

STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION  
CITY OF MANITOWOC, WISCONSIN

SECTION 300

EARTHWORK, GRADING, AND GRAVELING

<u>Section Number</u>	<u>Title</u>
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302	MATERIALS SPECIFICATIONS
303	CLEARING AND GRUBBING
304	OPEN GRADED BASE COURSE (OGBC)
305	COMPACTION
306	EXCAVATION BELOW SUB-GRADE

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CITY ENGINEER'S APPROVAL \_\_\_\_\_

*Valerie D. Nelson, P.E.*

## SECTION 300 - EARTHWORK, GRADING, AND GRAVELING

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## 301 - GENERAL

301.1 Scope Of Work  
This section shall address work consisting of excavating, grading, graveling, and associated items as required by the Contract Documents.

The Contractor shall furnish all labor, equipment, materials, supervision, tools, supplies and incidentals, as required by the work.

301.1.1 General Work Provisions  
The Contractor shall not be permitted to Grade and Gravel between December 1 and March 31 without written approval of the City Engineer.

301.2 Associated Sections Of These Standard Specifications  
The Contractor is advised that associated work is covered in other sections of this document and he shall be familiar with all applicable standards for the work. While not all-inclusive, the Contractor is especially advised to be familiar with the sections on Erosion, Sediment Control & Stormwater Control, Landscaping & Restoration, and Traffic Control.

Except as hereinafter otherwise noted, the following sections of the D.O.T. Specifications Latest Edition are, by reference made a part of these Standard Specifications. If any conflict exists between the City of Manitowoc's Standard Specifications and the DOT sections, or between City ordinance and the DOT sections, then the City regulations shall govern.

<u>D.O.T.</u> <u>Sections</u>	<u>Titled</u>
200	Earthwork
300	Base Courses

301.3 Material Source  
The source of materials for use on this project shall be subject to the approval of the Engineer. Sources shall be made known to the Engineer on or before the pre-construction date. Use of frozen material shall not be permitted.

301.4 Haul Route  
Requirements for Haul Routes shall conform to Section 209 of these Standard Specifications.

301.5 Grading Quantities  
Bidders are hereby notified that the Unclassified Excavation quantities listed in the Bidding Documents are based on the material in the fully compacted in place state and not in the loose cubic yards hauling state.

The unclassified excavation quantity is the total volume of excavated material for all streets. The plan for each street shows the required cubic yards of cut and fill material that was computed by the method of average end area and shall be the basis of pay measurement. The unclassified excavation quantity in cubic yards has been calculated based on material in its original position (the in place volume).

- 301.6     Surplus Material  
The Owner shall have first rights to surplus excavated material. If the Owner does not desire the surplus material, all material becomes property of the Contractor. All surplus excavated material not claimed by the Owner shall be properly disposed of by the Contractor at his expense at a disposal site in accordance with Section 210 of these Standard Specifications.
- 301.7     Grading Limits  
The grading limits shall be in accordance with the typical section shown on the plans, unless directed otherwise by the Engineer.
- 301.8     Borrow Excavation  
On all streets except pre-graded and graveled, where the fill quantity is greater than the cut quantity, a bid item of Borrow Excavation has been included for the extra material required on these streets. Excavated road gravel is not an acceptable material to be used as borrow material.
- The in place volume of Borrow Excavation is computed per the average end area.
- All work and materials for Borrow Excavation shall be in accordance with Section 208 of the Standard D.O.T. Specifications, unless otherwise specified by the Engineer.
- 301.9     Typical Sections  
Typical Sections for various Right of Ways and street widths are shown in the Earthwork, Grading and Graveling Details located at the end of this section.

## **302 - MATERIALS SPECIFICATIONS**

Materials for this work shall comply with applicable specifications in Sections 200 and 300 of D.O.T. Specifications, except as noted herein.

302.1

### **Materials**

When Breaker Run is specified, it shall mean the maximum size stone shall not exceed six (6") inch in diameter and shall not contain more than 15% by weight passing a one (1") inch sieve.

## **303 - CLEARING AND GRUBBING**

### 303.1 Scope Of Work

Clearing and Grubbing shall consist of cutting and disposing of trees, brush, windfalls, logs, and other vegetation located within the clearing limits, and the removing and disposing of roots, stumps, stubs, grubs, logs, and other timber from within the grubbing limits as hereinafter defined or which interfere with excavation, embankment, marsh or waste disposal, or designated clear vision areas.

