



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION**

ROADWAY DESIGN GUIDELINES

AUGUST 2008

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08



Department of Transportation; August 15, 2008;
PAN 401252; 364 copies. This public document
was promulgated at a cost of \$ 13.00 per copy.

FOREWORD

These guidelines establish uniform policies and procedures for roadway design activities within the Tennessee Department of Transportation. The guidelines do not establish any legal or administration interpretations of the Department's contracts. In the event that the terms of a contract and this guide are in conflict, this guide is subordinate to the contract.

Utilization of these guidelines will ensure more uniformity in the design of roadway plans by the Design Division. These guidelines are not intended to provide an explanation to every design problem encountered by design personnel. The guidelines should not be a substitute for good engineering knowledge, experience, or sound judgment.

As permitted under 23 CFR 625.3 (e), the roadway design policies and procedures herein do not apply for traffic engineering, spot improvements, road safety audit review (RSAR) projects, and safety projects such as signing, marking, signalization, roadway lighting and traffic barriers which include very minor or no roadway work. This will permit implementation of projects addressing safety and operational concerns in a timely manner without requiring design exceptions for those elements of the roadway that are beyond the scope of purpose and funding for these types of projects.

The Roadway Design Guidelines have been prepared for guidance in the preparation of roadway plans and estimates.

All design personnel should make every effort to become familiar with the new Guidelines and the format within which they were developed. An explanation of the format of the Guidelines and the manner in which they will be updated is explained on the next page.

These guidelines will be in a state of constant evaluation for any revisions, additions, and deletions to keep Roadway Design personnel current with improved design procedures.

The existing Metric Roadway Design Guidelines, General Notes, and Standard Drawings will no longer be updated, revised, or distributed in hard copy or posted on TDOT web site. Designers needing access to metric documents should contact the Design Division, Standards and Quality Assurance Section to obtain guidance for preparing metric plans.

FORMAT OF ROADWAY DESIGN GUIDELINES

The Roadway Design Guidelines have been categorized by the tasks that occur for the development of roadway plans. This is as follows:

- I. General Roadway Information
- II. Preliminary Plans Information
- III. Right-of-Way Plans Information
- IV. Construction Plans Information
- V. List of Current Standard Drawings Revision Dates
- VI. General Notes and Special Notes
- VII. Index
- VIII. Instructional Bulletins

The Roadway Design Guidelines are categorized by the particular design functions that must take place in the process of plans development. A typical set of roadway plans would first have the Preliminary Plans developed, next the Right-of-Way Plans, and finally the Construction Plans. An item will be listed where it first might occur during plans development. Later references will refer back to that previous listing. On rare occurrences an item might be forward referenced.

The Roadway Design Guidelines will be updated on an as needed basis. Directions to designers throughout the year will be in the form of "Instructional Bulletins".

Instructional Bulletins will be issued as the need arises throughout the year. They will have a number that designates the year and the sequence of bulletins for that year (for example 08-01). The practice or principle is to remain in effect for an extended period of time then the bulletin will contain the necessary pages to insert into the guidelines. If the instructions are no longer needed then the bulletin will be voided.

With this approach to updates, the designers shall be able to learn about where the guidelines are contained, and be able to find a particular item more easily.

TABLE OF CONTENTS

		SECTION NO.
SECTION I.	GENERAL	
CHAPTER	1. PROJECT RECORDS.....	1-100.00
	2. DESIGN PROCEDURES	1-200.00
SECTION II.	PRELIMINARY PLANS	
CHAPTER	1. DESIGN GUIDELINES	2-100.00
	2. DRAINAGE	2-200.00
	3. RIGHT-OF-WAY	2-300.00
SECTION III.	RIGHT-OF-WAY PLANS	
CHAPTER	1. GENERAL GUIDELINES.....	3-100.00
	2. DRAINAGE	3-200.00
	3. PLANS DEVELOPMENT AND CALCULATIONS.....	3-300.00
	4. PLANS SUBMITTALS	3-400.00
SECTION IV.	CONSTRUCTION PLANS	
CHAPTER	1. GENERAL PROVISIONS.....	4-100.00
	2. EARTHWORK	4-200.00
	3. BASES AND SUBGRADE TREATMENT	4-300.00
	4. FLEXIBLE SURFACES	4-400.00
	5. RIGID PAVEMENT	4-500.00
	6. STRUCTURES	4-600.00
	7. INCIDENTAL CONSTRUCTION.....	4-700.00
	8. ROADSIDE DEVELOPMENT	4-800.00
	9. MATERIALS	4-900.00
SECTION V.	LIST OF CURRENT STANDARD DRAWINGS REVISION DATES	
CHAPTER	1. STANDARD ROADWAY DRAWINGS.....	5-100.00
	2. STANDARD STRUCTURE DRAWINGS	5-200.00
SECTION VI.	GENERAL NOTES AND SPECIAL NOTES	
CHAPTER	1. GENERAL NOTES	6-100.00
	2. SPECIAL NOTES	6-200.00
SECTION VII.	INDEX	
SECTION VIII.	INSTRUCTIONAL BULLETINS	

LIST OF FIGURES

	SECTION NO.
SECTION I. GENERAL	
SECTION II. PRELIMINARY PLANS	
FIGURE 2-1a TITLE SHEET IDENTIFICATION FORMAT FOR CONSULTANT DESIGNED RIGHT-OF-WAY	2-115.00
FIGURE 2-1b TITLE SHEET IDENTIFICATION FORMAT FOR TDOT DESIGNED RIGHT-OF-WAY	2-115.00
FIGURE 2-2 TITLE SHEET SPECIAL NOTES FORMAT	2-115.01
FIGURE 2-3 EQUATION BLOCK FORMAT	2-115.05
FIGURE 2-4 TRAFFIC BLOCK FORMAT	2-115.15
FIGURE 2-5a TYPICAL TITLE SHEET PROJECT DESCRIPTION.....	2-115.20
FIGURE 2-5b TYPICAL TITLE SHEET PROJECT DESCRIPTION.....	2-115.20
FIGURE 2-6 REQUEST FOR TRAFFIC DATA FORM.....	2-120.00
FIGURE 2-7 GRADING QUANTITIES SHEET IDENTIFICATION FORMAT.....	2-145.07
FIGURE 2-8 CRITICAL LENGTHS OF GRADE FOR DESIGN, ASSUMED TYPICAL HEAVY TRUCK OF 200 LB/HP (120 KG/KW), ENTERING SPEED = 70 MPH (110 KM/H)	2-150.00
FIGURE 2-9 CHANNEL CHANGES.....	2-155.05
FIGURE 2-10 MINIMUM LENGTH (X) THROUGH LANE EXTENSIONS.....	2-160.00
FIGURE 2-11 TURNING LANE TERMINOLOGY	2-170.00
FIGURE 2-12 LEFT-TURN LANE ALIGNMENT	2-170.00
FIGURE 2-13 WARRANT FOR LEFT-TURN STORAGE LANES ON FOUR-LANE HIGHWAYS.....	2-170.00
FIGURE 2-14a WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 40 MPH, PERCENTAGE OF LEFTS, L = 5%.....	2-170.00
FIGURE 2-14b WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 40 MPH, PERCENTAGE OF LEFTS, L = 10%.....	2-170.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

FIGURE 2-14c	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 40 MPH, PERCENTAGE OF LEFTS, L = 15%.....2-170.00
FIGURE 2-14d	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 40 MPH, PERCENTAGE OF LEFTS, L = 20%.....2-170.00
FIGURE 2-14e	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 40 MPH, PERCENTAGE OF LEFTS, L = 30%.....2-170.00
FIGURE 2-14f	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 40 MPH, PERCENTAGE OF LEFTS, L = 40%.....2-170.00
FIGURE 2-15a	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 50 MPH, PERCENTAGE OF LEFTS, L = 5%.....2-170.00
FIGURE 2-15b	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 50 MPH, PERCENTAGE OF LEFTS, L = 10%.....2-170.00
FIGURE 2-15c	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 50 MPH, PERCENTAGE OF LEFTS, L = 15%.....2-170.00
FIGURE 2-15d	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 50 MPH, PERCENTAGE OF LEFTS, L = 20%.....2-170.00
FIGURE 2-15e	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 50 MPH, PERCENTAGE OF LEFTS, L = 30%.....2-170.00
FIGURE 2-15f	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 50 MPH, PERCENTAGE OF LEFTS, L = 40%.....2-170.00
FIGURE 2-16a	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 60 MPH, PERCENTAGE OF LEFTS, L = 5%.....2-170.00
FIGURE 2-16b	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 60 MPH, PERCENTAGE OF LEFTS, L = 10%.....2-170.00
FIGURE 2-16c	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 60 MPH, PERCENTAGE OF LEFTS, L = 15%.....2-170.00
FIGURE 2-16d	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 60 MPH, PERCENTAGE OF LEFTS, L = 20%.....2-170.00
FIGURE 2-16e	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 60 MPH, PERCENTAGE OF LEFTS, L = 30%.....2-170.00
FIGURE 2-16f	WARRANT FOR LEFT-TURN STORAGE LANES ON TWO-LANE HIGHWAYS, SPEED 60 MPH, PERCENTAGE OF LEFTS, L = 40%.....2-170.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

FIGURE 2-17	FLOW CHART FOR DETERMINING AND PROPOSING A RETAINING WALL	2-175.00
FIGURE 2-18	RURAL TYPE PROJECTS TYPICAL DRIVEWAY NOTATION	2-300.05
FIGURE 2-19	URBAN TYPE PROJECTS TYPICAL DRIVEWAY NOTATION	2-300.05
FIGURE 2-20	TYPICAL SECTION PRIVATE DRIVE TO BUSINESS, FIELD, OR RESIDENTIAL PROPERTY	2-300.05
FIGURE 2-21	TYPICAL R.O.W. ACQUISITION TABLE	2-320.05
FIGURE 2-22	GUIDE FOR SHOWING VARIOUS EASEMENTS IN PLANS.....	2-320.05
SECTION III. RIGHT-OF-WAY PLANS		
FIGURE 3-1	DESIGN EXCEPTION AND JUSTIFICATION FORM.....	3-110.02
FIGURE 3-2	REQUEST FOR SOILS SURVEY FORM.....	3-110.05
FIGURE 3-3	REQUEST FOR PAVEMENT DESIGN FORM	3-125.00
FIGURE 3-4	RIGHT-OF-WAY FUNDING APPROVAL REQUEST TRANSMITTAL LETTER EXAMPLE.....	3-400.20
FIGURE 3-5	RIGHT-OF-WAY "APPRAISALS AND ACQUISITION" TRANSMITTAL LETTER EXAMPLE.....	3-400.25
FIGURE 3-6	PERMITTING PROCESS FLOW CHART	3-410.00
FIGURE 3-7	EXAMPLE PERMIT ASSESSMENT.....	3-410.00
FIGURE 3-8	EXAMPLE VICINITY MAP	3-410.00
FIGURE 3-9	EXAMPLE TABLE OF IMPACTS.....	3-410.00
FIGURE 3-10	EXAMPLE LOCATION MAP	3-410.00
FIGURE 3-11	EXAMPLE CHANNEL CHANGE PERMIT SKETCHES.....	3-410.00
FIGURE 3-12	EXAMPLE PERMIT SKETCHES FOR CULVERTS LONGER THAN 200 FEET	3-410.00
FIGURE 3-13	EXAMPLE PERMIT SKETCHES FOR WETLAND IMPACTS	3-410.00
FIGURE 3-14	EXAMPLE APPROVED APPLICATION FOR PERMITS NOTIFICATION EMAIL	3-410.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

SECTION IV. CONSTRUCTION PLANS

FIGURE 4-1a	TITLE SHEET IDENTIFICATION FORMAT FOR CONSULTANT DESIGNED CONSTRUCTION	4-115.00
FIGURE 4-1b	TITLE SHEET IDENTIFICATION FORMAT FOR TDOT DESIGNED CONSTRUCTION	4-115.00
FIGURE 4-2	TYPICAL INDEX OF SHEETS.....	4-133.00
FIGURE 4-3	EXAMPLE OF GENERAL NOTES AND SPECIAL NOTES SHEET....	4-135.05
FIGURE 4-4	TYPICAL UTILITIES INDEX	4-137.00
FIGURE 4-5	TYPICAL FORMAT FOR UTILITY OWNER INFORMATION	4-137.00
FIGURE 4-6	UPPER RIGHT HAND CORNER BOX.....	4-137.00
FIGURE 4-7	EXAMPLE CONSTRUCTION PLANS TRANSMITTAL LETTER	4-140.00
FIGURE 4-8	ESTIMATE REVISION FORM	4-140.02
FIGURE 4-9	CONSTRUCTION QUANTITIES ESTIMATE DATA FILE TEMPLATE ...	4-140.05
FIGURE 4-10	REMOVAL OF BUILDINGS AND OBSTRUCTIONS DESCRIPTION BLOCK	4-202.10
FIGURE 4-11	EXAMPLE OF ESTIMATED QUANTITIES FOR ROADWAY APPROACHES BLOCK	4-203.25
FIGURE 4-12a	ESTIMATED GRADING QUANTITIES BLOCK (MATERIALS COMPOSITION KNOWN).....	4-203.55
FIGURE 4-12b	ESTIMATED GRADING QUANTITIES BLOCK (MATERIALS COMPOSITION UNKNOWN)	4-203.55
FIGURE 4-13	QUANTITIES OF CHANNEL EXCAVATION FOR SLAB TYPE AND BOX CULVERTS AND BRIDGES.....	4-204.05
FIGURE 4-14	POTENTIAL GUARDRAIL ENCROACHMENT.....	4-604.20
FIGURE 4-15	BOX BRIDGE OR CULVERT ELEVATION DETAILS.....	4-604.20
FIGURE 4-16	TYPICAL CROSS-SECTION INFORMATION FOR BOX AND SLAB TYPE CULVERTS AND BRIDGES	4-604.20
FIGURE 4-17	TYPICAL CONCRETE BOX OR SLAB TYPE CULVERT OR BRIDGE MODIFICATION	4-604.20
FIGURE 4-18	TYPICAL LIMITS OF CROWN VETCH	4-801.07

LIST OF TABLES

	SECTION NO.
SECTION I. GENERAL	
SECTION II. PRELIMINARY PLANS	
TABLE 2-1 GUIDELINES FOR ADVANCE PLACEMENT OF WARNING SIGNS	2-160.00
TABLE 2-2 APPROXIMATE TOTAL LENGTHS NEEDED FOR DECELERATION TO A STOP FROM DESIGN SPEED.....	2-170.00
TABLE 2-3 FUTURE TRAFFIC SIGNAL WARRANTS.....	2-170.00
TABLE 2-4 STORAGE LENGTH TO BE ADDED TO CHART VALUES OF LEFT-TURN LANE STORAGE LENGTHS	2-170.00
SECTION III. RIGHT-OF-WAY PLANS	
TABLE 3-1 COUNTY SOIL GROUPINGS	3-125.05
TABLE 3-2 PAVEMENT DESIGN NUMBER	3-125.05
TABLE 3-3 PAVEMENT DESIGN	3-125.05
TABLE 3-4 TYPICAL GRADE AND DRAIN PROJECT TIMELINE INCLUDING PERMIT ACTIVITIES.....	3-410.00
TABLE 3-5 TYPICAL BRIDGE AND APPROACH PROJECT TIMELINE INCLUDING PERMIT ACTIVITIES.....	3-410.00
TABLE 3-6 TYPICAL PLAN DISTRIBUTION.....	3-410.00
SECTION IV. CONSTRUCTION PLANS	
TABLE 4-1 ADJUSTMENT FACTOR FOR ESTIMATING ADDITIONAL REINFORCING STEEL QUANTITIES IN THE VERTICAL WALLS OF CONCRETE BOX OR SLAB TYPE CULVERTS OR BRIDGES.....	4-604.20
TABLE 4-2a, TABLE 4-2b, and TABLE 4-2c.....	VOIDED
TABLE 4-3 PERMANENT PAVEMENT MARKINGS, RAISED PAVEMENT MARKERS, RUMBLE STRIP AND RUMBLE STRIPE GUIDELINES.....	4-716.15

SECTION I - GENERAL

CHAPTER 1 - PROJECT RECORDS

- 1-100.00 PROJECT FOLDER
- 1-103.00 LETTING TO CONTRACT - DESIGN RECORDS
- 1-105.00 ROADWAY DESIGN CHECKLIST
- 1-110.00 PROJECT ACTIVITY STATUS SHEET
- 1-120.00 FIELD REVIEW PROCEDURES
- 1-130.00 INSTRUCTIONS REGARDING PUBLIC HEARING AND PUBLIC MEETING REQUIREMENTS

CHAPTER 2 - DESIGN PROCEDURES

- 1-200.00 ROADWAY DESIGN STANDARDS AND GUIDELINES
- 1-200.05 LOW VOLUME (ADT \leq 400) LOCAL ROAD
- 1-200.10 RESURFACING PROJECTS
- 1-200.25 ROAD SAFETY AUDIT REVIEW (RSAR) PROJECTS
- 1-200.30 PROJECTS OF LIMITED SCOPE
- 1-200.35 LOCAL PROGRAM
- 1-205.15 COORDINATE VALUES
- 1-205.20 DIMENSIONS AND DIRECTIONS ON PLANS
- 1-206.10 TRACT NUMBERS ON PLANS
- 1-210.00 GRADE SEPARATED RAILROAD CROSSINGS
- 1-210.05 AT-GRADE RAILROAD CROSSINGS
- 1-210.10 RAILROAD RIGHT-OF-WAY ENCROACHMENT - PARALLEL CONSTRUCTION
- 1-215.00 KNOWN ENVIRONMENTAL CONSTRAINTS
- 1-220.00 PLANS REVISION DISTRIBUTION SCHEDULE

SECTION I - GENERAL

CHAPTER 1 - PROJECT RECORDS

1-100.00 PROJECT FOLDER (See 2-100.00)

Design Project records consist of a Transportation Planning Report (TPR), survey notes, traffic data, geological reports, correspondence, and daily verbal communications relating to the production of project plans, and all other pertinent information regarding design development.

Each designer will be required to maintain an up-to-date project folder for each project.

Project design folder records will be labeled on the tab as follows:

County: _____ Route No.: _____

Project Description: _____

PIN: _____

A copy of all correspondence, in chronological order by dates will be kept in the folder.

1-103.00 LETTING TO CONTRACT - DESIGN RECORDS

Assemble the following design records for the finalized project, which are to be maintained by the designer or design firm.

1. Final grade computations
2. Final grading quantity computations
3. Final right-of-way computations
4. Final hydraulic computations
5. Final roadway quantity computations

The file containing the items mentioned above will be combined with any office correspondence file on the project, to become a complete "Design Records" file and a part of the legal documents substantiating the final Construction Plans.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

1-105.00 ROADWAY DESIGN CHECKLIST (See 2-105.00, 3-100.00 and 4-105.00)

In order to reduce plan revisions, errors, and standardize the preparation, format and content of plans, the following Roadway Design Checklist shall be used by all Designers, Consultants, Managers, Supervisors and personnel checking plans. This form shall be used on all projects.

The procedure for use of the form is as follows:

1. Download the latest Roadway Design Checklist in Word format from TDOT website.
2. Fill in the heading information on each sheet.
3. The designer or project supervisor will check off each blank when sure that each item is completed on the plans. NA (not applicable) may be used if an item is not required in a project.
4. Before submitting plans for a field review, the checklist shall be completed down to that particular stage of plans development.

1-110.00 PROJECT ACTIVITY STATUS SHEET (See 2-110.00 and 4-110.00)

Designers on all projects shall use the Project Activity Status Sheet that follows. This list is intended to help reduce plan errors. An up-to-date copy of this status sheet shall be kept in the project folder at all times.

This sheet shall be handled as follows:

1. Download the latest Project Activity Status Sheet in Word format from TDOT website.
2. Fill in heading information.
3. Each item is listed in the order in which it shall be accomplished and completion dates filled in as the activities are completed.
4. The heavy printed items are those normally shown in the "A&E" schedules and those dates shall be filled in under the "original" column by the TDOT supervisor and/or manager.
5. The other items shall have dates filled in by the designer and his supervisor under the "original" column, which fit within the "A&E", schedule dates.
6. If schedule problems develop so that the "A&E" dates cannot be met, the Program Development and Scheduling Office shall be notified and the new dates entered on this "Status Sheet" under the revisions column.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

7. The TDOT managers and/or supervisors will be responsible for keeping this "Status Sheet" up to date and furnishing an updated copy of this form to each TDOT or Consultant Designer for their information.

1-120.00 FIELD REVIEW PROCEDURES (See 2-330.00, 3-140.00 and 4-145.00)

All personnel who make arrangements and conduct field reviews shall follow these guidelines as follows:

1. All field reviews shall be scheduled and prints distributed **a minimum of three weeks** prior to the scheduled date of the field review. The beginning of the three weeks will start on the date the plans are either mailed or distributed from the Design Division. Field reviews scheduled in the region design offices should allow an additional two or three days for the prints to reach the headquarters offices.
2. The plans, when distributed, shall be complete through the appropriate stage of development in accordance to the Roadway Design Checklist.
3. Specialty support Design Division personnel shall be included on all Preliminary, Right-of-Way, Construction and Value Engineering Field Reviews.
 - A. On all notices of Preliminary, Right-of-Way and Construction Field Reviews, include the Pavement Design Section with one set of half-size prints of the plans.
 - B. On all notices of Construction Field Review, include the Design Traffic Engineering Section with one set of half-size prints of the plans. On Preliminary and Right-of-Way Field Reviews include the Design Traffic Engineering Section only on projects that include traffic signals and/or roadway lighting. (See sections 2-315.00 and 2-315.05 of Design Guidelines.)
4. Plans for Construction Field Reviews that involve a bridge shall include preliminary bridge layout drawings.
5. A complete field review report shall be distributed **within two weeks** of the review.
6. The Right-of-Way Field Review report shall include:
 - A. Comment to Structures if the horizontal and vertical geometry is adequate to continue bridge design.
 - B. The number of sets of final right-of-way distribution prints requested by the Regional Right-of-Way Office.
 - C. All changes requested shall be included in the plans when submitted for right-of-way or construction authorization.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

7. Send the Federal Highway Administration (FHWA) a Field Review Notice for all new and reconstruction projects on the Interstate System and all Demonstration Projects. Reviews for all new and reconstruction projects on the Interstate System and all Demonstration Projects shall be scheduled in coordination with FHWA. Appropriate project plans will be forwarded to FHWA for review. FHWA is not requiring Field Review Notices for any other Federal-Aid projects.
8. Do not send the FHWA a Field Review Report for projects, which were not attended by a representative of the FHWA.
9. Do not send to the Headquarters' Right-of-Way or Utilities Office Construction Field Review prints.

1-130.00 INSTRUCTIONS REGARDING PUBLIC HEARING AND PUBLIC MEETING REQUIREMENTS

In order to meet all legal requirements for advertising public hearings or public meetings, the Community Relations Division requests that all information pertaining to public hearings be received 45 days prior to the hearing and all information pertaining to public meetings 20 to 25 days prior to the meeting.

The manager requesting the hearing will be required to submit a cover letter, hearing notice, and location map. The cover letter and notice shall include the date of the hearing or meeting, the place the hearing or meeting is to be held, the project number, the description of the project, and the county in which the project is located. The cover letter shall additionally include the telephone number and address of the contact person. No action can be taken by the Community Relations Office to advertise the hearing or meeting if any of this information is not included in the notice and on the cover letter. Examples of the cover letter, hearing notice, and location map are attached.

The Tennessee Press requires that all advertisements be sent to their office in electronic format. Therefore, the Community Relations Office will need an e-mail of the notice as well as the location map for each project.

The Community Relations Office has requested that the location map be submitted as a Microsoft Word document. TDOT designers and managers may obtain information for converting Microstation drawings into Microsoft Word at:

http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/v8/locationmaps.pdf

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08



STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION NASHVILLE, TENNESSEE 37243-1402

MEMORANDUM

To: Ms. Judy B. Steele, Director, Community Relations Division

FROM: Michael Agnew, Assistant Director, Design Division

DATE: May 19, 2006

SUBJECT: REQUEST FOR ADVERTISEMENT OF A DESIGN MEETING
Project No. IM-81-1(102)7, 32001-1124-44, PIN 101203.00
I-81, Interchange @ State Route 32 (US 25E) Exit 8
Hamblen and Jefferson Counties

We are requesting you to advertise this project for a design meeting as described in the attached document.

I have arranged with Ms. Janice Brown, principal of North Middle School, at (865-986-9944, ext. 302) to have the school cafeteria available at 421 Hickory Creek Road, Morristown, TN 37771, from 4:30 p.m. to 8:00 p.m. for a 5:00 p.m. to 7:30 p.m. design meeting on Wednesday, December 15, 2004.

A copy of the project location map is attached for your use.

MA/AR/et
Attachment

cc: Jeff C. Jones
Amanda K. Tidwell
Derrick Tibbs
(Regional Design Manager)
(Regional ROW Manager)
File

**Figure 1-1
Example Cover Letter**

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

NOTICE OF HIGHWAY DESIGN MEETING

The Tennessee Department of Transportation (TDOT), an equal opportunity affirmative action employer, will conduct a Highway Design Meeting on the 28th day of February 2006 in the gymnasium of Witt Elementary School, 4650 S Davy Crockett Parkway, Morristown, TN 37814, to discuss project number IM-81-1(102)7, I-81 Interchange (Exit 8) at SR-32 (US-25E) in Hamblen County as shown on the general location map.

The project proposes to modify the I-81/SR-32 interchange and reconstruct SR-32 (US 25E) with five 12' travel lanes and two 12' shoulders within project limits. Out of the five lanes on SR-32, one will be the north bound third lane. The existing west bound I-81 on ramp will be replaced by a new free flow ramp at the northwest quadrant of the interchange. Northbound to westbound traffic from SR-32 to I-81 will also be routed through this new ramp. The existing east bound on and off ramps of I-81 will be realigned. Existing dual bridges on SR-32 will be replaced by a single bridge. Additional right-of-way and easements will be required along SR-32 and I-81.

This meeting will be held from 5:00 - 7:00 p.m. during which time there will be a presentation followed by a question and answer session. The public is invited to ask questions and make comments during the meeting. Representatives of TDOT will be present to answer questions on any aspect of the project.

Plans are available for public inspection at the offices of:

Mr. Paul Beebe
7345 Region Lane
Knoxville, TN 37914
Phone: (865) 594-2442

or

Mr. Ataur Rahman
1300 James K. Polk Bldg.
Nashville, TN 37243-0348
Phone: (615) 741-7958

Persons with a disability, who require aids or services to participate at the meeting, may contact Ms. Margaret Mahler at the following address:

Ms. Margaret Mahler
ADA / Safety Coordinator
Tennessee Department of Transportation
Suite 400, James K. Polk Building
505 Deaderick Street
Nashville, Tennessee 37243

or by e-mail:

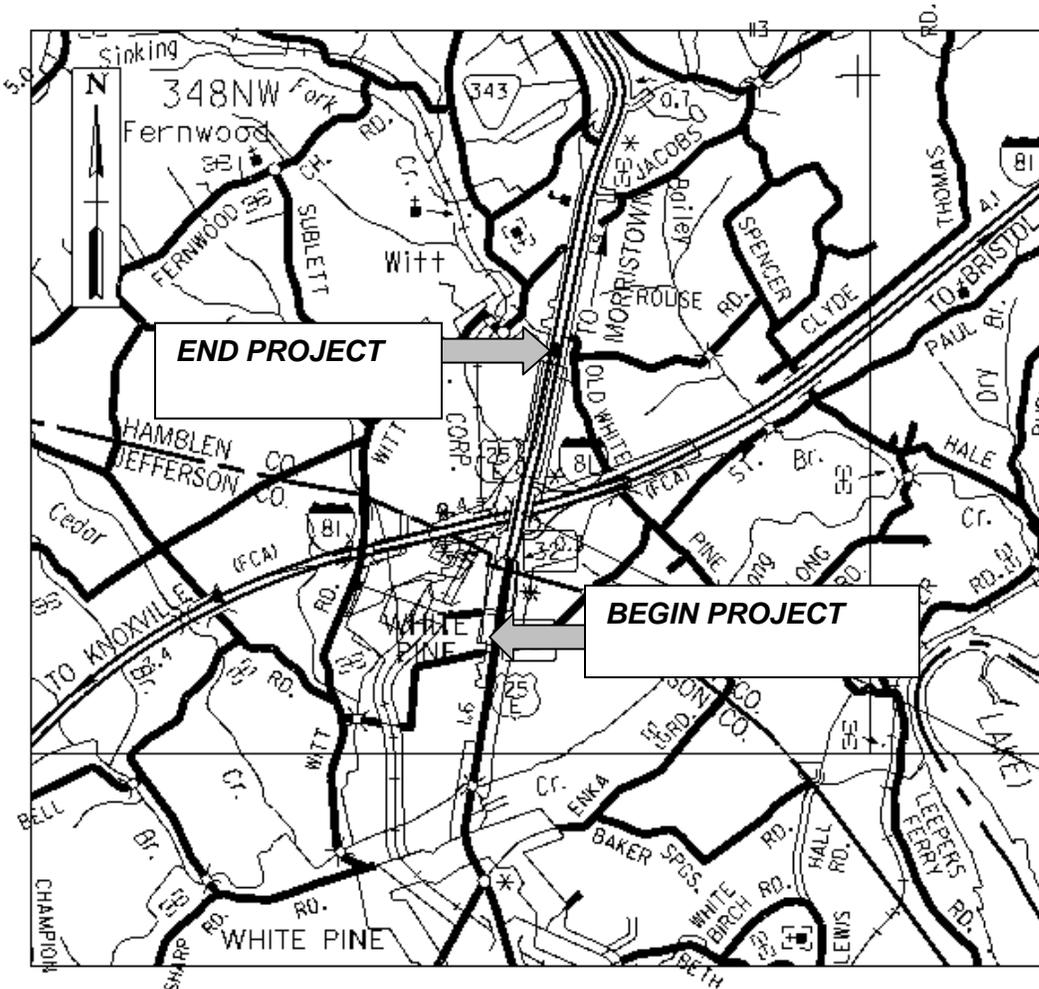
Margaret.Z.Mahler@state.tn.us
Phone (615) 741-3461
Fax (615) 253-1477
TTY Relay (877) 831-0298

A court reporter will be available to receive oral statements to be included in the project transcript. In addition, comment sheets are available for those who prefer to make written statements. Written statements and other exhibits to be included in the project transcript may be submitted within ten (10) days after the meeting date to the following address:

Project Comments
Tennessee Department of Transportation
Suite 700, James K. Polk Building
505 Deaderick Street
Nashville, Tennessee 37243-0332

Figure 1-2 Example Hearing Notice

HAMBLEN & JEFFERSON COUNTIES PROJECT NO. IM-81-1(102)7



**I-81, INTERCHANGE @ STATE ROUTE 32
(U.S. 25E) EXIT 8**

GENERAL LOCATION MAP

Figure 1-3
Example Hearing Notice

CHAPTER 2 - DESIGN PROCEDURES

1-200.00 ROADWAY DESIGN STANDARDS AND GUIDELINES

A list of documents used to design roadways in Tennessee can be found as part of TDOT Department Policy. This policy indicates the current recognized design standards for new construction or reconstruction of existing highways and should be utilized while giving due regard to topography, natural conditions, availability of road material, and prevailing traffic conditions.

1-200.05 LOW VOLUME (ADT ≤ 400) LOCAL ROAD

Standard drawing RD01-TS-1A should be used for the design of low-volume (current ADT ≤ 400) roadways classified as local roads. For additional guidance not covered on the standard drawing, designers should reference AASHTO "Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400)," 2001. For projects with design speeds greater than 40 mph, designers shall continue using standard drawing RD01-TS-1. Any exception to the use of standard drawing RD01-TS-1A on low volume local roads should be approved by the Design Division Director or the appropriate Assistant Director.

1-200.10 RESURFACING PROJECTS

A section shall be added at a later date, describing design procedures of resurfacing projects based on Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU).

1-200.25 ROAD SAFETY AUDIT REVIEW (RSAR) PROJECTS

A section shall be added at a later date, describing design procedures of Road Safety Audit Review projects.

1-200.30 PROJECTS OF LIMITED SCOPE

A section shall be added at a later date, describing design procedures of projects of limited scope.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

1-200.35 LOCAL PROGRAM

The design requirements of Locally Managed Projects are dependent on the project classification. Category 1 - Projects are located on the National Highway System or State Routes that are funded with Federal-Aid. These projects shall be designed in accordance with all TDOT Design Policies and Procedures. A TDOT Design Manager will be assigned to each of these projects to provide full oversight of the project. The TDOT Design Manager is responsible for ensuring all TDOT Design Policies and Procedures have been followed. The TDOT Design Manager is not responsible for providing guidance or assistance in the actual design of the project. A "Design Certification Letter" will be required for Category 1 Projects. Any comments provided by the Department shall be incorporated into the design of the project.

Category 2 - Projects are located on the National Highway System or State Routes that are not funded with Federal-Aid but which are funded with State Funds Only, Local Funds Only, or a combination of State Funds and Local Funds. Category 2 may include re-classified Category 3 projects such as Bridge Replacement (BRZ), State Industrial Access (SIA), Local Interstate Connector (LIC). Also they may be funded with Federal Funds. These projects shall be designed in accordance with all TDOT Design Policies and Procedures. A TDOT Design manager may be assigned to these projects to provide oversight. The Local Government will be required to submit a "Design Certification Letter". The TDOT Design Division will review these projects at each phase of development (see Project Distributions). Any comments provided by the Department shall be incorporated into the design of the project.

Federal regulations shall be followed on all Locally Managed Projects.

Refer to *Local Program Guidelines*, Chapter 5, "Roadway Design Procedures, Including Structural Design" for more information.

1-205.15 COORDINATE VALUES

Survey procedures require that all surveys shall be tied to the State Plane Coordinate System using the Tennessee Geodetic Reference Network (TGRN). All surveyed coordinate values will be based on the North American Datum 1983 (NAD/83) (1995 adjustment) coordinates and appropriate notes indicating such shall appear on the topography plot.

All design computations shall be based on these adjusted coordinate values. This will ensure that all computed points on the project would have coordinate values tied to the State Plane System. Assumed coordinates will not be used.

Coordinate values for all PI's shall be shown on present and proposed (if any are shown) layout sheets within each curve data table. Coordinate values shall also be listed for the beginning and ending points of the project. A **notation** near the title block in lower right hand corner for each sheet on which coordinates appear shall read, "**Coordinates are NAD/83 (1995), are datum adjusted by the factor of 1.000XXX" and tied to the TGRN. All elevations are referenced to the NAVD 1988.** The "1995" refers to the year of the most recent adjustment of coordinate values in Tennessee and 1.000XXX refers to the actual datum adjustment factor used for the project.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

1-205.20 DIMENSIONS AND DIRECTIONS ON PLANS

In order to provide consistency and maintain accuracies, the following criteria is to be adopted for the roadway plans.

1. Distances shown on the plans shall be no more accurate than the nearest 0.01 foot (35 ft, 35.0 ft, and 35.00 ft, are acceptable: 35.001 ft is not acceptable).
2. Bearings shown on the plans shall be no more accurate than 1 second (for example N 35 00' 01" E is acceptable; N 35 00' 01.1" E is not acceptable). P. I. coordinates shall be computed to four decimal places, and then bearings recomputed to even seconds. Bearings and the beginning coordinate point are then held constant and P. I.'s and ending coordinates recomputed to four decimal places.
3. Coordinates of P. I.'s and G. P. S. control points shall be shown to an accuracy of 0.0001 foot. Any other coordinates shall be shown to an accuracy of 0.01 foot.

1-206.10 TRACT NUMBERS ON PLANS

On all design projects, tract, and/or parcel numbers assigned during the survey process **shall not** be deleted, changed, or renumbered. Tract numbers are assigned during the survey process and have the same parcel number in the GEOPAK "GPK" file. The parcel information contained in the GPK file is used in survey and plan preparation and right-of-way processes. There should not be any duplicate tract numbers on any one project.

All survey assigned tract numbers and property owner information will be retained on the plans through the preliminary field review, if one is conducted. After that time the tract information can be removed from the acquisition table, property map, and plan sheets but the previously assigned tract numbers shall not be changed nor deleted from the GPK file. Tract numbers shall not be renumbered on the plans.

No tract shall be deleted after the plans have been submitted for incidental or printed for a design public hearing. The information in the acquisition table, property map, and layout sheets shall be crossed out in all places using a single line to indicate that no acquisition is required. This will insure that all tract information is retained in the GPK file and not deleted nor written over. The tract information is then recoverable and can be used by other sections as the information is passed to the Right-of-Way and Construction Divisions or returned to the Survey Office for updating.

1-210.00 GRADE SEPARATED RAILROAD CROSSINGS (See 1-210.05 and 2-325.00)

In order to facilitate and expedite the Railroad's review of all future highway plans, which include a highway-railroad grade separation, the following information must be on the preliminary plans, which are to be sent to the railroad for comments and/or approval:

1. Proposed minimum vertical clearance
2. Proposed minimum horizontal clearance on both sides of track
3. At skewed crossings, drawing must include a structure elevation view normal to the track
4. Proposed distance from centerline of track to toe of end slopes at their intersection with natural ground
5. If end slopes are to be paved, indicate limits of paving
6. Location of pole lines on railroad right-of-way
7. Existing and proposed drainage structures
8. Railroad station at highway-railroad intersection, or distance in feet from nearest railroad mile pole

In general, the information listed above is the minimum information needed by the railroad to enable them to make a logical investigation of the proposed project. To furnish less information would only serve to delay the railroad's approval of the plans. Include easement note as shown in 1-210.05.

Figure 1-4 indicates a method of showing the easement for a roadway bridge crossing over railroad.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

1-210.05 AT-GRADE RAILROAD CROSSINGS (See 1-210.00 and 2-325.00)

All designers shall prepare plans for at-grade railroad crossings using the following design criteria where feasible:

- Alignment: 90 degrees to the railroad desirable, 70 degrees minimum, with good sight distance in both directions.
- Grade: Where crossings involve two or more tracks, the top of rails for all tracks shall be brought to the same plane where practicable. The surface of the highway shall be in the same plane as the top of rails for a distance of 2 feet outside of rails for either multiple or single-track crossings. The top of rail plane shall be connected with the grade line of the highway each way by vertical curves (if necessary) of such length as is required to provide riding conditions and sight distances normally applied to the highway under consideration. It is desirable that the surface of the roadway be not more than 3 inches higher or 6 inches lower than the top of the nearest rail at a point 30 feet from the rail measured at right angles, thereto, unless track superelevation dictates otherwise. Desirable grades on the tangent immediately adjacent to the grade across the rails of the track shall be 5% or less but no steeper than 7%.
- Curbs: Proposed roadway curbs and/or curbs and gutter shall terminate no less than 13 feet from the centerline of the nearest tracks for at-grade railroad crossings.

The roadway right-of-way lines will terminate at the railroad right-of-way as shown on Figure 1-5. No easement will be shown on the plans for this crossing. The easement note as given below will be added to the present layout sheet near the crossing.

"Easement required for the railroad crossing is to be obtained by the Utilities Engineer by provisions contained in the crossing agreement negotiated with the railroad."

Bearings and distances will be provided along both the railroad right-of-way and the proposed roadway right-of-way lines. The distance to the nearest milepost will be shown at the intersection of the centerlines of the roadway and railroad.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

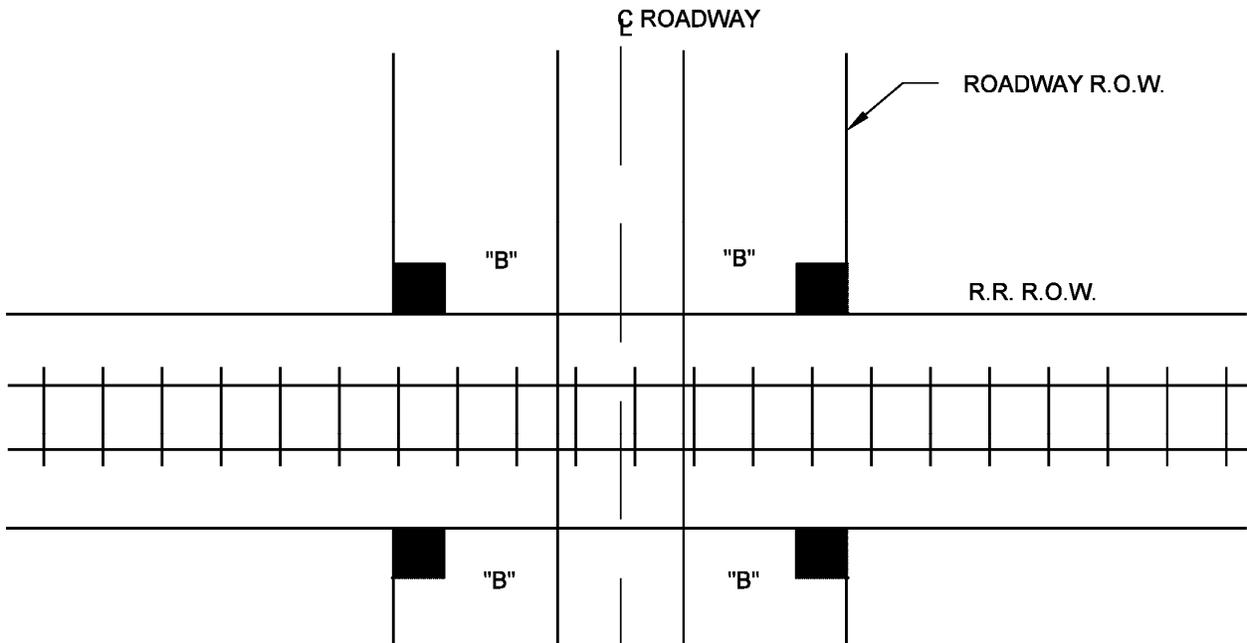


Figure 1-5
Method for Showing Right-of-Way at an At-Grade Railroad Crossings

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

1-210.10 RAILROAD RIGHT-OF-WAY ENCROACHMENT - PARALLEL CONSTRUCTION

When the proposed roadway is parallel to the railroad, as shown on Figure 1-6, the railroad shall be given a tract number and included in the right-of-way tabulation block as permanent easement to be acquired by the Right-of-Way Division.

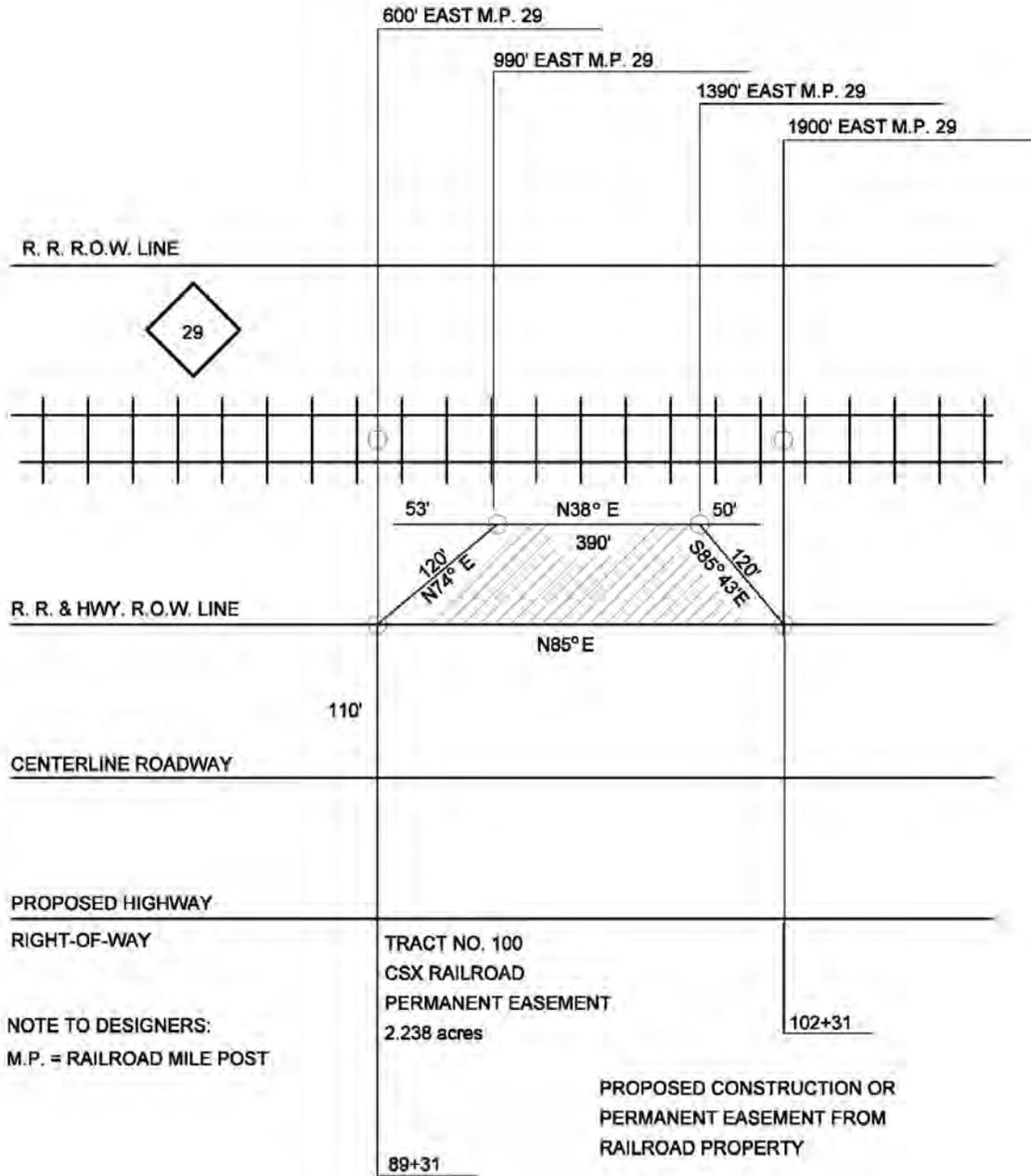


Figure 1-6
Example for Preparation of Right-of-Way Details
when Encroachment is Parallel to the Railroad

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

When constructing a roadway parallel to a track roadbed, if work is required inside the railroad right-of-way, the preferred construction limit (toe of slope) shall be no closer than 50 feet from the centerline of the nearest track.

If it is necessary to encroach nearer than the 50 feet described above, a set of preliminary plans, including cross-sections, showing how the proposed work ties to the existing railroad roadbed, are to be sent to the utility section of the Right-of-Way Office for review, comment and submittal to the railroad. Example shown in Figure 1-7 below.

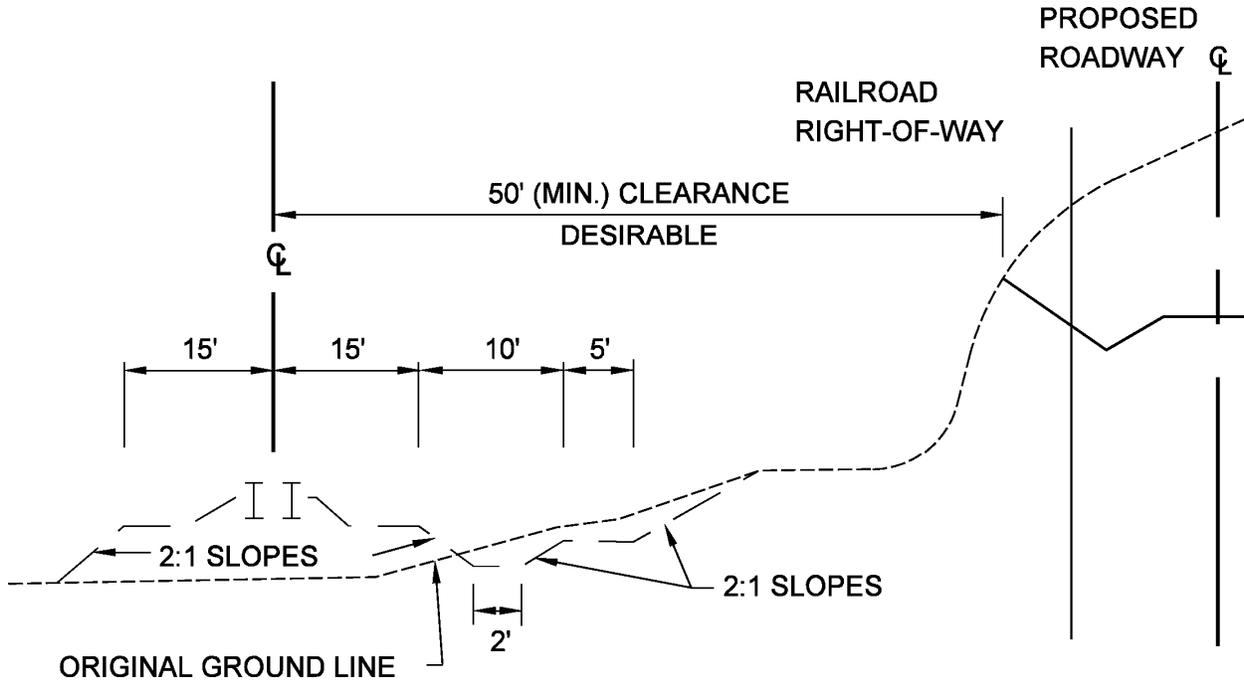


Figure 1-7
Sketch Showing the Minimum Requirement for Railroad Typical Roadbed Section. To Be Used as a Reference for Designers Working Inside Railroad Right-of-Way.

1-215.00 KNOWN ENVIRONMENTAL CONSTRAINTS

Any known environmental constraints identified in the environmental document or other expert sources should be indicated on the plans and brought to the Project Managers attention as soon as the constraints are recognized. Constraints may include, but not limited to the following: blue line steams, wetlands, a tree with political ties, registered historical sites, etc. Ecology, permit assessment, and SWPPP review items encountered are to be addressed prior to the right-of-way plan submittal.

1-220.00 PLANS REVISION DISTRIBUTION SCHEDULE

The current plans revision distribution schedule is listed below. This schedule is to be used for distribution of all plans revisions. Distribution schedules are attached for letting, right-of-way, and construction plans revision. Please note that revisions are filed and referred to by project number and revision dates, therefore, only one revision per day should be made on any project.

Distribution of Right-of-Way Plans Revisions

The following distribution will occur for all of right-of-way revisions regardless of whether they have been let to contract or not. Send original to the Director of the State Right-of-Way Division and copies to the appropriate Regional Right-of-Way Manager.

For Regions 1 and 4

- Director, State Right-of-Way Division – W/1 set (full size) & 1 set (half size) prints
- Regional Right-of-Way Manager, Region 1 – W/(See distribution of plans revisions on Right-of-Way Plans Revisions Request Form)
- Regional Right-of-Way Manager, Region 4 – W/(See distribution of plans revisions on Right-of-Way Plans Revisions Request Form)

For Region 2 and 3

- Director, State Right-of-Way Division – W/1 set (full size) & 2 sets (half size) prints
- Regional Right-of-Way Manager, Region 2 – W/(See distribution of plans revisions on Right-of-Way Plans Revisions Request Form)
- Regional Right-of-Way Manager, Region 3 – W/(See distribution of plans revisions on right-of-way Plans Revisions Request Form)

If the right-of-way revision is initiated by the Regional Right-of-Way Office, the initial right-of-way plans revisions will carry the same distribution as shown on the “Right-of-Way Print Plans Request Form”. The “Right-of-Way Plans Revision Form” should reflect that distribution. As the right-of-way process proceeds forward towards its end the distribution of right-of-way revisions will be reduced dramatically. The reduced number of sets of revised right-of-way plans should therefore be shown on the “Right-of-Way Plans Revision Form”. This situation should occur during the later stages of right-of-way acquisition and most of the time after the project has been let to contract.

If the right-of-way plans revision is initiated by the Design Division, the designer must check with the Regional Right-of-Way Office to find out the required distribution of right-of-way plans at that particular phase of the project.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Distribution of Letting Plans Revisions

Note: Designers should check with the State Construction Office to determine if plans revision notes and letters are required. If so, please furnish the items listed under the appropriate letting date, contact the Assistant State Construction Engineer responsible for the project to see if a revision can be processed before the letting.

For Regions 1, 2, 3, and 4

Letting Revision Distribution for projects with the following prefixes:

I, IM, ID, NH-1, STP-1, CM-1, MA-1, IXA-1, BR-1 and DPI

Send original to the Projects Management Engineer of the FHWA Division.

- FHWA Division, Project Management Engineer W/1 set prints (half size) & 4 copies of the letter
- Construction Division Director W/2 rev. sets prints (half size), 2 copies of the letter & 1 copy of the estimate revision request form
- Design Division, C.E. Manager 2 /w/1 rev set prints (half size) & 1 copy of the letter
- Design Division, Quality Assurance Office, C.E. Manager 1 W/1 set prints (half size) & 1 copy of the letter
- Printing Services Superintendent W/4 copies of the letter
- Program Operations Office, Estimates Section W/1 set rev. prints (half size), 1 copy of the letter and 1 copy of the estimate revision request form

Letting Revision Distribution for all other project prefixes including 100 percent state and IME.

Send original to the Director of the Construction Division.

- Construction Division Director W/2 rev. sets prints (half size), 2 copies of the letter & 1 copy of the estimate revision request form
- Design Division, C.E. Manager 2 W/1 rev. set prints (half size) & 1 copy of the letter
- Design Division, Quality Assurance Office, C.E. Manager 1 W/1 set prints (half size) & 1 copy of the letter
- Printing Services Superintendent W/4 copies of the letter
- Program Operations Office, Estimates Section W/1 set rev. prints (half size), 1 copy of the letter and 1 copy of the estimate revision request form

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Distribution of Construction Plans Revisions

For Regions 1, 2, 3, and 4

Construction Revision Distribution for projects with the following prefixes:

I, IM, ID, NH-1, STP-1, CM-1, MA-1, IXA-1, BR-1 and DPI

Send original to the Projects Management Engineer of the FHWA Division and copies to the appropriate Regional Construction Manager.

- FHWA Division, Projects Management Engineer W/1 set prints (half size) & 4 copies of the letter
- Regional Construction Manager, Region 1 – W/9 sets prints (full size), 6 sets (half size) prints & 1 copy of letter
- Regional Construction Manager, Region 2 – W/9 sets prints (full size), 7 sets (half size) prints & 1 copy of letter
- Regional Construction Manager, Region 3 – W/8 sets prints (full size), 7 sets (half size) prints & 1 copy of letter
- Regional Construction Manager, Region 4 – W/9 sets prints (full size), 6 sets (half size) prints & 1 copy of letter
- C.E. Manager 2, Design Division – W/1 set (half size) prints & 1 copy of the letter
- C. E Manager 1, Design Division, Quality Assurance Office – 1 set (half size) prints & 1 copy of the letter

Construction Revision Distribution for all other project prefixes including 100 percent state and IME.

Send original to the appropriate Regional Construction Manager.

- Regional Construction Manager, Region 1 – W/9 sets prints (full size), 6 sets (half size) prints & 1 copy of letter
- Regional Construction Manager, Region 2 – W/8 sets prints (full size), 7 sets (half size) prints & 1 copy of letter
- Regional Construction Manager, Region 3 – W/8 sets prints (full size), 7 sets (half size) prints & 1 copy of letter
- Regional Construction Manager, Region 4 – W/9 sets prints (full size), 6 sets (half size) prints & 1 copy of letter
- C.E. Manager 2, Design Division – W/1 set (half size) prints & 1 copy of the letter
- C.E. Manager 1, Design Division, Quality Assurance Office – 1 set (half size) prints & 1 copy of the letter

SECTION II - PRELIMINARY PLANS

CHAPTER 1 - DESIGN GUIDELINES

2-100.00	PROJECT FOLDER
2-105.00	ROADWAY DESIGN CHECKLIST - PRELIMINARY PLANS
2-110.00	PROJECT ACTIVITY STATUS SHEET
2-112.00	SIZE OF FULL-SIZE PLAN AND CROSS-SECTION SHEETS
2-115.00	IDENTIFICATION OF SUPERVISORS, DESIGNERS, AND CHECKERS ON TITLE SHEET
2-115.01	SPECIAL NOTES
2-115.05	EQUATION BLOCKS ON TITLE SHEET
2-115.10	EXCLUSIONS ON TITLE SHEET
2-115.15	TRAFFIC BLOCK ON TITLE SHEET
2-115.20	PROJECT DESCRIPTIONS
2-120.00	TRAFFIC DATA FOR DESIGN
2-125.00	VERTICAL CLEARANCES FOR NON-INTERSTATE BRIDGES
2-127.00	SUBMITTAL OF PLANS FOR STRUCTURAL GRADE APPROVAL
2-130.00	SUPERELEVATION RATES AND RUN-OFF
2-135.00	THE CLEAR ZONE ROADSIDE CONCEPT
2-135.05	CLEAR ZONES ON CURVED ALIGNMENTS
2-140.00	MEDIAN OPENING SPACING
2-140.05	MEDIAN OPENING SPACING - EXAMPLE PROBLEMS
2-145.00	EXCAVATION AND UNDERCUTTING
2-145.05	EARTHWORK BALANCES
2-145.07	SUBMISSION OF GRADING QUANTITIES SHEETS
2-145.10	SHRINKAGE AND SWELL FACTORS
2-150.00	TRUCK CLIMBING LANES

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

- 2-155.00 WETLANDS BOUNDARY DESIGNATION
- 2-155.02 HAZARDOUS MATERIAL STUDY
- 2-155.05 BOX AND SLAB-TYPE CULVERT AND BRIDGE LENGTHS, CHANNEL CHANGES, AND WETLANDS
- 2-160.00 EXTENSION OF THROUGH LANES BEYOND INTERSECTIONS AND REQUIREMENTS FOR LANE REDUCTION TRANSITION LENGTHS
- 2-165.00 TWO-LANE ENTRANCE RAMPS ON FREEWAYS AND EXPRESSWAYS
- 2-170.00 GUIDELINES FOR DESIGN OF TURNING LANES
- 2-175.00 GUIDELINES FOR DETERMINING AND PROPOSING RETAINING WALLS
- 2-180.00 LOCATION OF AUTOMATIC TRAFFIC RECORDERS (ATR) AND ROADWAY WEATHER INFORMATION SYSTEMS (RWIS) ON PROJECTS

CHAPTER 2 - DRAINAGE

- 2-200.00 COMPUTATION OF DRAINAGE
- 2-200.05 DRAINAGE TABLES AND CHARTS
- 2-200.10 EXAMPLE DRAINAGE PROBLEMS

CHAPTER 3 - RIGHT -OF-WAY

- 2-300.00 R.O.W. NOTES FOR ALL R.O.W. PROJECTS
- 2-300.05 R.O.W. NOTES ON PLANS REGARDING DRIVEWAYS
- 2-300.10 GUIDELINES FOR CONSTRUCTION AND RESURFACING OF PUBLIC ROAD INTERSECTIONS AND DRIVEWAYS ON HIGHWAY PROJECTS
- 2-310.00 ACCESS CONTROL - CROSSROADS AT INTERCHANGES
- 2-315.00 TRAFFIC SIGNAL AND LIGHTING DESIGNS FOR ROADWAY PROJECTS
- 2-315.05 ROADWAY LIGHTING INFORMATION FOR RIGHT-OF-WAY/UTILITIES
- 2-320.00 EASEMENTS - GENERAL
- 2-320.05 PERMANENT DRAINAGE EASEMENT ON PLANS
- 2-320.10 SLOPE EASEMENTS
- 2-320.15 CONSTRUCTION EASEMENTS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

- 2-320.20 PRELIMINARY RIGHT-OF-WAY ESTIMATE FROM PRELIMINARY FIELD REVIEW PLANS
- 2-325.00 RAILROADS
- 2-330.00 FIELD REVIEW PROCEDURES

SECTION II - PRELIMINARY PLANS

CHAPTER 1 - DESIGN GUIDELINES

- 2-100.00** PROJECT FOLDER (See 1-100.00)
- 2-105.00** ROADWAY DESIGN CHECKLIST - PRELIMINARY PLANS (See 1-105.00)
- 2-110.00** PROJECT ACTIVITY STATUS SHEET (See 1-110.00)
- 2-112.00** SIZE OF FULL-SIZE PLAN AND CROSS-SECTION SHEETS (See 3-102.00 and 4-112.00)

All reproducible photographic mylar sheets and cross-section sheets submitted for printing of the Preliminary, Right-of-Way, or Construction Plans shall be of a standard size. That size is to be either 36 x 23 or 34 x 23 inches prior to final trimming of margin along top and bottom edge. This margin is to be trimmed prior to submission of Construction Plans. Final size of sheets is to be 34 x 22 inches under all circumstances. Either of the standard widths mentioned are acceptable but should not be mixed in the plan set.

2-115.00 IDENTIFICATION OF SUPERVISORS, DESIGNERS, AND CHECKERS ON TITLE SHEET (See 3-105.00)

List on the lower left hand corner of the project title sheet: the names of the TDOT Civil Engineering Manager 1, TDOT Design Manager 1 or TDOT Roadway Specialist Supervisor 2 in charge of the project, the name of the firm designing the project if being done by a consultant, the name of the designer and the Design Project (P.E.) number. See examples in Figures 2-1a and 2-1b.

CONSULTANT DESIGN RIGHT-OF-WAY

TDOT DESIGN MANAGER : _____

DESIGNED BY : **(FIRM NAME)** _____

DESIGNER : **(RESPONSIBLE PERSON)** _____

P.E. NO.: _____

PIN : _____

**Figure 2-1a
Title Sheet Identification Format for Consultant Designed Right-of-Way**

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

T.D.O.T. DESIGN RIGHT-OF-WAY

TDOT ROAD SP. SV. 2 _____

DESIGNER _____

P.E. NO. _____

PIN _____

Figure 2-1b
Title Sheet Identification Format for TDOT Designed Right-of-Way

2-115.01 SPECIAL NOTES

The Special Notes shown on the lower left hand corner of the project title sheet shall read as follows:

SPECIAL NOTES

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED MARCH 1, 2006, AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT.

Figure 2-2
Title Sheet Special Notes Format

2-115.05 EQUATION BLOCKS ON TITLE SHEET (See 4-115.20)

The format for the Equation Block (if needed) is as shown in Figure 2-3.

If no Equation Block is needed it shall be so noted "NO EQUATIONS".

EQUATIONS	
DESCRIPTION	NET EFFECT ON NUMERATION
STA. xx + xx BK. = STA. xx + xx AH.	+ xx.xx
STA. xx + xx BK. = STA. xx + xx AH.	- xx.xx
TOTAL	± xx.xx

Figure 2-3
Equation Block Format

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

2-115.10 EXCLUSIONS ON TITLE SHEET (See 4-115.25)

If there are exclusions on the project, these shall be noted as follows:

EXCLUSION STA. XX+XXX TO STA. XX+XXX
NET EFFECT ON ENUMERATION \pm XX.XXX

If there is more than one exclusion, a block shall be drawn similar to the Equation Block.

If there are no exclusions, the sheet shall be noted "NO EXCLUSIONS".

2-115.15 TRAFFIC BLOCK ON TITLE SHEET

The format for the Traffic Block is as shown in Figure 2-4. The first line of data is current year and the other lines are design year.

TRAFFIC DATA	
ADT (20XX)	xxxx
ADT (20XX)	xxxx
DHV (20XX)	xxxx
D	xx - xx
T (ADT)	xx %
T (DHV)	xx %
V	xx mph

Figure 2-4
Traffic Block Format

2-115.20 PROJECT DESCRIPTIONS

Project descriptions on the title sheet and in all correspondence shall be in sequence as follows:

1. FAI number (if an Interstate)
2. State route number (if a state route)
3. U.S. route number (if a U.S. route)
4. Local road name
5. Project limits (from and to)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Typical descriptions are shown in Figures 2-5a and 2-5b.

S.R. 6 (U.S. 16, THOMASVILLE ROAD)
FROM: 0.5 MILES SOUTH OF BANANA TOWN
TO: 1.3 MILES NORTH OF TURTLEDOVE CREEK

Figure 2-5a Typical Title Sheet Project Description

S.R. 6 (U.S. 16, THOMASVILLE ROAD)
BRIDGE AND APPROACHES OVER TURTLEDOVE CREEK @ L.M. 2.45

Figure 2-5b Typical Title Sheet Project Description

In all correspondence, remember to include project number and county name.

SPECIAL LOG MILE NOTE:

On Interstate plans, both Interstate log miles (based on Interstate mileposts) and stations will be required when designating the begin and end points on all projects. To assist in determining the proper log mile, refer to the book *Log of the Interstate Highway System in Tennessee*. This reference also may be used for cross referencing the statewide Interstate log miles with the Interstate milepost miles.

On state highway plans, such as resurfacing projects, when using log miles to designate the begin and end points on projects, county log miles (mile posts) are to be used. To assist in determining the proper log mile, refer to the book *Log of the Interstate and State Highway System in Tennessee* for the region that the project is located.

Check with appropriate TDOT Manager for the location of a copy of these books.

2-120.00 TRAFFIC DATA FOR DESIGN

In order to establish a uniform and systematic method of obtaining desired traffic data for the construction year for all future projects, use the following procedure:

1. Mark two sketches (generally a print of the title sheet) to show the limits of the project and to establish the exact information desired. If crossroad volumes and/or turning movements on certain intersecting streets or roads are needed, this fact shall be clearly indicated by a sketch on the title sheet prints.
2. Regional design engineers shall submit the two sketches along with a properly filled out copy of the Request for Traffic Data Form shown in Figure 2-6 to the Traffic Planning and Statistics Office at the address shown on the form.
3. Headquarters design personnel shall submit two sketches with a properly filled out request form to their supervisor for proper handling.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

4. Consultants shall submit two sketches with a properly filled out form to the appropriate Design Manager.

Since the typical cross-section to be used is largely dependent on the anticipated traffic, it is urgent that traffic data for each newly assigned project be requested as soon as possible after beginning work on a project.

To expedite a pavement design from the Pavement Design Section, the following applicable notes shall be included under comments on the form. A copy of the completed form shall be forwarded with the pavement design request.

1. Furnish the 20xx-20xx ADL for pavement design on a four-lane roadway.
2. Furnish the 20xx-20xx ADL for pavement design on a four-lane roadway and the present ADT on all crossroads within the limits of the project.
3. Furnish the 20xx-20xx ADL for pavement design on a two-lane roadway.
4. Furnish the 20xx-20xx ADL for pavement design on a two-lane roadway and the present ADT on all crossroads within the limits of the project.

NOTE: ADL (Average Daily Loading)
 ADT (Average Daily Traffic)
 DHV (Daily Hour Volume)
 D (Directional Distribution)
 T (Truck Percentage)

NOTE: For Bridge Replacement Projects, ADL are not required for ADTs of 1,000 or less and percentage trucks of 7 percent or less.

NOTE: ADTs and DHVs are not required for crossroads with ADTs of 1,000 or less.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

TENNESSEE DEPARTMENT OF TRANSPORTATION PROJECT PLANNING DIVISION

PROJECT NO.: _____ ROUTE: _____
 COUNTY: _____ CITY: _____
 PROJECT PIN NUMBER: _____
 PROJECT _____

DIVISION REQUESTING:

MAINTENANCE	<input type="checkbox"/>	PAVEMENT DESIGN	<input type="checkbox"/>
PLANNING	<input type="checkbox"/>	STRUCTURES	<input type="checkbox"/>
PROG. DEVELOPMENT & ADM.	<input type="checkbox"/>	SURVEY & DESIGN	<input type="checkbox"/>
PUBLIC TRANS. & AERO.	<input type="checkbox"/>	TRAFFIC SIGNAL DESIGN	<input type="checkbox"/>
		OTHER _____	<input type="checkbox"/>

YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: _____
 PROJECTED LETTING DATE: _____

TRAFFIC ASSIGNMENT:

BASE YEAR		DESIGN YEAR					DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS		
		ADT	YEAR	ADT	DHV	%	YEAR	DIR.DIST.	DHV	ADT	FLEX

REQUESTED BY: NAME _____ DATE _____
 DIVISION _____
 ADDRESS _____

REVIEWED BY: _____ DATE _____
 TRANSPORTATION MANAGER 1
 SUITE 1000, JAMES K. POLK

APPROVED BY: _____ DATE _____
 TRANSPORTATION MANAGER 2
 SUITE 900, JAMES K. POLK BUILDING

COMMENTS:

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 ADT.

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR ADTs OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.
 SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS. (REV. 8/15/08)

**Figure 2-6
Request for Traffic Data Form**

2-125.00 VERTICAL CLEARANCES FOR NON-INTERSTATE BRIDGES

The minimum vertical clearance for all structures on all systems shall be not less than 16 feet over the entire roadway width, including the usable width of shoulder. The vertical clearance to sign trusses and pedestrian overpasses shall be 17 feet because of their lesser resistance to impacts. The vertical clearance from the deck to the cross bracing on through truss structures shall also be a minimum of 17 feet. The vertical clearance for railroad crossings from structure to top of rails shall be 23 feet.

An allowance of 6 inches shall be added to all vertical clearances to accommodate future resurfacing.

On crossings of low volume roadways where the cost of providing a 16 feet clearance might be considered unreasonable and may justify an exception, the Design and Structures Division personnel shall complete a joint cost analysis justifying a reduction in vertical clearance. This cost analysis shall be submitted to the Director of the Structures Division for approval.

2-127.00 SUBMITTAL OF PLANS FOR STRUCTURAL GRADE APPROVAL

The designer in the Structures Division shall receive all the material applicable to the drainage portion of the project as specified in Section 2.50 of the Survey Manual when receiving the survey. In addition, they shall receive all the material applicable to grade separations at highway and railroad crossings as specified in Section 2.70 of the Survey Manual when receiving the survey. When grade approval is requested the following material shall be submitted to the Director of the Structures Division.

1. Floodplain sections (stream crossing)
2. Stream profiles (stream crossing)
3. Roadway and railroad profile
4. Topography
 - A. See Section 2.50 and 2.70, and the Survey Check List, Box Bridge and Bridge Surveys Section of the latest edition of the Survey Manual
 - B. Low girder and bridge deck elevations
 - C. Stations for each substructure
5. Complete set of full-size preliminary plans with prints of digital terrain model sheets at bridge locations

2-130.00 SUPERELEVATION RATES AND RUN-OFF

On all major grade and drain projects spirals will be required on horizontal curves below the heavy lines as shown on Standard Drawings RD01-SE series. For horizontal curves above the heavy lines spirals may still be used.

On isolated bridge replacement projects, intersection improvements, widening of existing roadways, etc., where use of spirals would provide no real benefit and/or cause problems in design, spirals will not be required. It will still be necessary to provide superelevation and superelevation lengths as shown on RD01-SE series.

On urban projects, note that the maximum desirable superelevation rate is 4 percent.

On rural projects, the maximum desirable superelevation rate is 8 percent.

On "BRZ" projects with design speed of 30 mph or less and with gravel or "spot" double bituminous surface treatment, a maximum superelevation rate of 6 percent may be used without a design exception being required.

Exceptions to this policy shall be identified in field review reports.

Show the superelevation rate and speed on all plans as a part of the horizontal curve data, thus: "S.E. 5.4% 70 mph". Also, show transition length on non-spiraled curves.

2-135.00 THE CLEAR ZONE ROADSIDE CONCEPT

Clear zone distance (sometime referred to as clear zone, horizontal clearance to obstructions or roadside recovery area) as defined in the *AASHTO Roadside Design Guide*, other parts of this document and in other official publications shall be maintained on all projects.

2-135.05 CLEAR ZONES ON CURVED ALIGNMENTS

In Chapter 3 of the *AASHTO Roadside Design Guide* a formula is given for increase in clear zone on the outside of curves.

The clear zone on curved alignment is determined by increasing the value obtained from the *Roadside Design Guide* method for a tangent section of highway. The tangent section clear zone is increased by a curve correction factor, which is based on the degree of curvature and the design speed.

One note of caution, the designer must remember that the clear zone values (L_c) obtained are based on a constant side slope throughout the clear zone distance. In situations where the side slope changes within the calculated clear zone, the clear zone must be recalculated based on a weighted average of the side slopes.

2-140.00 MEDIAN OPENING SPACING

Safety and improved traffic operations dictate the need for providing roadways with medians in the State of Tennessee. The value of medians has been demonstrated many times in this state. Accident records indicate that the accident rate for non-median roadways in Tennessee is consistently higher than the accident rate for those roadways with medians. Since the number of median openings per mile has a significant effect on accident potential, it is important that such openings be held to a reasonable minimum and in the interests of equity, permitted at predetermined uniformly spaced specific locations. This procedure will provide a high degree of safety to the motoring public and also permit reasonable access to abutting property owners.

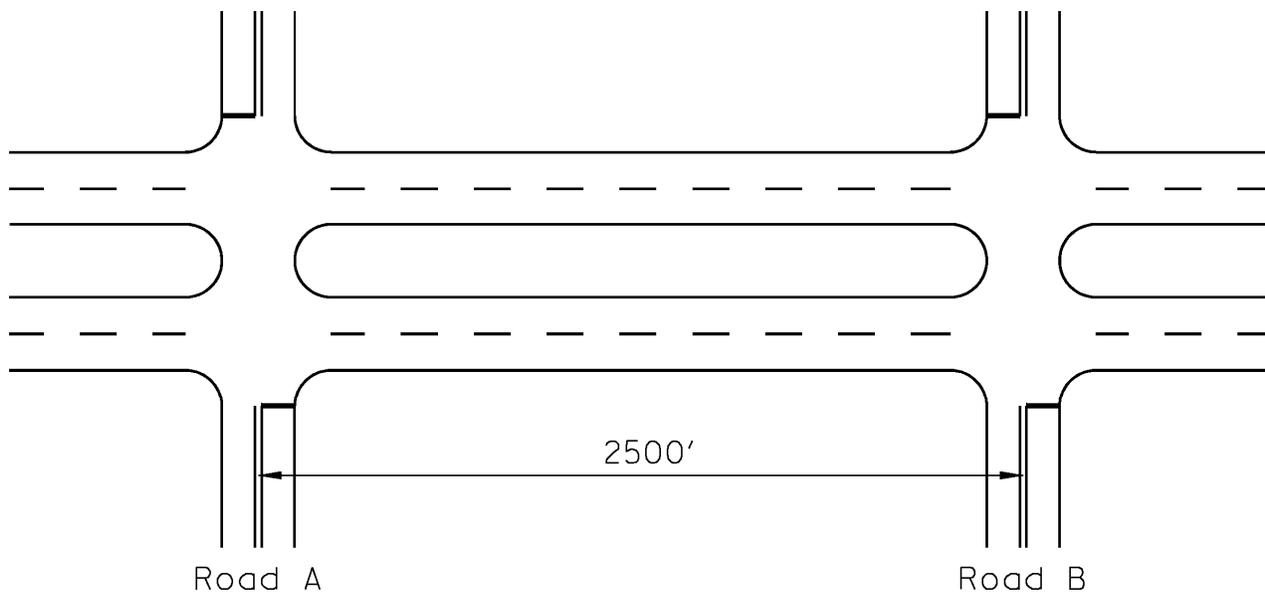
It is the policy of the Department to provide median openings at most existing city streets or county roads. It is also the policy of the Department to provide uniformly spaced openings between median openings for city streets or county roads for U-turn vehicles. The desirable uniform spacing is 1,320 feet (a range of 880 feet - 1,760 feet is acceptable) in rural areas and 660 feet (a range of 440 feet - 880 feet is acceptable) in urban areas.

Location of crossovers set by this policy shall be adjusted if safety considerations so dictate. An example is as follows: in order to minimize the potential for wrong way movements, adjustment of proposed crossover locations to align with an existing driveway shall be considered if the driveway centerline is within 75 feet of the proposed crossover centerline.

2-140.05 MEDIAN OPENING SPACING - EXAMPLE PROBLEMS

Ten example problems detailing the procedure to be used in determining the appropriate median opening spacing are as follows:

Example No. 1 Urban Section



Total distance between Road A and Road B is 2,500 feet. Since this is with an urban section of roadway, the appropriate median opening spacing would be that which most closely approximates 660 feet. It shall not, however, be less than 440 feet nor more than 880 feet.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

The first step in determining the proper spacing is to divide the total distance between the intersection openings (2,500 feet) by the desirable urban spacing (660 feet). This will tell us approximate number of spaces required.

This calculates to 3 or 4 spacings (2 or 3 midblock median openings) between Road A and Road B.

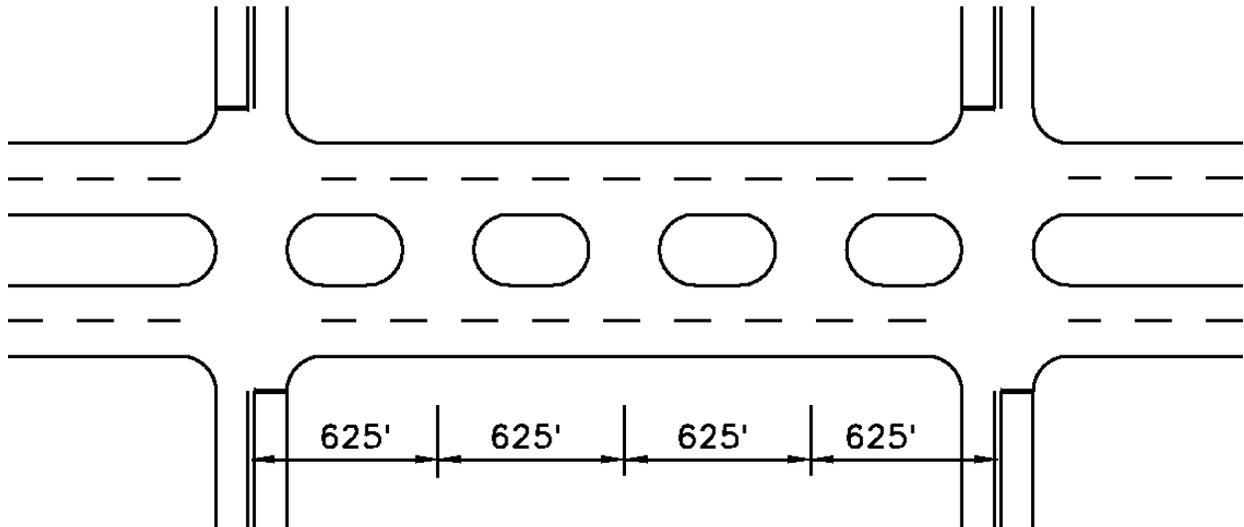
The next step is to determine which condition would result in a spacing nearest 660 feet, but which is also no less than 440 feet nor more than 880 feet. To do this, first divide the total distance between the intersection openings (2,500 feet) by the possible number of spacings (3 and 4). At the same time, check to see if the resulting distances are within the permissible range (440 feet - 880 feet) because if the resulting distance is not within this range, discard it as an alternative.

$$\frac{2500}{3} = 833 \quad 440 < 833 < 880 \text{ OK}$$

$$\frac{2500}{4} = 625 \quad 440 < 625 < 880 \text{ OK}$$

Both possible spacings (833 feet and 625 feet) are within the permissible range. Therefore, it must still be determined which is closest to 600 feet.

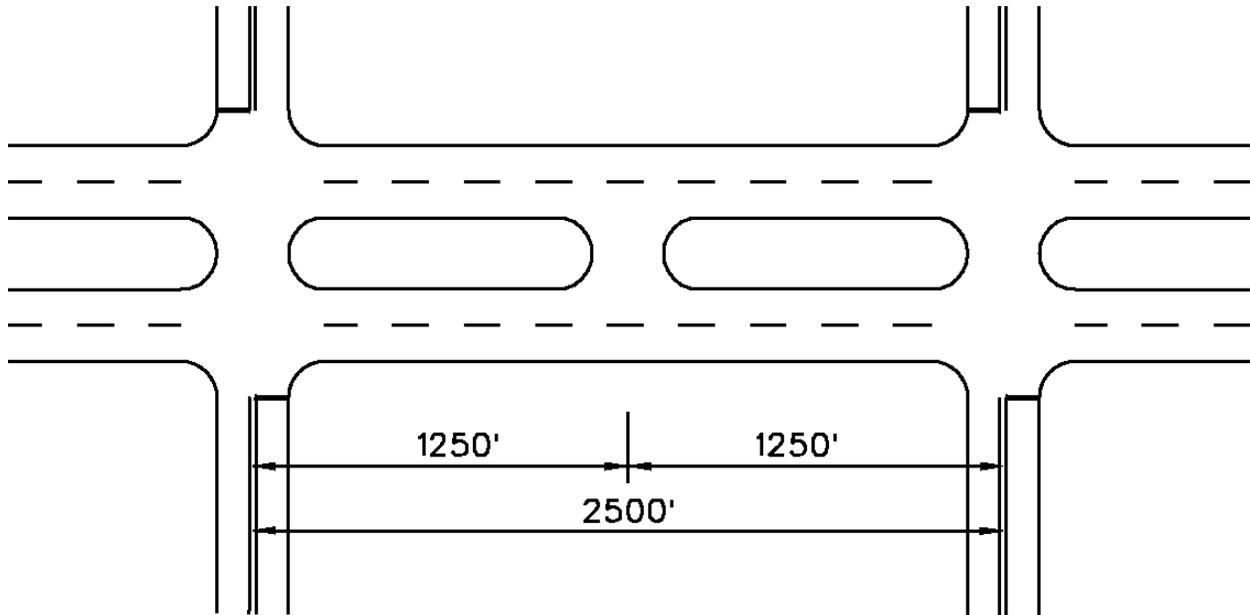
$\begin{array}{r} 833 \\ -660 \\ \hline 173 \end{array}$	$\begin{array}{r} 660 \\ -625 \\ \hline 35 \end{array}$
--	---



Since 35 is less than 173, the most appropriate median opening spacing between Road A and Road B would be 625 feet. This would result in 3 midblock median openings 625 feet apart.

Note that the number of midblock median openings is always one less than the number of spaces. Generally the whole number closest to the approximate number of spaces (4 for 3.75 above) will be the number of spaces which will yield the most appropriate median opening spacing

(which is true in this particular example). However, this is not always the case (see Example No. 8).



Example No. 2 Rural Section

Total distance between Road A and Road B is 2,500 feet. The desirable rural spacing is 1,320 feet, but no less 880 ft nor more than 1,760 feet.

$$\frac{2500}{1350} = 1.9$$

Therefore, there can be 1 or 2 spacings (0 or 1 midblock median openings). However, it must be determined which condition would result in a spacing nearest 1,320 feet, but which is also no less than 880 feet nor more than 1,760 feet.

$$\frac{2500}{1} = 2500 \quad 880 < 2,500 > 1,760 \quad \text{not acceptable}$$

$$\frac{2500}{2} = 1250 \quad 880 < 1,250 < 1,760 \quad \text{OK}$$

The only acceptable median opening spacing between Road A and Road B is 1,250 feet. Therefore, one midblock median opening shall be provided at a point 1,250 feet from each intersection.

Example No. 3 Urban Section

Total distance between intersection openings is 1,100 feet.

$$\frac{1100}{660} = 1.7$$

$$\frac{1100}{1} = 1100 \quad 440 < 1,100 > 880 \text{ not acceptable}$$

$$\frac{1100}{2} = 550 \quad 440 < 550 < 880 \text{ OK}$$

The only acceptable spacing is 550 feet. Therefore, one midblock median opening shall be provided at a point 550 feet from each intersection.

Example No. 4 Rural Section

Total distance between intersection openings is 1,100 feet.

$$\frac{1100}{1320} = 0.8$$

$$\frac{1100}{0} = \text{infinity} \quad \text{infinity} < 1,100 \text{ not acceptable}$$

$$\frac{1100}{1} = 1100 \quad 880 < 1,100 < 1,760 \text{ OK}$$

The only acceptable spacing is 1,100 feet and, therefore, no midblock median opening shall be installed.

Example No. 5 Urban Section

Total distance between intersection openings is 1,500 feet.

$$\frac{1500}{660} = 2.3$$

$$\frac{1500}{2} = 750 \quad 440 < 750 < 880 \text{ OK}$$

$$\frac{1500}{3} = 500 \quad 440 < 500 < 880 \text{ OK}$$

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

$$\begin{array}{r} 660 \\ -500 \\ \hline 160 \end{array} \qquad \begin{array}{r} 750 \\ -660 \\ \hline 90 \end{array}$$

Since 90 feet is less than 160 feet, the most appropriate median opening spacing would be 750 feet. Therefore, 1 midblock median opening shall be installed.

