

MORROW COUNTY

MINIMUM REQUIREMENTS

FOR THE

DESIGN AND CONSTRUCTION

OF

ROADS AND STREETS

IN

MAJOR SUBDIVISIONS

MORROW COUNTY ENGINEER

RANDY BUSH P.E. & P.S.

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The following Regulations and Policies of the Morrow County Engineering Department have been adopted so that there will be a uniform use throughout the county of good construction and development practices. These Regulations apply to all subdivisions in the unincorporated area of Morrow County.

This office is responsible for reviewing of the design and inspection of all street, storm sewers and other improvements within dedicated right-of-ways, the storm flow, both on and off the subdivision is also in the domain of this office. Proper lot grading is the responsibility of the owner and/or builder.

SUBDIVISION STANDARDS

1. STREETS

A. General – The alignment, width and location of all streets shall conform to the official Morrow County thoroughfare Plan, or subsequent amendments thereof, and shall be considered in their relation to existing and planning streets, to topographical conditions, to public convenience and safety and in their appropriate relation to the proposed used of the land and adjacent land to be served by such streets. The subdivider shall provide within the boundaries of the subdivision plat the necessary right-of-way for widening, continuance, or alignment of such streets in conformance with the Major Thoroughfare Plan by one of the following methods:

1. The dedication of the necessary right-of-way for the continuation, extension or connection of any present or planned thoroughfare.
2. When subdividing land fronting on an existing county or township road not designated on the Thoroughfare Plan a minimum of 60 feet of right-of-way will be necessary. Local streets shall be laid out to discourage through traffic.

B. MAJOR TRAFFIC ARTERIES AND PHYSICAL BARRIERS

1. Traffic Arteries: Where a subdivision abuts or contains an existing or proposed street classified as an arterial, the Planning Commission may require marginal access streets, reverse frontage lots with non-vehicular access, or such other treatment as may be necessary for adequate protection of residential properties and to afford separation of through and local traffic.
2. Physical Barriers: Where a subdivision borders on, or contains a railroad right-of-way or limited access highway right-of-way, a street may be approximately parallel to an on each side of such right-of-way.

C. Alignment

1. Horizontal
 - a. Jogs: Street jogs with centerline offsets of less than two hundred fifty (250) feet shall be prohibited.

- b. Angle of Intersections: Streets shall be laid out so as to intersect as nearly as possible at right angles and no street shall intersect with any other street or less than sixty (60) degrees.
- c. Intersection Approaches: Approaches to street intersections shall be straight for a distance of least one hundred (100) feet from the centerline of the street intersected.
- d. Reverse Curves: A tangent at least fifty (50) feet long shall be introduced between reverse curves.

2. Vertical

- a. Grade at Intersection: Approaches to intersections shall be reduced to grade not exceeding three (3) percent for a distance of at least one hundred (100) feet.

D. Classification: Each street in a subdivision shall be classified and shall be governed in accordance with the following table:

SCHEDULE OF REQUIRED STREET DESIGN STANDARDS

STREET CLASSIFICATION

TERRAIN CLASSIFICATION

LEVEL ROLLING HILLY

Arterial Streets

A.	Right-of-way Width	60'	60'	60'
B.	Grades			
	1. Maximum		5%	5%
	2. Minimum	.6%		

Collector Streets

A.	Right-of-way Width	60'	60'	60'
B.	Grades			
	1. Maximum		5%	7%
	2. Minimum	.5%		
C.	Minimum Stopping Site Distance	250'	200'	150'
D.	Minimum Spacing When Intersecting With an Arterial Street	1,320'	1,320'	1,320'
E.	Minimum Centerline Radius	350'	230'	150'

Local Streets

A.	Right-of-way Width	60'	60'	60'
B.	Grades			
	1. Maximum		8%	10%
	2. Minimum	.5%		
C.	Minimum Stopping Site Distance	200'	150'	150'
D.	Minimum Centerline Radius of Streets			
	With an Angle of Turn:			
	1. Between 80 and 100 Degrees	90	90	90
	2. Less than 80 or More than 100 Degrees	200	200	150

Cul-de-sacs and Loop Streets

A.	Right-of-way width	60'	60'	60'
B.	Grades			
	1. Maximum		8%	10%
	2. Minimum	.5%		
C.	Minimum Stopping Site Distance	200'	150'	150'
D.	Maximum Cul-de-sac Length	700'	600'	500'
E.	Street Property Line Diameter at closed end of Cul-de-sac	100'	100'	100'
F.	Minimum Centerline Radius of Streets with an Angle of Turn:			
	1. Between 80 and 100 degrees	90	90	90
	2. Less than 80 or More than 100 degrees	200	200	150
G.	Outside Pavement Diameter at Closed end of Cul-de-sac	76'	76'	76'

TYPICAL SECTIONS

The typical sections shall meet the current requirements as set forth by the Morrow County Engineer as shown in Appendix D. The Morrow County Engineers may request that any typical section within Morrow County which may be contiguous to a proposed section or existing section, within the corporate limits of any city or village, be of the same type and design as that of the city or village.

Concrete curbs may be required whenever the average lot width is 80 feet or less. This may be combined curb and gutter for lots over 66 feet wide and mountable curb must be used for lots 65 feet or less in width. Concrete for curb and sidewalks shall have 7% to 9% entrained air. Drainage pipe must be installed under both side ditches with an inlet at the upstream side of each driveway.