Unless otherwise specified, the limits of clearing and grubbing shall be the area within the slope easements as shown on the plans.

Clearing and grubbing shall be completed before placing of the embankment materials.

### 303.2 Disposal Of Waste Material

All cleared and grubbed materials shall become the property of the Contractor and shall be properly disposed of off-site. See Section 210 of these Standard Specifications regarding proper disposal of waste materials.

### 303.3 Protection Of Vegetation

Unless specifically designated otherwise on the plans, or by the Engineer, all trees, brush, shrubs, or other vegetation occurring within the limits defined above shall be cut off and disposed of as hereinafter provided. All stumps, roots, logs or timber and all brush, matted roots and debris not suitable for the roadway foundation within the grubbing limits shall be removed.

Trees and shrubs located beyond the clearing limits defined by a vertical plane located at the clearing limits shall not be removed unless their removal is specifically indicated by the contract. Within areas to be cleared, and where grubbing is not required, all shrubs and brush shall be cut within three (3") inches of the ground surface and all trees shall be clean cut as nearly flush with the ground surface as is reasonably possible with tools ordinarily used for such operations.

Should the Contractor cause damage to existing trees and shrubs, which are not specified to be removed, the Contractor shall follow the directions of the City and take what action is prescribed to ensure the survival of the tree. Any remedial work to damaged trees and shrubs shall be performed by the Contractor at no cost to the City.

Should the damage be such as to destroy or decrease the value of the tree or shrub, the Contractor may be liable for all costs of removing the tree or shrub in addition to a forfeiture for the replacement or decreased value as determined by the City.

Should the Contractor determine that a tree or shrub, which is not shown to be removed, encroaches in his work area requiring that it be trimmed or relocated, the Engineer shall determine how best to save the tree or shrub. The Contractor shall work with the City to minimize the impact on the tree or shrub.

Where feasible, trees shall be felled toward the center of the area to be cleared. Where trees cannot be felled without danger to traffic or injury to other trees, structures or property, they shall be cut in sections, of a size not to endanger the above, from the top down.

When so designated on the plans or directed by the Engineer, trees or shrubs located within clearing areas, which are desirable for shade or road beautification shall be preserved.

When limbs or branches of trees to be left in place overhang the roadbed and do not leave a clearance of at least fourteen (14') feet above the finished grade, such trees shall be carefully and symmetrically trimmed on their lower limbs or branches so as to provide a clearance of not less than fourteen (14') feet above finished grade. Such trimming shall be performed in accordance with directions of the City.

Unless otherwise specifically provided in the contract, all timber salvaged from the required clearing of right-of-way and easement areas shall become the property of the Contractor. If residents desire the timber and if the Contractor chooses to oblige, the Contractor shall locate timber only on private property.

303.4

Staking

Project staking shall conform to Section 203 of these Standard Specifications.

**304 - OPEN GRADED BASE COURSE (OGBC)**

When Open Graded Base Course is called for, the current WDOT Specifications shall be utilized unless otherwise specified in the Contract documents.

## **305 - COMPACTION**

### 305.1 Scope Of Work

This work shall consist of the compaction of soil and gravel for trenches; fill areas, sub grade and other areas requiring consolidation of materials.

### 305.2 Standard Proctor/ Proof Rolling

The basis for defining required compaction may be determined by laboratory tests to establish optimum compaction and moisture for the material being utilized on the project, at the Engineer's discretion. These tests shall be based on the Standard Proctor Method ASTM D698-91 T-99. If no proctor is deemed necessary by the Engineer, a proof roll will be required.

### 305.3 Moisture Content

When proctor tests are required, the moisture content of the fill material shall be within three (3%) percent of the optimum moisture content as determined by the Standard Proctor Test unless a different tolerance is specified in a soils investigation report recognized by the City Engineer. Should the material be deficient, or excessive, in moisture content the Contractor shall adjust the moisture content as required. If, due to weather conditions, the Contractor chooses to place the material with greater than optimum moisture, the fill area shall be retested by excavating test holes after it has had time to dry, and the material shall be subject to removal and replacement should it not meet compaction and moisture requirements. The Engineer shall have the right to direct the Contractor to use suitable material if conditions are such that, in the opinion of the Engineer, the material on site will not reach optimum moisture or is unsuitable for the use. No compensation will be given the Contractor for re-excavation or removal and replacement of unsuitable material. When no proctor test is required, the Contractor remains responsible for proper moisture content.