Example No. 6 Rural Section

Total distance = 1,500 feet

$$\frac{1500}{1320} = 1.1$$

$$\frac{1500}{1} = 1500 \quad 880 < 1,500 < 1,760 \text{ OK}$$

$$\frac{1500}{2} = 750 \quad 750 < 880 \text{ not acceptable}$$

The only acceptable spacing is 1,500 feet. Therefore, no midblock opening shall be installed.

Example No. 7 Urban Section

Total distance = 5,880 feet

$$\frac{5880}{660} = 8.9$$

$$\frac{5880}{8} = 735 \quad 440 < 735 < 880 \text{ OK}$$

$$\frac{5880}{9} = 653 \quad 440 < 653 < 880 \text{ OK}$$

$$\begin{array}{r} 735 \\ -660 \\ \hline 75 \end{array} \qquad \begin{array}{r} 660 \\ -653 \\ \hline 7 \end{array}$$

Since 7 is less than 75, the appropriate spacing is 653 feet resulting in 8 midblock median openings.

Example No. 8 Rural Section

Total distance = 5,880 feet

$$\frac{5880}{1320} = 4.5$$

$$\frac{5880}{4} = 1470 \quad 880 < 1,470 < 1,760 \quad \text{OK}$$

$$\frac{5880}{5} = 1176 \quad 880 < 1,176 < 1,760 \quad \text{OK}$$

1470	1320
-1320	-1176
150	144

Since 144 is less than 150, the most appropriate spacing is 1,176 feet resulting in 4 midblock median openings.

Example No. 9 Urban Section

Total distance = 5,940 feet

$$\frac{5940}{660} = 9.0$$

Therefore, the appropriate spacing would be 660 feet resulting in 8 midblock median openings.

Example No. 10 Rural Section

Total distance = 5,940 feet

$$\frac{5940}{1320} = 4.5$$

$$\frac{5940}{4} = 1485 \quad 880 < 1,485 < 1,760 \quad \text{OK}$$

$$\frac{5940}{5} = 1188 \quad 880 < 1,188 < 1,760 \quad \text{OK}$$

1485	1320
-1320	-1188
165	132

Since 132 is less than 165, the most appropriate median opening spacing is 1,188 feet resulting in 4 midblock median openings.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

2-145.00 EXCAVATION AND UNDERCUTTING (See 4-203.00)

2-145.05 EARTHWORK BALANCES (See 2-145.10, 3-315.05 and 3-315.15)

Compute earthwork using select end areas.

2-145.07 SUBMISSION OF GRADING QUANTITIES SHEETS (See 3-315.20 and 4-203.50)

All grading quantities sheets submitted with the Construction Plans shall show the federal and/or state project numbers, route numbers and/or street names and county on each sheet. Each sheet shall be numbered to reflect both the individual sheet number as well as the total number of quantity sheets in the submission. See Figure 2-7.

This data can be added to the top of standard GEOPAK earthwork reports.

GRADING QUANTITIES SHEET

COMPUTED BY: _____ SHEET _____ OF _____

CHECKED BY: _____ PROJECT NO.: _____

ROUTE NO. OR STREET: _____ COUNTY: _____

**Figure 2-7
Grading Quantities Sheet Identification Format**

2-145.10 SHRINKAGE AND SWELL FACTORS (See 2-145.05, 3-315.10, and 4-203.05)

Shrinkage and swell of earth and rock material vary with:

1. Types of material
2. Weather conditions
3. Equipment used
4. Depth of cuts and fills
5. Length of haul

Light work through wooded areas call for heavier shrinkage.

The following examples are offered as a guide:

1. Light cuts and fills

1 - 2 foot cuts and fills

Earth 30% to 50%
Chert 20% to 30%

2 - 4 foot cuts and fills

Earth 25% to 30%
Chert 10% to 15%

4 - 6 foot cuts and fills

Earth 15% to 20%
Chert 8% to 12%

2. Heavy cuts and fills

Earth 10%
Chert 0% to 8%

3. Heavy cuts and light fills

Cuts 12 feet +, Fills 1 - 2 feet (average)

Earth 15% to 20%
Chert 5% to 10%

Cuts 12 feet +, Fills 2 - 4 feet (average)

Earth 10% to 15%
Chert 5% to 10%

4. Shale and slate

5% to 10% shrinkage; varies with type of material

5. Sandstone

0% shrinkage to 15% swell; varies with type of material and weather conditions

6. Limestone

If material is a small percentage and mixed with embankment, 0% shrinkage

Heavy cuts and fills: 15% to 20% swell

Light fills: 20% swell

Do not call for rock to be placed in fills less than 3 feet in height unless requested by the Soils and Geology Office.

2-150.00 TRUCK CLIMBING LANES

The term “critical length of grade” is used to indicate the maximum length of a designated upgrade on which a loaded truck can operate without an unreasonable reduction in speed. When lengths are less than the critical length shown on Figure 2-8, the designer has achieved an acceptable design. When lengths are greater than the critical length shown on Figure 2-8, the designer must either modify the design or add an additional climbing lane. On all truck climbing lanes used on TDOT Projects, the designer shall adhere to the AASHTO recommended guidelines for the 10 mph reduction criterion.

Figure 2-8, which shows a 10 mph (15 km/h) speed reduction curve, was taken from Exhibit 3-59 on page 242 of *A Policy on Geometric Design of Highways and Streets* 2004. Please read and thoroughly understand the related text in this publication prior to attempting to establish a truck climbing lane.

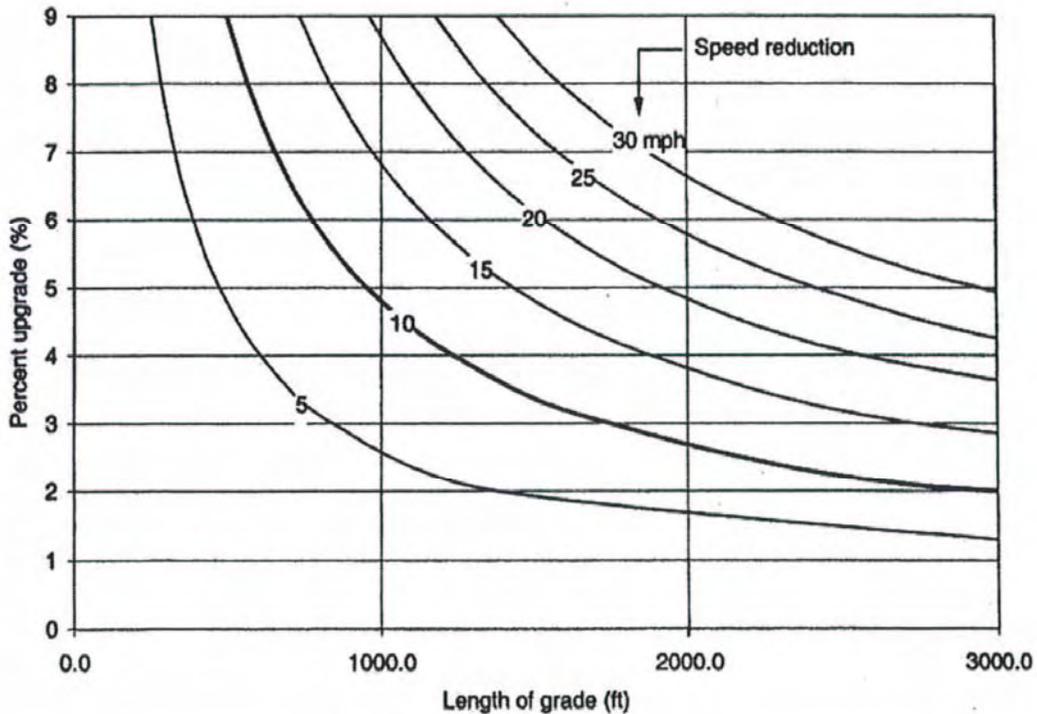


Figure 2-8
Critical Lengths of Grade for Design, Assumed Typical Heavy Truck of 200lb/hp (120 kg/kW), Entering Speed = 70 mph (110km/h)

2-155.00 WETLANDS BOUNDARY DESIGNATION

When a designer receives a project survey showing wetland involvement or the designer suspects wetland involvement, the designer shall send a half-size set of plans two weeks prior to the printing for the Preliminary Field Review (See Activity and Estimated Completion Schedule, A&E) to the Technical Studies Section of the Environmental Division. That division will mark the wetland boundaries on the plans and return them to the designer. The designer will then show the wetland boundaries on the plans.

Wetland boundaries will be shown by the symbol on Standard Drawing RD-L-1.

The word "WETLANDS" shall be placed inside the boundary.

Wetlands located immediately adjacent to the project shall be identified on the plans, if wetlands will be affected by the roadway construction or possible wetland impacts are identified by the Environmental Division. The plans shall also indicate locations where roadway outfall discharges are modified and locations where the wetland receiving flows are redirected.

The area (in square feet or acres) of any wetlands impacted by the project or any right-of-way taken for wetland replacement shall be indicated on the present layout sheet.

2-155.02 HAZARDOUS MATERIAL STUDY

The designer shall send a half-size set of plans for all projects requiring right-of-way acquisition two weeks prior to the printing for the Preliminary Field Review (See Activity and Estimated Completion Schedule, A&E) to the Environmental Impact Studies Section of the Environmental Planning Office. That office will use these plans to make a hazardous material study.

2-155.05 BOX AND SLAB-TYPE CULVERT AND BRIDGE LENGTHS, CHANNEL CHANGES, AND WETLANDS

The following procedures and policies need to be followed in order to achieve an environmentally acceptable project as perceived by the Corps of Engineers, Environmental Protection Agency, United States Fish and Wildlife Service, Tennessee Wildlife Resources Agency, and Tennessee Department of Environment and Conservation:

1. Any project which proposes long expanses of boxes and/or channel changes on blue-line streams and/or wetlands involvement must be studied for alternate solutions: after which, a project coordination meeting between the involved TDOT Divisions must be held.
2. Where box and slab-type culverts and bridges are employed, their length shall be held to a minimum. In the case of interchanges, intermittent boxes, rather than continuous boxes, are preferred.
3. Given the choice between long runs of boxes and channel changes, channel changes are generally preferred.
4. Concrete lined channels and rock lined (riprapped) channels are not acceptable for channel changes on blue-line streams.

5. In streams with enough flow to support aquatic life (blue-line streams), a normal flow keyway within a channel change shall be considered if flood plain hydraulics dictate a channel larger than the natural channel is required. The normal flow keyway shall have approximately the same width (X) and height (Y) as the existing normal flow channel, as shown in Figure 2-9.

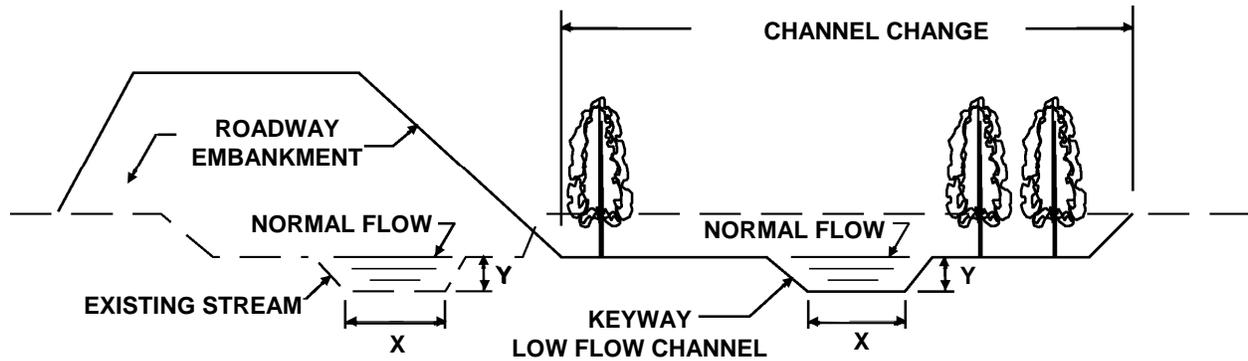


Figure 2-9
Channel Changes

6. Meanders must be included in channel changes on blue-line streams in order to maintain the natural stream length and slope.

For additional criteria on channel changes see Drainage Manual, Chapter 5, Section 5.05 Guidelines and Criteria for Stream Relocations. For additional criteria on box and slab-type culvert and bridge length see Drainage Manual, Chapter 6, Section 6.04, Guidelines and Criteria.

2-160.00 EXTENSION OF THROUGH LANES BEYOND INTERSECTIONS AND REQUIREMENTS FOR LANE REDUCTION TRANSITION LENGTHS

Existing two-lane highways are often widened to a multi-lane section at intersections to provide additional capacity (especially at signalized locations). Also, multi-lane highways are often designed to transition down to a two-lane highway downstream from an intersection.

In order to address the resulting lane drop situation, follow the schematic shown in Figure 2-10 which shows the minimum length for the additional through lanes required to adequately sign the lane drop and minimize lane changing within the intersection. An example for computing the required transition lengths is also included with this figure.

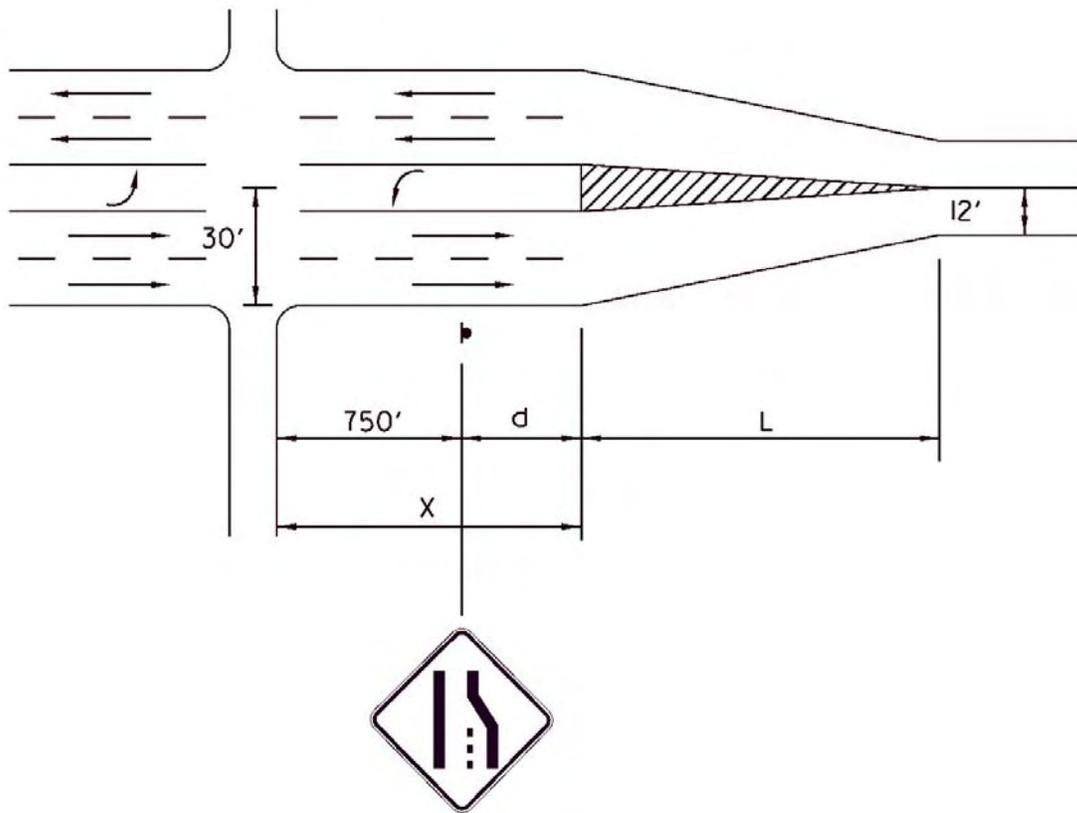


Figure 2-10
Minimum Length (X) through Lane Extensions

750 feet- Minimum distance at which sign is not visible to traffic approaching intersection (in order to minimize lane changing within intersection).

d - As required by *M.U.T.C.D.*, Sec. 2C-3, Table II-1, Condition A.

L - Transition length, as required by *M.U.T.C.D.*, Sec. 3B-8, Fig. 3-10.

Note - Terminating the outside lane as a right-turn lane at an intersection may be considered subject to the review and approval of the TDOT Signal Section and the Design Manager.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

To find “d” use the following table:

Posted or 85 th Percentile Speed (mph)	Advance Placement Distance ¹ (ft)								
	Condition A: Speed Reduction and Lane Changing in Heavy Traffic ²	Condition B: Deceleration to the listed advisory speed (mph) for the condition ⁴							
		0 ³	10	20	30	40	50	60	70
20	225 ft	N/A ⁵	N/A ⁵	-	-	-	-	-	-
25	325 ft	N/A ⁵	N/A ⁵	N/A ⁵	-	-	-	-	-
30	450 ft	N/A ⁵	N/A ⁵	N/A ⁵	-	-	-	-	-
35	550 ft	N/A ⁵	N/A ⁵	N/A ⁵	N/A ⁵	-	-	-	-
40	650 ft	125	N/A ⁵	N/A ⁵	N/A ⁵	-	-	-	-
45	750 ft	175	125	N/A ⁵	N/A ⁵	N/A ⁵	-	-	-
50	850 ft	250	200	150	100	N/A ⁵	-	-	-
55	950 ft	325	275	225	175	100	N/A ⁵	-	-
60	1100 ft	400	350	300	250	175	N/A ⁵	-	-
65	1200 ft	475	425	400	350	275	175	N/A ⁵	-
70	1250 ft	550	525	500	425	350	250	150	-
75	1350 ft	650	625	600	525	450	350	250	100

**Table 2-1
Guidelines for Advance Placement of Warning Signs**

Reference: M.U.T.C.D. 2003 Manual (Table 2C-4 of Section 2C.05)

Notes:

¹The distances are adjusted for a sign legibility distance of 175 ft for Condition A. The distances for Condition B have been adjusted for a sign legibility distance of 250 ft, which is appropriate for an alignment warning symbol sign.

²Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends. The distances are determined by providing the driver a PIEV time of 14.0 to 14.5 seconds for vehicle maneuvers (2004 AASHTO Policy, Exhibit 3-3, Decision Sight Distance, Avoidance Maneuver E) minus the legibility distance of 175 ft for the appropriate sign.

³Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Warning Signs. The distances are based on the 2004 AASHTO Policy, Stopping Sight Distance, Exhibit 3-1, providing a PIEV time of 2.5 seconds, a deceleration rate of 11.2 ft/second², minus the sign legibility distance of 175 ft.

⁴Typical conditions are locations where the road user must decrease speed to maneuver through the warned condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 second PIEV time, a vehicle deceleration rate of 10 ft/second², minus the sign legibility distance of 250 ft.

⁵No suggested distances are provided for these speeds, as the placement location is dependent on site conditions and other signing to provide an adequate advance warning for the driver.

EXAMPLE:

Posted speed = 55 mph

$X = 750 \text{ feet} + d = 750 \text{ feet} + 700 \text{ feet} = 1,450 \text{ feet}$

$L = S \times W \text{ (for speed 45 mph or more)} = 55 \times 18 = 990 \text{ feet}$

2-165.00 TWO-LANE ENTRANCE RAMPS ON FREEWAYS AND EXPRESSWAYS

Designers shall use the parallel design when introducing two-lane entrance ramps to freeways and expressways.

The parallel design is preferable for two reasons: (1) Past experience with the tapered design has been undesirable from an operational and safety standpoint; (2) Uniformity of design due to the fact that most two-lane entrance ramps statewide are the parallel type.

For examples of the parallel design for two-lane entrance ramps, refer to *A Policy on Geometric Design of Highways and Streets*, AASHTO, 2004, Pages 816 and 858 (Exhibits 10-52, A2 and 10-69, B).

2-170.00 GUIDELINES FOR DESIGN OF TURNING LANES

These guidelines are intended to assist the designer in designing left and right-turn lanes at intersections.

These guidelines provide information on material included in the AASHTO's *A Policy on Geometric Design of Highways and Streets*, 2004 and are an attempt to consolidate that information regarding the design of turn lanes.

The benefits of turn lanes at intersections are obvious in improved capacity and safety.

These guidelines are applicable to right and left-turn lanes, and give procedures for desirable design. Design may be limited by geometric or other constraints, but these guidelines shall be followed as closely as possible.

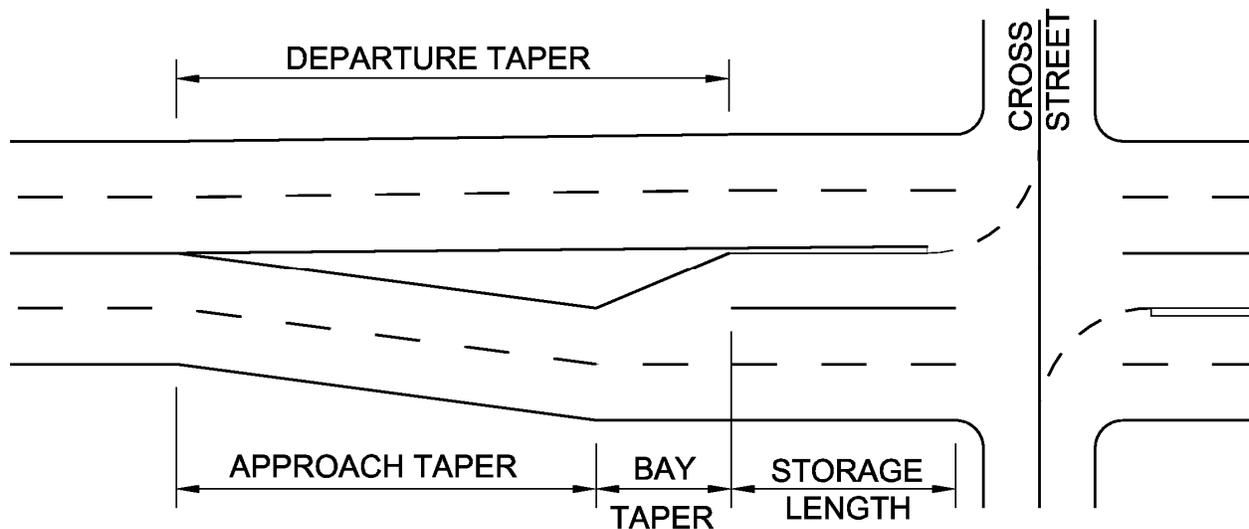


Figure 2-11
Turning Lane Terminology

1) APPROACH TAPER

a) $L = W \times S$, Speed ≥ 45 mph

b) $L = \frac{WS^2}{60}$, Speed < 45 mph

Where L = Length of Taper in feet

W = Width of Offset in feet

S = Design Speed in miles per hour

2) BAY TAPER

$L = \frac{WSL}{3}$, W, S as defined for approach taper above.

3) STORAGE LENGTHS

a) Unsignalized Intersections

To determine a warrant for and a required storage length, use the attached charts (Figures 2-13 through 2-16f) by M. D. Harmelink. (See also *A Policy of Geometric Design of Highways and Streets 2004*, Exhibit 9-75, page 685. This table is a condensed version of the Harmelink charts for two-lane highways.)

The first chart applies to four-lane highways, all speeds.

The remaining charts are a function of speed and the percentage of lefts in the approaching traffic, and are applicable only to two-lane highways.

Select the appropriate chart for design speed and percentage of left turns. Use the total advancing volume for the approach (left, through, and right) on the bottom axis of the chart, and the total opposing volume on the left axis of the chart.

b) Signalized Intersections

Storage lengths at signalized intersections are a function of signal timings, volumes, and saturation flow rates. Assistance in determining storage lengths can be provided by the Design Traffic Engineering Section, Signal and Lighting Office.

4) DEPARTURE TAPER

The departure taper begins at the end of the storage lane and ends at the beginning of the approach taper.

SOME SPECIAL NOTES:

- i) When the left-turn volume exceeds 300 vph, a double left-turn lane shall be considered. A capacity analysis will help determine the benefit of an additional lane. If a double left is proposed, use 60% of the turn volume to determine the storage length for each lane.
- ii) It is suggested in *A Policy of Geometric Design of Highways and Streets*, Chapter 9, that it is desirable to provide the appropriate deceleration distance for vehicles entering a left or right-turn lane. This distance can be considered to be the sum of the bay taper and the storage length for minimum design. From page 714, these lengths are:

Design Speed (mph)	Deceleration Length to Stop Condition for Less Than 3% Grade (ft)
30	170
40	275
45	340
50	410
55	485

Table 2-2
Approximate Total Lengths Needed for Deceleration to a Stop from Design Speed
 Reference: AASHTO, *A Policy on Geometric Design of Highways and Streets* (2004)

Adjustments to deceleration length for grades are found on page 848, Exhibit 10-71.

Providing deceleration lengths is not normally feasible on urban facilities.

When the deceleration length is to be provided, and this length exceeds the bay taper plus storage length, the additional length shall be provided as storage and the bay taper kept constant.

- iii) As suggested in the *2000 Highway Capacity Manual (HCM2000)*, page 10-18, exclusive right-turn lanes shall be considered when the right-turn volume exceeds 300 vph and the adjacent thru-lane volume also exceeds 300 vphpl. A capacity analysis will also provide a measure of the benefits of a right-turn lane to the overall intersection operation.
- iv) It shall be noted that at some intersections, lengths of turn lanes may be more a function of queue lengths in through lanes that might block access to turn lanes, thus reducing turn lane efficiency.

5) LOCATION OF LEFT-TURN LANES IN MEDIANS

As discussed in *A Policy of Geometric Design of Highways and Streets*, Chapter 9, it is desirable to align left-turn lanes in medians. The advantages of this placement are:

- i) Better visibility of opposing through traffic as left turners look for gaps.
- ii) Decreased conflict between opposing left-turn vehicle paths.
- iii) Increased numbers of left-turn vehicles served in a given period of time. The farther left the turn lane, the shorter the crossing distance for left-turn vehicles, allowing drivers to choose shorter gaps in opposing traffic and clear the intersection. There is also an increase in capacity at signalized intersections, due to more flexibility in left-turn phasing and shorter clearance intervals.

The following guidelines apply to four-lane divided highways with a maximum median width of 48 feet. For median widths greater than 48 feet or six-lane divided highways, left-turn lanes shall be designed as usual, constructed immediately to the left of the through lanes.

The centerline of left-turn lanes shall be placed along the centerline of the median, so that opposing left-turn lanes are directly opposite each other. Excess pavement area between the turn lane and adjacent through lane shall be marked with channelization striping (see Figure 2-10).

The attached ADT criteria can be used to estimate if a traffic signal will be warranted within five years of project opening (see Table 2-3).

If the current major street ADT and minor street ADT both meet the criteria for Warrant 1 or Warrant 2, future signalization is probable and the intersection design shall provide aligned left-turn lanes.

Currently signalized intersections or those to be signalized under the project shall be designed this way.

The number of approach lanes on the major street includes only through lanes. The same is true for the minor street, except in the case of "T"-intersections. For "T"-intersections, the number of approach lanes shall include left and right-turn lanes (if present) for the stem of the "T" as the minor street.

If the major street ADT differs on each side of the intersection, an average shall be used. For the minor street, use the higher ADT on the higher volume approach.

Be aware that there may be special conditions affecting signalization or geometric design. For those unusual conditions, the Design Traffic Engineering Section, Signal and Lighting Office can provide assistance.

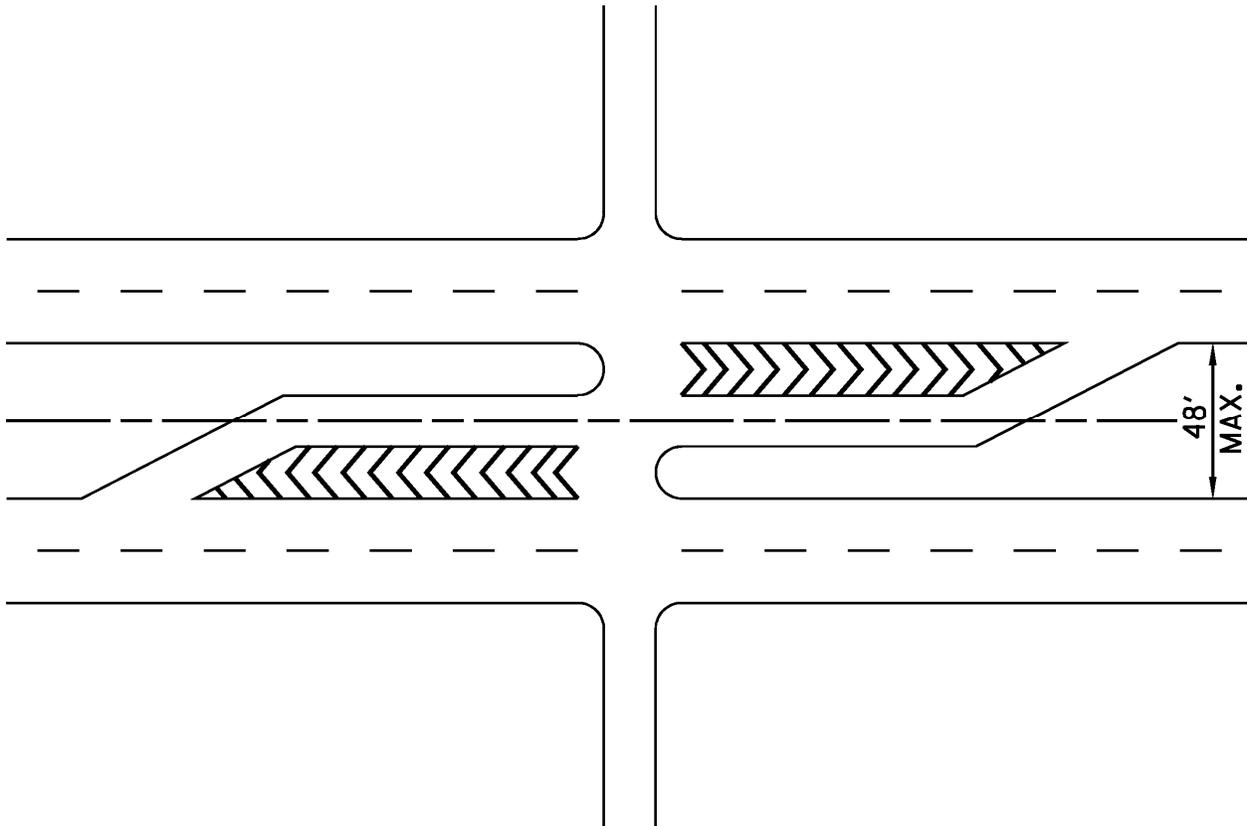


Figure 2-12
Left Turn Lane Alignment

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

NUMBER OF APPROACH LANES		WARRANT 1		WARRANT 2	
Major	Minor	Major ADT	Minor ADT	Major ADT	Minor ADT
1	1	5000	3000	7500	1500
2 or more	1	6000	3000	9000	1500
2 or more	2 or more	6000	4000	9000	2000
1	2 or more	5000	4000	7500	2000

**Table 2-3
Future Traffic Signal Warrants**

**VOLUME WARRANTS FOR LEFT - TURN STORAGE LANES
AT UNSIGNALIZED GRADE INTERSECTIONS**

CHART VALUE	% T _L = % TRUCKS IN V _L					
	0%	10%	20%	30%	40%	50%
75'	0	25'	25'	25'	50'	50'
100'	0	25'	25'	50'	50'	50'
125'	0	25'	25'	50'	50'	75'
150'	0	25'	50'	50'	75'	75'
175'	0	25'	50'	75'	75'	100'
200'	0	25'	50'	75'	100'	100'
250'	0	25'	50'	75'	100'	125'
300'	0	50'	75'	100'	125'	150'
350'	0	50'	75'	125'	150'	175'
400'	0	50'	100'	125'	175'	200'
450'	0	50'	100'	150'	200'	225'
500'	0	50'	100'	150'	200'	250'

**Table 2-4
Storage Length To Be Added To Chart Values Of
Left-Turn Lane Storage Lengths**

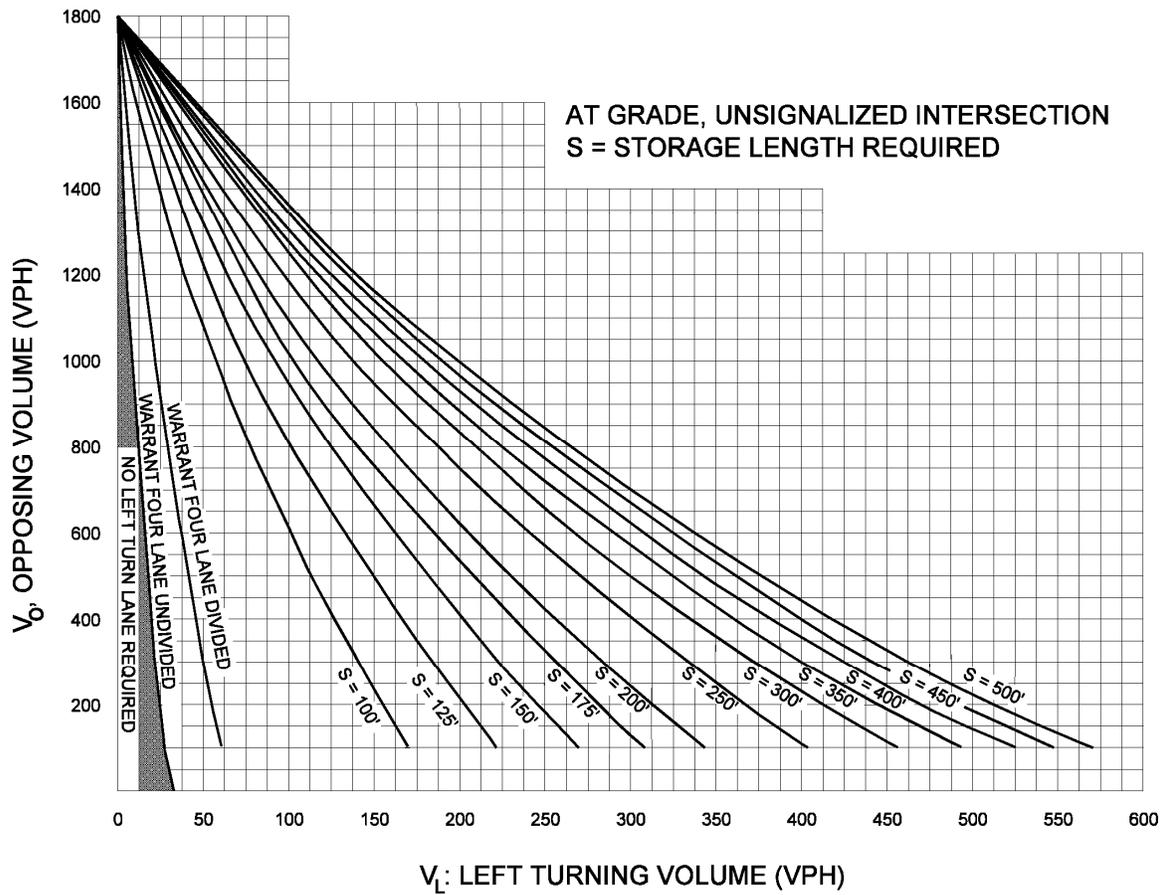


Figure 2-13
Warrant for Left-Turn Storage Lanes on Four-Lane Highways

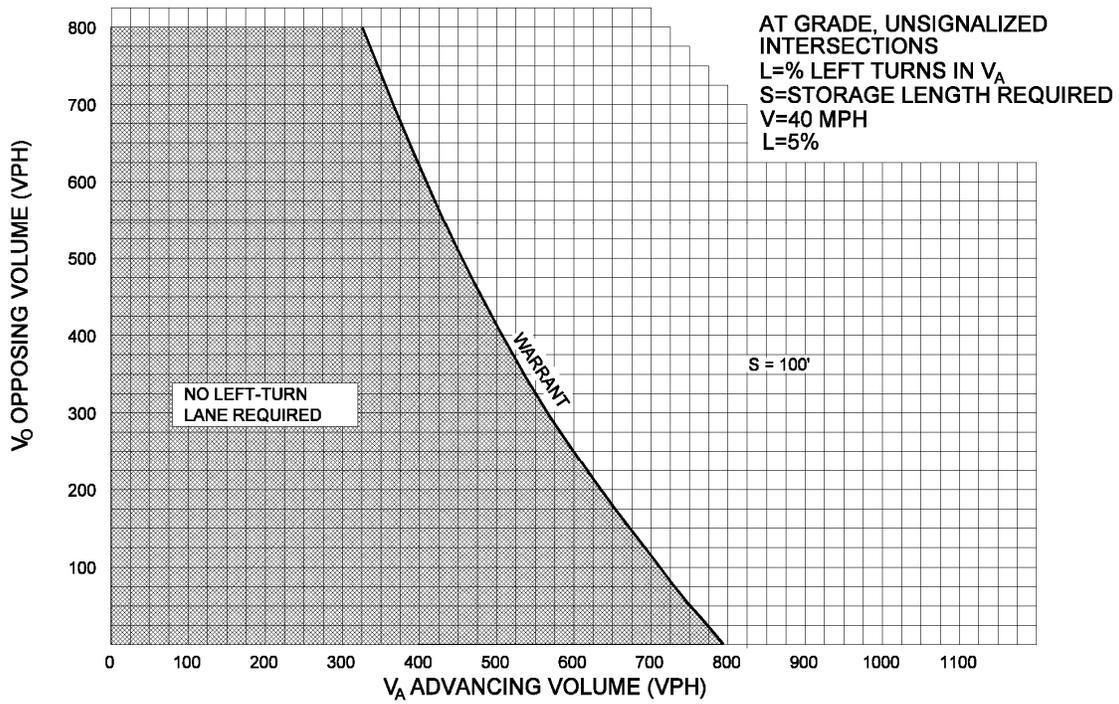


Figure 2-14a

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 40 mph and L = 5%)

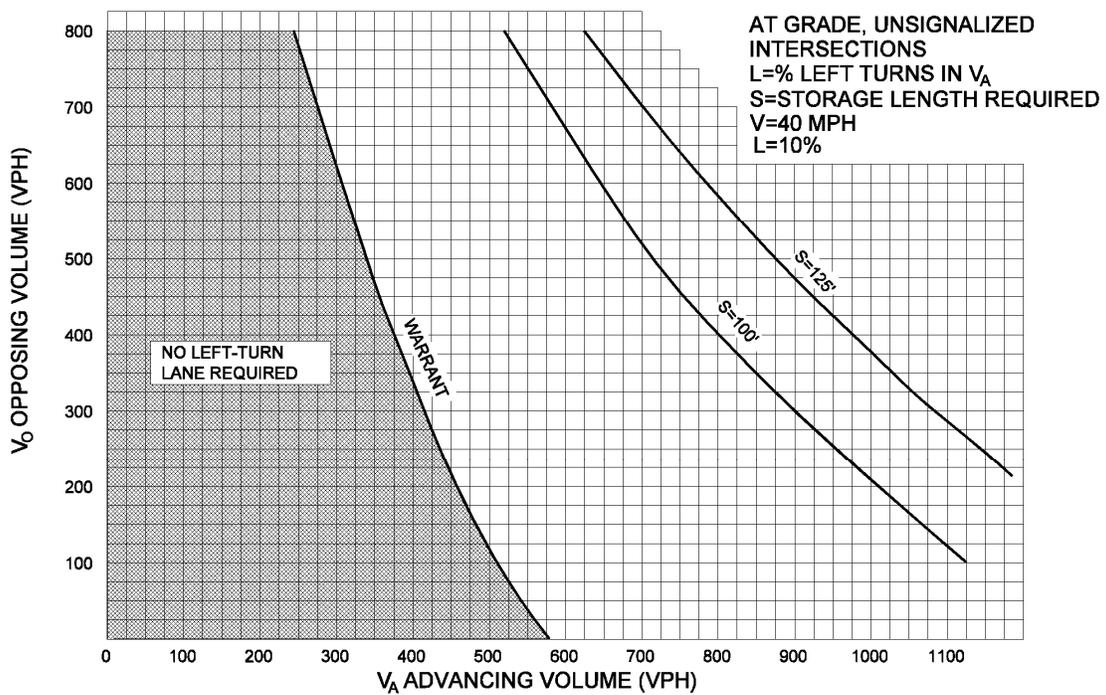


Figure 2-14b

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 40 mph and L = 10%)

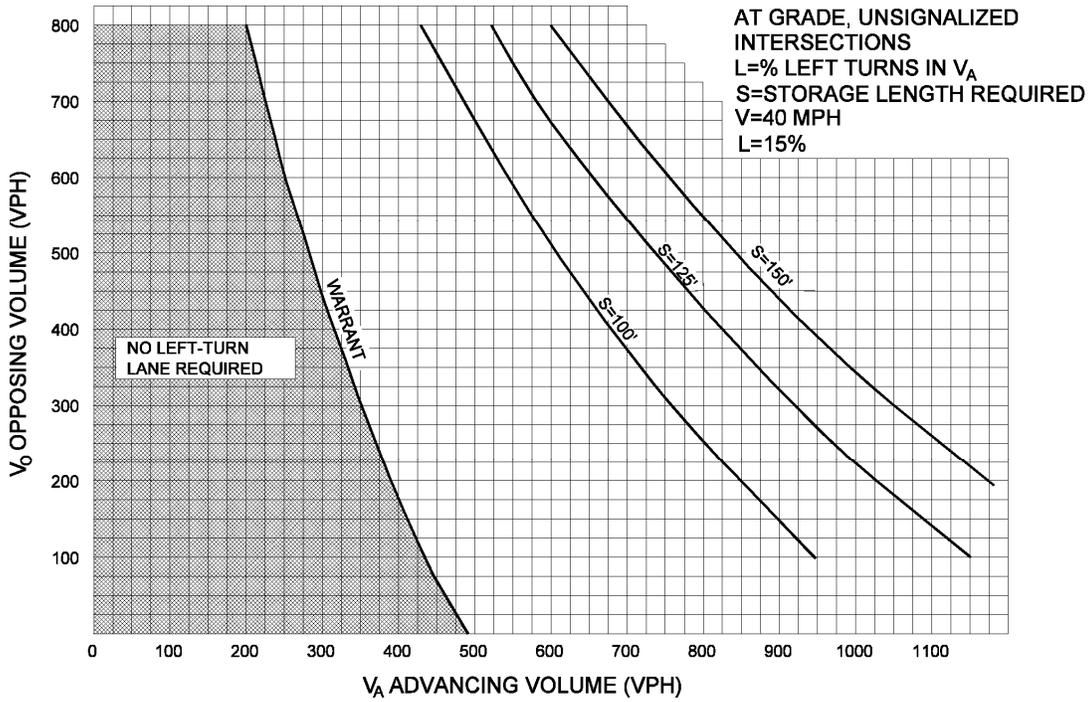


Figure 2-14c

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 40 mph and L = 15%)

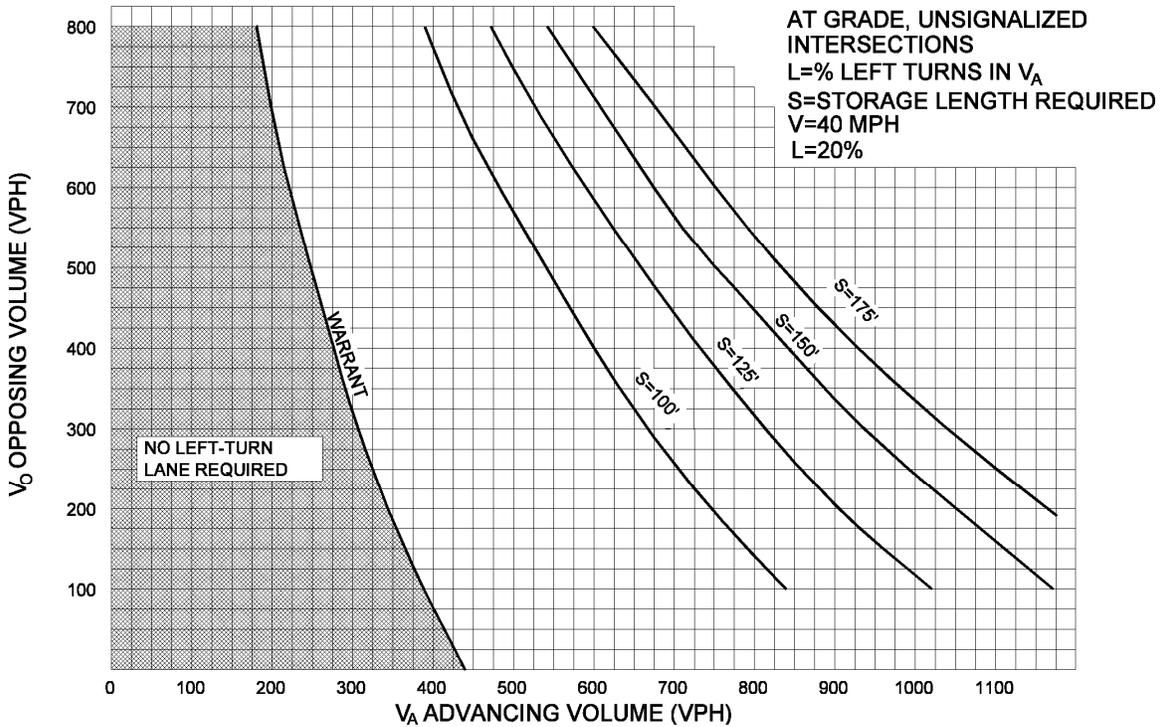


Figure 2-14d

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 40 mph and L = 20%)

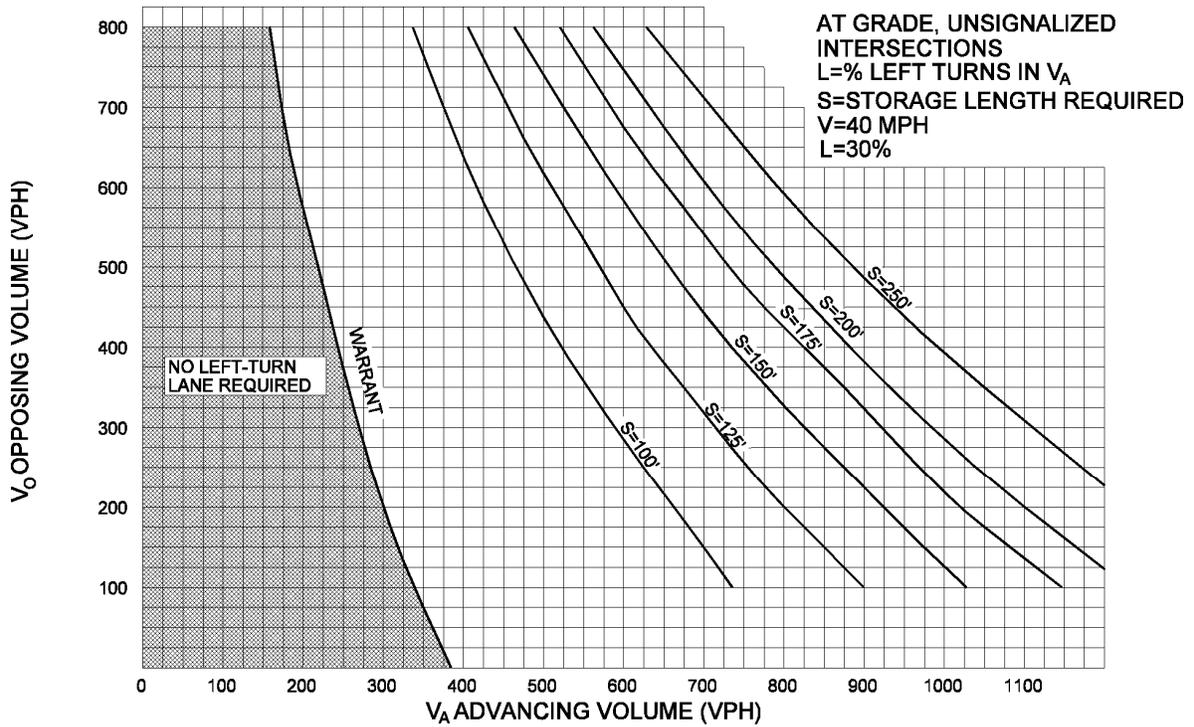


Figure 2-14e

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 40 mph and L = 30%)

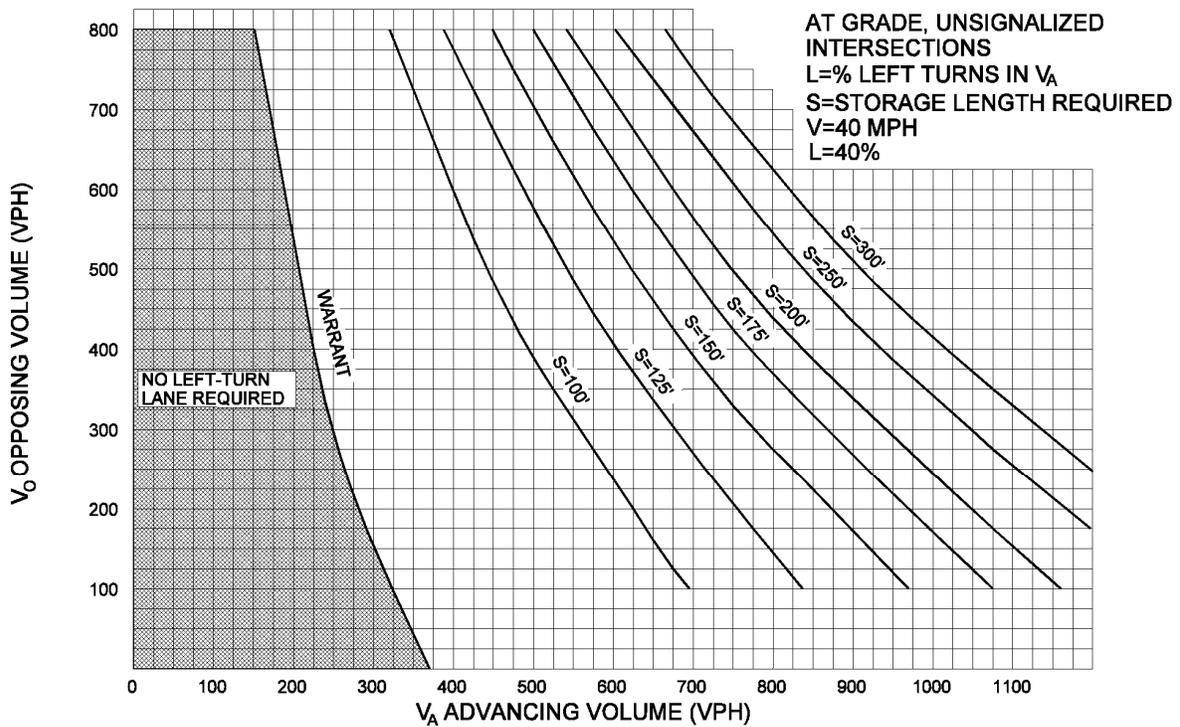


Figure 2-14f

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 40 mph and L = 40%)

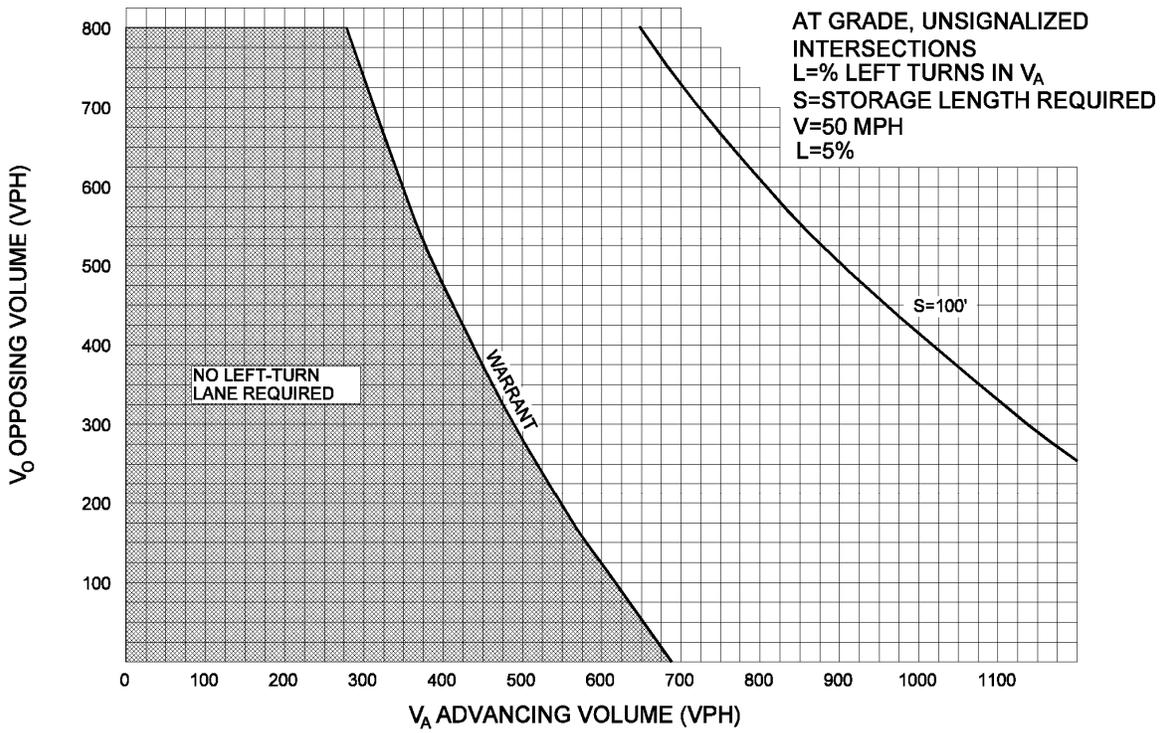


Figure 2-15a

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 50 mph and L = 5%)

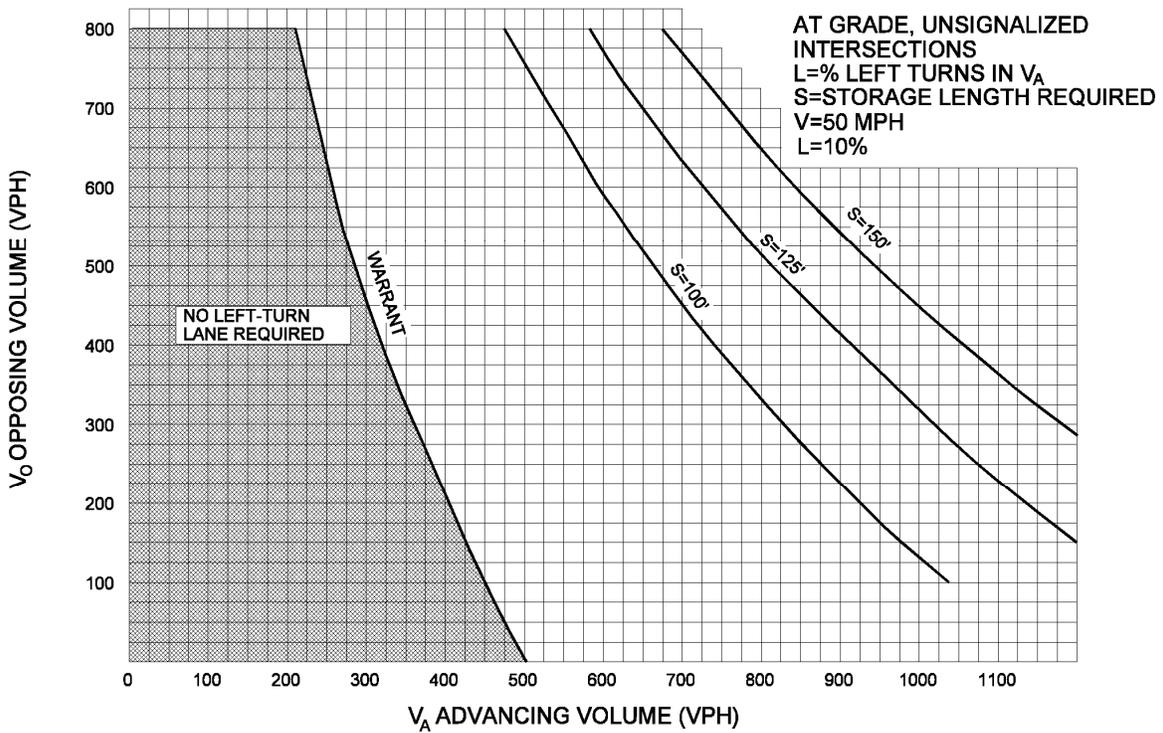


Figure 2-15b

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 50 mph and L = 10%)

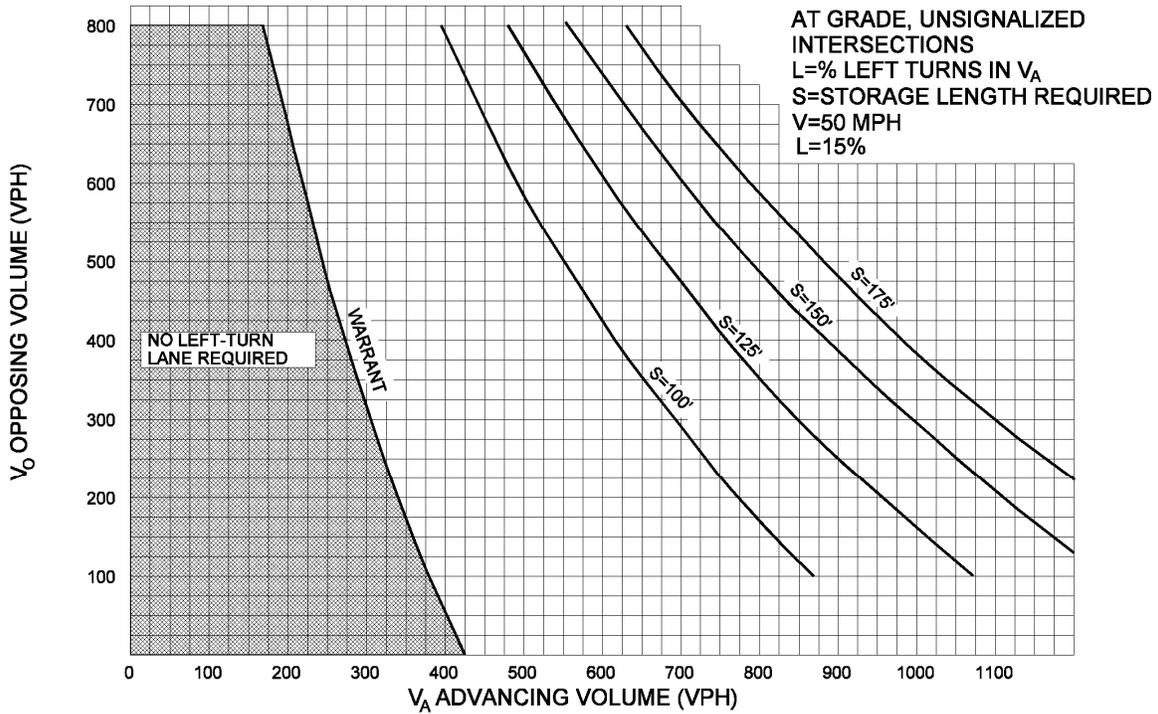


Figure 2-15c

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 50 mph and L = 15%)

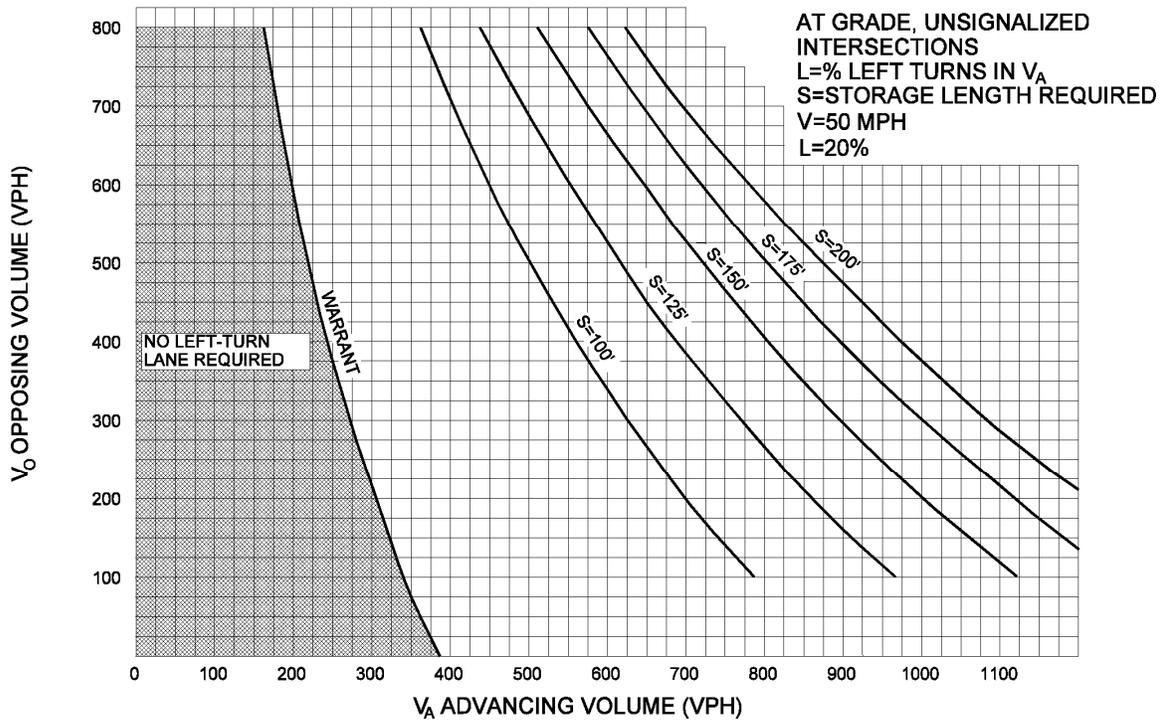


Figure 2-15d

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 50 mph and L = 20%)

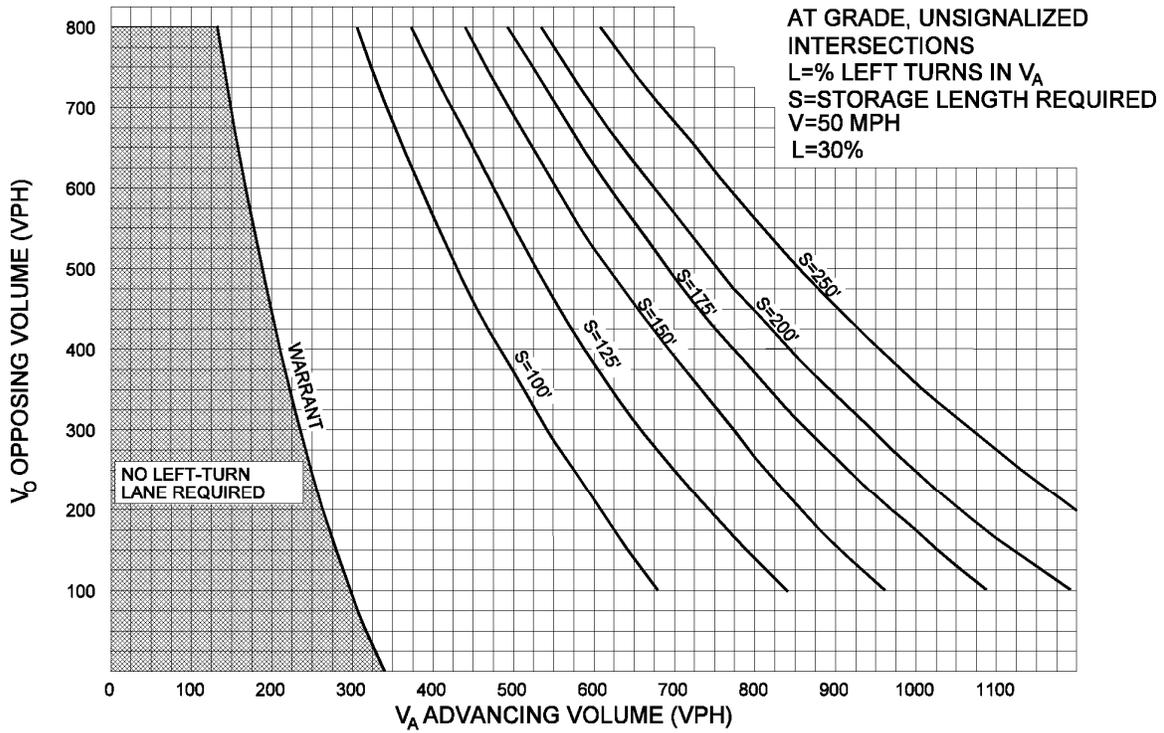


Figure 2-15e

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 50 mph and L = 30%)

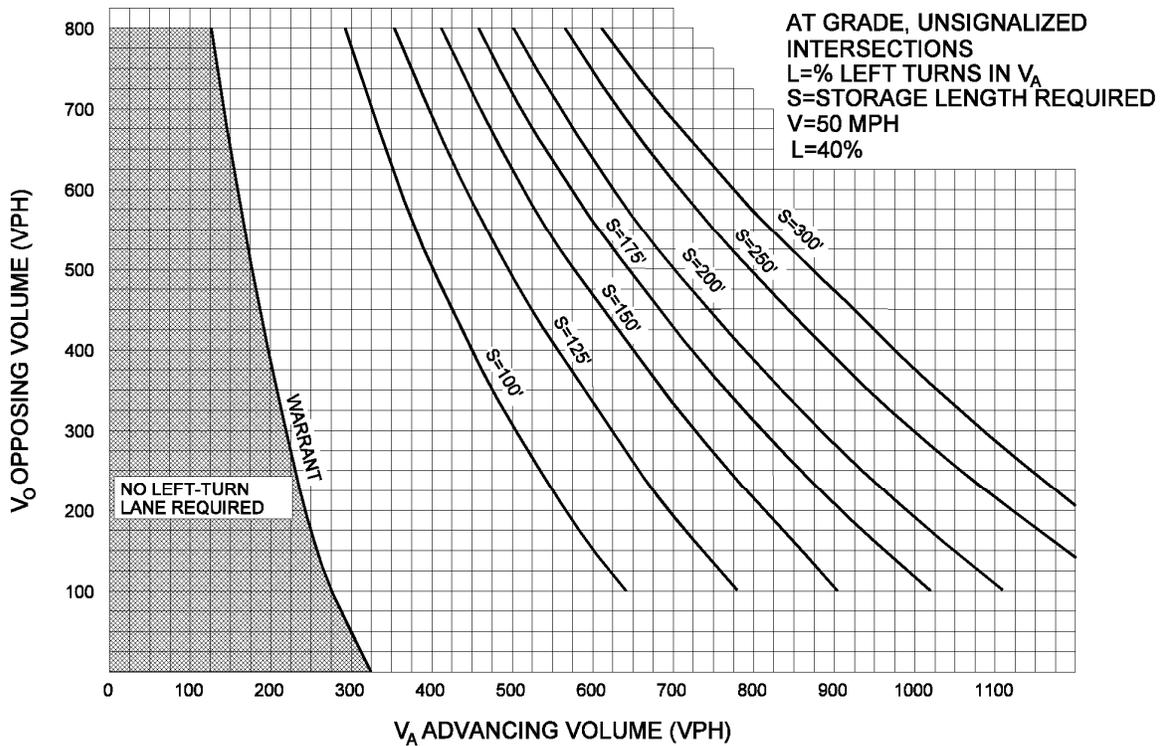


Figure 2-15f

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 50 mph and L = 40%)

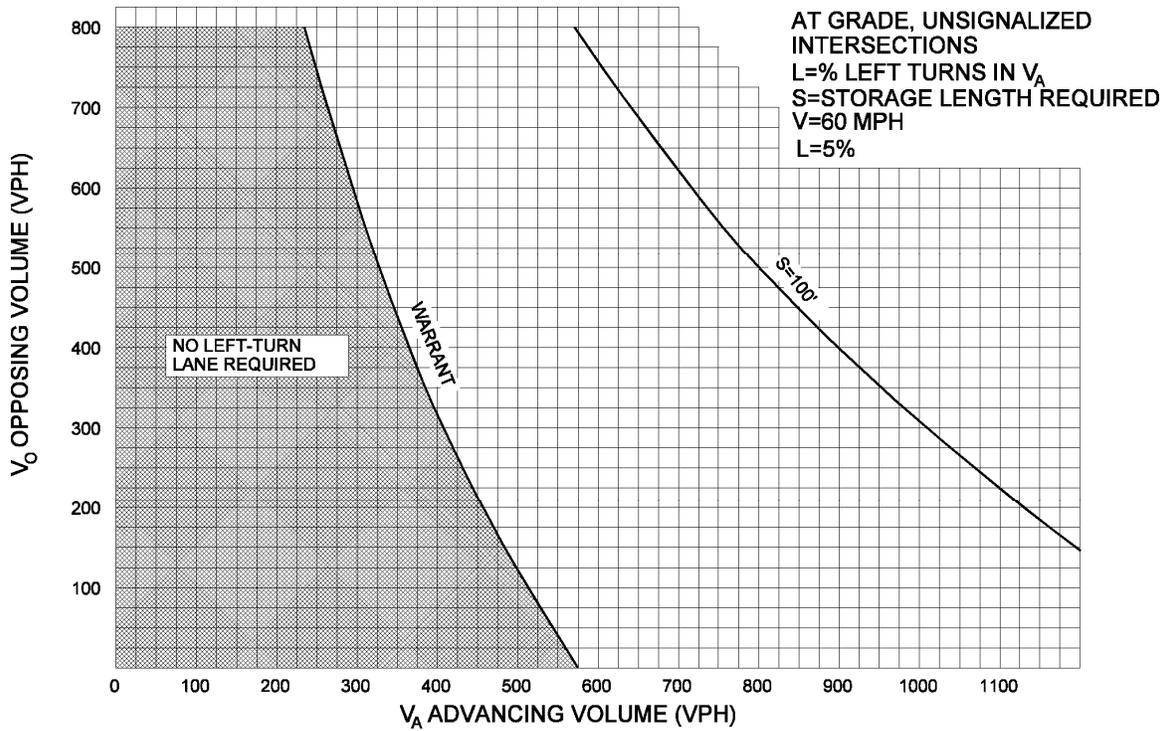


Figure 2-16a

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 60 mph and L = 5%)

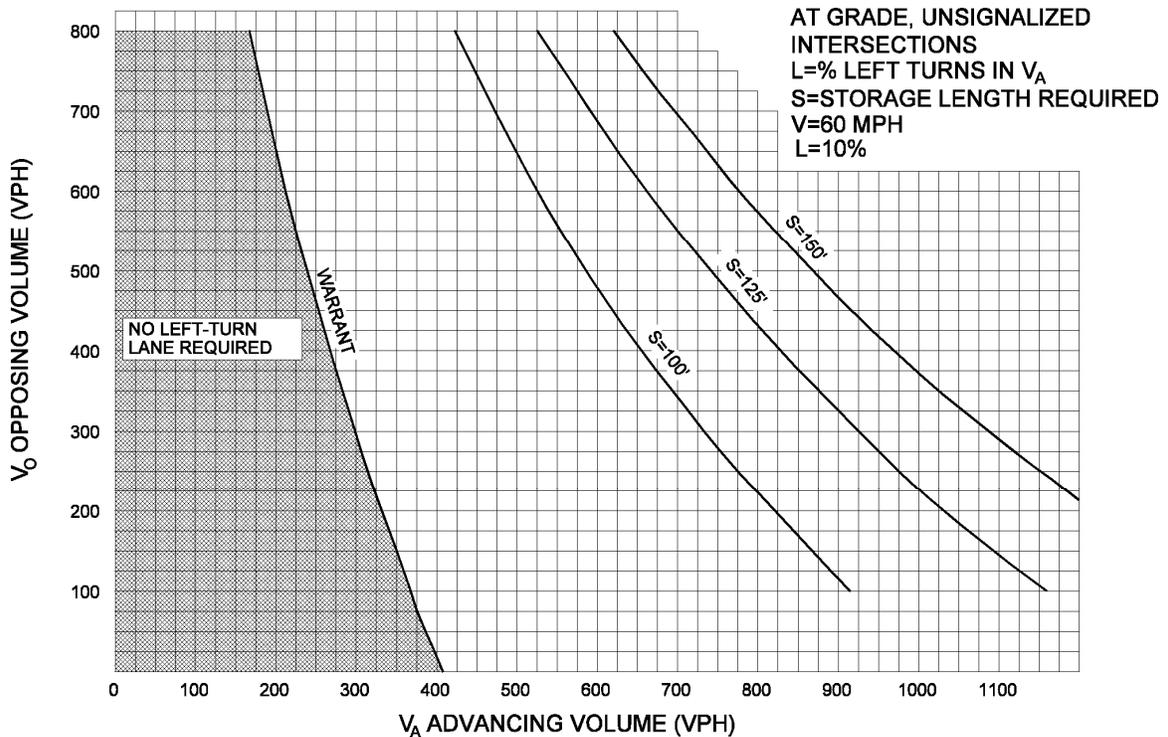


Figure 2-16b

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 60 mph and L = 10%)

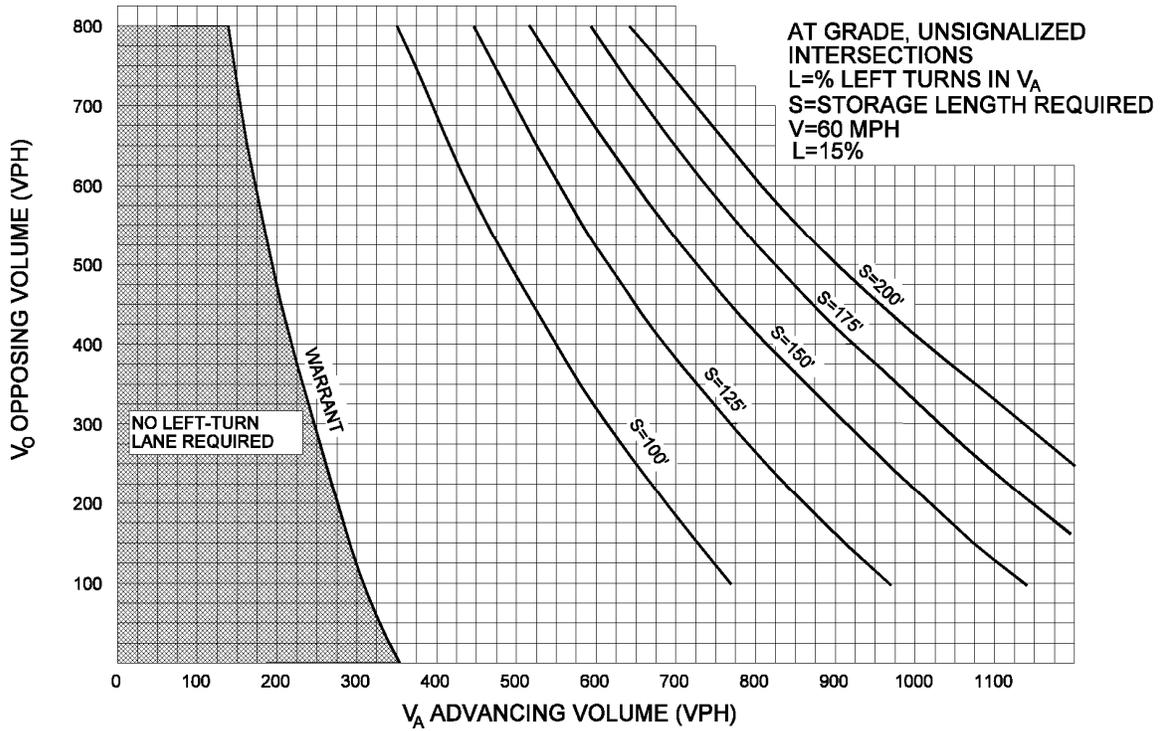


Figure 2-16c

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 60 mph and L = 15%)

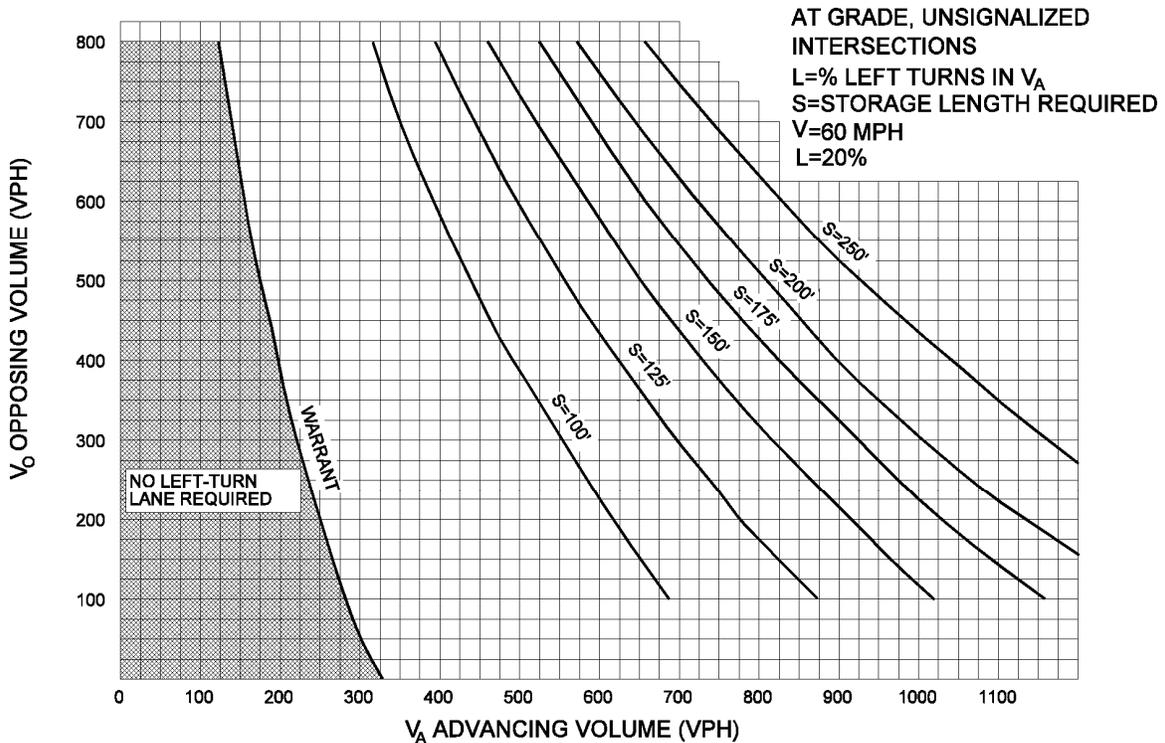


Figure 2-16d

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 60 mph and L = 20%)

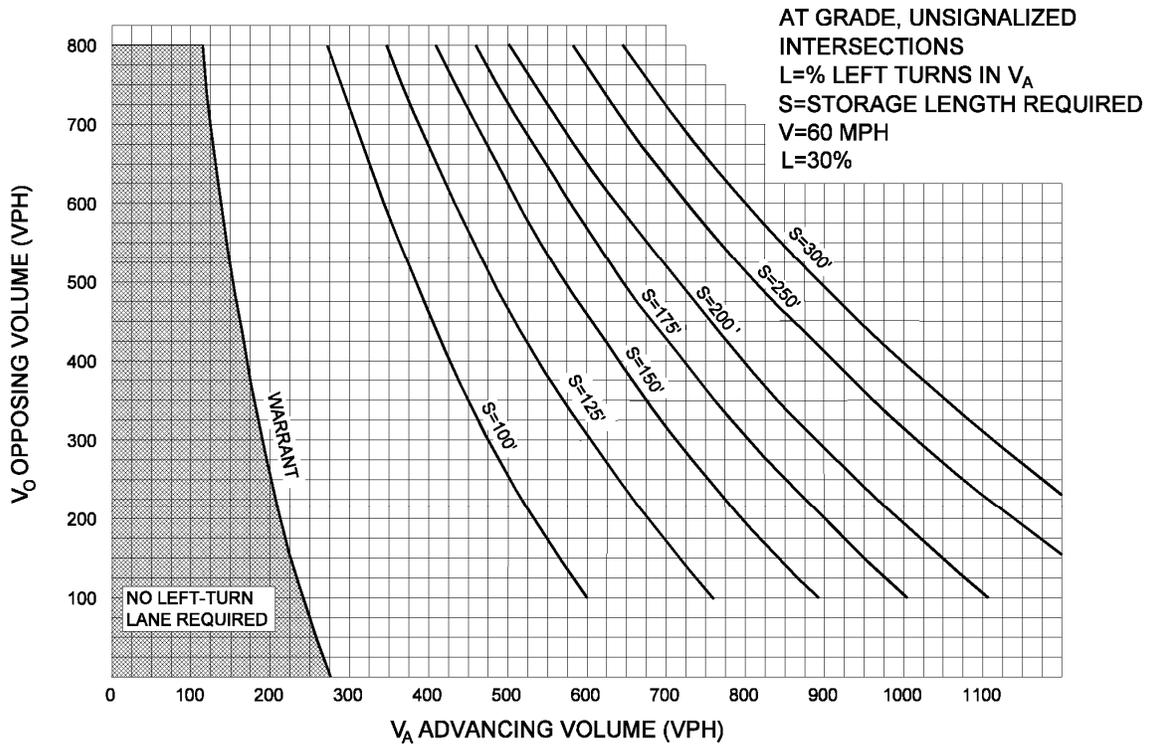


Figure 2-16e

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 60 mph and L = 30%)

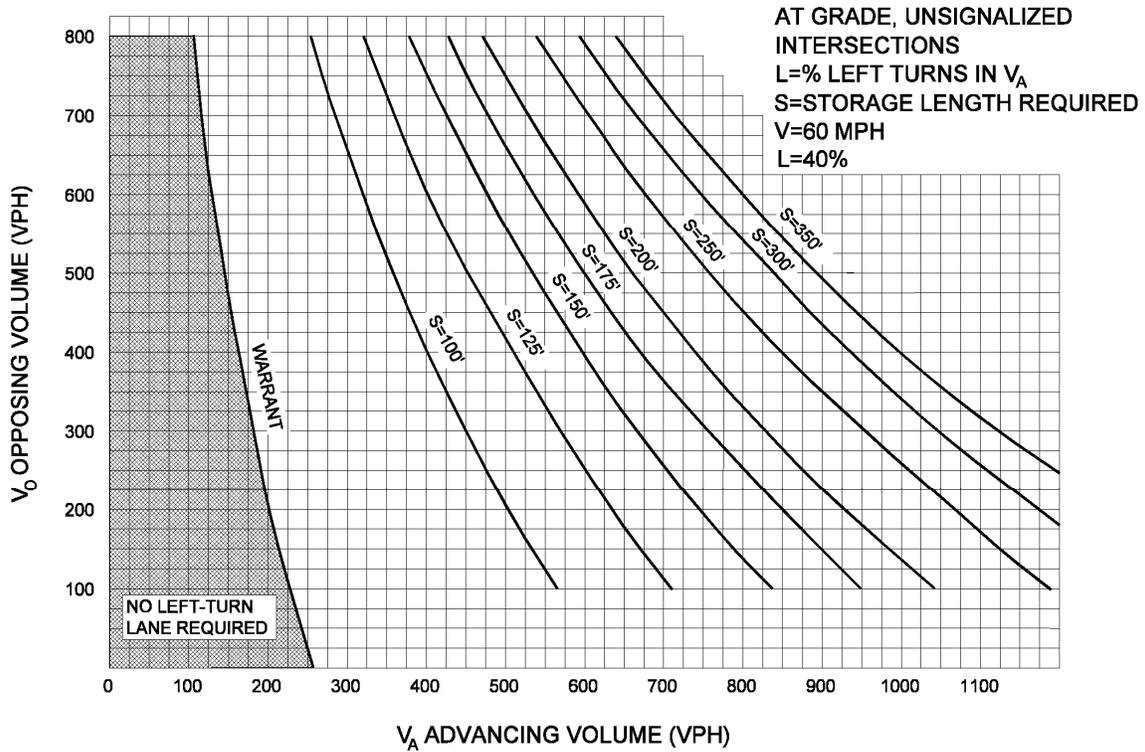


Figure 2-16f

Warrant for Left-Turn Storage Lanes on Two-Lane Highways (V = 60 mph and L = 40%)

2-175.00 GUIDELINES FOR DETERMINING AND PROPOSING RETAINING WALLS

For all design projects that contain retaining walls or that could potentially contain retaining walls, the responsibilities of the Design Division in relation to proposing a retaining wall design shall be as follows:

1. During the development of many roadway design projects, proposing a retaining wall is necessary due to right-of-way limitations, environmental impacts, drainage issues, or the need to reduce damage to adjacent properties. In most cases, a cost evaluation may be needed to justify a retaining wall. For those cases, the Designer should prepare a conceptual drawing in accordance with the Earth Retaining Structures Manual, Chapter 1, Section 3.0 - Conceptual Drawing Preparation. Right-of-way needs, including construction requirements, are to be clearly defined and shaded on the conceptual drawing and the roadway plans. Submit the conceptual drawing and plans to the Structures Division and Right-of-Way Division for cost estimates evaluating the economics of the proposed retaining wall.