A street designated as a collector will be built 36 feet wide face to face of curb or 36 feet wide on uncurbed sections. Any other width shall be of the discretion of the Morrow County Engineer. Boulevards are not permitted, nor is the placing of any decorations within the dedicated right-of-way.

PLAN AND PROFILE

The plan view shall be at a scale of 1 inch = 50 feet. Any other scale will need approval in advance of the plan preparation. Pavement details for cul-d-sac's or other pertinent drawings shall be to a scale of 1 inch = 20 feet. The plan view shall show the proposed road or street alignment, right-of-way and pavement widths, centerlines, bearing, stationing, curve or radius data, existing and proposed drainage and any proposed water or sanitary lines within the dedicated right-of-way and at points of crossing the storm sewer within the subdivision. Any other significant feature or factor, shall also be shown on the plans. The centerline of road or street construction shall coincide with the Centerline of the right-of-way. Any changes from same shall be at the discretion of the Morrow County Engineer or his representative. The stationing shall proceed from left to right on the plan sheet and the beginning stationing shall be on the west or south. A north point shall be indicated on each plan sheet.

The profile view shall have a horizontal scale of the same as plan view and a vertical scale of 1 inch = 5 feet. The existing and proposed centerline profile, elevations, gradients, existing and proposed drainage lines and vertical curves shall be shown. The future profile grade shall be established a sufficient distance beyond the subdivision to eliminate abrupt changes in grade in the future. The minimum street gradient shall be 0.5%. When establishing road or street gradients, fullest consideration shall be given to abutting property.

Vertical curves shall be used at all points on the gradient where the algebraic difference is 1% or greater. The minimum length of any vertical curve shall be 100 feet. The minimum non-passing sight distance shall be 200 feet on vertical curves.

Plans shall have a minimum of two field set bench marks completely described, based on U.S.G.S. datum.

DRAINAGE

It will be necessary to direct storm water to an adequate drainage ditch, stream or storm sewer system with vegetated swales, filter strips or pipes.

No subdivision will be approved unless there is an adequate outlet for the storm water.

Generally it will be necessary to pipe storm water to an adequate drainage ditch, stream or an existing storm system which has the capacity to carry the flow.

No natural drainage course shall be altered and no fill, buildings or structures shall be placed in it unless provision is made for the flow of water in a manner satisfactory to the County Engineer. An easement shall be provided on both sides of the existing important surface drainage course adequate for the purpose of protecting, widening, deepening, enclosing or otherwise improving such stream for drainage purpose.

1. Drainage Plan

Prior to the start of construction of any houses or streets the subdivider shall furnish the County Engineer with a plot plan showing the slab or floor elevation of each house proposed to be constructed. The subdivider shall also show by the use of arrows how he proposed to drain each lot.

The subdivider shall submit topographic maps showing the area to be drained with calculations prepared by a licensed engineer in determining the proposed storm water collection system.

2. Block and Lot Grading

Block and lot grading shall be as follows:

- a. Parts of all lots shall drain to a street or ditch along rear lot lines.
- b. Drainage shall be provided across rear and side lot lines provided that drainage onto adjoining properties shall be skillfully controlled.
- c. Lots shall be graded so that water drains away from each building or structure at a minimum grade of two (.02) percent. Surface drainage swales shall have a minimum grade of one half (.005) of one percent and shall be designed so that surface water will drain into a street gutter, storm sewer or natural drainage way.

3. Drainage System Requirements

The design criteria for drainage systems shall be based on the state of Ohio, Department of highways Manual of Location and Design.

a. Road Drainage System

The road storm sewer system shall serve as the prime drainage system. It shall be designed to carry the runoff from roadways, adjacent land areas and storm water systems serving buildings and structures. Design discharge used to determine pavement inlet spacing; and roadway and driveway pipe culvert sizes, shall be subject to review and approval of the County Engineer.

b. Off Road Drainage System

The design of the off road drainage system shall include the watershed affecting the subdivision and shall be extended to a watercourse of ditch adequate to receive the storm drainage.

- 1) Watercourses or ditches shall not be enclosed in a pipe unless open ditch drainage is not feasible. Vegetated swales (open ditches) shall have a side slope ratio minimum of 3:1 and a minimum two (2) feet bottom width.
- 2) Storm drainage courses carried along the side of lot lines shall be open drainage unless natural gradient or space limitations make surface drainage infeasible.
- 3) All storm drainage courses carried along side lot lines shall be enclosed with approved pipe.

c. Protection of Drainage Systems

The subdivider shall adequately protect all ditches (roadways and watercourses) to the satisfaction of the County Engineer as follows:

- 1) Ditch protection shall be provided by seeding or sodding as specified by the State of Ohio Department of Highways, construction and material specifications.
- 2) Ditches on all adjoining lands shall be cleaned, restored and protected by the subdivider as directed by the County Engineer where the outlet velocity of storm sewers, culvert pipes, drive pipes or side drains exceeds the allowable velocities of the drainage ditch.

DRAINAGE DESIGN CRITERIA

All storm sewer pipe shall be concrete pipe, except as allowed in specific requests. Under pavement 706.02 reinforced concrete pipe shall be used.