The Contractor shall have water available to increase moisture content during dry weather should it be required to meet the optimum levels as determined by the Proctor Test or by the field engineer's visual and tactile discretion.

### 305.4 Fill Placement

All fill materials shall be placed in maximum twelve (12") inch (loose depth) lifts prior to compaction.

### 305.5 Method Of Compaction

All fill shall be compacted by means of mechanical compaction, suitable for the material and moisture conditions. Jetting may be utilized only after prior consent of the Engineer. If jetting is utilized, the Contractor is responsible for all water damage or delay to the project due to moisture problems.

The roadway shall be graded and compacted to a sub-grade, as shown in the typical section for each street. Where manholes, valve boxes and other obstructions practically prevent rolling, the area shall be made solid by tamping with tampers of not less than forty (40#) pounds. Rollers shall not be used within one (1') foot on any existing curb. This area shall be tamped with tampers of not less than forty (40#) pounds.

305.5.1 Trench Section

Material shall be placed and compacted as specified above.

Minimum compaction shall be 95% of Standard Proctor for material deeper than two (2') feet below the proposed finished pavement grade. Minimum compaction for material shallower than two (2') feet below the proposed finished pavement grade shall be 100% of Standard Proctor. When no Proctor is required for a project, the Contractor remains responsible for compaction in one-foot lifts that achieve the above results.

305.5.2 Embankments

Material shall be placed and compacted as specified above.

Unless specified otherwise in the Contract Documents, the minimum compaction shall be 95% of Standard Proctor. No embankments shall be constructed without a Standard Proctor test.

305.5.3 Granular Base Course

Material shall be placed and compacted as specified above.

The minimum compaction shall be 100% of Standard Proctor.

305.6 Testing

Testing may be performed by utilization of a Nuclear Density Testing Device. When no Nuclear Density meter is utilized, a proof roll shall be utilized. Determination of testing methods shall be at the sole discretion of the Engineer.

305.7 Basis Of Payment

The cost of compacting the materials shall be included in the Contract Unit Price bid for the work causing its need, unless specifically stated otherwise in the contract documents, and shall include all labor, supervision, equipment, materials, tools, supplies, and incidentals required to place, spread, compact, moisten, or dry the material in accordance with these Standard Specifications. When specific testing and monitoring is required, it shall be included in the unit price for the work for which the test is completed unless otherwise written in the contract documents.

## **306 – EXCAVATION BELOW SUB-GRADE**

### 306.1 Excavation Below Sub-Grade

When the Engineer determines that the sub-grade is unacceptable because of a natural condition, the Engineer may elect to let the sub-grade dry for a reasonable period, or excavate to a minimum depth of (6") inches not to exceed four (4') feet below sub-grade.

### 306.2 Basis Of Payment

1) When excavation is performed below the sub-grade and before the base course has been placed, it shall be constructed and paid for as follows:

- A) Excavation shall be paid for at the unit price bid for Unclassified Excavation.
- B) 6 Inch Breaker Run, 1-1/2 Inch Graded Crushed Stone, or ¾ Inch Graded Crushed Stone, as determined by the Engineer, shall be used as backfill material. The material shall be paid for at the unit price bid if there is one, or at the unit price shown in the Schedule of Fixed Prices.

2) No base course shall be placed on wet or otherwise yielding subbase. However, when excavation must be performed below the sub-grade and after the base course has been placed, it shall be constructed and paid for as follows:

- A) The base course quantity shall be included in the unclassified excavation quantity.
- B) All base course placed shall be paid for at the unit price bid per square yard. This includes base course placed before and after excavation.
- C) 6 Inch Breaker Run or 1-1/2 Inch Graded Crushed Stone, as determined by the Engineer, shall be used as backfill material. The material shall be paid for at the unit price bid if there is one, or at the unit price shown in the Schedule of Fixed Prices.