After receiving the estimates, the Design Manager and the Designer determine if the retaining wall will be cost effective. If the retaining wall is cost effective or is required for other reasons or compelling factors such as environmental considerations, continue to prepare roadway plans with the retaining wall and complete step 2, below. When environmental factors are involved it may also be necessary to coordinate with the Environmental Division.

2. Submit the roadway plans and the conceptual drawing to the Structures Division, Hydraulic Section (if water is involved), and the Materials and Tests Division as appropriate. The submittal package should include the standard Letter of Transmittal provided in Appendix C of the Earth Retaining Structures Manual.

The flow chart in Figure 2-17 depicts the Design Division's responsibilities with regard to determining and proposing a retaining wall.

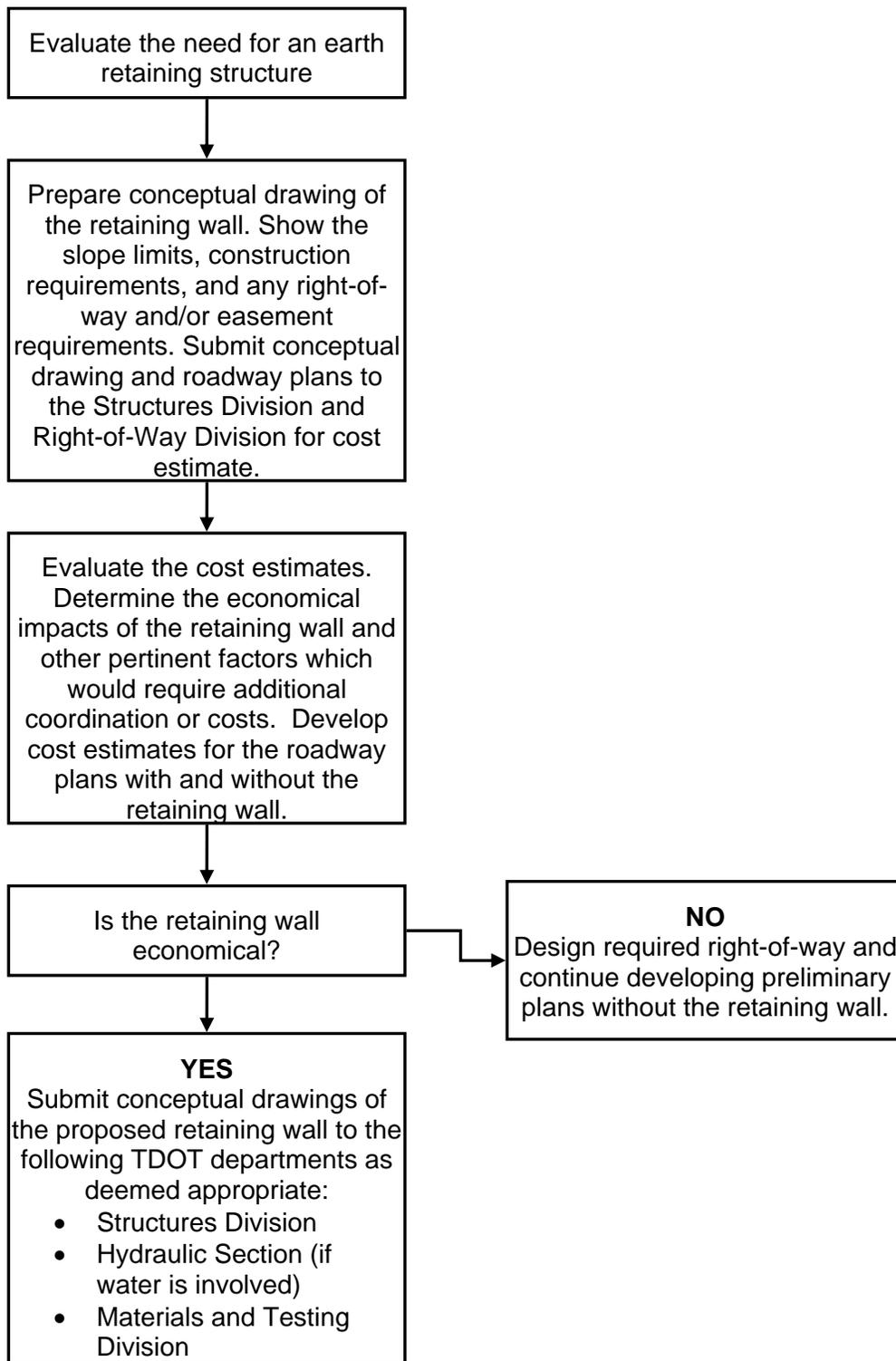


Figure 2-17
Flow Chart for Determining and Proposing a Retaining Wall

2-180.00 LOCATION OF AUTOMATIC TRAFFIC RECORDERS (ATR) AND ROADWAY WEATHER INFORMATION SYSTEMS (RWIS) ON PROJECTS

In order to avoid damage to Automatic Traffic Recorder (ATR) and RWIS Weather Station (RWIS) equipment that might be located within the limits of TDOT projects, the Design Division has been requested to identify equipment for ATR's or RWIS's located within the project limits during development of project plans. On projects developed in-house, it will be the responsibility of the designer to make this determination. On projects developed by consultants, it will be the responsibility of the TDOT Design Manager.

To determine whether an ATR is located within a project, check TRIMS using the standard query "ATR Locations" (statewide) or "ATR Locations by Region". The county, route and log mile location for each respective ATR is listed. Please note that if you use the "ATR Locations by Region" query you must enter the correct region number under Value in the criteria window at the bottom. The query will also provide RWIS Weather Station information if a RWIS is also located at the ATR location.

If an ATR is found within a project, notify Director of Project Planning Division, at (615) 741-2208 with a description of the proposed work in the vicinity of the ATR location. If the work on the project is likely to affect the operation of the ATR equipment, the roadway designer will be given a list of item numbers and descriptions for inclusion in the construction plans quantity block.

To determine whether a RWIS Weather Station is located within a project, check TRIMS using the standard query "RWIS Locations". The county, route and log mile for each RWIS location is listed statewide. The query will list stand alone RWIS sites and RWIS sites located at ATR locations.

If a RWIS is found within a project, notify the Manager of Maintenance Division at (615) 532-3825. He will determine if the equipment will be affected by the work and arrange for the equipment to be replaced or advise the designer of appropriate items to include the plans to replace the affected equipment.

If inclusion of construction items is required and the project includes any traffic signal work, notify the Manager of Traffic Design Section, at (615) 741-5265 in order to avoid possible duplication of construction items.

CHAPTER 2 - DRAINAGE

In order to assist the designer performing drainage and hydrologic design, the Design Division has developed a Drainage Manual to provide a collection of applicable drainage criteria, policies and examples. The Manual discusses Tennessee Department of Transportation policies, practices and procedures for performing drainage design and hydraulic analyses on projects that are the responsibility of TDOT.

Designers shall use Chapters 1-10 of the Design Division Drainage Manual for all projects designed or constructed by TDOT. These chapters include:

- Chapter 1 Introduction
- Chapter 2 General Drainage Polices and Practices
- Chapter 3 Drainage Plan Requirements
- Chapter 4 Hydrology
- Chapter 5 Roadside Ditches and Streams
- Chapter 6 Culverts
- Chapter 7 Storm Drainage Systems
- Chapter 8 Stormwater Storage Facilities
- Chapter 9 Energy Dissipators
- Chapter 10 Erosion Prevention and Sediment Control

Limited copies of the manual will be distributed for internal use only. Consultants and other interested persons may download the Manual from the TDOT Internet site. The Manual can be found at:

http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/DrainManChap%201-10.htm

2-200.00 COMPUTATION OF DRAINAGE

See Chapter 4 of the Drainage Manual.

2-200.05 DRAINAGE TABLES AND CHARTS

See Chapter 4 of the Drainage Manual.

2-200.10 EXAMPLE DRAINAGE PROBLEMS

See Chapter 4 of the Drainage Manual.

CHAPTER 3 - RIGHT -OF-WAY

2-300.00 R.O.W. NOTES FOR ALL R.O.W. PROJECTS (See 3-305.00)

All the notes below, which apply, will be put on the first property map sheet or first present layout sheet of the Right-of-Way Plans.

1. It is intended that all buildings and/or portions of buildings that are within the proposed right-of-way and/or easement lines for the project, be removed in the process of right-of-way acquisition. If any such buildings or improvements are not removed in the course of right-of-way acquisition, the Design Manager, Design Division (and Design Manager, Regional Design Office, if plans are being developed in the Regional Office) is/are to be notified in sufficient time to permit having such removals designated as a part of the construction contract.
2. All ramps must conform to the Department's "Policy on Financing Construction on Public Road Intersections and Driveways on Highway Resurfacing, Reconstruction and Construction Projects on New Locations", *The Manual on Rules and Regulations for Constructing Driveways on State Highway Right-of-Way, Standard Drawing RP-R-1*, and other accepted design and safety standards.

2-300.05 R.O.W. NOTES ON PLANS REGARDING DRIVEWAYS (See 3-305.05 and 3-310.00)

See Figures 2-18 through 2-20 for examples of how to show driveways on plans.

All ramp profiles (private drives, field entrances, business entrances, private and public side roads) shall be drawn on reproducible photographic mylar cross-section sheets.

All the notes below, which apply, will be put on the first property map sheet or the first present layout sheet of the Right-of-Way Plans.

1. New or Reconstruction Projects - with partial access control -
 - A. Existing paved driveway per tract remainder will be replaced in-kind to a touchdown point.
 - B. Where the existing driveway is unpaved and the proposed driveway exceeds 7 percent in grade, each driveway will be paved to a touchdown point or until the grade is less than 7 percent.
 - C. Where the existing driveway is unpaved and the proposed driveway is less than 7 percent in grade, each driveway will be paved a shoulder width from the edge of pavement and the remainder of that driveway replaced in-kind to a touchdown point.
 - D. Any necessary paving of driveways will be done during paving operations on the main roadway.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

- E. Tract remainders not having an existing driveway will be provided a 50-foot opening in the access control fence, and a driveway will be constructed unless access is provided from an intersecting road or based on physical conditions and/or conflicts with other design considerations which prevent an access opening. Paving of these new driveways will be in accordance with the 7 percent criteria previously mentioned for existing driveways.
2. New or Reconstruction Projects - with no access control -
- A. Existing paved driveway per tract remainder will be replaced in-kind to a touchdown point.
 - B. Where the existing driveway is unpaved and the proposed driveway exceeds 7 percent in grade, each driveway will be paved to a touchdown point or until the grade is less than 7 percent.
 - C. Where the existing driveway is unpaved and the proposed driveway is less than 7 percent in grade, each driveway will be paved a shoulder width from the edge of pavement and the remainder of that driveway replaced in-kind to a touchdown point.
 - D. New driveways provided in the plans will be paved based on the 7 percent criteria. Those 7 percent or steeper in grade will be paved and those flatter than 7 percent will be covered with base stone.
 - E. Any necessary paving of driveways will be done during paving operations on the main roadway.
 - F. Additional driveways and field entrances other than those provided in the plans shall require a permit on a state route.
 - (1) On projects without curb and gutter, it will be the responsibility of the owner to secure a permit and to construct additional desired driveways.
 - (2) On projects with curb and gutter, it will be the responsibility of the owner to secure a permit. After the permit has been granted, the Department will construct the driveway or field entrance through the curb and sidewalk, provided the curb and sidewalk have not been constructed. It will be the responsibility of the property owner to construct the driveway from back of sidewalk to the touchdown point.
 - G. On non-state routes additional driveways and field entrances other than those provided in the plans shall require a permit only if the local agency specifies the need for that permit.

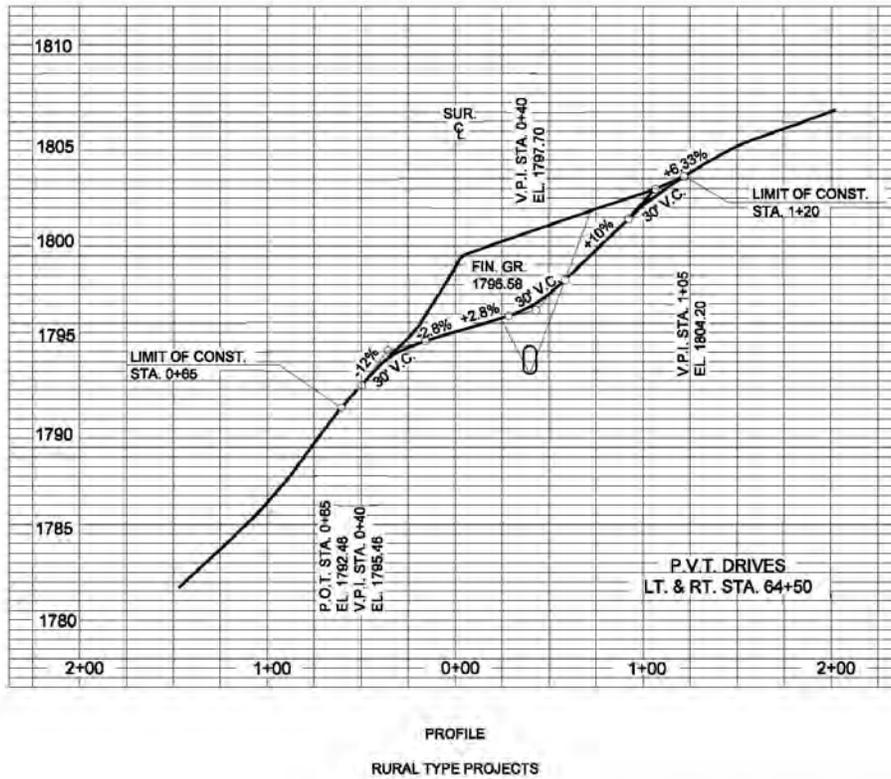
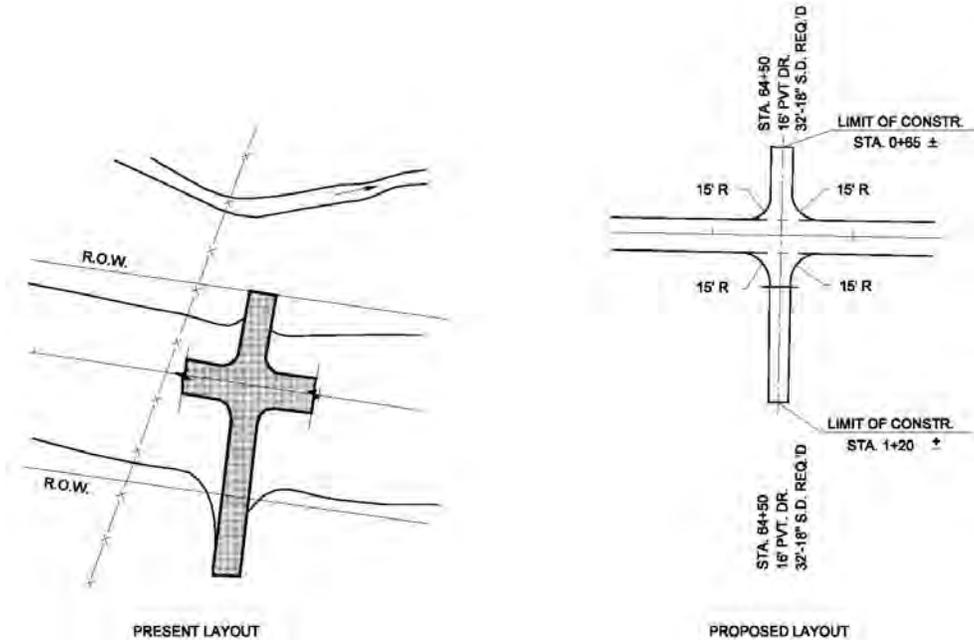


Figure 2-18
Rural Type Projects Typical Driveway Notation

Note: This figure is for layout procedure purposes only. Please refer to manuals and standards for design information.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

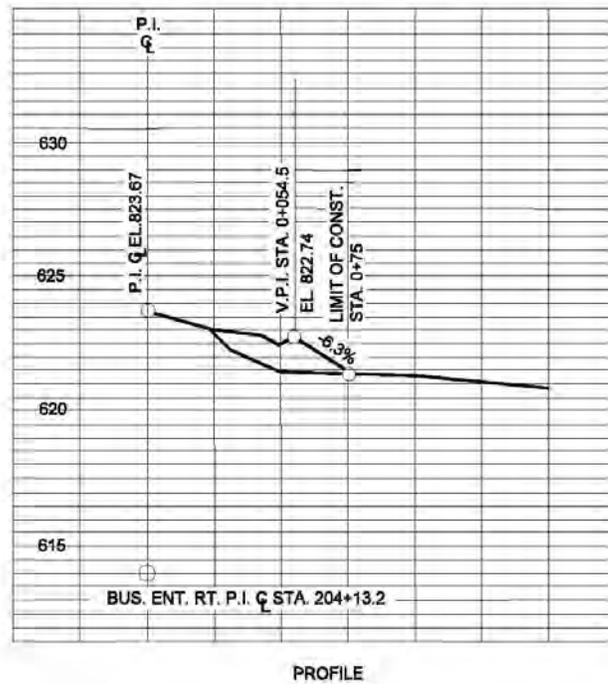
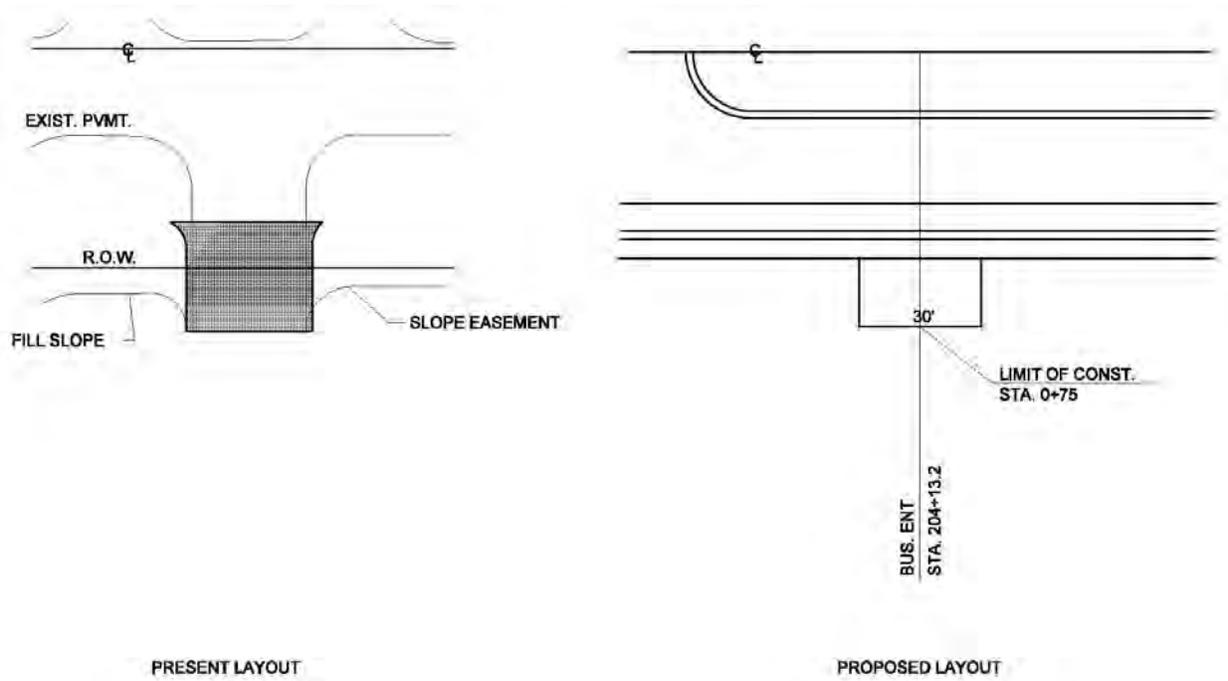


Figure 2-19
Urban Type Projects Typical Driveway Notation

Note: This figure is for layout procedure purposes only. Please refer to manuals and standards for design information.

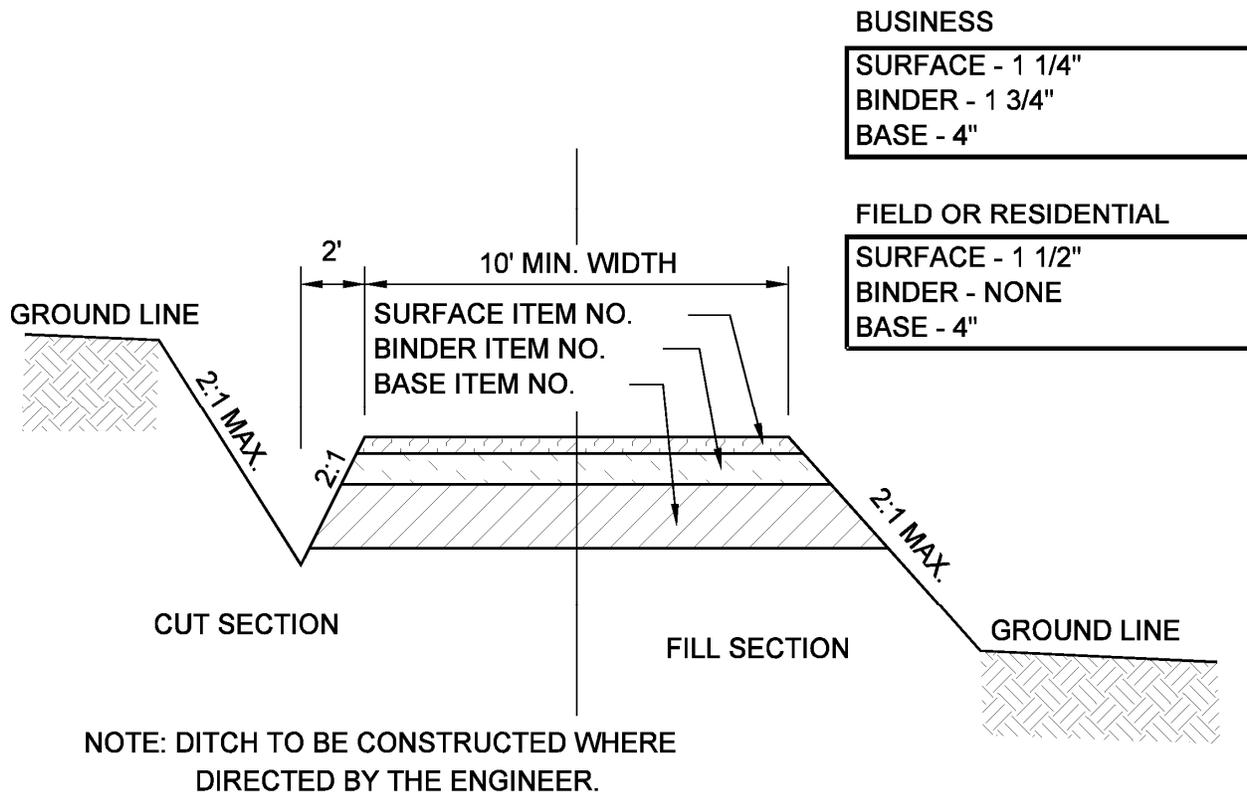


Figure 2-20
Typical Section Private Drive to Business, Field, or Residential Property

NOTES TO DESIGNERS:

1. Driveway design shall be in accordance with the State of Tennessee *Rules and Regulations for Construction of Driveways on State Highway Right-of-Way*.
2. Where surface of existing drive is concrete, substitute 6 inches of concrete for base and surface.
3. For curb and gutter sections, this typical section is to begin at the back edge of the proposed or future sidewalk. See Standard Drawings RP-D-15 and RP-D-16 for design of drives from curb line to back of sidewalk.
4. If an existing drive is greater than 10 feet, the width of the proposed drive shall be equal to the existing width; but not greater than the maximum allowable width as specified in the rules and regulations.
5. If existing drive is gravel, surfacing will be for one shoulder width. The remainder of the drive will be replaced with gravel to the touchdown point.

2-300.10 GUIDELINES FOR CONSTRUCTION AND RESURFACING OF PUBLIC ROAD INTERSECTIONS AND DRIVEWAYS ON HIGHWAY PROJECTS

I. GENERAL

This is a general guide for designers and departmental staff to use in developing project plans. Driveway installations on highway rights-of-way by individuals, firms, and corporations for each property are governed by TCA §54-5-301 through 54-5-303 and *Rules and Regulations for Construction of Driveways on State Highway Right-of-Way* (Rev. Jan. 1, 1967). Locations of driveways on new construction are also guided by the above Rules. In an effort to provide statewide uniformity, all future resurfacing, reconstruction and projects on new location shall include public road intersection and driveway construction in accordance with the provisions of this Guideline.

II. DEFINITION OF TERMS

Paved Shoulder Width - The width of the shoulder paved as part of the project.

Paver Width - The width of asphalt paving machine used on mainline paving with maximum width not to exceed 12 feet or to extend beyond right-of-way limit.

Normal Right-of-Way - An imaginary line which, when projected through a public road intersection, would enclose the normal slopes of the highway.

III. RESURFACING

A. Where directed by the TDOT Engineer, the Contractor shall be required to shape public side roads, business entrances, and private drives, as well as clean existing drains before placing materials. All costs are to be included in the price bid for other items of construction.

B. Resurfacing projects on roadways with shoulders and ditches (no curb or gutter):

1. All public side roads shall be paved one paver width through the intersection as a minimum. A satisfactory transition from the new pavement to the existing grade of the intersecting public road or business entrance shall be provided. Should the pavement of the intersecting public road be distressed, the resurfacing width may be increased to the normal right-of-way line.

2. Private driveways, field entrances, and business entrances will be resurfaced a paver width (lane width) as a minimum. A pavement taper to transition the new pavement shall be required, it shall be based on an additional 1 foot of width per inch depth of pavement. If the shoulder is narrow enough that the sum of the shoulder and the transition are less than a paver width (lane width), the transition shall occur within the paver width. If the sum of the shoulder and the transition is greater than a paver width (lane width), the transition shall occur outside of the paver width.

- C. Resurfacing projects on roadway with urban curb and gutters
 - 1. Public road intersections shall be resurfaced to the end of the radius. A satisfactory transition from the new pavement to the existing grade of the intersecting public road shall be provided.
 - 2. Residential driveways and business entrances shall have a minimum width of material not less than one foot used in the transition to feather the pavement edge.
- D. In all cases, the length of the pavement transition, the thickness and width of the resurfacing and any additional pavement materials shall be as directed by the TDOT Engineer.

IV. NEW OR RECONSTRUCTION

- A. Facilities with Full Access Control
 - 1. Full access control will be maintained for the entire designated project limits.
- B. Facilities with Limited Access Control
 - 1. Access will be allowed at public roads and streets only. No driveways will be permitted access to the mainline project.
- C. Facilities with Partial Access Control - driveways permitted:
 - 1. Fence Opening:

One 50-foot opening in the control access fence will be provided per tract remainder, unless access is provided from an intersecting road or based on physical conditions and/or conflicts with other design considerations, which prevent an access opening.
 - 2. Existing Driveways:

Existing paved driveway per tract remainder will be replaced in-kind to a touchdown point.

Where the existing driveway is unpaved and the proposed driveway exceeds 7 percent in grade, each proposed driveway will be paved to a touchdown point or until the grade is less than 7 percent.

Where the existing driveway is unpaved and the proposed driveway is less than 7 percent in grade, each proposed driveway will be paved a shoulder width from the edge of pavement and the remainder of that driveway replaced in-kind to a touchdown point.
 - 3. Requirements for field entrances and/or other driveways:

New driveways provided in the plans will be paved based on the 7 percent criteria. Those 7 percent or steeper in grade will be paved and those flatter than 7 percent will be covered with base stone.

Field entrances provided in the plans will be covered with base stone.

Normally, one field entrance or driveway, whichever is appropriate, per tract remainder will be provided except in the following circumstances:

- a. In the project's preconstruction condition, there is a barrier to access such as a substantial cut, fill, ditch or curb.
- b. A non-gated fence where the existing frontage is totally fenced.
- c. In the project's post-construction condition, there is a substantial cut, fill, or ditch.

Also, small remainders and damage considerations are to be reviewed by the Design Division and the Right-of-Way Office to determine if a proposed driveway or field entrance is justified. The location, design and method of surfacing of the field entrance or driveway must be in accordance with the previously mentioned Rules. If the landowner does not desire a driveway, then it will not be included in the project.

4. All public roads will be paved to a touchdown point.

D. Non-Access Control Facilities

1. Existing paved driveways will be replaced in-kind to a touchdown point.
2. Where the existing driveway is unpaved and the proposed driveway exceeds 7 percent in grade, each proposed driveway will be paved to a touchdown point or until the grade is less than 7 percent.
3. Where the existing driveway is unpaved and the proposed driveway is less than 7 percent in grade, each proposed driveway will be paved a shoulder width from the edge of pavement and the remainder of that driveway replaced in-kind to a touchdown point.

4. Requirements for field entrances and/or other driveways:

New driveways provided in the plans will be paved based on the 7 percent criteria. Those 7 percent or steeper in grade will be paved and those flatter than 7 percent will be covered with base stone.

Field entrances provided in the plans will be covered with base stone.

Normally, one field entrance or driveway, whichever is appropriate, per tract remainder will be provided except in the following circumstances:

- a. In the project's preconstruction condition, there is a barrier to access such as a substantial cut, fill, ditch or curb.
- b. A non-gated fence where the existing frontage is totally fenced.
- c. In the project's post construction condition, there is a substantial cut, fill, or ditch.

Also, small remainders and damage considerations are to be reviewed by the Design Division and Right-of-Way Office to determine if a proposed driveway or field entrance is justified. The location, design and method of surfacing of the field entrance or driveway must be in accordance with the previously mentioned Rules. Variances may be permitted due to the proximity of existing drives to property lines. No drives will be allowed in radii. If the landowner does not desire a driveway, then it will not be included in the project.

5. All public roads will be paved to a touchdown point.

In order to assist local governments with compliance with the Americans with Disabilities Act, it will now be the department's intent to repair or install curb ramps which meet the Americans with Disabilities Act Accessibility Guidelines whenever possible as we encounter them through resurfacing.

While according to TCA §54-5-202, the department is responsible, when resurfacing or performing any maintenance work on a roadway, for work from "curb to curb", due to the limited resources of some localities, the department will attempt to install or repair curb ramps whenever possible and funds are available.

The local governments is still responsible for maintaining the sidewalks, curb ramps, etc.

2-310.00 ACCESS CONTROL - CROSSROADS AT INTERCHANGES

The extent of the access control for rural highways will be 300 feet from the ramp terminal, treating each side of the crossroad independently. Thus, where the interchange ramp terminals at the crossroad are not opposite each other, the limits of access control will not be opposite; each being 300 feet from the ramp terminal which governs. For urban highways, the extent of access control shall be 100 feet.

2-315.00 TRAFFIC SIGNAL AND LIGHTING DESIGNS FOR ROADWAY PROJECTS

(See 3-140.00, 3-400.05, 3-400.15, 4-145.00, 4-714.00 and 4-730.10)

The following steps are to be followed in order to assist the Design Traffic Engineering Section in providing signalization and lighting designs in a timely manner as well as to allow the Design Traffic Engineering Section to schedule its work efficiently.

- A. When the APR indicates that signalization and/or lighting is required on a project, or if signalization and/or lighting is not included in the APR, but there is suspicion that signals and/or lighting may be involved in a project, the Design Traffic Engineering Section shall receive plans two weeks prior to the Preliminary Field Review in order to schedule this work with other duties. Designers are reminded that all available design traffic data (including ADT's, DHV's, Design Speed, and traffic turning movements at all intersections) shall be included in the preliminary plans. The Design Traffic Engineering Section will respond to the designer indicating where signalization is warranted, or if no signalization will be involved, give any comments pertaining to geometric improvements that will provide better operations characteristics.
- B. For Right-of-Way or Utility Plans, the designer shall submit electronic files through disks or E-mail no later than four weeks prior to the Right-of-Way Field Review or Utility Plans Submittal. These electronic files shall adhere to the following stipulations:
 - 1. These files shall consist of a Alignment File, a Survey File, and a Proposed Final (merged) .tin and .gpk files.
 - 2. No other files shall be submitted unless specifically requested by the Design Traffic Engineering Section, Signal and Lighting Office.
 - 3. All files shall follow the naming convention set forth in the *Survey and Design Computer-Aided Drafting Standards*.
 - 4. The working units of all these files shall coincide with the working units set forth in the *Survey and Design Computer-Aided Drafting Standards*.
 - 5. All files shall be in DGN format.

The Design Traffic Engineering Section, Signal and Lighting Office will provide support pole and lighting pole locations and related information for the Right-of-Way Plans (or Utility Plans).

- C. For Construction Plans the designer shall resubmit the Work File through disks or E-mail no later than four weeks prior to the Construction Field Review to ensure

that the latest changes will be reflected on the signal and/or lighting layout. The previously stated stipulations shall apply to the submittal of the new Work File to be used for the Construction Plans.

- D. The Design Traffic Engineering Section, Signal and Lighting Office will then complete and submit final signal and/or lighting design, quantities, standard drawings, and applicable notes for Construction Plans assembly.

2-315.05 ROADWAY LIGHTING INFORMATION FOR RIGHT-OF-WAY/UTILITIES

(See 3-140.00, 3-400.05, 3-400.15, 4-145.00 and 4-714.00)

When the Advance Planning Report (APR) indicates that lighting is required on a project, the designer shall furnish the Design Traffic Engineering Section, Signal and Lighting Office with a set of prints and request a pole location layout. These prints shall be furnished by the designer at the "preliminary plans" stage of project development to ensure that the utility requirements will be shown on the plans for the Right-of-Way Field Review.

If there is no right-of-way acquisition required on the plans, but lighting is required, the designer shall furnish the Design Traffic Engineering Section, Signal and Lighting Office with a set of prints of the plans as soon as the present and proposed layout sheets are drawn and request the light pole locations.

2-320.00 EASEMENTS - GENERAL (See 3-300.05)

The Right-of-Way Acquisition Table shall have three columns for easements. The first column shall be for Permanent Drainage Easements, the second column shall be for Slope Easements, and the third column shall be for Construction Easements.

Figure 2-21 is a model R.O.W. Acquisition Table.

Figure 2-22 demonstrates how to show various easements on the plans.

2-320.05 PERMANENT DRAINAGE EASEMENT ON PLANS (See 2-200.00)

Slope and Construction Easements shall not overlap Permanent Drainage Easements. The Permanent Drainage Easement shall extend from the Right-of-Way and have precedence over other easements.

Permanent drainage easements may be appropriate for channel changes and realignments or ditches where no ditch existed before the proposed project.

Permanent drainage easements will be required for ponding occurring outside the right-of-way, as discussed elsewhere in this document.

On urban curb and gutter roadway sections, when catch basins must be located outside the right-of-way line to eliminate ponding or when a cross drain pipe and headwalls are installed outside the right-of-way line, permanent drainage easements shall be set up for these structures. Good engineering judgment must be exercised regarding the amount of drainage easement taken.

Riprap, for the protection of proposed structures that are outside of the right-of-way, shall be located within a permanent drainage easement.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

There may be isolated instances where permanent drainage easements may be required for other reasons. In these instances, the Right-of-Way Division's concurrence shall be required.

R.O.W. ACQUISITION TABLE

TRACT NO.	PROPERTY OWNERS	COUNTY RECORDS				TOTAL AREA (ACRES)			AREA TO BE ACQUIRED (ACRES)			AREA REMAINING (ACRES)			EASEMENT (SQUARE FEET)		
		TAX MAP NO.	PARCEL NO.	DEED BK.	PAGE	LEFT	RIGHT	TOTAL	LEFT	RIGHT	TOTAL	LEFT	RIGHT	PERM. DRAIN.	SLOPE	CONST.	
1	BERT C. NICHOLSON	42	8	16	142											0.138 AC	
2	GINGER BURCHETT	42	9	24	216											2.807	
3	GLENN LADD	42	10	30	123	42,006		42,006	3,279		3,279	38,727				0.97	
4	IRENE S. MONK	42	11	77	289		52,098	52,098		2,099 S.F.	2,099 S.F.	52,052					
5	ROBERT L. BRYANT	42	12	63	352	36,699	58,965	95,664	10,146	9,244	19,39	26,553	49,721				

① FOR CONSTRUCTION OF DETOUR

② FOR CONSTRUCTION OF DRAINAGE DITCH

③ FOR CONSTRUCTION OF RETAINING WALL

NOTE: EASEMENT AREAS SHOULD BE SHOWN IN ACRES AND NOTED AS SUCH WHEN GREATER THAN 0.1 ACRES SQUARE FEET. AREAS ACQUIRED AND REMAINING SHOULD BE SHOWN IN SQUARE FEET AND NOTED AS SUCH WHEN LESS THAN 0.1 ACRES. IN URBAN PROJECTS THE PREDOMINANT UNITS FOR AREA ACQUIRED AND REMAINING SHOULD BE SHOWN IN SQUARE FEET.

Figure 2-21
Typical R.O.W. Acquisition Table

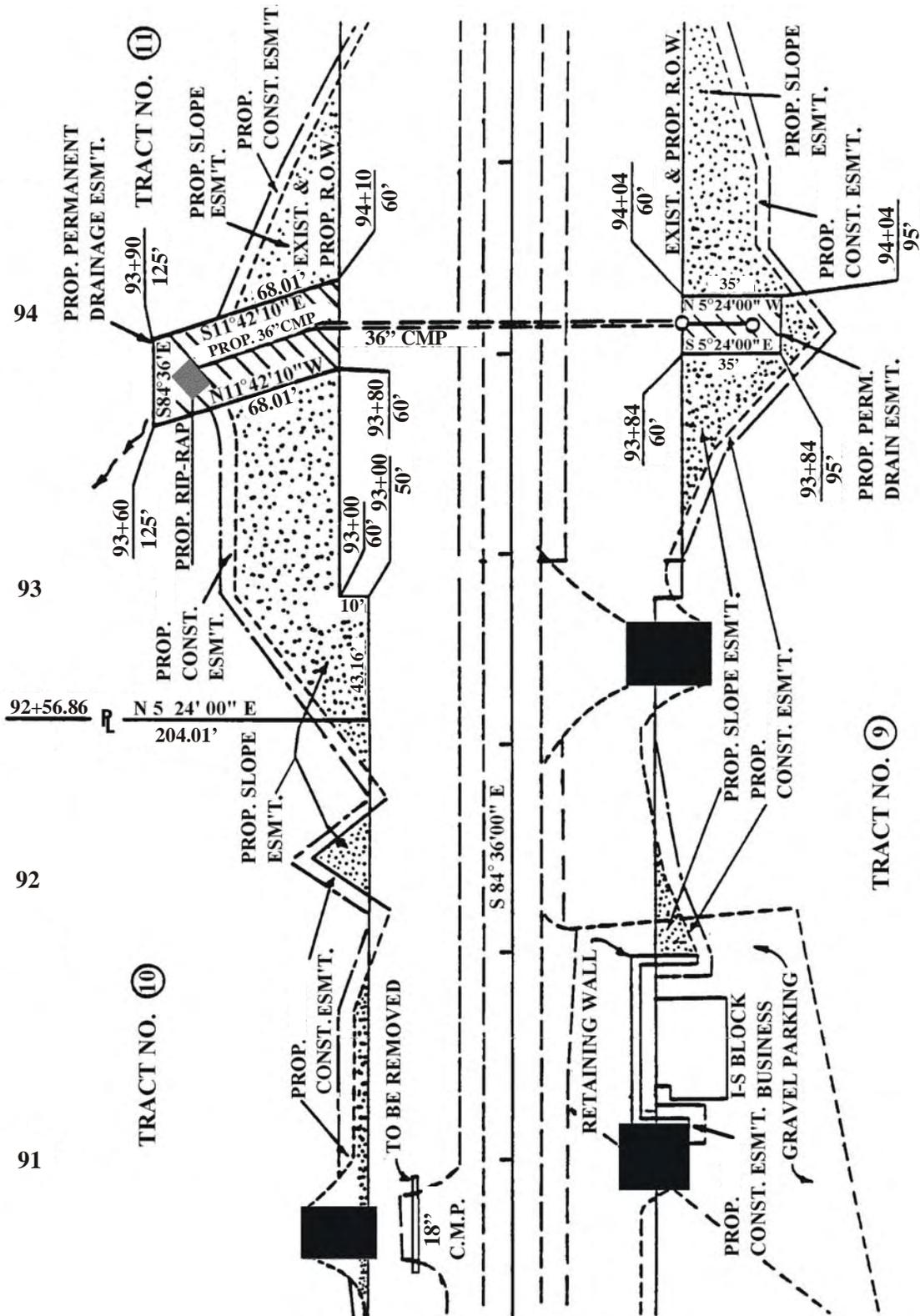


Figure 2-22
Guide for Showing Various Easements in Plans

2-320.10 SLOPE EASEMENTS

The Slope Easement column shall contain only that area outside the right-of-way, required for slopes.

2-320.15 CONSTRUCTION EASEMENTS

All easement areas that do not go in the Drainage Easement or Slope Easement columns, such as detours, some drainage ditches and channel improvements (such as widening or bank stabilization with riprap), locations where a ditch or channel already exists, sediment basins and other erosion prevention and sediment control areas, working room for retaining walls and permanent easement on railroad right-of-way, shall be placed in the construction easement column and footnoted as appropriate.

A 10-foot construction easement, for working outside slope easements, is to be shown on the plans sheet. This construction easement may be reduced or eliminated as necessary to avoid trees, buildings, etc. It may be necessary to increase the easement size to allow for pollution control structures and high fills.

2-320.20 PRELIMINARY RIGHT-OF-WAY ESTIMATE FROM PRELIMINARY FIELD REVIEW PLANS

Design will provide preliminary acquisition areas and slope easement areas to the Right-of-Way Division so that a preliminary right-of-way estimate can be developed. Design managers will be responsible for furnishing a copy of the R.O.W. Acquisition Excel File with acquisition areas and slope easement areas prior to scheduling the preliminary field review.

Designers shall calculate preliminary areas using the following procedure:

1. Calculate acquisition areas and slope easements with MicroStation's Measure Area tool using the Points or Flood methods. It is not necessary to store areas in the GEOPAK GPK file nor should time be spent defining shape elements in MicroStation for area calculations.
2. In the **R.O.W. Acquisition Excel File** provided by Survey and includes owner and tract information, enter the calculated square foot areas on the "DES IN" worksheet.
3. Make a copy of the Excel file and rename it using the State Route Number, County and Pin Number followed by the extension .xls. **Example: SR1Knox405132.00.xls**
4. Consultants shall provide the Excel file to the Design Manager. For projects developed in-house, the designer should submit the excel file to the e-mail address listed below with a copy of the e-mail being sent to the Design Manager.
5. Submit the Excel file via email as an attachment to Preliminary.AcquisitionTable@state.tn.us. Subject line for email should be Preliminary Areas-State Route #, County, PIN. **Example: Preliminary Areas, SR 1, Knox County, PIN 405132.00.**

2-325.00 RAILROADS (See 1-210.00, 1-210.05 and 1-210.10)

2-330.00 FIELD REVIEW PROCEDURES (See 1-120.00)

SECTION III - RIGHT-OF-WAY PLANS

CHAPTER 1 - GENERAL GUIDELINES

- 3-100.00 ROADWAY DESIGN CHECKLIST - R.O.W. PLANS**
- 3-102.00 SIZE OF FULL-SIZE PLAN AND CROSS-SECTION SHEETS**
- 3-105.00 IDENTIFICATION OF SUPERVISORS, DESIGNERS, AND CHECKERS ON TITLE SHEET**
- 3-105.05 SIGNATURES OF THE COMMISSIONER AND THE CHIEF ENGINEER ON TITLE SHEET**
- 3-105.10 CONSULTANT'S SEAL, SIGNATURE, AND DATE ON TITLE SHEET**
- 3-110.02 DESIGN EXCEPTION REQUESTS**
- 3-110.05 SOILS AND GEOLOGY REPORTS**
- 3-115.00 UPDATING SURVEYS**
- 3-120.00 REVISIONS ON UNECONOMIC REMNANTS**
- 3-125.00 PAVEMENT DESIGN REQUESTS**
- 3-125.05 PAVEMENT DESIGN - SELECTED BRZE AND BR-STP**
- 3-130.00 ABANDONMENT OF WATER WELLS**
- 3-140.00 FIELD REVIEW PROCEDURES**
- 3-145.00 NOTICE OF INTENT (NOI) FORM**

CHAPTER 2 - DRAINAGE

- 3-200.00 SELECTION OF PIPE MATERIALS**
- 3-200.05 COMPARISON OF LARGE PIPES WITH BOX CULVERTS**
- 3-200.10 BRIDGE END DRAINS**
- 3-200.30 USE OF TRENCH OR SLOTTED DRAIN PIPE**
- 3-205.00 END TREATMENT FOR CROSS DRAINS (UNDER MAINLINE)**
- 3-205.05 END TREATMENTS FOR CROSS DRAINS (UNDER PUBLIC SIDE ROADS)**
- 3-205.10 END TREATMENTS FOR SIDE DRAINS**

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

- 3-205.15 END TREATMENTS FOR MEDIAN DRAINS
- 3-205.20 PLACEMENT OF HEADWALLS ON CULVERTS
- 3-215.00 PLANS FORMAT FOR CROSS DRAINS
- 3-216.00 SUBMISSION OF ALL CULVERT SECTIONS
- 3-220.00 USE OF PIPE CULVERTS OTHER THAN "ROUND" PIPE
- 3-225.00 HYDRAULIC COMPUTATION RECORDS
- 3-230.00 IMPROVED INLET GUIDELINES
- 3-235.00 MANHOLES IN PAVEMENT AREA
- 3-236.00 COMPUTATION OF SIZE FOR CIRCULAR MANHOLES AND CATCH BASINS
- 3-240.00 STOCK PASSES
- 3-250.00 CATCH BASIN GRATE ELEVATIONS SHOWN ON THE PLANS
- 3-251.00 USE OF CATCH BASINS WITH STRUCTURAL STEEL GRATE UNITS
- 3-253.00 PERFORMANCE OF NUMBER 38, 39, 40, 42, 43 AND 44 AREA DRAINS IN SUMP CONDITIONS
- 3-255.00 SPACING BETWEEN CATCH BASINS FOR MAINTENANCE CLEAN OUTS
- 3-256.00 USE OF JUNCTION BOXES
- 3-260.00 ALTERNATING CATCH BASINS
- 3-261.00 USE OF NO. 6-72 CATCH BASINS
- CHAPTER 3 - PLANS DEVELOPMENT AND CALCULATIONS
- 3-300.00 AREAS SHOWN IN RIGHT-OF-WAY ACQUISITION TABLE
- 3-300.05 EASEMENT AREAS
- 3-305.00 R.O.W. NOTES FOR ALL R.O.W. PROJECTS
- 3-305.05 R.O.W. NOTES ON PLANS REGARDING DRIVEWAYS
- 3-305.06 NPDES PERMITTED PROJECTS
- 3-305.07 UTILITY RELOCATION NOTES ON EPSC PLANS
- 3-305.10 PRIVATE DRIVEWAYS SHOWN ON R.O.W. PLANS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

- 3-305.15 GUIDELINES ON CONSTRUCTION AND RESURFACING OF PUBLIC ROAD INTERSECTIONS AND DRIVEWAYS ON HIGHWAY PROJECTS
- 3-310.05 HANDICAP RAMPS
- 3-310.10 DRIVEWAY APRONS
- 3-315.00 CAPPING ROCK FILLS
- 3-315.05 TOPSOIL REQUIREMENTS FOR EARTHWORK BALANCES
- 3-315.10 SHRINKAGE AND SWELL FACTORS
- 3-315.15 EARTHWORK BALANCES IN PLANS
- 3-315.20 SUBMISSION OF GRADING QUANTITIES SHEETS
- 3-325.00 RAILROADS
- 3-330.00 PAVEMENT MARKINGS AND SIGNING ON INTERSTATE AND FULL ACCESS CONTROL ROADWAYS

CHAPTER 4 - PLANS SUBMITTALS

- 3-400.00 PRINTING FOR INCIDENTALS
- 3-400.05 PRINTING FOR "UTILITIES ONLY"
- 3-400.10 ADVANCE ACQUISITION PROJECTS
- 3-400.15 PRELIMINARY CONSTRUCTION QUANTITY ESTIMATES
- 3-400.20 RIGHT-OF-WAY FUNDING APPROVAL REQUESTS
- 3-400.25 PRINTING FOR ROW APPRAISALS AND ACQUISITION
- 3-400.30 DGN FILE DISTRIBUTION OF RIGHT-OF-WAY PLANS
- 3-400.35 ADDITION OF EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) PLANS INTO FIELD REVIEW AND FINAL ROW PLANS
- 3-400.40 ADDITION OF CONTOURS TO PLANS
- 3-405.00 RIGHT-OF-WAY REVISIONS
- 3-410.00 ENVIRONMENTAL PERMIT REQUIREMENTS
- 3-410.02 PLACEMENT OF TREES IN MITIGATION AREAS

SECTION III - RIGHT-OF-WAY PLANS

CHAPTER 1 - GENERAL GUIDELINES

- 3-100.00 ROADWAY DESIGN CHECKLIST - R.O.W. PLANS** (See 1-105.00)
- 3-102.00 SIZE OF FULL-SIZE PLAN AND CROSS-SECTION SHEETS** (See 2-112.00 and 4-112.00)
- 3-105.00 IDENTIFICATION OF SUPERVISORS, DESIGNERS, AND CHECKERS ON TITLE SHEET** (See 2-115.00)

The signature block in the lower left corner of the project title sheets shall conform to the samples shown in these guidelines.

- 3-105.05 SIGNATURES OF THE COMMISSIONER AND THE CHIEF ENGINEER ON TITLE SHEET** (See 4-115.05)

Please refer to the appropriate Instructional Bulletin for signatures on the title sheets for lettings, right-of-way submittals, and utility submittals.

- 3-105.10 CONSULTANT'S SEAL, SIGNATURE, AND DATE ON TITLE SHEET**

When a consultant submits plans for R.O.W. Appraisals and Acquisition, the consultant's seal, signature, and date shall be placed on the right side of the title sheet above the Chief Engineer's signature.

- 3-110.02 DESIGN EXCEPTION REQUESTS**

Despite the range of flexibility that exists with respect to the controlling elements of design, there are situations in which the accepted criteria are not applicable to the project circumstances or could not reasonably be met. For such instances, when it is appropriate, the design exception process allows for the use of criteria other than the accepted values.

The design exception process requires formal approval for exceptions relating to the following 13 controlling criteria: (1) design speed, (2) lane width, (3) shoulder width, (4) bridge width, (5) structural capacity, (6) horizontal alignment, (7) vertical alignment, (8) grades, (9) stopping sight distance, (10) cross slopes, (11) superelevation, (12) vertical clearance, and (13) horizontal clearance (other than the clear zone).

The approval authority for design exceptions on the Interstate System or the Appalachian Development Highway System is with the **FHWA Division Administrator**. The approval authority for design exceptions on any other system is with the **TDOT Director of the Design Division**.

Design exception requests for Interstate or Appalachian Development Highway System projects shall be submitted to the FHWA Division Administrator **from** the Director of the Design Division.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

All applicable material from the following list shall be addressed in narrative form on the **Design Exception and Justification Form**, shown in Figure 3-1, by the Design Division, Design Manager who is responsible for the design of the project for which the design exception request is made. For locally developed projects, the highest local official responsible for the project is responsible for this task.

1. Accident experience or data.
2. The effect of the variance from the design standard on safety and operation of the facility.
3. Any safety mitigation measures considered and provided to minimize the effect of the reduced design.
4. The compatibility of the design and operation with adjacent sections.
5. The comparative cost of the full standard versus the lower design being proposed.
6. The long term effect of the reduced design as compared to the full standard.
7. The difficulty in obtaining the full standard such as right-of-way restriction, delays, environmental impacts, etc.
8. Any capacity reductions or operational problems caused by the proposed exception.
9. Level of service for full standards versus the reduced design.
10. The cumulative effect of more than one standard that is being reduced.
11. The possibility of improving or correcting the reduced design feature in the future.

The completed design exception including any attachments shall be submitted to the appropriate Assistant Director (C.E. Manager 2). The design exception will then be distributed to a Design Exception Review Committee appointed by the Director of the Design Division. The Design Exception Review Committee will review the exception and provide a recommendation regarding approval of the design exception. If necessary, the review committee will provide the Design Manager with any comments regarding the proposed exception prior to making a recommendation regarding approval of the exception.

Approved design exceptions **shall** be noted, with approval date, in the lower right corner of the title sheet.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-1402

(DESIGN EXCEPTION REQUEST AND JUSTIFICATION FORM)

TO: _____, Division Administrator, FHWA (Exceptions requiring FHWA approval)
Director, Design Division, TDOT (All other exceptions)

FROM: _____, Director, Design Division, TDOT (Exceptions requiring FHWA approval)
Design Manager, Design Division, TDOT
Highest Local Official Responsible for the Project, Title (Locally
Developed Projects)

DATE: _____

SUBJECT: **Design Exception Request**
Project No. _____
PIN _____
Project Description: _____

CONTROLLING CRITERIA FOR WHICH EXCEPTION IS REQUESTED:

- | | | | | | | | |
|---|--------------------------|--------------------|--------------------------|---------------------|--------------------------|--------|--------------------------|
| Design Speed | <input type="checkbox"/> | Lane Width | <input type="checkbox"/> | Shoulder Width | <input type="checkbox"/> | Grades | <input type="checkbox"/> |
| Horizontal Alignment | <input type="checkbox"/> | Vertical Alignment | <input type="checkbox"/> | Cross Slopes | <input type="checkbox"/> | | |
| Stopping Sight Distance | <input type="checkbox"/> | Superelevation | <input type="checkbox"/> | Bridge Width | <input type="checkbox"/> | | |
| Horizontal Clearance
(other than clear zone) | <input type="checkbox"/> | Vertical Clearance | <input type="checkbox"/> | Structural Capacity | <input type="checkbox"/> | | |

DESIGN EXCEPTION REQUESTED:

(Note: List location and controlling element of the feature an exception is requested. Example:
1) Station 4+50, 30 mph horizontal curve 2) Station 10+00 to 13+00, 11ft. lane width instead of 12ft. 3) 20 mph vertical alignment (Sag K=24) instead of 40 mph)

Figure 3-1
Design Exception and Justification Form

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

DESIGN DATA:

Highway Functional Classification: _____
 Standard for the Above Classification: _____
 Existing Posted Speed: _____ Proposed Posted Speed: _____
 Type of Terrain: _____ Rural or Urban Area: _____
 Traffic Data: ADT (20 _____): _____ D: _____
 ADT (20 _____): _____ T: _____
 DHV: _____ V: _____

(For factors not applicable to the design exception mark N/A)

DESIGN FEATURES:

	Standard	Existing	Proposed	N/A
Cross Slope:	_____	_____	_____	_____
Superelevation:	_____	_____	_____	_____
Minimum Radius of Curve:	_____	_____	_____	_____
Minimum Stopping Sight Distance:	_____	_____	_____	_____
Minimum "K" Value for Crest Vertical Curve:	_____	_____	_____	_____
Minimum "K" Value for Sag Vertical Curve:	_____	_____	_____	_____
Maximum Grade:	_____	_____	_____	_____

ROADWAY TYPICAL SECTION:

	Standard	Existing	Proposed	N/A
Horizontal Clearance: (other than the clear zone)	_____	_____	_____	_____
Shoulder Widths:	_____	_____	_____	_____
Outside Shoulders:	_____	_____	_____	_____
Inside Shoulders:	_____	_____	_____	_____
Lane Width:	_____	_____	_____	_____

BRIDGE FEATURES:

	Standard	Existing	Proposed	N/A
Traffic Lane Widths:	_____	_____	_____	_____
Outside Shoulder Widths:	_____	_____	_____	_____
Inside Shoulder Widths:	_____	_____	_____	_____
Load Capacity or Sufficiency Rating:	_____	_____	_____	_____
Vertical Clearance:	_____	_____	_____	_____
To Waterway:	_____	_____	_____	_____
To Other Highway:	_____	_____	_____	_____
To Railroad:	_____	_____	_____	_____

**Figure 3-1 (Continued)
 Design Exception and Justification Form**

FACTORS CONSIDERED:

(Note: Each of the following factors shall be addressed in narrative form. If a factor is not applicable, or data is not available, only the appropriate box needs to be checked. For factors that are not a consideration, justification should be included.)

1) Accident experience or data

Data Available No Data Available Not Applicable

2) Effect of the variance from the design standards on safety and operation of the facility

Effect considered No effect on the facility Not Applicable

3) Safety mitigation measures considered and provided

Measures provided Measures not justified Not Applicable

4) Compatibility of the design and operation with adjacent sections

Considered Not a Consideration Not Applicable

5) Comparative cost of the full standard versus the lower design proposed

Considered Not a Consideration Not Applicable

6) Long term effect of the reduced design as compared to the full standard

Considered Not a Consideration Not Applicable

7) Difficulty obtaining the full standard such as right-of-way restriction, environmental impacts, etc.

Considered Not a Consideration Not Applicable

8) Capacity reductions or operational reductions caused by the design

Considered Not a Consideration Not Applicable

9) Level of service for the full standard versus the proposed design

Considered Not a Consideration Not Applicable

10) Cumulative effect of more than one standard that is being reduced

Considered Not a Consideration Not Applicable

**Figure 3-1 (Continued)
Design Exception and Justification Form**

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

11) Possibility of improving or achieving the full standard feature in the future

Applicable Not Applicable Not on the state highway system

DESIGN EXCEPTION AND JUSTIFICATION:

(Note: This section shall include a narrative description of the design exception request and includes a recommendation for approval)

ATTACHMENTS:

(Note: Include appropriate items such as plan prints, accident data, estimates, sketches, photos, etc.)

DESIGN EXCEPTION REVIEW COMMITTEE RECOMMENDATION FOR APPROVAL:

_____, Assistant Director, Design Division, Region 1

_____, Assistant Director, Design Division, Region 2

_____, Assistant Director, Design Division, Region 3

_____, Assistant Director, Design Division, Region 4

Comments Attached

APPROVED: _____

Division Administrator, FHWA
(Director, Design Division, TDOT)

_____ **Date**

cc: Quality Assurance Section

Figure 3-1 (continued)
Design Exception and Justification Form

3-110.05 SOILS AND GEOLOGY REPORTS (See 3-140.00)

On all projects which have grade and drain, the Soils and Geology Report shall be requested approximately one month prior to requesting the Preliminary Plans Field review. Two (2) half-size sets of prints of the plans **with existing contours** on the present layout sheets and two (2) half-size sets of prints of the cross-sections will be submitted to the Geotechnical Engineering Section of the Materials and Tests Division for a Soils and Geology Report. The designer is to submit a request for C.B.R. tests, which will be needed for pavement design. If a grade or alignment change is made on the project subsequent to the submission of the plans, then replacement plan sheets and cross-section sheets are to be resubmitted.

All soils data shall be incorporated into the plans prior to submission of final Right-of-Way Plans.

Once soils data is added on the cross-sections, the Design Manager will submit one (1) half size set of plans and one (1) half size set of cross-sections to the Geotechnical Engineering Section for review and approval. On projects with major geotechnical considerations, the Geotechnical Engineering Section may request additional prints of the plans and/or cross-sections for review at other stages of plan development.

A copy of the Request for Soils Survey Form is shown in Figure 3-2.



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 NASHVILLE, TENNESSEE 37243-1402

SOILS REQUEST FORM

TO: Mr. Bill Trolinger
 Civil Engineering Manager 2
 Materials and Tests Office
 6601 Centennial Boulevard
 Nashville, TN 37243-0360

FROM: Design Manager
 Design Division

DATE OF REQUEST:

DATE REQUESTED BACK:

WE REQUEST SOILS SURVEY DATA, C.B.R. and WATER SAMPLE RESULTS, IF NEEDED ON:

PROJECT NO. :

COUNTY:

ROUTE NO. :

PROJECT LENGTH:

DESCRIPTION OF PROJECT:

THE FOLLOWING DATA RELATIVE TO THE PROJECT IS SUBMITTED HEREWITH:

NO. OF SETS	DESCRIPTION
2	Half-size prints
2	Half-size cross-sections

REMARKS:

Figure 3-2
 Request for Soils Survey Form

3-115.00 UPDATING SURVEYS

All additional survey information requests will be sent to the Regional Survey Supervisor responsible for the survey. An e-mail copy of the request will be forwarded to the Survey Coordinator's Office in Headquarters.

Requests will normally take place following the **Preliminary Field Review** and the **Right-of-Way Field Review**, if necessary. Every effort will be made to make sure all additional information required is requested at these times, this will cut down on the number of times survey crews are sent out repetitively on the same project.

It is the designer's responsibility to thoroughly review their survey information and additional needs prior to requesting additional information from the Regional Survey Office. This will aid in minimizing multiple trips to the project by survey crews.

All requests will consist of a transmittal letter, or the use of AdditionalSurveyRequestForm.xlt located under the TDOT Letters tab in Microsoft Excel (New), either option will include:

- PIN (from PPRM)
- P.E. NUMBER
- COUNTY
- ROUTE
- PROJECT DESCRIPTION

When requesting additional information, requested information will be shown either in electronic format or on a marked set of prints. Also, it may be necessary to include GEOPAK information. This is covered in the CADD Guidelines.

If wetlands were not identified on the original survey, the location and extent of missing wetlands will be requested in one of the additional information requests. Prior to requesting additional information, that includes wetland locations; the design section will contact the environmental section and make sure wetlands have been marked.

Add the date(s) of the original survey and each survey update in the lower right side of the Right-of-Way Title Sheet.

3-120.00 REVISIONS ON UNECONOMIC REMNANTS

The Regional Office adding the uneconomic remnant acquisition to the plans will submit a plan change request. The parent (original) tract will be left as it appears in the acquisition table. Place the uneconomic remnant in the table separately as an 8000 series number using the parent tract number as the last digits. For example, Tract 25 would be Tract 8025. The "Total Area Acquired" column for Tract 8025 will be the area required from Tract 25 as an uneconomic remnant. In order to identify the remnant properly, it shall be specially shown on the property map and the present layout sheets with broken single cross hatching and labeled as an uneconomic remnant. If an uneconomic remnant is sold, the word "Sold" shall be added to the table of acquisition by footnote. The word "Sold", name of grantee, and date of transfer shall be placed on the property map and present layout sheets adjacent to the remnant.

3-125.00 PAVEMENT DESIGN REQUESTS (See 3-125.05)

The design of a pavement structure takes into consideration many forms of input. Several of these are traffic loadings, soil characteristics (C.B.R. tests), materials availability, construction requirements, past performance, quality control and departmental policy. Paving sections are analyzed for structural capacity and for life-cycle cost. Because of these factors, pavement designs will be set by the Pavement Design Section only. On field reviews, any comments relating to pavement sections shall be noted in the field review report and then brought to the attention of the Pavement Design Section. After reviewing the requested change with the designer, the Pavement Design Section will make the final decision on changes to be incorporated into the project plans relative to paving.

The Pavement Design Section will furnish pavement designs on projects where concrete pavement or plant mix asphalt pavement is required, except for state industrial access projects, metro-urban resurfacing projects, and 100% state resurfacing projects. For BRZE and BR-STP projects with an ADL (Average Daily Loading) of 150 or less, or an ADT (Average Daily Traffic) less than 1,000 and percent trucks less than seven, pavement sections shall be designed as in Section 3-125.05.

The project designer will request a pavement design from the Pavement Design Section, by submitting the form shown in Figure 3-3. This form will be submitted at the same time as distribution of plans for the Preliminary Field Review. This request will include a half-size copy of the title sheet, typical section sheet(s), proposed layout sheet(s), and a traffic report which includes an ADL for the mainline and any other major roads or streets within the limits of the project. These sheets are all needed to better analyze the needs of side roads, overlays, pavement alternates and other pavement design features.

If major changes (as determined by Design Manager) are made in grade and/or alignment, it shall be necessary to submit a new set of half-sizes.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-1402

REQUEST FOR PAVEMENT DESIGN

TO: Design Division
Pavement Design Section
Suite 1800 James K. Polk Bldg.
Nashville, TN 37243

DATE: _____
COUNTY: _____
PROJECT NO. _____
DESCRIPTION: _____

DESIGNER: _____
ROUTE: _____
PROJECT PIN: _____

PROPOSED LETTING DATE: _____

PLEASE CHECK THE BOX FOR ALL DESIGN ITEMS THAT APPLY TO YOUR PROJECT.

SAVE FOR FORM

- TRAFFIC TO BE MAINTAINED DURING CONSTRUCTION
- NEW ALIGNMENT WIDENING INTERSECTING RDS.
- RESURFACING DETOUR ROAD

OTHER COMMENTS: _____

ATTACHMENTS:

- TRAFFIC W/ADL'S SOILS 1/2 SIZE PLANS

PLEASE EXPLAIN ANY MISSING ATTACHMENTS (include date requested for soils and traffic): _____

cc: Program Scheduling Section

file

RETURN TO: _____

initial

Figure 3-3
Request for Pavement Design Form

3-125.05 PAVEMENT DESIGN - SELECTED BRZE AND BR-STP (See 3-125.00)

For BRZE and BR-STP projects with an ADL of less than 150, the pavement design can be obtained by using the County Soils Groupings, shown in Table 3-1, and Tables 3-2 and 3-3.

ADL's will not be provided when ADT's (Average Daily Traffic) are 1,000 or less and percentage of trucks is 7% or less. In this case, use Pavement Design No. IV for ADT less than or equal to 200 and Pavement Design No. I for ADT greater than 200 but less than or equal to 1,000.

Two examples are given as follows:

The designer has a BRZE project in Hamblen County. The ADL is 53. First, go to the County Soils Groupings, Table 3-1, to obtain the Group No. which is 2. Then refer to Table 3-2, go to the column for Group 2 and down to the row containing 53 ADL. This determines that Pavement Design I shall be used. Refer to Table 3-3 to obtain the pavement design (1.25 in. "D" mix, 2.00 in. "B-M2", 3.00 in. "A" mix, and 8.00 in. "303-01").

The designer has a BRZE project in Hamblen County. The ADT is 874 and the percentage of trucks is 5. No ADL is given, because the ADT and truck percentage is low. As stated above, Pavement Design I shall be used. Refer to Table 3-3 to obtain the pavement design (1.25 in. "D" mix, 2.00 in. "B-M2", 3.00 in. "A" mix, and 8.00 in. "303-01").

When the existing road is crushed stone base only or base and double bituminous surface treatment, the roadway surface shall be replaced in kind.

When the shoulders are 4 feet or less, the designer will distinguish on the field review whether the shoulder shall be stone and double bituminous surface treatment or paved with 1.25 inches of 411 D mix.

The proposed roadway pavement shall be a higher type or equal surface than that of the shoulders.

When using ADT's for pavement design, use design year traffic.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

COUNTY	GROUP	COUNTY	GROUP	COUNTY	GROUP
Anderson	2	Hamilton	3	Morgan	4
Bedford	3	Hancock	6	Obion	5
Benton	2	Hardeman	3	Overton	6
Bledsoe	6	Hardin	2	Perry	3
Blount	4	Hawkins	6	Pickett	5
Bradley	1	Haywood	4	Polk	5
Campbell	4	Henderson	3	Putnam	6
Cannon	4	Henry	3	Rhea	1
Carroll	4	Hickman	4	Roane	4
Carter	6	Houston	6	Robertson	4
Cheatham	3	Humphreys	5	Rutherford	6
Chester	4	Jackson	6	Scott	2
Claiborne	2	Jefferson	4	Sequatchie	3
Clay	6	Johnson	6	Sevier	1
Cocke	5	Knox	4	Shelby	5
Coffee	4	Lake	3	Smith	3
Crockett	4	Lauderdale	4	Stewart	5
Cumberland	5	Lawrence	5	Sullivan	4
Davidson	3	Lewis	4	Sumner	3
Decatur	3	Lincoln	3	Tipton	5
Dekalb	3	Loudon	6	Trousdale	4
Dickson	6	McMinn	3	Unicoi	6
Dyer	5	McNairy	4	Union	5
Fayette	5	Macon	4	Van Buren	5
Fentress	2	Madison	4	Warren	5
Franklin	4	Marion	3	Washington	4
Gibson	5	Marshall	4	Wayne	5
Giles	5	Maury	5	Weakley	4
Grainger	6	Meigs	3	White	4
Greene	5	Monroe	3	Williamson	3
Grundy	2	Montgomery	4	Wilson	2
Hamblen	2	Moore	3		

**Table 3-1
County Soil Groupings**

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

FLEX ADLs	COUNTY SOIL GROUP NUMBER					
	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	GROUP 6
1-19	I	I	III	III	III	IV
20 - 29	I	I	I	I	III	III
30 - 39	I	I	I	I	I	III
40 - 59	II	I	I	I	I	I
60 - 89	II	II	I	I	I	I
90 - 119	II	II	II	I	I	I
120 - 150	II	II	II	II	I	I

**Table 3-2
Pavement Design Number**

MIX TYPE	PAVEMENT DESIGN NUMBER			
	I	II	III	IV
"D"	1.25"	1.25"	1.25"	1.25"
"B-M2"	2.00"	2.00"	2.00"	2.00"
"A"	3.00"	3.00"	----	----
303-01 or 02	8.00"	10.00"	12.00"	8.00"

**Table 3-3
Pavement Design**

3-130.00 ABANDONMENT OF WATER WELLS

If during the location and design phase it is determined that a water well requires abandonment, the Design Office shall request information at the time shown on the Project Activity Status Sheet (see 1-110.00) by notifying the Geologist Water Well Program, Division of Water Supply, 401 Church Street, Sixth Floor L & C Tower, Nashville, Tennessee 37243-1549, telephone 1-800-523-4873 or (615)532-0176. The Design Office shall also request an inspection of the well and recommendations concerning sealing. Quantities and bid items shall then be set up in the project plans for the contractor to perform the actual sealing of the well.

When requesting a well inspection and recommendations for sealing from the Water Management Division, the designer shall provide the following:

1. A print of the title sheet and of the plan sheet showing the location of the well.
2. The name, address and telephone number of the driller, the date the well was drilled and the name and telephone number of the property owner at the time the well was drilled, if the information is available.

The designer shall take the initiative to ensure that this information is returned in time to incorporate it into the project plans. The well shall be located on the proposed layout sheet and a note added as to whether the well is to be sealed by the contractor.

Every effort is to be made to ensure that this information is on the project plans before turning them in for the letting. All water wells shall be sealed in accordance with the standards set forth by the Tennessee Department of Environment and Conservation (TDEC).

3-140.00 FIELD REVIEW PROCEDURES (See 1-120.00, 2-315.00, 2-315.05, 3-110.05 and 3-330.00)

3-145.00 NOTICE OF INTENT (NOI) FORM

The Notice of Intent (NOI) is an application for the National Pollutant Discharge Elimination System (NPDES) Permit. This is required for any project which has an area of 1 acre or more disturbed by the proposed construction. The NOI form should be completed by the Storm Water Pollution Prevention Plan (SWPPP) consultant.

CHAPTER 2 - DRAINAGE

In order to assist the designer performing drainage and hydrologic design, the Design Division has developed a Drainage Manual to provide a collection of applicable drainage criteria, policies and examples. The manual discusses Tennessee Department of Transportation policies, practices and procedures for performing drainage design and hydraulic analyses on projects that are the responsibility of TDOT.

Designers shall use Chapters 1-10 of the Design Division Drainage Manual for all projects designed or constructed by TDOT. These chapters include:

Chapter 1	Introduction
Chapter 2	General Drainage Polices and Practices
Chapter 3	Drainage Plan Requirements
Chapter 4	Hydrology
Chapter 5	Roadside Ditches and Streams
Chapter 6	Culverts
Chapter 7	Storm Drainage Systems
Chapter 8	Stormwater Storage Facilities
Chapter 9	Energy Dissipators
Chapter 10	Erosion Prevention and Sediment Control

Limited copies of the manual will be distributed for internal use only. Consultants and other interested persons may download the manual from the TDOT Internet site. The manual can be found at:

http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/DrainManChap%201-10.htm

3-200.00 SELECTION OF PIPE MATERIALS

See Drainage Manual, Chapter 6, Section 6.04.2 Culvert Size and Type Selection.

3-200.05 COMPARISON OF LARGE PIPES WITH BOX CULVERTS

See Drainage Manual, Chapter 6, Section 6.04.2.2.2 Selection of Large Pipes vs. Box Culverts.

3-200.10 BRIDGE END DRAINS

See Drainage Manual, Chapter 7, Section 7.03.6 Bridge End Drains.

3-200.30 USE OF TRENCH OR SLOTTED DRAIN PIPE

See Drainage Manual, Chapter 7, Section 7.03.3.4 Use of Longitudinal Drains.

3-205.00 END TREATMENT FOR CROSS DRAINS (UNDER MAINLINE)

See Drainage Manual, Chapter 6, Section 6.04.3.1.1 End Treatments for Culverts Under Mainline.

3-205.05 END TREATMENTS FOR CROSS DRAINS (UNDER PUBLIC SIDE ROADS)

See Drainage Manual, Chapter 6, Section 6.04.3.1.2 End Treatments For Culverts Under Public Side Roads.

3-205.10 END TREATMENTS FOR SIDE DRAINS

See Drainage Manual, Chapter 6, Section 6.04.3.1.3 End Treatments For Culverts Under Private Drives.

3-205.15 END TREATMENTS FOR MEDIAN DRAINS

See Drainage Manual, Chapter 6, Section 6.04.3.1.4 End Treatments For Median Crossovers.

3-205.20 PLACEMENT OF HEADWALLS ON CULVERTS

See Drainage Manual, Chapter 6, Section 6.04.3 Selection of Appurtenances.

3-215.00 PLANS FORMAT FOR CROSS DRAINS

See Drainage Manual, Chapter 6, Section 6.04.1 Site Layout.

3-216.00 SUBMISSION OF ALL CULVERT SECTIONS

See Drainage Manual, Chapter 6, Section 6.02 Documentation Procedures.

3-220.00 USE OF PIPE CULVERTS OTHER THAN "ROUND" PIPE

See Drainage Manual, Chapter 6, Section 6.04.2.2.1 Use of Pipe Culverts Other Than Round Pipe.

3-225.00 HYDRAULIC COMPUTATION RECORDS

See Drainage Manual, Chapter 6, Section 6.02 Documentation Procedures.

3-230.00 IMPROVED INLET GUIDELINES

See Drainage Manual, Chapter 6, Section 6.04.3.2 Improved Inlets.

3-235.00 MANHOLES IN PAVEMENT AREA

See Drainage Manual, Chapter 7, Section 7.03.5.7 Manholes in the Pavement Area.

3-236.00 COMPUTATION OF SIZE FOR CIRCULAR MANHOLES AND CATCH BASINS

See Drainage Manual, Chapter 7, Section 7.03.5.5 Pipe Connections to Structures.

3-240.00 STOCK PASSES

See Drainage Manual, Chapter 6, Section 6.04.3.5 Stock Passes.

3-250.00 CATCH BASIN GRATE ELEVATIONS SHOWN ON THE PLANS

See Drainage Manual, Chapter 7, Section 7.03.3.6 Catch Basin Grate Stations and Elevation Shown on the Plans.

3-251.00 USE OF CATCH BASINS WITH STRUCTURAL STEEL GRATE UNITS

See Drainage Manual, Chapter 7, Section 7.03.3.3.1 Use of Inlets with Structural Steel Grates.

3-253.00 PERFORMANCE OF NUMBER 38, 39, 40, 42, 43 AND 44 AREA DRAINS IN SUMP CONDITIONS

See Drainage Manual, Chapter 7, Section 7.04.4.3 Inlet Performance at Sag Points.

3-255.00 SPACING BETWEEN CATCH BASINS FOR MAINTENANCE CLEAN OUTS

See Drainage Manual, Chapter 7, Section 7.03.5.6 Spacing Between Catch Basins and Manholes.

3-256.00 USE OF JUNCTION BOXES

See Drainage Manual, Chapter 7, Section 7.03.5.4 Junction Boxes.

3-260.00 ALTERNATING CATCH BASINS

See Drainage Manual, Chapter 7, Section 7.03.5.1.1 Alternate Catch Basins.

3-261.00 USE OF NO. 6-72 CATCH BASINS

See Drainage Manual, Chapter 7, Section 7.03.5.1.2 Use of No. 6-72 Catch Basins.

CHAPTER 3 - PLANS DEVELOPMENT AND CALCULATIONS

3-300.00 AREAS SHOWN IN RIGHT-OF-WAY ACQUISITION TABLE

Acquisition Areas and Easement Areas of 0.100 acres or more shall be shown in acres to 3 decimal places. Areas less than 0.100 acres shall be shown to the nearest square foot.

Right-of-way areas left and right shall be based on the centerline used for construction. If the proposed centerline is changed during design, it shall be necessary to recompute the areas left and right supplied with the survey and appearing in the TOTAL AREA columns of Figure 2-21 of the guidelines.

3-300.05 EASEMENT AREAS (See 2-320.00)

3-305.00 R.O.W. NOTES FOR ALL R.O.W. PROJECTS (See 2-300.00)

3-305.05 R.O.W. NOTES ON PLANS REGARDING DRIVEWAYS (See 2-300.05)

3-305.06 NPDES PERMITTED PROJECTS

All projects which require a NPDES permit shall add the Erosion Prevention and Sediment Control (EPSC) Notes found in section 6-290.03, Erosion Prevention and Sediment Control Special Notes, NPDES and shall follow the guidance indicated in section 6-290.03 to determine if "Special Notes" are required.

3-305.07 UTILITY RELOCATION NOTES ON EPSC PLANS

All projects which require utility relocations as part of the contract shall add the notes found in section 6-290.04, Erosion Prevention and Sediment Control Special Notes, Utility Relocation.

3-305.10 PRIVATE DRIVEWAYS SHOWN ON R.O.W. PLANS (See 2-300.05)

3-305.15 GUIDELINES ON CONSTRUCTION AND RESURFACING OF PUBLIC ROAD INTERSECTIONS AND DRIVEWAYS ON HIGHWAY PROJECTS (See 2-300.10)

3-310.05 HANDICAP RAMPS

Right-of-Way plans for new construction or reconstruction projects shall accommodate the appropriate curb ramp and truncated dome surface details shown on the current standard drawings. The handicap ramp standard drawings detail four (4) types or layouts of handicap ramps that can be used at intersections depending upon the site layout, topography, and right-of-way constraints. Types 1 and 2 are the preferred types to be used. Types 3 and 4 are appropriate for areas with right-of-way constraints. Designers should indicate the type ramp to be used at each intersection on the plans. Designers should use the estimated quantities for a 90 degree intersection on a 0.0% grade when calculating quantities for intersections other than 90 degrees or with grades other than 0.0%. Limits of payments for handicap ramps are shown on the standard drawings.

Ramps shall be indicated on the Right-of-Way Plans for field review. Ramps adjacent to lowered curb for driveways may be eliminated.

Truncated Domes shall be used with all handicap ramps.

Refer to the RP-H-SERIES Standard Drawings for details.

3-310.10 DRIVEWAY APRONS

Right-of-Way plans for new construction or reconstruction projects shall accommodate the appropriate driveway aprons. The driveway standard drawings have been modified to provide ADA compliant cross-slope for sidewalks through driveway aprons. The aprons have also been modified to provide for a better turning radius into the drive.

3-315.00 CAPPING ROCK FILLS

In areas where a solid rock fill is expected and grassed slopes are designed, provide road and drainage excavation (unclassified) or borrow excavation (unclassified) in sufficient quantity to cap these fills with a minimum of 9 inches +/- of common material before placing topsoil and seeding.

3-315.05 TOPSOIL REQUIREMENTS FOR EARTHWORK BALANCES
(See 2-145.05 and 4-203.30)

In areas to be seeded, compute the quantity of topsoil required based on a 3-inch ± thickness with a 100% shrinkage.

Topsoil will not be required on projects where all slopes are to be sodded. A note shall be added to the plans detailing any other special areas where topsoil will not be required (such as rock fills not to be seeded).

Do not make deductions in topsoil and seeding quantities for sodded or paved ditch areas on normal projects requiring topsoil and seeded slopes.

Topsoil shall be secured from within the proposed roadway balances where possible. If necessary, embankment areas shall be stripped in addition to excavation areas.

When final earthwork balances are calculated, the topsoil shall be taken into account in the following manner:

1. Calculate the topsoil needed and the topsoil available to see if all the topsoil can possibly be obtained from the proposed roadway areas.
2. Adjust the cross-section end areas as necessary to reflect the topsoil that is to be stripped. These adjusted areas are to be used to balance the job.
3. Balance the project using the proper shrinkage and swell factors.
4. On the profile, when showing the earthwork balance, include the topsoil figures in the balance. See example calculations in 3-315.15.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

If enough topsoil cannot be obtained from the proposed earthwork areas, add a "Furnishing and Spreading Topsoil" item to the Roadway Quantity Table for the remainder.

3-315.10 SHRINKAGE AND SWELL FACTORS (See 2-145.10)

3-315.15 EARTHWORK BALANCES IN PLANS (See 2-145.05)

Examples of how to calculate earthwork balances and how to show these balances on the plans profile sheet are as follows:

- 1. Earthwork balanced.
 - A. Show on profile sheet.

EXC. (UNCL.) 295,000 C.Y.	[COMMON 250,000 C.Y. (INCL. 13,000 C.Y. FROM EXCAVATION AREAS AND 5,000 C.Y. FROM EMBANKMENT AREAS; 12,500 C.Y. FROM COUNTY ROADS AND PRIVATE DRIVES)
]	ROCK 45,000 C.Y.

EXC.
EMB.

[EMB. 253,489 C.Y. (INCL. 5,490 C.Y. FOR COUNTY ROADS AND PRIVATE DRIVES; 5,000 C.Y. TO REPLACE STRIPPED TOPSOIL)
	SHR. 15%
	SW. 15%

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

B. Calculation procedure for balanced section

250,000 C.Y. Exc. (Common)
-13,000 C.Y. Topsoil from exc. areas
- 5,000 C.Y. Topsoil from emb. areas
232,000 C.Y. Exc. (Common) available for balance

Exc. (Com) + [Exc. (Rock) x 1.15] vs. Emb.

1.15

232,000 + (45,000 x 1.15) vs. 253,489 C.Y.

1.15

201,739 + 51,750 vs. 253,489 C.Y.

253,489 C.Y. = 253,489 C.Y.