Design Frequency	2 Year – Storm Sewer
	2 Year – Curb Inlets
	5 Year – Open Ditch
	10 Year – Minor Culvert
	25 Year – Major Culvert

Method used to estimate peak or design flow (Q):

Q- C I A or Chart D-801 of Location and Design Manual, State of Ohio, Department of Highways.

Coefficient of runoff for:

Paved Areas	0.9
Residential	0.4-0.6
Cultivated and Woods	0.3
Apartment Areas	0.5-0.8

Minimum time for:

First ditch catch basin	15 Min.
First curb inlet	10 Min.

Minimum cover top of pipe to subgrade: 9 inches

Minimum velocity in sewer: 3.0 feet per second

Maximum length between manholes or suitable cleanout points:

Under 36 inches	300'
36 inches – 60 inches	500'
over 60 inches	750'

Minimum pipe size 12 inches

Allowable Velocities in ditch (2 year)

Seeded (vegetated) lining to filter strip	1 feet per second
Vegetated to retention pond	2-3 feet per second
Velocities over 5 feet per second and paved ditches are not allowed	
Vegetated swales should be cleared of noxious weeds and trash but not mowed below 6 inches more than twice a year	
Sod	5 feet per second
Over 5 feet per second use paved lining.	

Minimum slope of ditches: 0.40%

Maximum spread into traveled lane on curbed streets – 8 feet.

Curb inlets will be State Highway Standard inlets. Catch basins will be State Highway 2-2A, 2-2B, 2-2, 2-4, 2-5, 2-6 or with special permission I-1 side ditch inlets.

Manholes will be State Highway Standard No. 1 or if required Standard No. 2. Omitting drop pipe.

JOINTS

The joints of pipe under pavement shall be made of a material meeting the Construction and Material Specifications of the State or Ohio Department of Transportation 706.11 on 36" or smaller pipe. This joint material shall be used from structure to structure for curbed streets or between ditch lines on open ditch sections. On pipe larger than 36" in these conditions, the joints shall be concrete mortar joints.

Open joint pipe shall be used on longitudinal lines parallel to pavement when the typical section has a 304 aggregate base course.

All other applications may be with the bituminous mastic joint material. The use of other joint materials will be considered upon request.

BACKFILL

Transverse storm sewers, water lines, sanitary sewers and utility lines within the dedicated right-of-way shall be backfilled with compacted granular material to within six (6) inches of the subgrade or the existing ground in accordance with Item 310.

Longitudinal lines under the pavement driveway or sidewalk shall also be backfilled with compacted material as per Item 310. Longitudinal utility lines which have part of the trench under the pavement driveway or sidewalk shall be backfilled with suitable soil compacted in accordance with Item 203.

EASEMENTS

Easements shall have a minimum width of seven and one-half (7 ½) feet on each side of a lot line or such additional width as may be required for necessary access to the utility involved. Easements shall be located along rear or side lot lines except under special circumstances where they may be required in other locations. For lots facing curvilinear streets, the rear easement should consist of straight lines with a minimum of points of deflection.

INTERSECTIONS

The minimum curb radius shall be 20 feet to face of curb. Without curb the minimum pavement radius shall be 30 feet to edge of pavement.

An area of clear vision at street intersections shall be provided.

GUARD RAIL AND SEEDING, ETC.

The necessity of guard rail, seeding, type of backfill or other special conditions, shall be determined with the assistance of the Morrow County Engineer or his representative before completion of the construction plans.

CONSTRUCTION PROCEDURE

Before the start of construction the following must be done:

1. Street improvement plans will not be signed until the subdivision plat has been signed.
2. Submit one (1) set of prints for review including drainage calculations, drainage maps delineating the area tributary to the proposed storm system and any existing drainage facilities within and adjacent to the proposed site.
3. After plans have been reviewed, submit revised plans and title sheet for signing by the Morrow County Engineer or his Representative. Then submit to the Board of County Commissioners for their approval. If portions of the work is within the village or city or on a township road, plans should be submitted to these agencies for their review and approval.
4. When all necessary signatures are obtained, send three (3) sets of the signed plans to the Morrow County Engineer's Office.
5.
 - a. Submit a Performance Bond (see Appendix B) for 100% of cost of street and storm sewer work, or
 - b. An escrow account (see Appendix C) for 100% of the Street and Storm Sewer costs.
6. Send a certified check to cover the cost of the County Engineer's Inspector. This amount to start the work is 1% of estimated Construction costs, but not more than \$1,000.00. This check is made payable to the Morrow County Treasurer but submitted to the County Engineer's Office for proper credit. Inspection is charged at the rate of \$20.00 per hour for time spent on the project. As the project progresses, if more inspection money is needed, it will be requested by letter showing how inspection

time has been used up to that time. Any inspection money left over will be returned when the project is accepted.

FIELD CONSTRUCTION AND ENGINEERING

All items of work covered and stipulated in the construction plans, altered or any extra work shall be performed in accordance with the lines, grades, typical cross sections and dimensions shown on the construction plans. All streets shall be graded the full width of the right-of-way. The setting and marking of all line, profile and grade stakes necessary for the layout of the work in accordance with the construction plans will be performed, under the supervision of a Registered Engineer or Registered Surveyor. Should any misunderstanding arise, as to the intent or meaning of the construction plans, or any discrepancy appear in same, or in the proper method of setting and marking of the construction stakes, the decision of the Morrow County Engineer in such cases shall be final.