- END OF SECTION 300 -

STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

CITY OF MANITOWOC, WISCONSIN

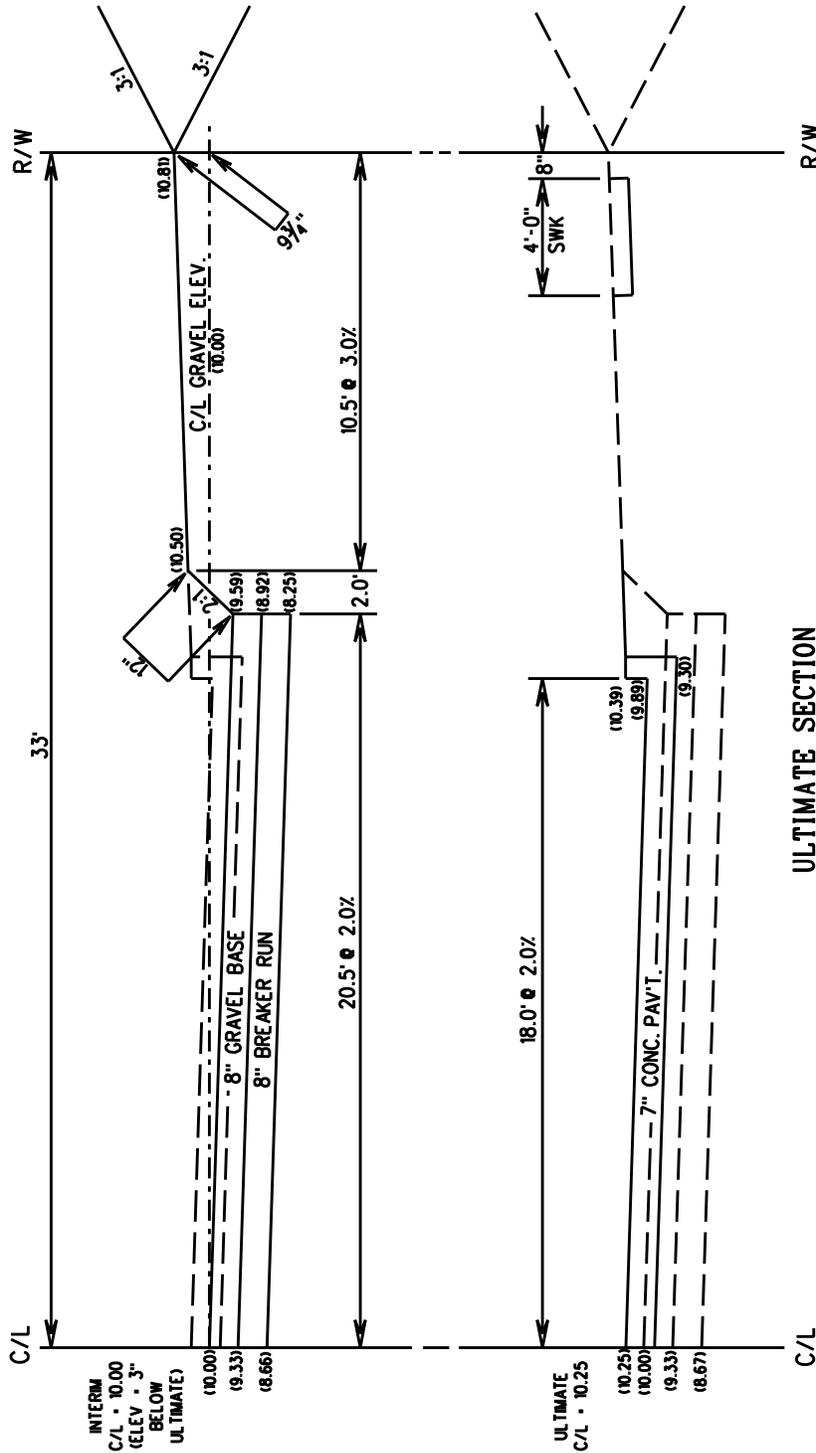
SECTION 300

EARTHWORK, GRADING, AND GRAVELING

DETAILS

<u>Detail Number</u>	<u>Title</u>
301	Typical Urban Section For 36' Curbs on 66' R.O.W.
302	Typical Urban Section For 42' Curbs on 80' R.O.W.
303	Typical Rural Section with 24' Pavement Width
304	Typical Driveway For Rural Pavement

INTERIM SECTION



Note: Street shall be graded to the Interim Section.  
 C/L of Interim Section shall be 3" below  
 final pavement grade.