Balanced

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

2. Earthwork unbalanced.

A. Show on profile sheet.

EXC. (UNCL.)	[<table style="border-collapse: collapse;"> <tr> <td style="padding-right: 10px;">COMMON</td> <td style="padding-right: 10px;">350,000 C.Y.</td> <td rowspan="2" style="padding-left: 10px;">(INCL. 13,000 C.Y. TOPSOIL EXCAVATION AREAS AND 5,000 C.Y. FROM EMBANKMENT AREAS; 12,500 C.Y. FROM COUNTY ROADS AND PRIVATE DRIVES; 100,000 C.Y. EXCESS MATERIAL.)</td> </tr> <tr> <td>ROCK</td> <td>45,000 C.Y.</td> </tr> </table>	COMMON	350,000 C.Y.	(INCL. 13,000 C.Y. TOPSOIL EXCAVATION AREAS AND 5,000 C.Y. FROM EMBANKMENT AREAS; 12,500 C.Y. FROM COUNTY ROADS AND PRIVATE DRIVES; 100,000 C.Y. EXCESS MATERIAL.)	ROCK	45,000 C.Y.
COMMON	350,000 C.Y.	(INCL. 13,000 C.Y. TOPSOIL EXCAVATION AREAS AND 5,000 C.Y. FROM EMBANKMENT AREAS; 12,500 C.Y. FROM COUNTY ROADS AND PRIVATE DRIVES; 100,000 C.Y. EXCESS MATERIAL.)					
ROCK	45,000 C.Y.						

EXC.
EMB.

[<table style="border-collapse: collapse;"> <tr> <td style="padding-right: 10px;">EMB.</td> <td style="padding-right: 10px;">253,489 C.Y.</td> <td style="padding-left: 10px;">(INCL. 5,490 C.Y. FOR COUNTY ROADS AND PRIVATE DRIVES; 5,000 C.Y. TO REPLACE STRIPPED TOPSOIL)</td> </tr> </table>	EMB.	253,489 C.Y.	(INCL. 5,490 C.Y. FOR COUNTY ROADS AND PRIVATE DRIVES; 5,000 C.Y. TO REPLACE STRIPPED TOPSOIL)
EMB.	253,489 C.Y.	(INCL. 5,490 C.Y. FOR COUNTY ROADS AND PRIVATE DRIVES; 5,000 C.Y. TO REPLACE STRIPPED TOPSOIL)		

SHR. 15%
SW. 15%

B. Calculation procedure for unbalanced section

350,000 C.Y. Exc. (Common)
 -13,000 C.Y. Topsoil from exc. areas
 - 5,000 C.Y. Topsoil for emb. area
 332,000 C.Y. Exc. (Common) available for balance

Exc. (Com) + [Exc. (Rock) x 1.15] vs. Emb.
 1.15
 332,000 + (45,000 x 1.15) vs. 253,489 C.Y.
 1.15
 340,446 C.Y. vs. 253,489 C.Y.

The 86,957 C.Y. of excess material has had the shrinkage factor applied to it (this assumes all excess material will be common). When this quantity is multiplied by the shrinkage factor to "unshrink" it, the excess becomes 100,000 C.Y.

3-315.20 SUBMISSION OF GRADING QUANTITIES SHEETS (See 2-145.07 and 4-203.50)

3-325.00 RAILROADS (See 1-210.00, 1-210.05 and 1-210.10)

3-330.00 PAVEMENT MARKINGS AND SIGNING ON INTERSTATE AND FULL ACCESS CONTROL ROADWAYS (See 3-140.00, 4-713.05 and 4-716.13)

The Design Division, Signals, Signing and Lighting Section will develop pavement marking and signing plans for all projects involving Interstate and full-access control roadways and interchanges, except resurfacing projects.

The Design Division, Signals, Signing and Lighting Section will review the plans a minimum of two weeks prior to the Right-of-Way Field Review in order to determine whether the proposed design can be marked and signed in accordance with the *M.U.T.C.D.* The designer shall furnish the Design Division, Signals, Signing and Lighting Section with one full-size print of the title sheet and proposed layouts a minimum of two weeks prior to the Right-of-Way Field Review.

The designer shall provide proposed layout sheets on reproducible mylar at either 1"=50' or 1"=100' scale at the beginning of the Construction Plans preparation period. These layouts shall only include: construction centerline, edge of pavement, pavement widths, the P.C. and P.T. (or the T.S., S.C., C.S. and S.T.) of any curves, guardrail and retaining walls. Prints of the typical sections shall also be included with the proposed layouts.

For those projects designed with TDOT's accepted CADD format, the designer shall provide computer disks (or an e-mail) with signing and marking sheet files with the same information as above within the file (not a reference file). **No other files** are to be sent unless specifically requested by the Design Division, Signals, Signing and Lighting Section. All files must be submitted in a DGN format. Working units of these files must coincide with the working units guidelines set forth in the *Survey and Design Computer Aided Drafting & Design Standards*. Following these guidelines will help ensure that signing and marking plans and details are done in a timely manner. Any submittals straying from the above guidelines will be returned to the Design Manager in charge of the design project.

CHAPTER 4 - PLANS SUBMITTALS

3-400.00 PRINTING FOR INCIDENTALS

Print plans for "All Incidentals Except Appraisals" if the project has more than 10 tracts. (See distribution list below.) It shall only be necessary to print the title sheet, typical sections, property maps (with Right-of-Way Acquisition Table with property owners name and county records portions completed) and the present layouts. Proposed layouts are not to be printed for incidental right-of-way work. Do not print for "Incidentals" if there are 10 tracts or less in the plans. There will not be duplicate tract numbers on any one project. During Right-of-Way Plans preparation, tracts may need to be added or deleted, but all tract numbers appearing on the preliminary plans must continue to appear on subsequent Right-of-Way Plans for the project, including the acquisition stage Right-of-Way Plans. If for any reason the tract number becomes unneeded, it must continue to be shown in the table of acquisition and on the property map and present layout sheets with the number crossed out in all places using a single line. Stamp or mark prints of title sheets for "Incidentals Only". The title sheet must have a right-of-way project number in the upper right-hand corner (not the P.E. number). This applies to all right-of-way projects to be acquired by the State. **For projects whose right-of-way is to be acquired by Local Government**, the preliminary engineering number is to be used in the upper right-hand corner of the title sheet. Using 0.2" lettering, ink "Right-of-way to be acquired by Local Government" on the right side of title sheet above the signatures. Incidental plans submission will not be submitted for projects whose right-of-way is being acquired by local governments.

Prints for "Incidentals"

1. T.D.O.T. Regional Design Office (In house and consultant design)
Prints of the plans shall be furnished to the Quality Assurance Section, Design Standards Section as follows:

2 Sets of Half-Size

State in submittal letter when prints were sent to Regional Right-of-Way Office.

- T.D.O.T. Regional Design Office (In-house and consultant design)
Prints of the plans shall be furnished to the Regional Right-of-Way Office as follows:

Region 1	10	Sets Full-Size
Region 2	6	Sets Full-Size
Region 3	6	Sets Full-Size
Region 4	6	Sets Full-Size

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

2. T.D.O.T. Headquarters Design Office (In-house and consultant design) Prints of the plans shall be furnished to the Quality Assurance Section, Design Standards Section as follows:

Region 1	10	Sets Full-Size and 1 Set Half-Size
Region 2	6	Sets Full-Size and 1 Set Half-Size
Region 3	6	Sets Full-Size and 1 Set Half-Size
Region 4	6	Sets Full-Size and 1 Set Half-Size

3-400.05 PRINTING FOR "UTILITIES ONLY" (See 2-315.00 and 2-315.05)

On any project, other than a paving or resurfacing project, that does not have right-of-way acquisition involved, the designer will submit one (1) half-size sets of prints to the Quality Assurance Section, Design Standards Office to be used for utility investigation and funding by headquarters personnel. In addition, the designer will submit two (2) full-size sets of prints for each utility involved plus one (1) full-size and one (1) half-size set of prints for the regional utilities engineer to the Quality Assurance Section, Design Standards Office. These sets of prints will be used for utility investigation by the regional utilities engineer and the utilities themselves. Submission shall be made as soon as the plans are complete enough to show what work is to be done. If the Utilities Section needs a different number of prints, the designer will be advised.

3-400.10 ADVANCE ACQUISITION PROJECTS

Once "Advance Acquisition" has begun, tract numbers may not be changed.

3-400.15 PRELIMINARY CONSTRUCTION QUANTITY ESTIMATES (See 4-140.00 and 4-140.05)

A preliminary construction quantity estimate shall be prepared on all projects when the funding is requested for the Final R.O.W. Plans. The Design Manager responsible for the project will forward one (1) half-size set of prints of the right-of-way plans and the quantity data to the Estimating and Bid Analysis Office. This submission should be done concurrently with the right-of-way funding approval request. **Projects shall not be submitted for "appraisals and acquisition" or "utilities only" until the preliminary construction quantity estimate is submitted.**

Each designer shall follow the procedure below to obtain the preliminary construction cost estimates:

1. Calculate preliminary quantities to a reasonable detail. Any known quantities which cannot be estimated (example: signal and signing quantities) should be identified and included in the e-mail transmitted to the Estimating and Bid Analysis Office.
2. The TDOT designer or consultant shall give the Design Manager responsible for the project one (1) half-size set of prints and the preliminary construction

quantities estimate data via e-mail or CD. The estimate will contain project description information, pay item numbers, and quantities in the proper format. See section 4-140.05 for additional information. Design managers and designers shall keep a copy of the estimate data in the project folder and a copy of the estimate file.

3. If bridges, retaining walls, or other structures designed by the Structures Division are proposed, the designer shall indicate structures are required and include the structure designer and manager on the project data portion of the estimate file. This information is necessary to insure that the structures are included in the preliminary estimate.
4. Where open-ended item numbers are used, the designer shall fill in the descriptions in the estimate data file. Where lump sum item numbers are used, description and break down of the quantities must be submitted with the estimate data file. Without completing these item descriptions, there is no way the estimator in the Estimating and Bid Analysis Office can complete the preliminary construction cost estimate.
5. Preliminary construction quantities estimates shall be updated whenever a revision to the plans is made that will significantly alter the project cost or every twelve (12) months until construction plans turn-in. In the event that no plan changes are made during the previous twelve month period, the Design Manager will resubmit the original data file with a request that the estimate be updated since the previous estimate is a year old.
6. For federal over-site projects, a preliminary estimate using the construction plans quantities shall be submitted to the Estimating and Bid Analysis Office when the plans are distributed for the construction field review. A construction estimate will still be submitted with construction plans submittal in accordance with Section 4-140.00 and 4-140.05.

SUBMITTAL OF PRELIMINARY CONSTRUCTION QUANTITIES ESTIMATES

For in-house and consultant design projects, the Design Manager, or designer shall forward the completed construction estimate Excel file via e-mail to the following Groupwise e-mail address: Name: **Estimates, TDOT Preliminary** (User Id: JJPRELIM). A copy of the e-mail shall be placed in the project folder to document the submittal of the construction quantities.

3-400.20 RIGHT-OF-WAY FUNDING APPROVAL REQUESTS (See 4-140.00)

Funding approval shall be requested and received on all right-of-way projects prior to their submission to be printed for “appraisals and acquisition.” The funding approval shall be requested approximately two (2) weeks prior to the anticipated right-of-way turn-in date. See Section 3-400.15 for further details.

When requesting funding approval for right-of-way “appraisals and acquisition,” send one (1) half-size print of the title sheet with right-of-way funding approval request transmittal letter, example shown in Figure 3-4, to the Program Operations Office, Federal Aid Section. Furnish a copy of the request to the Quality Assurance Section, Design Standards Office.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

An approved signed and dated copy of the right-of-way funding request approval transmittal letter shall be included with the Right-of-Way Project Plans turn-in assembly. See Section 3-400.25 for further details.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-1402

MEMORANDUM

TO: Programs Operations Office
Attn: Federal Aid Section
Suite 600, James K. Polk Bldg.
Nashville, TN 37243-1402

FROM: Larry Jordan, Transportation Manager 1
Design Office, Headquarters

DATE: December 30, 1999

SUBJECT: Right-of-Way Funding Approval Request
Project No.: STP-13(15), 43005-2234-14, 43005-1226-04
Description: S.R. 13 from S.R. 230 to Main Street in Waverly
Humphreys County

In accordance with the Roadway Design Guidelines, I am requesting funding approval for R.O.W. appraisals and acquisition. For your use, I have attached one (1) half-size title sheet of this project.

At your earliest convenience following funding approval, please initial and date below and return a copy of this form to my office.

Funding Approval for Right-of-Way Appraisals and Acquisition:

By: _____

Date: _____

Attachment
cc: Standards and Quality Assurance Office

Figure 3-4
Right-of-Way Funding Approval Request Transmittal Letter Example

3-400.25 PRINTING FOR ROW APPRAISALS AND ACQUISITION (See 2-315.00, 2-315.05, and 3-400.00)

When submitting a project for right-of-way “appraisals and acquisition,” the Design Manager in charge of the project is to send one full-size set of the Right-of-Way Project Plans and cross-sections, a copy of the Right-of-Way Plans Request Form, three (3) CD’s with Microstation and Geopak files, and a copy of the Right-of-Way Funding Request Approval Transmittal Letter (see Section 400.20) to the Quality Assurance Section, Design Division. To insure the proper and rapid processing of Right-of-Way Plans, the following transmittal letter, shown in figure 3-5, shall accompany the Right-of-Way or Utilities Only Plans submittal to the Standards and Quality Assurance Section. The title sheet shall be plotted on 4 mil double matte finish reproducible photographic mylar. The other right-of-way sheets may be plotted on reproducible vellums or paper as directed by the TDOT Design Manager. Cross-sections shall be plotted on paper.

Refer to Section 3-400.15 for preliminary construction quantity estimate. This estimate shall be completed and submitted to the Estimating and Bid Analysis Office prior to submitting plans for “appraisals and acquisition”. The date the information was submitted to the Estimating and Bid Analysis Section shall be included in the right-of-way submittal transmittal letter.

It is important that the incidentals report data be incorporated into the plans before finalizing the Right-of-Way Plans to reduce right-of-way revisions. However, **if it is imperative** that final Right-of-Way Plans be submitted before receiving the incidentals report data, the TDOT C.E. Manager 2 will give the approval to proceed to the Design Manager in charge of the project. This approval shall be noted on the Right-of-Way Funding Request approval transmittal letter to the Program Operations Office, Federal Aid Section. See Section 3-400.00 for additional information not shown on this page.

When a consultant submits plans for right-of-way “appraisals and acquisition,” the consultant’s seal, signature, and date shall be placed on the right side of the mylar title sheet above the Chief Engineer’s signature.

All cross-sections will have the project number shown and be numbered in the upper right-hand project identification block. The sheet numbering will follow the numbering used on the plan sheets in the same manner used in the construction plans.

Before plans are submitted for “appraisals and acquisition” of right-of-way, all information which might affect the existing or relocated utilities shall be shown on the plans. This includes, but is not limited to, the following:

1. Storm sewers, catch basins, manholes, cross drains, side drains, box culverts, channel changes, special ditches and other drainage facilities.
2. Preliminary bridge layouts and hydraulic data.
3. Retaining walls.
4. Guardrails.
5. Detour roads.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

6. Traffic signal pole locations including attachment heights and footing details.
7. Street light pole locations.
8. Erosion prevention and sediment control devices (EPSC Plan)
9. Other details which might affect utilities.



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 NASHVILLE, TENNESSEE 37243-1402

MEMORANDUM

TO: Standards and Quality Assurance Section, Design Division
 Attn: ROW Plans Submittal
 Suite 1300, J.K. Polk Bldg.
 Nashville, TN. 37243-1402

FROM: Paul Beebe
 Civil Engineering Manager 1
 Region 1 Design Office

DATE: February 3, 2006

SUBJECT: Project No. BH-STP-131(4), 47027-2214-94
 PIN 100500.00
 SR 131, Bridge over Meadow Creek @ L.M. 5.78
 Knox County

The subject project is being submitted for right-of-way plans submittal. The following information is being forwarded to initiate printing and plans distribution:

- x Right-of-Way Plans (20 Sheets)
- x Cross-Sections (10 Sheets)
- x Right-of-Way Plans Request Form
- x CD's Containing CADD files (3 CD's)
- x Right-of-Way Funding Approval Request
 Funding Approval Date January 31, 2006
- x Preliminary construction estimate quantities e-mailed to Estimating and Bid
 Analysis Office on January 20, 2006

Comments: 30 Full size plans, 10 Half-size plans and 6 full size cross-sections sent directly to the Region 1 Right-of-Way and Utilities Office.

For further information, please contact Maysoon Haddad Phone: (865) 555 - 1234.

cc: Program Operations Office

Figure 3-5
Right-of-Way “Appraisals and Acquisition” Transmittal Letter Example

3-400.30 DGN FILE DISTRIBUTION OF RIGHT-OF-WAY PLANS

The Department requires “CAD Plan Files Disclaimer and Limitation of Liability Agreement” forms to be submitted for distributing the files to persons outside the department in order to provide protection from unauthorized and/or potentially harmful reuse of the data contained in the files.

For security purposes the files on the CD’s will be archived (compressed, zipped, etc.) with a software program having the ability to password protect the archive and capable of making a self-extracting (.exe) file. The password should be at least eight (8) characters and/or numbers in a nonsensical sequence. Designers creating the archive will be responsible for setting the archive password and maintaining the password in the project design folder. Design managers will maintain a record of password for projects developed by consultants. The Department has available WinZip which can be loaded by IT staff for in-house designers. Consultants can find several suitable archiving programs that can be downloaded for free on the internet.

The sequence for creating CD’s is as follows:

1. Create an archive file. Archive files for utilities will be named using the State Right-of-Way project number (i.e. 76001223104.exe). If dual counties are involved, use the project number for the county where the project begins.
2. Add the needed files. These should be the sheet layouts, the files needed to create the sheets (reference files), and cross-sections. Files created by software such as alignments (.gpk), digital terrain models (.tin), etc. need not be included.
3. Password protect the files.
4. Create a self-extracting executable file (.exe).

The CD’s and password will be submitted along with the right-of-way plans to the Standards and Quality Assurance Section. The Standards and Quality Assurance Section will retain one (1) CD and the password and distribute two (2) CD’s and the password to the Regional Right-of-Way/Utilities Office. For regional design offices that directly submit right-of-way prints to the Regional Right-of-Way/ Utilities Office, one (1) CD and the password will be distributed to the Standards and Quality Assurance Section and two (2) CD’s and the password will be distributed to the Regional Right-of-Way/Utilities Office.

When right-of-way staking is required by regional survey personnel, the regional right-of-way office will be responsible for furnishing one copy of the files along with the staking request to the regional survey and design office.

The printed plan sheets are the Official State records and these files are for drafting purposes only. Therefore, updates to the archive files will only be made if significant changes are made to the plans (see “CAD Plan Files Disclaimer and Limitation of Liability Agreement”). The design manager will make the determination of significance and ensure that the appropriate personnel are notified of the changes.

On all Right-of-Way plans where there is either direct Railroad Involvement inside the project limits, or there is a Railroad within 200-feet of the project limits, and such project involves either Norfolk Southern Railroad (formerly Southern Railroad), CSXT Railroad (formerly CSX), BNSF Railway Co. (formerly St. Louis and San Francisco RR), Illinois Central Railroad

(ICRR) (Formerly Canadian National RR), or Union Pacific Railroad (formerly MOPAC RR), the plans shall be distributed as follows:

One (1) Half-Size Paper Copy of the plans to Railroad Coordinator at Utilities Office along with One (1) CD with the plans in PDF or Microstation Format for submission to the Railroad(s) for projects involving CSXT or Norfolk Southern. For all other projects involving railroads please submit Four (4) Half-Size Paper Copies to the Railroad Coordinator at Utilities Office.

3-400.35 ADDITION OF EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) PLANS INTO FIELD REVIEW AND FINAL ROW PLANS

Erosion Prevention and Sediment Control (EPSC) Plans sheets shall be included in the plans submitted for Right-of-Way Appraisals and Acquisition. EPSC Plan sheets shall also be included in right-of-way field review and construction field review plans. EPSC Plan sheets shall immediately follow the Culvert Cross Sections. The EPSC Plan should be complete to the extent possible; however, quantity tabulations will not be required until printed for construction field review.

Once plans are formally submitted, any changes to the EPSC Plan sheets due to design revision, right-of-way revision, permit requirements, mitigation requirements, ecological evaluation requirements, EPSC notes revisions, addition or deletion of sheets, etc. will require a formal plan revision.

The Design Manager should contact the Technical Studies Section of the Environmental Division when EPSC Plans are revised to determine if revised plan sheets or other information is needed.

3-400.40 ADDITION OF CONTOURS TO PLANS

Contours shall be included in plans for all projects submitted for Right-of-Way Appraisal and Acquisition and Construction except for resurfacing projects, projects where a survey is not required, and small projects or projects of limited scope where a surface is not developed. Contours shall also be included in right-of-way field review and construction field review plans. Contours should include existing (pre-construction) and proposed contours. Contours for intermediate construction phases are not required. For small projects or projects of limited scope where a surface is not developed, cross sections shall be included in all plans submittals in lieu of contour sheets.

Contour sheets should be developed at the same scale as the EPSC Plan sheets. Designers should refer to Design CADD standards for contour sheet development. Existing contours should be included on Phase 1 of the EPSC Plan or may developed as a separate sheet. Existing contour sheets will include the project centerline, contours at an interval sufficient to show the direction of flow, contour elevations, north arrow, scale, existing edges of pavement, and streams and rivers. Proposed contours should be included on the final phase of the EPSC Plan or as separate sheets. Proposed contour sheets will include the project centerline, contours at an interval sufficient to show the direction of flow, contour elevations, north arrow, streams and rivers, proposed edges of pavement, and proposed slope lines. Proposed contours will only be required to the top of cut or toe of slope. It will not be required to connect to existing contours outside the slope lines. Surface development should include the

mainline and side roads. When developed as a separate set of sheets, contours should immediately follow EPSC sheets.

Since site conditions and topography are unique to each project, designers should seek input from the Natural Resources Office Permits Section of the Environmental Division to determine contour intervals.

3-405.00 RIGHT-OF-WAY REVISIONS (See 1-220.00)

When a project has been printed for right-of-way appraisals and acquisition, and a change becomes necessary anywhere on the project, a Right-of-Way Plans revision is required. All right-of-way revisions will be submitted through the Design Manager responsible for the project in an accurate and timely manner.

In the Regional Design Offices, the Design Manager responsible for the project will distribute the right-of-way revision prints to the appropriate Regional personnel. They will submit right-of-way revision prints for the appropriate Headquarters personnel through the Plans Sales Office.

In the Headquarters Design Offices, the Design Manager responsible for the project will distribute the right-of-way revision prints through the Plans Sales Office.

3-410.00 ENVIRONMENTAL PERMIT REQUIREMENTS

Projects involving the placement, extension or removal of pipes, bridges or culverts and/or channel changes, or other work causing environmental impacts to water bodies will require a review by the Designer. The Designer shall review the project for possible impacts to streams, drainage ways, and/or water bodies which support aquatic life at the location of the project. This review will utilize the appropriate USGS Quadrangle maps to determine if blue line streams are present and/or the ecology report that is supplied by the Technical Studies Office in the Environmental Division.

For any project meeting the above criteria, Designers shall submit one half size set of Right-of-Way Field Review Plans to the Environmental Division for permit evaluation. After the Environmental Division receives both the half size set of Right-of-Way Field Review Plans and the Ecology Report, they will complete the permit evaluation. The permit evaluation shall determine the necessary permits required for the project. The findings of the permit evaluation will be documented in a report called the Permit Assessment.

Consultants and Designers shall submit **all submittals** to the Design Manager in the Design Division for submittal to the C.E. Manager 1 in the Environmental Division.

If the project does not require items submitted for permit evaluation, the Designer shall send a letter to the Environmental Division, copied to the Program Scheduling Office, stating that no environmental impacts will occur as a result of the project.

Figure 3-6 contains a flow chart depicting the steps which should be followed to complete permit application approval.

Figure 3-7 is an example of a permit assessment, which has been completed by the Environmental Division and returned to the appropriate Design Manager. Along with the appropriate project and reference information, the Permit Assessment provides an itemized list of revisions and instructions for the designer to complete, which should insure prompt permit approval.

Once the project has been evaluated for required permits, and the Designer receives the permit assessment, the Designer will be responsible for preparing the information and sketches required for the Environmental Division to apply for the required permits. The permit sketches and applicable information shall be submitted as indicated in the project schedule. For typical grade and drain projects permit sketches and applicable information shall be submitted approximately 146 weeks into the project. For typical bridge and approach projects the permit sketches and applicable information shall be submitted approximately 39 weeks into the project.

If there is a lag in the schedule due to unforeseen delays the permit sketches and applicable information shall be submitted 12 months or 52 weeks prior to the projected letting date. The permits sketches and applicable information shall be submitted to the Natural Resource Office Permit Section for permit application.

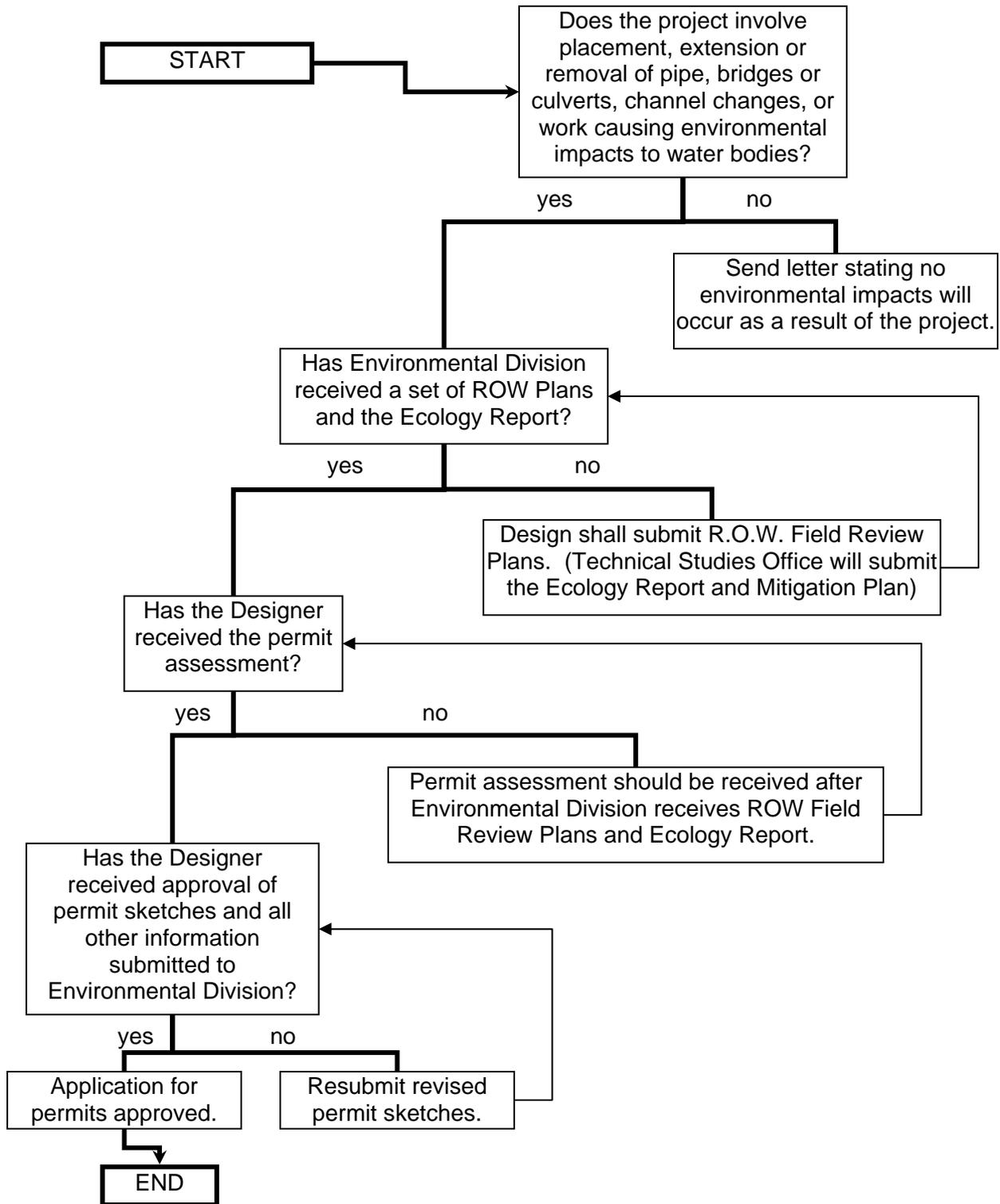


Figure 3-6
Permitting Process Flow Chart



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 ENVIRONMENTAL DIVISION
 SUITE 900, J. K. POLK BUILDING
 505 DEADERICK STREET
 NASHVILLE, TN 37243-0334
 TELEPHONE: (615) 253-2477 FAX: (615) 741-1098

MEMORANDUM

TO: Mr. Jim Bivens, Roadway Specialist Supervisor 2
 Region 1 Design Office

FROM:  John L. Hewitt, C.E. Manager 1
 Environmental Permits Office

DATE: January 24, 2005

SUBJECT: PERMIT ASSESSMENT / DISTRIBUTE PERMIT REQUIREMENTS
 P.E. # 40115-1406-94
 FED # BRZE-4000(34)
 PIN 100618.00
 Lampkin Road
 Bridge over Walnut Fork Creek
 Henry County

Thank you for sending the plans for review on the above referenced project. Please refer to the Environmental Boundaries and Mitigation Design Memorandum dated November 19, 2004 from Ms. Lilah Miller when making the following adjustments:

- 1) Please make the following revisions to the erosion control sheet 6:
 - Please list standard drawings EC-STR-31 "Temporary Diversion Channels" and EC-STR-25 "Temporary Road Crossing", on the standard drawing index sheet and in the appropriate Erosion Control Legends.
 - Please relocate or remove the temporary silt fence from within Walnut Fork Creek (west bank around abutment).
 - Please show all existing wetlands.
 - Please show erosion control notes.
 - If haul roads are needed please show on the erosion control sheet.

- 2) Please make the following revisions for the impact between station 102+50 ± (Rt. & Lt.) and 108+50 ± (Rt. & Lt.):
 - Permit sketches will be required for this impact. Please refer to comment number three and the enclosed example set of permit sketches for information and requirements.
 - Revise the present layout (sheet 4) to show the existing wetland along Walnut Fork Creek. Please refer to Ms. Miller's Memorandum for information concerning wetland location.
 - Revise sheet 4A (proposed layout sheet) to show only wetlands remaining after construction.
 - Please label cut and fill lines on the present layout sheet (sheet 4).

**Figure 3-7
 Example Permit Assessment**

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Mr. Jim Bivens
January 24, 2005
Page 2

- If haul roads are needed, please show on the present and proposed layout sheets (4 and 4A).
 - For all temporary wetland impacts please indicate all trees that are to be planted on the proposed layout sheets, erosion control sheets, and permit sketches that involve the replacement of trees from Ms. Miller's Memorandum. Also please add the tree planting scheme for temporary wetland impact areas and the following notes to the proposed layout sheet and permit sketches:
 - The area of temporary wetland impact shall be restored to pre-construction elevation and reseeded / or replanted according to the mitigation design and permit sketches as soon as possible following the completion of construction activities.
 - "No substitutions for any of the tree species will be accepted without written permission from the TDOT Environmental Division. No Clones or Cultivars will be accepted. Any trees found to be either incorrect species, improperly planted, or which do not survive, at anytime prior to termination of the contract, shall be removed and replaced at the contractor's expense. Stakes and wires will be removed immediately prior to contract termination."
- 3) For each wetland impact requiring permit sketches, please provide the information listed in the current roadway guidelines, as well as, a wetland impact table with the temporary and permanent impact areas and volumes listed, separately. The permit sketches are required to indicate the temporary and permanent wetland impacts, cross-hatched separately. Where trees are to be planted on-site (i.e. temporary replacement of wetlands), please show the mitigation (tree species, spacing, location, note for no substitutions, etc.) on the permit sketches and proposed layout plan sheet in the plans.
- 4) Please show and label the wet weather conveyance (WWC-1) on the present layout sheet (sheet 4). Please refer to Ms. Miller's Memorandum for location and information concerning wet weather conveyances.
- 5) To avoid additional delays, please verify that all comments and corrections mentioned in this Memorandum and the Memorandum from Ms. Miller have been completed and are accurate before submittal to this office.
- 6) Please provide our office with four sets of revised half-size plans, including erosion control plan sheets, and one set of permit sketches.

If you have any questions, please contact Anthony Myers at (615) 532-9945.

JLH:ARM:kek

Enclosures

cc: Mr. Freddy Miller, Roadway Design Office
Mr. Sam Cardwell, Program Scheduling Section
Dr. Deedee Kathman, Technical Studies Office
Permit File, Reading File, Chronological File

Figure 3-7 (continued)
Example Permit Assessment

Permit Issuing Agencies

Several State and Federal Agencies issue permits for impacts to Waters of the United States and Waters of the State of Tennessee. These agencies have regulatory authority over the Tennessee Department of Transportation. These agencies, and the permits the agencies issue, are described in the following paragraphs. Included are links to the agencies' website. The following agencies issue the permits for various environmental impacts.

Tennessee Department of Environment and Conservation (TDEC)

The following is a link to TDEC's permit website:

<http://www.state.tn.us/environment/permits/>

Aquatic Resource Alteration Permit (ARAP)

Many impacts to wetlands and streams considered Waters of the State of Tennessee are covered by one of the previously issued "**General**" permits (road crossings, wet weather conveyances, bank stabilization, utility line crossings, etc.).

Impacts to Waters of the State of Tennessee not covered by one of the General ARAP's require an "**Individual**" permit. The "Individual" permit is also referred to as a "**Section 401 Water Quality**" permit. Typically, Individual permits are required for channel changes and wetland impacts greater than 0.25 acres of isolated wetlands or 0.1 acres of non-isolated wetlands. Individual permits require a 30 day public notice before they can be issued.

Individual Federal permits, (Corps of Engineers and Coast Guard) require a "**401 Water Quality Certification**" from TDEC. Typically, a 401 certification is similar to an Individual ARAP. It is usually issued under one of the federal permits that utilize the federal public notice process. This is typically required for impacts to Waters and Wetlands of the United States.

National Pollutant Discharge Elimination System Permit (NPDES)

This permit controls water pollution by regulating point sources (i.e. ditches, pipes) that discharge pollutants into Waters of the State of Tennessee. The Storm Water Pollution Prevention Plan (SWPPP) Consultant shall be responsible for completing the SWPPP document and the "Notice of Intent" (NOI), which is required when the disturbed area for a project is one acre or more.

Class V Injection Well Permit

This permit is required for any project that fills or affects stormwater runoff flowing into an open sinkhole or cave within the Right-of-Way or in the vicinity of the project. This permit is also required for any project that may affect the ground water via a sinkhole.

A treatment plan may be required from the Geotechnical Engineering Section of the Division of Materials and Tests, and will need to be placed in the plans for submittal with the application for this permit. A geotechnical report may also be needed with the application for this permit.

Since a sketch is not required for this permit, the entire sinkhole must be shown on the present layout sheet of the plans. The proposed layout sheet should show the remaining portion of the sinkhole (if any) and applicable treatment.

Tennessee Wildlife Resources Agency (TWRA)

The following is a link to the TWRA’s website:

<http://www.state.tn.us/twra/index.html>

Reelfoot Watershed Management Permit

The Reelfoot Watershed Management permit is required for all projects that effects water flowing within the drainage basin of Reelfoot Lake. This permit requires a joint application to the TWRA and TDEC.

United States Army Corps of Engineers (USACE)

The following is a link to the USACE’s permit website:

<http://www.usace.army.mil/cw/cecwo/reg/>

Section 404 Permit

Permits for Section 404 include environmental impact to Waters of the United States (including Waters of the State of Tennessee). The permit will either be “Nationwide” or “Individual” Permit, as describe below.

Nationwide Permits

This permit is required for environmental impacts to Waters of the United States (including Waters of the State of Tennessee). Many impacts are covered under previously issued general or “**Nationwide**” Permits (minor road crossings, categorical exclusions, bank stabilization, isolated waters and headwaters, etc.). TDEC ARAP permits **are required** to accompany most Nationwide Permits.

Individual Permits

Impacts to streams and wetlands considered Waters of the United States (including Waters of the State of Tennessee), not covered by one of the Nationwide permits require an “**Individual**” permit. These are generally impacts to streams or wetlands larger than 0.5 acres. TDEC 401 Water Quality Certification is required along with the Individual Section 404 Permits.

Section 404 – Federal Emergency Management Agency (FEMA) Requirements

All projects with either the Nationwide or Individual Section 404 Permits must conform to FEMA standards. If the roadway project is located within a flood study area where either base flood elevations or a designated floodway has been determined, contact the Hydraulic Design Section of the Structures Division for further guidance and design procedures on FEMA Study information.

The appropriate coordination information for Flood Study streams (i.e. “no-rise” certification and letter to corresponding officials, Conditional Letter of Map Revision

(CLOMR), FEMA map name and number, FEMA Flood Insurance Study Name, etc.), should be supplied to the Environmental Division by the Hydraulic Design Section of the Structures Division for the permit submission.

Additional information is needed from the Designer when projects impact Corps of Engineers reservoirs. This is typically when TDOT is acquiring right-of-way from the Corps of Engineers. Contact the Environmental Permits Office for affected reservoir elevations. The quantities of cut and fill, in cubic yards, are required within the affected reservoir elevations. If the project causes a loss of flood storage for the reservoir, an offset plan may be required. Once the Environmental Permits Office receives this information, the Designer will be informed of the appropriate Corps of Engineers official to contact for determining if an offset plan is necessary. This may require the purchase of additional right-of-way or additional design work on the subject reservoir or route.

Section 10 Permit

A Section 10 permit is required for streams considered navigable by the Corps of Engineers, but not covered by a Coast Guard Bridge Permit. With a Section 10 Permit, TDEC will require a 401 Water Quality Certification.

Coast Guard Bridge Permit

The following is a link to the Coast Guard's Bridge permit website:

<http://www.uscg.mil/hq/cg5/cg5411/default.asp>

This permit is required for projects which impact streams or rivers deemed navigable by the Coast Guard. TDEC will require a 401 Water Quality Certification with this permit.

Tennessee Valley Authority

The following is a link to TVA's permit website:

<http://www.tva.gov/river/26apermits/>

Section 26a Permit

A Section 26a permit is required for all projects within the Tennessee River Watershed that may affect Waters of the United States, Waters of the State of Tennessee, and/or TVA administered public land. All impacts (except minor impacts) require a Section 26a permit which is an individual permit. Minor impacts will typically require a letter of "No-Objection" from TVA.

If a Section 26a permit is required, the Hydraulic Design Section of the Structures Division shall provide an offset plan. Power storage and flood storage elevations may be obtained from the Hydraulic Design Section of the Structures Division.

Information Required for Submittal to Environmental Division for Permit Processing

The Designer shall prepare the permit sketches and applicable information including half-size plans, vicinity map, a table listing the environmental impacts, and project specific permit sketches. The project specific permit sketches identified in the Project Assessment shall also include a location map. The following is a detailed list of information required for submittal to the Environmental Division for permit processing:

- 1) The permit assessment will indicate the number of copies of half-size plans required for permit processing. The roadway plans shall be provided and should include:
 - Cover sheet with location map
 - Typical sections
 - Present and proposed layouts, including information contained in the ecology report, with:
 - Cut and fill slope lines
 - Streams and springs
 - Wetland boundaries
 - Proposed structures on streams
 - Open sinkholes and caves that will be filled in, undercut, and/or receive runoff from the project
 - Mitigation features (meanders in proposed relocated streams, and tree plantings for both relocated streams and wetlands, if indicated in the ecology report)
 - Information on how in-stream work will be separated from flowing water and specific engineering details required for the contractor to build the project
 - Roadway profiles
 - Culvert sections of all culverts on streams
 - Erosion prevention and sediment control plans
 - Detour and construction access or haul roads (if they require temporary stream or wetland crossings) with streams

- 2) A vicinity map based on a color 7 ½-minute Quadrangle map, showing the stream crossings. The vicinity map shall be on an 8 ½ x 11-inch sheet. If the Quadrangle portion showing the project is larger than that which will fit on the 8 ½ x 11-inch sheet, it shall be divided into 8 ½ x 11-inch segments and labeled with match lines. The vicinity map shall provide the following information:
 - Proposed alignment
 - Scale shall be indicated graphically
 - Circle the stream crossings, and other impacts such as wetland fills, sinkholes, caves, and structure locations
 - Label the station of each crossing
 - Label the location and stations of the project termini and the construction limits of the roadway project
 - Date prepared (and date of latest revision)
 - Contour interval
 - North arrow
 - An information block containing the following information:
 - The Tennessee Department of Transportation shall be identified as the applicant

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

- The Quadrangle sheet name and number
- Preliminary Engineering number
- Project Identification Number (PIN)
- Route number and name
- Official project description
- County
- Nearest town or city

Figure 3-8 is an example Vicinity Map required for submittal with the permit sketches.

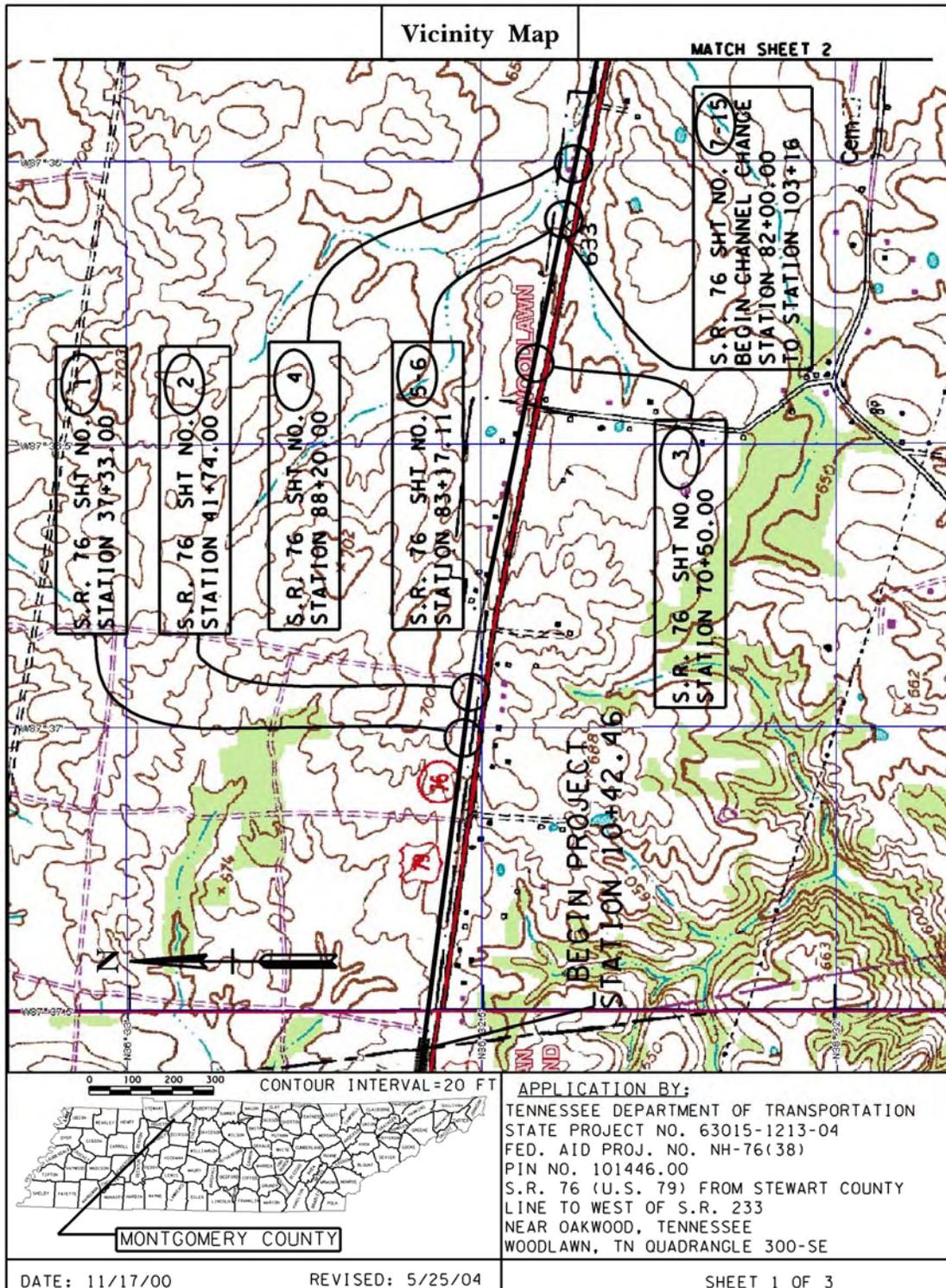


Figure 3-8
Example Vicinity Map

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

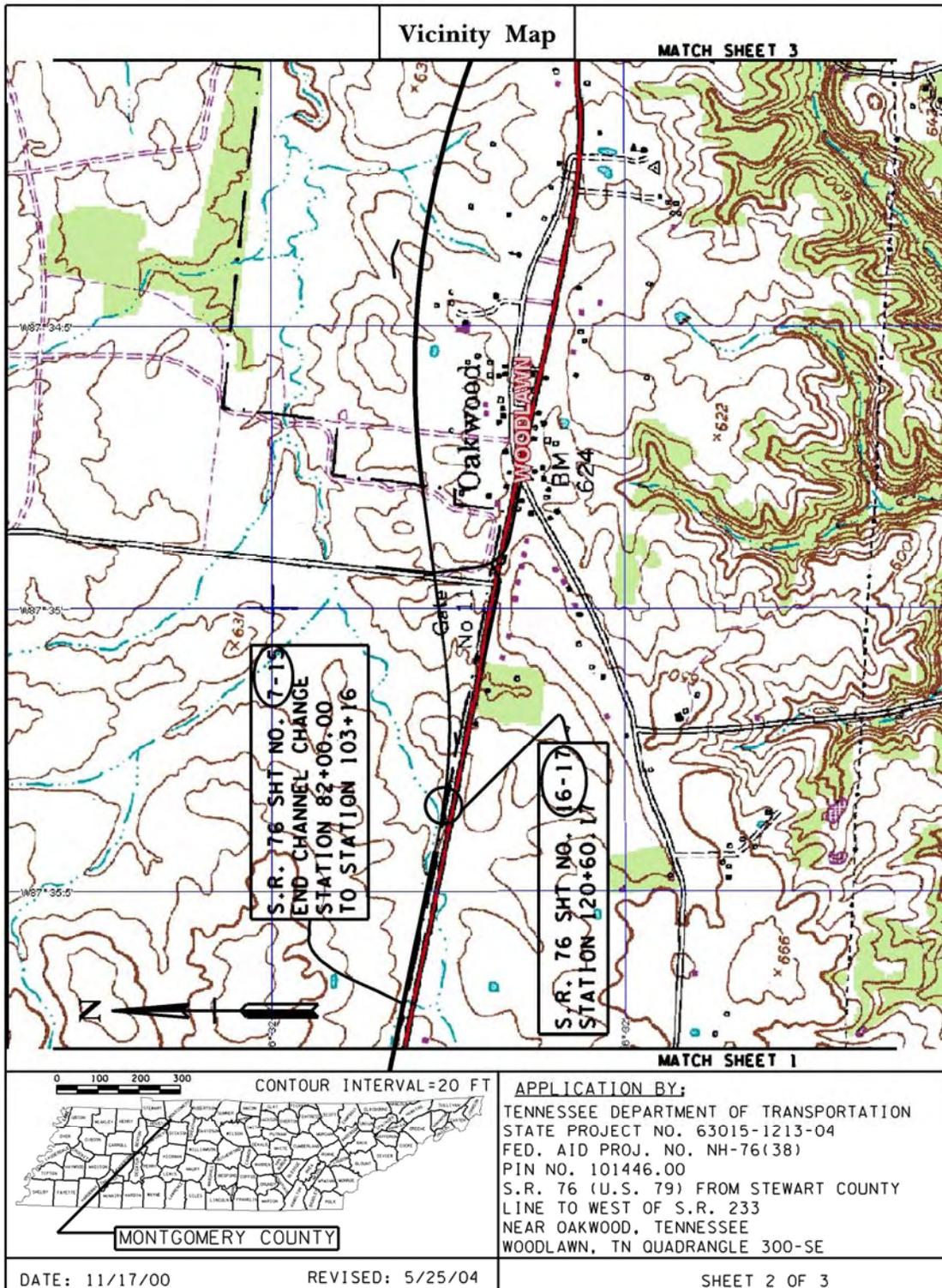


Figure 3-8 (continued)
 Example Vicinity Map

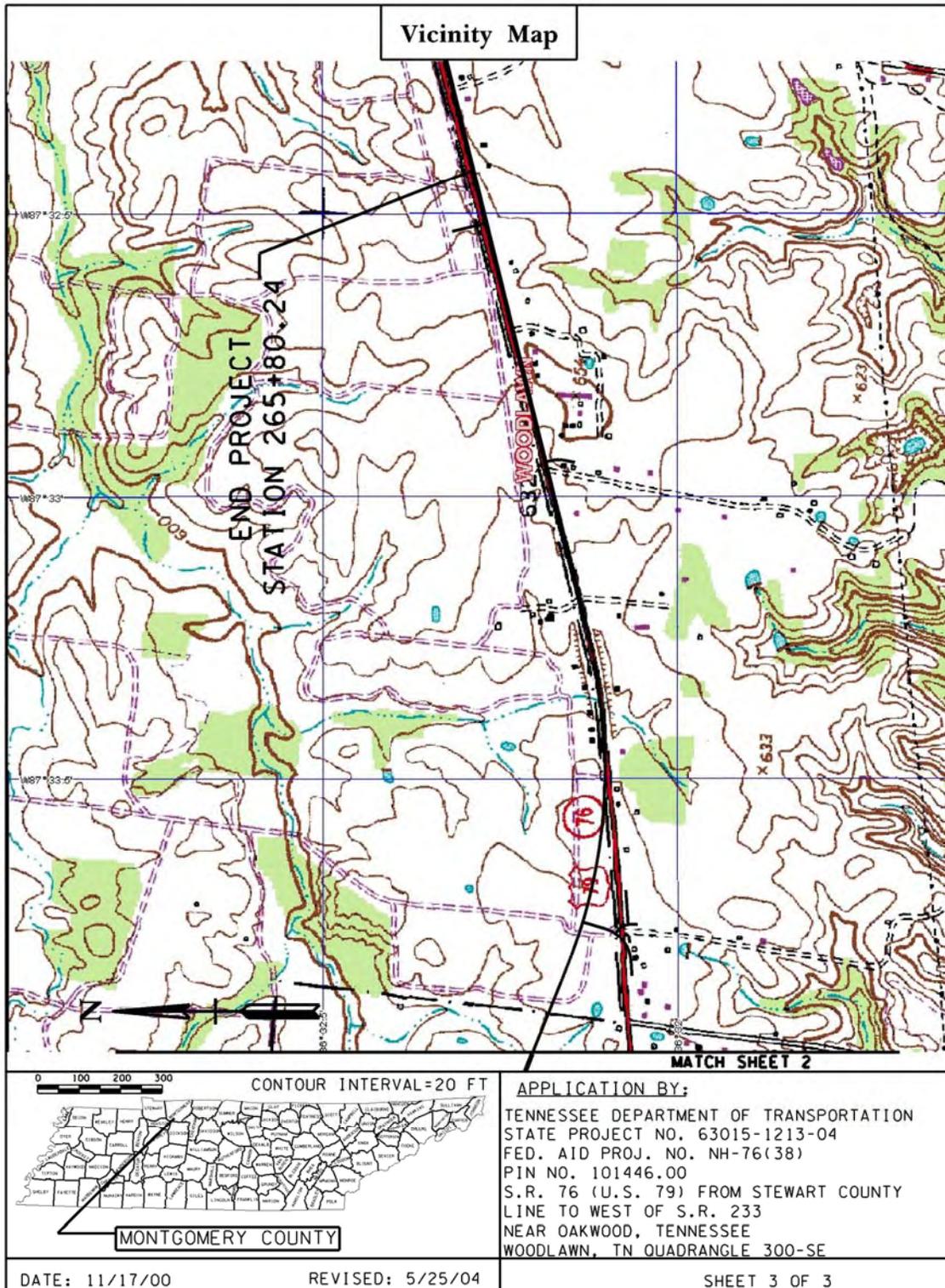


Figure 3-8 (continued)
Example Vicinity Map

- 3) Provide a table of environmental impacts listing the following:
- Station or range of stations of impact (i.e. STA. 65+20.00 or STA. 82+00 to 103+16)
 - Feature impacted (wetland, channel, stream, etc.)
 - Specific impact on the feature (wetland fill, channel change, stream relocation, etc.)

Figure 3-9 is an example of a table listing the environmental impacts for project.

S.R. 76 List of Environmental Impacts

Table One

Station No.	Impact	Area in Acres	Feature Impacted
37+33	Wetland Fill	0.044	Isolated Wetland
41+74	Wetland Fill	0.065	Isolated Wetland
70+50	Wetland Fill	0.531	Isolated Wetland
88+20	Wetland Fill	0.008	Isolated Wetland

Station No.	Impact	Length in ft.	Feature Impacted
83+17.11	Culvert	297	Fletchers Fork Creek
82+00 to 103+16	Channel Changes	2116	Fletchers Fork Creek
120+60.17	Culvert	219	Fletchers Fork Creek

	Property Owner	Address
37+33	Jane Smith	556 Quali Hollow Road, Clarksville, Tn 55555
41+74	Jane Smith	556 Quali Hollow Road, Clarksville, Tn 55555
70+50	Jane Smith	556 Quali Hollow Road, Clarksville, Tn 55555
88+20	John Doe	555 Quali Hollow Road, Clarksville, Tn 55555
83+17.11	John Doe	555 Quali Hollow Road, Clarksville, Tn 55555
82+00 to 103+16	John Doe	555 Quali Hollow Road, Clarksville, Tn 55555
120+60.17	Jane Smith	556 Quali Hollow Road, Clarksville, Tn 55555

**Figure 3-9
Example Table of Impacts**

- 4) Provide permit drawings as required

Site specific permit drawings will be required for certain impacts. The purpose of the drawings is to provide the regulatory agencies with details of the impacts which can then be brought to the attention of the general public via the public notice process. The drawings shall be of a nature so as not to overwhelm the non-engineering public with technical information, yet specific enough to provide details of the environmental impacts and any on-site mitigation. Specific engineering details required for the contractor to build the project shall be detailed in the plans and included with the submission of material to the Environmental Division.

Location Map

A location map will be required for all permit drawing submittals. Where multiple impacts occur within a single project, a single location map shall be utilized that indicates each specific impact requiring permit sketches. In addition to the information required on the vicinity map, the following additional information will be required on the location map:

- Project site indicated on portion of county map
- County indicated on inset state map
- Location of all site-specific environmental impacts shall be indicated with station number

Figure 3-10 is an example of a Location Map.

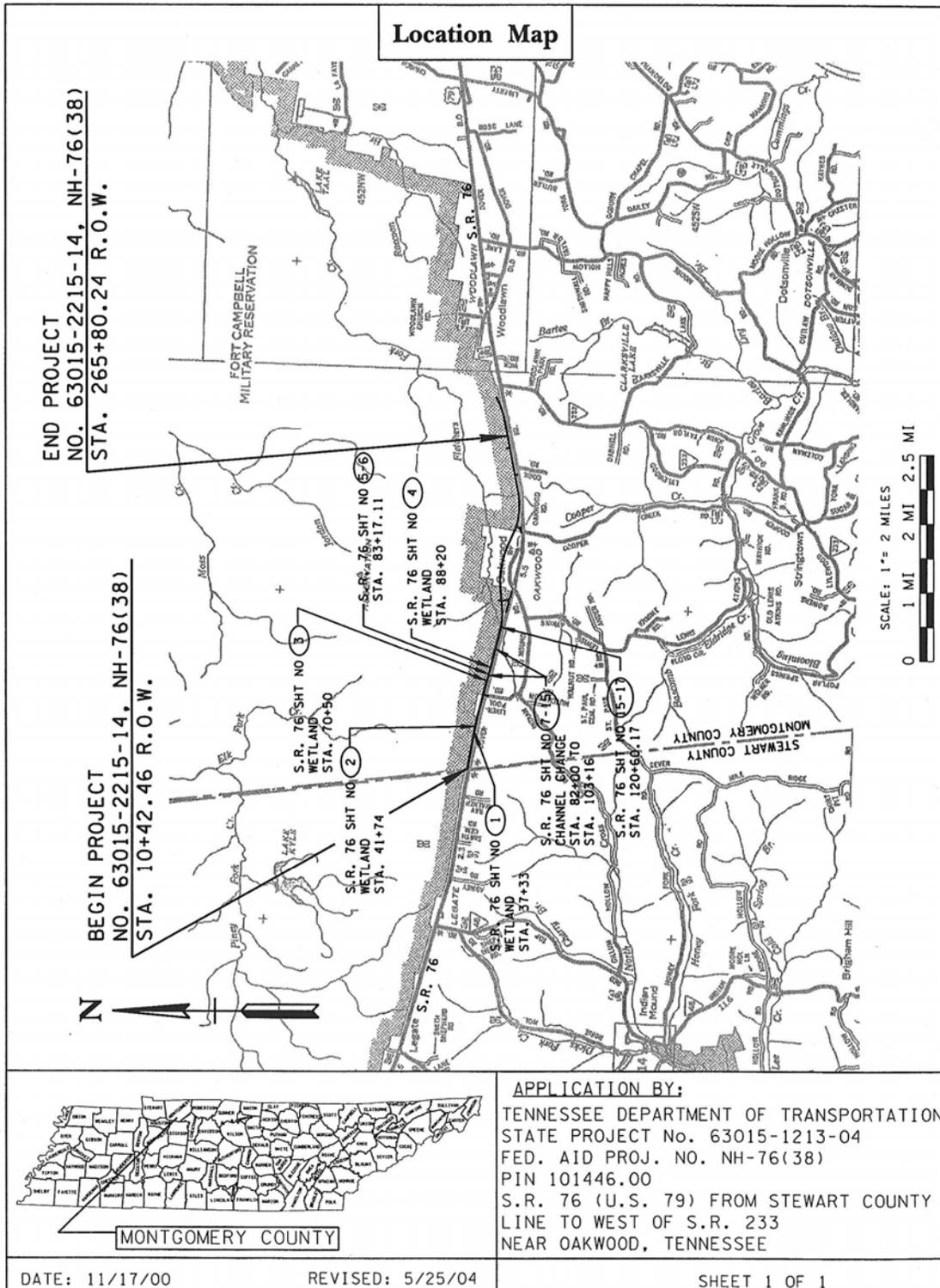


Figure 3-10
Example Location Map

General Permit Drawings

All permit drawings shall have the following general information (See “Permit Border Cell”):

- All maps and drawings shall be on 8½ x 11-inch reproducible paper
- Submit the fewest number of drawings necessary to adequately show the proposed activity. The orientation may be either portrait or landscape.
- Since drawings must be reproduced by photocopying, color shading shall not be used. Drawings may show work as dot shading, or other similar graphic symbols. Only use hatching and cross-hatching for wetland impacts.
- A 1-inch margin shall be left at the top edge and left side for binding purposes
- A ½-inch bottom edge and right side border shall also be utilized
- The adjacent property owner’s names and tract numbers labeled (A separate permit drawing listing the property owner’s names, tract numbers and addresses of each impact.)
- North arrow
- All drawings shall be to scale, and the scale shall be indicated graphically
- Proposed Right-of-Way boundaries and all easements shown and labeled
- Proposed cut and fill slope lines shown and labeled
- Delete unnecessary information to avoid clutter
- An information block containing the following information:
 - Tennessee Department of Transportation shall be identified as the applicant
 - Quadrangle sheet name and number
 - Preliminary Engineering Number
 - Project Identification Number (PIN)
 - Route number and name
 - Official project description
 - County
 - Nearest town or city
 - Sheet __ of __

Additional Permit Specific Sketch Requirements:

In addition to the above general information, the following information will be required on the site specific permit drawings:

Bank Stabilization

The following information is required on permit sketches for bank stabilization:

- Station or range of stations of the impact
- Plan view of bank stabilization location
- Type of material to be used
- Typical cross-section of the bank stabilization (to scale)
- Longitudinal impact of the bank stabilization
- Any other relevant features (to scale)

Channel Changes

The following information is required on permits for channel changes, alterations, or longitudinal encroachments (transitions of up to 50 ft on either end of a culvert is not included in this category):

- Station or range of stations of the impact
- Plan view of the channel change showing:
 - Location of and labeling the existing stream, relocated stream, channel changes, alterations or longitudinal encroachments
 - Proposed trees, meanders, deflectors, species, spacing, etc. for replacement of channel
- Typical cross-section of existing and proposed channel (to scale). The proposed channel dimensions shall match the existing channel dimensions as closely as possible. If channel widening is needed for high flow, please contact the Technical Studies Office for an appropriate channel design. This shall also be shown on the proposed layout sheet in the plans.
- Length and size of existing open channel impacted
- Length and size of existing structures along the impact
- Length of relocated channel
- Length and size of structures located along the channel change
- Length of rip-rap and/or relevant features with the channel change. Rip-rap shall only be used in streams where absolutely necessary and when used the evidence to support its use shall be given (to prevent erosion, velocity, etc...)
- Notes regarding in-kind replacement of trees or channel (no substitutions, etc...)
- Other relevant features (to scale)

The Hydraulic Design Section of the Structures Division will perform the design of a channel change, if the 50-year discharge exceeds 500 cubic feet per second, at the downstream section of the proposed change.

Figure 3-11 is an example of Permit Sketches required for a channel change.

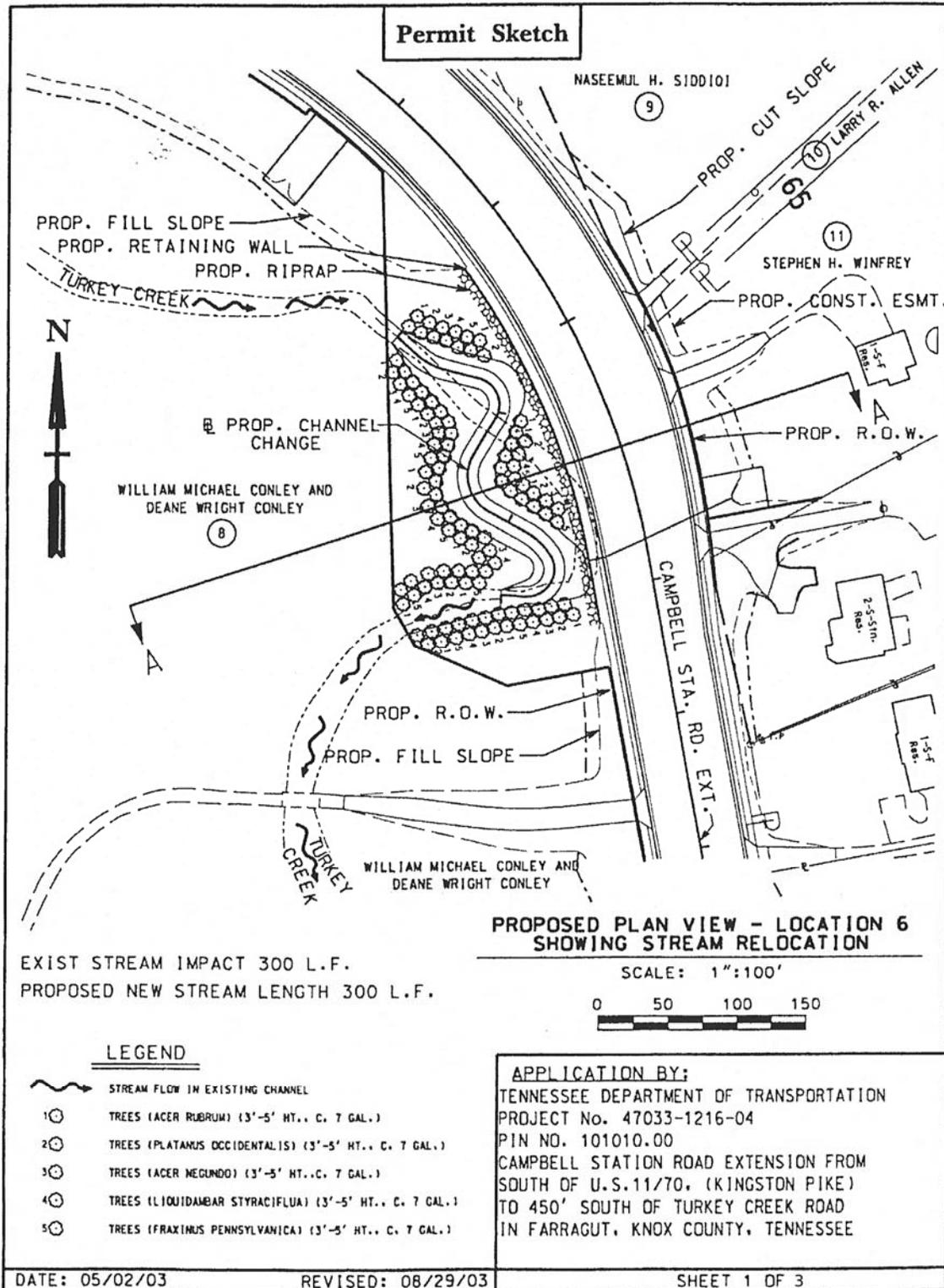


Figure 3-11
Example Channel Change Permit Sketches

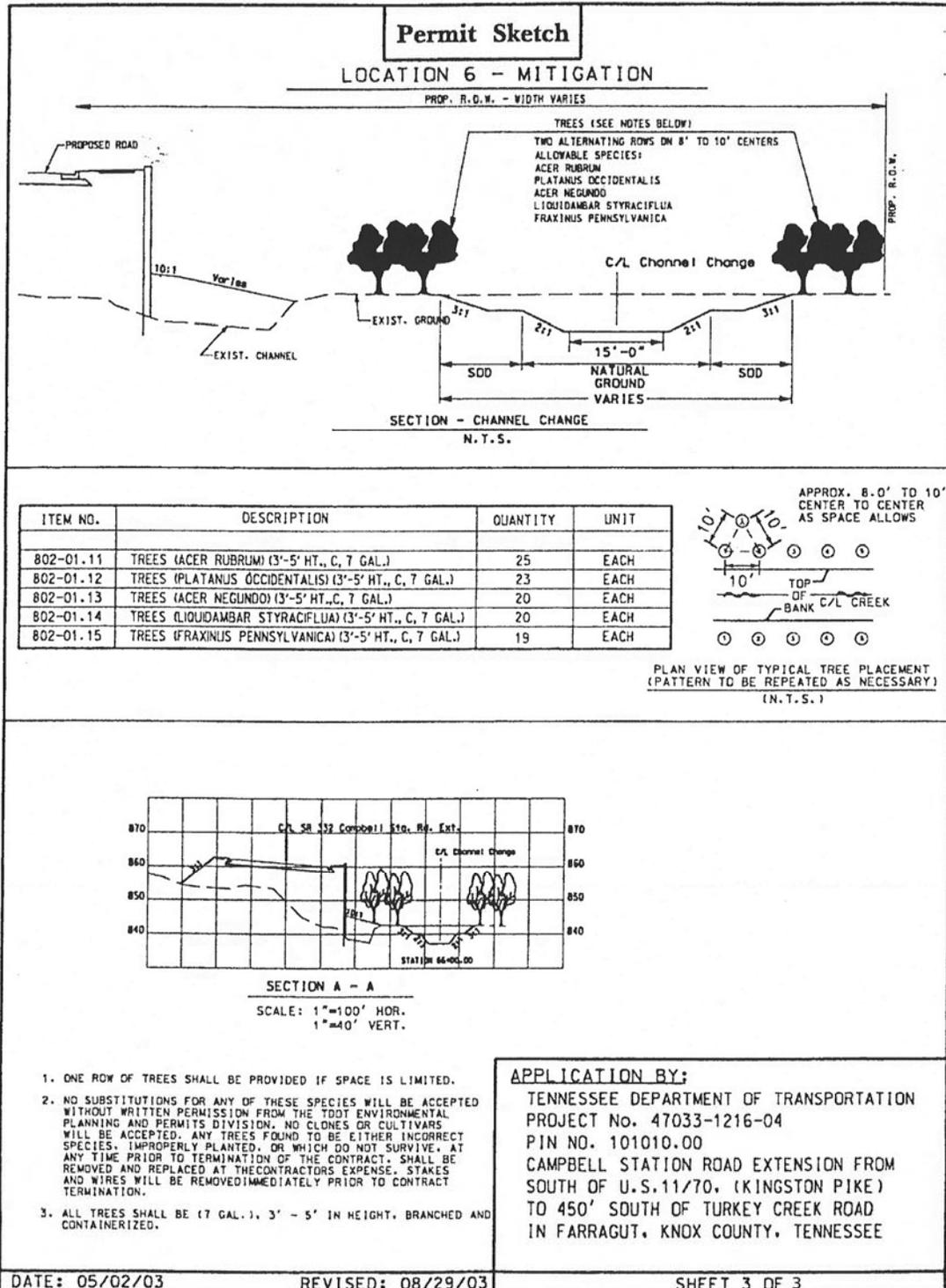


Figure 3-11 (continued)
Example Channel Change Permit Sketches

Culverts longer than 200 feet

The following information is required on permit sketches for new culverts longer than 200 feet and for culvert extensions which will result in the culvert being greater than 200 feet (including the concrete aprons):

- Station or range of stations of the impact
- Plan view showing:
 - Location of and labeling of the existing and proposed culvert and extensions
 - Proposed rip-rap (to scale)
 - Proposed trees for in-kind replacement
- Notes regarding in-kind replacement of trees (no substitutions, etc.)
- Typical cross-section of the culvert (to scale)
- Other relevant features (to scale)
- Table indicating:
 - Length of existing open channel impacted
 - Length and size of existing structures along the impact
 - Length and size of proposed structures, concrete aprons, endwalls or wingwalls along the impact
 - Length of proposed rip-rap
 - Length of tree plantings for in-kind replacement

Figure 3-12 is an example of the typical sketches required for a culvert longer than 200 feet.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

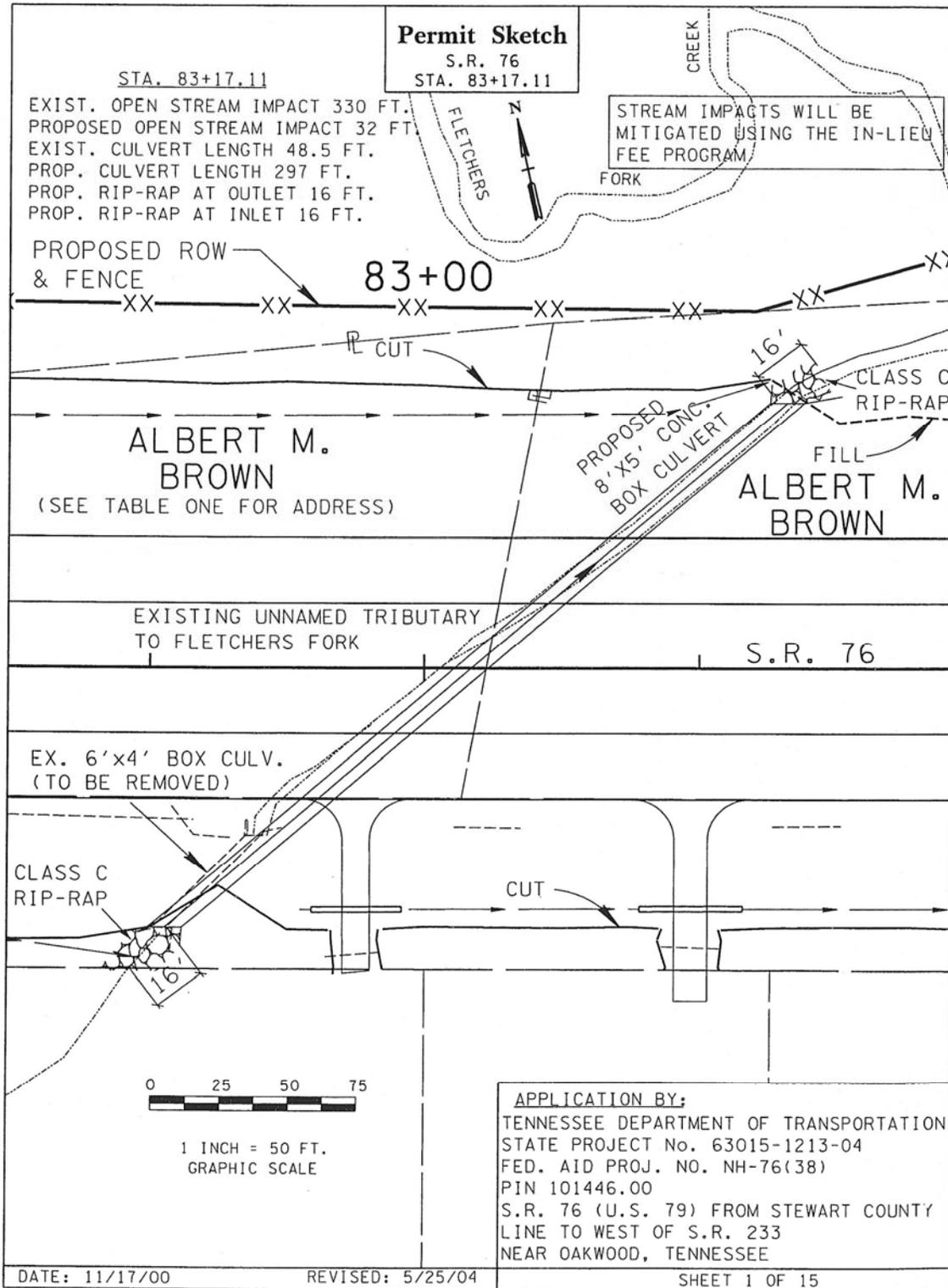


Figure 3-12
Example Permit Sketches for Culverts Longer than 200 Feet

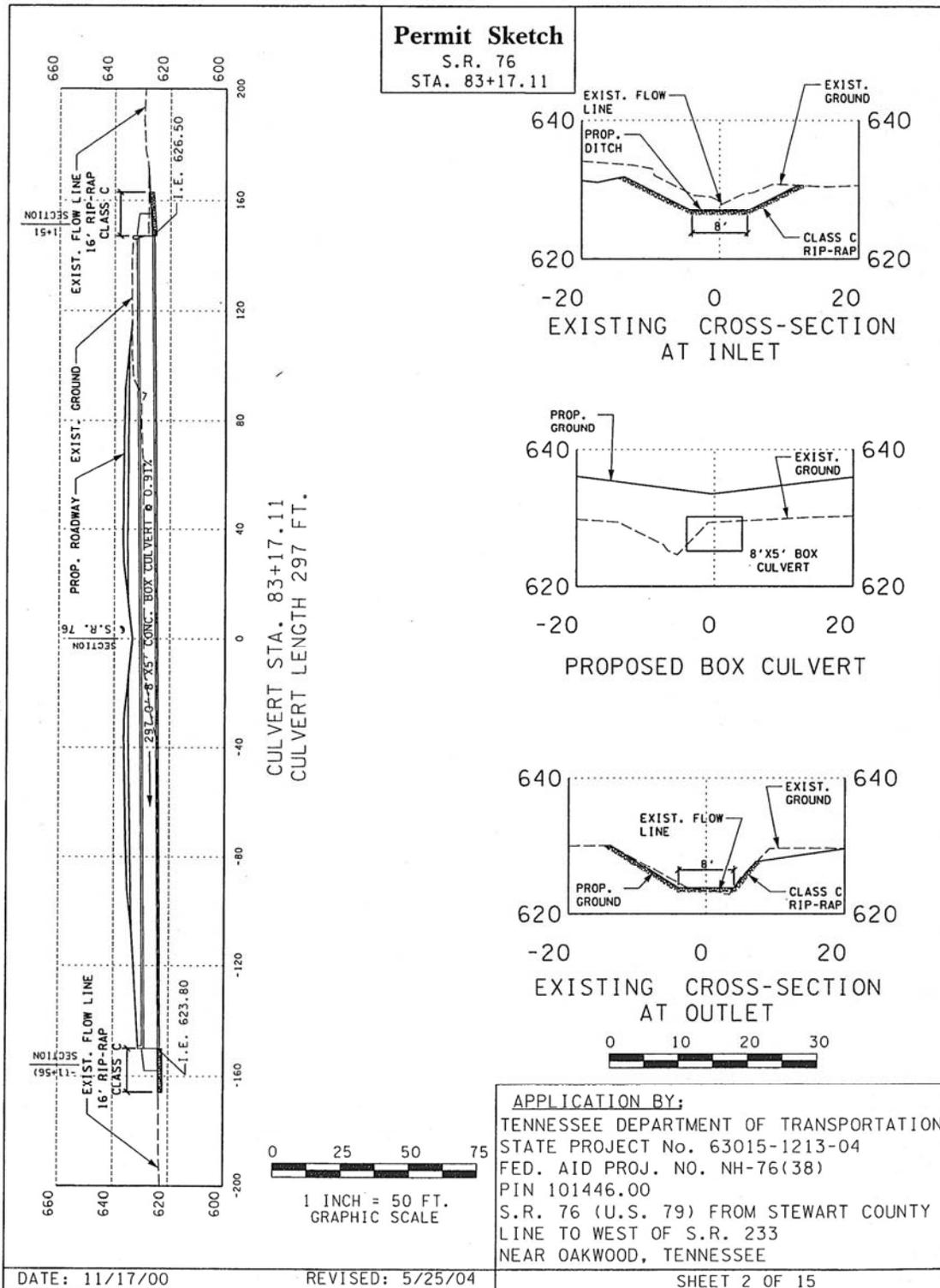


Figure 3-12 (continued)
Example Permit Sketches for Culverts Longer than 200 Feet

Endangered Species

The following information is required on permit sketches for projects involving areas of concern such as National Wild and Scenic River System, a State Scenic River, or waters designated as Outstanding National Resource Waters or projects where Endangered Species are affected or jeopardized.

- Station or range of stations of the impact
- Plan view of site indicating the area of concern
- Notes regarding mitigation of impact
- Other relevant features (to scale)

Streams Containing Contaminated Sediments

The following information is required on permit sketches for streams containing contaminated sediments:

- Station or range of stations of the impact
- Plan view of site indicating the area containing contaminated sediments
- Type of material to be used decontaminate the location
- Notes regarding mitigation of impact
- Other relevant features (to scale)

Wetland Impacts

The following information is required on permit sketches for wetland impacts:

- Station or range of stations of the impact
- Plan view of impact area showing:
 - Existing and proposed conditions (to scale)
 - Cross-hatch the permanent wetland impacts and hatch the temporary wetland impacts
 - Construction haul/access roads
 - Note indicating if a portion of the wetland is outside of TDOT Right-of-Way, easements, and/or not to be disturbed during construction
- Profile view of impact area showing existing and proposed conditions (to scale)
- Boundaries of the existing wetland shall be indicated even if the wetland extends past the Right-of-Way or easement lines
- Notes regarding mitigation (tree, species, etc...) of temporary wetland replacement as indicated in the ecology report (also, shown on proposed layout sheet in plans)
- Table indicating:
 - Legend of hatching for the permanent and temporary wetland impacts
 - Area of the permanent and temporary wetland impacts in acres
 - Volume of the permanent and temporary wetland impacts in cubic yards

Figure 3-13 is an example of the typical sketches required for wetland impacts.

