approved, are introduced by the subdivider.

PASSED: January 2, 1973
Board of County Commissioners,
Resolution No. 29

AMENDED: October 13, 1981
Board of County Commissioners
Resolution No. 81-1879

AMENDED: February 16, 1982
Board of County Commissioners
Resolution No. 82-254

AMENDED: August 12, 1982
County Planning Commission
Resolution No. 10

AMENDED: November 13, 1986
County Planning Commission
Resolution No. 14

AMENDED: November 1, 1988
Board of County Commissioners
Resolution No. 88-2110

AMENDED: May 16, 1989
Board of County Commissioners
Resolution No. 89-1007

AMENDED: March 12, 1992
County Planning Commission
Resolution No. 5

AMENDED: October 6, 1992
Board of County Commissioners
Resolution No. 92-2134

AMENDED: June 10, 1993
County Planning Commission
Resolution No. 8

AMENDED: May 11, 1995
County Planning Commission
Resolution No. 4

AMENDED: January 11, 1996
County Planning Commission
Resolution No. 1

AMENDED: March 4, 2003
Board of County Commissioners
Resolution No. 03-0372

AMENDED: December 15, 2005
Board of County Commissioners
Resolution No. 05-2216

AMENDED: January 27, 2006
County Planning Commission
Resolution No. 1

AMENDED: July 10, 2008
County Planning Commission
Resolution No. 3