NO SCALE

TYPICAL URBAN SECTION  
 FOR 36' CURBS ON 66' R.O.W.

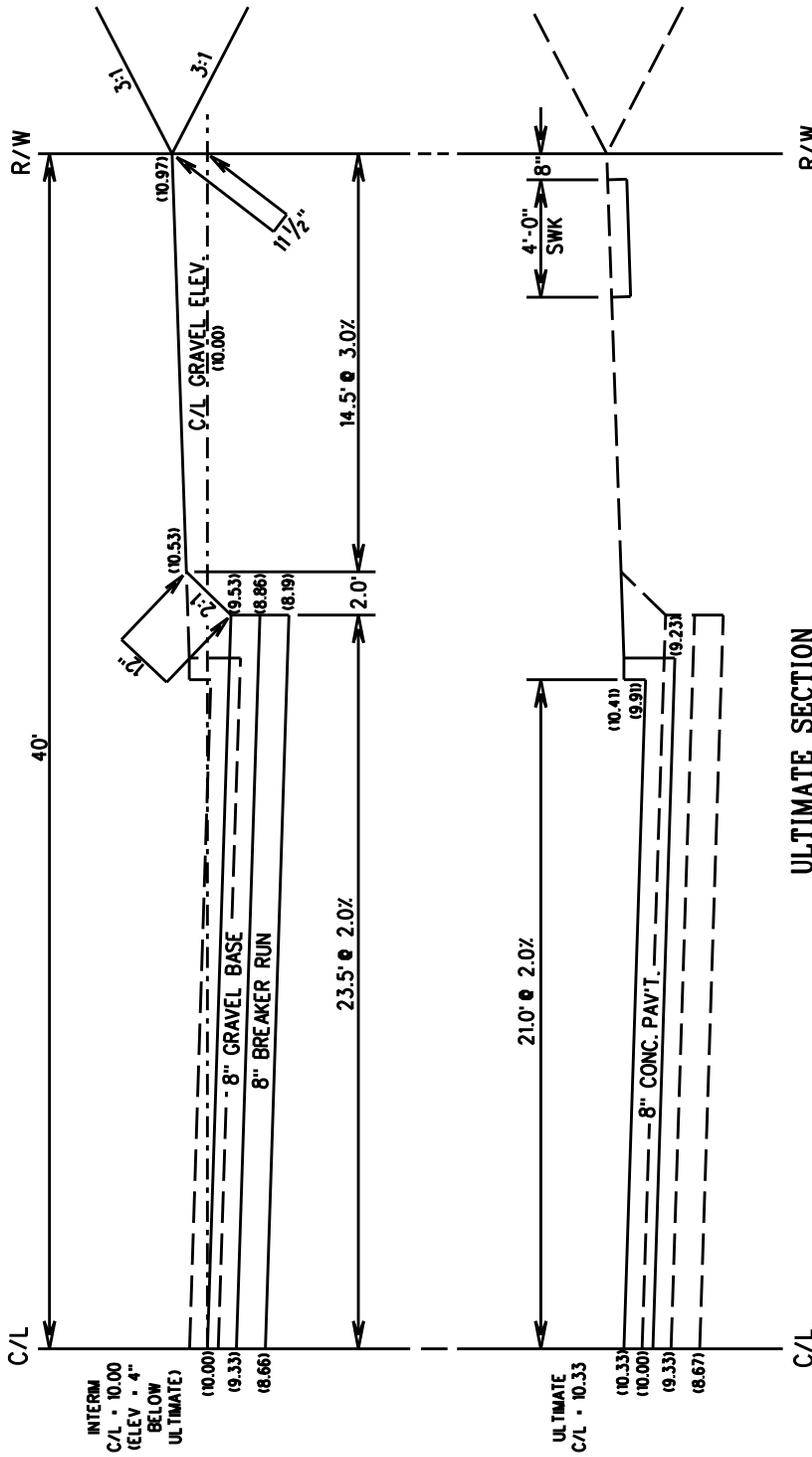


City of Manitowoc  
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Rev. Jan '08

FORM NO.  
 301

INTERIM SECTION



Note: Street shall be graded to the Interim Section.  
C/L of Interim Section shall be 4" below final pavement grade.