Cut sheets for the storm sewers shall be prepared and submitted to the Office of the Morrow County Engineer 48 hours prior to starting construction.

If it becomes necessary to modify the improvements and/or plans as approved, due to unforeseen circumstances, the subdivider shall inform the County Engineer in writing of the conditions requiring the modifications. Written authorization from the County Engineer to make the required modifications must be received before proceeding with the construction of all improvements.

INSPECTION

Inspection of the work shall be made by the Morrow County Engineer or his representative. Forty-eight (48) hours notice will be required before any work or inspection takes place. This inspection by the Morrow County Engineer includes work which is being inspected by other persons as long as it is within right-of-way. Failure to comply with the above may result in the rejection of the work and the project. Failure to reject any defective work or material shall not in any way prevent later rejection when such defects are discovered or obligate Morrow County to final acceptance.

All field construction, engineering and inspection shall be in accordance with the "Construction and Material Specifications" of the State of Ohio, Department of Transportation unless otherwise approved in advance by the Morrow County Engineer or his representative.

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. The County Engineer shall make a final inspection of all street improvements, storm and sanitary sewer and water improvements.

PERMANENT MONUMENTS

Permanent monuments shall be placed at each boundary corner and at each change in direction of the boundary; and one such monument shall also be placed at each street intersection on the right-of-way line and at curves on one side of the street on the right-of-way line. A permanent monument shall be concrete with a minimum size of 6 inch by 6 inch or 6 inch diameter by 30 inch with a reinforcing bar or pipe cast in the center. In lieu of this type of monument a permanent monument may be one inch solid iron pin, minimum length of 36 inches. The top of all permanent monuments shall not extend above the finished grade.

Before final acceptance of the street improvement by the Board of County Commissioners, the subdivider or developer shall, through registered surveyor, certify to the Morrow County Engineer that monuments destroyed by construction have been replaced. The final plat indicates where monuments are set for the county records.

ELECTRIC AND POWER LINES

In all subdivisions electric current conductors shall be buried as per specifications of the electric company. Above ground concrete pads for transformers will be permitted.

Electric current for street lighting must be supplied through underground cables. Such lighting systems including standards and their spacing must be approved by the County Engineer and the electric company involved.

IMPROVEMENT AGREEMENT AND GUARANTEE

1. Assurance of completion of Improvements

No lot, proposed lot or parcel of land which is subject to these regulations shall be sold or leased nor shall there be any building permit issued for the improvement of such lot or parcel of land until the improvements required by these regulations, or assurance of their completion have been completed. The assurance of completion of improvements shall be satisfied by the furnishing of a performance bond or other guarantee.

2. Reduction of Bond or Escrow Account

The subdivider shall give written notice to the County Engineer when improvements covered by bond or escrow account have been completed; the County Engineer shall then make any and all inspections essential to the determination that such improvements conform to all standards of this resolution; and that the County Engineer, within fourteen (14) days of receiving the heretofore described written notice, convey a written report to the County Commissioners and the developer, stating his approval or disapproval, as the case may be. In the event the County Engineer disapproves, he shall state his reasons for doing so in a written report to both parties.

Upon approval of the improvements, the performance bond or escrow account shall be replaced by a maintenance bond or continuance of the escrow account equal to 10% of the performance bond or escrow account for a duration of one (1) year. This will be released after a final acceptance inspection.

3. Liability and Property Damage Insurance

The subdivider shall furnish evidence of liability insurance in the amount of \$250,000 for each injury and in an amount of \$500,000 for injuries resulting from any one occurrence, and property damage insurance in the amount of \$100,000, which shall indemnify and save harmless the County from any and all liability arising by reason of the conditions of the streets of said subdivision or out of the construction of installations of all improvements. A copy of the insurance policy shall remain at all times with the County Commissioners.

APPENDICES

APPENDIX A

SUBDIVIDER'S AGREEMENT

This agreement executed on this _____ day of _____, 20____ by and between _____ Subdivider, as evidenced by the _____ Plat to be filed with the County Recorder of Morrow County and the Board of County Commissioners of Morrow County, Ohio, is governed by the following conditions and considerations, to wit:

Said Subdivider shall not transfer any lot parcel or tract therefrom or shall proceed with any construction work on the proposed subdivision including grading that may affect the arrangement of streets or other public improvements until he has obtained approval of the plat from the Morrow County Planning Commission and further until the plat of said subdivision has been recorded with the County Recorder of Morrow County, Ohio.

And said Subdivider is to construct all public improvements shown by the engineering drawings, all of which are a part of this agreement.

Said subdivider is to execute a performance bond or a certificate of deposit or escrow account to the satisfaction of the Board of County Commissioners to insure the faithful performance of this agreement.

The Subdivider shall pay the entire cost and expense of said improvements, and shall deposit with the Morrow County Engineer the sum of money to be estimated to be necessary to pay the cost of inspection. Upon completion and acceptance of the improvement, any unexpected balance remaining from such deposit or deposits shall be refunded.