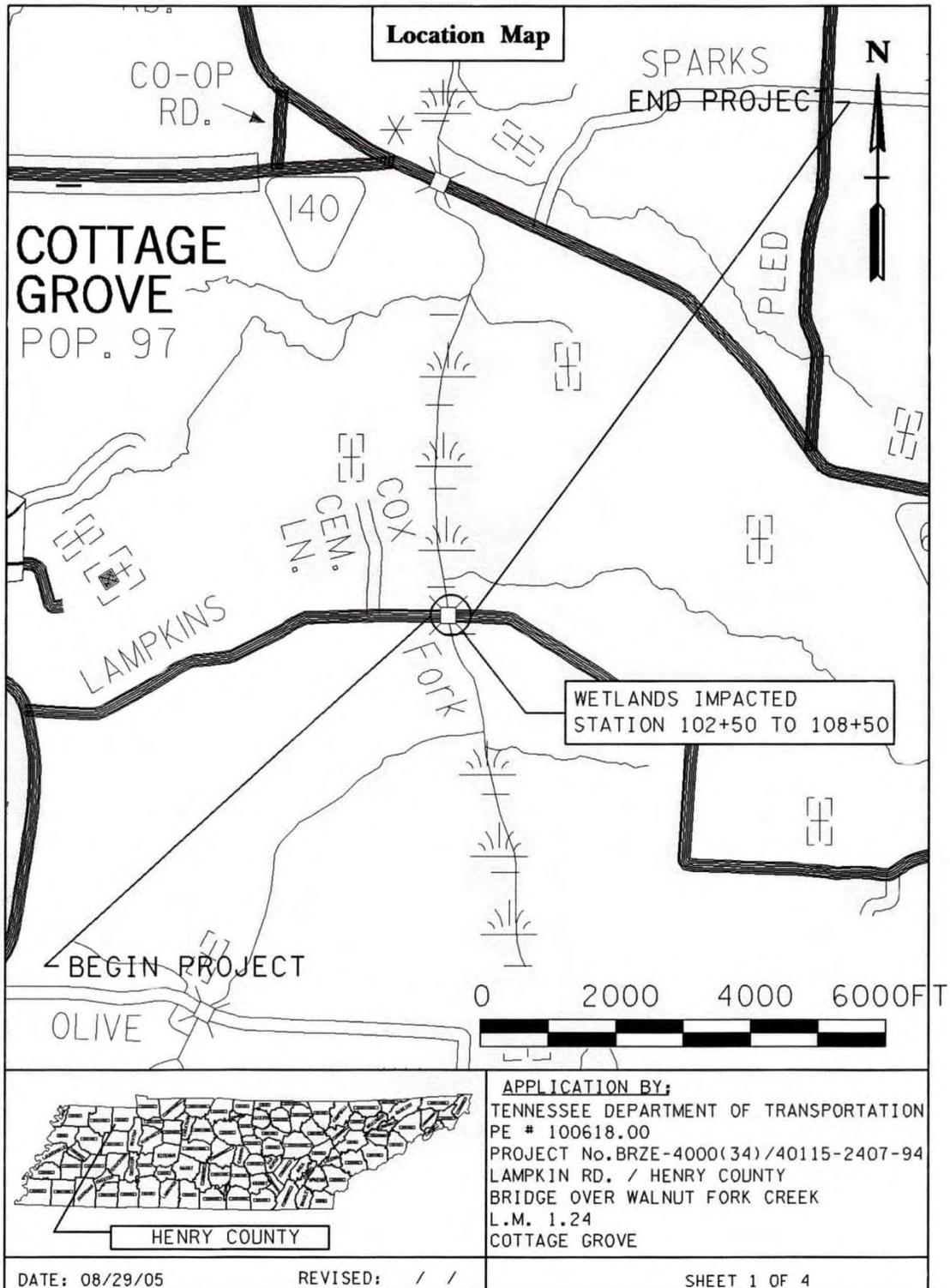


Figure 3-13
Example Permit Sketches for Wetland Impacts

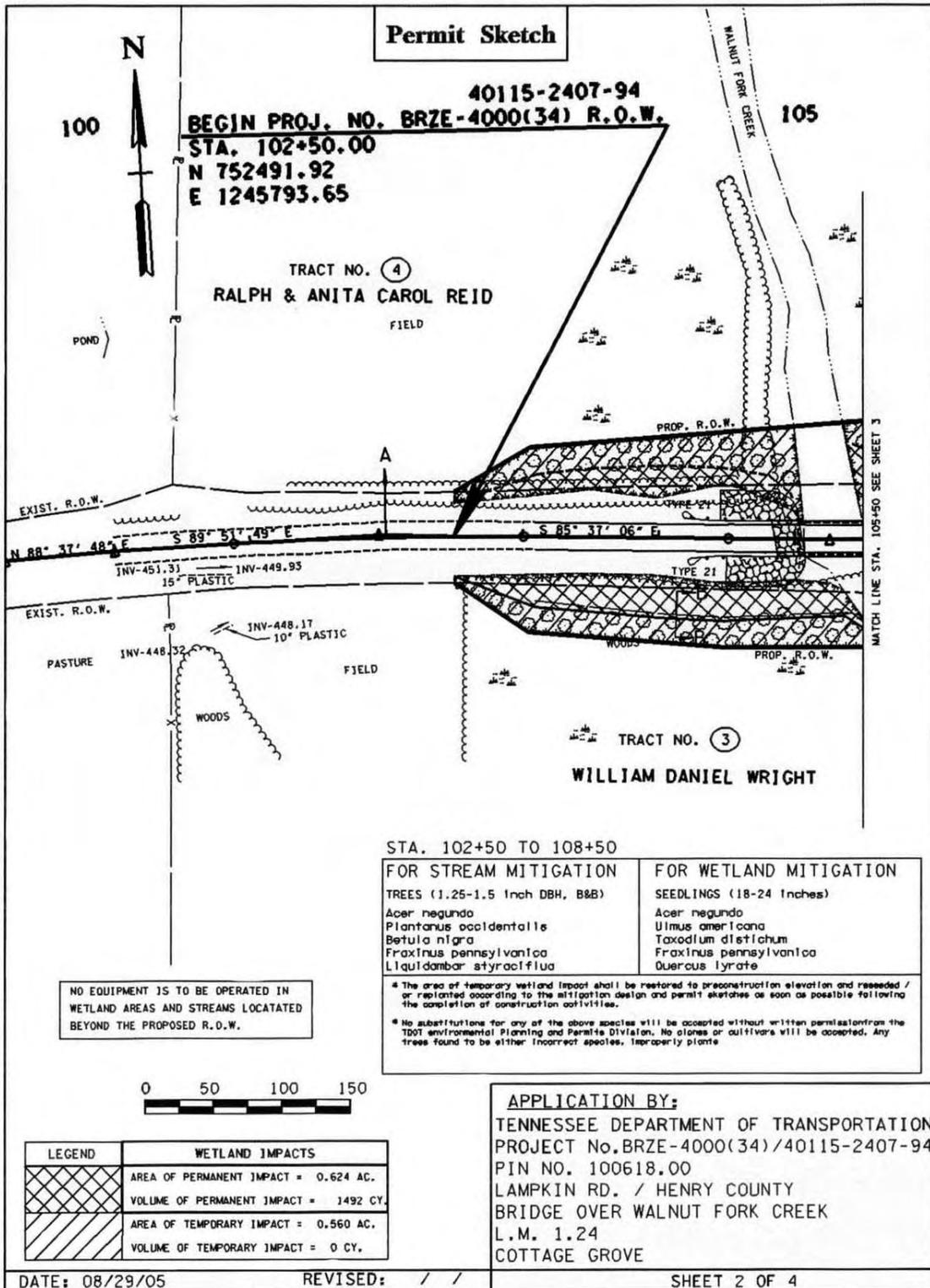


Figure 3-13 (continued)
 Example Permit Sketches for Wetland Impacts

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

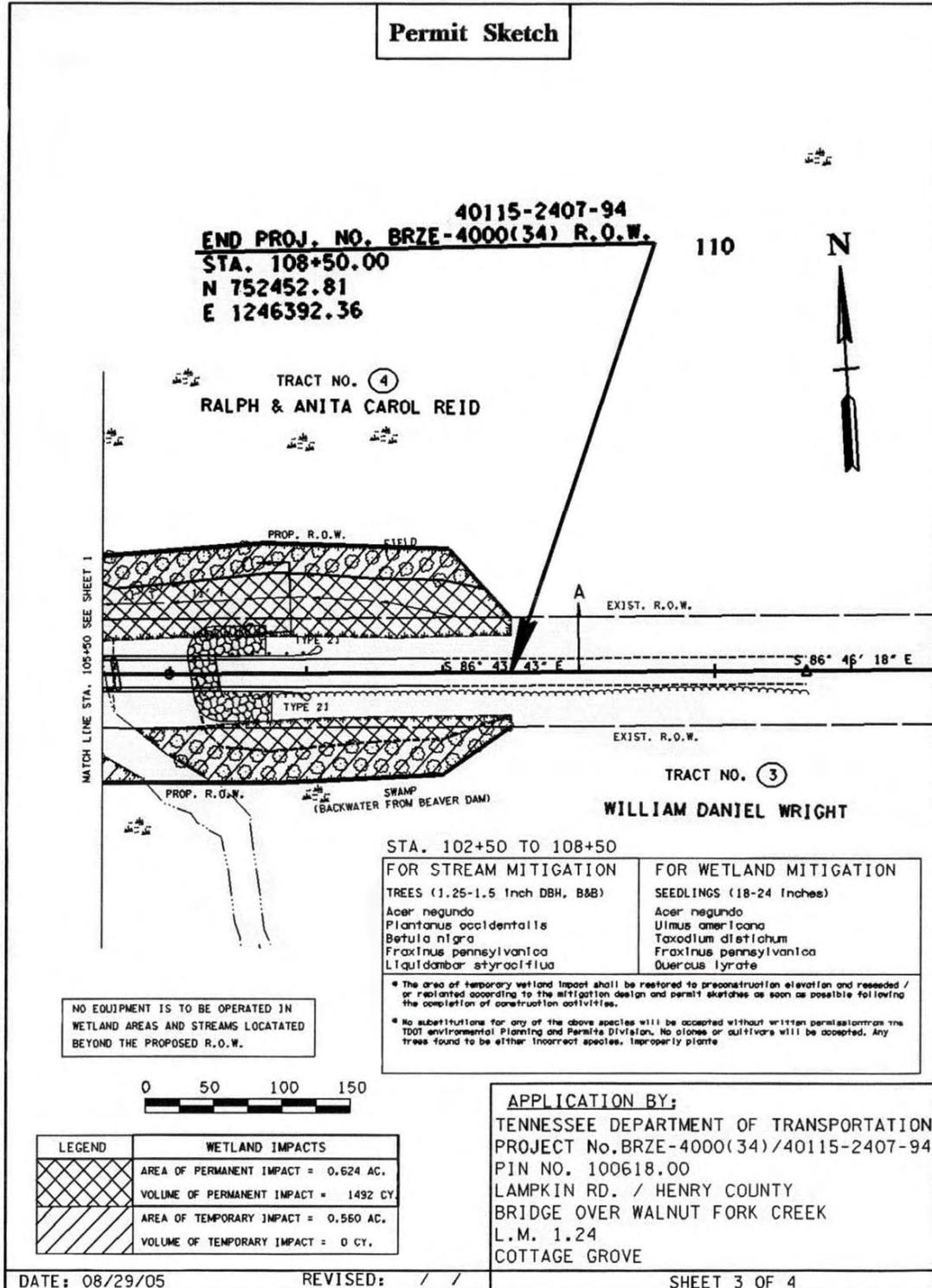


Figure 3-13 (continued)
 Example Permit Sketches for Wetland Impacts

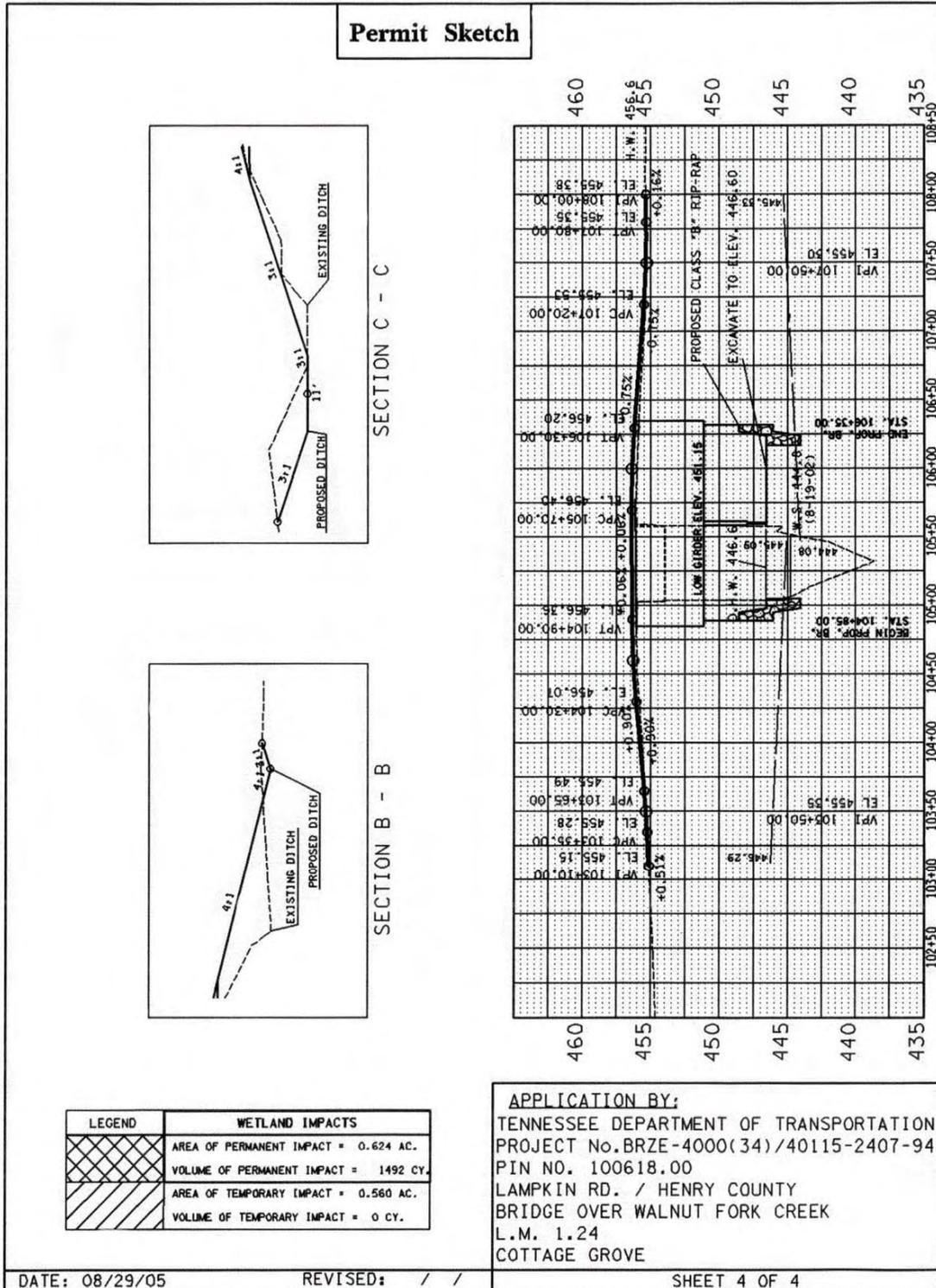


Figure 3-13 (continued)
 Example Permit Sketches for Wetland Impacts

Application For Permit Approval

Once the Application for Permits is approved and submitted to the regulatory agency (TDEC, TVA, etc...) by the Environmental Division, an e-mail will be sent to the Design Manager. Please note, if the regulatory agency disagrees with the Environmental Divisions assessment, the regulatory agency will request more information.

Figure 3-14 is an example e-mail that will be sent to the Design Manager.

PE # 39945-1679-04
 PIN 104395.00
 SIA - Mt. Ararat Road
 Serving Beech River Airport
 Henderson County

Our office reviewed the above referenced project for a permit assessment (Activity 670-PPRM) and application (Activity 675-PPRM). We applied for Water Quality Permits on November 28, 2005 and no further information is needed at this time. If the regulatory agencies have specific requests, we will notify your office, as soon as possible, for any additional information that may be needed. If the plans change from the date of application, in areas shown as a stream on the quad map or listed as a stream in the ecology report dated July 22, 2005, please notify our office, as soon as possible, for further review.

Figure 3-14
Example Approved Application for Permits Notification E-Mail

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Table 3-4 identifies typical project activities for the permitting process required for a typical three mile grade and drain project with some environmental concerns. Table 3-5 identifies project activities for the permitting process required for a typical bridge and approach project. Some of the activities have designated Activity Numbers as designated in the Program Project and Resource Management Activities Manual. Please note the number of weeks may vary per project due to unforeseeable delays. Activities which are identified in the Program, Project, and Resource Management Activities Manual are designated in Tables 3-4 and 3-5.

Grade & Drain Project Week No.	Design Division Description of Activity	Other Divisions Description of Activity
0	Design Begins. (Begin Activity No. 340)	
6	Designer sends plans to Structures Division for Grade Approval and to Environmental Division for locating Environmental Boundaries and to distribute plans to SWPPP Consultant. (End of Activity No. 340)	
7		Environmental Division to send Plans to SWPPP Consultant.
11		Structures Division sends Grade Approval to Design Division. (Activity No.345)
15		SWPPP Consultant to send Design Division information concerning highly impaired waters (if such are on project).
17	Design Manager Distributes Preliminary PS&E Field Review Plans and for Technical Studies. (Activity No. 365)	
18		Environmental Division starts reviewing plans for natural resources impacts etc. (Beginning of Activity No. 370) and sends Preliminary PS&E Plans to SWPPP Consultant.
21*	Design Manager Conducts Preliminary PS&E Field Review. (Activity No. 375)	SWPPP Consultant to provide comments at Preliminary PS&E Field Review.

**Table 3-4
Typical Grade and Drain Project Timeline Including Permit Activities**

Note: Number of weeks may vary.

* indicates project milestones

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Grade & Drain Project Week No.	Design Division Description of Activity	Other Divisions Description of Activity
23	Design Manager Distributes Preliminary PS&E Field Review Report. (Activity No. 390)	
24		Environmental Division ends reviewing plans for natural resource impacts and provides: "Environmental Boundaries and Avoidance memoranda" to Design, Geotechnical and Structures Divisions. (End of Activity No. 370)
33*	Design Office Conducts Design Meeting. (Activity No. 400)	
44	Design Manager reviews Hearing Transcript & prepares Response Letter. Design Director reviews and approves Response Letter. Design Manager distributes Response Letter. Design Manager notifies Environmental Division of any alignment changes. (Activity No. 410)	
45		Environmental Division revises Environmental Document for any alignment changes and does any required field work necessary due to alignment shift.
53	Designer Completes ROW Plans Preparation (End of Activity No. 535) and Design Manager Distributes ROW PS&E Field Review Plans to Environmental Division for Environmental Permit Evaluation.	
54		Environmental Division Receives ROW PS&E Plans to develop Mitigation Plans (Activity No. 565) and sends ROW PS&E Plans to SWPPP Consultant.

**Table 3-4 (continued)
Typical Grade and Drain Project Timeline Including Permit Activities**

Note: Number of weeks may vary.

* indicates project milestones

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Grade & Drain Project Week No.	Design Division Description of Activity	Other Divisions Description of Activity
56*	Design Manager Conducts ROW PS&E Field Review. (Activity No. 540)	SWPPP Consultant attends ROW Field Review.
60		SWPPP Consultant to send comments concerning EPSC Plan Sheets to the Design Division.
64	Designer to respond to all of comments from SWPPP Consultant.	
67	Designer begins Finalizing ROW Plans. (Beginning of Activity No. 585)	Environmental Division prepares Final Mitigation Plan. (Activity No. 570)
72	Designer Finalizes ROW Plans. (End of Activity No. 585)	
77	Designer Begins Refining ROW Plans. (Beginning of Activity No. 588)	Environmental Division Distributes Permit Assessment, with permit locations, and final mitigation design to Design Division. (Activity No. 670)
80*	Design Manager Distributes Final ROW and/or Utility Plans and Preliminary Estimate. (Activity No. 600)	
146	Design Manager Submits Permit Sketches and Plan Sheets to Environmental Division. (End of Activity No 575) <i>(** If there is a lag in the schedule due to other issues this should take place 12 months or 52 weeks prior to Letting Date)</i>	
147		Environmental Division to begin review of Permit Sketches and Plan Sheets and makes any request for adjustment to the appropriate Design Manager of Project. (Beginning of Activity No. 675)

**Table 3-4 (continued)
Typical Grade and Drain Project Timeline Including Permit Activities**

Note: Number of weeks may vary.

* indicates project milestones

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Grade & Drain Project Week No.	Design Division Description of Activity	Other Divisions Description of Activity
159		Environmental Division to apply for Permits (End of Activity No. 675) notifies Design Division via email. (<i>**If there is a lag in the schedule to other issues this should take place 9 months or 39 weeks prior to Letting Date</i>)
180	Design Manager Distributes Construction PS&E Field Review Plans. (End of Activity No. 705)	Environmental Division sends Construction PS&E Plans to SWPPP Consultant.
183	Design Manager Conducts Construction PS&E Field Review. (Activity No. 710)	SWPPP Consultant comments concerning EPSC Plans to be included in report.
183	Design Manager informs Environmental Division (Permits) of any changes resulting from Construction PS&E Field Review that would require a permit application revision.	
185	Design Manager to Distribute Construction PS&E Field Review Report.	Environmental Division Obtains Permits. (End of Activity No. 680)
189	Design Manager Submits Final Roadway Plans (mylars) w/estimate to Program Operation Office, Estimate Section. (End of Activity No. 715)	Environmental Division sends Final Roadway Plans to the SWPPP Consultant for the completion of the SWPPP.
198*		CONTRACT LETTING

**Table 3-4 (continued)
Typical Grade and Drain Project Timeline Including Permit Activities**

Note: Number of weeks may vary.

* indicates project milestones

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Bridge & Approach Project Week No.	Design Division Description of Activity	Other Divisions Description of Activity
0	Design Begins. (Begin Activity No. 340)	
6	Design Manager sends Preliminary Plans to Structures Division for Grade Approval and to Environmental Division to distribute plans to SWPPP Consultant. (End of Activity No. 340)	
7		Environmental Division to send Plans to SWPPP Consultant.
11		Structures Division sends Grade Approval to Design Division. (Activity No. 345)
15	Design Division sends Preliminary Plans (that have received Grade Approval from Structures Division) to Environmental Division for Technical Studies. (Activity No. 365)	
20		Environmental Division conducts technical studies to verify environmental boundaries, wetlands, hazardous material, biological concerns, mitigation measures and/or commitments in plans are consistent with environmental document. Environmental Division provides Environmental Boundaries & Avoidance Memo. (Activity No. 370)
23		Structures Division provides Preliminary Bridge Layout to the Design Division. (Activity No. 490)
25	Design Division distributes ROW Plans for Preliminary/ROW PS&E Field Review and to the Environmental Division for the permit assessment process and for the SWPPP Consultant.	

**Table 3-5
Typical Bridge and Approach Project Timeline Including Permit Activities**

Note: Number of weeks may vary.

* indicates project milestones

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Bridge & Approach Project Week No.	Design Division Description of Activity	Other Divisions Description of Activity
28*	Design Division conducts PREL/ROW PS&E Field Review. (Activity No. 540)	SWPPP Consultant to provide comments on the EPSC Plans Sheets to be included in PS&E Field Review Report.
30	Design Manager Distributes Preliminary/ROW Field Review Report.	
31		Environmental Division sends "Permit Assessment Report" to the Design Division. (Activity No. 670)
35*	Design Division distributes Final ROW and/or Utility Plans and Preliminary Estimate. (**this milestone is contingent on getting authorization for Right-of-Way Funding) (Activity No. 600)	
39	Design Division submits Permit Sketches and Plan Sheets to the Environmental Division. (Activity No. 575)	
40	Design Division prepares Construction Plans. (Activity No. 705)	Environmental Division to begins Review of Permit Sketches and Plan Sheets and makes any request for adjustment to the appropriate Design Manager of Project.
46		Environmental Division to apply for Permits and notifies Design Division via email. (Activity No. 675)
50	Design Division distributes Construction PS&E Prints.	Environmental Division sends Construction PS&E Plans to SWPPP Consultant.
53	Design Manager Conducts Construction PS&E Field Review. (Activity No. 710)	SWPPP Consultant comments concerning EPSC Plans to be included in Field Review Report.

**Table 3-5 (continued)
Typical Bridge and Approach Project Timeline Including Permit Activities**

Note: Number of weeks may vary.

* indicates project milestones

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Bridge & Approach Project Week No.	Design Division Description of Activity	Other Divisions Description of Activity
53	Design Manager informs Environmental Division (Permits) of any changes from Construction PS&E Field Review that would require a permit application revision.	
55	Design Manager to Distribute Construction PS&E Field Review Report.	Environmental Division Obtains Permits. (Activity No. 680)
61	Design Manager submits Final Roadway Plans (mylars) w/estimate to Program Operation Office, Estimate Section.	Environmental Division sends Final Roadway Plans to the SWPPP Consultant for the completion of the SWPPP.
70*		CONTRACT LETTING

**Table 3-5 (continued)
Typical Bridge and Approach Project Timeline Including Permit Activities**

Note: Number of weeks may vary.

* indicates project milestones

Permit Drawing Cells

The following cells shall be used for permit drawings and can be found in the TDOT Design Division's standard cell libraries (**STDS.CEL**):

- **PMLOCP** Permit drawing location map form (portrait)
- **PMLOCL** Permit drawing location map form (landscape)
- **PMSK** Permit drawing sketch form (portrait)
- **PMSKGR** Permit drawing sketch form (landscape with profile grid)

These cells can be accessed through the TDOT Design Division MicroStation© interface on the "Permits and Forms" dialog. This dialog can be brought up through the TDOT drop down menu on the MicroStation© title bar.

The latest versions of the standard cell libraries and programs to access them can be obtained on TDOT Design Division's CADD web page at:

http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/v8/v8design.htm

Plans Distribution to the Environmental Division

For all projects requiring permits Table 3-6 shows the distribution of plans to the Environmental Division. This is to be done in order to facilitate coordination, simplify plans distribution, and minimize requests for additional sets of prints.

1. Printing at major milestones will include a distribution to the Director of the Environmental Division, Suite 900, James K. Polk Building. Refer to Table 3-6 for the correct number of prints. This will eliminate separate printings and distributions for permit assessments and technical studies including archaeological, ecological, historical, and hazardous waste purposes.
2. Plans should be 2-hole punched to accommodate ecco fasteners / plans hangers.
3. The right-of-way field review prints shall include the proposed EPSC plan sheets. Quantity tabulations are not needed for the field review plans.
4. The plans submitted for permit application purposes shall include mitigation plans and EPSC sheets.
5. The Design Division shall furnish the Natural Resources Office, Environmental Division with a .PDF file of the title sheet, estimated roadway quantities, drainage map, EPSC notes, EPSC plans, and contour sheets twelve weeks prior to the letting. All construction field review comments shall be incorporated into the plans prior to submittal of the .PDF file (only final EPSC quantities are needed on the estimated roadway quantity sheets). Sheets do not have to be sealed for this submittal. Sheets should be sent as one (1) .PDF file rather than separate .PDF files for each sheet. Design staff should email .PDF files to Environmental.NPDES.TDOT@state.tn.us. The email should include "Final SWPPP Plans" and the PIN in the subject line. For files too large to email, the designer shall send an email to the above address advising that the files will be sent on a CD to the Natural Resources Office.
6. The Environmental Division will be responsible for requesting final construction plans from the print shop after plans are submitted.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 08/15/08

Activity	Distribution
Hydraulic Grade Approval. (Only Required for Projects with Access Control or when Noise Walls are Proposed)	1 set ½ size plans to Director of the Environmental Division, 900 James K. Polk Bldg. 1 set ½ size plans to Region 1 biologist (for Region 1 projects only) Note: Electronic files (Microstation) to Ecology and Air & Noise Section, Environmental Division, 900 James K. Polk Bldg. for noise study
Preliminary Field Review	5 sets ½ size plans, 1 set ½ size cross-sections to Director of the Environmental Division, 900 James K. Polk Bldg. 1 set ½ size plans to Region 1 biologist (for Region 1 projects only)
Design Public Hearing/Meeting	No prints required. However, notify Director of Environmental Division (by email) of any alignment changes.
Right of Way Field Review or combined Preliminary & ROW Field Review Note: Include all erosion prevention and sediment control plan sheets.	6* sets ½ size plans, 2 sets ½ size cross-sections to Director of the Environmental Division, 900 James K. Polk Bldg. 1 set ½ size plans, 1 set ½ size cross-sections to Region 1 biologist (for Region 1 projects only) 1 set ½ size plans, 1 set ½ size cross-sections to Storm Water Permits, Natural Resources Office, Environmental Division, 900 James K. Polk Bldg. *Reduce to 5 sets ½ size plans if Preliminary Field Review plans were provided on the project
Permit Sketches , etc. for permit application	5 sets ½ size plans, 1 set ½ size cross-sections, 1 set of sketches, response to Permit Assessment & any additional requirements as indicated by the Permit Assessment Report to Permits Section, Natural Resources Office of the Environmental Division, 900 James K. Polk Bldg.
Construction Field Review	5 sets ½ size plans, 2 sets ½ size cross-sections to Director of the Environmental Division, 900 James K. Polk Bldg. 1 set ½ size plans, 1 set ½ size cross-sections to Region 1 biologist (for Region 1 projects only) 1 set ½ size plans, 1 set ½ size cross-sections to Storm Water Permits, Natural Resource Office, Environmental Division, 900 James K. Polk Bldg.
Final EPSC Plans (12 weeks prior to letting)	Electronic file (.PDF) including title sheet, estimated roadway quantities, drainage map, EPSC notes, EPSC plans, and contours sheets) to Storm Water Permits, Natural Resource Office, Environmental Division, 900 James K. Polk Bldg.

**Table 3-6
Typical Plan Distribution**

3-410.02 PLACEMENT OF TREES IN MITIGATION AREAS

Areas designated for tree planting for water quality impacts typically include restored or existing wetlands, channel changes, and when specified, areas around streams and the inlet and outlet areas at culverts. The Technical Studies Office in the Environmental Division shall be consulted to determine which areas require tree planting. All required tree planting must be located within the permanent right-of-way rather than in a drainage easement. Sufficient room shall be designated for the placement of trees and seedlings near culverts, channel relocations and along stream banks, or other mitigation features, within the right-of-way boundaries. These trees should be protected from disturbance during construction and from maintenance activities after construction. Within the approved permit, the regulatory agencies will specify how long and what percentage of survival is needed to satisfy the conditions of the specific permit.

All notes required by the Technical Studies Office, Environmental Division, or specified in the Ecology report must be placed in the final ROW plans for the permit applications.

SECTION IV – CONSTRUCTION PLANS

CHAPTER 1 - GENERAL PROVISIONS

- 4-100.00 INTRODUCTION
- 4-105.00 ROADWAY DESIGN CHECKLIST - CONSTRUCTION PLANS
- 4-110.00 PROJECT ACTIVITY STATUS SHEET
- 4-112.00 SIZE OF FULL-SIZE PLAN AND CROSS-SECTION SHEETS
- 4-115.00 IDENTIFICATION OF SUPERVISORS, DESIGNERS, AND CHECKERS ON TITLE SHEET
- 4-115.05 SIGNATURES OF THE COMMISSIONER AND THE CHIEF ENGINEER ON TITLE SHEET
- 4-115.10 ENGINEER'S SEAL, SIGNATURE, AND DATE ON TITLE SHEET
- 4-115.15 PROJECT LENGTHS
- 4-115.20 EQUATION BLOCKS ON TITLE SHEET
- 4-115.25 EXCLUSIONS ON TITLE SHEET
- 4-115.30 PROJECT DESCRIPTIONS
- 4-115.35 TRAFFIC DATA BLOCK ON TITLE SHEET
- 4-120.00 HAUL ROADS ON ALL PROJECTS
- 4-125.00 BRIDGE CLEARANCES ON PAVING PROJECTS
- 4-130.00 SALVAGE CREDITS ON FEDERALLY-FUNDED PROJECTS
- 4-133.00 CONSTRUCTION PLANS INDEX
- 4-135.00 GENERAL NOTES ON CONTRACT PLANS
- 4-135.05 SPECIAL NOTES ON CONTRACT PLANS
- 4-137.00 ADDITION OF UTILITY SHEETS TO CONSTRUCTION PLANS
- 4-140.00 CONSTRUCTION PROJECT QUANTITY ESTIMATES AND PLANS SUBMITTAL
- 4-140.02 LETTING REVISIONS
- 4-140.03 ITEM NUMBERS

- 4-140.05 CONSTRUCTION QUANTITIES ESTIMATE DATA FILE
- 4-140.09 ESTIMATE CONFIDENTIALITY
- 4-145.00 FIELD REVIEW PROCEDURES
- 4-150.00 CONSTRUCTION REVISIONS

CHAPTER 2 - EARTHWORK

- 4-202.00 REMOVAL OF STRUCTURE
- 4-202.01 REMOVAL OF STRUCTURES AND OBSTRUCTIONS
- 4-202.10 REMOVAL OF BUILDINGS AND OBSTRUCTIONS
- 4-202.13 ABANDONMENT OF WATER WELLS
- 4-203.00 EXCAVATION AND UNDERCUTTING
- 4-203.02 DEFINITION OF TERMS USED FOR EARTHWORK GRADING CALCULATIONS
- 4-203.05 SHRINKAGE AND SWELL FACTORS
- 4-203.10 GRADING LINE THROUGH SOLID ROCK
- 4-203.15 PRESPLITTING OF ROCK EXCAVATION
- 4-203.20 GRADED SOLID ROCK BORROW
- 4-203.25 ROADWAY APPROACHES
- 4-203.30 TOPSOIL COMPUTATION
- 4-203.35 CHANNEL EXCAVATION FOR BOX AND SLAB TYPE CULVERTS AND BRIDGES
- 4-203.40 COMPUTATIONS FOR ITEM NO. 203-06 WATER
- 4-203.45 EARTHWORK BALANCES ON WIDENING OF EXISTING ROADWAYS
- 4-203.50 SUBMISSION OF GRADING QUANTITIES SHEETS FOR CONSTRUCTION
- 4-203.55 USE OF ESTIMATED GRADING QUANTITIES BLOCK FOR ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED)
- 4-204.00 PIPE CULVERT EXCAVATION AND BEDDING
- 4-204.05 EXCAVATION FOR CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- 4-209.00 EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) FOOTNOTE
- 4-209.01 COMPUTATIONS OF EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) QUANTITIES
- 4-209.05 EXCAVATION OR PLACEMENT OF RIP-RAP IN THE DRY

CHAPTER 3 - BASES AND SUBGRADE TREATMENT

- 4-300.00 CRITERIA FOR USE OF PERFORMANCE GRADE ASPHALT ON STATE RESURFACING AND CONSTRUCTION PROJECTS
- 4-301.00 COMPUTATION OF SUBGRADE TREATMENT (GRANULAR)
- 4-302.00 COMPUTATION OF SUBGRADE TREATMENT (LIME)
- 4-303.00 COMPUTATIONS FOR MINERAL AGGREGATE BASE
- 4-303.05 GRANULAR BACKFILL FOR STRUCTURES
- 4-304.00 COMPUTATIONS FOR SOIL-CEMENT BASE
- 4-307.00 COMPUTATIONS FOR BITUMINOUS PLANT MIX BASE (HOT MIX)
- 4-308.00 COMPUTATIONS FOR BITUMINOUS COATED AGGREGATE BASE (PLANT MIX)
- 4-309.00 COMPUTATIONS FOR AGGREGATE-CEMENT BASE COURSE - LIMESTONE
- 4-309.01 COMPUTATIONS FOR AGGREGATE-CEMENT BASE COURSE - GRAVEL
- 4-312.00 COMPUTATIONS FOR AGGREGATE-LIME-FLY ASH STABILIZED BASE COURSE

CHAPTER 4 - FLEXIBLE SURFACES

- 4-400.00 PAVING POLICY - RESURFACING
- 4-400.03 PERFORMANCE GRADE MIX
- 4-400.05 HERBICIDE USE IN EMULSIFIED ASPHALT - RESURFACING
- 4-402.00 COMPUTATIONS FOR PRIME COAT
- 4-403.00 COMPUTATIONS FOR TACK COAT
- 4-404.00 COMPUTATIONS FOR DOUBLE BITUMINOUS SURFACE TREATMENT
- 4-405.00 COMPUTATIONS FOR BITUMINOUS SEAL COAT (CHIP SEAL)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- 4-405.01 USE OF BITUMINOUS SEAL COAT (CHIP SEAL) ALONG EDGE OF PAVED SHOULDER WHILE MAKING LANE SHIFTS DURING CONSTRUCTION
 - 4-406.00 COMPUTATIONS FOR BITUMINOUS SEAL COAT (SPLIT APPLICATION)
 - 4-411.00 COMPUTATIONS FOR ASPHALTIC CONCRETE SURFACE (HOT MIX)
 - 4-411.02 RAISED BITUMINOUS RUMBLE STRIPS
 - 4-411.03 SCORED RUMBLE STRIPS
 - 4-411.04 RUMBLE STRIPES
 - 4-411.05 RIDEABILITY SPECIFICATIONS
 - 4-414.05 COMPUTATIONS FOR MICRO-SURFACING
 - 4-415.00 COLD PLANING OF BITUMINOUS PAVEMENT
- CHAPTER 5 - RIGID PAVEMENT
- 4-501.00 PORTLAND CEMENT CONCRETE PAVEMENT
 - 4-502.00 COMPUTATIONS FOR UNDERSEALING CONCRETE PAVEMENT
- CHAPTER 6 - STRUCTURES
- 4-604.00 TYPE DESIGNATION FOR CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES
 - 4-604.05 PRECAST, PRESTRESSED BRIDGE DECK PANELS
 - 4-604.10 PAVED APRON FOR BOX CULVERT AND BRIDGE OUTLETS
 - 4-604.20 CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES IN SHALLOW FILLS
 - 4-604.25 STEEL BAR REINFORCEMENT (ROADWAY)
 - 4-604.30 CULVERT EXCAVATION FOR BOX OR SLAB TYPE CULVERTS OR BRIDGES
 - 4-604.35 CHANNEL EXCAVATION FOR BOX OR SLAB TYPE CULVERTS OR BRIDGES
 - 4-604.40 STOCK PASSES
 - 4-611.00 CHECKING OF DRAINAGE PLANS PRIOR TO CONSTRUCTION
 - 4-611.05 BRIDGE END DRAINS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- 4-617.00 BRIDGE DECK SEALANT
- 4-621.00 TEMPORARY STRUCTURES
- 4-625.00 ABANDONMENT OF WATER WELLS

CHAPTER 7 - INCIDENTAL CONSTRUCTION

- 4-705.00 GUARDRAIL INSTALLATION ACROSS BOX OR SLAB TYPE CULVERTS AND CONCRETE DECK BRIDGES
- 4-705.05 GUARDRAIL END TERMINALS
- 4-707.00 ROW STOCK FENCE
- 4-709.05 RIP-RAP
- 4-710.00 UNDERDRAINS
- 4-712.00 TRAFFIC CONTROL IN CONSTRUCTION ZONES
- 4-712.05 RECORD-A-COMMENT SIGN
- 4-712.10 DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS
- 4-712.15 SPECIAL CONSTRUCTION SIGNS
- 4-712.20 MERGE LEFT
- 4-712.25 USE OF LANE CLOSURE WITH LEFT HAND MERGE
- 4-713.00 FLEXIBLE DELINEATIONS
- 4-713.05 ROADWAY SIGNING ON INTERSTATE AND FULL ACCESS CONTROL ROADWAYS
- 4-713.10 ROADWAY SIGNING EXCEPT INTERSTATE AND FULL-ACCESS CONTROL ROADWAYS
- 4-713.15 ROADWAY SIGNING
- 4-713.20 ADVANCE GUIDE SIGNS AND EXIT DIRECTIONAL SIGNS ON TRAFFIC CONTROL PLANS
- 4-713.25 NOTE ALLOWING TRAFFIC TO TEMPORARILY DRIVE ON MILLED SURFACE TO BE PLACED IN INTERSTATE RESURFACING PLANS
- 4-714.00 ROADWAY LIGHTING
- 4-716.00 CHANNELIZATION STRIPING

- 4-716.05 PAVEMENT MARKING GUIDELINES
- 4-716.10 POLICY FOR TEMPORARY PAVEMENT MARKINGS
- 4-716.11 TEMPORARY PAVEMENT MARKING FOR USE ON PAVEMENT SURFACE OTHER THAN FINAL
- 4-716.13 PAVEMENT MARKING PLANS ON INTERSTATE AND FULL-ACCESS CONTROL ROADWAYS
- 4-716.15 PERMANENT PAVEMENT MARKINGS
- 4-716.16 STRIPING RAMPS ON RESURFACING PLANS
- 4-416.17 STRIPING ON MICRO SURFACE PAVEMENTS
- 4-716.20 PAVEMENT MARKING GENERAL NOTES FOR ROADWAY PLANS
- 4-716.25 SPECIALTY PAVEMENT MARKINGS
- 4-716.30 USE OF REMOVABLE PAVEMENT MARKING LINE
- 4-716.35 SNOWPLOWABLE RAISED PAVEMENT MARKERS
- 4-716.36 RAISED PAVEMENT MARKERS
- 4-730.08 REPLACEMENT OF TRAFFIC SIGNAL DETECTION LOOPS
- 4-730.10 TRAFFIC SIGNALS
- 4-730.15 STRUCTURAL SUPPORTS FOR TRAFFIC SIGNALS
- 4-730.20 TEMPORARY TRAFFIC SIGNAL SYSTEMS USED AT TWO-LANE BRIDGE RECONSTRUCTION SITES
- 4-740.00 GEOTEXTILE FABRIC AND GEOMEMBRANE

CHAPTER 8 - ROADSIDE DEVELOPMENT

- 4-801.00 SEEDING (WITH MULCH)
- 4-801.05 CROWN VETCH MIXTURE (WITH MULCH)
- 4-801.07 TEMPORARY SEEDING (WITH MULCH)
- 4-801.10 WATER (SEEDING AND SODDING)
- 4-801.15 SEEDING (SUPPLEMENTAL APPLICATION)
- 4-801.20 FERTILIZER (SUPPLEMENTAL APPLICATION)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

4-805.00 EROSION CONTROL BLANKET

4-806.00 PROJECT MOWING CYCLE

CHAPTER 9 - MATERIALS

4-905.00 SILICONE SEALANT

SECTION IV – CONSTRUCTION PLANS

CHAPTER 1 - GENERAL PROVISIONS

4-100.00 INTRODUCTION

This chapter addresses construction matters, which do not fit neatly into any of the other chapters.

4-105.00 ROADWAY DESIGN CHECKLIST - CONSTRUCTION PLANS (See 1-105.00)

4-110.00 PROJECT ACTIVITY STATUS SHEET (See 1-110.00)

4-112.00 SIZE OF FULL-SIZE PLAN AND CROSS-SECTION SHEETS (See 2-112.00 and 3-102.00)

4-115.00 IDENTIFICATION OF SUPERVISORS, DESIGNERS, AND CHECKERS ON TITLE SHEET

On the lower left-hand corner of the project title sheet list the name of the TDOT Civil Engineering Manager 1, TDOT Design Manager 1 or TDOT Roadway Specialist Supervisor 2 in charge of the project, the name of the firm designing the project (if being done by a consultant), the name of the designer, the name of the person(s) who checked the plans and the Design Project (P.E.) number. See Figures 4-1a and 4-1b.

CONSULTANT DESIGN CONSTRUCTION

TDOT C.E. MANAGER 1 OR
TDOT DESIGN MANAGER 1: _____

DESIGNED BY: _____ (Firm Name)
DESIGNER: _____ (Responsible Person) CHECKED BY: _____

P.E. NO. _____
PIN NO. _____

**Figure 4-1a
Title Sheet Identification Format for Consultant Designed Construction**

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

T.D.O.T. DESIGN CONSTRUCTION

T.D.O.T. ROAD SP. SV. 2: _____

DESIGNER: _____ CHECKED BY : _____

P.E. NO. _____

PIN NO. _____

Figure 4-1b

Title Sheet Identification Format for TDOT Designed Construction

4-115.05 SIGNATURES OF THE COMMISSIONER AND THE CHIEF ENGINEER ON TITLE SHEET (See 3-105.05)

4-115.10 ENGINEER’S SEAL, SIGNATURE, AND DATE ON TITLE SHEET

When plans are submitted for Construction, the engineer’s seal, signature, and date shall be placed on the right side of the title sheet above the Chief Engineer's signature. The engineer’s seal, signature, and date must also be placed on every subsequent sheet of the Construction Plans (except the cross-sections), usually in the lower right-hand corner.

4-115.15 PROJECT LENGTHS

All projects shall show - "Roadway Length, Bridge Length, Box Bridge Length and Project Length" - on the title sheet. If there are no bridges or box bridges, show those lengths as "0.000 miles". If box bridges serve as a riding surface for vehicles, that length shall be added together in the same manner as roadway and regular bridge length for a total project length. If the box bridge does not serve as a riding surface, the box-bridge length will not be added in with the others, and a footnote to the Box Bridge Length will be added below the project length to say "Not included in the project length".

4-115.20 EQUATION BLOCKS ON TITLE SHEET (See 2-115.05)

4-115.25 EXCLUSIONS ON TITLE SHEET (See 2-115.10)

4-115.30 PROJECT DESCRIPTIONS (See 2-115.20)

4-115.35 TRAFFIC DATA BLOCK ON TITLE SHEET

The designer will place the traffic design data block on all construction title sheets, except for those used on 100% State Resurfacing Projects, as per Construction Plans checklist in Section 1-105.00 of the Design Guidelines. For an example of a traffic data block, see Section 2-115.15 of the Design Guidelines. This applies to both full-size 36-inch x 23-inch and 11-inch x 17-inch title sheets.

On 100% State Resurfacing Projects, the designer will be required to show only the current ADT as taken from the report prepared by the Bureau of Planning and Development titled *Traffic Flow Maps - Tennessee Roads and Streets* and the posted speed as submitted by the Regional Construction Office.

4-120.00 HAUL ROADS ON ALL PROJECTS

Haul roads shall be shown on the traffic control plans unless it is decided during the Construction Field Review that one is not required. All necessary construction items required to keep the road in satisfactory condition for the contractor shall be included in the plans.

4-125.00 BRIDGE CLEARANCES ON PAVING PROJECTS

The designer shall furnish the Structures Division with a list of all bridges under which the roadway passes. The Structures Division will check the vertical clearance records and furnish the designer with the maximum permissible thickness of overlay under the structure.

4-130.00 SALVAGE CREDITS ON FEDERALLY-FUNDED PROJECTS

Salvage credit (credit to Federal funds) is to be considered when there is a need to dispose of expendable and nonexpendable tangible personal property previously acquired with Federal funds. Such property may be unused construction materials, salvaged highway appurtenances or other equipment and/or material for which the useful life extends beyond the construction contract.

Salvage, for credit to Federal funds, need not be a consideration under the following circumstances:

1. The value of the item(s) is less than \$5,000.
2. Salvageable item(s) become the contractor's property by virtue of the contract provisions. (See last paragraphs Subsection 104.10 of the Standard Specifications.)
3. The item(s) will be reused on a future project eligible under Title 23 U.S.C.
4. The cost of salvaging an item(s) would exceed the value of the item(s) salvaged.

If salvage credits are to be applied, the FHWA shall be made aware so that a fair market value may be determined.

If items are to be considered under No. 3 above, maintenance personnel need to be made aware, because certain record keeping will be involved.

4-133.00 CONSTRUCTION PLANS INDEX

The format used in the following construction index is to be adhered to on all construction projects.

The sheet names and sequence of sheets shown in Figure 4-2 are intended to establish a general order for placement of the sheets in the plans. Actual sheet numbers will be determined based on the sheets used on a specific construction project.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

SHEET NAME	SHEET NO.
Title Sheet	1
Roadway Index and Standard Drawings Index	1A
Estimated Bridge Quantities and Bridge Index	2
Estimated Roadway Quantities	2A - 2A1
Estimated Utilities Quantities	2B - 2B1
Typical Sections and Paving Schedule	2C - 2F
General Notes and Special Notes	2G
Tabulated Quantities	2H - 2J
Detail Sheets	2K - 2L
Property Maps and Right-of-Way Acquisition Tables	3, 3A - 3B
Present Layouts	4 - 14
Proposed Layouts	4A - 14A
Proposed Profiles (if needed)	4B - 14B
Public Side Roads and Ramp Profiles	16 - 17
Private Drive and Field Ramp Profiles	18 - 21
Interchange Grading Plans	22 - 24
Drainage Maps	25 - 27
Culvert Sections	28 - 30
Erosion Prevention and Sediment Control (EPSC) Plans	31 - 33
Wetland Mitigation Plans	34 - 35
Traffic Control Plans with Construction Phasing Notes	36, 36A - 36Z
Signing and Pavement Marking Plans	37, 37A - 37Z
Sign Schedule Sheets	38, 38A - 38Z
Miscellaneous Signing Details (* see below)	39, 39A - 39Z
Signal Layouts	40, 40A - 40Z
Lighting Layouts	41, 41A - 41Z
Soils Sheets	42, 42A - 42Z
Roadway Cross-Sections	43 - 191
Side Road Cross-Sections	192 - 200
Utility Index, Utility Owners, and Utility Sheets	U1-1 - U1-xx

Figure 4-2
Typical Index of Sheets

* Unless otherwise contacted by the Design Traffic Engineering Section, Signing Office.

4-135.00 GENERAL NOTES ON CONTRACT PLANS (See 6-100)

A list of general notes frequently used on project plans is included in Section VI. The designer shall place these notes on the second sheet series of the plans under the heading of "General Notes."

Good engineering judgment is required in the use of these notes and any other notes in the plans. If notes are extracted from other parts of this document, refer to the appropriate part to determine the intent of the note.

These notes have been agreed upon by the various offices of the Department involved in the design, right-of-way acquisition, utility relocation and adjustment, construction, etc.; therefore, care shall be taken that the notes are reproduced on the plans exactly as they are in this document, unless there is an excellent reason for revising the wordage.

4-135.05 SPECIAL NOTES ON CONTRACT PLANS (See 6-200)

A list of special notes frequently used on project plans is included in Section VI. Special notes also include notes written specifically for the project or notes that vary in any way from the computerized list of general or special notes listed in Section VI. The designer shall place these notes on the second sheet series of the plans under the heading "Special Notes". The designer should also be aware that individual notes may be required to be included on specific plans sheets as indicated in Section VI.

Special Notes are to be placed and identified on the plans as follows:

1. Special Notes are to be placed immediately following General Notes in the plans.
2. Special Notes are to be identified with the header "Special Notes". The heading "Special Notes" should not be included as a sub-header under General Notes.
3. The Index Sheet should include "Special Notes" when applicable.
4. General Notes that are modified are to be included as Special Notes.
5. Special Notes are to be grouped together and sub-headers used. For modified general notes, the same sub-header found in the general notes should be used in the Special Notes. Special Notes specific to the project should be placed under the appropriate sub-header or an appropriate sub-header be created.
6. Notes requested by the Environmental Division should be included as Special Notes except for special circumstances that require the note to be shown on the specific plan sheet for which the note applies. In these cases, a special note should be included in the Special Notes indicating the location of the note.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

7. For notes added at the direction of the Environmental Division, the following sub-headers should be used:
 - A. Environmental - Air and Noise
 - B. Environmental – Archaeology
 - C. Environmental – Ecology
 - D. Environmental - Hazardous Materials
 - E. Environmental - Historic Preservation
 - F. Environmental – Mitigation
 - G. Environmental – Permits

Notes in the Design Guidelines and Instructional Bulletins specified to be placed in other locations in the plans should continue to be placed as directed.

FILE NO.	DESIGN DIVISION	TENNESSEE D.O.T.	DATE	PROJECT NO.	SHEET NO.
				CONST. 2001 (BITE-3939(11))	22

GENERAL NOTES	SPECIAL NOTES
<p>GRADING</p> <p>(1) AREA THAT IS DISTURBED OUTSIDE LIMITS OF CONSTRUCTION AND ADJACENT TO PROJECT SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.</p> <p>(2) CERTIFICATION FOR ALL BORROW PITS MUST BE OBTAINED IN ACCORDANCE WITH SUBSECTION 107.06 OF THE STANDARD SPECIFICATIONS.</p> <p>(3) THE CONTRACTOR SHALL NOT DISPOSE OF ANY MATERIAL EITHER ON OR OFF STATE-OWNED R.O.W. IN A REGULATORY FLOOD WAY AS DEFINED BY THE FEDERAL AVIATION ADMINISTRATION (F.A.A.) AND/OR REMOVAL BY SAME. ALL MATERIAL SHALL BE DISPOSED OF IN UPLAND (NON-WETLAND) AREAS AND ABOVE ORDINARY HIGH WATER OF ANY ADJACENT WATERCOURSE. THIS DOES NOT ELIMINATE THE NEED TO OBTAIN ANY NECESSARY PERMITS OR APPROVALS THAT MAY BE REQUIRED BY ANY OTHER FEDERAL, STATE OR LOCAL AGENCY.</p> <p>SEEDING AND SODDING</p> <p>(4) ALL EXISTING ROADS WITHIN THE RIGHT-OF-WAY AND NOT IN THE GRADED AREA THAT ARE TO BE SEEDING SHALL BE REPAIRED TO ORIGINAL CONDITION. THE PAVEMENT WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS. TOP SOIL IN EXISTING ROADWAYS SHALL BE MEASURED AND PAID FOR UNDER ITEMS 203.04 AND/OR 203.07 SEEDING, IN ACCORDANCE WITH SECTION 801 OF THE STANDARD SPECIFICATIONS. WILL BE MEASURED AND PAID FOR UNDER ITEM 801-01.</p> <p>(5) SOG SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLANS TO PREVENT DAMAGE TO ADJACENT FACILITIES AND PROPERTY DUE TO PROGRESSES.</p> <p>(6) ITEM NO. 801-01, SEEDING (WITH MULCH), SHALL BE USED ON ALL SLOPES.</p> <p>GUARDRAIL</p> <p>(7) GUARDRAIL IS TO BE COMPLETE IN PLACE BEFORE THE MAINLINE ROADWAY IS OPENED TO TRAFFIC.</p> <p>DRAINAGE</p> <p>(8) THE CONTRACTOR SHALL SHAPE DITCHES TO THE SPECIFIED DESIGN SPECIFICALLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS.</p> <p>(9) CULVERT EXCAVATION FOR CONCRETE BOX OR SLAB TYPE CULVERTS OR BRIDGES WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS.</p> <p>(10) THE CUTTING OF INLET AND OUTLET DITCHES WHERE SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER WILL BE MEASURED AND PAID FOR AS ITEM NO. 203-01 ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED).</p> <p>(11) WHERE A CULVERT (PIPE, SLAB OR BOX) IS MOVED TO A NEW LOCATION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXCAVATION AND THE AMOUNT OF PAYMENT WILL BE MADE DUE TO SUCH CHANGE.</p> <p>(12) DURING CONSTRUCTION OF DRAINAGE STRUCTURES ALL COST ASSOCIATED WITH MAINTAINING THE FLOW OF WATER AND TRAFFIC AT THESE STRUCTURES DURING THE PHASED CONSTRUCTION OF THIS PROJECT SHALL BE INCLUDED IN THE PRICE OF THE DRAINAGE STRUCTURES AND TRAFFIC CONTROL ITEMS.</p> <p>MISCELLANEOUS</p> <p>(13) THE CONTRACTOR SHALL BE REQUIRED TO REMOVE AND RESET MAILBOXES WHERE AND AS DIRECTED BY THE ENGINEER.</p> <p>(14) NOTHING IN THE GENERAL NOTES OR SPECIAL PROVISIONS SHALL BE CONSIDERED AS A WAIVER OF THE CONTRACTOR'S OBLIGATION TO THE RESIDENTS ALONG THE PROPOSED CONSTRUCTION AREA.</p>	<p>ROAD CLOSURE NOTES</p> <p>(15) NO LESS THAN SEVEN (7) DAYS PRIOR TO THE CLOSURE OF THE ROAD, THE CONTRACTOR SHALL NOTIFY THE AFFECTED AGENCIES AND THE AGENCIES COMPLETELY DESCRIBING THE AFFECTED ROADS AND THE APPROXIMATE DURATION OF THE CONSTRUCTION. THESE PARTIES INCLUDE BUT ARE NOT LIMITED TO: (1) LOCAL LAW ENFORCEMENT (SCHOOL SUPERINTENDENT), (2) UNITED STATES POSTAL SERVICE, AND (6) LOCAL ROAD SUPERINTENDENT.</p> <p>PAVEMENT MARKINGS</p> <p>(16) ALL NEW PAVEMENT MARKINGS SHALL BE RE-APPLIED TO EXISTING PAVEMENT. PERMANENT MARKINGS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-10-01 PAINTED PAVEMENT MARKINGS (4' LINE), (L), (M).</p> <p>GRADED SOLID ROCK</p> <p>(17) THE ROCK FILL (GRADED SOLID ROCK) MATERIAL SHALL CONSIST OF SOUND, NON-DEGRADABLE LIMESTONE OR SANDSTONE WITH A MAXIMUM SIZE OF 3" (AT LEAST 50% BY WEIGHT) OF THE ROCK SHALL BE GREATER THAN 10% (BY WEIGHT) SHALL BE LESS THAN 2" IN DIAMETER. THE MATERIAL SHALL BE ROUGHLY EQUIVDIMENTIONAL, THIN, SLABBY AND MECHANICALLY MIXED. THE MATERIAL SHALL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-10-01 GRADED SOLID ROCK MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING FIVE FEET IN DEPTH.</p> <p>CONSTRUCTION WORK ZONE & TRAFFIC CONTROL NOTES</p> <p>(18) IF THE CONTRACTOR MOVES OFF THE PROJECT, HE SHALL COVER OR REMOVE ALL UNNEEDED SIGNS AS DIRECTED BY THE ENGINEER. COSTS INCLUDED IN THE ORIGINAL UNIT PRICE BID FOR ITEM NO. 712-06, SIGNS (CONSTRUCTION) PER SQUARE FOOT.</p> <p>(19) A LONG TERM BUT SPORADIC USE WARNING SIGN, SUCH AS A FLAGGER SIGN, MAY REMAIN IN PLACE WHEN NOT REQUIRED PROVIDED THE SIGN FACE IS FULLY COVERED.</p> <p>(20) UNNEEDED SIGNS SHALL NOT BE OVERLAPED OR ERECTED UNLESS PREVIOUSLY REMOVED. UNNEEDED SIGNS ARE PRESENT NECESSITATING WARNING DEVICES SHALL BE LIMITED TO THE IMMEDIATE AREAS OF CONSTRUCTION WHERE A HAZARD IS PRESENT. THESE DEVICES SHALL NOT BE STORED ALONG THE ROADWAY WITHIN THIRTY (30) FEET OF THE EDGE OF THE GUARDRAIL. BRIDGE RAIL AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADTS LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL INCREASE OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. THESE DEVICES SHALL BE REMOVED IMMEDIATELY UPON COMPLETION OF THE PROJECT. THE ENGINEER SHALL DETERMINE IF THEY ARE NO LONGER NEEDED, WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK. THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.</p>
<p>CONSTRUCTION WORK ZONE & TRAFFIC CONTROL NOTES</p> <p>(1) UNNEEDED SIGNS SHALL NOT BE OVERLAPED OR ERECTED UNLESS PREVIOUSLY REMOVED. UNNEEDED SIGNS ARE PRESENT NECESSITATING WARNING DEVICES SHALL BE LIMITED TO THE IMMEDIATE AREAS OF CONSTRUCTION WHERE A HAZARD IS PRESENT. THESE DEVICES SHALL NOT BE STORED ALONG THE ROADWAY WITHIN THIRTY (30) FEET OF THE EDGE OF THE GUARDRAIL. BRIDGE RAIL AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADTS LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL INCREASE OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. THESE DEVICES SHALL BE REMOVED IMMEDIATELY UPON COMPLETION OF THE PROJECT. THE ENGINEER SHALL DETERMINE IF THEY ARE NO LONGER NEEDED, WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK. THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.</p>	<p>CONSTRUCTION WORK ZONE & TRAFFIC CONTROL NOTES</p> <p>(1) UNNEEDED SIGNS SHALL NOT BE OVERLAPED OR ERECTED UNLESS PREVIOUSLY REMOVED. UNNEEDED SIGNS ARE PRESENT NECESSITATING WARNING DEVICES SHALL BE LIMITED TO THE IMMEDIATE AREAS OF CONSTRUCTION WHERE A HAZARD IS PRESENT. THESE DEVICES SHALL NOT BE STORED ALONG THE ROADWAY WITHIN THIRTY (30) FEET OF THE EDGE OF THE GUARDRAIL. BRIDGE RAIL AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADTS LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL INCREASE OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. THESE DEVICES SHALL BE REMOVED IMMEDIATELY UPON COMPLETION OF THE PROJECT. THE ENGINEER SHALL DETERMINE IF THEY ARE NO LONGER NEEDED, WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK. THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.</p>
<p>EROSION CONTROL</p> <p>(2) REGARDING SEASONAL WORK LIMITATION OR LIMITATION ON THE TOTAL AREA OF EXPOSED SOIL.</p> <p>EXCAVATION OR PLACEMENT OF RIP-RAP IN THE DRY</p> <p>(3) ANY EXCAVATION OF THE STREAM CHANNEL AREA (e.g., FOR PIER FOUNDATIONS) SHALL BE PERFORMED IN THE DRY. EXCAVATION SHALL BE PERFORMED IN THE DRY AND SHALL BE ACCOMPLISHED BY THE USE OF SHEET PILES, FLUMES, DIVERSION PIPE WITH SAND BAG DAM AT PIPE INLET, JERSEY BARRIERS, ETC. ALL WORK FOR EXCAVATION IN THE STREAM CHANNEL AREA INCLUDING EROSION PREVENTION AND SEDIMENT CONTROL SHALL BE PERFORMED IN THE DRY. SEQUENCING FOR CONSTRUCTION IN THE DRY (DESCRIPTION), THIS ITEM SHALL INCLUDE ALL COSTS FOR MATERIALS, LABOR, MAINTENANCE, REMOVAL, SITE RESTORATION, AND OTHER MISCELLANEOUS ITEMS.</p> <p>ENVIRONMENTAL-ECOLOGY</p> <p>(4) STATE FROM THE ENVIRONMENTAL DIVISION OR A RESIGNEE WILL ADVISE THE CONTRACTOR DURING THE PRE-CONSTRUCTION MEETING CONCERNING WHEN ENVIRONMENTAL DIVISION PERSONNEL OR DESIGNATED CONSULTANTS WILL NEED TO BE ON SITE OR WORKING. SOME WHICH COULD AFFECT THE STREAM OR SPECIES.</p> <p>(5) STATE FROM THE ENVIRONMENTAL DIVISION OR A RESIGNEE WILL ADVISE THE CONTRACTOR DURING THE PRE-CONSTRUCTION MEETING CONCERNING WHEN ENVIRONMENTAL DIVISION PERSONNEL OR DESIGNATED CONSULTANTS WILL NEED TO BE ON SITE OR WORKING. SOME WHICH COULD AFFECT THE STREAM OR SPECIES.</p> <p>(6) ALL BRIDGE PROJECTS WITH THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT IDENTIFIED MUST HAVE MEASURES IN PLACE TO CONTAIN CONCRETE DUST, CEMENT DUST AND ALL OTHER MATERIALS. THESE MATERIALS ARE NOT ALLOWED TO ENTER THE STREAM.</p> <p>ENVIRONMENTAL-HISTORIC PRESERVATION</p> <p>(7) ANY DRIVEWAY WORK AT THE HISTORIC PROPERTY WILL BE AS MINIMAL AS POSSIBLE.</p>	<p>CONSTRUCTION WORK ZONE & TRAFFIC CONTROL NOTES</p> <p>(1) UNNEEDED SIGNS SHALL NOT BE OVERLAPED OR ERECTED UNLESS PREVIOUSLY REMOVED. UNNEEDED SIGNS ARE PRESENT NECESSITATING WARNING DEVICES SHALL BE LIMITED TO THE IMMEDIATE AREAS OF CONSTRUCTION WHERE A HAZARD IS PRESENT. THESE DEVICES SHALL NOT BE STORED ALONG THE ROADWAY WITHIN THIRTY (30) FEET OF THE EDGE OF THE GUARDRAIL. BRIDGE RAIL AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADTS LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL INCREASE OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. THESE DEVICES SHALL BE REMOVED IMMEDIATELY UPON COMPLETION OF THE PROJECT. THE ENGINEER SHALL DETERMINE IF THEY ARE NO LONGER NEEDED, WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK. THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.</p>

STATE OF TENNESSEE	GENERAL NOTES AND SPECIAL NOTES
DEPARTMENT OF TRANSPORTATION	

Figure 4-3
 Example of General Notes and Special Notes Sheet
 4-7

4-137.00 ADDITION OF UTILITY SHEETS TO CONSTRUCTION PLANS

The Commissioner is authorized to reimburse utilities for the cost of utility relocation as established by Tennessee Code Annotated, Title 54, Chapter 5, Part 8. As a result of this legislation, utilities will have the option of including their relocations in the Department’s plans for certain projects. Construction plans for local controlled projects may include utility relocation plans if requested by the local government.

The Regional Utilities Office will submit the Utility Sheets, Utility Relocation Plans, and a Utilities Index Sheet directly to the Program Operations Office for letting, just as roadway and structure plans are submitted. If utilities are to be included in the construction contract, the Utilities Office will also submit estimated utility quantities to the Design Manager. The roadway designer will be responsible for developing the “Estimated Utility Quantities Sheet” to be included in the roadway plans, using quantities provided by the Design Manager.

In order to establish a uniform procedure for adding utility estimated quantities and sheets to the plans the following guidelines will be used:

1. The Design Manager shall contact the Regional Utilities Office approximately fourteen (14) weeks prior to the letting date to determine if utilities will be included as part of the construction contract. (Responsible Office: Design)
2. The Utilities Office will submit estimated utility quantities (in excel .xls format) with **assigned item numbers, units of measurement, and descriptions** to the Design Manager a minimum of twelve (12) weeks prior to the letting. (Responsible Office: Utilities)
3. Sheet No. 2B will be used for the “Estimated Utilities Quantities” sheet. If additional sheets are needed, sheet numbers 2B1, 2B2, etc. should be used. The following footnote should be added to sheet 2B: “See Sheet U1-1 for index of utility sheets. Applicable footnotes for Estimated Utilities Quantities will be on the utility tabulation blocks.” (Responsible Office: Design)
4. The Utilities Office will be responsible for the Utility Estimate. The Utilities Office will supply the Estimates Section with the estimate file and unit prices for all utility items included in the plans. (Responsible Office: Utilities)
5. Sheet No. U1-1, “Utilities Index, Utility Owners, and Utility Sheets” will be shown in the “Roadway Index” after the Cross Sections. (Responsible Office: Design)
6. All utility sheets (including utility relocation sheets) and utility owners shall be listed on Sheet U1-1, “Utilities Index, Utility Owners, and Utility Sheets.” This sheet may include the first utility sheet or it may follow as Sheet U1-2. See Figure 4-4. For format of Utility Owners see Figure 4-5. (Responsible Office: Utilities)
7. All utility sheets (including utility relocation sheets) will use the standard TDOT box in the upper right corner to identify the sheet. See Figure 4-6. (Responsible Office: Utilities)
8. All sheets shall be 36” X 22” and plotted on 4 mil mylar. (Responsible Office: Utilities)

9. An engineer licensed in the State of Tennessee shall seal utility relocation sheets. (Responsible Office: Utilities)
10. Revisions to utility sheets will be forwarded to the Design Manager to insure the "Estimated Utility Quantities" are updated and included in the revision distribution. (Responsible Office: Design and Utilities)
11. Utility quantities and item numbers will be consistent with the units of measurement used for the roadway plans. (Responsible Office: Utilities)

UTILITIES INDEX (EXAMPLE)

SHEET NAME	SHEET NUMBER
Utilities Index, Utility Owners, and Utility Sheets	U1-1 – U1-xx
Electrical Relocation Sheets	U2-1 – U2-xx
Water Relocation Sheets	U3-1 – U3-xx
Sewer Relocation Sheets	U4-1 – U4-xx
Gas Relocation Sheets	U5-1 – U5-xx
Cable TV Relocation Sheets	U6-1 – U6-xx
TVA Relocation Sheets	U7-1 – U7-xx

Figure 4-4
Typical Utilities Index

UTILITY OWNERS AND CONTACTS

Water:

Metro Water and Sewer
 P.O. Box 123
 Nashville, TN 37243
 Contact: John Smith
 Telephone: 615-555-1212
 Fax: (if available)
 E-mail: (if available)

Electrical:

Nashville Electric
 1000 Church Street
 Nashville, TN 37216
 Contact: Mike Jones
 Telephone: 615-555-1234
 Fax: (if available)
 E-mail: (if available)

Sewer:

Metro Water and Sewer
 P.O. Box 123
 Nashville, TN 37243
 Contact: Bill Williams
 Telephone: 615-555-1213
 Fax: (if available)
 E-mail: (if available)

**Figure 4-5
 Typical Format for Utility Owner Information**

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2003	NH-I-40-7(157)359	U1-1

**Figure 4-6
 Upper Right Hand Corner Box**

1. Use "**CONST.**" for the type project. The designation "ROW" should not be added since utility sheets are not included in the right-of-way plans.
2. Use year project is let.
3. Insert federal construction project number. If not a federal project, use the state construction project number.

4-140.00 CONSTRUCTION PROJECT QUANTITY ESTIMATES AND PLANS SUBMITTAL
(See 1-220.00 and 3-400.15)

The following shall be provided to the Program Operations Office, Estimates Section when submitting final Construction Plans:

1. The Right-of-Way title sheet that will be forwarded to the Plans Sales Office by the Estimates Section. The designer shall pencil both the federal and state construction project numbers along the left margin of the Right-of-Way title sheet prior to turning it in with the Final Construction Plans.
2. If the project includes grading quantities, six copies of the grading quantity calculation sheets will be furnished with the plans.
3. A complete construction quantity estimate (with item numbers) shall be submitted to the Estimates Section with the plans. (See Sections 3-400.15 and 4-140.05.)
4. If the project includes right-of-way removal items, the unit prices furnished by the Right-of-Way Office will be shown in the unit price column of the submitted estimate. A copy of the letter from the Right-of-Way Office stating the values of the various removal items shall be submitted with the plans. All other unit prices will be set by the Estimates Section.
5. If the project includes non-participating items, any information concerning price will be furnished to the Estimates Section.

Any and all changes to the items after submittal must be revised in accordance with the Plans and Estimates Revision guidelines. (See Section 4-140.02.)

To insure the proper and rapid processing of Construction Plans, the following transmittal letter, shown in Figure 4-7, shall accompany the Construction Plans submittal to the Estimating and Bid Analysis Office.

If further information is required, please contact the Estimating and Bid Analysis Office.

Note: Refer to Section 1-220.00 for the current plans revision distribution schedule.



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-1402**

MEMORANDUM

TO: Estimating and Bid Analysis Office
Attn: Estimates Section
Suite 400 J.K. Polk Bldg.
Nashville, TN. 37243-1402

FROM: James Iway, Roadway Specialist Supervisor
Design Office, Region 2

DATE: February 8, 2006

SUBJECT: Project No.: BR-STP-33 (10), 44004-3211-94
PIN 100300.00
Description: S.R. 50, Bridge & Approaches over Will Bee Creek (L.M. 0.23)
Jackson County

The following completed construction plan items for the referenced project are being transmitted for the June 2006 Letting Process.

- X Original Construction Drawings (38 Sheets)
- X Original Roadway Cross-Sections (52 Sheets)
- X Original R.O.W. Title Sheet
- X Copy Haul Distance Sheet
- X Copy Grading Quantity Sheets
- N/A Copy R.O.W. Office building removal letter
- N/A 3 ½ " computer disk or CD w/ estimate
- X Estimate emailed
- 11" X 17" Resurfacing Plans (___ Sheets)

Comments:

For further information, please contact William B. Dunn Phone: (615) 520-4556

cc: David Davis
James Johnston
File

**Figure 4-7
Example Construction Plans Transmittal Letter**

4-140.01 11 x 17-INCH PLANS SUBMITTAL

State resurfacing plans will be submitted on an 11” by 17” format and will be limited to a maximum of 12 sheets in this format. All plans requiring more than 12 sheets will be submitted on standard full size mylar plans sheets.

When submitting plans on 11” by 17” paper, a minimum margin shall be provided on all sheets. The minimum margin shall be 1-inch for the left margin and 0.2-inch for the top, bottom and right margin.

The original copy shall be submitted to the Estimating and Bid Analysis Office.

4-140.02 LETTING REVISIONS

The determination of a letting revision will be made by the Headquarters Construction Office. An estimate revision may or may not require a Letting Revision, if the plans have not been printed by the Printing Services Office.

All letting revisions generated in the Regional Design Offices will be submitted through the TDOT C.E. Manager 2 responsible for the project. The TDOT C.E. Manager 2 will be responsible for having the revision forwarded to the Estimating and Bid Analysis Office in an accurate and timely manner.

All letting revisions generated in the Headquarters Design Offices will be submitted through the TDOT Design Manager responsible for the project. They will be responsible for having the revision forwarded to the Estimating and Bid Analysis Office in an accurate and timely manner.

It will be the responsibility of the C.E. Manager 2 to retrieve any original reproducible mylars from “A” Level which are to be revised on projects generated in the regions. It will be the responsibility of the Design Manager responsible for the project to retrieve any original reproducible mylars from “A” Level which are to be revised on their own projects. The revised reproducible mylars will then be returned to “A” Level after the revision has been completed.

An “Estimate Revision Request” form, shown in Figure 4-8, must be filled out for each revision and it must be initialed by one of the members of the Estimates Section. After the “Estimate Revision Request” form has been initialed, one (1) copy of that form will remain with the Estimates Section and one (1) initialed copy of the form with the plans change will be taken to the Construction Office. This information is necessary in order to maintain a current and accurate state estimate.

4-140.03 ITEM NUMBERS

Item numbers, item descriptions, and units of measurement which are to be used with the March 1, 2006 Standard Specifications for Road and Bridge Construction Book are available at the following we site.

<http://www.tdot.state.tn.us/RoadItemLists/roaditemlist.htm>

The list is updated daily by the Construction Division. A list of the item numbers and descriptions is not printed in the Design Guidelines or Instructional Bulletins.

If an item number is needed, the Design Manager should contact the Contract Specifications Office, Suite 700, James K. Polk Building, Nashville, Tennessee 37243 to determine if an item number will be assigned or included in another item.

4-140.05 CONSTRUCTION QUANTITIES ESTIMATE DATA FILE

The construction quantities estimate is an Excel file, as shown in Figure 4-9, in the format as designated by the TDOT Excel templates.

For TDOT employees, the templates are available in the self-extracting archive, 2ndSheets.exe at

<http://home.tdot.state.tn.us/asstchiefengrdesign/Design/v8design/default.htm#MSOffice>

For consultants, the templates are available in the self-extracting archive, 2ndSheets.exe at

http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/v8/V8design.htm#MSOffice

Instructions for use of these templates are in **2ndSheetsV8.pdf**, also at the same site.

There are Excel templates for projects with one, two or three state project numbers. For jobs with more than three state project numbers, see CADDV8.pdf for instructions.

No prices are to be entered in the estimate. Quantities cannot contain commas.

All items shall be listed in numerical order, regardless of the order they are listed in the plans.

SUBTOTAL CODES: (See CADDV8.pdf for detailed instructions)

- a) Roadway items shall be listed on a sheet separate from the Box-Bridge items. The sheet name for Roadway items must start with **Col**.
- b) Box-Bridge items shall be listed on a sheet separate from the Roadway items. The sheet name for Box Bridge items must start with **Box**.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- c) Alternate Roadway items shall be listed after all of the other roadway items. The alternates will be designated in column C as Alternate AA1, Alternate AA2, Alternate AA3, Alternate AB1, Alternate AB2, etc. Alternates AA1 would alternate with AA2 and AA3. AB1 would alternate with AB2, etc.
- d) Non-participating items are listed by column as designated on the **Proj Data** sheet.

SUBMITTAL OF CONSTRUCTION QUANTITIES ESTIMATES

For in-house design projects, the designer shall forward the completed construction estimate Excel file via e-mail at the time final plans are submitted to the following Groupwise e-mail address:

Name: **Estimates, TDOT Construction** (User Id: JJCONST).

For consultant design projects, the completed Excel file is to be forwarded with the final construction plans to the Design Manager for submittal. Submittal may be on either CD, DVD, or via e-mail. The manager will forward the file via e-mail to:

Name: **Estimates, TDOT Construction** (User Id: JJCONST).

SUBMITTAL OF PRELIMINARY CONSTRUCTION QUANTITIES ESTIMATES (See 3-400.15)

For in-house design projects, the designer shall forward the completed construction estimate Excel file via e-mail to the following Groupwise e-mail address: Name: **Estimates, TDOT Preliminary** (User Id: JJPRELIM).

For consultant design projects, the completed excel file is to be forwarded to the Design Manager for submittal. Submittal may be on either CD, DVD, or via e-mail. The manager will forward the file via e-mail to: Name: **Estimates, TDOT Preliminary** (User Id: JJPRELIM).

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

	A	B	C	D
		Project No. 1 Data	Project No. 2 Data	Project No. 3 Data
1				
2	State Project Number			
3	Federal Project Number			
4	Non Participating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Project Description			
7	Letting Date			
9	Project Type of Work			
10	Unit (English or Metric)			
12	County			
13	Route			
14	Road Name			
15	Type of Road			
17	Project Length			
18	Beginning Station			
19	Ending Station			
20	Beginning Log Mile			
21	Ending Log Mile			
22	North Coordinate			
23	East Coordinate			
24	Longitude			
25	Latitude			
27	Roadway Designer			
28	Roadway CE Manager			
29	Date Turned In			
31	Bridge Required			
32	Bridge Designer			
33	Bridge CE Manager			

ESTIMATED ROADWAY QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
307-02.08	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING B-M2	TOW	3182
411-02.01	ASPHALT CEMENT (PG70-22) (ACS) GRADING D	TOW	112
	Alternative AA1		
303-01	MINERAL AGGREGATE, TYPE A BASIC, GRADING D	TOW	35000
307-02.01	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A	TOW	6477
307-02.02	ASPHALT CEMENT (PG70-22) (BPMB-HM) GRADING A-5	TOW	165
	Alternative AA2		
303-01	MINERAL AGGREGATE, TYPE A BASIC, GRADING D	TOW	25000
307-02.01	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A	TOW	5667
307-02.02	ASPHALT CEMENT (PG70-22) (BPMB-HM) GRADING A-5	TOW	124
309-01.01	MINERAL AGGREGATE (A-CBC)	TOW	10653
309-01.02	PORTLAND CEMENT (A-CBC)	TOW	411
309-02	BITUMINOUS MATERIAL (A-CBC)	TOW	28
	Alternative AA3		
303-01	MINERAL AGGREGATE, TYPE A BASIC, GRADING D	TOW	25000
307-02.01	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A	TOW	5667
307-02.02	ASPHALT CEMENT (PG70-22) (BPMB-HM) GRADING A-5	TOW	124
312-01	MINERAL AGGREGATE (ALFSB)	TOW	7711
312-02	LIME	TOW	293
312-03	FLY ASH	TOW	921
312-04	BITUMINOUS MATERIAL (ALFSB)	TOW	28

Figure 4-9
Construction Quantities Estimate Data File Template

4-140.09 ESTIMATE CONFIDENTIALITY

The designer is hereby instructed to follow the TDOT guidelines regarding the handling of the construction cost estimates and unit bid prices as listed below.

1. **Construction Cost Estimates:** All designers are hereby instructed to keep the construction cost estimate confidential. These cost estimates shall never be made public and may only be revealed to the proper officials of TDOT. Should an inquiry be made by a person other than a TDOT official, refer the inquirer to a Manager in the Design Division. Secure the cost estimates at all times so that no unauthorized person may have access to them.
2. **Unit Bid Prices:** After a project is let, but prior to awarding it, all designers are hereby instructed not to divulge any unit prices bid on a project to anyone. When a project bid is rejected and not awarded, the unit prices are never to be made public. Any inquiry made in regard to bid prices shall be referred to your Manager for proper handling.

4-145.00 FIELD REVIEW PROCEDURES (See 1-120.00, 2-315.00 and 2-315.05)

On interstate resurfacing and controlled access resurfacing projects with interchanges, the designer shall inspect guardrail on all ramps and crossroads, which are State Routes within the access control limit of the interchange, and upgrade guardrail to current standards.

4-150.00 CONSTRUCTION REVISIONS (See 1-220.00)

When a project has been awarded to construction, and a change becomes necessary anywhere on the project, a Construction Plans revision is required. All construction revisions will be submitted through the TDOT Design Manager responsible for the project in an accurate and timely manner.

In the Regional Design Offices, the TDOT Design Manager responsible for the project will distribute the construction revision prints to the appropriate Regional personnel. They will submit construction revision prints for the appropriate Headquarters' personnel through the Plans Sales Office.

In the Headquarters Design Offices, the TDOT Design Manager responsible for the project will distribute the construction revision prints through the Plans Sales Office.

Note: Refer to Section 1-220.00 for the current plans revision distribution schedule.

CHAPTER 2 - EARTHWORK

4-202.00 REMOVAL OF STRUCTURE

When the proposed structure is a girder bridge, the removal items for the existing structure(s) shall be placed on the Estimated Structure Quantities sheet and numbered in sequence beginning with Item No. 202-04.01 and continuing through Item No. 202-04.49, as required.

When the proposed structure is a box bridge, the removal item for the existing structure(s) shall be placed on the Estimated Roadway Quantities sheet (in the Box Bridge block). When the proposed structure is a box culvert, the removal item for the existing structure(s) shall be placed on the Estimated Roadway Quantities sheet (in the Roadway block). The removal items shall be numbered in sequence beginning with Item No. 202-04.50 and continuing through Item No. 202-04.99, as required.

The removal items shall be footnoted as to whether the salvage shall become the property of the contractor, city, county or state.

4-202.01 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

When Item No. 202-01, Removal of Structures and Obstructions, Lump Sum, or Item No. 202-01.50, Removal of Structures and Obstructions, Each, is used on a project, the designer shall add a footnote detailing exactly what major items are included in the item (this includes, but is not limited to catch basins, manholes, junction boxes, etc.). This is done so the Department's estimators and contractors bidding on a project will be able to more accurately estimate the cost of this item.

Generally, all removals that belong with Item Nos. 202-06.01 through 202-06.99 shall be listed as such and shall not be included in Item No. 202-01 or 202-01.50.

4-202.10 REMOVAL OF BUILDINGS AND OBSTRUCTIONS

All existing buildings and/or obstructions to be removed within the project limits are to be paid for under the bid price for Item No. 202-06.01, Removal of Buildings (Tract No. __) through Item No. 202-06.99, Removal of Buildings (Tract No. ____) per lump sum. All buildings and obstructions to be removed under these item numbers shall be so designated by the Regional Right-of-Way Office. The pay items in the Estimated Roadway Quantities Block shall be footnoted as follows:

“Bid price includes all salvage value of material. See tabulated quantities sheet No. 2__ for removal of buildings and obstructions description block.”

An example of a Removal of Buildings and Obstructions Description Block is shown in Figure 4-10.

REMOVAL OF BUILDINGS AND OBSTRUCTIONS DESCRIPTION BLOCK		
PAY ITEM	TRACT NO.	DESCRIPTION

NO ADDITIONAL COMPENSATION WILL BE MADE FOR THESE REMOVALS.

Figure 4-10
Removal of Buildings and Obstructions Description Block

4-202.13 ABANDONMENT OF WATER WELLS (See 4-625.00)

Item No. 202-13, Water Well Abandonment per Each, shall be used any time a water well is abandoned. This will cover all items necessary for the sealing of the well, except for grout. Item No. 604-15.01, Portland Cement Grout per cubic yard, shall be used to seal wells, and, for estimating purposes, shall be computed as shown below:

1. Wells with a diameter of 1 foot or less

The grout fill material shall extend from the bottom of the well to within 5 feet of the final surface, where the well is in a roadway cut, or to within 5 feet of the existing ground surface, where the well is located under roadway embankment or where the well is located outside of the construction limits.

2. Wells with a diameter greater than 1 foot

The bottom 5 feet of the well, or a depth equal to the depth of the water, whichever is greater, shall be filled with cement grout.

Information necessary to make these computations shall be requested when coordinating with the Tennessee Water Management Division, in accordance with Section 3-130.00 of these guidelines.

4-203.00 EXCAVATION AND UNDERCUTTING (See 2-145.00)

The Special Provision for Section 203 allows the use of Item No. 203-05, Undercutting, per Cubic Yard, as a pay item if the amount of undercutting needed, as specified in the soil report, is approximately 10% or more of Item No. 203-01, Road and Drainage Excavation (Unclassified).

All information regarding undercutting shall be clearly shown on the plans for the Construction Field Review. The decision to use the undercutting item shall be made on the Construction Field Review by the Design Division.

4-203.02 DEFINITION OF TERMS USED FOR EARTHWORK GRADING CALCULATIONS

The geotechnical report and geotechnical related drawings should be consulted by the roadway designer to determine what type of materials will be encountered during excavation and embankment construction for a project. The geotechnical report should provide enough information to determine the type materials described below and to determine appropriate shrink or swell factors. Some geotechnical reports may provide project specific recommendations for shrink and swell factors. It is recommended that the designer contact the Geotechnical Engineering Section as needed to clarify any questions arising regarding the nature of materials to be encountered and accounted for in the grading tabulations and bid quantities.

The following terms and definitions will be used by all TDOT Divisions so that a consistent definition is used in all phases of project development and in contract documents. Guidance to designers as to the material breakdown to be shown on the plans and cross-sections should be found in the geotechnical report.

- A. SOIL MATERIAL Soil material is material that is predominantly made up of naturally occurring mineral particles which are fairly readily separated into relatively small pieces, and in which the mass may contain air, water, or organic materials. This material may contain rock pieces in the form of disconnected slabs, lenses, or boulders of less than approximately 0.5 cubic yards. The main soil groups consist of clay, silt, sand, gravel, cobbles, boulders (less than 0.5 cubic yard volume) or a combination of any of the constituents. For construction purposes, this material would typically be considered to be excavatable by conventional excavation machinery such as pans, track hoes, or front end excavators/loaders. This material would have a shrink factor as given in the shrink factors shown in Section 2-145.10 of the Design Guidelines or as recommended by the Geotechnical Engineering Section of the Materials and Tests Division.

B. SOLID ROCK MATERIAL Solid rock material is that naturally occurring material composed of mineral particles so firmly bonded together that relatively great effort is required to separate the particles (i.e. blasting or heavy crushing forces). For construction purposes, this material would typically have to be blasted to separate into pieces small enough to load and transport on earth moving trucks and which when subjected to proper pre-split and production blasting would result in a uniform stable rock cut face. Note that this material would not by definition necessarily be a proven source of any rock type aggregate such as solid rock, graded solid rock, rip rap, or other rock aggregate construction products. This material would have a significant swell factor as given in swell factors shown in Section 2-145.10 of the Design Guidelines or as recommended by the Geotechnical Engineering Section of the Materials and Tests Division.

C. SOFT ROCK OR DEGRADABLE ROCK This material is that naturally occurring material composed of mineral particles that are so firmly bonded such that they are not fairly readily separated into small pieces yet has such relatively low bonding strength that would allow for separating into small pieces through moderate to heavy crushing forces. For construction purposes this material would have to be subjected to ripping type equipment, hoe rams, or rugged use of a large bulldozer in order to separate the material such that it can be readily loaded into earth moving trucks. These materials would typically be shales, claystones, siltstones, weathered sandstones, weathered schist and weathered gneiss. This material would have a relatively small shrink or swell factor depending on the type material and the degree of weathering, disintegration, or degradation.

D. TRANSITIONAL MATERIALS This material is that material comprised of a combination of those materials described above occurring in either non-uniform interbedded layers of the above materials (i.e. shale material with relatively thin layers of solid rock such as hard limestone) or erratic localized changes of material types both laterally and with depth (such as a geologic formation resulting in pinnacled rock columns, floating boulders or lenses intercalated with clay soil, a common occurrence in certain regions of Tennessee). For construction purposes, this material may have to be excavated using a combination of excavation methods such as blasting of rock pinnacles, layers or boulders along with a ripping of weathered rock and excavating of soil with track hoes or loaders all within a localized area. This material would not be suitable for the use of excavating pan type equipment.

COMMON EXCAVATION Common excavation is that sum of materials excavated from a project inclusive of all those materials described in **A**, **C**, and **D** above. The grouping of these materials is to generally define those materials that would not generally be acceptable to permanently place on a pre-split, blasted face and also to define those materials that would not be considered a source of a defined fill material such as solid rock fill, graded solid rock, rip rap or other rock type aggregates. Typically the materials in this grouping would have either a shrink factor or a relatively low swell factor as compared to solid rock material described in **B** above.