NO SCALE

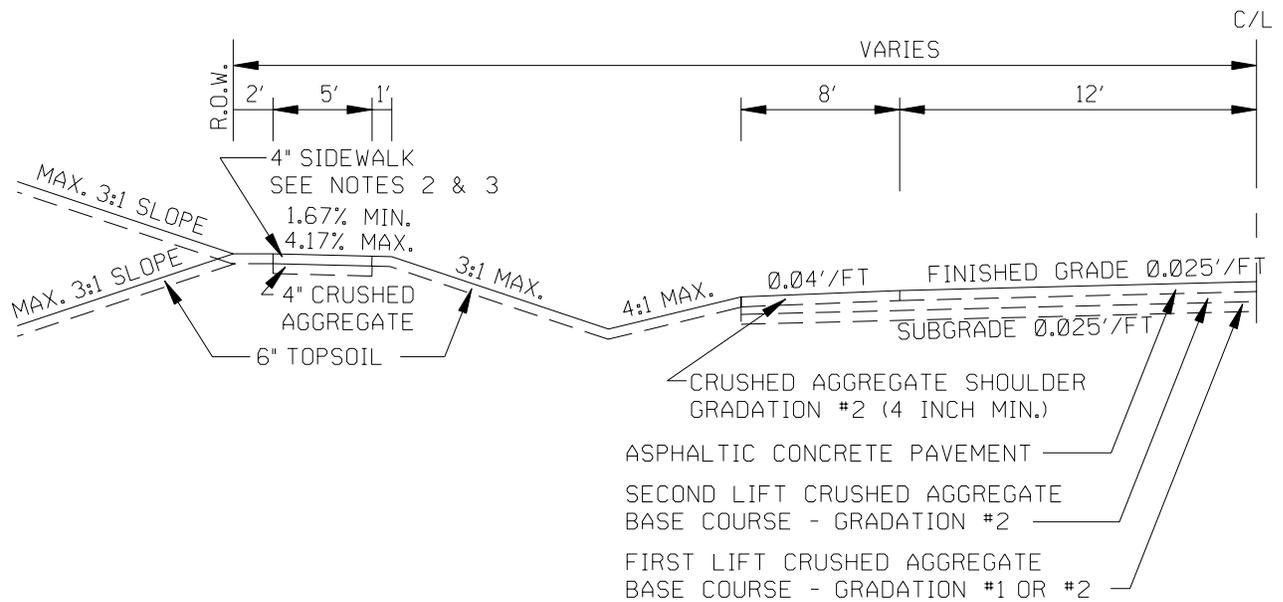
TYPICAL URBAN SECTION  
FOR 42' CURBS ON 80' R.O.W



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FORM NO.  
302



NOTES:

- 1.) THE THICKNESS OF PAVEMENT AND BASE COURSE SHALL BE AS SPECIFIED IN THE SPECIAL PROVISIONS ON CITY CONTRACTS OR AS APPROVED BY THE CITY ENGINEER ON PRIVATE DEVELOPMENT PROJECTS.
- 2.) THE STREET SIDE OF THE SIDEWALK SHALL BE AT LEAST 1 INCH BUT NOT MORE THAN 2 1/2 INCHES LOWER THAN THE SIDE AWAY FROM THE STREET.
- 3.) THE STREET SIDE OF THE SIDEWALK SHALL BE AT LEAST 1/3 INCH ABOVE THE TOP OF THE FUTURE CURB FOR EACH FOOT OF DISTANCE FROM THE BACK OF THE FUTURE CURB.