The Subdivider shall hold Morrow County free and harmless from any and all claims for damages of every nature arising or growing out of the construction of such improvement, and shall defend, at his or their own cost and expense, each and every suit of action brought against said Morrow County by reason thereof until the improvement has been accepted by the Morrow County Engineer and Board of County Commissioners.

All to be performed within a period of one year from the date of this agreement, which is hereby fixed by said County as a reasonable period, but an extension of time may be granted if approved by the Board of County Commissioners.

The subdivider further agrees that any violation of or noncompliance with any of the provision and stipulations of this agreement shall constitute a breach of contract and the Morrow County Engineer shall have the right to stop the work forthwith and use the surety to complete the work.

APPENDIX A – Continued

SUBDIVIDER'S AGREEMENT – Continued

In consideration whereof, the board of County Commissioners of Morrow County, Ohio, hereby grants the subdivider or his agent the right and privilege to make the improvement stipulated herein.

WITNESS:

SUBDIVIDER

SUBDIVIDER

BOARD OF COUNTY
COMMISSIONERS
MORROW COUNTY, OHIO

APPENDIX B

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That, We _____ as Principal, and _____ as Surety, are hold and firmly bound unto the Board of County Commissioners, county of Morrow and State of Ohio, in the sum of _____ Dollars, lawful money of the United States, for the payment of which well and truly to be made, we bind ourselves, our heirs, executors, successors and assigns, jointly and severally, firmly by these presents.

The condition of the foregoing obligation is such that:

WHEREAS, said Principal will make the following improvements. All public improvements and other work as set forth to be done and performed in accordance with the plans, specifications and provisions of the contract executed between said principal and County Commissioners of Morrow County, for the development and improvement in _____ Subdivision, in _____ Township, Morrow County, Ohio.

NOW, THEREFORE, if the said Principal shall fully and faithfully perform all the work specified to be done and performed by the contract executed between the Principal of this Bond and the Board of County Commissioners of Morrow County, and within the time prescribed, and in accordance with the plans, specifications and provisions therefore, to which reference is made, the same being a part hereof, as if fully incorporated herein; then this obligation shall be void, otherwise to remain in full force and effect in law; it being expressly understood and agreed that the liability of the surety for any or all claims hereunder, shall in no event exceed the penal amount of this obligation as herein stated.

The said Surety hereby stipulates and agrees that no modifications, omissions or additions, in or to the terms of said contract or in or to the plans or specifications therefore or any extension of time, shall in any way affect the obligations of said surety on its bond.

WITNESS OUR HANDS this _____ day of _____, 20_____.

PRINCIPAL _____

_____ SURETY

By: _____

APPENDIX C

Morrow County Commissioners
c/o Morrow County Engineer
48 East High Street
Mt. Gilead, Ohio 43338

RE: (Name of Subdivision)

Attention: County Engineer

Gentlemen:

At the request of (name of Developer), we are holding escrow funds under our custody in the amount of \$ _____.

The purpose of this deposit of \$ _____ is to assure the Morrow County Commissioners that the installation of streets and storm sewers in (Name of Subdivision), located in _____ Township, Morrow County, Ohio, will be faithfully and satisfactorily installed, also, that this escrow agreement will be used in lieu of (Name of Developer), giving a Performance bond.

The escrow funds will be held by us and disbursed to the Contractor monthly on the basis of 90% of the estimate of Completion by the Contractor and approval by the Morrow County Engineer. The final 10% will be disbursed upon acceptance of the subject improvements by the Morrow County Engineer and the Board of County Commissioners of Morrow County, Ohio.

Yours Truly,

APPROVED: BY _____
(Developer)

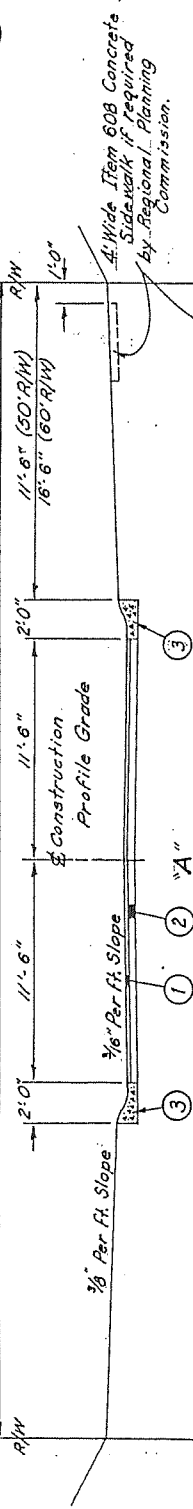
APPROVED BY _____
(Contractor)