UNCLASSIFIED EXCAVATION Unclassified excavation is that sum of materials excavated from a project inclusive of all those items described in **A**, **B**, **C**, and **D** above. On most projects, road and drainage excavation will be listed as unclassified and is to be bid as one item regardless of the type material encountered. See section 203.02 (a) of the Standard Specifications for Road and Bridge Construction.

Generally, all earthwork for roadway projects will be paid for under Item 203-01, Road and Drainage Excavation (Unclassified), C.Y., except in situations where special or unique conditions exist that would warrant bidding earthwork as either separate bid items or embankment in place bid items. For projects which earthwork items other than Road and Drainage Excavation (Unclassified) may be appropriate, the Design Manager will consult with both the Geotechnical Section and the Headquarters Construction Division to determine if other pay items are appropriate and what material type breakdown will be shown on the grading tabulation and earthwork balances in the plans.

See Section 6-200.00 for notes which shall be added to the plans as Special Notes on **ALL** projects for which a Geotechnical Report is prepared unless otherwise directed by the Design Manager after consultation with the Soils and Geology Section of the Materials and Tests Division and the Headquarters Construction Division. All grading quantities on the Estimated Roadway Quantities Sheet should also be footnoted "Refer to Special Notes."

4-203.05 SHRINKAGE AND SWELL FACTORS (See 2-145.10)

4-203.10 GRADING LINE THROUGH SOLID ROCK

Do not show a solid rock grading line on the typical sections. Specifications for excavation of rock at the subgrade, and where rock slopes are to be seeded, are covered in the Standard Specifications.

4-203.15 PRESPLITTING OF ROCK EXCAVATION

On all projects having rock excavation, a quantity shall be included for pre-splitting the rock at the outside limits of the cut areas containing the rock.

Pre-splitting shall not be required on slopes flatter than 1:1 as per Section 203 of the Standard Specifications.

The quantity of pre-splitting shall be computed from the roadway cross-sections.

4-203.20 GRADED SOLID ROCK BORROW

On all projects requiring graded (sized) solid rock borrow for rock buttresses, revetment, etc, the unit of payment shall be per ton instead of per cubic yard. This item shall be paid for as follows:

Item No. 203-02.01 - Borrow Excavation (Graded Solid Rock) - Ton

Use a factor of 1.7636 tons per cubic yard for estimating quantities.

4-203.25 ROADWAY APPROACHES

On bridge replacement projects with a minimal amount of roadway work on the approaches, the designer shall consider using Item No. 203-30.01, Roadway Approaches. This is a lump sum pay item to construct bridge approaches that have quantities that are too small to be accurately measured in the field. This item has been developed to replace those items, which, - 716because of the small quantities, are uneconomical to measure and document for payment under present procedures.

Item No. 203-30.01 may include: road and drainage excavation, borrow excavation, channel and culvert excavation on box bridges, clearing and grubbing, topsoil, seeding, sodding and water. The required quantities need to be calculated and shown in a tabulated block for purposes of cost estimating and bidding. Other items may be included in this item, if appropriate, but shall be discussed and approved during the construction field review before inclusion.

As a guideline, it is recommended that Item No. 203-30.01 be considered anytime that the total excavation is approximately 1500 C.Y. or less. However, other items and factors may influence the decision to use this item. Designers shall use their best judgment on a project by project basis to determine the need for Item No. 203-30.01.

Figure 4-11, shown below, shall be used to itemize the quantities included in Roadway Approaches. The note, "No change in compensation will be made for normal variations in estimated quantities." is required.

ALL COSTS OF THESE ESTIMATED QUANTITIES TO BE INCLUDED IN PRICE BID FOR ROADWAY APPROACHES ITEM NO. 203-30.01							
Road & Drain Exc. (Uncl.)	Borrow Excavation (Uncl.)	Water	Placing & Spreading Topsoil	Channel Exc.	Seeding w/Mulch	Water Seeding & Sodding M.G.	Sodding (New Sod)
C.Y.	C.Y.	M.G.	C.Y.	C.Y.	Unit	M.G.	S.Y.
1508	169	4	283	440	20	2	38

NO CHANGE IN COMPENSATION WILL BE MADE FOR NORMAL VARIATIONS IN ESTIMATED QUANTITIES.

**Figure 4-11
Example of Estimated Quantities for Roadway Approaches Block**

For projects with more than one structure, each site shall be estimated, and an item per site used. Use the Roadway Approach Item No. 203-30.01 followed by 203-30.02, etc.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

4-203.30 TOPSOIL COMPUTATION (See 3-315.05)

4-203.35 CHANNEL EXCAVATION FOR BOX AND SLAB TYPE CULVERTS AND BRIDGES

The channel excavation must be computed by the roadway designers. The channel excavation will be included in the Estimated Roadway Quantities Block. DO NOT include the cost of this item in the unit cost of concrete. This item must be bid separately under the price bid for Item No. 203-08, Channel Excavation (Unclassified), per cubic yard. See Section 4-204.05 for limits of this item.

See Section 4-204.05, concerning culvert excavation for box and slab type culverts and bridges.

4-203.40 COMPUTATIONS FOR ITEM NO. 203-06 WATER

Embankment:

Earth embankment (C.Y.) x 2.525 Gal/C.Y. = M.G. / 1000 Gal/M.G.

Base material and granular backfill:

Compacted volume (C.Y.) x 15.150 Gal/C.Y. = M.G. / 1000 Gal/M.G.

Foundation preparation (Item No. 204-10.01 through 204-10.16):

Width of subgrade (Ft) x 0.5 Ft x Length of project(Ft) x 4 Gal/C.Y. = M.G. / 27 C.F./C.Y. x 1000 Gal/M.G.

Subgrade treatment (lime) (Item Nos. 302-01.01):

Subgrade treatment volume (C.Y.) x 40.400 Gal/C.Y. = M.G. / 1000 Gal/M.G.

Soil-cement base (Item Nos. 304-01.02):

Volume of base (C.Y.) x 15.150 Gal/C.Y. = M.G. / 1000 Gal/M.G.

Aggregate-cement base (Item Nos. 309-01.01 and 309-01.02):

Volume of base (C.Y.) x 15.150 Gal/C.Y. = M.G. / 1000 Gal/M.G.

Lime fly-ash base (Item Nos. 312-01, 312-02, and 312-03):

Volume of base (C.Y.) x 30.77 Gal/C.Y. = M.G. / 1000 Gal/M.G.

NOTE: For urban-type projects, which require an unusually large amount of water for dust control, use a quantity of water six times the amount calculated.

4-203.45 EARTHWORK BALANCES ON WIDENING OF EXISTING ROADWAYS

When balancing the earthwork on a project that involves a grade change on the existing roadway, attention needs to be paid to the construction sequencing. It is not possible to maintain traffic on the existing roadway and, at the same time, use material from that roadway to lower the grade, or conversely, to add material to raise the grade of the existing roadway.

When the designer considers the need to stockpile material, detour traffic, or maintain traffic by other means, this shall be detailed in the traffic control plans, earthwork balances, or elsewhere as deemed appropriate.

4-203.50 SUBMISSION OF GRADING QUANTITIES SHEETS FOR CONSTRUCTION
(See 2-145.07 and 3-315.20)

4-203.55 USE OF ESTIMATED GRADING QUANTITIES BLOCK FOR ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED)

On all projects using Item No. 203-01, Road and Drainage Excavation (Unclassified), it is to be referred to as unclassified excavation. When the designed has received the Soils and Geology Report stating approximately what portion is common and what portion is solid rock, he or she is to use a block as shown in Figure 4-12a. If the designed does not know the composition of the material being excavated, he or she is to use a block as shown in Figure 4-12b.

ESTIMATED GRADING QUANTITIES							
STATION TO STATION	ROAD & DRAINAGE EXC. (UNCL.)		BORROW EXCAVATION		CHANNEL EXC. C.Y.	EXCESS EXC. WASTE C.Y.	EMB. C.Y.
	COMMON - C.Y.	S. ROCK - C.Y.	UNCL. - C.Y.	S. ROCK - C.Y.			

Figure 4-12a
Estimated Grading Quantities Block (Materials Composition Known)

ESTIMATED GRADING QUANTITIES							
STATION TO STATION	ROAD & DRAINAGE EXC. (UNCL.)		BORROW EXCAVATION		CHANNEL EXC. C.Y.	EXCESS EXC. WASTE C.Y.	EMB. C.Y.
	C.Y.		UNCL. - C.Y.	S. ROCK - C.Y.			

Figure 4-12b
Estimated Grading Quantities Block (Materials Composition Unknown)

4-204.00 PIPE CULVERT EXCAVATION AND BEDDING

The cost of excavation for the installation of pipe culverts, sewers, conduits, all other culverts, all minor structures of any type and description are not to be measured and paid for directly, but will be included in the price bid per linear foot of pipe.

Designers shall include both standard drawings D-PB-1 and D-PB-2 in plans on projects allowing HDPE as a pipe alternate. Designers are to refer to the Design Division Drainage Manual, Chapter 6, Section 6.04.2.2 and Table 6A-1, for pipe selection criteria and allowed alternates for roadway classes and fill heights.

Designers should note that bedding material shall no longer be paid for as a separate item but will be included in the cost of the proposed pipe culvert.

See Standard Drawing No. D-PB-1 and D-PB-2 for additional details.

4-204.05 EXCAVATION FOR CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES (See 4-203.35)

Compute quantities of **culvert excavation** (Figure 4-13) for these structures only if directed to do so. If culvert excavation is not computed for these structures, include the following note in the plans:

“Culvert excavation for concrete box or slab type culverts or bridges will not be measured and paid for directly, but the cost will be included in the cost of other items.”

See Section 4-203.35, concerning **channel excavation** for box and slab type culverts and bridges.

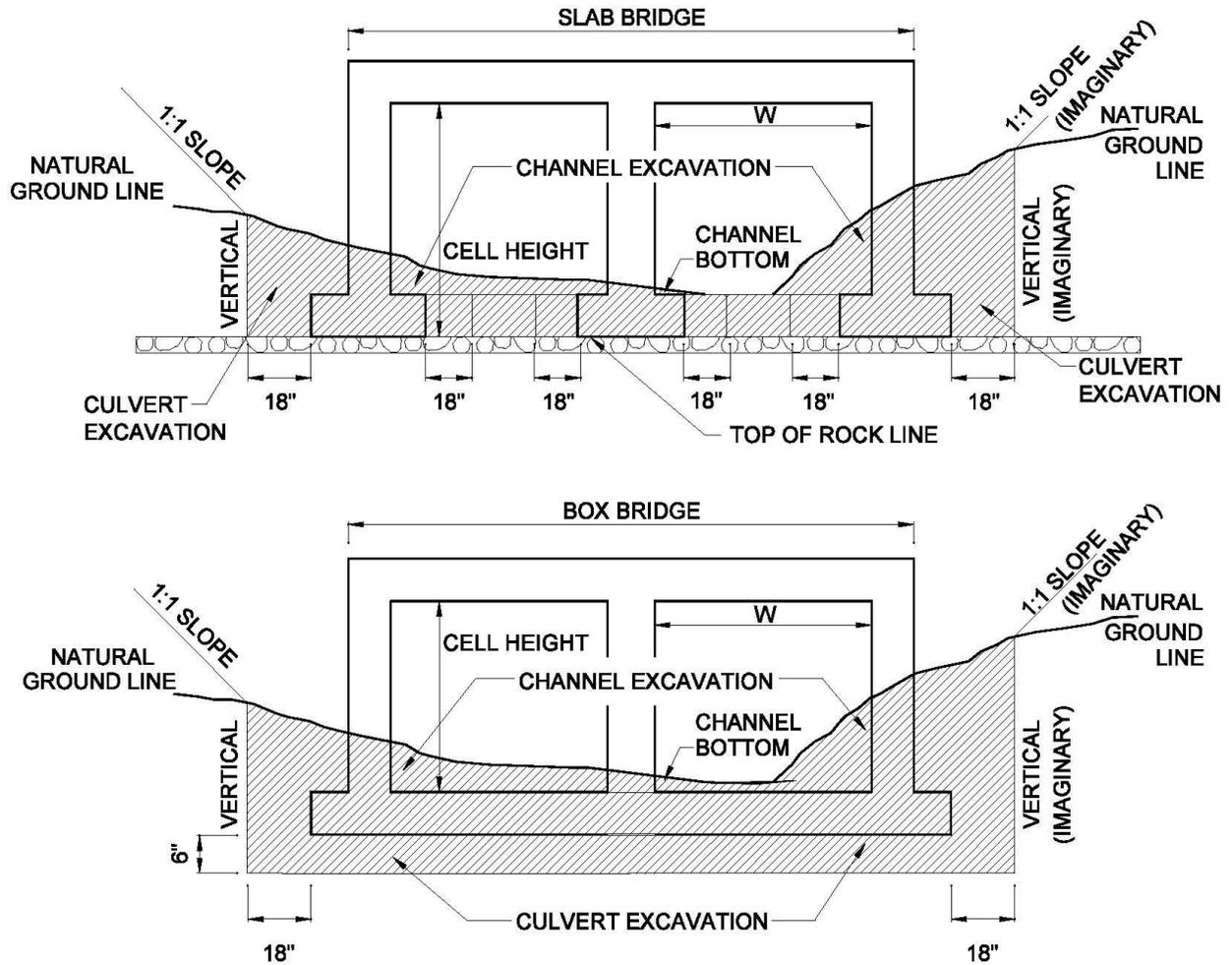


Figure 4-13
Quantities of Channel Excavation for Slab Type and Box Culverts and Bridges

4-209.00 EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) FOOTNOTE

The designer shall **footnote** all applicable erosion prevention and sediment control (EPSC) pay items as follows:

"See Subsection 209.07 of the Standard Specifications for Maintenance Replacement."

4-209.01 COMPUTATIONS OF EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) QUANTITIES

See Chapter 10 of the Drainage Manual.

4-209.05 EXCAVATION OR PLACEMENT OF RIP-RAP IN THE DRY

See Section 6-290.01 for a "Special Note" which shall be added to all plans with multi-barrel culverts or bridge structures.

CHAPTER 3 - BASES AND SUBGRADE TREATMENT

4-300.00 CRITERIA FOR USE OF PERFORMANCE GRADE ASPHALT ON STATE RESURFACING AND CONSTRUCTION PROJECTS

The type of performance grade asphalt used on all state resurfacing and construction projects shall adhere to the following criteria:

Performance Grade PG64-22 Asphalt is to be used on all state resurfacing projects and construction projects with current ADT less than 10,000.

Performance Grade PG70-22 Asphalt is to be used on all state resurfacing projects and construction projects with current ADT greater than 10,000, and on the NHS system on SR-15 (US-64), SR-5 (US-45W), SR-43 (US-45E), and SR-22 regardless of their traffic volume.

Performance Grade PG76-22 Asphalt is to be used on all interstate resurfacing projects and construction projects. It may also be used on state resurfacing and construction projects in cases of heavy truck traffic or severe rutting. However, in order to be used on these projects, prior approval by the Director of Materials and Tests, must be given.

Performance Grade PG82-22 Asphalt is to be used on selected urban interstate projects with extremely high volumes. These projects will always be designated by the Pavement Design Section.

On all construction projects where the pavement design has been supplied by the Pavement Design Section, the designer shall check the pavement design to ensure that it concurs with this policy. This will be particularly critical on older projects when the pavement design has been supplied some time ago. If the designer finds a deviation between the pavement design and this policy, they are to contact the Pavement Design Section to clarify the problem and, if necessary, to get the pavement design modified.

4-301.00 COMPUTATION OF SUBGRADE TREATMENT (GRANULAR)

Item No. 301-01 Aggregate for Subgrade Treatment

$$\text{Compacted volume (C.Y.)} \times 2.03 \text{ Tons/C.Y.} = \text{Tons}$$

4-302.00 COMPUTATION OF SUBGRADE TREATMENT (LIME)

Item No. 302-01.01 Hydrated Lime

$$\frac{\text{Subgrade treatment volume (C.Y.)} \times \text{*Weight (Lb./C.Y.)} \times \text{* \%}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

* Weight to be supplied by the Pavement Design Section in Lb./C.Y.

* % to be supplied by the Pavement Design Section to be used in decimal form (for example, 5% = 0.05).

NOTE: To be used only when specifically recommended.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Item No. 302-02 Bituminous Material (S. T. Lime)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.20 \text{ Gal./Sq. Yd.}}{231 \text{ Gal./Ton}} = \text{Tons}$$

INFORMATIONAL: Subsection 302.08 of the Standard Specifications requires slurry application unless otherwise shown on plans. If dry application is specified by the Pavement Design Section, it shall be necessary to footnote pay items.

4-303.00 COMPUTATIONS FOR MINERAL AGGREGATE BASE

Item Nos. 303-01, *303-01.08, *303-01.09 and 303-02

Loose weight of material = 2,900 Lb./C.Y.

$$\frac{2,900 \text{ Lb./C.Y.} \times 1.4}{2,000 \text{ Lb./Ton}} = 2.03 \text{ Tons/C.Y.}$$

Compacted volume (C.Y.) x 2.03 Tons/C.Y. = Tons

* To be used normally when the blending of two or more materials (for example, gravel and chert, etc.) is specified.

Item No. 303-01.01 Granular Backfill (Roadway)

Compacted volume (C.Y.) x 1.75 Tons/C.Y. = Tons

Item No. 303-01.03 Granular Backfill (Retaining Walls)

Compacted volume (C.Y.) x 1.75 Tons/C.Y. = Tons

Item No. 502-05 Calcium Chloride Type 1

Total aggregate (Tons) x 0.06 Bag/ Ton = Bags

Item No. 303-10.01 Mineral Aggregate (Size 57)

Loose weight of material = 2,619 Lbs./C.Y.

$$\frac{2,619 \text{ Lb./C.Y.} \times 1.02}{2,000 \text{ Lb./Ton}} = 1.34 \text{ Tons/C.Y.}$$

Uncompacted volume (C.Y.) x 1.34 Tons/C.Y. = *Tons

* To be used for fill material between concrete median barriers at areas requiring bridge pier protection in the median (See Standard Drawing Nos. S-MB-2 and S-MB-4).

$$\frac{2,619 \text{ Lb./C.Y.} \times 1.14}{2,000 \text{ Lb./Ton}} = 1.49 \text{ Tons/C.Y.}$$

Compacted volume (C.Y.) x 1.49 Tons/C.Y. = **Tons

** To be used when called for with erosion prevention and sediment control structures.

Item No. 303-10.03 through 303-10.06 Mineral Aggregate (Specify Size)

Compacted volume (C.Y.) x 1.75 Tons/C.Y. = Tons

4-303.05 GRANULAR BACKFILL FOR STRUCTURES

It will no longer be necessary to obtain backfill quantities from the Structures Division. Item Nos. 303-01.01, Granular Backfill (Roadway) and 303-01.03, Granular Backfill (Retaining Walls), will be used for backfilling structures that are included on the Estimated Roadway Quantities sheet only (such as box and slab type culverts and bridges, gravity type retaining walls, etc.). If there is a separate Box Bridge Quantity Block, do not list the item in that block.

For backfilling of structures, where the structure quantities are included in estimated structure items, Item No. 303-01.02, Granular Backfill (Bridges) will be used, and it will be listed on the Estimated Structures Quantity sheet only. It cannot be used in the roadway quantities.

4-304.00 COMPUTATIONS FOR SOIL-CEMENT BASE

Item No. 304-01.02 Cement (Soil-Cement Base)

Volume of New Material x 1.300 (Shrinkage Factor) = Volume of Select Material (C.Y.)

$$\frac{94 \text{ Lb./C.F.} \times 27 \text{ C.F./C.Y.}}{2,000 \text{ Lb./Ton}} = 1.269 \text{ Tons/C.Y.}$$

Total Volume C.Y. x 1.269 Tons/C.Y. x 9% (Volume of Select Material) = Tons
12% (In-place Soil)

Item No. 304-02 Bituminous Material (Soil-Cement Base)

$$\frac{\text{Surface area (Sq.Yd.)} \times 0.2 \text{ Gal./ Sq. Yd.}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

4-307.00 COMPUTATIONS FOR BITUMINOUS PLANT MIX BASE (HOT MIX)

PG64-22 Base Mixes (Grading "A")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons Item 307-01.01}$$

NOTE: 1 inch per square yard weighs 115 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG64-22 Base Mixes (Grading "A-S")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons} \quad \text{Item 307-01.02} \\ \times 0.9675 = \text{Tons} \quad \text{Item 307-01.03} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

PG64-22 Base Mixes (Grading "A-CRL")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons} \quad \text{Item 307-01.04} \\ \times 0.9675 = \text{Tons} \quad \text{Item 307-01.05} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

PG64-22 Base Mixes (Grading "B")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 307-01.06}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG64-22 Base Mixes (Grading "B-M")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 307-01.07}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG64-22 Base Mixes (Grading "B-M2")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 307-01.08}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG64-22 Base Mixes (Grading "C")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,960 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 307-01.09}$$

NOTE: 1 inch per square yard weighs 110 ± pounds

PG64-22 Base Mixes (Grading "C-W")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,960 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 307-01.10}$$

NOTE: 1 inch per square yard weighs 110 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG64-22 Base Mixes (Grading "CS")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons Item 307-01.15}$$

NOTE: Application rate of 40 pounds (depth of 0.35") per square yard shall be used unless otherwise specified.

NOTE: 1 inch per square yard weighs 115 ± pounds

PG64-22 Base Mixes (For 0.75" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons Item 307-01.13}$$

NOTE: 1 inch per square yard weighs 106 ± pound

PG64-22 Base Mixes (For 1" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons Item 307-01.14}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG70-22 Base Mixes (Grading "A")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons Item 307-02.01}$$

NOTE: 1 inch per square yard weighs 115 ± pounds

PG70-22 Base Mixes (Grading "A-S")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons Item 307-02.02} \\ \times 0.9675 = \text{Tons Item 307-02.03} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

PG70-22 Base Mixes (Grading "A-CRL")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons Item 307-02.04} \\ \times 0.9675 = \text{Tons Item 307-02.05} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG70-22 Base Mixes (Grading "B")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-02.06}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG70-22 Base Mixes (Grading "B-M")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-02.07}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG70-22 Base Mixes (Grading "B-M2")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-02.08}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG70-22 Base Mixes (For 0.75" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307.02.13}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

PG70-22 Base Mixes (For 1" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-02.14}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG76-22 Base Mixes (Grading "A")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.01}$$

NOTE: 1 inch per square yard weighs 115 ± pounds

PG76-22 Base Mixes (Grading "A-S")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons} \quad \text{Item 307-03.02} \\ \times 0.9675 = \text{Tons} \quad \text{Item 307-03.03} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG76-22 Base Mixes (Grading "A-CRL")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons} \quad \text{Item 307-03.04} \\ \times 0.9675 = \text{Tons} \quad \text{Item 307-03.05} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

PG76-22 Base Mixes (Grading "B")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.06}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG76-22 Base Mixes (Grading "B-M")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.07}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG76-22 Base Mixes (Grading "B-M2")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.08}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG76-22 Base Mixes (Grading "C")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,960 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.09}$$

NOTE: 1 inch per square yard weighs 110 ± pounds

PG76-22 Base Mixes (For 0.75" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307.03.13}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

PG76-22 Base Mixes (For 1" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.14}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG82-22 Base Mixes (Grading "B-M2")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-04.08}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

Crumb Rubber Mod. Base Mixes (GAP Grading Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-20.01}$$

NOTE: 1 inch per square yard weighs 115 ± pounds

4-308.00 COMPUTATIONS FOR BITUMINOUS COATED AGGREGATE BASE (PLANT MIX)

Item Nos. 308-01 (Mix No. 1) and 308-02 (Mix No. 2) Cold Mixes

$$\frac{\text{Compacted volume (C.Y.)} \times 3240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.965 = \text{Tons} \quad \text{Item 308-01.01} \\ \text{Item 308-02.01} \\ \times 0.035 = \text{Tons} \quad \text{Item 308-01.02} \\ \text{Item 308-02.02} \end{array}$$

NOTE: 1 inch per square yard weighs 90 ± pounds

Place a footnote under the quantity block referring to Item No. 308-01.01 reading as follows:

"Includes approximately 40 pounds per square yard of choker stone for each 3.5 inch layer."

Place a footnote under the quantity block referring to Item No. 308-02.01 reading as follows:

"Includes approximately 30 pounds per square yard of choker stone for each 2.5 inch layer."

Mix No. 1 shall be specified for layers 3 inch thick or more and Mix No. 2 for layers less than 3 inches.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

4-309.00 COMPUTATIONS FOR AGGREGATE-CEMENT BASE COURSE - LIMESTONE

Item No. 309-01.01 Mineral Aggregate (A-CBC)

Compacted volume (C.Y.) x 1.9456 Tons/C.Y. = Tons

Item No. 309-01.02 Portland Cement (A-CBC)

Compacted volume (C.Y.) x 0.0751 Tons/C.Y. = Tons

Item No. 309-02 Bituminous Material (A-CBC)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.20 \text{ Gal./Sq. Yd.}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

4-309.01 COMPUTATIONS FOR AGGREGATE-CEMENT BASE COURSE - GRAVEL

Item No. 309-01.01 Mineral Aggregate (A-CBC)

Compacted volume (C.Y.) x 1.8145 Tons/C.Y. = Tons

Item No. 309-01.02 Portland Cement (A-CBC)

Compacted volume (C.Y.) x 0.0884 Tons/C.Y. = Tons

Item No. 309-02 Bituminous Material (A-CBC)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.20 \text{ Gal./Sq. Yd.}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

4-312.00 COMPUTATIONS FOR AGGREGATE-LIME-FLY ASH STABILIZED BASE COURSE

Item No. 312-01 Mineral Aggregate (ALFSB)

Compacted volume (C.Y.) x 1.690 Tons/C.Y. = Tons

Item No. 312-02 Lime

Compacted volume (C.Y.) x 0.0643 Tons/C.Y. = Tons

Item No. 312-03 Fly-Ash

Compacted volume (C.Y.) x 0.2019 Tons/C.Y. = Tons

Item No. 312-04 Bituminous Material (ALFSB)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.20 \text{ Gal./Sq. Yd.}}{231 \text{ Gal./ Ton}}$$

CHAPTER 4 - FLEXIBLE SURFACES

4-400.00 PAVING POLICY - RESURFACING

This policy is for paving on intersections with public roads, private drives, field entrances and business entrances.

1. Public Roads (non curb and gutter)

Public road intersections will be resurfaced a paver width through the intersection as a minimum. Should the pavement of the intersecting road be distressed, the resurfacing width may be increased to the normal right-of-way.

2. Public Roads (curb and gutter section)

On curb and gutter sections, public road intersections will be resurfaced to the end of radius.

3. Private drives, field entrances and business entrances (no curb and gutter).

Private driveways, field entrances, and business entrances will be resurfaced a paver width (lane width) as a minimum. A pavement taper to transition the new pavement shall be required, it shall be based on an additional 1 foot of width per 1 inch depth of pavement. If the shoulder is narrow enough that the sum of the shoulder and transition is less than a paver width (lane width), the transition shall occur within the paver width. If the sum of the shoulder and the transition is greater than a paver width (lane width), the transition shall occur outside of the paver width.

4. Private drives and business entrances (curb and gutter section).

For urban typical sections (curb and gutter), a minimum width of material not to exceed 1 foot will be used to feather the pavement edge.

4-400.03 PERFORMANCE GRADE MIX

When a Performance Grade Mix is called for on resurfacing plans, the Item Number on the Quantity Sheet shall be referenced with the following footnote:

"The contractor has the option of using the Performance Grade Mix or regular asphalt on the paving of driveways and business entrances."

4-400.05 HERBICIDE USE IN EMULSIFIED ASPHALT - RESURFACING

The following note shall be used on all State resurfacing projects (except those using any latex modified products) which have bituminous surface treatment on the shoulders.

"The contractor is to furnish the herbicide, PRIMATOL 25-E, and add it to the asphalt emulsion used in constructing the first course on bituminous surface treated shoulders. The Primatol shall be added at the rate of 15 gallons per 1,200 gallons of emulsion. Empty containers of herbicide are to be properly disposed of by the contractor outside the project site area. All costs associated with the addition of the herbicide shall be included in the cost of other items."

This note applies to double bituminous surface treatment and/or single bituminous surface treatment only. This note will not apply for the use of regular hot mix on the shoulders.

4-402.00 COMPUTATIONS FOR PRIME COAT

Item No. 402-01 Bituminous Material for Prime Coat (PC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./Sq. Yd.)}}{\text{**231 Gal./ Ton}} = \text{Tons}$$

* Rate 0.30 - .35 Gal./Sq. Yd.

** When Tar only is specified use 213 Gal./ Ton

Item No. 402-02 Aggregate for Cover Material (PC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Lb./ Sq. Yd.)}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

* Rate 8 - 12 Lb./Sq. Yd.

4-403.00 COMPUTATIONS FOR TACK COAT

Item No. 403-01 Bituminous Material for Tack Coat (TC)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.02 \text{ (Gal./Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

Item No. 403-02 Asphalt Cement for Tack Coat (TC)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.05 \text{ (Gal./Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

4-404.00 COMPUTATIONS FOR DOUBLE BITUMINOUS SURFACE TREATMENT

Item No. 404-01.01 Bituminous Material for Double Bituminous Surface Treatment (DBST)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./ Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

* Rate 0.68 - 0.84 Gal./ Sq. Yd.

Item No. 404-01.02 Mineral Aggregate for Double Bituminous Surface Treatment (DBST)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*Rate (Lb./ Sq. Yd.)}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

* Rate 40 - 58 Lb./ Sq. Yd.

4-405.00 COMPUTATIONS FOR BITUMINOUS SEAL COAT (CHIP SEAL)

Item No. 405-01.01 Bituminous Material for Bituminous Seal Coat (BSC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./ Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

* Rate 0.26 - 0.36 Gal./ Sq. Yd. (GENERAL USE)

* Rate 0.10 - 0.25 Gal./ Sq. Yd. (MILLING - COLD PLANING)

Item No. 405-01.02 Mineral Aggregate for Bituminous Seal Coat (BSC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Lb./Sq. Yd.)}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

* Rate 16 - 26 Lb./Sq. Yd. (GENERAL USE)

* Rate 0 - 12 Lb./Sq. Yd. (MILLING - COLD PLANING)

On all projects where a bituminous seal coat is placed after milling of the existing surface, use rate as specified above unless otherwise advised in pavement design as submitted from the Special Design Section. After the bituminous seal coat is placed, a tack coat (see section 4-403.00, Item No. 403-01) is to be used prior to the placement of the first lift of proposed pavement.

4-405.01 USE OF BITUMINOUS SEAL COAT (CHIP SEAL) ALONG EDGE OF PAVED SHOULDER WHILE MAKING LANE SHIFTS DURING CONSTRUCTION

Application shall begin at point where the stone touches paved shoulder and extend outwardly from the paved shoulder to the point where the stone meets the subgrade. Application rate shall be computed based on 1.5 times maximum application rate for general use shown in Section 4-405.00. This will allow a quantity large enough for contractor to reapply chip seal as needed during the course of the construction operations.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Chip seal to be paid for under Item Nos. 405-01.01, Bituminous Material for Bituminous Seal Coat (BSC) per Ton, and 405-01.02, Mineral Aggregate for Bituminous Seal Coat (BSC) per Ton. Pay items to be footnoted as follows:

"Includes quantity to be used along edge of paved shoulder while making lane shifts during the course of construction in order to reduce rutting along edge of shoulder."

4-406.00 COMPUTATIONS FOR BITUMINOUS SEAL COAT (SPLIT APPLICATION)

Item No. 406-01.01 Bituminous Material for Bituminous Seal Coat, Split Application (BSC-SA)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

* Rate 0.46 - 0.54 Gal./ Sq. Yd.

Item No. 406-01.02 Aggregate for Bituminous Seal Coat, Split Application (BSC-SA)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Lb./ Sq. Yd.)}}{2,000/ \text{Ton}} = \text{Tons}$$

* Rate 36 - 44 Lb./ Sq. Yd.

4-411.00 COMPUTATIONS FOR ASPHALTIC CONCRETE SURFACE (HOT MIX)

Item No. 411-01 Grading "D" Surface (Performance Grade PG64-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 411-01.10}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-01 Superpave Surface (Performance Grade PG64-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.06 = \text{Tons} \quad \text{Item 411-01.03} \\ \times 0.94 = \text{Tons} \quad \text{Item 411-01.04} \end{array}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-01 Grading "E" Surface (Performance Grade PG64-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,870 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 411-01.11}$$

NOTE: 1 inch per square yard weighs 107.5 ± pounds

Item No. 411-01 Grading "E" Shoulders (Performance Grade PG64-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,708 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 411-01.07}$$

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

NOTE: 1 inch per square yard weighs 103 ± pounds
Item No. 411-02 Grading "D" Surface (Performance Grade PG70-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 411-02.10}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-02 Superpave Surface (Performance Grade PG70-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.06 = \text{Tons} \quad \text{Item 411-02.03} \\ \times 0.94 = \text{Tons} \quad \text{Item 411-02.04} \end{array}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-02 Grading "E" Surface (Performance Grade PG70-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,870 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 411-02.11}$$

NOTE: 1 inch per square yard weighs 107.5 ± pounds

Item No. 411-03 Grading "D" Surface (Performance Grade PG76-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 411-03.10}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-03 Superpave Surface (Performance Grade PG76-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.06 = \text{Tons} \quad \text{Item 411-03.03} \\ \times 0.94 = \text{Tons} \quad \text{Item 411-03.04} \end{array}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-04 Grading "D" Surface (Performance Grade PG82-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 411-04.10}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

4-411.02 RAISED BITUMINOUS RUMBLE STRIPS

Raised bituminous rumble strips are a traffic warning device. Raised bituminous rumble strips will require a detail to be furnished in the plans. This type of rumble strip is to be used for warning or unexpected stop conditions and shall not be used routinely as a shoulder treatment. At approaches to narrow bridges, where the shoulder width is less than the normal roadway shoulder width, the raised bituminous rumble strip may be used to warn the motoring public of this roadway condition.

4-411.03 RUMBLE STRIPS

Scored rumble strips are a traffic warning device, and when required, shall be constructed in accordance with Standard Drawings T-M-15 and T-M-15A or as shown on the plans. Raised bituminous rumble strips and scored rumble strips are the two types of rumble strips normally used in Tennessee.

Scored rumble strips and scored rumble stripes provide an audible warning to vehicles leaving the travel lane. Unlike a scored rumble stripe which is placed at the edge line location, a scored rumble strip is placed on the shoulder adjacent to the travel lane and edge line.

Refer to Section 4-716.15 for guidelines for placement of rumble strips on shoulders. Scored shoulders will be constructed on asphalt or concrete shoulders. Asphalt shoulders must have a minimum depth of pavement of one and one-half inches. Scored shoulders should also be omitted adjacent to ramps, acceleration and deceleration lanes including tapers and along the radius of side road approaches, entrances and median crossovers.

Rumble strips shall be specified on all new construction and resurfacing projects on the Interstate System and access controlled state routes. Both the inside and the outside shoulders shall be scored. The scored rumble strip shall be constructed in accordance with Standard Drawing T-M-15. Rumble strips are to be paid for under Item No. 411-12.01, Scoring Shoulders (Continuous) (16 inch Width), L.M. For estimating purposes, the item will be measured longitudinally along the edge of each shoulder and will usually be four (4) times the project length less deductions for entrance and exit ramps, public roads, and bridges. When concrete shoulders are present rumble strips are to be constructed in accordance with Standard Drawing RP-CS-1 or RP-CS-2. Rumble strips on concrete shoulders shall be paid for under Item No. 501-03.03, Scoring Concrete Shoulders (Non-Continuous) (36 inch Width), L.F. The item will be measured as the actual length of pavement scored along each shoulder.

Refer to Section 4-716.15 for guidelines for placement of rumble strips on non-access controlled state routes. When rumble strips are placed on non-access controlled routes, paved shoulders should be 8ft. or wider. A 30 foot rumble will be followed by a 10 foot gap in the rumble to allow for bicycles to cross without having to traverse the rumble strip. Rumble strips should normally only be placed on rural routes with posted speeds of 45 mph or greater. Rumble strips may be used on urban routes where accident history or other factors warrant the placement. When placed on urban routes, designers should give consideration to expected bicycle traffic and noise generated. The scored rumble strip shall be constructed in accordance with Standard Drawing T-M-15A. Rumble strips are to be paid for under Item No. 411-12.02, Scoring Shoulders (Non-continuous) (16 inch Width), L.M. The item will be measured and paid as the actual length of pavement scored along each shoulder. Rumble strips should be omitted on shoulders adjacent

to designated bike lanes and may also be omitted from locations recommended by the TDOT bicycle coordinator.

4-411.04 RUMBLE STRIPES

Rumble stripes are a traffic warning device, and when required, shall be constructed in accordance with Standard Drawing T-M-16. A scored rumble stripe is a scored rumble placed along the outside edge line of the travel lane with the edge line placed along the scored rumble.

Refer to Section 4-716.15 for guidelines for the placement of rumble stripes. Rumble strips should normally only be placed on rural routes with posted speeds of 40 mph or greater. The rumble stripe shall consist of a 30 foot scored rumble followed by a 10 gap to allow for bicycles to cross without having to traverse the rumble. Rumble stripes may be used on urban routes where accident history or other factors warrant the placement. When placed on urban routes, designers should give consideration to expected bicycle traffic and noise generated.

Scored rumble stripes are to be paid for under Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8 inch Width), L.M. or Item No. 411-12.04, Scoring for Rumble Stripe (Non-Continuous (4 inch Width), L.M. The item will be measured and paid as the actual length of pavement scored along each shoulder.

When rumble stripes are specified, pavement markings shall be Spray Thermoplastic (60 mil). Enhanced Flatline Thermoplastic Markings shall not be used. Striping is to be paid for under the appropriate pavement marking item number. Rumble stripes should be omitted on shoulders adjacent to designated bike lanes and may also be omitted from locations recommended by the TDOT bicycle coordinator.

4-411.05 RIDEABILITY SPECIFICATIONS

For all projects having asphaltic concrete surface Grading "D", a determination shall be made as to whether or not the rideability specification shall be included in the contract. This determination will be made by the State Construction Office after the plans have been submitted.

4-414.05 COMPUTATIONS FOR MICRO-SURFACING

Item No. 414-03.01 Emulsified Asphalt for Micro-Surfacing

$$0.12 \times \text{Below aggregate quantity} = \text{Tons}$$

NOTE: Application rate based on 12 percent of the dry weight of the aggregate.

Item No. 414-03.02 Aggregate for Micro-Surfacing

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{XX Lb./ Sq. Yd.}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

NOTE: Application rate of 30 pounds (approximate depth 0.375") per square yard shall be used if plans require a leveling mixture (14 pounds per square yard) and a surface

mixture (16 pounds per square yard) to be placed, or 22 pounds (approximate depth 0.275") per square yard if only a surface mixture is to be placed, unless otherwise specified.

Item No. 403-01 Bituminous Material for Tack Coat (TC) to be used with Micro-Surfacing

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./ Sq. Yd.)}}{231 \text{ Gal./ Sq. Yd.}} = \text{Tons}$$

* Rate 0.05 - 0.10 (Gal./Sq. Yd.)

4-415.00 COLD PLANING OF BITUMINOUS PAVEMENT

On projects having 2,000 Tons or more of cold planed material, it shall be paid for by the Ton. This shall be calculated using 105 Lb./S.Y./Inch of estimated depth to be cold planed, converted to Tons.

This shall be measured and paid for under Item No. 415-01.01, Cold Planing of Bituminous Pavement per Ton.

On projects where the required depth of cold planing is known and the quantity is less than 2,000 Tons, it may be paid for by the square yard. The Regional Construction Office shall be consulted prior to using this unit of measure. Depth of Cold Planing must be specified on the plans.

This shall be measured and paid for under Item No. 415-01.02 Cold Planing of Bituminous Pavement per Square Yard.

On projects having less than 2,000 Tons of cold planed material, and where no scales are readily available (check with the Regional Construction Office), and the required depth is not known, it shall be paid for by the cubic yard.

This shall be measured and paid for under Item No. 415-01.03, Cold Planing of Bituminous Pavement per Cubic Yard.

CHAPTER 5 - RIGID PAVEMENT

4-501.00 PORTLAND CEMENT CONCRETE PAVEMENT (See 4-905.00)

4-502.00 COMPUTATIONS FOR UNDERSEALING CONCRETE PAVEMENT

NOTE: The quantities are listed in the order of computation procedure.

Item No. 502-02 Holes

$$\frac{\text{Length of project (ft) x number of lanes x 4 holes/slab}}{\text{Length of slabs}} = \text{Each}$$

Item No. 502-10 Cement-Fly Ash Grout

- (a) Cubic feet/hole x number of holes = Cubic Feet
- (b) Use one of the following values as directed on the Construction Field Review:
 1. Concrete pavement in worse than average condition.
0.4 - 0.5 cubic feet/hole
 2. Concrete pavement in average condition.
0.4 cubic feet/hole
 3. Concrete pavement in better than average condition.
0.3 - 0.4 cubic feet/hole

NOTE: Pavement with cement-treated bases shall fall within the better than average range.

CHAPTER 6 - STRUCTURES

4-604.00 TYPE DESIGNATION FOR CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES

The plans must clearly indicate for each culvert or bridge, the type (box or slab) on which the quantities are based. This should be accomplished by showing a column in the tabulation block for culverts or bridges, indicating the type.

The current Standard Drawings for box or slab type culverts or bridges are found in the Standard Structure Drawings. Special or new designs may be requested through the proper channels from the Structures Division.

The Standard Drawing Index Sheet for all projects having either concrete box and/or slab culverts or bridges shall include the following:

Standard Drawing numbers STD-15-1 through STD-15-6, STD-15-8, STD-15-9, STD-15-12 through STD-15-15, STD-15-19, STD-15-20, and STD-15-25 through STD-15-29 will be used on all structures.

Standard Drawing STD-15-10 will be used when the structure is on 90 or 75 degree skew.

Standard Drawing STD-15-11 will be used when the structure is on 60 or 45 degree skew.

Standard Drawing STD-15-24 will be used for all skews other than 90 degrees.

In addition to these drawings, the designer will use the appropriate STD-15 series of drawings showing the particular structures that apply to the project.

4-604.05 PRECAST, PRESTRESSED BRIDGE DECK PANELS

Precast, prestressed bridge deck panels will not be allowed to be used on concrete box or slab type culverts.

4-604.10 PAVED APRON FOR BOX CULVERT AND BRIDGE OUTLETS

Use Standard Drawing STD-15-16 on all concrete box culverts and bridges in Region IV. This drawing may be used in selected locations in Regions I, II, and III, if requested by the Structures or Design Division during the Construction Field Review.

The quantities shall be added to the concrete and steel quantities for the box culvert or bridge. Footnote these quantities to show the amount of concrete and steel bar reinforcement included for the paved aprons. The steel bar reinforcement may be computed using a weight of 58 pounds per 100 square feet of apron, plus the weight of the A-400 bars.

4-604.20 CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES IN SHALLOW FILLS

On concrete box and slab type culverts and bridges where there is little or no fill to be placed on top of the structure and/or there are significant effects on construction due to grades, superelevation or curvature, the designer shall place information on the plans as follows:

- A. Where the horizontal curvature of the roadway, as opposed to the normally straight nature of the inlet and outlet, is sufficient that the guardrail may encroach on the shoulder and/or roadway (Figure 4-14), the designer shall investigate the need to have the inlet and outlet constructed on a curve parallel to the centerline of the roadway.

If curved inlets and/or outlets are required, a note similar to the one below shall be placed on the culvert section.

"The inlet and outlet ends of the box culvert at Sta. ____ shall be curved parallel to the centerline of the roadway."

- B. Where grades and/or superelevation cause significant effects on construction, the designer shall show the following additional details and elevations on the culvert drainage section as shown in Figure 4-15:

1. Add detail of box showing flow line, top of wall and top of slab adjacent to vertical walls on both inlet and outlet ends.
2. Show elevations of top of curb and top of wingwalls to suit roadway grades and superelevation. The height of curb may vary; but shall not exceed a height of 2.5 feet above the top of the box. In the event this occurs, the designer will contact the Structures Division (Hydraulics Section) to work out the problem.
3. Provide a cross-section of the roadway on top of the box showing the asphalt paving needed on the box to obtain the roadway grade and proper pavement cross slope. See Figure 4-16.
4. Show crown or superelevation when the concrete top slab is to be the riding surface.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- C. On box and slab type culverts and bridges with less than 1 foot of fill (with fill defined as embankment, base and pavement), the designer will be responsible for computing all concrete and reinforcing steel quantities accordingly. The correction factor for the adjustment of reinforcing steel quantities, based on the modifications of vertical height by the designer, is included in Table 4-1 (See associated Figure 4-17). The Structures Division will assist the designer in these calculations, if he or she requires assistance.

- D. If the top slab is to be used as the riding surface, and the Design Speed is less than 40 mph, the following note shall be added to the plans.

“Bridge deck finish to be burlap drag in accordance with method “A” as specified in Subsection 604.23 of the *Tennessee Department of Transportation Standard Specifications*.”

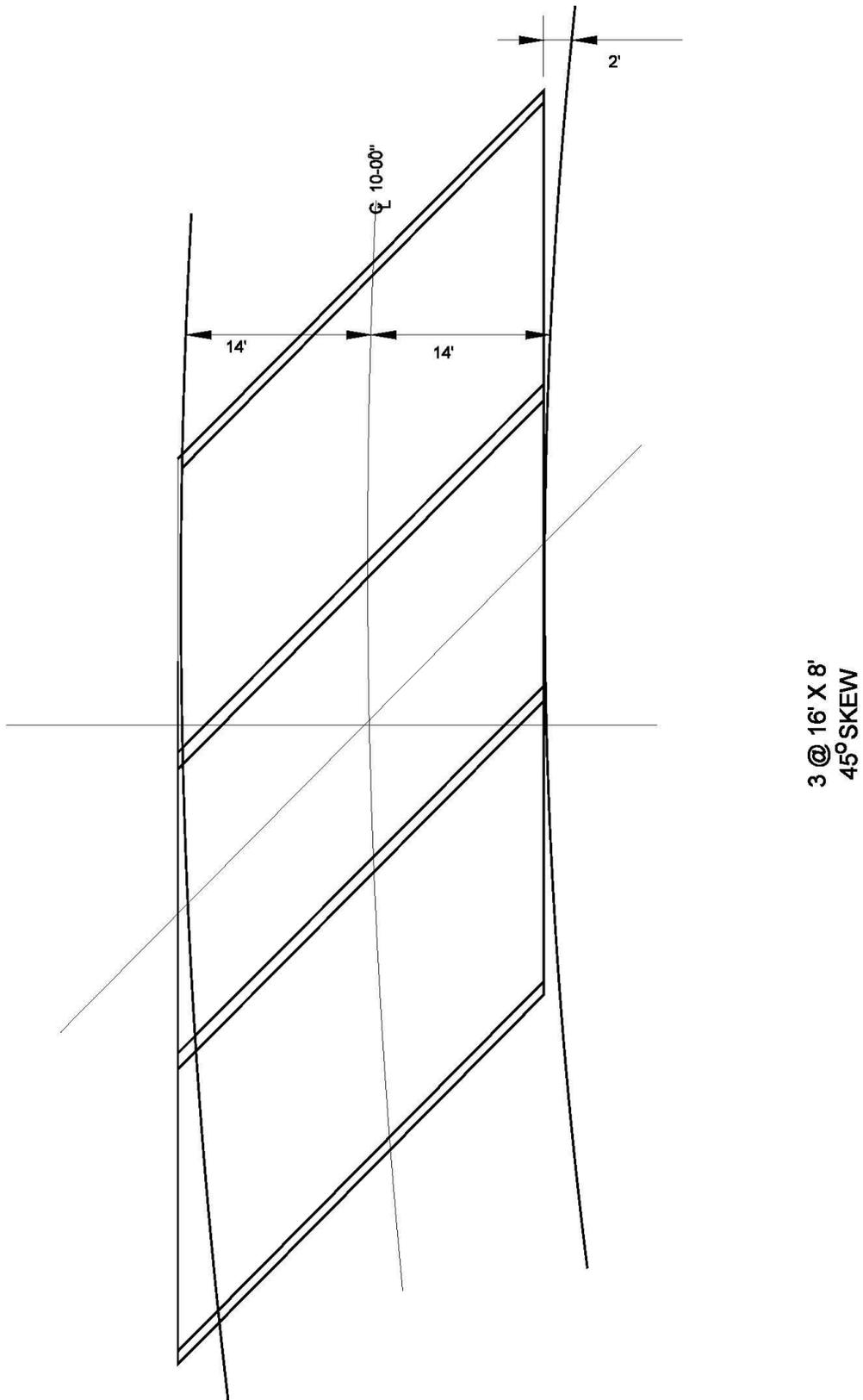


Figure 4-14
Potential Guardrail Encroachment

BOX BRIDGE OR CULVERT ELEVATIONS

STATION	TOP OF CURB ELEV.				TOP OF SLAB ELEV.				FLOW LINE ELEV.				TOP OF WING ELEV.			
	ELEV. A-1	ELEV. A-2	ELEV. A-3	ELEV. A-4	ELEV. B-1	ELEV. B-2	ELEV. B-3	ELEV. B-4	ELEV. C-1	ELEV. C-2	ELEV. C-3	ELEV. C-4	ELEV. D-1	ELEV. D-2	ELEV. D-3	ELEV. D-4

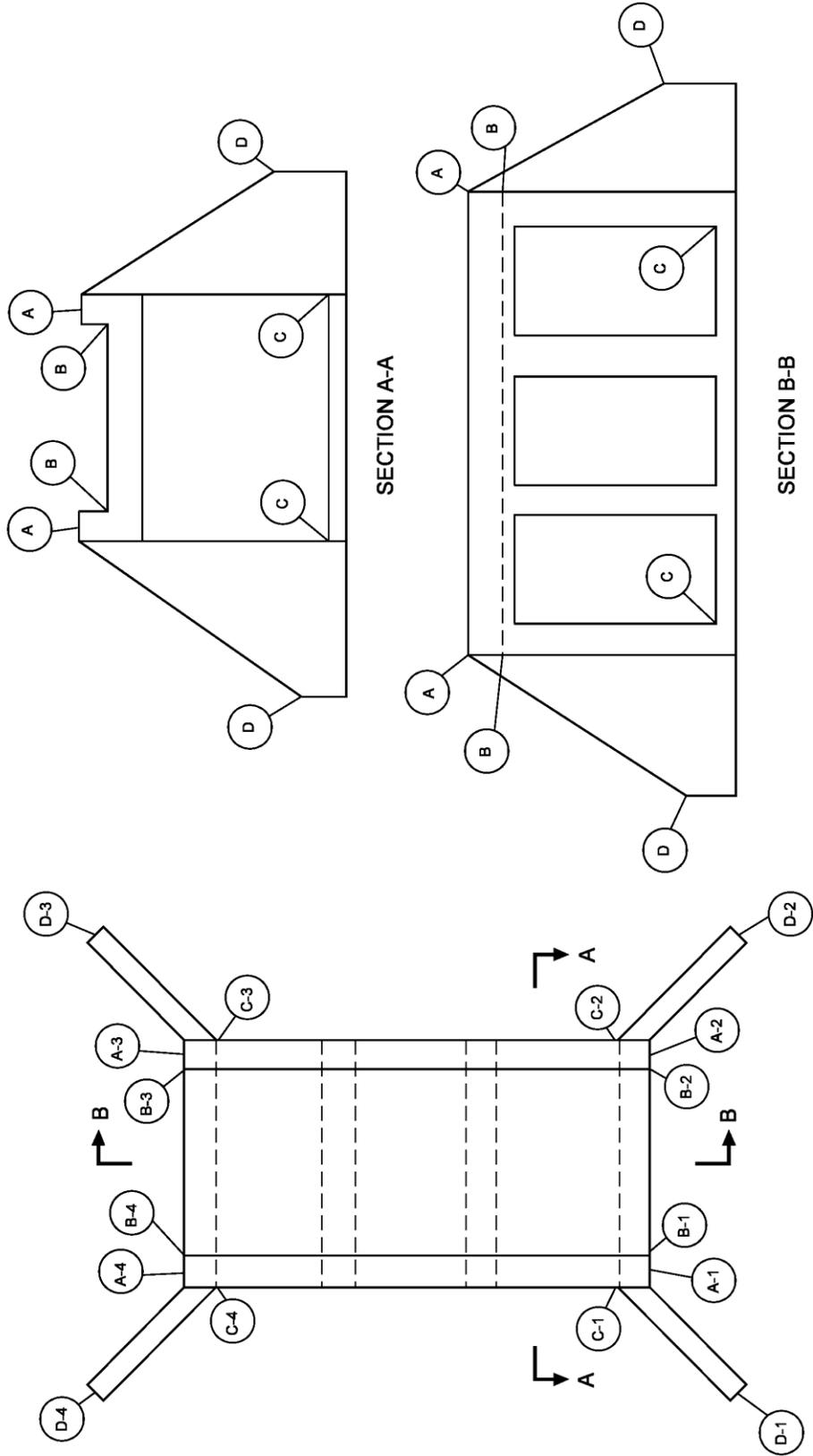


Figure 4-15
Box Bridge or Culvert Elevation Details

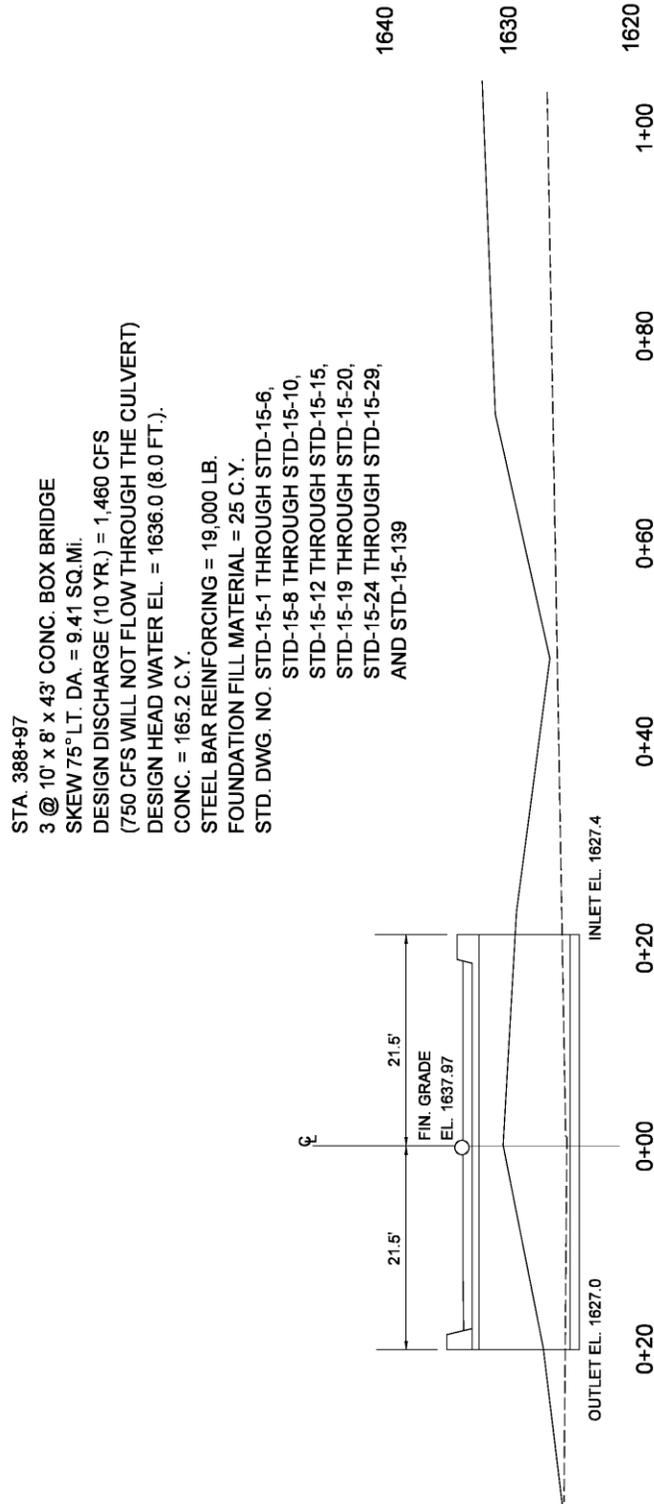


Figure 4-16
 Typical Cross-Section Information for Box and Slab Type Culverts and Bridges

ADJUSTMENT FACTOR FOR ESTIMATING ADDITIONAL REINFORCING STEEL QUANTITIES IN THE VERTICAL WALLS OF CONCRETE BOX OR SLAB TYPE CULVERTS OR BRIDGES		
SPAN WIDTH IN FEET	*EXTERIOR WALL IN LB./L.F./V.F.	*INTERIOR WALL IN LB./L.F./V.F.
8	2.27	1.33
10	2.45	1.50
12	2.94	1.71
14	3.94	2.17
16	3.94	2.17
18	3.94	2.17

* ADDITIONAL POUNDS OF REINFORCING STEEL IN VERTICAL WALLS BASED ON POUNDS PER LINEAR FOOT ONE FOOT IN HEIGHT FOR ANY NUMBER OF BARRELS ON ANY SKEW. THIS TABLE IS GOOD FOR AN INCREASE IN WALL HEIGHT NOT EXCEEDING TWO FEET AND FILL HEIGHTS NOT EXCEEDING TWO FEET.

Table 4-1
Adjustment Factor for Estimating Additional Reinforcing Steel Quantities in the Vertical Walls of Concrete Box or Slab Type Culverts or Bridges

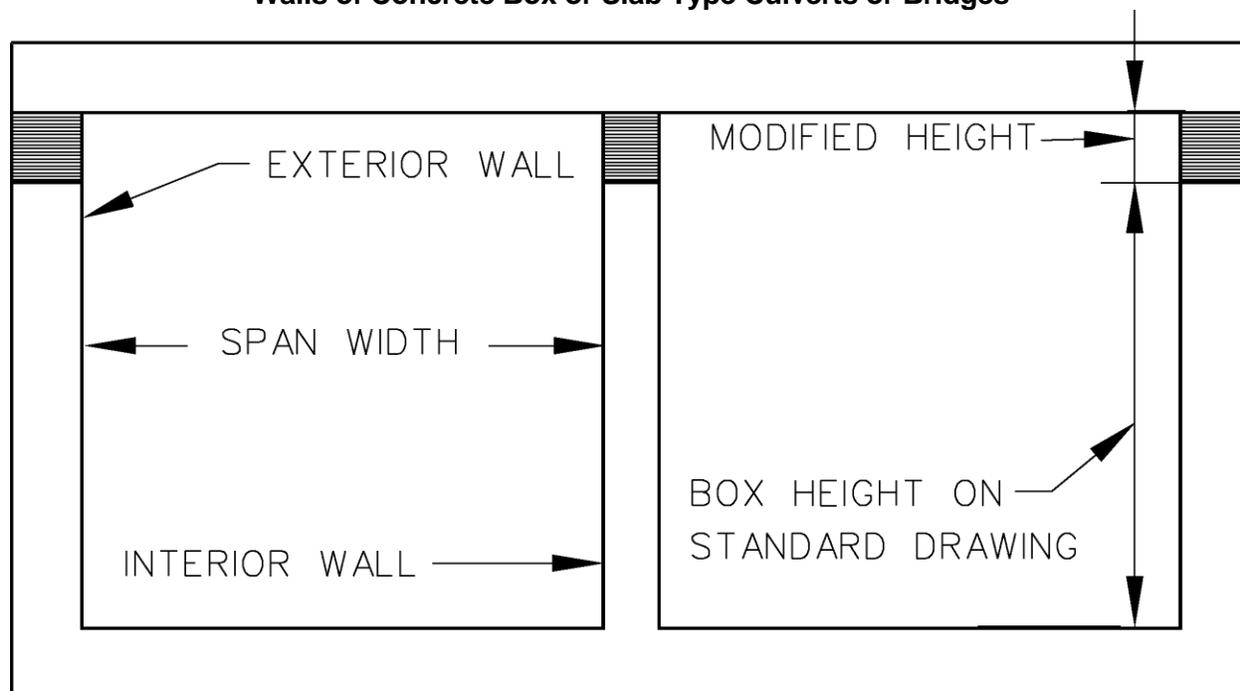


Figure 4-17
Typical Concrete Box or Slab Type Culvert or Bridge Modification

4-604.25 STEEL BAR REINFORCEMENT (ROADWAY)

On all projects which include reinforced concrete box or slab type culverts or bridges, Standard Drawing No. STD-9-1, Standard Reinforcing Bar Support Details for Concrete Slabs, shall be listed on the appropriate culvert sheets and in the index.

If the top slab used on concrete box or slab type culverts or bridges is to be used as a riding surface or has less than 1 foot of fill over it, then epoxy-coated reinforcing steel is to be used in the top mat of the top slab and curbs, including tie bars for curbs and corner bars of the exterior walls. All other steel is to be in the form of black bars. The unit cost bid for Item No. 604-02.02, Steel Bar Reinforcement (Box Bridges), is to include any additional cost for epoxy-coated steel as noted on plans details or Standard Drawings.

If the project has a reinforced concrete deck bridge, this drawing will appear in the bridge index and it will not be necessary to list it again in the roadway index.

4-604.30 CULVERT EXCAVATION FOR BOX OR SLAB TYPE CULVERTS OR BRIDGES
(See 4-203.35 and 4-204.05)

4-604.35 CHANNEL EXCAVATION FOR BOX OR SLAB TYPE CULVERTS OR BRIDGES
(See 4-203.35)

4-604.40 STOCK PASSES (See 3-240.00)

4-611.00 CHECKING OF DRAINAGE PLANS PRIOR TO CONSTRUCTION

Before finalizing drainage plans, the designer is to ensure that the drainage portion of their Construction Plans is consistent with current standard drawings. This will consist of making sure that the invert elevations shown on the proposed plan sheets facilitate the use of standard small drainage structures. The designer is to use the same invert drop across the structures that are used on the standard drawings. This check must be completed prior to submitting the Construction Plans to the Estimating and Bid Analysis Office. It is necessary to make this adjustment in order to eliminate costly construction changes to the catch basins, manholes, junction boxes, etc.

Invert elevations are to be shown in the plans for all pipes entering and leaving these small drainage structures. The grate elevation is to be shown for all catch basins. The top of lid elevation is to be shown for all manholes. The top of slab elevation is to be shown for all junction boxes. The proper tabulation of these structures is shown in section 3-200.00.

4-611.05 BRIDGE END DRAINS

When bridge end drains are included on a project, the designer will only have to calculate quantities for **drain pipe** and **end treatment**. The Structures Division Standard Drawings STD-1-6 through STD-1-9 show a bridge end drain for structures, which have concrete approach slabs and Standard Drawings STD-1-10 through STD-1-13 show a bridge end drain for structures without concrete approach slabs. The designer shall check the preliminary structures layout sheet to see which drawings are included. On some structures, such as those having open bridge railing, bridge end drains will not be used. If there are questions about these drawings or the type of bridge end drain to use, check with the appropriate Structures Division personnel.

The length of the outlet pipe is to be measured from the outside limits of the bridge end drain pipe, which is included in the cost of the bridge drain box (as shown on Standard Drawings STD-1-7 or STD-1-11), down the slope to the end of the outlet pipe. Actual length for payment will come from measurement taken from the appropriate sheet in the Roadway Plans. It shall be paid for as Item No. 610-07.03, 18-inch Pipe Drain (Bridge Drain) per linear foot. The cost of the bridge drain outlet pipe endwall shall be paid for as Item No. 709-01.01, Rubble-Stone Rip-Rap per cubic yard. These pay items in the Estimated Roadway Quantities Block shall be footnoted as follows:

“Standard Drawing STD-1-7 (or STD-1-11) is to be used for burial of the outlet pipe and for end treatment details.”

The designer shall reference only the appropriate Standard Drawing in the above note. Standard Drawing STD-1-7 will be used in the note when the structure has a concrete approach slab. Standard Drawing STD-1-11 will be used in the note when the structure does not have a concrete approach slab.

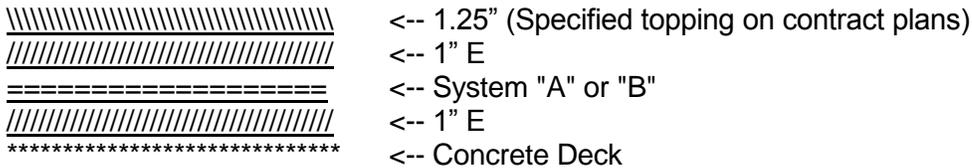
When bridge-end drains are not required, the shoulder shall be paved full width for a distance of 25 feet past the end of the parapet, and rip-rap shall be hand placed around the guardrail for an equal distance.

4-617.00 BRIDGE DECK SEALANT

In figuring the quantity of bridge deck sealant, include a two foot transition length beyond each end of the bridge. Do not use sealant on approach pavement.

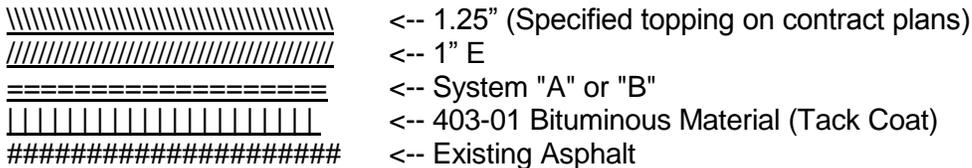
The following is the procedure for using bridge deck sealant:

1. Bare concrete decks considered sealable shall be sealed using a "sandwich seal", system "A" or "B", as follows:



2. Concrete decks with existing asphalt overlays shall be sealed using a "sandwich seal", System "A" or "B".

- A. For state projects the existing asphalt will be sealed as follows:



Existing asphalt overlays are not to be removed unless the bridge deck has deteriorated to the point that the overlay is unstable.

- B. On State projects, if the deck survey indicates the existing asphalt is too rough to seal, a 1-inch layer of "E" mix will be substituted for the tack coat. Since the membrane must be installed on a uniform surface, leveling ("C" mix), or additional "E" mix may be necessary to bring the deck surface to a true plane.

NOTE: When overlaying existing bridges, the Structures Division will furnish expansion joint adjustment details upon request by the designer if expansion joints exist.

NOTE: On construction projects where "E" mix is not specified, but "D" mix is specified, "D" mix may be substituted for "E" mix.

NOTE: On construction projects where "C-W" mix is specified in lieu of "D" or "E" mix for surface course, "C-W" mix shall be used as follows:

1. Bottom layer below System "A" or "B" = 1.25 inches thick
2. Top layer above System "A" or "B" = 1.75 inches thick.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

The bridge deck sealant and the wearing surface over the sealant will continue to be roadway items with the Structures Division furnishing the quantity of deck sealant as part of the bridge design.

Unless otherwise directed, the appropriate pay item for bridge deck sealant is:

Item No. 617-01 Bridge Deck Sealant per square yard

4-621.00 TEMPORARY STRUCTURES

On all construction projects having detours requiring temporary drainage structures, the designer shall use Item Nos. 621-01.01 through 621-01.10, Temporary Structures (Description-STA) per lump sum, as opposed to using the specific item numbers for each type of structure (pipe, box culvert, etc.). Item Nos. 621-01.01 through 621-01.10 shall be footnoted as follows:

"Quantity is based on minimum calculated length. Actual length required will be determined based on field conditions encountered. The bidder is responsible for verifying estimated lengths prior to submitting their bid. Additional length, if any, required by actual field measurements will be installed at no additional cost. All costs shall be included in the bid price for these items."

This footnote is for Item Nos. 621-01.01 through 621-01.10, which have been identified by the Structures Division or as needed by the design. The above footnote does not apply to any temporary structure used for a channel change or erosion prevention and sediment control.

4-625.00 ABANDONMENT OF WATER WELLS (See 4-202.13)

Item No. 625-01.01, Well Abandonment per Lump Sum, will no longer be used.

CHAPTER 7 - INCIDENTAL CONSTRUCTION

4-705.00 GUARDRAIL INSTALLATION ACROSS BOX OR SLAB TYPE CULVERTS AND CONCRETE DECK BRIDGES

The designers of the roadway plans will calculate and show estimated quantities of all W-beam guardrail across the subject structures. Some coordination may be required with the Structures Division to find out if the culvert rail is concrete parapet or W-beam guardrail.

Concrete Box or Slab Type Culverts and Bridges

If the embankment depth at the point where the guardrail post is driven is greater than or equal to 3.67 feet, use Item No. 705-02.02, "Single Guardrail (Type 2)".

If the top of the concrete slab is used as the riding surface, use Item No. 705-01.04, "Metal Beam Guard Fence", with the post bolted to the slab per Standard Drawing S-GR-22.

If the embankment depth at the point where the guardrail would normally be driven is less than 42 inches, use Item No. 705-01.04, "Metal Beam Guard Fence", with the post bolted to the top of the slab.

Note that post spacing of 3 feet-1-1/2 inches is required for Item No. 705-01.04, and that the pay length will be the sum of the number of posts bolted plus one multiplied by 3 feet-1-1/2 inches.

See Standard Drawing S-GR-22 for details of bolting post to the bridge deck or top slab.

Concrete Deck Bridges

If a concrete deck bridge has a concrete parapet wall, it shall be connected to the metal approach guardrail with Item No. 705-01.01, "Guardrail at Bridge Ends", shown on Standard Drawing S-GR-23.

If the designer has a project that has an existing concrete slope face end post as detailed on Standard Drawing SBR-2-131 and SBR-2-132, the metal rail shall be attached with Item No. 705-10.30, Guardrail Attachment to Slope Face Endpost, L.F., or an existing concrete vertical face endpost, as detailed on SBR-2-133 and SBR-2-134. The metal rail shall be attached with Item No. 705-10.31 Guardrail Attachment to Vertical Face Endpost, L.F.

If a concrete deck bridge has metal guardrail, it shall be Item No. 705-01.04, "Metal Beam Guard Fence", as shown on Standard Drawing S-GR-22.

4-705.05 GUARDRAIL END TERMINALS

On the designated state highway system, when using gating type approach end terminals, it is required to specify an end terminal that meets NCHRP 350 crash criteria. Tangential Energy Absorbing Guardrail End Terminals shall be used per Standard Drawing S-GR-43 and S-GR-44, Item No. 705-04.07.

The most desirable approach end terminal continues to be buried in backslope, Guardrail End Terminal (Type 12), Item No. 705-04.02. When it is not applicable to use this type of end terminal, a gating type, tangential energy absorbing guardrail end terminal (type 38) shall be used.

On all other roads not on the designated state highway system, including side roads to state and U.S. highways, when the current design speed exceeds 40 miles per hour, the same type of terminals meeting the NCHRP 350 crash criteria are required as stated above.

On all low speed roads not on the designated state highway system, including side roads to state and U.S. routes, when the current design speed is 40 miles per hour or less, the Slotted Rail Terminal - SRT 75 (Type 21) terminal anchor, or equal shall be used. Payment is to be made under Item No. 705-04.04 Guardrail Terminal (Type 21).

On all low speed, low volume local bridge replacement projects, standard drawing S-GR-23A should be used. The standard details the guardrail attachment at bridge ends and the minimum length of installation for low volume (current ADT \leq 400) local roads with speeds of 40 mph or less. The use of the earth pad as shown on standard drawing S-GR-39 is not required for this installation.

4-707.00 ROW STOCK FENCE

On projects where right-of-way stock fence is required use standard drawing S-F-10. Standard drawing S-F-10C is approved for use on ROW Fence for Bridge and Culverts and S-F-10D is approved for use on ROW Fence Locations at Interchanges.

4-709.05 RIP-RAP

For estimating purposes, multiply cubic yards by 1.75 to convert to tons.

Machined rip-rap (Class A-1, A-2, A-3, B, and C) will be measured by the ton (1.75 Tons/C.Y.) as designed and completed in place (unless revised by the sequence of construction, which may require reconstruction and remeasurement.)

Computed Quantity (C.Y.) x 1.75 Tons/C.Y. = Total (Tons)

Classifications of machined rip-rap and their pay item nos. are as follows:

709-05.05	Machined Rip-Rap (Class A-3)
709-05.06	Machined Rip-Rap (Class A-1)
709-05.07	Machined Rip-Rap (Class A-2)
709-05.08	Machined Rip-Rap (Class B)
709-05.09	Machined Rip-Rap (Class C)

These classifications are detailed in Subsection 709.03 of the Standard Specifications.

If a gradation of machined rip-rap other than these is required, use Item No. 709-05.10 through 709-05.13, Machined Rip-Rap (Description), and use the rip-rap notes in Section VI, General Notes and Special Notes.

All machined rip-rap quantities are to be shown in the Estimated Roadway Quantities Block. Those quantities supplied by the Structures Division shall be added to any roadway quantities for the same item number, and they shall be footnoted. Footnote each structure separately identifying all quantities and the structures with which they are used.

4-710.00 UNDERDRAINS

The designer will use underdrains, with or without filter cloth, as detailed on Standard Drawings RD-UD-3 and RD-UD-4, on all new paving projects and rehabilitation projects as directed by the Pavement Design Section.

The designer will need only to show the underdrain on the roadway typical section and refer to it as "Detail ____" using the proper detail identification letter shown on Standard Drawing RD-UD-3.

4-712.00 TRAFFIC CONTROL IN CONSTRUCTION ZONES

As a result of statewide reviews of traffic control in construction zones conducted by the Department and the FHWA, the following guidelines are suggested for consideration in the development of traffic control plans.

CONSTRUCTION SIGNING

The use of advisory speed plates shall be limited to locations where the traffic control design warrants a 10 miles per hour or more reduction in speed, such as an approach into a median crossover on a divided highway. The designer shall make every effort to achieve a traffic control design that would avoid the use of these plates.

Detour signs shall be used only when traffic is rerouted onto another road and not used for diversions (runarounds), lane shifts, etc. on the road under construction. A Road Work Next XX sign shall be used on road work more than 1 mile in length and shall be rounded to the next mile up (example: 5.4 miles in road work shall be shown as 6 miles on the Road Work Next XX sign).

BARRICADES AND DRUMS

Plastic drums shall be used in lieu of Type II barricades due to better performance in terms of durability and target value.

LIGHTING DEVICES

1. Where plastic drums are used, there are certain situations where additional delineation provided by lighting devices is not necessary. Type C (steady burn) lamps are not recommended for use with plastic drums along tangent sections following a lane closure taper or along a line of drums delineating the edge of the traveled way. The large target area of reflective sheeting on drums has been shown to provide adequate delineation for these conditions. However, the use of Type C lamps is still recommended for use with drums on tapers. Also, Type C lamps on drums, including tangent sections, might be considered when climatic conditions (for example fog) dictate the need for additional delineation.
2. Where portable concrete barrier rails are used, vertical panels are recommended in lieu of Type C lamps. These devices have provided adequate delineation at a much lower cost, while requiring much less maintenance effort as compared to Type C lamps.
3. High intensity (Type B) lamps, the use of which is optional according to the *MUTCD*, are frequently attached to the initial set of road work signs in advance of the work zone (Road Work Ahead, Road Work ½ Mile, etc.). These lamps do not add any significant degree of attention to these signs. Furthermore, they are costly to provide and maintain. The use of Type B lamps shall be limited to just those situations where a "spot" hazard is anticipated and additional delineation of a channelizing device is considered necessary.

MARKINGS

1. Wide (8 inch) solid lane lines are recommended for use as temporary marking at lane transitions and lane shifts. Wide lines provide better guidance through changes in alignment, especially where conflicting traces of removed marking may remain.
2. Wide-edge line marking is also recommended for use next to portable concrete barrier rail.

TEMPORARY RAISED PAVEMENT MARKERS

Raised pavement markers should be placed on lane lines for lane shifts on divided highways and freeways and 2-lane two-way diversion (run-arounds), as shown on the T-WZ-series Standard Drawings.

Temporary raised pavement markers should also be considered for use through construction projects on major facilities and locations where the lane visibility is an issue. The use of temporary raised pavement markers should be addressed at the construction field review on projects involving major facilities

Designers should ensure that the appropriate 716 series of pay items are included in the construction plans for temporary raised pavement markers.

VERTICAL PANELS

1. The designer shall use the pay Item No. 712-06.01, vertical panels per square foot, when using vertical panels on a project.
2. Vertical panels are covered in Section 6F-5 of the *MUTCD*.
3. When developing a Traffic Control Plan for a project, the designer shall make a preliminary decision whether to use drums, barricades or vertical panels, depending on the length of time they need to remain in place. A final determination as to which shall be used will be made at the Construction Field Review.
4. It shall be necessary to specify the size of the panels and how many square feet are "right" panels and how many are "left" panels.
5. Vertical panels on "U" posts shall be used adjacent to the outside shoulders of divided highways when shifting traffic to the outside onto the shoulders (resulting in a reduced outside shoulder). Spacing of these panels shall be 200 feet maximum.

PORTABLE BARRIER RAIL

Taper rates shall be 10:1 or flatter for designs where posted speeds are less than or equal to 40 mph, and 15:1 or flatter for designs where posted speeds are greater than 40 mph. The approach ends of the portable barrier rail shall be located outside the clear zone or be shielded with a portable energy absorbing terminal. The energy absorbing terminals shall be paid for under Item No. 705-08.51, Portable Impact Attenuator NCHRP350 TL-3 per each, and footnoted as follows:

"This item shall be a portable energy absorbing terminal meeting the requirements of NCHRP 350 for Test Level 3. Examples would be a Quad-Guard, a React 350 or a TRACC. The pay item will include furnishing and installing all components as shown on the manufacturer's drawing."

BARRIER RAIL DELINEATORS

Barrier rail delineators (item no. 705-04.50) shall be used on portable barrier rail in accordance with the T-WZ-SERIES standard drawings and Section 4-716.11 of these guidelines. Barrier rail delineators should meet the following specifications:

1. Portable barrier rail delineator reflective sheeting shall meet ASTM D4956, Type V specifications.
2. Delineator should have 4" x 3" dimensions. Delineators with dimensions other than 4" x 3" may be used if the product is on the approved products list. The variations in delineator dimension should not exceed $\pm 10\%$.
3. Different types of barrier rail delineators should not be mixed in the same line.
4. Portable Barrier Rail Delineators shall be high impact, UV-stabilized, engineered thermoplastic or polycarbonate substrate.

The TDOT approved qualified product list will be used to identify acceptable products.

FREEWAY WORK ZONE CAPACITY

Guidance will be added at a later date regarding freeway work zone capacity.

4-712.05 RECORD-A-COMMENT SIGN

The "**Record-A-Comment**" sign shall be used on all interstate and freeway projects with a current ADT of 30,000 vehicles/day or greater. Signs should be located, in each direction, approximately 1000 feet beyond the "End of Road Work" sign. The signs will be paid for under item 712-06, Signs Construction, S.F.

The "Record-A-Comment" sign should be footnoted in the tabulated block as follows: 96"X48" (Blue Background with White Copy) 0.100" sheet aluminum.

The sign is included in the Tennessee Supplement to the MUTCD as TN-55a.

4-712.10 DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS

In order to minimize the hazard to traffic where differences in elevations between adjacent roadway elements exist, the following procedures shall apply, unless otherwise shown on the Plans or directed by the Engineer. **The designer is advised that the following procedures be presented in the form of traffic control notes shown on the traffic control sheets and not the general notes sheet. In addition, the designer is to show only those notes that apply to the specific phase of traffic control shown on the sheet on which the note appears.**

- A. Differences in elevation between adjacent traffic lanes or traffic lane and shoulder where the traffic lane is being used by traffic, caused by base, paving or resurfacing:
 1. Differences in elevation between adjacent roadway elements greater than 0.75 inch and not exceeding 2 inches:

- a. Warning signs, UNEVEN PAVEMENT (W8-11) and/or SHOULDER DROP-OFF (W8-9a), shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.
 - b. Differences in elevation between adjacent traffic lanes being utilized by traffic caused by added pavement shall be eliminated within three workdays.
 - c. Differences in elevation between adjacent traffic lanes being utilized by traffic caused by cold planing shall be eliminated within three workdays.
 - d. When the difference in elevation is between the traffic lane being utilized by traffic and shoulder, the difference in elevation shall be eliminated within seven workdays after the condition is created.
2. Differences in elevation between adjacent roadway elements greater than 2 inches and not exceeding 6 inches, traffic is not to be allowed to traverse this difference in elevation:
- a. Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:
 - (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
 - (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.
 - b. If the difference in elevation is eliminated or decreased to 2 inches or less by the end of each workday, cones may be used during daylight hours in lieu of drums, barricades or other approved protective devices mentioned in Paragraph A, provided warning signs are erected. Warning signs (uneven pavement and/or low shoulder) shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of two signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.
 - c. When the difference in elevation is between the through traffic lane and the shoulder, and the elevation difference is less than 3.5 inches, the Contractor may use warning signs and/or protective devices as applicable and approved by the Engineer. See Paragraph A regarding use of drums, barricades or other approved protective devices. Warning signs (uneven pavement and/or low

shoulder) will be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.

In these situations the Contractor shall limit his operations to one work zone not exceeding 2 miles in length unless otherwise noted on the plans or approved by the Engineer. Once the Contractor begins work in a work zone, a continuous operation shall be maintained until the difference in elevation is eliminated. Simultaneous work on separate roadways of divided highways will be considered independently in regard to restriction of work zone activity.

3. Differences in elevation between adjacent roadway elements greater than 6 inches, but not exceeding 18 inches, the Contractor, with the Engineer's approval, may utilize one of the following:
 - a. The Contractor shall accomplish separation by drums, barricades or other approved devices in accordance with the following:
 - (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
 - (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

In order to use this method, the contractor must reduce the difference in elevation to 6 inches or less by the end of the work day that the condition is created.

- b. The Contractor shall provide drums, barricades or other approved separation devices as specified in Paragraph A, and construct a stone wedge with a 4:1 slope, or flatter, to eliminate the vertical offset if the lower elevation is at or below subgrade at the end of each day.
- c. The Contractor shall provide drums, barricades or other approved separation devices as specified in Paragraph A, and if the lower elevation is base stone or asphalt pavement, placement of subsequent layers of pavement must begin the next work day and progress continuously until the difference in elevation is eliminated or reduced to 6 inches or less.
- d. The Contractor shall provide separation by portable barrier rail.

For preceding conditions a, b, and c, the Contractor shall use the shoulder drop-off warning sign (W8-9a). It shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. In these situations

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

the Contractor shall limit his operations to one work zone not exceeding 1 mile in length, unless otherwise noted on the Plans or approved by the Engineer. Once the Contractor begins work in a work zone, a continuous operation shall be maintained until the difference is eliminated. Simultaneous work on separate roadways of divided highways will be considered independently in regard to restriction of work zone activity.

4. For differences in elevation between adjacent roadway elements greater than 18 inches:

Separation will be provided by the use of portable barrier rail.

In this situation the Contractor shall limit his operations to one work zone not exceeding 1 mile in length unless otherwise noted on the Plans or approved by the Engineer. Once the Contractor begins work in a work zone a continuous operation shall be maintained until the difference in elevation is eliminated. Simultaneous work on separate roadways of divided highways will be considered independently in regard to restriction of work zone activity.

- B. If the difference in elevation is within 30 feet of the nearest traffic lane being used by traffic caused by grading, excavation for utilities, drainage structures, undercutting, etc:

1. If the difference in elevation is within 8 feet of the nearest traffic lane with difference in elevation greater than 3/4 inch and not exceeding 2 inches:

Warning signs (uneven pavement and/or low shoulder) shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.

2. If the difference in elevation is within 8 feet of the nearest traffic lane with difference in elevation greater than 2 inches and not exceeding 6 inches:

- a. Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:

- (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.

- (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

3. If the difference in elevation is within 8 feet of the nearest traffic lane with difference in elevation greater than 6 inches:

- a. Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:

- (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
- (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

- b. Eliminate vertical offset by constructing a stone wedge or grading to a 4:1 slope, or flatter, or use portable barrier rail.