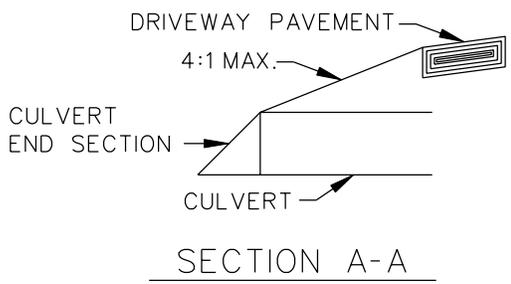
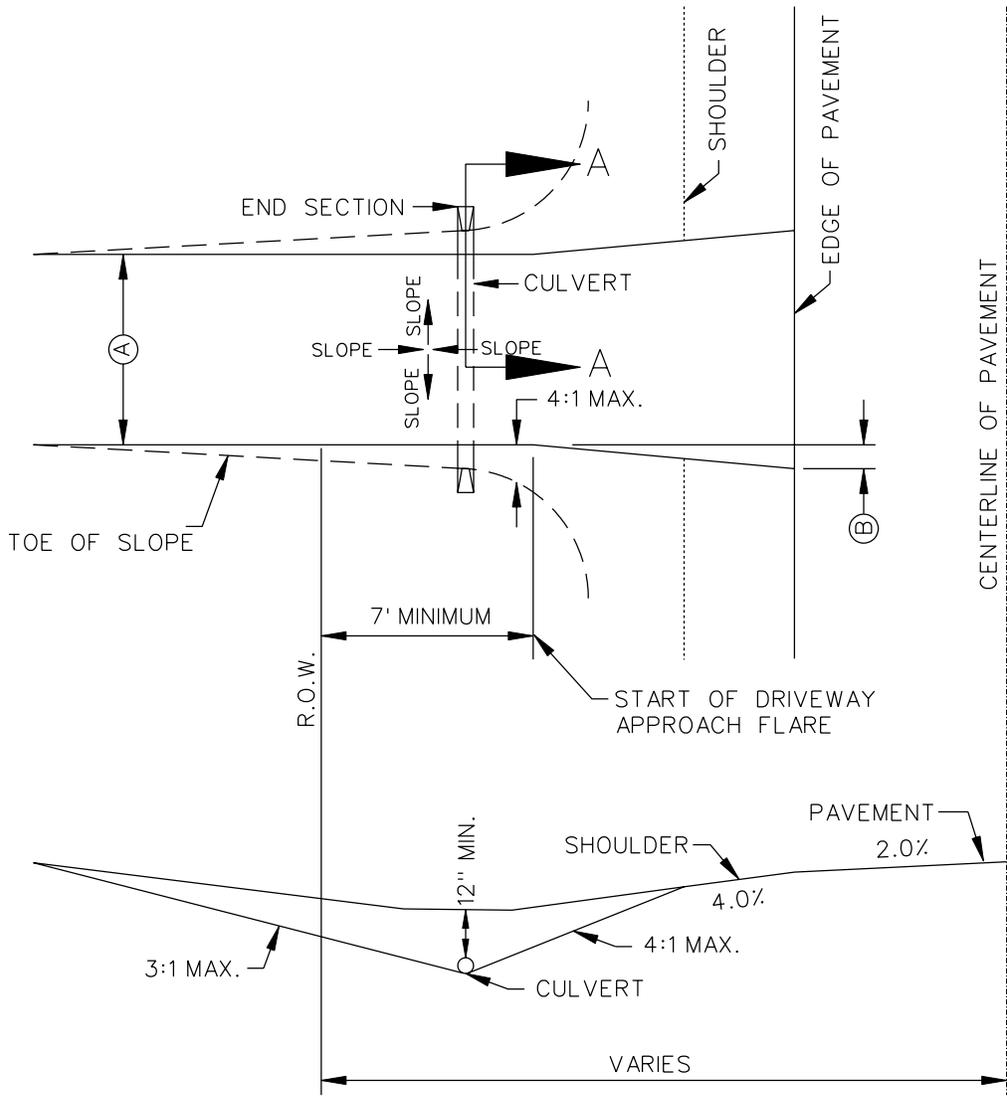
TYPICAL RURAL SECTION  
WITH 24' PAVEMENT WIDTH



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FORM NO.  
303



- Ⓐ ≤ 25' MAX. FOR RESIDENTIAL
- ≤ 35' MAX. FOR COMMERCIAL AND RESIDENTAL DUPLEXES WITH ADJOINING DRIVEWAYS
- Ⓑ ≤ 3' FOR RESIDENTIAL PROPERTY
- ≤ 5' FOR COMMERCIAL PROPERTY

NO SCALE

# TYPICAL DRIVEWAY FOR RURAL PAVEMENT



Rev. 4/05

FORM NO. 304