APPROVED BY _____
Morrow County, Ohio
County Engineer

APPENDIX - D

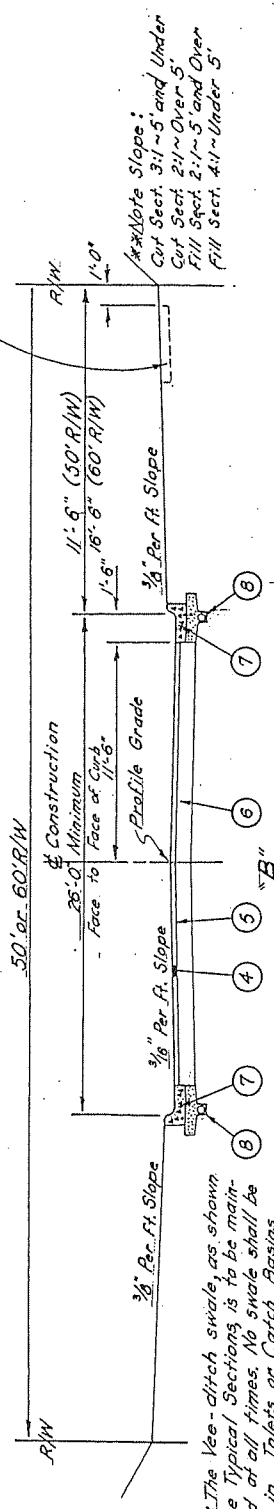
* 50' or 60' R/W

* 50' of Right of Way will be acceptable if approved by the Morrow Co. Engineer



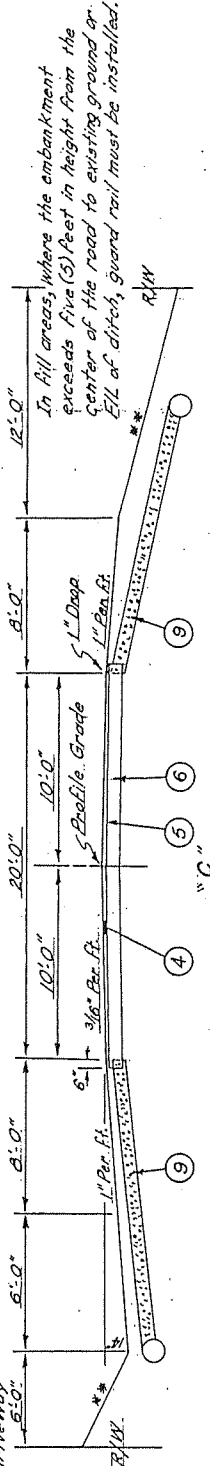
4" Wide Item 608 Concrete Sidewalk if required by Regional Planning Commission.

* 50' or 60' R/W



* Note Slope: Cut Sect. 3:1 ~ 5' and Under Fill Sect. 2:1 ~ 5' and Over 5' Fill Sect. 4:1 ~ Under 5'

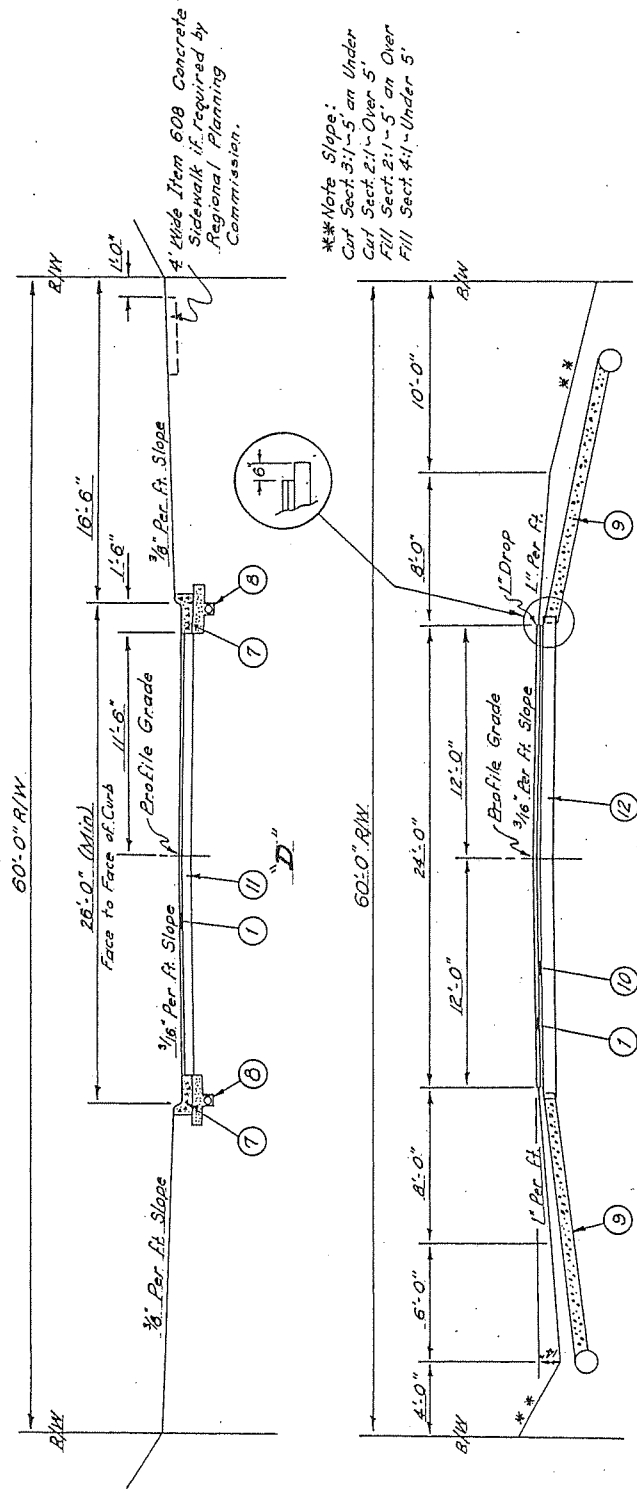
NOTE: The Vee-ditch swales, as shown on the Typical Sections, is to be maintained at all times. No swale shall be filled in. Inlets or Catch Basins shall be placed on the upstream side of each driveway.