The Contractor shall schedule the work so as to minimize the time traffic is exposed to an elevation difference. Once the Contractor begins an activity that creates an elevation difference within 8 feet of a traffic lane, the activity shall be pursued as a continuous operation until the elevation difference is eliminated.

- C. If the difference in elevation is farther than 8 feet from the nearest traffic lane but not more than 30 feet from the nearest traffic lane:

Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:

- 1. Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
- 2. Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

The contractor shall schedule the work so as to minimize the time traffic is exposed to an elevation difference. Once the contractor begins an activity that creates an elevation difference, the activity shall be pursued as a continuous operation until the elevation difference is eliminated.

4-712.15 SPECIAL CONSTRUCTION SIGNS (See 4-712.10)

“WORKERS PRESENT” SIGN

A pay item for the “Workers Present” (TN-44) sign is to be used on all Interstate construction projects in the event that reduced speed limits for the construction zone are requested and established by the contractor. This sign is to be placed 1,000 feet in advance of the reduced speed limit sign, which is to be located at the beginning of the active construction work zone. These signs shall be located on the right side and on the median side of the roadway (except on the concrete median barrier wall sections). The signs shall be located only on the right side downstream of each interchange on-ramp within the active construction work zone.

The “Workers Present” sign will be paid for under Item No. 712-06.16, Signs (Construction) (Reduced Speed Warning) per each. This item will be footnoted as follows:

“Item to be used only when the contractor establishes a reduced speed limit within the project construction work zone limits. Item includes sign face, supports, and two type “B” flashers per the standard specifications. The contractor shall be responsible for turning on the type “B” flashers when workers are in the construction work zone and turning them off when workers are no longer in the construction work zone.”

4-712.20 MERGE LEFT

Controlled access projects which utilize lane closure details shall be reviewed for the inclusion of Merge Left. Interstate construction or maintenance projects where traffic is reduced to one lane of traffic through the work zone are the primary candidates.

The following criteria will be used for determining Merge Left use:

- Projects on rural interstates should include Merge Left.
- Projects on urban interstates will be reviewed for Merge Left considering factors such as number of lanes, interchange spacing, and proximity to major splits.
- Other controlled access facilities will be considered on a case-by-case basis.

Any interstate or controlled access facility with lane closures not utilizing Merge Left shall be brought to the attention of the appropriate Civil Engineering Manager 2 prior to finalizing the traffic control.

4-712.25 USE OF LANE CLOSURE WITH LEFT HAND MERGE

Controlled access projects which utilize lane closure details shall be reviewed for the inclusion of Merge Left. Interstate construction or maintenance projects where traffic is reduced to one lane of traffic through the work zone are the primary candidates.

The following criteria will be used for determining Merge Left use:

1. Projects on rural interstates should include Merge Left.
2. Projects on urban interstates will be reviewed for Merge Left considering factors such as number of lanes, interchange spacing, and proximity to major splits.
3. Other controlled access facilities will be considered on a case-by-case basis.

The Assistant Director, Design Division, shall be notified in writing for any interstate or controlled access facility with lane closures not utilizing Merge Left prior to finalizing the traffic control. The memorandum shall contain the reasons left merge would be inappropriate.

Standard Drawing T-WZ-21 details Merge Left. The layout and signage may require modification depending on site and field conditions.

The designer will provide quantities for a uniformed police officer which will be paid for under Item No. 712-08.06 Uniformed Police Officer per hour. The Region Construction Supervisor is to be contacted in order to establish the number of hours to be shown in the plans on a case-to-case basis by the Design Manager.

4-713.00 FLEXIBLE DELINEATIONS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

On resurfacing projects (4R, etc.), the Design Office will be responsible for computing the quantity of flexible delineators and shall refer to Standard Drawing T-S-11 for the proper procedure in figuring these quantities.

If the resurfacing is tapered out before reaching the ramp terminal, the designer shall look at the need for delineators along the ramp as well as along the main line. On projects that already have flexible delineators, this would mean replacing any broken or missing delineators. On projects that have the button delineator on metal posts, this would mean complete replacement with flexible delineators.

The designer does not need to show the location of the proposed delineators, but must make sure Standard Drawing T-S-11 is included in the contract plans so the proper location can be determined by the engineer and contractor.

On projects, which the Design Traffic Engineering Section, Signing Office will be developing the marking and signing plans, the flexible delineators will also be included in these plans.

4-713.05 ROADWAY SIGNING ON INTERSTATE AND FULL ACCESS CONTROL ROADWAYS (See 3-330.00)

4-713.10 ROADWAY SIGNING EXCEPT INTERSTATE AND FULL-ACCESS CONTROL ROADWAYS

When there is signing on a project, the designer shall notify the Design Traffic Engineering Section, Signing Office a minimum of four weeks prior to printing plans for the Construction Field Review.

On non-access controlled highways, when the proposed signing is located on the designer's proposed layout sheets or on the designer's pavement marking sheets, the Design Traffic Engineering Section, Signing Office will no longer be responsible for applying the proposed signing to these sheets.

A marked-up set of prints will be sent to the TDOT Design Manager in charge of the project for their review of the proposed signing. The designer of the project will then be responsible for putting the proposed signing on their sheets. An updated "Signing Cell Library" will be furnished if needed.

The Design Traffic Engineering Section, Signing Office will still furnish the sign schedule sheets, quantities, recommended standard drawings and general notes for the proposed signing plan.

This will alleviate some of the problems with coordinating the proposed signing with the increased revising and changing of the designer's layouts.

4-713.15 ROADWAY SIGNING

On projects (resurfacing, bridge replacement, etc.) requiring no more than three different types of permanent signs, the designer will use Standard Drawing T-S-20 in the Index of Standard Drawings.

The designer will need to show the proposed location and designate the type of sign (R1-1, R1-2, TN-5, etc.) on the plans. These signs will be paid for per each under Item No. 713-16.20 through 713-16.29. Appropriate General Notes and Standard Drawings will also need to be included.

If any particular sign needed for a project is not included on Standard Drawing T-S-20, or if there are any questions, contact the Design Traffic Engineering Section, Signing Office.

See Traffic Design Manual, Chapter 6, Signing and Pavement Marking.

4-713.20 ADVANCE GUIDE SIGNS AND EXIT DIRECTIONAL SIGNS ON TRAFFIC CONTROL PLANS

The designer shall include advance guide signs and exit directional signs (green and white signs) on all phases of the traffic control plan for projects on access controlled highways including interchange cross streets. Advance guide signs and exit directional signs should also be shown on the traffic control plan on access controlled resurfacing projects when the traffic control phasing requires the placement of temporary pavement markings which conflict with directional signs or requires directional signs to be relocated or adjusted. It will be the designer's responsibility to prepare any required traffic control base sheets for all phases showing the layout and location of all directional and guide signs. Supplemental signing is not required to be shown.

Existing signs should be used as part of the traffic control plan for as long as possible throughout the different construction phases provided signs are located in accordance with MUTCD and does not provide inaccurate information. The most common conflict of existing signing with new construction occurs when overhead guide signs with down arrows or diagrammatic signs displaying lane lines are over lanes that are closed during certain construction phases. Once existing signs cannot be used at the original location, the designer should attempt to relocate the existing sign or place the permanent sign. If relocation or placement of the permanent sign is not feasible, a new temporary advance guide sign or exit directional sign shall be shown on the traffic control plan for the affected construction phase and for any other construction phase the sign is needed. Sign location shall conform to the MUTCD. Sign size should be the same as the sign removed if feasible. There shall be at least one temporary advance directional and temporary exit directional for each exit on the project.

For signs located on overhead structures, the designer should contact the Signing Section of the Design Division Signal and Signing Office for additional guidance.

The following guidance should be used when it is necessary to install temporary exit directional signs or temporary advanced guide signs. The designer should contact the Signing Section of the Design Division Signal and Signing Office for any additional technical questions or guidance required.

1. In the event it is not feasible to replace an exit directional sign with the existing sign size, the new sign shall be 48" x 96", 0.100" sheet aluminum. The letters will be minimum 8 inch "D" (all capital) letters and there will be a 3/4" border with a 2" radius. The color will be a reflective green background with a reflective white copy. The supports will be included in the sq. ft. of the sign face as it is with other construction signs.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

2. The information on exit directional signs should be the same as the information on the existing signs that were removed. There shall be no more than four lines of copy on these signs. The layout of these signs should look as close to the existing as possible.
3. On advanced guide signs; the first line shall be the exit number for the interchange (i.e. EXIT 234), the second line will be the first destination (i.e. OLD HICKORY BLVD), the third line will be the second (i.e. MADISON), the fourth line will be NEXT RIGHT (Center all lines of copy). These signs should be located no closer than one half mile from the exit directional sign.
4. The exit directional sign shall have the same exit number and destinations as the advance guide but in lieu of NEXT RIGHT there will be a type "B" arrow at a 45 degree angle to the right. (Center all lines of copy.) These signs should be located at the beginning of the taper for the appropriate exit ramp.
5. If an interchange has a TN. (TN-6a -TN-6d) or U.S. (M1-4) route shield on the directional signing, then a shield and if needed a cardinal direction (M3-1 –M3-4) shield, will be show mounted to the left support under both the advance and exit directional signs.
6. If more lines of copy are needed, then the designer can add a 24" x 96" or another 48"x 96" sheet of aluminum to the bottom of the first sign but the size shall not be larger than a total of 96"x96".
7. Removal of existing signs shall be paid for under item number 713-15, Removal of Signs, Posts, and Footings, Lump Sum. New signs shall be paid for under item number 712-06.10, New Signs (Construction), per S.F. Design Managers should contact the construction office to have item numbers assigned when the traffic control plan involves relocating existing signs.

One set of traffic control plans shall be sent to the Signing Section of the Design Division Signal and Signing Office a minimum of twelve weeks prior to the construction field review for review when advance guide signs or exit directional signs are included in the traffic control plan. For resurfacing projects, plans should be sent as soon as possible. **No other traffic control plans shall be sent for review.**

See Section 6-170.00 for notes to be placed in the general notes on all access controlled and interstate projects and on access controlled and interstate resurfacing projects when the traffic control phasing requires placement of temporary pavement markings which conflict with directional signs or requires directional signs to be relocated or adjusted.

4-713.25 NOTE ALLOWING TRAFFIC TO TEMPORARILY DRIVE ON MILLED SURFACE TO BE PLACED IN INTERSTATE RESURFACING PLANS

See Section 6-250.02 for a note to be added to interstate resurfacing plans for all projects which include cold planing items. The note should be added as a Special Note.

Designers should also include the motorcycle warning sign (TN-64) on interstate resurfacing projects. Two (2) signs should be placed on the interstate in advance of the cold

planned section. A motorcycle warning sign should also be placed on entrance ramps located within the limits of a cold planned section.

4-714.00 ROADWAY LIGHTING (See 2-315.05)

See Traffic Design Manual, Chapter 7, Roadway Lighting.

4-716.00 CHANNELIZATION STRIPING

For all channelization markings detailed on Standard Drawing T-M-7, the following pay items and methods of measurement shall be used:

- A. 716-02.04, Plastic Pavement Marking (Channelization Striping) - Sq. Yd.
716-05.04, Painted Pavement Marking (Channelization Striping) - Sq. Yd.
The unit of payment is per square yard of striping material applied including the boundary lines of the channelized area. This is applicable for 8 inch wide border lines only. All other border lines (edgelines and double yellow centerline) are paid for under their respective pay items and measured by the linear foot. This is used on medians, pavement transitions, obstruction approaches and traffic islands with areas greater than 400 Sq. ft.
- B. 716-04.04, Plastic Pavement Marking (Transverse Shoulder) - Linear ft
The unit of payment is per linear foot of diagonal marking. The 4 inch edge line is paid for under a "Pavement Marking (Line)" item.
- C. 716-02.07, Plastic Pavement Marking (24-inch Barrier Line) - Linear ft
716-05.07, Painted Pavement Marking (24-inch Barrier Line) - Linear ft
The unit of payment is per linear foot of boundary line (with no diagonal marking used).

Note that the unit of payment for Item No. 716-08.04, Removal of Pavement Marking (Channelization Striping), has been changed from per linear foot to per square yard of striping material removed.

4-716.05 PAVEMENT MARKING GUIDELINES

These guidelines are general in nature for average-type projects. It is not intended that these guidelines supersede the exercise of good engineering judgment in the development of a good pavement marking plan for a project. Special problem areas may require special treatment, which shall be determined on the Construction Field Review.

Traffic volumes may be found in the Project Planning Division's latest Traffic Flow Maps book. The information is available at:

<http://www.tdot.state.tn.us/projectplanning/adt.asp>.

Generally, centerlines and edgelines shall be placed on all pavements with a minimum total width of 16 feet.

If there are no centerline pavement markings on the existing roadway before the proposed construction or resurfacing project begins, no temporary centerline pavement markings will be

required on the roadway during construction. A centerline on the final surface may be required depending on the surface materials.

If surface materials other than hot plant mix asphalt (such as cold mix asphalt, DBST, etc.) are applied, no temporary or permanent centerline markings will be required, since these surface materials would be incapable of retaining the pavement markings.

See the sections 4-716.10 through 4-716.36 for guidance for temporary and permanent pavement marking and section 6-145.00 for pavement marking general notes.

See Traffic Design Manual, Chapter 6, Signing and Pavement Marking.

4-716.10 TEMPORARY PAVEMENT MARKINGS

Temporary pavement markings on the intermediate layers of pavement open to traffic will be installed to permanent standards daily with reflective tape or reflectorized paint.

No temporary striping is required on the final surface if preformed plastic (716-10.01 or 716-10.15) or reflectorized paint (716-05.01) is the permanent marking material, since these permanent markings are to be installed daily as the final surface paving operations proceed.

If the permanent marking material is thermoplastic, the contractor may elect to mark the final layer of pavement with reflectorized paint to permanent standards daily and wait until the paving operation has been completed before the permanent markings are installed. In this case, the temporary markings for the final layer will not be measured and paid for directly, but the costs are to be included in the price bid for the permanent markings.

4-716.11 TEMPORARY PAVEMENT MARKING FOR USE ON PAVEMENT SURFACE OTHER THAN FINAL

1. ON ALL INTERSTATES AND EXPRESSWAYS (Duration of Marking > 1 month)

A. On Non-Transition Sections:

- a. Lane lines** – use 8” painted white skip lines and white raised pavement markers on 40” spacing.
- b. Left edge lines** (yellow) – Use 8” painted solid yellow lines and yellow raised pavement markers on 20’ spacing.
- c. Right edge lines** (white) – **Allow as equals:**

(1) Use 8” solid white wet-reflective temporary tape (according to manufacturer’s specifications).

(2) Use 8” painted solid white lines with an approved white barrier rail delineator on top of barrier rail on 20’ spacing,

Or

Use 8" painted solid white lines only or with white flexible delineators at outside edge of shoulder on 20' spacing when no barrier rail is present.

B. On Transition Sections:

- a. **Lane lines** – Use 8" painted solid white lines and white raised pavement markers on 20' spacing.
- b. **Left edge lines** (yellow) – Use 8" painted solid yellow lines and yellow raised pavement markers on 20' spacing.
- c. **Right edge lines** (white) – Allow as equals:
 - (1) Use 8" solid white wet-reflective temporary tape (according to manufacturer's specifications)
 - (2) Use 8" painted solid white lines with an approved white barrier rail delineator on top of barrier rail on 20' spacing.

Or

Use 8" painted solid white lines only or with white flexible delineators at outside edge of shoulder on 20' spacing when no barrier rail is present.

NOTES:

- (1) Raised pavement markers are to be placed in a single row, not staggered, under all applications.
- (2) If Project Engineer has specific recommendations they should be discussed at the Construction Field Review.
- (3) Missing raised pavement markers shall be replaced:
 - a) at least monthly or b) at the instruction of the engineer.
- (4) All raised pavement markers shall be removed before placement of the final pavement surface. The cost of removal shall be included in the price bid for raised pavement markers.

2. STATE ROUTES WITH 4 OR MORE LANES (Unlit During Construction)

- A. **Lane Lines** – Use white painted skip lines, 2" wider than prescribed permanent lines, and raised pavement markers on 80' spacing.
- B. **Edge and center lines** – Use solid lines (yellow or white, as appropriate) 2" wider than prescribed permanent lines. Raised pavement markers (yellow or white, as appropriate) may be specified for use on a case-by-case basis, as determined at the Construction Field Review. Raised pavement markers should not be used on right edge line. When raised pavement markers are used for the left edge line, spacing shall be 20'.

NOTES:

- (1) Raised pavement markers are to be placed in a single row, not staggered, under all applications.
- (2) If Project Engineer has specific recommendations they should be discussed at the Construction Field Review.
- (3) Missing raised pavement markers shall be replaced:
 - a) at least monthly or b) at the instruction of the engineer.
- (4) All raised pavement markers shall be removed before placement of the final pavement surface. The cost of removal shall be included in the price bid for raised pavement markers.

3. ALL OTHER STATE ROUTES

All Lines – Use regular 4” marking lines. Centerline yellow raised pavement markers may be considered on a case-by-case basis. Discuss need at Construction Field Review.

NOTES:

- (1) Raised pavement markers are to be placed in a single row, not staggered, under all applications.
- (2) If Project Engineer has specific recommendations they should be discussed at the Construction Field Review.
- (3) Missing raised pavement markers shall be replaced:
 - a) at least monthly or b) at the instruction of the engineer.
- (4) All raised pavement markers shall be removed before placement of the final pavement surface. The cost of removal shall be included in the price bid for raised pavement markers.

4-716.13 PAVEMENT MARKING PLANS ON INTERSTATE AND FULL-ACCESS CONTROL ROADWAYS (See 3-330.00)

4-716.15 PERMANENT PAVEMENT MARKINGS (See 4-411.03 and 4-411.04)

Designers should refer to Table 4-3 for pavement marking guidelines for all interstate and state routes. In addition to pavement marking guidelines, Table 4-3 provides guidance for the placement of rumble strips and rumble stripes. This guidance shall be used on all new, reconstruction, and resurfacing projects except in areas which require special treatment as determined on the Construction Field Review and approved by the Director of the Design Division.

Items numbers for pavement markings are available at the TDOT web site.

http://www.tdot.state.tn.us/RoadItemLists/roaditem_index.htm

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Permanent Pavement Markings, Raised Pavement Markers, Rumble Strip and Rumble Stripe Guidelines

Roadway Classification		Interstate and Full Access Controlled Roadways (Includes Ramps)		
Current ADT		All ADT's		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
All shoulder Widths	6" Enhanced Flatline Thermoplastic Item No. 716-12.02, Enhanced Flatline Thermo Pvmr Mrkng (6 In Line), L.M.	6" Enhanced Flatline Thermoplastic with Snowplowable Raised Pavement Markers (SRPM's) Item No. 716-12.02, Enhanced Flatline Thermo Pvmr Mrkng (6 In Line), L.M. and Item No. 716-01.22, Snwplwble Pvmr Mrks (Mono-Dir) (1 Color), Each.	Continuous 16" Rumble Strip on Inside and Outside Shoulder. Dwg. T-M-15. Item No. 411-12.01, Scoring Shoulders (Continuous) (16 In Width), L.M. See notes 7 & 9.	1, 2, 5, 7, 9

Roadway Classification		Multilane State Routes (Four or More Lanes)		
Current ADT		All ADT's		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
Less than 2'	4" Enhanced Flatline Thermoplastic Item No. 716-12.01, Enhanced Flatline Thermo Pvmr Mrkng (4 In Line), L.M.	4" Enhanced Flatline Thermoplastic with Raised Pavement Markers (RPM's) Item No. 716-12.01, Enhanced Flatline Thermo Pvmr Mrkng (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	None	1, 2, 4, 6
2' - 6'	Use 4" Spray Thermoplastic (60 mil) when Rumble Stripes are specified. Item No. 716-13.01, Spray Thermo Pvmr Mrkng (60 mil) (4 In Line), L.M.	Use 4" Spray Thermoplastic (60 mil) with Raised Pavement Markers (RPM's) when Rumble Stripes are Specified. Item No. 716-13.01, Spray Thermo Pvmr Mrkng (60 mil) (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	8" Rumble Stripe on Shoulders (Rural Only). Dwg. T-M-16. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8 In Width), L.M. See notes 7 & 9.	1, 2, 4, 6, 7, 8, 9
8' or Wider	4" Enhanced Flatline Thermoplastic Item No. 716-12.01, Enhanced Flatline Thermo Pvmr Mrkng (4 In Line), L.M.	4" Enhanced Flatline Thermoplastic with Raised Pavement Markers (RPM's) Item No. 716-12.01, Enhanced Flatline Thermo Pvmr Mrkng (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	16" Rumble Strip on Outside Shoulders (Rural Only). Dwg. T-M-15A. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8 In Width), L.M. Continuous 16" Rumble Strip on Inside Shoulders (Rural Only) (If Present). Dwg. T-M-15. Item No. 411-12.01, Scoring Shoulders (Continuous) (16 In Width), L.M. See notes 7 & 9.	1, 2, 4, 6, 7, 9

Table 4-3 (Sheet 1 of 4)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Roadway Classification		Two and Three Lane State Routes		
Current ADT		12,000 or Greater		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
Less than 2'	4" Enhanced Flatline Thermoplastic Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M.	4" Enhanced Flatline Thermoplastic with Raised Pavement Markers (RPM's) Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	None	1, 2, 4, 6
2'-6'	Use 4" Spray Thermoplastic (60 mil) when Rumble Stripes are specified. Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M.	Use 4" Spray Thermoplastic (60 mil) with Raised Pavement Markers (RPM's) when Rumble Stripes are Specified. Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	8" Rumble Stripe on Shoulders (Rural Only). Dwg. T-M-16. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8 In Width), L.M. See notes 7 & 9.	1, 2, 4, 6, 8, 9
8' or Wider	4" Enhanced Flatline Thermoplastic Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M.	4" Enhanced Flatline Thermoplastic with Raised Pavement Markers (RPM's). Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	16" Rumble Strip on Shoulders (Rural Only). Dwg. T-M-15A. Item No. 411-12.02, Scoring for Rumble Stripe (Non-Continuous) (16 In Width), L.M. See notes 7 & 9.	1, 2, 4, 6, 9

Roadway Classification		Two and Three Lane State Routes		
Current ADT		2,000 to 12,000		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
Less than 2'	4" Spray Thermoplastic (60 mil) Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M.	4" Spray Thermoplastic (60 mil) with Raised Pavement Markers (RPM's) Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	None	1, 2, 4, 6, 9
2'-6'			8" Rumble Stripe on Shoulders (Rural Only). Dwg. T-M-16. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8" Width), L.M. See notes 7 & 9.	
8' or Wider			8" Rumble Stripe on Shoulders (Rural Only). Dwg. T-M-16. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8" Width), L.M. See notes 7 & 9.	

Table 4-3 (Sheet 2 of 4)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Roadway Classification		Two and Three Lane State Routes		
Current ADT		Under 2,000		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
Less than 2'	4" Spray Thermoplastic (40 mil)	4" Spray Thermoplastic (40 mil) with Raised Pavement Markers (RPM's)	None	1, 2, 4, 6
2'-6'	Item No. 716-13.06, Spray Thermo Pvmr Mrkng (40 mil) (4" Line), L.M.	Item No. 716-13.06, Spray Thermo Pvmr Mrkng (40 mil) (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.		
8' or Wider				

Roadway Classification		Off-System Routes - Includes Off-System Bridge Replacement , Intersection, Signal, RSAR, and SIA		
Current ADT		1,000 or Greater		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
All Shoulder Widths	4" Spray Thermoplastic (40 mil)	4" Spray Thermoplastic (40 mil)	None	1, 2
	Item No. 716-13.06, Spray Thermo Pvmr Mrkng (40 mil) (4 In Line), L.M.	Item No. 716-13.06, Spray Thermo Pvmr Mrkng (40 mil) (4 In Line), L.M.		

Roadway Classification		Off-System Routes - Includes Off-System Bridge Replacement , Intersection, Signal, RSAR, and SIA		
Current ADT		Under 1,000		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
All Shoulder Widths	4" Paint	4" Paint	None	3
	Item No. 716-05.01, Painted Pavement Marking (4" Line), L.M.	Item No. 716-05.01, Painted Pavement Marking (4" Line), L.M.		

Table 4-3 (Sheet 3 of 4)

**Permanent Pavement Markings, Raised Pavement Markers,
Rumble Strip and Rumble Stripe Guidelines Notes**

1. The contractor may elect to use either thermoplastic or preformed plastic for specialty striping items. These items include stop lines, cross walks, arrows, words, channelization, and other specialty striping items except lines.
2. The following footnote shall be added to all Specialty Striping Items: **“The contractor may elect to substitute Preformed Plastic for Thermoplastic. Preformed Plastic shall be paid for at the same unit price as bid for Thermoplastic.”**
3. Specialty striping items may be either paint or thermoplastic.
4. Due to increased plowing considerations, snowplowable raised pavement markers (SRPM's) should be used in Claiborne, Sullivan, Carter, Cumberland, Putnam, Overton, Montgomery, Robertson, Sumner, Henry, Obion, and Weakley Counties instead of raised pavement markers. Bi-directional snowplowable raised pavement marker (reflector on both sides) shall be paid for under Item No. 716-01.21, Snowplowable Pvmnt Mrkrs (Bi-Dir) (1 Color), Each. Mono-directional snowplowable raised pavement markers (reflector on one side only) shall be paid for under Item No. 716-01.22, Snowplowable Pvmnt Mrkrs (Mono-Dir) (1 Color), Each. Refer to T-M-series standard drawings for details. Three lane and multilane roads with 2-way traffic will normally require both mono-directional and bi-directional raised pavement markers. Two lane roads will normally require bi-directional raised pavement markers.
5. Rumble strips are not required on ramps.
6. Bi-directional raised pavement marker (reflector on both sides) shall be paid for under Item No. 716-01.11, Raised Pvmnt Markers (Bi Directional) (1 Color Lens), Each. Mono-directional raised pavement markers (reflector on one side only) shall be paid for under Item No. 716-01.12, Raised Pvmnt Markers (Mono-Directional) (1 Color Lens), Each. Refer to T-M-series standard drawings for details. Three lane and multilane roads with 2-way traffic will normally require both mono-directional and bi-directional raised pavement markers. Two lane roads will normally require bi-directional raised pavement markers.
7. For concrete shoulders, the rumble strip is to be placed in accordance with standard drawings RP-CS-1 or RP-CS-2. Item No. 501-03.03, Scoring Concrete Shoulders (Non-Continuous) (36 In Width), L.F. Length of scoring shall be measured as the actual length of pavement scored.
8. When Rumble Stripes are not used Pavement Markings should be 4" Enhanced Flatline Pavement Markings. Item No. 716-12.01, Enhanced Flatline Thermo Pvmnt Mrkng (4 In Line), L.M.
9. See 4-411.03 and 4-411.04 for additional guidance regarding rumble strip and rumble stripe placement.

Table 4-3 (Sheet 4 of 4)

4-716.16 STRIPING RAMPS ON RESURFACING PLANS

In the process of preparing plans for construction or resurfacing projects involving roadways that abut connecting ramps, consideration shall be given to striping these ramps. When work is not being done on the entire ramp, this ramp would not normally be re-striped beyond where the work is being done. The roadway designer shall contact the Regional Traffic Engineer to determine the need to re-stripe these ramps in their entirety. Stop bars, turn lane arrows and other pavement instructive markings may be included at the discretion of the Regional Traffic Engineer applying the appropriate standard drawings that shall be included in the plans. The decision to re-stripe shall be made based on the condition of the pavement markings and consideration may be given to compliance with the standards. If this striping is done, the ramps shall be marked using current standards for pavement markings as shown on Standard Drawings T-M-6 and T-M-9 and other appropriate standard drawings and marked up to the connecting roadway. Add the following to the plans:

“Ramps shall be marked up to where they connect to the intersecting roadway.”

4-716.17 STRIPING ON MICRO SURFACE PAVEMENTS

Pavement markings on micro surface pavements should follow guidance provided in Table 4-3 for lane lines and edge lines.

4-716.20 PAVEMENT MARKING GENERAL NOTES FOR ROADWAY PLANS

See section 6-145.00 for General Pavement Marking Notes.

4-716.25 SPECIALTY PAVEMENT MARKINGS

Contractors will have the option of using either Thermoplastic or Preformed Plastic Pavement Markings specialty markings. For plan development and bidding purposes, designers will use the appropriate Thermoplastic Pavement Marking items numbers. All specialty pavement marking item numbers shall be footnoted:

“Contractor may elect to substitute Preformed Plastic for Thermoplastic. Preformed Plastic shall be paid for at the same unit price as bid for Thermoplastic.”

On projects where plastic specialty pavement items are being used, the following items will be used:

1. Crosswalk with longitudinal lines as shown on Standard Drawing T-M-4 will use the following pay item:

716-02.09, Plastic Pavement Marking (Longitudinal Cross-walk) per linear foot.

The measurement for this marking is identical to that for standard crosswalk, for example, one measurement along the centerline of the crosswalk (perpendicular to curbs).

2. Dotted white line for vehicle double turn path delineation requires an 8-inch stripe. Pay item will be as follows:

716-02.08, Plastic Pavement Marking (8" Dotted Line) per linear foot.

4-716.30 USE OF REMOVABLE PAVEMENT MARKING LINE

Item No. 712-09.01, Removable Pavement Marking Line per linear foot, shall be used as temporary marking for directional or separation of traffic during the traffic control phases of construction when these lines are used on a roadway surface that is to remain in place and undisturbed.

Item No. 716-05.01, Painted Pavement Marking (4" Line) per linear mile, shall be used as temporary marking for directional or separation of traffic during the traffic control phases of construction when these lines are used on a roadway surface that is to be paved, cold planed or otherwise removed.

4-716.35 SNOWPLOWABLE RAISED PAVEMENT MARKERS

Snowplowable raised pavement markers shall be included on all Interstate and full-access controlled roadways. See Table 4-3 for guidance.

On interstate and full-access control resurfacing projects, the designer shall be responsible for verifying the existence of snowplowable raised pavement markers and for computing the quantity of these markers for removal. The designer shall also compute the quantity for new snowplowable raised pavement markers to be installed for these projects.

On projects which the Design Division, Signals, Signing and Lighting Section will be developing the marking and signing plans, the snowplowable raised pavement markers will also be included in these plans.

4-716.36 RAISED PAVEMENT MARKERS

Raised pavement markers should be included on state routes. Reflective pavement markers are to be placed in accordance with the T-M- series standard drawings and the current edition of the MUTCD.

On resurfacing projects, the designer shall be responsible for verifying the existence of raised pavement markers and for computing the quantity of these markers for removal. The designer shall also compute the quantity for new raised pavement markers to be installed for these projects.

Spacing of raised pavement markers may be reduced or additional raised pavement markers added in areas that require special treatment as determined by the design manager or on the construction field review. When additional raised pavement markers are used, the markers shall be placed in accordance with the current edition of the MUTCD. Raised pavement markers may be omitted on urban roadways where roadway lighting is present. Raised pavement markers should not be used on the right edge line.

See Table 4-3 for guidance regarding type of markers to be used.

4-730.08 REPLACEMENT OF TRAFFIC SIGNAL DETECTION LOOPS

When there are existing traffic signals on a cold planing project, contact shall be made with the City or County to determine the presence and location of detection loops. If loops are present, and there is no way to avoid them in the cold planing process, then add Item Nos. 730-14.02, Saw Slot, and 730-14.03, Loop Wire, to the plans.

The designer will obtain as-built plans from the maintaining agency to utilize for quantity calculations. These plans shall then be forwarded to the Regional Construction Office for submission to the contractor at the Pre-construction Conference.

See Section 6-175.00 for notes which shall be added to all plans with the replacement of traffic signal detection loops.

Standard Drawings T-SG-2 and T-SG-3 shall be included.

The Designer shall be aware that other pavement rehabilitation and resurfacing projects may affect the detection loops, in which case procedures described above will be required. Another type of project is the resealing of concrete pavement joints when a signal is controlling interstate ramp terminals with a local street.

4-730.10 TRAFFIC SIGNALS (See 2-315.00)

See Traffic Design Manual, Chapter 4, Traffic Signal Design.

4-730.15 STRUCTURAL SUPPORTS FOR TRAFFIC SIGNALS

See Section 6-270.00 for a "Special Note" which shall be added to all plans with proposed signal poles, mast arms, strain poles, etc.

The Traffic Signals, Lighting, and Signing Section will forward all signal designs to the Structures Division for pole design. Design Managers should contact the Traffic Signals, Lighting, and Signing Section on projects the design consultant is performing signal design to coordinate this requirement.

4-730.20 TEMPORARY TRAFFIC SIGNAL SYSTEMS USED AT TWO-LANE BRIDGE RECONSTRUCTION SITES

When using Item No. 730-40, Temporary Traffic Signal System per each, to provide traffic control for one-lane alternating flow at two-lane bridge reconstruction sites, alternate this item with Item No. 730-50, Temporary Traffic Signal System (Radio Controlled) per each. (See Standard Drawing Nos. T-WZ-32, T-WZ-33, T-WZ-34, and T-WZ-35 details and general notes)

4-740.00 GEOTEXTILE FABRIC AND GEOMEMBRANE

See Chapter 10 of the Drainage Manual.

CHAPTER 8 - ROADSIDE DEVELOPMENT

4-801.00 SEEDING (WITH MULCH) (See 4-801.05)

Method for computation of seeding on right-of-way.

$\frac{\text{Area to be seeded (Sq. ft)}}{1,000 \text{ Sq. ft/unit}}$	X 1.25	= _____ units	Item No. 801-01 and/or Item No. 801-01.02
---	--------	---------------	---

Method for computation of seeding on waste areas and borrow pits outside right-of-way.

$\frac{\text{Excess material to be wasted (C.Y.)}}{500 \text{ C.Y./unit}}$	= _____ units	Item No. 801-01 and/or Item No. 801-01.02
--	---------------	---

$\frac{\text{Borrow material (C.Y.)}}{500 \text{ C.Y./unit}}$	= _____ units	Item No. 801-01 and/or Item No. 801-01.02
---	---------------	---

4-801.05 CROWN VETCH MIXTURE (WITH MULCH)

See Section 4-801.00 for computations.

Item 801-01.02, Crown Vetch Mixture (with Mulch), shall be used on slopes 3:1 or steeper and other areas that are inaccessible for mowing.

Crown vetch mixture shall be used, unless otherwise directed on the Construction Field Review, in all areas of Tennessee except Region IV.

On any project requiring crown vetch, the following note shall be put in the general notes with the parentheses being replaced by the proper item.

"Item No. 801-01.02, Crown Vetch Mixture (with mulch), and description shall be used on slopes 3:1 or steeper and other areas, as indicated in the plans, that are inaccessible for mowing."

4-801.07 TEMPORARY SEEDING (WITH MULCH)

The use of Temporary Seeding (with Mulch) is strongly recommended on projects.

Item No. 801-01.07 Temporary Seeding (With Mulch)

Item No. 801-02 Seeding (Without Mulch)

Temporary seeding (with mulch), and seeding (without mulch) will be measured by the unit (1,000 Sq. Ft.) as designed and completed in place, unless revised by the sequence of construction, in which case complete replacement and remeasurement may be required.

$$\frac{\text{Total area of seeding (Sq. ft) x number of effective phases of the sequence of construction}}{1,000 \text{ (Sq. ft) / unit}} = \text{Total seeding (units)}$$

Exceptional locations where the slopes are flatter than 3:1, but where crown vetch is requested on the Construction Field Review, shall be outlined on the proposed layout sheet in a manner similar to Figure 4-18.

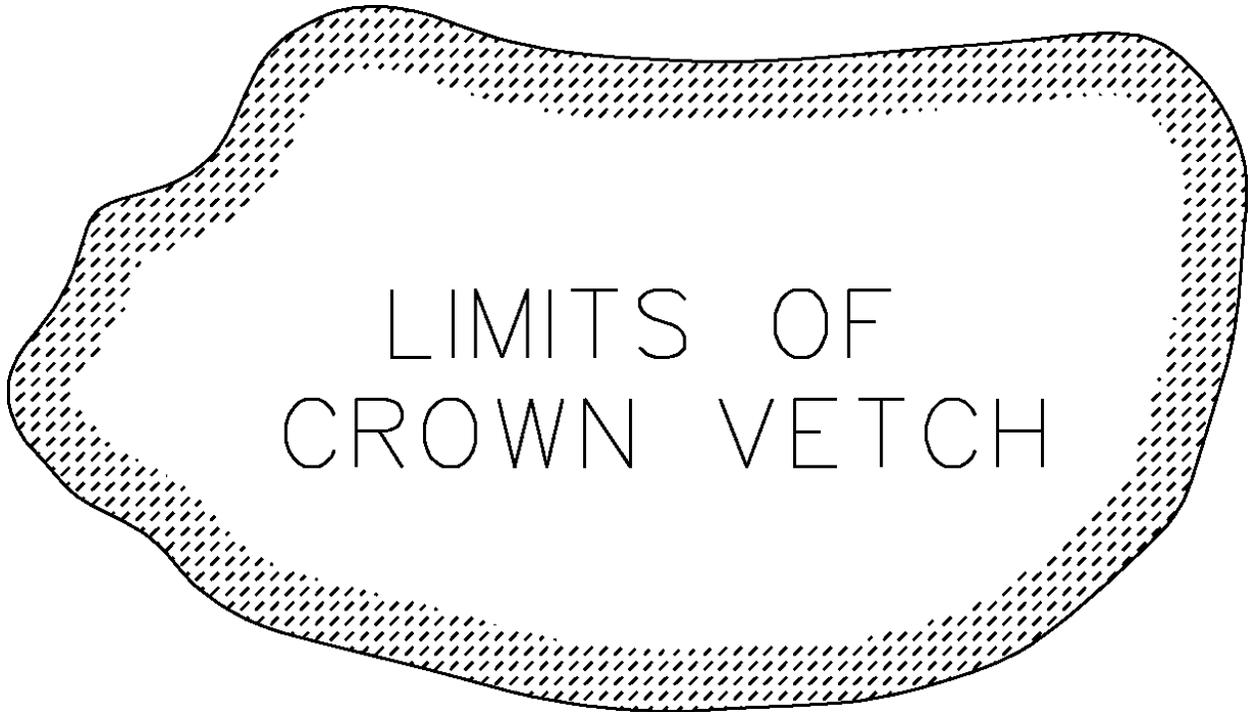


Figure 4-18
Typical Limits of Crown Vetch

4-801.10 WATER (SEEDING AND SODDING)

Item No. 801-03 Water (Seeding and Sodding)

Water for seeding, sodding, crown vetch mixture or sprigging (crown vetch):

Water will be measured by the thousand gallon (M.G.) as designed and completed in place, unless revised by the sequence of construction, in which case complete replacement and remeasurement may be required.

Seeding-
(all areas) $\frac{\text{Surface area (Sq. ft.) x 0.1 M.G. /unit}}{1,000 \text{ Sq. ft./unit}} = \text{_____ M. Gal. Item No. 801-03}$

Total seeding (units) x 0.1 M.G./ unit = Total Water (M.G.)

The designer shall **footnote** pay item as follows:

"Includes _____ thousand gallons for erosion prevention and sediment control."

Sodding $\frac{\text{Surface area (Sq. Yd.)} \times 10 \text{ Gal./Sq. Yd.}}{1,000 \text{ Gal./M.G.}} = \text{_____ M. Gal.}$ Item No. 801-03

4-801.15 SEEDING (SUPPLEMENTAL APPLICATION)

10 pound Minimum Quantity

Units of 801-01 x 1.5 Lbs/Unit x 15% = _____ Lbs. Item No. 801-07

Units of 801-01.02 x 1.5 Lbs/Unit x 15% = _____ Lbs. Item No. 801-07.01

4-801.20 FERTILIZER (SUPPLEMENTAL APPLICATION)

1 Ton Minimum Quantity

Units of 801-01 and/or 801-01.02 x $\frac{23 \text{ Lb./Unit} \times 15\%}{2,000 \text{ Lb./Ton}}$ = _____ Tons Item No. 801-08

4-805.00 EROSION CONTROL BLANKET

See Chapter 10 of the Drainage Manual.

4-806.00 PROJECT MOWING CYCLE

Projects on State Routes with high traffic volumes and high visibility shall include Item No. 806-02.03, Project Mowing, Cycle, on their construction plans. This item is not intended for use on resurfacing projects.

For the purpose of determining applicable projects, designers will include Project Mowing on ***new construction projects, reconstruction projects*** (including widening) or ***on-system bridge replacement projects where one or more of the following apply:***

- Expected project duration is one year or greater
- Project is in a urban area (for purposes of this bulletin an urban area is defined as any city with a population of 5,000 or greater)
- The current Average Daily Traffic (ADT) is 20,000 or greater

The quantity to be set up for a project should be based on a minimum of 2 mowing cycles per year of construction. Since most projects fall into the 2 to 3 year range, a minimum of 4-6 cycles would be needed. The number of mowing cycles per year of construction may be increased based upon input received at the construction field review. Design Managers should check with the Construction Division to determine the length of the contract.

Item no. 806-02.03, Project Mowing, Cycl., shall include the following footnote: "Item includes litter and trash removal. This work will not be measured and paid for directly but will be included in the cost of Item No. 806-02.03, Project Mowing, Cycl."

CHAPTER 9 - MATERIALS

4-905.00 SILICONE SEALANT

Silicone sealant shall be used on all new projects using Portland cement concrete pavement as a primary pavement for the main line or ramps, excluding rehabilitation of all old concrete pavement or joint repair. The silicone sealant is specified in Subsection 905.05 of the *Tennessee Department of Transportation Standard Specifications*.

SECTION V - LIST OF CURRENT STANDARD DRAWINGS

CHAPTER 1 – STANDARD ROADWAY DRAWINGS

ROADWAY DESIGN STANDARD DRAWINGS

ROADWAY DESIGN STANDARDS

DRAINAGE - CULVERTS AND ENDWALL

DRAINAGE - CATCH BASINS AND MANHOLES

ROADWAY AND PAVEMENT APPURTENANCES

SAFETY APPURTENANCES AND FENCE

TRAFFIC CONTROL APPURTENANCES

EROSION PREVENTION AND SEDIMENT CONTROL

CHAPTER 2 – STANDARD STRUCTURE DRAWINGS

STRUCTURE DESIGN STANDARD DRAWINGS

BRIDGE APPURTENANCES ENGLISH (NEW STRUCTURES)

BRIDGE APPURTENANCES ENGLISH (BOX CULVERTS)

BRIDGE APPURTENANCES ENGLISH (BRIDGE REPAIRS)

SECTION V - LIST OF CURRENT STANDARD DRAWINGS

CHAPTER 1 – STANDARD ROADWAY DRAWINGS

ROADWAY DESIGN STANDARD DRAWINGS

ROADWAY DESIGN STANDARDS

RD-A-1	12-18-99	STANDARD ABBREVIATIONS
RD-L-1	10-26-94	STANDARD LEGEND
RD-L-2	09-05-01	STANDARD LEGEND FOR UTILITY INSTALLATIONS
RD-L-3	04-15-04	STANDARD LEGEND FOR SIGNALIZATION AND LIGHTING
RD-L-4	04-15-04	STANDARD LEGEND FOR SIGNALIZATION AND LIGHTING
RD-L-5	05-01-08	STANDARD LEGEND FOR EROSION PREVENTION AND SEDIMENT CONTROL
RD-L-6	05-01-08	STANDARD LEGEND FOR EROSION PREVENTION AND SEDIMENT CONTROL
RD-L-7		STANDARD LEGEND FOR EROSION PREVENTION AND SEDIMENT CONTROL
RD-S-11	03-31-03	DESIGN AND CONSTRUCTION DETAILS FOR ROADSIDE SLOPE DEVELOPMENT
RD-S-11A	03-31-03	ROADSIDE DITCH DETAILS FOR DESIGN AND CONSTRUCTION
RD-SA-1	03-31-03	SAFETY APPROACH TO UNDERPASSES GRADING DESIGN AND SLOPE PROTECTION
RD-SE-2	10-26-95	URBAN SUPERELEVATION DETAILS
RD-SE-3	10-26-95	RURAL SUPERELEVATION DETAILS
RD-TS-1	03-31-03	DESIGN STANDARDS FOR LOCAL ROADS AND STREETS
RD-TS-2	03-31-03	DESIGN STANDARDS FOR COLLECTOR ROADS AND STREETS
RD-TS-2A	03-31-03	DESIGN STANDARDS FOR 4-6 LANE COLLECTOR HIGHWAYS WITH DEPRESSED MEDIANS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

RD-TS-2B	03-31-03	DESIGN STANDARDS FOR 4-6 LANE COLLECTOR HIGHWAYS WITH FLUSH MEDIANS
RD-TS-3	03-31-03	DESIGN STANDARDS FOR 2-LANE ARTERIAL HIGHWAYS
RD-TS-3A	03-31-03	DESIGN STANDARDS 4-6 LANE ARTERIAL HIGHWAYS WITH DEPRESSED MEDIANS
RD-TS-3B	03-31-03	DESIGN STANDARDS 4-6 LANE ARTERIALS WITH INDEPENDENT ROADWAYS
RD-TS-3C	03-31-03	DESIGN STANDARDS 4-6 LANE ARTERIAL HIGHWAYS WITH FLUSH MEDIANS
RD-TS-4	03-31-03	DESIGN STANDARDS 1 & 2 LANE RAMPS
RD-TS-5	03-31-03	DESIGN STANDARDS FREEWAYS WITH DEPRESSED MEDIANS
RD-TS-5A	03-31-03	DESIGN STANDARDS FREEWAYS WITH INDEPENDENT ROADWAYS
RD-TS-5B	03-31-03	DESIGN STANDARDS FREEWAYS WITH MEDIAN BARRIER
RD-TS-6	03-31-03	TYPICAL CURB AND GUTTER SECTIONS WITH SHOULDER
RD-TS-6A	03-31-03	TYPICAL CURB AND GUTTER SECTIONS WITHOUT SHOULDER
RD-TS-7	03-31-03	DESIGN STANDARDS 2-LANE HIGHWAY WITH CONTINUOUS 2-WAY LEFT-TURN LANE
RD-TS-7A	03-31-03	DESIGN STANDARDS 2-LANE CURB & GUTTER WITH CONTINUOUS 2-WAY LEFT-TURN LANE
RD-TS-8		SHARED USE PATH TYPICAL SECTIONS
RD-UD-3	09-05-96	UNDERDRAIN DETAILS
RD-UD-4	05-27-01	UNDERDRAIN LATERAL DETAILS
RD-UD-6	12-18-94	LATERAL UNDERDRAIN ENDWALL DETAIL FOR 1:1 & 2:1 SLOPES
RD-UD-7	12-18-94	LATERAL UNDERDRAIN ENDWALL DETAIL FOR 3:1 & 4:1 SLOPES
RD-UD-8		LATERAL UNDERDRAIN ENDWALL DETAIL FOR 5:1 SLOPES
RD-UD-9	12-18-94	LATERAL UNDERDRAIN ENDWALL DETAIL FOR 6:1 SLOPES

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

RD01-S-11	04-04-03	DESIGN AND CONSTRUCTION DETAILS FOR ROADSIDE SLOPE DEVELOPMENT
RD01-S-11A	10-15-02	ROADSIDE DITCH DETAILS FOR DESIGN AND CONSTRUCTION
RD01-S-11B	10-15-02	DESIGN AND CONSTRUCTION DETAILS FOR ROCK CUT SLOPE AND CATCHMENT
RD01-S-12	10-15-02	CLEAR ZONE CRITERIA
RD01-SA-1	10-15-02	SAFETY APPROACH TO UNDERPASSES GRADING DESIGN AND SLOPE PROTECTION
RD01-SD-1		INTERSECTION SIGHT DISTANCE DESIGN AND GENERAL NOTES
RD01-SD-2		INTERSECTION SIGHT DISTANCE LANDSCAPE AND OBSTRUCTION
RD01-SD-3		INTERSECTION SIGHT DISTANCE 2-LANE ROADWAYS
RD01-SD-4		INTERSECTION SIGHT DISTANCE 5-LANE AND 4-LANE UNDIVIDED ROADWAYS
RD01-SD-5		INTERSECTION SIGHT DISTANCE 4-LANE DIVIDED HIGHWAYS
RD01-SD-6		INTERSECTION SIGHT DISTANCE 6-LANE DIVIDED HIGHWAYS
RD01-SD-7		INTERSECTION SIGHT DISTANCE FOR PASSIVE RAILROAD HIGHWAY GRADE CROSSINGS
RD01-SE-2	10-15-02	URBAN SUPERELEVATION DETAILS
RD01-SE-3	10-15-02	RURAL SUPERELEVATION DETAILS
RD01-TS-1	10-15-02	DESIGN STANDARDS FOR LOCAL ROADS AND STREETS
RD01-TS-1A		DESIGN STANDARDS FOR LOW-VOLUME LOCAL ROADS (ADT<=400)
RD01-TS-2	10-15-02	DESIGN STANDARDS FOR COLLECTOR ROADS AND STREETS
RD01-TS-2A	10-15-02	DESIGN STANDARDS 4 AND 6 LANE COLLECTOR HIGHWAYS WITH DEPRESSED MEDIANS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

RD01-TS-2B	10-15-02	DESIGN STANDARDS 4 AND 6 LANE COLLECTOR HIGHWAYS WITH FLUSH MEDIANS
RD01-TS-3	10-15-02	DESIGN STANDARD FOR 2-LANE ARTERIAL HIGHWAYS
RD01-TS-3A	10-15-02	DESIGN STANDARDS 4 AND 6 LANE ARTERIAL HIGHWAYS WITH DEPRESSED MEDIANS
RD01-TS-3B	10-15-02	DESIGN STANDARDS 4 AND 6 LANE ARTERIALS WITH INDEPENDENT ROADWAYS
RD01-TS-3C	10-15-02	DESIGN STANDARDS 4 AND 6 LANE ARTERIAL HIGHWAYS WITH FLUSH MEDIANS
RD01-TS-4	10-15-02	DESIGN STANDARDS 1 AND 2 LANE RAMPS
RD01-TS-5	10-15-02	DESIGN STANDARDS FREEWAYS WITH DEPRESSED MEDIANS
RD01-TS-5A	10-15-02	DESIGN STANDARDS FREEWAYS WITH INDEPENDENT ROADWAYS
RD01-TS-5B	10-15-02	DESIGN STANDARDS FREEWAYS WITH MEDIAN BARRIER
RD01-TS-6	10-15-02	TYPICAL CURB AND GUTTER SECTIONS WITH SHOULDER
RD01-TS-6A	10-15-02	TYPICAL CURB AND GUTTER SECTIONS WITHOUT SHOULDER
RD01-TS-7	10-15-02	DESIGN STANDARDS 2-LANE HIGHWAY WITH CONTINUOUS 2-WAY LEFT-TURN LANE
RD01-TS-7A	10-15-02	DESIGN STANDARDS 2-LANE CURB AND GUTTER WITH CONTINUOUS 2-WAY LEFT-TURN LANE

DRAINAGE - CULVERTS AND ENDWALL

D-FLU-1		FLUME DETAILS
D-PB-1	04-15-07	STANDARD DETAILS, CLASS "B" BEDDING AND CULVERT EXCAVATION
D-PB-2	07-12-07	STANDARD DETAILS FOR HDPE PIPE INSTALLATION
D-PE-1	02-12-76	TYPE "A" CONCRETE ENDWALL (2:1 SLOPE. 36" TO 78")
D-PE-3B(1)	07-17-07	CONCRETE ENDWALL TYPE "U" WITH STEEL PIPE GRATE (FOR 18" THRU 48" PIPE) (3:1 SLOPE)
D-PE-3B(2)	05-27-01	CONCRETE ENDWALL TYPE "U" WITH STEEL PIPE GRATE (FOR 18" THRU 48" PIPE) (3:1 SLOPE)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

D-PE-4	01-19-97	STRAIGHT "L" AND "U" TYPE CONCRETE ENDWALL
D-PE-4B(1)	03-30-00	CONCRETE ENDWALL TYPE "U" WITH STEEL PIPE GRATE (FOR 18" THRU 48" PIPES) (4:1 SLOPE)
D-PE-4B(2)	07-17-07	CONCRETE ENDWALL TYPE "U" WITH STEEL PIPE GRATE (FOR 18" THRU 48" PIPES) (4:1 SLOPE)
D-PE-5	05-27-01	WINGWALLS HORIZONTAL OVAL CONCRETE PIPES
D-PE-6	05-27-01	STRAIGHT ENDWALLS VERTICAL OVAL CONCRETE PIPES
D-PE-6A	05-27-01	WINGWALLS VERTICAL OVAL CONCRETE PIPES
D-PE-6B(1)	03-30-00	CONCRETE ENDWALL TYPE "U" WITH STEEL PIPE GRATE (FOR 18" THRU 48" PIPES) (6:1 SLOPE)
D-PE-6B(2)	07-17-07	CONCRETE ENDWALL TYPE "U" WITH STEEL PIPE GRATE (FOR 18" THRU 48" PIPES) (6:1 SLOPE)
D-PE-7	05-27-01	STRAIGHT ENDWALLS FLATBASE CONCRETE PIPES
D-PE-7A	05-27-01	WINGWALLS FLATBASE CONCRETE PIPES
D-PE-8	01-19-97	DETAIL OF STANDARD PIPE AND PIPE-ARCH CULVERT WITH BEVELED ENDS AND RIP-RAP
D-PE-9	04-25-90	CONCRETE ENDWALLS TYPE "B" (FOR ROUND & SIDE TAPERED INLETS, PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 AND 4:1 SLOPES) 1976
D-PE-9A	10-25-82	GENERAL DIMENSIONS QUANTITIES, ROUND PIPE CONCRETE ENDWALLS TYPE "B" (PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 AND 4:1 SLOPES) 1976
D-PE-9B		GENERAL DIMENSIONS AND QUANTITIES, SIDE TAPER INLETS, CONCRETE ENDWALLS TYPE "B" (PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 AND 4:1 SLOPES) 1976
D-PE-9C		BILL OF STEEL (SHEET 1 OF 4) CONCRETE ENDWALLS TYPE "B" (FOR CONCRETE ROUND AND SIDE TAPERED INLET, PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 SLOPE) 1976
D-PE-9D		BILL OF STEEL (SHEET 2 OF 4) CONCRETE ENDWALLS TYPE "B" (FOR CONCRETE ROUND AND SIDE TAPERED INLET, PIPE SIZES 15" TO 78", ALL SKEWS, 4:1 SLOPE) 1976
D-PE-9E		BILL OF STEEL (SHEET 3 OF 4) CONCRETE ENDWALLS TYPE "B" (FOR STEEL ROUND AND SIDE TAPERED INLET, PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 SLOPE) 1976

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

D-PE-9F		BILL OF STEEL (SHEET 4 OF 4) CONCRETE ENDWALLS TYPE "B" (FOR STEEL ROUND AND SIDE TAPERED INLET, PIPE SIZES 15" TO 78", ALL SKEWS, 4:1 SLOPE) 1976
D-PG-3	04-15-97	FERROUS AND ALUMINUM CORRUGATED METAL PIPE
D-PG-4	07-29-94	FERROUS AND ALUMINUM CORR. METAL PIPE-ARCHES
D-PO-1	05-27-01	OVAL & FLAT BASE CONCRETE CULVERT PIPE
D-PS-1	03-15-76	STRUTTING DETAILS FOR CORRUGATED METAL & STRUCTURAL PLATE ROUND PIPE
D-SEW-6DA	05-27-01	CONCRETE ENDWALL TYPE "SD" WITH STEEL PIPE GRATE (FOR 15" THRU 48" PIPES) (6:1 SLOPE)
D-SEW-6DB	10-26-92	CONCRETE ENDWALL TYPE "SD" WITH STEEL PIPE GRATE (FOR 15" THRU 48" PIPES) (6:1 SLOPE)
D-SEW-6DC	04-15-05	CONCRETE ENDWALL TYPE "SD" WITH STEEL PIPE GRATE (FOR 18" THRU 30" PIPES) (6:1 SLOPE)
D-SEW-6DD	04-15-05	CONCRETE ENDWALL TYPE "SD" WITH STEEL PIPE GRATE (FOR 18" THRU 30" PIPES) (6:1 SLOPE)
D-SEW-12D	05-27-01	CONCRETE ENDWALL TYPE "SD" WITH STEEL PIPE GRATE (FOR 15" AND 18" PIPES) (12:1 SLOPE)

DRAINAGE - CATCH BASINS AND MANHOLES

D-CB-10LPC	07-29-04	LOW PROFILE LOWERED CURB 32" X 26" RECTANGULAR CONCRETE NO. 10LPC CATCH BASIN
D-CB-10RA		STANDARD PRECAST 48" CIRCULAR NO. 10 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-10S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 10 CATCH BASIN
D-CB-10SB		STANDARD 4' X 4' SQUARE CONCRETE NO. 10 CATCH BASIN
D-CB-12B	07-29-02	STANDARD RECTANGULAR BRICK NO. 12 CATCH BASIN
D-CB-12LP	07-29-04	LOW PROFILE 32" X 32" SQUARE CONCRETE NO. 12LP CATCH BASIN
D-CB-12P	07-29-02	STANDARD PRECAST RECTANGULAR CONCRETE NO.12 CATCH BASIN
D-CB-12RA	05-27-01	STANDARD PRECAST 48" CIRCULAR NO. 12 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

D-CB-12RB	05-27-01	STANDARD PRECAST 60" AND 72" CIRCULAR NO. 12 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-12RC	05-27-01	STANDARD PRECAST 84" THRU 120" CIRCULAR NO. 12 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-12S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 12 CATCH BASIN
D-CB-12SB	07-29-02	STANDARD 4' X 4' SQUARE CONCRETE NO. 12 CATCH BASIN
D-CB-12SC	09-11-02	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 12 CATCH BASIN
D-CB-12SD	09-11-02	STANDARD 7' X 7' SQUARE CONCRETE NO. 12 CATCH BASIN
D-CB-12SE	05-05-05	STANDARD 9' X 9' SQUARE CONCRETE NO. 12 CATCH BASIN
D-CB-13B	07-29-02	STANDARD RECTANGULAR BRICK NO. 13 CATCH BASIN
D-CB-13P	07-29-02	STANDARD PRECAST RECTANGULAR CONCRETE NO. 13 CATCH BASIN
D-CB-13RA	05-27-01	STANDARD PRECAST 48" CIRCULAR NO. 13 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-13RB	05-27-01	STANDARD PRECAST 60" AND 72" CIRCULAR NO. 13 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-13RC	05-27-01	STANDARD PRECAST 84" THRU 120" CIRCULAR NO. 13 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-13S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 13 CATCH BASIN
D-CB-14B	07-29-02	STANDARD RECTANGULAR BRICK NO. 14 CATCH BASIN
D-CB-14P	07-29-02	STANDARD PRECAST RECTANGULAR CONCRETE NO. 14 CATCH BASIN
D-CB-14RB	05-27-01	STANDARD PRECAST CIRCULAR NO. 14RB CATCH BASIN
D-CB-14S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 14 CATCH BASIN
D-CB-14SE	05-05-05	STANDARD 9' X 9' SQUARE CONCRETE NO. 14 CATCH BASIN
D-CB-16B	07-29-02	STANDARD RECTANGULAR BRICK NO. 16 CATCH BASIN
D-CB-16S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 16 CATCH

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

		BASIN
D-CB-17S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 17 CATCH BASIN
D-CB-25B	07-29-02	STANDARD RECTANGULAR BRICK NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25LP	07-29-04	STANDARD LOW PROFILE 32" X 32" SQUARE CONCRETE NO. 25LP CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25P	07-29-02	STANDARD PRECAST RECTANGULAR CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25RA	05-27-01	STANDARD PRECAST 48" CIRCULAR NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25RB	05-27-01	STANDARD PRECAST CIRCULAR NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25SB	07-29-02	STANDARD 4' X 4' SQUARE CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25SC	09-11-02	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25SD	09-11-02	STANDARD 7' X 7' SQUARE CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25SE	05-05-05	STANDARD 9' X 9' SQUARE CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-26P	07-29-02	STANDARD PRECAST RECTANGULAR CONCRETE NO. 26 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-26S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 26 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-27S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 27 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-28B	07-29-02	STANDARD RECTANGULAR BRICK NO. 28 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-28LP	07-29-04	LOW PROFILE 32" X 32" SQUARE CONCRETE NO. 28LP CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

D-CB-28P	07-29-02	STANDARD PRECAST RECTANGULAR CONCRETE NO. 28 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-28RA	05-27-01	STANDARD PRECAST 48" CIRCULAR NO. 28 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-28RB	05-27-01	STANDARD PRECAST CIRCULAR NO. 28 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-28S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 28 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-29P	07-29-02	STANDARD PRECAST RECTANGULAR CONCRETE NO. 29 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-29S	07-29-02	STANDARD RECTANGULAR CONCRETE NO. 29 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-31R	10-26-03	STANDARD PRECAST CIRCULAR NO. 31 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-31SD	09-11-02	STANDARD 7' X 7' SQUARE CONCRETE NO. 31 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-31SE	02-13-04	STANDARD 9' X 9' SQUARE CONCRETE NO. 31 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-32LP	06-30-03	STANDARD 80" X 32" RECTANGULAR CONCRETE NO. 32 CATCH BASIN (FOR USE UNDER CONCRETE MEDIUM BARRIER WALL)
D-CB-38RB	09-05-04	STANDARD PRECAST CIRCULAR NO. 38 CATCH BASIN
D-CB-38S	07-29-02	STANDARD 32" X 32" SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-38SB	09-05-04	STANDARD 4' X 4' SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-38SC	09-05-04	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-39RB	05-27-01	STANDARD PRECAST CIRCULAR NO. 39 CATCH BASIN
D-CB-39S	07-29-02	STANDARD 4' X 4' SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-39SC		STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-39SD	09-11-02	STANDARD 7' X 7' SQUARE CONCRETE NO. 39 CATCH BASIN

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

D-CB-39SE	02-13-04	STANDARD 9' X 9' SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-40S	07-29-02	STANDARD 4' X 8' RECTANGULAR CONCRETE NO. 40 CATCH BASIN
D-CB-40SE	05-05-05	STANDARD 9' X 9' SQUARE CONCRETE NO. 40. CATCH BASIN
D-CB-41LP	07-29-04	LOW PROFILE 32" X 32" SQUARE CONCRETE NO. 41LP CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41P	07-29-02	STANDARD 4' X 3' PRECAST RECTANGULAR CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41RB	05-27-01	STANDARD PRECAST CIRCULAR NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41S	07-29-02	STANDARD 4' X 3' RECTANGULAR CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41SB	07-29-02	STANDARD 4' X 4' SQUARE CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41SC	09-11-02	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41SD	09-11-02	STANDARD 7' X 7' SQUARE CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41SE	05-05-05	STANDARD 9' X 9' SQUARE CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-42RB	05-27-01	STANDARD PRECAST CIRCULAR NO. 42 CATCH BASIN
D-CB-42S	01-19-05	STANDARD 32" X 32" SQUARE CONCRETE NO. 42 CATCH BASIN
D-CB-42SB	07-29-04	STANDARD 4' X 4' SQUARE CONCRETE NO. 42 CATCH BASIN
D-CB-42SC		STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 42 CATCH BASIN
D-CB-42SD	09-11-02	STANDARD 7' X 7' SQUARE CONCRETE NO. 42 CATCH BASIN
D-CB-43R	05-27-01	STANDARD PRECAST CIRCULAR NO. 43R CATCH BASIN

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

D-CB-43SB	07-29-02	STANDARD 8' X 4' RECTANGULAR CONCRETE NO. 43SB CATCH BASIN
D-CB-43SC	07-29-02	STANDARD 8' X 5'2" RECTANGULAR CONCRETE NO. 43SC CATCH BASIN
D-CB-44SE	05-05-05	STANDARD 9' X 9' SQUARE CONCRETE NO. 44 CATCH BASIN
D-CB-45S	05-27-01	STANDARD 8' X 4' RECTANGULAR CONCRETE NO. 45 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-46SE	05-05-05	STANDARD 9' X 9' SQUARE CONCRETE NO. 46 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-51SC	09-11-02	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 51 CATCH BASIN (FOR USE IN FRONT OF CONCRETE RETAINING WALL)
D-CB-51SD		STANDARD 7' X 7' SQUARE CONCRETE NO. 51 CATCH BASIN FOR USE IN FRONT OF CONCRETE RETAINING WALL)
D-CB-51SE		STANDARD 9' X 9' SQUARE CONCRETE NO. 51 CATCH BASIN
D-CB-52SE		STANDARD 9' x 9' SQUARE CONCRETE NO. 52 CATCH BASIN
D-CBB-12A	05-27-01	TYPE "B" CAST IRON FRAME, GRATE & NONMOUNTABLE INLET DETAILS FOR NOS. 10, 12, 14, 16, AND 17 TYPE CATCH BASINS
D-CBB-12B	05-27-01	TYPE "B" CAST IRON FRAME, GRATE & 6" MOUNTABLE INLET DETAILS FOR NOS. 25, 26 AND 27 TYPE CATCH BASINS
D-CBB-12C	05-27-01	TYPE "B" CAST IRON FRAME, GRATE & 4" MOUNTABLE INLET DETAILS FOR NOS. 28 AND 29 TYPE CATCH BASINS
D-CBB-13	05-27-01	TYPE "B" CAST IRON FRAME, GRATE & NONMOUNTABLE INLET DETAILS FOR NO. 13 TYPE CATCH BASINS
D-CBB-31	05-27-01	TYPE "B" CAST IRON FRAME, GRATE & INLET DETAILS FOR NOS. 31, 41, 45, 46, & 51 TYPE CATCH BASINS
D-CBB-31	05-27-01	TYPE "B" CAST IRON FRAME GRATE & INLET DETAILS FOR NOS. 31, 41, 45, 46, & 51 TYPE CATCH BASINS
D-CBB-42	05-27-01	CAST IRON GRATE DETAILS FOR NOS. 42, 43 & 44 TYPE CATCH BASINS
D-JBS-1	07-29-02	STANDARD 32" X 32" SQUARE CONCRETE NO. 1 JUNCTION

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

		BOX
D-JBS-2	07-29-02	STANDARD 4' X 4' SQUARE CONCRETE NO. 2 JUNCTION BOX
D-JBS-3	09-11-02	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 3 JUNCTION BOX
D-JBS-4	09-11-02	STANDARD 7' X 7' SQUARE CONCRETE NO. 4 JUNCTION BOX
D-JBS-5	09-11-02	STANDARD 9' X 9' SQUARE CONCRETE NO. 5 JUNCTION BOX
D-MH-2	05-27-01	STANDARD MASONRY & PRECAST NO. 3 MANHOLE
D-MH-3	04-15-00	STANDARD PRECAST CIRCULAR LID DETAILS FOR NO. 3 MANHOLE
D-MH-3A	05-27-01	STANDARD PRECAST CIRCULAR LID DETAILS FOR NO. 3 MANHOLE (108" AND 120" DIA.)
D-MH-4	05-27-01	STANDARD NO. 3 MANHOLE CASTINGS AND STEPS
D-MH-5	09-11-02	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 3 MANHOLE
D-MH-6	09-11-02	STANDARD 7' X 7' SQUARE CONCRETE NO. 3 MANHOLE
D-MH-7	09-11-02	STANDARD 9' X 9' SQUARE CONCRETE NO. 3 MANHOLE
D-SDS-1	07-29-02	STANDARD 32" X 32" SQUARE CONCRETE NO. 1 SPRING DRAIN BOX
D-SDS-2A	07-29-02	STANDARD 4' X 4' SQUARE CONCRETE NO. 2A SPRING DRAIN BOX
D-SDS-2B	07-29-02	STANDARD 4' X 4' SQUARE CONCRETE NO. 2B SPRING DRAIN BOX
D-SDS-3A	07-29-02	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 3A SPRING DRAIN BOX
D-SLD-1	05-27-01	SLOTTED DRAINS
D-SLD-2	05-27-01	SLOTTED DRAINS
D-SLD-3	05-27-01	SLOTTED DRAINS
D-TD-1		TRENCH DRAIN

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

ROADWAY AND PAVEMENT APPURTENANCES

RP-CS-1	05-27-01	CONCRETE SHOULDER RUMBLE STRIP DETAIL (FOR 4-LANE DIVIDED HIGHWAY)
RP-CS-2	05-27-01	CONCRETE SHOULDER RUMBLE STRIP DETAIL (FOR 6-LANE OR WIDER DIVIDED HIGHWAY)
RP-D-15	07-15-08	DETAILS OF STANDARD CONCRETE DRIVEWAYS
RP-D-16	07-15-08	DETAILS OF LOWERED STANDARD CONCRETE DRIVEWAYS
RP-DHO-1	10-26-93	MEDIAN OPENINGS ON 4-LANE DIVIDED HIGHWAY
RP-H-3	07-17-07	HANDICAP RAMP AND TRUNCATED DOME SURFACE DETAIL
RP-H-4		PERPENDICULAR CURB RAMP
RP-H-5		PARALLEL CURB RAMP
RP-H-6		MEDIAN CROSSING
RP-H-7		PERPENDICULAR HANDICAP RAMP FOR 20' THRU 60' RADIUS
RP-H-8		PERPENDICULAR HANDICAP RAMP FOR 20' THRU 60' RADIUS
RP-H-9		PARALLEL HANDICAP RAMP FOR 20' THRU 60' RADIUS
RP-I-5	12-18-96	EXAMPLES OF STREET AND ALLEY INTERSECTIONS
RP-J-1	10-26-00	PORTLAND CEMENT CONCRETE PAVEMENT JOINT TYPES AND SPACING
RP-J-3	10-26-00	PORTLAND CEMENT CONCRETE PAVEMENT JOINT TYPES AND SPACING
RP-J-5	07-01-01	TYPICAL ACCELERATION AND DECELERATION LANE JOINT TYPES AND SPACING FOR CONCRETE RAMPS
RP-J-7	10-26-00	CONCRETE RAMP JOINT TYPES AND SPACING
RP-J-9	01-19-02	CONTRACTION AND CONSTRUCTION JOINTS FOR CONCRETE PAVEMENT
RP-J-11	07-29-96	3/4" AND 1-3/4" EXPANSION AND EDGE PAVEMENT JOINTS
RP-J-13	03-20-91	3/4" AND 1-3/4" ELASTOMERIC COMPRESSION JOINT SEALS
RP-J-15	01-19-02	LONGITUDINAL CONTRACTION AND CONSTRUCTION

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

JOINTS

RP-J-17	10-26-00	DOWEL ASSEMBLY DEVICES
RP-J-18	10-21-05	DOWEL ASSEMBLY DEVICES
RP-J-19	10-21-05	DOWEL ASSEMBLY DEVICES
RP-J-23	10-26-04	CONCRETE PAVEMENT REPAIR DETAILS
RP-J-24	05-27-01	CONCRETE PAVEMENT SPALL AND RANDOM CRACK REPAIR DETAILS
RP-J-25	05-27-01	CONCRETE PAVEMENT JOINT REPAIR DETAILS
RP-MC-1	02-28-02	STANDARD 4" SLOPING (MOUNTABLE) CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS
RP-MC-2	02-28-02	STANDARD 6" SLOPING (MOUNTABLE) CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS
RP-NMC-10	07-29-03	STANDARD VERTICAL (NONMOUNTABLE) CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS
RP-NMC-11	02-28-02	STANDARD VERTICAL (NONMOUNTABLE) CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS
RP-PMR-1	05-27-01	STANDARD DETAILS FOR PROPOSED PERMANENT MAINTENANCE RAMP
RP-R-1	05-27-01	STANDARD RAMPS TO SIDE ROADS
RP-S-7	07-29-96	DETAILS FOR STANDARD CONCRETE SIDEWALKS
RP-S-8	01-19-93	DETAILS FOR STANDARD CONCRETE STEPS AND PIPE HANDRAILS

SAFETY APPURTENANCES AND FENCE

S-F-1		HIGH VISIBILITY FENCE
S-F-10	01-24-08	STANDARD RIGHT-OF-WAY STOCK FENCE
S-F-10A	01-24-08	STANDARD RIGHT-OF-WAY STOCK FENCE WITH TIMBER POSTS
S-F-10B	05-27-01	STANDARD RIGHT-OF-WAY CHAIN LINK FENCE
S-F-10C		RIGHT-OF-WAY FENCE AT BRIDGES AND BOX CULVERTS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

S-F-10D		RIGHT-OF-WAY FENCE LOCATIONS AT INTERCHANGES
S-FG-11	01-24-08	STANDARD STOCK FENCE GATE
S-FG-20	01-24-08	EXAMPLES OF WATER GATES AND WATER CROSSINGS
S-GR-11	11-26-07	W-BEAM & THRIE BEAM BARRIER RAIL AND RUB RAIL ALTERNATES
S-GR-12	05-27-03	W-BEAM BARRIER POST DETAILS AND SPECIFICATIONS
S-GR-13	05-27-03	BARRIER RAIL MOUNTING, POST BLOCK-OUTS WITH VERTICAL ADJUSTMENT HOLES
S-GR-13A		BARRIER RAIL MOUNTING POST FOR PLASTIC BLOCK-OUTS WITH HORIZONTAL ADJUSTMENT HOLES
S-GR-14	09-05-98	W-BEAM BARRIER FASTENING HARDWARE AND BRIDGE APPROACH DELINEATORS
S-GR-15	06-30-05	W-BEAM BARRIER TERMINAL ELEMENT DETAILS
S-GR-16	05-27-01	GUARDRAIL BARRIER TREATMENT FOR PIERS IN MEDIAN
S-GR-17	09-11-02	BRIDGE END PROTECTION IN MEDIAN FOR DUAL BRIDGE
S-GR-18	05-15-08	GUARDRAIL TERMINAL (TYPE IN-LINE) AND SHOULDER LINE DETAIL
S-GR-19	10-06-06	GUARDRAIL TERMINAL ANCHORS, TYPE 12 AND TYPE 13
S-GR-19A	05-15-08	TYPE 12 BURIED-IN-BACKSLOPE GUARDRAIL TERMINAL
S-GR-19B	05-15-08	TYPE 12 ALTERNATE BURIED IN BACKSLOPE GUARDRAIL TERMINAL
S-GR-19C		GUARDRAIL TERMINAL ANCHOR, TYPE 13 ALTERNATE
S-GR-20	05-27-01	MEDIAN DIVIDER GUARDRAIL AND GUARDRAIL TERMINAL ANCHORS
S-GR-21	06-02-08	LENGTH OF NEED AND TERMINAL REQUIREMENTS IN FILLS
S-GR-22	03-13-08	GUARDRAIL ATTACHMENT TO CONCRETE DECKS OF BOX AND SLAB CULVERTS AND BRIDGES
S-GR-23	09-11-02	GUARDRAIL ATTACHMENT TO STRUCTURES AND PROTECTIVE GUARDRAIL AT BRIDGE ENDS DETAILS
S-GR-23A		GUARDRAIL ATTACHMENT TO BRIDGE END FOR LOW-

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

		VOLUME LOCAL ROADS (ADT<400)
S-GR-24	05-15-08	GUARDRAIL END TERMINALS AT BRIDGE ENDS
S-GR-26	03-15-08	SLOTTED GUARDRAIL TERMINAL ANCHOR (TYPE 21)
S-GR-27	05-27-03	GUARDRAIL TERMINAL ANCHOR (TYPE 21) ELEMENT ASSEMBLY DETAILS
S-GR-28	06-30-05	GUARDRAIL TERMINAL ANCHOR (TYPE 21) POST AND ASSEMBLY DETAILS
S-GR-38	05-15-08	DETAILS FOR CONSTRUCTION OF EARTH PAD FOR TYPE 38 GUARDRAIL END TERMINALS
S-GR-38A	06-30-05	DETAILS FOR CONSTRUCTION OF ALTERNATE EARTH PAD FOR TYPE 38 GUARDRAIL END TERMINALS
S-GR-39	05-27-01	DETAILS FOR CONSTRUCTION OF EARTH PAD FOR TYPE 21 GUARDRAIL END TERMINALS
S-GR-43		TANGENTIAL GUARDRAIL TERMINAL ANCHOR (TYPE 38) POST LAYOUT AND ERECTION DETAILS
S-GR-44		TANGENTIAL GUARDRAIL TERMINAL ANCHOR (TYPE 38) (2 TUBE) GUARDRAIL ELEMENT POST AND ASSEMBLY DETAILS
S-MB-1	01-31-06	STANDARD CONCRETE MEDIAN BARRIER
S-MB-2	05-27-01	STANDARD CONCRETE MEDIAN BARRIER (BRIDGE PIER PROTECTION)
S-MB-3	10-26-99	STANDARD CONCRETE GLARE SCREEN MEDIAN BARRIER
S-MB-3A	10-26-99	STANDARD CONCRETE GLARE SCREEN MEDIAN BARRIER
S-MB-4	05-27-01	STANDARD CONCRETE GLARE SCREEN MEDIAN BARRIER (BRIDGE PIER PROTECTION)
S-MB-7		STANDARD DETAILS FOR CONCRETE BARRIER WALL INCLUDING GUARDRAIL ATTACHMENT
S-MB-8		STANDARD DETAILS FOR CONCRETE BARRIER WALL AT BRIDGE BENTS INCLUDING GUARDRAIL ATTACHMENT
S-RP-2	01-19-99	STANDARD CONCRETE RIGHT-OF-WAY MARKERS
S-SSMB-1		32" SINGLE SLOPE CONCRETE BARRIER WALL

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

S-SSMB-2 51" SINGLE SLOPE CONCRETE BARRIER WALL

TRAFFIC CONTROL APPURTENANCES

T-FAB-1	05-27-97	FLASHING YELLOW ARROW BOARD
T-FO-1		FIBER OPTIC AERIAL ENTRANCE DETAILS
T-FO-2		FIBER OPTIC UNDERGROUND ENTRANCE DETAILS
T-FO-3		FIBER OPTIC AERIAL CONNECTION DETAILS
T-FO-4		FIBER OPTIC PULL BOX, CABINET & POLE DETAILS
T-L-1	02-15-07	STANDARD LIGHTING DETAILS - FOUNDATIONS
T-L-1SA	07-29-04	STANDARD LIGHTING DETAILS FOR SINGLE ARM SUPPORTS
T-L-1TM		STANDARD LIGHTING DETAILS TENON MOUNTED OFFSET LIGHTING SUPPORTS
T-L-2	09-11-03	FOUNDATION DETAIL FOR LUMINAIRE MOUNTED ON CONCRETE MEDIAN BARRIER
T-L-3	04-15-96	STANDARD LIGHTING DETAILS - PULL BOXES
T-L-4	07-29-04	STANDARD LIGHTING DETAILS CONDUIT, CABLE INSTALLATION
T-M-1	04-15-04	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS AND MARKING ABBREVIATIONS
T-M-2	09-05-04	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS
T-M-3	09-19-91	MARKING STANDARDS FOR TRAFFIC ISLANDS, MEDIANS & PAVED SHOULDERS ON CONVENTIONAL ROADS
T-M-4	03-15-07	STANDARD INTERSECTION PAVEMENT MARKINGS
T-M-5	09-05-04	MARKING DETAILS FOR EXPRESSWAYS & FREEWAYS
T-M-6	07-29-98	MARKING DETAIL FOR EXPRESSWAY & FREEWAY INTERCHANGES
T-M-7	10-10-06	GORE MARKING DETAILS FOR EXPRESSWAY & FREEWAY INTERCHANGES
T-M-8	10-10-06	MARKING DETAILS FOR EXPRESSWAYS & FREEWAYS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

T-M-9 T-M-10	11-30-04	MARKING DETAILS FOR RAMP INTERSECTIONS SIGNING AND PAVEMENT MARKINGS FOR SHARED-USE PATHS
T-M-11		SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANES AND ROUTES ON RURAL ROADS
T-M-12		SIGNING AND PAVEMENT MARKINGS FOR URBAN BICYCLE LANES
T-M-13		SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANES
T-M-14		SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANES AT INTERSECTIONS
T-PBR-1	02-22-04	INTERCONNECTED PORTABLE BARRIER RAIL
T-PBR-2	10-10-06	DETAIL FOR VERTICAL PANELS AND FLEXIBLE DELINEATORS
T-RR-1	10-23-06	TYPICAL PAVEMENT MARKING AT RAILROAD-HIGHWAY GRADE CROSSINGS AND RAILROAD ADVANCE WARNING SIGN
T-RR-2	07-29-96	STANDARD DRAWING FOR RAILROAD AND HIGHWAY CROSSING SIGNAL WITH GATE
T-RR-3	07-29-96	STANDARD DRAWING FOR RAILROAD-HIGHWAY CROSSING SIGNAL
T-RR-4	07-29-96	STANDARD DRAWING FOR TYPICAL CURB & GUTTER PLAN FOR RAILROAD-HIGHWAY CROSSING WITH OR WITHOUT GATES
T-RR-5	07-29-96	STANDARD DRAWING FOR RAILROAD-HIGHWAY CROSSING SIGNAL TYPICAL CANTILEVER SIGN
T-RR-6		TYPICAL SIGNING AND MARKING AT PASSIVE RAILROAD HIGHWAY GRADE CROSSINGS
T-S-6	02-12-91	STANDARD MOUNTING DETAILS - BOLTED EXTRUDED PANELS
T-S-7	02-12-91	HIGHWAY SHIELDS USED ON INTERSTATE AND U.S. NUMBERED ROUTES
T-S-8	07-15-91	HIGHWAY SHIELDS USED ON STATE NUMBERED ROUTES AND ARROWS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

T-S-9	05-27-03	STANDARD LAYOUT - GROUND MOUNTED SIGNS
T-S-10	05-27-03	STANDARD MOUNTING DETAILS - FLAT SHEET SIGNS, ALUMINUM-STEEL DESIGN
T-S-11	05-27-01	DELINEATOR AND MILEPOST DETAILS
T-S-12	05-27-03	STANDARD STEEL GROUND MOUNTED SIGNS, BREAK-AWAY TYPE POST FOOTING DETAILS, SQUARE TUBES
T-S-13	05-27-01	STANDARD STEEL GROUND MOUNTED SIGNS, BREAK-AWAY TYPE POST FOOTING DETAILS, I-BEAMS
T-S-14	05-27-01	STANDARD STEEL GROUND MOUNTED SIGNS, BREAK-AWAY TYPE POST FOOTING DETAILS, WF-BEAMS
T-S-15	12-07-90	STANDARD CONDUIT & GROUND DETAILS FOR OVERHEAD & CANTILEVER SIGN STRUCTURES
T-S-16	10-23-06	GROUND MOUNTED ROADSIDE SIGN AND DETAILS
T-S-16A		GROUND MOUNTED ROADSIDE SIGN PLACEMENT DETAILS
T-S-17	10-26-96	STANDARD GROUND MOUNTED SIGN USING PERFORATED/KNOCKOUT SQUARE TUBE
T-S-18	05-27-01	END OF ROADWAY AND DEAD END SIGNS, METAL BARRICADES (TYPE III) & WORK ZONE SPEED SIGNS
T-S-19	07-29-91	STANDARD MEMBERS BENDAWAY SIGN SUPPORTS STEEL DESIGN
T-S-20	05-27-01	SIGN DETAILS
T-SG-1	07-29-04	WOOD POLE, DETAILS FOR SPAN MOUNTED SIGNALS
T-SG-2	07-29-04	LOOP LEAD-INS CONDUIT AND PULL BOXES
T-SG-3	11-11-04	STANDARD NOTES AND DETAILS OF INDUCTIVE LOOPS
T-SG-3A		ALTERNATE DETECTION DETAILS
T-SG-4		SPAN WIRE AND MESSENGER CABLE DETAILS
T-SG-5	07-29-04	CONTROLLER CABINET DETAILS
T-SG-7	07-29-04	SIGNAL HEAD ASSEMBLIES AND PEDESTRIAN PUSH BUTTON SIGNS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

T-SG-7A	07-29-04	TYPICAL SIGNAL HEAD PLACEMENT
T-SG-8	07-29-04	STRAIN POLE DETAILS FOR SPAN MOUNTED SIGNALS
T-SG-9	11-16-07	DETAILS OF CANTILEVER SIGNAL SUPPORT
T-SG-9A		MISCELLANEOUS SIGNAL DETAILS
T-SG-10	02-15-07	MAST ARM POLE AND STRAIN POLES FOUNDATION DETAILS
T-SG-11	07-29-04	MAINTENANCE OF EXISTING SIGNALS DURING HIGHWAY CONSTRUCTION
T-SG-12	07-29-04	TYPICAL WIRING FOR SIGNAL HEADS AND DETECTION LOOPS
T-SG-13		FLASHING BEACON DETAIL
T-WZ-10	01-19-01	ADVANCE ROAD WORK SIGNING ON HIGHWAYS AND FREEWAYS
T-WZ-11	03-13-09	ONE LANE CLOSURE DETAIL ON DIVIDED HIGHWAYS
T-WZ-12	03-13-09	ONE LANE CLOSURE DETAIL FOR BRIDGES ON DIVIDED HIGHWAYS
T-WZ-13	03-13-09	TWO-OUTSIDE LANE CLOSURE ON FREEWAY OR EXPRESSWAY
T-WZ-14	03-13-09	TWO-OUTSIDE LANE CLOSURE ON INTERSTATE AND EXPRESSWAY (PORTABLE BARRIER RAIL)
T-WZ-15	03-13-09	INTERIOR LANE CLOSURE ON FREEWAYS OR EXPRESSWAYS
T-WZ-16	03-13-09	LANE SHIFT ON DIVIDED HIGHWAYS AND FREEWAYS
T-WZ-18	03-13-09	SHOULDER CLOSURE DETAIL FOR FREEWAYS AND DIVIDED HIGHWAYS
T-WZ-19	03-13-09	MEDIAN CROSS-OVER DETAIL ON DIVIDED HIGHWAYS
T-WZ-20	12-18-99	GEOMETRIC MEDIAN CROSS-OVER DETAIL ON DIVIDED HIGHWAYS
T-WZ-21	09-01-05	LANE CLOSURE WITH LEFT HAND MERGE AND LANE SHIFT
T-WZ-30	09-01-05	TRAFFIC CONTROL 2-LANE, 2-WAY DIVERSION (40 MPH OR LESS)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

T-WZ-31	09-01-05	TRAFFIC CONTROL 2-LANE, 2-WAY DIVERSION (GREATER THAN 40 MPH)
T-WZ-32	03-03-06	TRAFFIC CONTROL PLAN SIGNAL LAYOUT FOR TRAFFIC SIGNAL AT TWO LANE BRIDGE RECONSTRUCTION SITE
T-WZ-33	05-27-98	TRAFFIC CONTROL PLAN FOR CLOSE INTERSECTION CONDITIONS USING TRAFFIC SIGNAL AT TWO LANE BRIDGE RECONSTRUCTION SITE
T-WZ-34	09-01-05	TRAFFIC CONTROL PLAN GENERAL NOTES FOR TRAFFIC SIGNAL AT TWO LANE BRIDGE RECONSTRUCTION SITE
T-WZ-35	07-29-03	TRAFFIC CONTROL PLAN PAY ITEM AND SIGN DETAILS FOR TRAFFIC SIGNAL AT TWO LANE BRIDGE RECONSTRUCTION SITE
T-WZ-36	09-01-05	LANE CLOSURE ON LOW-VOLUME 2-LANE HIGHWAY
T-WZ-40	09-01-05	RIGHT LANE CLOSURES AT NEAR SIDE OF INTERSECTIONS
T-WZ-41	09-01-05	LEFT LANE CLOSURES AT NEAR SIDE OF INTERSECTIONS
T-WZ-42	09-01-05	CENTER LANE CLOSURES AT NEAR SIDE OF INTERSECTIONS
T-WZ-50	07-29-03	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 2 OR 3 LANE MAJOR ROUTES
T-WZ-51	07-29-03	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 4 OR 5 LANE MAJOR ROUTES
T-WZ-52	07-29-03	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 4 OR 5 LANE MAJOR AND MINOR ROUTES
T-WZ-53	07-29-03	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 4 OR MORE LANE DIVIDED MAJOR ROUTES
T-WZ-54	07-29-03	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 4 OR MORE LANE DIVIDED MAJOR ROUTES AND 4 OR MORE LANE MINOR ROUTES

EROSION PREVENTION AND SEDIMENT CONTROL

EC-STR-1	04-01-08	DEWATERING STRUCTURE
EC-STR-2	04-01-08	SEDIMENT FILTER BAG
EC-STR-3B	04-01-08	SILT FENCE

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

EC-STR-3C	04-01-08	SILT FENCE WITH WIRE BACKING
EC-STR-3D	04-01-08	ENHANCED SILT FENCE
EC-STR-3E	04-01-08	SILT FENCE FABRIC JOINING DETAILS
EC-STR-4	04-01-08	ENHANCED SILT FENCE CHECK (TRAPEZOIDAL DITCH)
EC-STR-4A	04-01-08	ENHANCED SILT FENCE CHECK (V-DITCH)
EC-STR-6	04-01-08	ROCK CHECK DAM
EC-STR-6A		ENHANCED ROCK CHECK DAM
EC-STR-7	04-01-08	SEDIMENT TRAP WITH CHECK DAM
EC-STR-8		FILTER SOCK
EC-STR-11	04-01-08	CULVERT PROTECTION TYPE 1
EC-STR-11A		CULVERT PROTECTION TYPE 2
EC-STR-12	04-01-08	ROCK SEDIMENT DAM
EC-STR-13	04-01-08	ROCK AND EARTH SEDIMENT EMBANKMENT
EC-STR-15	04-01-08	SEDIMENT BASIN
EC-STR-16	04-01-08	SEDIMENT BASINS RISER AND COLLAR APPURTENANCES
EC-STR-17	04-01-08	SEDIMENT BASIN EMBANKMENT DETAILS
EC-STR-19	04-01-08	CATCH BASIN PROTECTION
EC-STR-21	04-01-08	PERMANENT RIPRAP BASIN ENERGY DISSIPATOR
EC-STR-25	04-01-08	TEMPORARY CULVERT CROSSING, CONSTRUCTION EXIT, CONSTRUCTION FORD
EC-STR-27	04-01-08	TEMPORARY SLOPE DRAIN AND BERM
EC-STR-29	04-01-08	PERMANENT SLOPE DRAIN PIPE
EC-STR-31	04-01-08	TEMPORARY DIVERSION CHANNEL
EC-STR-31A	04-01-08	TEMPORARY DIVERSION CHANNEL DESIGN
EC-STR-32	04-01-08	TEMPORARY DIVERSION CULVERTS
EC-STR-33	04-01-08	SUSPENDED PIPE DIVERSION (DOWNSTREAM)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

EC-STR-33A	04-01-08	SUSPENDED PIPE DIVERSION (UPSTREAM)
EC-STR-34	04-01-08	EROSION CONTROL BLANKET FOR SLOPE INSTALLATION
EC-STR-35	04-01-08	FILTER BERMS
EC-STR-36	04-01-08	TURF REINFORCEMENT MAT FOR CHANNEL INSTALLATION
EC-STR-37	04-01-08	SEDIMENT TUBE
EC-STR-38	04-01-08	FLOATING TURBIDITY CURTAIN
EC-STR-39	04-01-08	CURB INLET PROTECTION TYPE 1 & 2
EC-STR-39A	04-01-08	CURB INLET PROTECTION TYPE 3 & 4
EC-STE-40		CATCH BASIN FILTER ASSEMBLY FOR CIRCULAR STRUCTURES
EC-STR-41		CATCH BASIN FILTER ASSEMBLY (TYPE 1)
EC-STR-41A		CATCH BASIN FILTER ASSEMBLY (TYPE 1) SLIPCOVER DETAILS
EC-STR-42		CATCH BASIN FILTER ASSEMBLY (TYPE 2)
EC-STR-42A		CATCH BASIN FILTER ASSEMBLY (TYPE 2) SLIPCOVER DETAILS
EC-STR-43		CATCH BASIN FILTER ASSEMBLY (TYPE 3)
EC-STR-43A		CATCH BASIN FILTER ASSEMBLY (TYPE 3) SLIPCOVER DETAILS
EC-STR-44		CATCH BASIN FILTER ASSEMBLY (TYPE 4)
EC-STR-44A		CATCH BASIN FILTER ASSEMBLY (TYPE 4) SLIPCOVER DETAILS
EC-STR-45		CATCH BASIN FILTER ASSEMBLY (TYPE 5)
EC-STR-45A		CATCH BASIN FILTER ASSEMBLY (TYPE 5) SLIPCOVER DETAILS
EC-STR-46		CATCH BASIN FILTER ASSEMBLY (TYPE 6)
EC-STR-46A		CATCH BASIN FILTER ASSEMBLY (TYPE 6) SLIPCOVER DETAILS
EC-STR-47		CATCH BASIN FILTER ASSEMBLY (TYPE 7)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

EC-STR-47A		CATCH BASIN FILTER ASSEMBLY (TYPE 7) SLIPCOVER DETAILS
EC-STR-48		CATCH BASIN FILTER ASSEMBLY (TYPE 8)
EC-STR-48A		CATCH BASIN FILTER ASSEMBLY (TYPE 8) SLIPCOVER DETAILS
EC-STR-49		CATCH BASIN FILTER ASSEMBLY (TYPE 9)
EC-STR-49A		CATCH BASIN FILTER ASSEMBLY (TYPE 9) SLIPCOVER DETAILS
EC-STR-50		CATCH BASIN FILTER ASSEMBLY (TYPE 10)
EC-STR-50A		CATCH BASIN FILTER ASSEMBLY (TYPE 10) SLIPCOVER DETAILS
EC-STR-51		CATCH BASIN FILTER ASSEMBLY (TYPE 11)
EC-STR-51A		CATCH BASIN FILTER ASSEMBLY (TYPE 11) SLIPCOVER DETAILS
EC-STR-55	04-01-08	GABION CHECK DAM
EC-STR-56	04-01-08	GABION CHECK DAM DESIGN TABLES
EC-STR-57	04-01-08	GABION ASSEMBLY DETAILS
EC-STR-58	04-01-08	GABION ASSEMBLY DETAILS
EC-STR-59	04-01-08	GABION CHECK DAM GENERAL NOTES AND COMPONENT PROPERTIES
EC-STR-61		LEVEL SPREADERS
EL-P-10	05-27-96	TYPICAL ROADWAY LANDSCAPE PLANTING DETAILS
EL-P-11	05-27-96	TYPICAL MATURE PLANT SPREAD AND CRITERIA FOR PROXIMITY TO ROADWAY
EL-W-1	05-27-96	DETAILS OF TREE WALLS
EL-W-2	05-27-01	STANDARD GRAVITY-TYPE RETAINING WALLS

(This page intentionally left blank.)