In Fill areas, where the embankment exceeds five (5) feet in height from the center of the road to existing ground or FFL of ditch, guard rail must be installed.

- ① Item 404 - 1/2" (Min.) Asphalt Concrete (65-100) or AC-20
- ② Item 301 - 4 1/2" Bituminous Aggregate Base (65-100) or AC-20
- ③ Item 609 - RC Concrete Mountable Curb
- ④ Item 404 - 2" (Min.) Asphalt Concrete (65-100) or AC-20
- ⑤ Item 408 - Prime Coat, Using 0.35 Gal. Per Sq. Yd. of MC-30, RT-2, CBAE-352
- ⑥ Item 304-9' Aggregate Base
- ⑦ Item 609 - Concrete Curb and Gutter
- ⑧ Item 605 - 4" Pipe Underdrain, Including Porous Backfill
- ⑨ Item 605 - Aggregate Drains (50' Intervals on each side)

* Cuds are interchangeable; retain 4" Pipe Underdrain on Section "B"

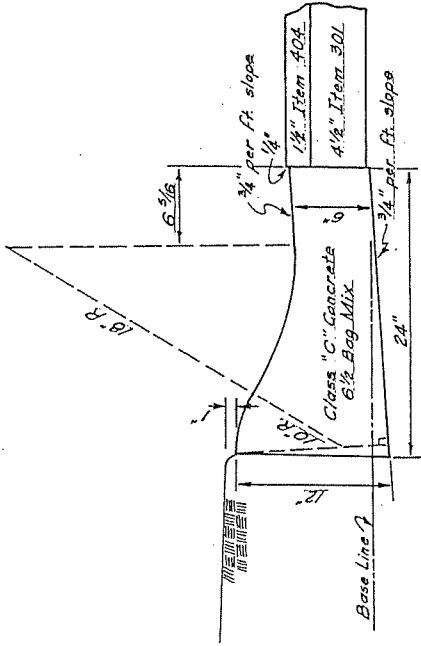


***Note Slope:
 Cur Sect. 3:1 - Under 5'
 Cur Sect. 2:1 - Over 5'
 Fill Sect. 2:1 - 5' on Over
 Fill Sect. 4:1 - Under 5'

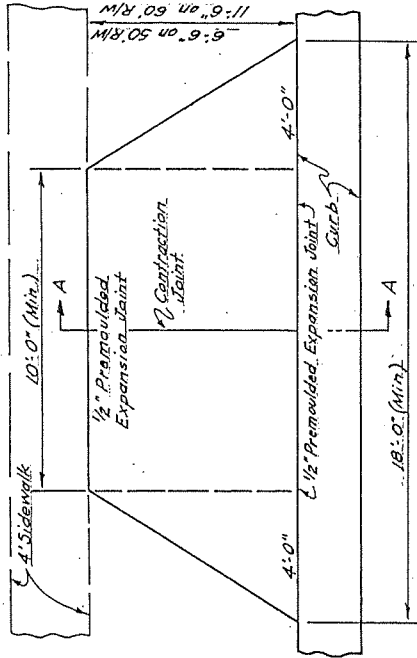
INDUSTRIAL ROAD TYPICAL

- (1) Item 404 - 1/2" (Min.) Asphalt Concrete (85-100) or AC-20
- (2) Item 402 - 1/2" Asphalt Concrete (85-100) or AC-20
- (3) Item 609 - Concrete Curb and Gutter
- (4) Item 605 - 4" Pipes Under-drain, Including Form Backfill
- (5) Item 605 - Aggregate Drains (50' Intervals on each side)
- (6) Item 305 - 6" Portland Cement Concrete Base (4.75 Bag Mix)
- (7) Item 301 - 6" Bituminous Aggregate Base (85-100) or AC-20
- (8) 4" Wide Item 609 Concrete Sidewalk if Required by Regional Planning Commission.
- (9) 1" Drop
- (10) 1" Profile Grade
- (11) 3/16" Per Ft. Slope
- (12) 1" Per Ft. Slope

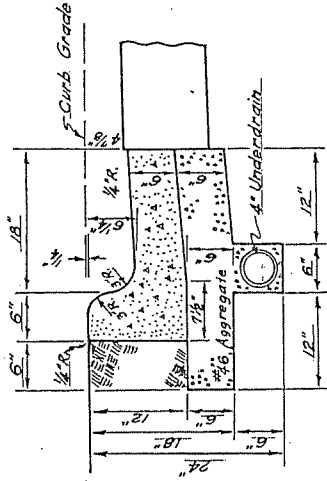
Note: When the pavement design shown on the Typical Sections is not adequate for contemplated heavier load requirements, or width is not adequate for anticipated traffic volume, the proposed street sections shall be designed in accordance and agreement with the Marrow County Engineering Department.



DETAIL MOUNTABLE CURB

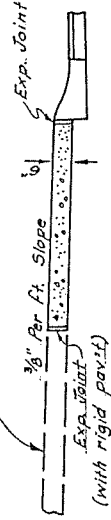


CONCRETE DRIVEWAY APPROACH
(Must be used with Mountable Curb Section)
Item 452 - 6" Plain P.C. Concrete Pavement



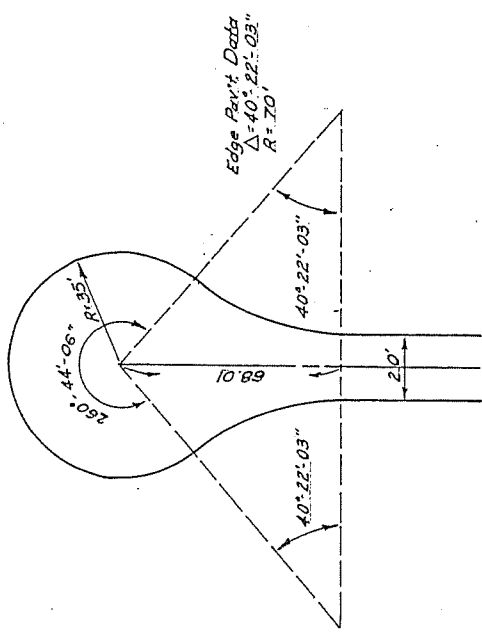
COMBINED CURB AND GUTTER
Class "C" Concrete
6 1/2 Bag Mix

Drive beyond approach may be either flexible or rigid pavement.

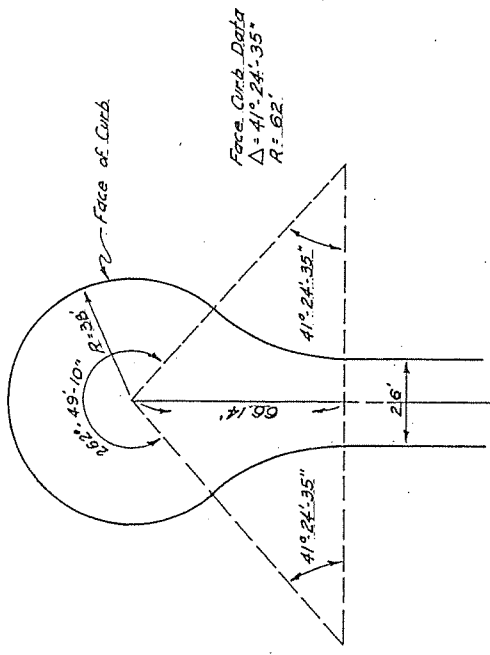


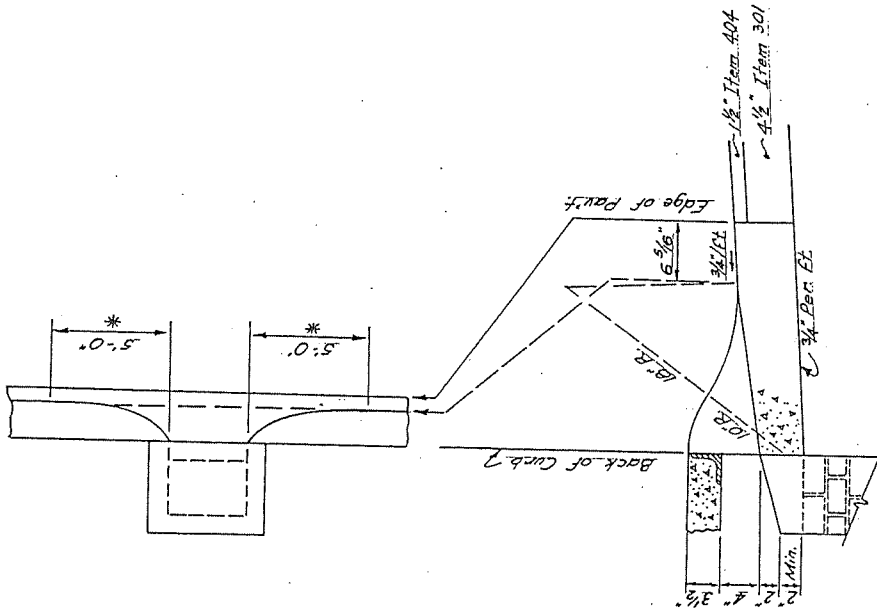
SECTION A-A

Edge Pav't Data
 $\Delta = 260^\circ 44' 06''$
 $R = 35'$



Face Curb Data
 $\Delta = 262^\circ 49' 10''$
 $R = 38'$





CURB DETAIL AT INLET
PLAN & SECTION

* Transition Curb & Gutter to Inlet Opening.

ROADS AND STREETS

ACCEPTANCE

BOARD OF MORROW COUNTY COMMISSIONERS

Don R. Staley – Chairman
Jean McClintock – Vice-Chairman
Olen D. Jackson

MORROW COUNTY PLANNING COMMISSION

Betsy Clark – Chairman
Bob Davis – Vice-Chairman

MORROW COUNTY ENGINEER

L. Randy Bush

ADOPTED: April 22, 1991 to be effective June 1, 1991

COMMISSIONER'S JOURNAL

Vol. 33 Page 139

Replacing the Regulations Adopted September 3, 1974

Commissioner's Journal Vol. 25 Page 108



L. RANDY BUSH
COUNTY ENGINEER

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