CHAPTER 2 – STANDARD STRUCTURE DRAWINGS

STRUCTURE DESIGN STANDARD DRAWINGS

BRIDGE APPURTENANCES ENGLISH (NEW STRUCTURES)

STD-1-1	07-31-00	BRIDGE RAILING CONCRETE PARAPET
STD-1-1SS	10-15-08	BRIDGE RAILING SINGLE SLOPE CONCRETE PARAPET
STD-1-2	03-28-08	SLIDER PLATE AND DECK DRAIN
STD-1-2SS		SLIDER PLATES FOR SINGLE SLOPE PARAPETS AND DECK DRAINS
STD-1-3	07-31-00	STD. CONCRETE MEDIAN BARRIER
STD-1-3SS		STD. SINGLE SLOPE CONCRETE MEDIAN BARRIER
STD-1-4	01-05-01	SLIDER PLATES FOR MEDIAN BARRIER
STD-1-4SS		SLIDER PLATE ASSEMBLIES FOR SINGLE SLOPE MEDIAN BARRIER
STD-1-5	04-08-05	PAVEMENT AT BRIDGE ENDS
STD-1-6	04-28-97	BRIDGE END DRAIN W/ PABE
STD-1-7	07-31-00	BRIDGE END DRAIN W/ PABE
STD-1-8	05-01-95	BRIDGE END DRAIN 2' X 8' 7" W/PABE
STD-1-9	05-01-95	BRIDGE END DRAIN 4' X 7" W/PABE
STD-1-10	03-28-94	BRIDGE END DRAIN W/O PABE
STD-1-11	05-21-99	BRIDGE END DRAIN W/O PABE
STD-1-12	03-28-94	BRIDGE END DRAIN 2'x8'7" W/O PABE
STD-1-13	03-28-94	BRIDGE END DRAIN 4'x8'7" W/O PABE
STD-2-1	10-15-08	BRIDGE MOUNTED INTERCONNECTED PORTABLE BARRIER RAIL
STD-2-2		VERTICAL PANEL DETAILS
STD-3-1	02-14-94	STRIPSEAL EXPANSION JOINT
STD-3-2	02-14-94	STRIPSEAL EXPANSION JOINT

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

STD-4-1	04-08-05	STD. PRECAST PRESTRESSED BRIDGE DECK PANELS GENERAL DETAILS
STD-4-2	04-08-05	STD. PRECAST PRESTRESSED BRIDGE DECK PANELS DESIGN CRITERIA
STD-4-3	03-02-02	STD.PRECAST PRESTRESSED BRIDGE DECK PANELS GENERAL DETAILS
STD-4-4	06-10-96	STD. PRECAST PRESTRESSED BRIDGE DECK PANELS CONSTRUCTION DETAILS
STD-5-1	10-25-93	STD. PILE DETAILS
STD-5-2	04-08-05	STD. PILE DETAILS
STD-6-1	05-21-99	STANDARD SEISMIC DETAILS
STD-6-2	11-07-94	STANDARD SEISMIC DETAILS
STD-7-1	07-31-00	STD. CONCRETE RAIL
STD-8-2	04-08-05	LIGHT STANDARD SUPPORT DETAILS
STD-8-2SS		SINGLE SLOPE PARAPET STANDARD LIGHT SUPPORT DETAILS
STD-8-3	09-01-91	MEDIAN BARRIER LIGHT STANDARD SUPPORT DETAILS
STD-8-3SS		SINGLE SLOPE MEDIAN BARRIER STANDARD LIGHT SUPPORT DETAILS
STD-8-4		SIGN, LUMINAIRE, AND TRAFFIC SIGNAL SUPPORTS
STD-9-1	10-07-08	REINFORCING BAR SUPPORT DETAILS FOR CONCRETE SLABS
STD-10-1	04-08-05	MISCELLANEOUS ABUTMENT AND DRAINAGE DETAILS
STD-11-1	08-13-02	BRIDGE RAILING W/ STRUCTURAL TUBING
STD-11-2		STANDARD CONCRETE CLASSIC RAIL
STD-14-1	10-15-08	STD. DETAILS AND INT. DIAPH.DETAILS FOR BULB – TEE BEAMS
STD-14-2	10-15-08	STD. DETAILS AND INT. DIAPH.DETAILS FOR I-BEAMS
STD-14-3	10-15-08	STD. DETAILS FOR PRESTRESSED BOX BEAMS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

STD-16-1 ALUMINUM ARCH CULVERT HADWALL DETAILS

BRIDGE APPURTENANCES ENGLISH (BOX CULVERTS)

STD-15-1	11-06-08	INDEX OF DRAWINGS AND TERMINOLOGY
STD-15-2	3-28-08	GENERAL NOTES
STD-15-3	02-28-03	DESIGN SECTION LIMITS
STD-15-4	12-07-01	TYPICAL SECTION AND DETAILS
STD-15-5	02-28-03	TYPICAL ELEVATION
STD-15-6	03-28-08	CURB AND RAIL DETAILS SKEW NOT LESS THAN 45 DEG.
STD-15-7	03-02-02	STANDARD EDGE BEAM DETAILS FOR FILLS GREATER THAN 3' - 8"
STD-15-8	12-07-01	INTERIOR WALL END TREATMENTS
STD-15-9	02-28-03	TYPICAL WINGWALL DETAILS AND NOTES
STD-15-10	11-06-08	WINGWALL DIMENSIONS AND QUANTITIES
STD-15-11		WINGWALL DIMENSIONS AND QUANTITIES
STD-15-12	03-28-08	WINGWALL & SPECIAL RETAINING WALL DESIGN SECTION
STD-15-13		WINGWALL DESIGN SECTION
STD-15-14	02-28-03	BACKFILL AND DRAINAGE DETAILS
STD-15-15		BACKFILL AND DRAINAGE DETAILS
STD-15-16	12-07-01	PAVED OUTLET DETAIL
STD-15-16A		LOW FLOW CHANNEL CONSTRUCTION DETAILS FOR CULVERT INLET AND OUTLET
STD-15-17		DEBRIS DEFLECTION WALL
STD-15-18		DEBRIS DEFLECTION WALL
STD-15-19		SIDEWALK AND MISCELLANEOUS DETAILS
STD-15-20		WARPED SLOPE DETAIL
STD-15-21	03-02-02	STAGE CONSTRUCTION JOINT DETAIL (FILL ABOVE TOP OF

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

		SLAB NOT GREATER THAN 3'-8")
STD-15-22	02-28-03	EXTENSION DETAILS
STD-15-23	12-07-01	EXTENSION DETAILS FOR SCOURED OUTLET
STD-15-24	12-07-01	END SECTION DETAILS
STD-15-25		PRECAST BOX CULVERT DETAILS
STD-15-26		PRECAST BOX CULVERT DETAILS
STD-15-27		PRECAST BOX CULVERT DETAILS
STD-15-28		PRECAST BOX CULVERT DETAILS
STD-15-29		PRECAST BOX CULVERT DETAILS
STD-15-30		STANDARD INTERNAL ENERGY DISSIPATOR FOR BOX AND PIPE CULVERTS
STD-15-35		BOX BRIDGE, 1 BARREL AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-15-36		BOX BRIDGE, 1 BARREL AT 8', CLEAR HTS. 3' - 4', 0 - 60' FILL
STD-15-37		BOX BRIDGE, 1 BARREL AT 8', CLEAR HTS. 5' - 8', 0 - 60' FILL
STD-15-38	09-19-06	BOX BRIDGE, 1 BARREL AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-39		BOX BRIDGE, 1 BARREL AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-15-40		BOX BRIDGE, 1 BARREL AT 12', CLEAR HTS. 4' - 7', 0 TO 60' FILL
STD-15-41		BOX BRIDGE, 1 BARREL AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL
STD-15-42		BOX BRIDGE, 1 BARREL AT 14', CLEAR HTS. 5' - 7', 0 - 60' FILL
STD-15-43		BOX BRIDGE, 1 BARREL AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-15-44		BOX BRIDGE, 1 BARREL AT 14', CLEAR HTS. 12' - 14', 0 - 60' FILL

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

STD-15-45	BOX BRIDGE, 1 BARREL AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-46	BOX BRIDGE, 1 BARREL AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-15-47	BOX BRIDGE, 1 BARREL AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-15-48	BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-49	BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 9' - 13', 0 - 60' FILL
STD-15-50	BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 14' - 18', 0 - 60' FILL
STD-15-55	BOX BRIDGE, 2 BARRELS AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-15-56	BOX BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 3' - 4', 0 - 60' FILL
STD-15-57	BOX BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 5' - 8', 0 - 60' FILL
STD-15-58	BOX BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-59	BOX BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-15-60	BOX BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 4' - 7', 0 TO 60' FILL
STD-15-61	BOX BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL
STD-15-62	BOX BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 5' - 7', 0 - 60' FILL
STD-15-63	BOX BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-15-64	BOX BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-15-65	BOX BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

STD-15-66		BOX BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-15-67		BOX BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-15-68		BOX BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-69		BOX BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 9' - 13', 0 - 60' FILL
STD-15-70		BOX BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 14' - 18', 0 - 60' FILL
STD-15-75		BOX BRIDGE, 3 BARRELS AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-15-76		BOX BRIDGE, 3 BARRELS AT 8', CLEAR HTS. 3' - 4', 0 - 60' FILL
STD-15-77	12-07-01	BOX BRIDGE, 3 BARRELS AT 8', CLEAR HTS. 5' - 8', 0 - 60' FILL
STD-15-78	12-07-01	BOX BRIDGE, 3 BARRELS AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-79	12-07-01	BOX BRIDGE, 3 BARRELS AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-15-80		BOX BRIDGE, 3 BARRELS AT 12', CLEAR HTS. 4' - 7', 0 TO 60' FILL
STD-15-81		BOX BRIDGE, 3 BARRELS AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL
STD-15-82		BOX BRIDGE, 3 BARRELS AT 14', CLEAR HTS. 5' - 7', 0 - 60' FILL
STD-15-83		BOX BRIDGE, 3 BARRELS AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-15-84		BOX BRIDGE, 3 BARRELS AT 14', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-15-85		BOX BRIDGE, 3 BARRELS AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-86		BOX BRIDGE, 3 BARRELS AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

STD-15-87		BOX BRIDGE, 3 BARRELS AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-15-88		BOX BRIDGE, 3 BARRELS AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-89		BOX BRIDGE, 3 BARRELS AT 18', CLEAR HTS. 9' - 13', 0 - 60' FILL
STD-15-90		BOX BRIDGE, 3 BARRELS AT 18', CLEAR HTS. 14' - 18', 0 - 60' FILL
STD-15-95		SLAB BRIDGE, 1 BARREL AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-15-96		SLAB BRIDGE, 1 BARREL AT 8', CLEAR HTS. 3' - 4', 0 - 60' FILL
STD-15-97		SLAB BRIDGE, 1 BARREL AT 8', CLEAR HTS. 5' - 8', 0 - 60' FILL
STD-15-98		SLAB BRIDGE, 1 BARREL AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-99	02-28-03	SLAB BRIDGE, 1 BARREL AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-15-100	02-28-03	SLAB BRIDGE, 1 BARREL AT 12', CLEAR HTS. 4' - 7', 0 TO 60' FILL
STD-15-101	02-28-03	SLAB BRIDGE, 1 BARREL AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL
STD-15-102		SLAB BRIDGE, 1 BARREL AT 14', CLEAR HTS. 5' - 9', 0 - 60' FILL
STD-15-103		SLAB BRIDGE, 1 BARREL AT 14', CLEAR HTS. 10' - 14', 0 - 60' FILL
STD-15-104		SLAB BRIDGE, 1 BARREL AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-105		SLAB BRIDGE, 1 BARREL AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-15-106		SLAB BRIDGE, 1 BARREL AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-15-107		SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

STD-15-108		SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 9' - 13', 0-60' FILL
STD-15-109		SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 14' - 18', 0 - 60' FILL
STD-15-115	02-28-03	SLAB BRIDGE, 2 BARRELS AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-15-116	02-28-03	SLAB BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 3' - 4', 0 - 60' FILL
STD-15-117	02-28-03	SLAB BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 5' - 8', 0 - 60' FILL
STD-15-118	02-28-03	SLAB BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-119	02-28-03	SLAB BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-15-120	02-28-03	SLAB BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 4' - 7', 0 TO 60' FILL
STD-15-121	02-28-03	SLAB BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL
STD-15-122	02-28-03	SLAB BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 5' - 7', 0 - 60' FILL
STD-15-123	02-28-03	SLAB BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-15-124	02-28-03	SLAB BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-15-125	02-28-03	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-126	02-28-03	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-15-127	02-28-03	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-15-128	02-28-03	SLAB BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-129	02-28-03	SLAB BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 9' - 13', 0 - 60' FILL

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

STD-15-130	02-28-03	SLAB BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 14' – 18', 0 - 60' FILL
STD-15-135		SLAB BRIDGE, 3 BARRELS AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-15-136		SLAB BRIDGE, 3 BARRELS AT 8', CLEAR HTS. 3' - 4', 0 - 60' FILL
STD-15-137		SLAB BRIDGE, 3 BARRELS AT 8', CLEAR HTS. 5' - 8', 0 - 60' FILL
STD-15-138		SLAB BRIDGE, 3 BARRELS AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-139		SLAB BRIDGE, 3 BARRELS AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-15-140		SLAB BRIDGE, 3 BARRELS AT 12', CLEAR HTS. 4' - 7', 0 TO 60' FILL
STD-15-141		SLAB BRIDGE, 3 BARRELS AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL
STD-15-142		SLAB BRIDGE, 3 BARRELS AT 14', CLEAR HTS. 5' - 7', 0 - 60' FILL
STD-15-143		SLAB BRIDGE, 3 BARRELS AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-15-144		SLAB BRIDGE, 3 BARRELS AT 14', CLEAR HTS. 12' – 14', 0 - 60' FILL
STD-15-145		SLAB BRIDGE, 3 BARRELS AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-146		SLAB BRIDGE, 3 BARRELS AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-15-147		SLAB BRIDGE, 3 BARRELS AT 16', CLEAR HTS. 13' – 16', 0 - 60' FILL
STD-15-148	12-07-01	SLAB BRIDGE, 3 BARRELS AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-149	12-07-01	SLAB BRIDGE, 3 BARRELS AT 18', CLEAR HTS. 9' - 13', 0 - 60' FILL
STD-15-150	12-07-01	SLAB BRIDGE, 3 BARRELS AT 18', CLEAR HTS. 14' – 18', 0 - 60' FILL

BRIDGE APPURTENANCES ENGLISH (BRIDGE REPAIRS)

SBR-2-115	01-04-96	GENERAL NOTES AND DETAILS FOR EXPANSION JOINT REPLACEMENT CONSTRUCTION TYPES "A" THRU "J" - 1991
SBR-2-116	01-04-96	GENERAL DETAILS FOR STRIPSEAL EXPANSION JOINT REPLACEMENT CONSTRUCTION DETAILS TYPES "A" THRU "J" - 1991
SBR-2-117	05-30-96	STRIPSEAL EXPANSION JOINTS - REPLACEMENT CONSTRUCTION DETAILS TYPE "A" AND TYPE "B" - 1991
SBR-2-118	05-30-96	STRIPSEAL EXPANSION JOINT REPLACEMENT CONSTRUCTION DETAILS TYPE "C" AND TYPE "D" - 1991
SBR-2-119	05-30-96	STRIPSEAL EXPANSION JOINT REPLACEMENT CONSTRUCTION DETAILS TYPE "E" AND TYPE "F" - 1991
SBR-2-120	05-30-96	STRIPSEAL EXPANSION JOINT REPLACEMENT CONSTRUCTION DETAILS TYPE "G" AND "H" - 1991
SBR-2-121	01-04-96	STRIPSEAL EXPANSION JOINT REPLACEMENT CONSTRUCTION DETAILS TYPE "J" - 1991
SBR-2-122	01-04-96	DETAILS FOR PRECAST SLAB BRIDGE CHANNELS, SPANS 16' - 0" THRU 34' - 0", DEGREE OF SKEW 90 - 75 - 60 - 45 - 1992
SBR-2-123	01-04-96	DETAILS FOR PRECAST SLAB BRIDGE CHANNELS, SPANS 16' - 0" THRU 34' - 0", DEGREE OF SKEW 90 - 75 - 60 - 45 - 1992
SBR-2-124	01-04-96	DETAILS SHOWING REPLACEMENT OF EXISTING BRIDGERAIL SYSTEM WITH NEW JERSEY SHAPE CONCRETE PARAPET AND NEW 10' -2" ENDPOST - 1988
SBR-2-125	11-05-01	DETAILS SHOWING REPLACEMENT OF EXISTING BRIDGERAIL SYSTEM WITH NEW JERSEY SHAPE CONCRETE PARAPET AND NEW 10' -2" ENDPOST - 1988
SBR-2-126	01-04-96	DETAILS SHOWING REPLACEMENT OF EXISTING BRIDGERAIL SYSTEM WITH NEW JERSEY SHAPE CONCRETE PARAPET AND NEW 10' -2" ENDPOST - 1988
SBR-2-127	11-05-01	DETAILS SHOWING PIER PROTECTION WITH NEW CONCRETE BARRIER WALL - 1988

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 04/07/08

SBR-2-128	01-04-96	DETAILS SHOWING PIER PROTECTION WITH NEW CONCRETE BARRIER WALL - 1988
SBR-2-129	11-05-01	DETAILS SHOWING PIER PROTECTION WITH NEW VERTICAL CONCRETE BARRIER - 1988
SBR-2-130	01-04-96	DETAILS SHOWING PIER PROTECTION WITH NEW VERTICAL CONCRETE BARRIER - 1988
SBR-2-131	01-22-02	DETAILS SHOWING GUARDRAIL ATTACHMENT AT BRIDGE ENDS TO EXISTING CONCRETE SLOPE FACE ENDPOST - 1989
SBR-2-132	01-04-96	DETAILS SHOWING GUARDRAIL ATTACHMENT AT BRIDGE ENDS EXISTING CONCRETE SLOPE FACE ENDPOST - 1989
SBR-2-133	01-22-02	DETAILS SHOWING GUARDRAIL ATTACHMENT AT BRIDGE ENDS TO EXISTING CONCRETE VERTICAL FACE ENDPOST - 1989
SBR-2-134	01-04-96	DETAILS SHOWING GUARDRAIL ATTACHMENT AT BRIDGE ENDS TO EXISTING CONCRETE VERTICAL FACE ENDPOST - 1989
SBR-2-135	01-22-02	GUARDRAIL ATACHMENT TO EXISTING PIER PROTECTION - 1991
SBR-2-136	11-05-01	STANDARD DRAWING FOR REPLACING EXISTING CONCRETE ENDPOST AND GUARDRAIL AT EXISTING BRIDGE ENDS - 1992
SBR-2-137	11-05-01	STANDARD SHOWING DETAILS FOR ATTACHING NEW GUARDRAIL TO EXISTING END OF BRIDGE - 1992
SBR-2-138	11-05-01	STANDARD SHOWING DETAILS FOR ATTACHING NEW GUARDRAIL AT EXISTING BRIDGE END AND ALONG EXISTING BRIDGE RAIL - 1992
SBR-2-140	11-05-01	STANDARD SHOWING DETAILS FOR ATTACHING NEW GUARDRAIL ALONG EXISTING BRIDGE RAILS - 1992
SBR-2-144	01-22-02	STANDARD SHOWING DETAILS OF ATTACHING GUARDRAIL BRIDGERAIL TO TOP OF EXISTING CURBS - 1992

SECTION VI – GENERAL NOTES AND SPECIAL NOTES

CHAPTER 1 – GENERAL NOTES

6-100.00	GRADING
6-105.00	SEEDING AND SODDING
6-110.00	GUARDRAIL
6-115.00	DRAINAGE
6-120.00	UTILITIES
6-125.00	FENCING
6-130.00	MISCELLANEOUS
6-135.00	ROAD CLOSURE
6-140.00	RIGHT – OF – WAY
6-145.00	PAVEMENT MARKINGS
6-150.00	PAVEMENT
6-150.01	PAVING
6-150.02	RESURFACING
6-155.00	GRADED SOLID ROCK
6-160.00	RIPRAP
6-165.00	SIGNING
6-170.00	TRAFFIC CONTROL DIRECTIONAL SIGNING
6-175.00	SIGNALIZATION
6-180.00	CONSTRUCTION WORK ZONE & TRAFFIC CONTROL
6-185.00	LIGHTING
6-190.00	EROSION PREVENTION AND SEDIMENT CONTROL
6-190.01	DISTURBED AREA
6-190.02	SEDIMENT CONTROL
6-190.03	STREAM/WETLAND

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- 6-190.04 SPECIES
- 6-190.05 INSPECTION, MAINTENANCE, REPAIR
- 6-190.06 MATERIALS
- 6-190.07 SWPPP, PERMITS, PLANS, RECORDS
- 6-190.08 LITTER, DEBRIS, WASTE, PETROLEUM

CHAPTER 2 – SPECIAL NOTES

- 6-200.00 GRADING
- 6-250.00 PAVEMENT
 - 6-250.02 RESURFACING
 - 6-250.03 PAVEMENT EDGE DROP-OFF TRAFFIC CONTROL
- 6-270.00 SIGNALIZATION
- 6-290.00 EROSION PREVENTION AND SEDIMENT CONTROL
 - 6-290.01 STREAM/WETLAND
 - 6-290.02 HIGH QUALITY WATERS
 - 6-290.03 NPDES
 - 6-290.04 UTILITY RELOCATION
 - 6-290.05 LITTER, DEBRIS, WASTE, PETROLEUM
 - 6-290.06 POLYACRYLAMIDE
- 6-295.00 ENVIRONMENTAL
 - 6-295.01 ECOLOGY
 - 6-295.02 STREAM RELOCATION

SECTION VI – GENERAL NOTES AND SPECIAL NOTES

CHAPTER 1 – GENERAL NOTES

6-100.00 GRADING

- (1) ANY AREA THAT IS DISTURBED OUTSIDE LIMITS OF CONSTRUCTION DURING THE LIFE OF THIS PROJECT SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
- (2) CERTIFICATION FOR ALL BORROW PITS MUST BE OBTAINED IN ACCORDANCE WITH SUBSECTION 107.06 OF THE STANDARD SPECIFICATIONS.
- (3) THE CONTRACTOR SHALL NOT DISPOSE OF ANY MATERIAL EITHER ON OR OFF STATE-OWNED R.O.W. IN A REGULATORY FLOOD WAY AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY WITHOUT APPROVAL BY SAME. ALL MATERIAL SHALL BE DISPOSED OF IN UPLAND (NON-WETLAND) AREAS AND ABOVE ORDINARY HIGH WATER OF ANY ADJACENT WATERCOURSE. THIS DOES NOT ELIMINATE THE NEED TO OBTAIN ANY OTHER LICENSES OR PERMITS THAT MAY BE REQUIRED BY ANY OTHER FEDERAL, STATE OR LOCAL AGENCY.
- (4) ARCHAEOLOGICAL SITE NO. _____ MUST BE AVOIDED AS A SOURCE OF FILL OR HEAVY MACHINERY STAGING AREA. EARTH FILL WILL BE REQUIRED FROM AREAS OUTSIDE THE PROPOSED RIGHT-OF-WAY. CERTIFICATION MUST BE OBTAINED IN ACCORDANCE WITH SUBSECTION 107.06 OF THE STANDARD SPECIFICATIONS.

6-105.00 SEEDING AND SODDING

- (1) ALL EXISTING ROADS WITHIN THE RIGHT-OF-WAY AND NOT IN THE GRADED AREA THAT ARE TO BE ABANDONED SHALL BE SCARIFIED, OBLITERATED, TOPSOILED AND SEEDED. SCARIFYING AND OBLITERATING THE PAVEMENT WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS. TOPSOIL, IN ACCORDANCE WITH SECTION 203 OF THE STANDARD SPECIFICATIONS, WILL BE MEASURED AND PAID FOR UNDER ITEMS 203-04 AND/OR 203-07. SEEDING, IN ACCORDANCE WITH SECTION 801 OF THE STANDARD SPECIFICATIONS, WILL BE MEASURED AND PAID FOR UNDER ITEM 801-01.
- (2) SOD SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLANS TO PREVENT DAMAGE TO ADJACENT FACILITIES AND PROPERTY DUE TO EROSION ON ALL NEWLY GRADED CUT AND FILL SLOPES AS WORK PROGRESSES.

NOTE: SEE SECTION 4-801.05. NOTE (3) SHALL BE PLACED IN THE GENERAL NOTES WITH THE BLANK BEING FILLED IN WITH THE PROPER ITEM NUMBER

- (3) ITEM NO. ____ SHALL BE USED ON SLOPES 3:1 OR STEEPER AND OTHER AREAS AS INDICATED IN THE PLANS THAT ARE INACCESSIBLE FOR MOWING.
- (4) ITEM NO. 801-01, SEEDING (WITH MULCH), SHALL BE USED WHERE EROSION CONTROL BLANKET OR SOD ARE NOT APPLIED.
- (5) ITEM NO. 801-02, SEEDING (WITHOUT MULCH) AND EROSION CONTROL BLANKET, SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLANS AS WELL AS LOCATIONS DIRECTED BY THE ENGINEER.

6-110.00 GUARDRAIL

- (1) THE CONTRACTOR SHALL NOT REMOVE ANY SECTIONS OF EXISTING GUARDRAIL TO REWORK SHOULDERS OR FLATTEN SLOPES UNTIL THE ENGINEER CONCURS IN THE NECESSITY OF REMOVAL DUE TO CONSTRUCTION REQUIREMENTS AND THE APPROPRIATE WARNING DEVICES ARE INSTALLED. THE PROPOSED GUARDRAIL, INCLUDING ANY ANCHOR SYSTEM, SHALL BE INSTALLED QUICKLY TO MINIMIZE TRAFFIC EXPOSURE TO ANY HAZARD. NO PAYMENT WILL BE MADE FOR A SECTION OF PROPOSED GUARDRAIL, INCLUDING ANCHORS, UNTIL IT IS COMPLETE IN PLACE.

NOTE: NOTE (2) NOT NECESSARY IF NOTE (1) IS USED.

- (2) THE PROPOSED GUARDRAIL, INCLUDING ANY ANCHOR SYSTEM, SHALL BE INSTALLED QUICKLY TO MINIMIZE TRAFFIC EXPOSURE TO ANY HAZARD. NO PAYMENT WILL BE MADE FOR A SECTION OF PROPOSED GUARDRAIL, INCLUDING ANCHORS, UNTIL IT IS COMPLETE IN PLACE.

NOTE: NOTE (3) NOT NECESSARY IF NOTE (2) IS USED. IF BARRICADES OR DRUMS AND TYPE "A" LIGHTS ARE NOT ALREADY IN THE CONTRACT, BE SURE TO PROVIDE FOR PAYMENT.

- (3) IF ANY APPROACH END OF A SECTION OF GUARDRAIL OR BRIDGE RAIL MUST TEMPORARILY BE LEFT INCOMPLETE AND EXPOSED TO TRAFFIC, THE CONTRACTOR SHALL USE TWO (2) TEMPORARY BARRICADES OR DRUMS WITH TYPE A LIGHTS AND ROUNDED END ELEMENTS AS MINIMUM MEASURES TO PROTECT TRAFFIC FROM THE HAZARD OF AN EXPOSED END. ALL COST OF FURNISHING AND INSTALLING A TEMPORARY ROUNDED END ELEMENT SHALL BE INCLUDED IN THE COST OF THE PROPOSED GUARDRAIL.

NOTE: NOTE (4) TO BE USED ON NEW ALIGNMENT ONLY.

- (4) GUARDRAIL IS TO BE COMPLETE IN PLACE BEFORE THE MAINLINE ROADWAY IS OPENED TO TRAFFIC.

6-115.00 DRAINAGE

- (1) THE CONTRACTOR SHALL SHAPE DITCHES TO THE SPECIFIED DESIGN. THIS WORK WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS.

NOTE: SEE SECTION 4-204.00

- (2) EXCAVATION FOR _____ WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT WILL BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PIPE (PIPE CULVERTS, STORM SEWERS, CONDUITS, ALL OTHER CULVERTS AND MINOR STRUCTURES).

NOTE: SEE SECTION 4-204.05

- (3) CULVERT EXCAVATION FOR CONCRETE BOX OR SLAB TYPE CULVERTS OR BRIDGES WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS.
- (4) THE CUTTING OF INLET AND OUTLET DITCHES WHERE SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER WILL BE MEASURED AND PAID FOR AS ITEM NO. 203-01 ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED).
- (5) WHERE A CULVERT (PIPE, SLAB OR BOX) IS MOVED TO A NEW LOCATION OTHER THAN THAT SHOWN ON THE PLANS, INCREASING OR DECREASING THE AMOUNT OF CULVERT EXCAVATION, NO INCREASE OR DECREASE IN THE AMOUNT OF PAYMENT WILL BE MADE DUE TO SUCH CHANGE.
- (6) DURING CONSTRUCTION OF DRAINAGE STRUCTURES ALL COST ASSOCIATED WITH MAINTAINING THE FLOW OF WATER AND TRAFFIC, AT THESE STRUCTURES, DURING THE PHASED CONSTRUCTION OF THIS PROJECT ARE TO BE INCLUDED IN THE UNIT PRICE OF THE DRAINAGE STRUCTURES AND TRAFFIC CONTROL ITEMS.

6-120.00 UTILITIES

- (1) THE LOCATIONS OF UTILITIES SHOWN WITHIN THESE PLANS ARE APPROXIMATE ONLY. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD BY CONTACTING THE UTILITY COMPANIES INVOLVED. NOTIFICATION BY CALLING THE TENNESSEE ONE CALL SYSTEM, INC., AT 1-800-351-1111 AS REQUIRED BY TCA 65-31-106 WILL BE REQUIRED.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- (2) UNLESS OTHERWISE NOTED, ALL UTILITY ADJUSTMENTS WILL BE PERFORMED BY THE UTILITY OR IT'S REPRESENTATIVE. THE CONTRACTOR AND UTILITY OWNERS WILL BE REQUIRED TO COOPERATE WITH EACH OTHER IN ORDER TO EXPEDITE THE WORK REQUIRED BY THIS CONTRACT. ON CONTRACTS WHERE CONSTRUCTION STAKES, LINES, AND GRADES ARE CONTRACT ITEMS, THE CONTRACTOR WILL BE REQUIRED TO PROVIDE RIGHT-OF-WAY OR SLOPE STAKES, DITCH OR STREAM BED GRADES, OR OTHER ESSENTIAL SURVEY STAKING TO PREVENT CONFLICTS WITH THE HIGHWAY CONSTRUCTION. FREQUENTLY, THIS WILL BE REQUIRED AS THE FIRST ITEM OF WORK AND AT ANY LOCATION ON THE PROJECT DIRECTED BY THE ENGINEER.
- (3) THE CONTRACTOR WILL PROVIDE ALL NECESSARY PROTECTIVE MEASURES TO SAFEGUARD EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION OF THIS PROJECT. IN THE EVENT THAT SPECIAL EQUIPMENT IS REQUIRED TO WORK OVER AND AROUND THE UTILITIES, THE CONTRACTOR WILL BE REQUIRED TO FURNISH SUCH EQUIPMENT. THE COST OF PROTECTING UTILITIES FROM DAMAGE AND FURNISHING SPECIAL EQUIPMENT WILL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF CONSTRUCTION.
- (4) PRIOR TO SUBMITTING HIS BID, THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR CONTACTING OWNERS OF ALL AFFECTED UTILITIES IN ORDER TO DETERMINE THE EXTENT TO WHICH UTILITY RELOCATIONS AND/OR ADJUSTMENTS WILL HAVE UPON THE SCHEDULE OF WORK FOR THE PROJECT. WHILE SOME WORK MAY BE REQUIRED 'AROUND' UTILITY FACILITIES THAT WILL REMAIN IN PLACE, OTHER UTILITY FACILITIES MAY NEED TO BE ADJUSTED CONCURRENTLY WITH THE CONTRACTOR'S OPERATIONS. ADVANCE CLEAR CUTTING MAY BE REQUIRED BY THE ENGINEER AT ANY LOCATION WHERE CLEARING IS CALLED FOR IN THE SPECIFICATIONS AND CLEAR CUTTING IS NECESSARY FOR A UTILITY RELOCATION. ANY ADDITIONAL COST WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE CLEARING ITEM SPECIFIED IN THE PLANS.
- (5) THE CONTRACTOR SHALL NOTIFY EACH INDIVIDUAL UTILITY OWNER OF HIS PLAN OF OPERATION IN THE AREA OF THE UTILITIES. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL CONTACT THE UTILITY OWNERS AND REQUEST THEM TO PROPERLY LOCATE THEIR RESPECTIVE UTILITY ON THE GROUND. THIS NOTIFICATION SHALL BE GIVEN AT LEAST THREE (3) BUSINESS DAYS PRIOR TO COMMENCEMENT OF OPERATIONS AROUND THE UTILITY IN ACCORDANCE WITH TCA 65-31-106.

6-125.00 FENCING

- (1) LOCATION OF THE FENCE SHALL BE ONE FOOT INSIDE THE RIGHT-OF-WAY EXCEPT WHERE SHOWN ON THE PLANS.
- (2) FENCES SHALL BE TURNED IN AT DRAINAGE STRUCTURES, STOCK PASSES AND BRIDGES WHERE DIRECTED BY THE ENGINEER SO AS TO ABUT WINGWALLS AND/OR ABUTMENTS.
- (3) THE CONTRACTOR SHALL GIVE THE AFFECTED PROPERTY OWNERS TWO WEEKS NOTICE PRIOR TO CUTTING FENCES.
- (4) THE CONTRACTOR SHALL BE REQUIRED TO INSTALL ACCESS CONTROL FENCES PRIOR TO CUTTING EXISTING STOCK FENCES IN AREAS UTILIZED BY DOMESTIC LIVESTOCK OR OTHER AREAS AS DIRECTED BY THE ENGINEER.

6-130.00 MISCELLANEOUS

- (1) ALL DETOUR, ACCESS, SERVICE AND FRONTAGE ROADS SHALL BE CONSTRUCTED WITH A MINIMUM OF ONE (1) COURSE OF BASE MATERIAL BEFORE TRAFFIC IS INTERRUPTED ON EXISTING ROADS.
- (2) THE CONTRACTOR SHALL BE REQUIRED TO REMOVE AND RESET MAILBOXES WHERE AND AS DIRECTED BY THE ENGINEER.
- (3) NOTHING IN THE GENERAL NOTES OR SPECIAL PROVISIONS SHALL RELIEVE THE CONTRACTOR FROM HIS RESPONSIBILITIES TOWARD THE SAFETY AND CONVENIENCE OF THE GENERAL PUBLIC AND THE RESIDENTS ALONG THE PROPOSED CONSTRUCTION AREA

6-135.00 ROAD CLOSURE

- (1) NO LESS THAN SEVEN (7) DAYS PRIOR TO THE CLOSURE OF THE ROAD, THE CONTRACTOR SHALL NOTIFY THE FOLLOWING INDIVIDUALS OR AGENCIES COMPLETELY DESCRIBING THE AFFECTED ROADS AND THE APPROXIMATE DURATION OF THE CONSTRUCTION: THESE PARTIES INCLUDE, BUT ARE NOT LIMITED TO: (1) LOCAL LAW ENFORCEMENT OFFICE, (2) LOCAL FIRE DEPARTMENT, (3) AMBULANCE SERVICE, (4) LOCAL SCHOOL SUPERINTENDENT, (5) UNITED STATES POSTAL SERVICE, AND (6) LOCAL ROAD SUPERINTENDENT.

6-140.00 RIGHT – OF – WAY

NOTE: SEE SECTION 2-300.00. NOTES (1) OR (2) TO BE USED ON ALL ROW PROJECTS.

NOTE: NOTE (1) TO BE USED FOR PLANS PREPARED OR MANAGED IN THE HEADQUARTERS DESIGN OFFICE.

- (1) IT IS INTENDED THAT ALL BUILDINGS AND/OR PORTIONS OF BUILDINGS THAT ARE WITHIN THE PROPOSED RIGHT-OF-WAY AND/OR EASEMENT LINES FOR THE PROJECT BE REMOVED THERE FROM IN THE PROCESS OF RIGHT-OF-WAY ACQUISITION. IF ANY SUCH BUILDINGS OR IMPROVEMENTS ARE NOT REMOVED IN THE COURSE OF RIGHT-OF-WAY ACQUISITION, THE CIVIL ENGINEERING MANAGER 2, DESIGN DIVISION IS TO BE NOTIFIED IN SUFFICIENT TIME TO PERMIT HAVING SUCH REMOVALS DESIGNATED AS A PART OF THE CONSTRUCTION CONTRACT.

NOTE: NOTE (2) TO BE USED FOR PLANS PREPARED OR MANAGED IN THE REGIONAL DESIGN OFFICES.

- (2) IT IS INTENDED THAT ALL BUILDINGS AND/OR PORTIONS OF BUILDINGS THAT ARE WITHIN THE PROPOSED RIGHT-OF-WAY AND/OR EASEMENT LINES FOR THE PROJECT BE REMOVED THERE FROM IN THE PROCESS OF RIGHT-OF-WAY ACQUISITION. IF ANY SUCH BUILDINGS OR IMPROVEMENTS ARE NOT REMOVED IN THE COURSE OF RIGHT-OF-WAY ACQUISITION, THE CIVIL ENGINEERING MANAGER 2, DESIGN DIVISION AND THE CIVIL ENGINEERING MANAGER 1, REGIONAL DESIGN OFFICE, ARE TO BE NOTIFIED IN SUFFICIENT TIME TO PERMIT HAVING SUCH REMOVALS DESIGNATED AS A PART OF THE CONSTRUCTION CONTRACT.
- (3) ALL RAMPS MUST CONFORM TO THE DEPARTMENT'S "POLICY ON FINANCING CONSTRUCTION OF PUBLIC ROAD INTERSECTIONS AND DRIVEWAYS ON HIGHWAY RESURFACING, RECONSTRUCTION AND CONSTRUCTION PROJECTS ON NEW LOCATIONS", THE MANUAL ON RULES AND REGULATIONS FOR CONSTRUCTING DRIVEWAYS ON STATE HIGHWAY RIGHT-OF-WAY, STANDARD DRAWING RP-R-1, AND OTHER ACCEPTED DESIGN AND SAFETY STANDARDS.

NOTE: SEE SECTION 2-300.05. NOTES (4) THROUGH (8) ARE TO BE USED ON NEW OR RECONSTRUCTION PROJECTS WITH PARTIAL ACCESS CONTROL. NOTES (4) THROUGH (7) AND NOTE (9) GO ON ALL NEW OR RECONSTRUCTION PROJECTS WITH NO ACCESS CONTROL.

- (4) EXISTING PAVED DRIVEWAY PER TRACT REMAINDER WILL BE REPLACED IN KIND TO A TOUCHDOWN POINT.
- (5) WHERE THE EXISTING DRIVEWAY IS UNPAVED AND THE PROPOSED DRIVEWAY EXCEEDS 7 PERCENT IN GRADE, EACH DRIVEWAY WILL BE PAVED TO A TOUCHDOWN POINT OR UNTIL THE GRADE IS LESS THAN 7 PERCENT.
- (6) WHERE THE EXISTING DRIVEWAY IS UNPAVED AND THE PROPOSED DRIVEWAY IS LESS THAN 7 PERCENT IN GRADE, EACH DRIVEWAY WILL BE PAVED A SHOULDER WIDTH FROM THE EDGE OF PAVEMENT AND

THE REMAINDER OF THAT DRIVEWAY REPLACED IN KIND TO A TOUCHDOWN POINT.

- (7) ANY NECESSARY PAVING OF DRIVEWAYS WILL BE DONE DURING PAVING OPERATIONS ON THE MAIN ROADWAY.
- (8) TRACT REMAINDERS NOT HAVING AN EXISTING DRIVEWAY WILL BE PROVIDED ONE 50-FOOT OPENING IN THE ACCESS CONTROL FENCE AND A DRIVEWAY WILL BE CONSTRUCTED UNLESS ACCESS IS PROVIDED FROM AN INTERSECTING ROAD OR BASED ON PHYSICAL CONDITIONS AND/OR CONFLICTS WITH OTHER DESIGN CONSIDERATIONS WHICH PREVENT AN ACCESS OPENING. PAVING OF THESE NEW DRIVEWAYS WILL BE IN ACCORDANCE TO THE 7 PERCENT CRITERIA PREVIOUSLY MENTIONED FOR EXISTING DRIVEWAYS.
- (9) NEW DRIVEWAYS PROVIDED IN THE PLANS WILL BE PAVED BASED ON THE 7 PERCENT CRITERIA. THOSE 7 PERCENT OR STEEPER IN GRADE WILL BE PAVED AND THOSE FLATTER THAN 7 PERCENT WILL BE COVERED WITH BASE STONE.

NOTE: SEE SECTION 2-300.05. NOTES (10) AND (11) GO ON PROJECTS THAT ARE ON STATE ROUTES AND NOTE (12) GOES ON PROJECTS THAT ARE NOT ON STATE ROUTES.

- (10) ON PROJECTS WITHOUT CURB AND GUTTER THAT ARE ON STATE ROUTES, IT WILL BE THE RESPONSIBILITY OF THE OWNER TO SECURE A PERMIT AND TO CONSTRUCT ADDITIONAL DRIVEWAYS AND FIELD ENTRANCES OTHER THAN THOSE PROVIDED IN THE PLANS.
- (11) ON PROJECTS WITH CURB AND GUTTER THAT ARE ON STATE ROUTES, IT WILL BE THE RESPONSIBILITY OF THE OWNER TO SECURE A PERMIT. AFTER THE PERMIT HAS BEEN GRANTED, THE DEPARTMENT WILL CONSTRUCT THE DRIVEWAY OR FIELD ENTRANCE THROUGH THE CURB AND SIDEWALK, PROVIDED THE CURB AND SIDEWALK HAVE NOT BEEN CONSTRUCTED. IT WILL BE THE RESPONSIBILITY OF THE PROPERTY OWNER TO CONSTRUCT THE DRIVEWAY OR FIELD ENTRANCE FROM BACK OF SIDEWALK TO TOUCHDOWN POINT FOR ANY ADDITIONAL DRIVEWAYS OR FIELD ENTRANCES OTHER THAN THOSE PROVIDED IN THE PLANS.
- (12) ON NON-STATE ROUTES, ADDITIONAL DRIVEWAYS AND FIELD ENTRANCES OTHER THAN THOSE PROVIDED IN THE PLANS SHALL REQUIRE A PERMIT ONLY IF THE LOCAL AGENCY SPECIFIES THE NEED FOR THAT PERMIT.

NOTE: SEE SECTION 1-210.05.

- (13) EASEMENT REQUIRED FOR THE RAILROAD CROSSING IS TO BE OBTAINED BY THE UTILITIES ENGINEER BY PROVISIONS CONTAINED IN THE CROSSING AGREEMENT NEGOTIATED WITH THE RAILROAD.

6-145.00 PAVEMENT MARKINGS

NOTE: SEE SECTION 4-716.05 THROUGH 4-716.36.

TEMPORARY PAVEMENT MARKING ON INTERMEDIATE LAYERS

- (1) TEMPORARY PAVEMENT LINE MARKINGS ON INTERMEDIATE LAYERS OF PAVEMENT SHALL BE REFLECTIVE TAPE OR REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAYS WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.01, PAINTED PAVEMENT MARKING (4" LINE), L.M.
- (2) TEMPORARY PAVEMENT LINE MARKINGS ON INTERMEDIATE LAYERS OF PAVEMENT SHALL BE REFLECTIVE TAPE OR REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAYS WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.20, PAINTED PAVEMENT MARKING (6" LINE), L.M.
- (3) TEMPORARY PAVEMENT LINE MARKINGS ON INTERMEDIATE LAYERS OF PAVEMENT SHALL BE REFLECTIVE TAPE OR REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAYS WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.02, PAINTED PAVEMENT MARKING (8" BARRIER LINE), L.F.
- (4) WIDE (8 INCH) TEMPORARY PAVEMENT MARKING LINE WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.02 PAINTED PAVEMENT MARKING (8" BARRIER LINE), LIN. FT.

FINAL PAVEMENT MARKING IF 4" ENHANCED FLATLINE THERMOPLASTIC IS USED

- (5) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 4" ENHANCED FLATLINE THERMOPLASTIC INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-12.01, ENHANCED FLATLINE THERMO PVMT MRKNG (4IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 6" ENHANCED FLATLINE THERMOPLASTIC IS USED

- (6) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 6" ENHANCED FLATLINE THERMOPLASTIC INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-12.02, ENHANCED FLATLINE THERMO PVMT MRKNG (6IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 8" ENHANCED FLATLINE THERMOPLASTIC IS USED

- (7) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 8" ENHANCED FLATLINE THERMOPLASTIC INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-12.03, ENHANCED FLATLINE THERMO PVMT MRKNG (8IN BARRIER LINE), L.F. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN

INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 4" SPRAY THERMOPLASTIC (60 mil) IS USED

- (8) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 4" SPRAY THERMOPLASTIC (60 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.01, SPRAY THERMO PVMT MRKNG (60 mil) (4IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 6" SPRAY THERMOPLASTIC (60 mil) IS USED

- (9) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 6" SPRAY THERMOPLASTIC (60 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.02, SPRAY THERMO PVMT MRKNG (60 mil) (6IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 8" SPRAY THERMOPLASTIC (60 mil) IS USED

- (10) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 8" SPRAY THERMOPLASTIC (60 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.03, SPRAY THERMO PVMT MRKNG (60 mil) (8IN BARRIER LINE), L.F. THE CONTRACTOR SHALL HAVE THE

OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 4" SPRAY THERMOPLASTIC (40 mil) IS USED

- (11) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 4" SPRAY THERMOPLASTIC (40 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.06, SPRAY THERMO PVMT MRKNG (40 mil) (4IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 6" SPRAY THERMOPLASTIC (40 mil) IS USED

- (12) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 6" SPRAY THERMOPLASTIC (40 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.07, SPRAY THERMO PVMT MRKNG (40 mil) (6IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 8" SPRAY THERMOPLASTIC (40 mil) IS USED

- (13) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 8" SPRAY THERMOPLASTIC (40 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL

NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.08, SPRAY THERMO PVMT MRKNG (40 mil) (8IN BARRIER LINE), L.F. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF REFLECTORIZED PAINT IS USED

- (14) PERMANENT PAVEMENT LINE MARKINGS SHALL BE REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.01 PAINTED PAVEMENT MARKING (4IN LINE), L.M.
- (15) PERMANENT PAVEMENT LINE MARKINGS SHALL BE REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.20 PAINTED PAVEMENT MARKING (6IN LINE), L.M.
- (16) PERMANENT PAVEMENT LINE MARKINGS SHALL BE REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.02 PAINTED PAVEMENT MARKING (8IN BARRIER LINE), L.F.

DETOURS, LANE SHIFTS AND MEDIAN CROSS-OVERS

- (17) THE PAVEMENT MARKING ON THE _____(C)_____ FOR _____(D)_____ WILL BE INSTALLED AND MAINTAINED TO THE SAME STANDARDS AS FOR PERMANENT MARKINGS ON THE MAIN ROADWAY. THESE MARKINGS SHALL BE IN PLACE PRIOR TO ALLOWING TRAFFIC ONTO THE PAVEMENT. THESE PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. _____(E)_____, LIN. MI.

(C) NOTE: FILL IN THE BLANK WITH APPROPRIATE WORDS(S) FOR THE SPECIAL ROADWAY(S): DETOUR, LANE SHIFT, MEDIAN CROSSOVER, ETC.

(D) NOTE: FILL IN THE BLANK WITH APPROPRIATE WORD(S) FOR THE KIND OF PAVEMENT MARKING(S) NEEDED: CENTERLINE, EDGELINES, LANE LINES.

(E) NOTE: SEE SECTIONS 4-712.10 AND 4-716.11. FILL IN THE BLANK WITH ITEM NO. 716-05.01 PAINTED PAVEMENT MARKING (4IN LINE), L.M., 716-05.20 PAINTED PAVEMENT MARKING (6IN LINE), L.M., OR ITEM NO. 716-05.02 PAINTED PAVEMENT MARKING (8IN BARRIER LINE), L.F.

(18) BEFORE OPENING THE _____(C)_____ TO TRAFFIC, THE TRANSITIONAL MARKINGS ON THE EXISTING ROADWAY MUST BE IN PLACE. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM 712-09.01 REMOVABLE PAVEMENT MARKING LINE, LIN. FT. ALL EXISTING MARKINGS IN THE AREA OF THESE TRANSITIONAL MARKINGS SHALL BE OBLITERATED AND ALL EXISTING RAISED PAVEMENT MARKERS SHALL BE REMOVED TO ELIMINATE CONFLICTING MARKINGS. REMOVAL OF THE EXISTING CONFLICTING MARKINGS AND RAISED PAVEMENT MARKERS WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN ITEM NO. 712-01 TRAFFIC CONTROL, LUMP SUM.

(C) NOTE: FILL IN THE BLANK WITH APPROPRIATE WORDS(S) FOR THE SPECIAL ROADWAY(S): DETOUR, LANE SHIFT, MEDIAN CROSSOVER, ETC.

(19) BEFORE OPENING THE _____(C)_____ TO TRAFFIC, THE TRANSITIONAL MARKINGS ON THE EXISTING ROADWAY MUST BE IN PLACE. ALL EXISTING MARKINGS IN THE AREA OF THESE TRANSITIONAL MARKINGS SHALL BE OBLITERATED AND ALL EXISTING RAISED PAVEMENT MARKERS SHALL BE REMOVED TO ELIMINATE CONFLICTING MARKINGS. REMOVAL OF THE EXISTING CONFLICTING MARKINGS AND RAISED PAVEMENT MARKERS WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN ITEM NO. 712-01 TRAFFIC CONTROL, LUMP SUM.

(C) NOTE: FILL IN THE BLANK WITH APPROPRIATE WORDS(S) FOR THE SPECIAL ROADWAY(S): DETOUR, LANE SHIFT, MEDIAN CROSSOVER, ETC.

6-150.00 PAVEMENT

NOTE: NOTES (1), (2), (3), (4), (5), AND (8) ARE TO BE PLACED ON ALL RESURFACING PROJECTS ON ROADWAYS WITH SHOULDERS AND DITCHES (NO CURB AND GUTTER).

NOTE: NOTES (1), (2), (3), (6), (7), AND (8) ARE TO BE PLACED ON ALL RESURFACING PROJECTS ON ROADWAYS WITH URBAN CURB AND GUTTERS.

6-150.01 PAVING

- (1) THE CONTRACTOR SHALL BE REQUIRED TO PAVE IN THE DIRECTION OF TRAFFIC.
- (2) THE CONTRACTOR SHALL BE REQUIRED TO COLD PLANE AND PAVE IN THE DIRECTION OF TRAFFIC.

6-150.02 RESURFACING

NOTES (3) THROUGH (8) FOR RESURFACING ONLY

- (3) WHERE DIRECTED BY THE TDOT ENGINEER, THE CONTRACTOR SHALL BE REQUIRED TO SHAPE PUBLIC SIDE ROADS, BUSINESS ENTRANCES, AND PRIVATE DRIVES, AS WELL AS CLEANING OF EXISTING DRAINS BEFORE PLACING MATERIALS. ALL COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF CONSTRUCTION.
- (4) ALL PUBLIC SIDE ROADS SHALL BE PAVED ONE PAVER WIDTH THROUGH THE INTERSECTION AS A MINIMUM. A SATISFACTORY TRANSITION FROM THE NEW PAVEMENT TO THE EXISTING GRADE OF THE INTERSECTING PUBLIC ROAD OR BUSINESS ENTRANCE SHALL BE PROVIDED. SHOULD THE PAVEMENT OF THE INTERSECTING PUBLIC ROAD BE DISTRESSED, THE RESURFACING WIDTH MAY BE INCREASED TO THE NORMAL RIGHT OF WAY LINE.
- (5) PRIVATE DRIVEWAYS, FIELD ENTRANCES, AND BUSINESS ENTRANCES WILL BE RESURFACED A PAVER WIDTH (LANE WIDTH) AS A MINIMUM. A PAVEMENT TAPER TO TRANSITION THE NEW PAVEMENT SHALL BE REQUIRED, IT SHALL BE BASED ON AN ADDITIONAL ONE FOOT OF WIDTH PER ONE INCH DEPTH OF PAVEMENT. IF THE SHOULDER IS NARROW ENOUGH THAT THE SUM OF THE SHOULDER AND THE TRANSITION ARE LESS THAN A PAVER WIDTH, THE TRANSITION SHALL OCCUR WITHIN THE PAVER WIDTH. IF THE SUM OF THE SHOULDER AND THE TRANSITION IS GREATER THAN A PAVER WIDTH (LANE WIDTH), THE TRANSITION SHALL OCCUR OUTSIDE OF THE PAVER WIDTH.
- (6) ON CURB AND GUTTER SECTIONS, PUBLIC ROAD INTERSECTIONS SHALL BE RESURFACED TO THE END OF RADIUS. A SATISFACTORY TRANSITION FROM THE NEW PAVEMENT TO THE EXISTING GRADE OF THE INTERSECTING PUBLIC ROAD SHALL BE PROVIDED.
- (7) ON URBAN TYPICAL SECTIONS, (CURB AND GUTTER), RESIDENTIAL DRIVEWAYS AND BUSINESS ENTRANCES SHALL HAVE A MINIMUM WIDTH OF MATERIAL NOT LESS THAN ONE FOOT USED IN THE TRANSITION TO FEATHER THE PAVEMENT EDGE.
- (8) IN ALL CASES, THE LENGTH OF THE PAVEMENT TRANSITION, THE THICKNESS AND WIDTH OF THE RESURFACING AND ANY ADDITIONAL

PAVEMENT MATERIALS SHALL BE AS DIRECTED BY THE TDOT ENGINEER.

6-155.00 GRADED SOLID ROCK

NOTE: IF A NOTE WORDED DIFFERENTLY FROM (1) IS SUPPLIED, THAT NOTE SHOULD BE USED. IF A MAXIMUM DIMENSION TWO FEET OR LESS IS SPECIFIED, NOTE (2) IS NOT NECESSARY; HOWEVER, IF A MAXIMUM DIMENSION GREATER THAN TWO FEET BUT NOT THREE FEET IS SPECIFIED, IT SHALL BE NECESSARY TO CONTACT THE CONSTRUCTION OFFICE FOR THE APPROPRIATE MAXIMUM DEPTH TO BE USED IN NOTE (2).

- (1) THE ROCK FILL (GRADED SOLID ROCK) MATERIAL SHALL CONSIST OF SOUND, NON-DEGRADABLE LIMESTONE OR SANDSTONE WITH A MAXIMUM SIZE OF 3'-0". AT LEAST 50% (BY WEIGHT) OF THE ROCK SHALL BE UNIFORMLY DISTRIBUTED BETWEEN 1'-0" AND 3'-0" IN DIAMETER, AND NO GREATER THAN 10% (BY WEIGHT) SHALL BE LESS THAN 2" IN DIAMETER. THE MATERIAL SHALL BE ROUGHLY EQUIDIMENSIONAL; THIN, SLABBY MATERIALS WILL NOT BE ACCEPTED. THE CONTRACTOR SHALL BE REQUIRED TO PROCESS THE MATERIAL WITH AN ACCEPTABLE MECHANICAL MEANS (A SCREENING PROCESS CAPABLE OF PRODUCING THE REQUIRED GRADATION). THE ROCK SHALL BE APPROVED BY A REPRESENTATIVE OF THE DIVISION OF MATERIALS AND TESTS BEFORE USE.
- (2) THIS GRADED SOLID ROCK MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING FIVE FEET IN DEPTH.

6-160.00 RIPRAP

NOTES (1) AND (2) ARE NOT REQUIRED IF CLASS A-1, A-2, B, OR C MACHINED RIPRAP IS USED.

- (1) MACHINED RIPRAP SHALL BE IN ACCORDANCE WITH SECTION 709 OF THE STANDARD SPECIFICATIONS EXCEPT AS MODIFIED BY THIS NOTE. MACHINED RIPRAP SHALL BE CLEAN SHOT ROCK CONTAINING NO SAND, DUST, OR ORGANIC MATERIALS AND SHALL VARY IN SIZE FROM ___" TO ___'-___". THE STONE SIZES SHALL BE DISTRIBUTED UNIFORMLY THROUGHOUT THE SIZE RANGE WITH NO MORE THAN 20% OF THE MATERIAL (BY WEIGHT) LESS THAN ___". THE THICKNESS OF THE STONE LAYER SHALL BE ___'-___" (+/-3") AND THE SIZE GRADATION SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT THE LAYER THICKNESS AND FROM TOP TO BOTTOM OF THE SLOPE.

UPON COMPLETION OF THE PROJECT, A VISUAL INSPECTION SHALL REVEAL THAT APPROXIMATELY 50% OF THE SURFACE AREA CONSISTS OF STONES ___" OR LARGER. PAYMENT WILL BE MADE UNDER ITEM

709-05.10 MACHINED RIPRAP (DESCRIPTION), C.Y., AND QUANTITIES WILL BE BASED ON THE AVERAGE THICKNESS OF ___'- ___".

- (2) RIPRAP SHALL CONSIST OF FURNISHING AND PLACING EITHER RUBBLE STONES BY HAND OR MACHINED. RUBBLE STONE SHALL MEET THE REQUIREMENTS OF SECTION 709 OF THE STANDARD SPECIFICATIONS AND SHALL BE CLEAN (FREE FROM ORGANIC MATTER), DURABLE, ANGULAR WITH FRACTURED FACES, NEARLY RECTANGULAR IN SHAPE WITH A BREADTH OR THICKNESS AT LEAST ONE-THIRD ITS LENGTH.

IF THE CONTRACTOR ELECTS TO USE MACHINED RIPRAP, IT SHALL BE IN ACCORDANCE WITH SECTION 709 OF THE STANDARD SPECIFICATIONS EXCEPT AS MODIFIED BY THIS NOTE. MACHINED RIPRAP SHALL BE CLEAN SHOT ROCK CONTAINING NO SAND, DUST, OR ORGANIC MATERIALS, AND SHALL VARY IN SIZE FROM ___" TO ___'- ___". THE STONE SIZES SHALL BE DISTRIBUTED UNIFORMLY THROUGHOUT THE SIZE RANGE WITH NO MORE THAN 20% OF THE MATERIAL (BY WEIGHT) LESS THAN ___". THE THICKNESS OF THE STONE LAYER SHALL BE ___'- ___" (+/-3") AND THE SIZE GRADATION SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT THE LAYER THICKNESS AND FROM TOP TO BOTTOM OF THE SLOPE. UPON COMPLETION OF THE PROJECT, A VISUAL INSPECTION SHALL REVEAL THAT APPROXIMATELY 50% OF THE SURFACE AREA CONSISTS OF STONES ___" OR LARGER. PAYMENT WILL BE MADE UNDER ITEM ___(A)_____ AND QUANTITIES WILL BE BASED ON A THICKNESS OF ___'- ___".

(A) NOTE: FILL IN THE BLANK WITH APPROPRIATE RIPRAP ITEM NUMBER.

6-165.00 SIGNING

- (1) THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL FLAT SHEET SIGNS SHALL BE APPLIED BY SILK SCREENING PROCESS, EXCEPT THAT CUTOUT DIRECT APPLIED COPY SHALL BE USED ON ALL FLAT SHEET SIGNS WITH A GREEN BACKGROUND. THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL EXTRUDED PANEL SIGNS SHALL BE DEMOUNTABLE AND ATTACHED TO THE SIGN FACE, AS OUTLINED IN THE STANDARD SPECIFICATIONS. ALL SHIELDS ON GUIDE SIGNS SHALL BE DEMOUNTABLE AND ATTACHED TO THE SIGN FACE AS OUTLINED IN THE STANDARD SPECIFICATIONS.
- (2) THE LENGTHS OF ALL SIGN SUPPORTS SHOWN ON THE SIGN SCHEDULE ARE APPROXIMATE AND ARE FOR ESTIMATING PURPOSES ONLY. THE LENGTHS WERE COMPUTED FROM THE CROSS-SECTIONS CONTAINED IN THE CONSTRUCTION PLANS. IN THE EVENT THE SUPPORT LENGTHS ARE 2 FEET SHORTER OR LONGER THAN SHOWN ON THE PLANS, THE ENGINEER SHALL VERIFY THE SUPPORT TYPE WITH THE DESIGN

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- DIVISION, SIGNING AND MARKING SECTION, TELEPHONE NO. (615)-741-0982. THE CONTRACTOR SHALL VERIFY ALL SUPPORT LENGTHS AT THE SITE PRIOR TO ORDERING MATERIAL.
- (3) THE TOP OF THE SIGN FOOTINGS SHALL BE PLACED LEVEL WITH THE GROUND LINE.
 - (4) AFTER THE SIGN LOCATIONS HAVE BEEN STAKED, BUT PRIOR TO ORDERING ANY MATERIAL FOR THE SUPPORTS, THERE SHALL BE A FIELD INSPECTION AND APPROVAL BY THE REGIONAL CONSTRUCTION OFFICE.
 - (5) THE CONTRACTOR SHALL BE REQUIRED TO FURNISH LAYOUT DRAWINGS (3 SETS) OF ALL EXTRUDED PANEL SIGNS WITH SPACING OF ALL LETTERS, NUMERALS, SHIELDS, AND ARROWS. THE LAYOUT DRAWINGS SHALL BE SENT TO THE DESIGN DIVISION, SIGNING AND MARKING SECTION, SUITE 1000, J. K. POLK BUILDING, NASHVILLE, TN 37243-0350.
 - (6) ALL SIGNS MARKED "TO BE REMOVED" ARE TO BE REMOVED BY THE CONTRACTOR AND PAID FOR UNDER ITEM 713-15 AND BECOME THE PROPERTY OF THE CONTRACTOR.
 - (7) THE EXISTING FOOTINGS ARE TO BE REMOVED 6 INCHES BELOW GROUND LINE.
 - (8) THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL FLAT SHEET SIGNS SHALL BE APPLIED BY SILK SCREENING PROCESS, EXCEPT THAT CUT-OUT DIRECT APPLIED COPY SHALL BE USED ON ALL FLAT SHEET SIGNS WITH A GREEN BACKGROUND, OR BROWN BACKGROUND.
 - (9) THE LENGTHS OF ALL SIGN SUPPORTS SHOWN ON THE SIGN SCHEDULE ARE APPROXIMATE AND ARE FOR ESTIMATING PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ALL SUPPORT LENGTHS AT THE SITE PRIOR TO ERECTION.
 - (10) THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL FLAT SHEET SIGNS SHALL BE APPLIED BY SILK SCREENING PROCESS.

6-170.00 TRAFFIC CONTROL DIRECTIONAL SIGNING

NOTE: NOTES (1) THROUGH (5) ARE TO BE PLACED ON ALL ACCESS CONTROLLED AND INTERSTATE RECONSTRUCTION PROJECTS AND ACCESS CONTROLLED AND INTERSTATE RESURFACING PROJECTS WHEN THE TRAFFIC CONTROL PHASING REQUIRES PLACEMENT OF TEMPORARY PAVEMENT MARKINGS WHICH CONFLICT DIRECTIONAL SIGNS OR REQUIRES DIRECTIONAL SIGNS TO BE RELOCATED OR ADJUSTED.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- (1) ON ALL ACCESS CONTROLLED AND INTERSTATE RECONSTRUCTION AND NEW CONSTRUCTION PROJECTS, THE CONTRACTOR SHALL UTILIZE ALL EXISTING DIRECTIONAL SIGNING FOR AS LONG AS POSSIBLE. THESE EXISTING SIGNS CAN BE MOVED USING TEMPORARY SUPPORTS AS NEEDED. AS SOON AS THESE EXISTING DIRECTIONAL SIGNS COME DOWN PERMANENTLY, THE CONTRACTOR SHALL HAVE UP AT LEAST ONE NEW TEMPORARY "ADVANCE GUIDE SIGN" AND ONE NEW TEMPORARY "EXIT DIRECTIONAL SIGN" AT ALL EXIT RAMPS. THESE SIGNS ARE TO BE MAINTAINED WITHIN CLEAR VIEW OF THE PUBLIC ON THE RIGHT SIDE OF THE HIGHWAY AND SHALL BE REPLACED IF DAMAGED, DURING ALL PHASES OF CONSTRUCTION, AS DIRECTED BY THE ENGINEER.
- (2) THE SIZE OF THESE NEW TEMPORARY SIGNS WILL BE DETERMINED BY THE MESSAGE. THE MESSAGE SHALL BE THE SAME AS THE EXISTING SIGN THAT THESE NEW TEMPORARY SIGNS WILL BE REPLACING. THE LETTER SIZE SHALL BE A MINIMUM OF 8 INCH, "D" UPPER CASE LETTER. THE DIRECTIONAL ARROW WILL BE A "B" ARROW AT A 45 DEGREE ANGLE (SAME ANGLE AS THE EXISTING ARROW). THE MATERIAL SHALL BE 0.100 INCH SHEET ALUMINUM; THE COLOR SHALL BE A REFLECTIVE GREEN BACKGROUND WITH REFLECTIVE WHITE COPY.
- (3) ALL WORK AND MATERIAL TO MAKE THESE NEW TEMPORARY DIRECTIONAL SIGNS ALONG WITH ADEQUATE SUPPORTS AND TO MOVE THEM AS NEEDED DURING EACH PHASE OF CONSTRUCTION WILL BE PAID FOR UNDER ITEM NO. _____ (A), AS DIRECTED BY THE ENGINEER.

(A) NOTE: FILL IN THE BLANK WITH APPROPRIATE 712-SERIES ITEM NUMBER.

- (4) SOME OF THESE DIRECTIONAL SIGNS WILL NEED AN INTERSTATE, U.S., OR A STATE HIGHWAY SHIELD, A CARDINAL DIRECTION, AND A DIRECTION ARROW TO ACCOMPANY THE DIRECTIONAL SIGN. THESE SIGNS SHALL BE MOUNTED BELOW THE DIRECTIONAL SIGN.
- (5) ALL EXISTING "EMERGENCY REFERENCE MARKERS" AND "HOSPITAL SIGNS" SHALL BE MAINTAINED WITHIN FULL VIEW OF THE MOTORING PUBLIC THROUGHOUT ALL PHASES OF CONSTRUCTION. ALL WORK IN MOVING AND TEMPORARY SUPPORTS SHALL BE PAID FOR UNDER ITEM NO. _____ (B).

(B) NOTE: FILL IN THE BLANK WITH APPROPRIATE 712-SERIES ITEM NUMBER.

NOTE: NOTE (6) SHOULD BE PLACED ON ACCESS CONTROL AND INTERSTATE PROJECTS WITH EXISTING "LOGO" SIGNS.

- (6) WHEN "LOGO" SIGNS ARE ON ACCESS CONTROLLED AND INTERSTATE RECONSTRUCTION AND NEW CONSTRUCTION PROJECTS, THE

CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THESE SIGNS IN FULL VIEW TO THE MOTORING PUBLIC DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL BE HELD RESPONSIBLE TO THE DEPARTMENT FOR THE REIMBURSEMENT OF THE SIGN FACE IF IT IS DAMAGED. ALL WORK IN MOVING THESE "LOGO" SIGNS AND THE TEMPORARY SUPPORTS ARE TO BE PAID FOR UNDER ITEM NO. _____(C)_____, AS DIRECTED BY THE ENGINEER. THE SUPPORTS FOR THE FINAL LOCATION OF THESE SIGNS WILL BE PAID FOR UNDER OTHER ITEMS OF CONSTRUCTION.

(C) NOTE: FILL IN THE BLANK WITH APPROPRIATE 712-SERIES ITEM NUMBER.

NOTE: NOTE (7) SHOULD BE PLACED ON NON-ACCESS CONTROLLED PROJECTS.

- (7) WHEN EXISTING "TOURIST ORIENTED DIRECTIONAL SIGNS" (TODS) ARE ON NON-ACCESS CONTROLLED CONSTRUCTION PROJECTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THESE SIGNS IN FULL VIEW TO THE MOTORING PUBLIC DURING ALL PHASES OF CONSTRUCTION. ALL WORK IN MOVING THESE "TODS" AND TEMPORARY SUPPORTS ARE TO BE PAID FOR UNDER ITEM NO. _____(D)_____, AS DIRECTED BY THE ENGINEER. NEW SUPPORTS AND SIGN FACE FOR FINAL LOCATION WILL BE PAID FOR UNDER OTHER ITEMS OF CONSTRUCTION.

(D) NOTE: FILL IN THE BLANK WITH APPROPRIATE 712-SERIES ITEM NUMBER.

6-175.00 SIGNALIZATION

- (1) EQUIPMENT AND INSTALLATION OF TRAFFIC SIGNALS SHALL COMPLY WITH TDOT STANDARD SPECIFICATIONS, SECTION 730.

NOTE: NOTE (2) IS FOR USE IN HAMILTON COUNTY, AS DIRECTED.

- (2) EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE TDOT "SPECIAL PROVISIONS REGARDING SECTION 730C-TRAFFIC SIGNALS."

NOTE: NOTE (3) IS FOR USE IN KNOX COUNTY, AS DIRECTED.

- (3) EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE TDOT "SPECIAL PROVISIONS REGARDING SECTION 730K-TRAFFIC SIGNALS."

NOTE: NOTE (4) IS FOR USE IN SHELBY COUNTY, AS DIRECTED.

- (4) EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE TDOT "SPECIAL PROVISIONS REGARDING SECTION 730M-TRAFFIC SIGNALS."

NOTE: NOTE (5) IS FOR USE IN DAVIDSON COUNTY, AS DIRECTED.

- (5) EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE TDOT "SPECIAL PROVISIONS REGARDING SECTION 730N-TRAFFIC SIGNALS."
- (6) SALVAGEABLE EQUIPMENT SHALL BECOME THE PROPERTY OF THE (CITY OR COUNTY) AND SHALL BE STOCKPILED AT A LOCATION DESIGNATED BY THE ENGINEER FOR PICKUP BY THE (CITY OR COUNTY).
- (7) IF RESURFACING IS INCLUDED IN THE PROJECT, SIGNAL DETECTION LOOPS SHALL BE INSTALLED BEFORE THE FINAL SURFACE IS APPLIED.
- (8) ANY SIGNAL HEADS, WHEN VISIBLE TO DRIVERS BUT NOT OPERATIONAL, SHALL BE COMPLETELY COVERED.
- (9) SIGNAL HEADS SHALL FLASH A MINIMUM OF SEVEN (7) DAYS PRIOR TO ACTIVATION OF THE SIGNAL.
- (10) THE CONTRACTOR SHALL CONTACT _____ A MINIMUM OF THIRTY (30) DAYS PRIOR TO ACTIVATION OF THE SIGNAL TO OBTAIN THE INITIAL SIGNAL TIMINGS.

NOTE: FOR NOTES (11) THROUGH (18) SEE SECTION 4-730.08.

- (11) THE PROJECT ENGINEER SHALL NOTIFY THE LOCAL GOVERNMENTAL AGENCY RESPONSIBLE FOR TRAFFIC CONTROL MAINTENANCE AT LEAST ONE DAY IN ADVANCE OF THE COLD PLANING ACTIVITY AT SIGNALIZED INTERSECTIONS WHERE DETECTOR LOOPS ARE ON THE PAVEMENT. THE MAINTAINING AGENCY WILL THEN BE RESPONSIBLE FOR DISCONNECTING THE LOOP DETECTORS AND MAKING ANY NECESSARY TIMING ADJUSTMENTS IN THE SIGNAL CONTROLLER PRIOR TO THE CONSTRUCTION.
- (12) THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR SUPPLYING THE CONTRACTOR WITH AS BUILT SIGNAL PLANS AT THE PRE-CONSTRUCTION CONFERENCE. THESE PLANS WILL PROVIDE THE CONTRACTOR WITH THE DESIRED LOCATION FOR DETECTOR LOOP REPLACEMENT.
- (13) LOOPS SHALL BE INSTALLED IN THE LEVELING COURSE IF A LEVELING COURSE IS PROVIDED.
- (14) LOOP REPLACEMENT SHALL BE IN ACCORDANCE WITH SECTION 730 OF THE STANDARD SPECIFICATIONS.

6-180.00 CONSTRUCTION WORK ZONE & TRAFFIC CONTROL

- (1) ADVANCED WARNING SIGNS SHALL NOT BE DISPLAYED MORE THAN FORTY-EIGHT (48) HOURS BEFORE PHYSICAL CONSTRUCTION BEGINS. SIGNS MAY BE ERECTED UP TO ONE WEEK BEFORE NEEDED, IF THE SIGN FACE IS FULLY COVERED.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- (2) IF THE CONTRACTOR MOVES OFF THE PROJECT, HE SHALL COVER OR REMOVE ALL UNNEEDED SIGNS AS DIRECTED BY THE ENGINEER. COSTS OF REMOVAL, COVERING, AND REINSTALLING SIGNS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT ALL COSTS SHALL BE INCLUDED IN THE ORIGINAL UNIT PRICE BID FOR ITEM NO 712-06, SIGNS (CONSTRUCTION) PER SQUARE FOOT.
- (3) A LONG TERM BUT SPORADIC USE WARNING SIGN, SUCH AS A FLAGGER SIGN, MAY REMAIN IN PLACE WHEN NOT REQUIRED PROVIDED THE SIGN FACE IS FULLY COVERED.
- (4) TRAFFIC CONTROL DEVICES SHALL NOT BE DISPLAYED OR ERECTED UNLESS RELATED CONDITIONS ARE PRESENT NECESSITATING WARNING.
- (5) USE OF BARRICADES, PORTABLE BARRIER RAILS, VERTICAL PANELS, AND DRUMS SHALL BE LIMITED TO THE IMMEDIATE AREAS OF CONSTRUCTION WHERE A HAZARD IS PRESENT. THESE DEVICES SHALL NOT BE STORED ALONG THE ROADWAY WITHIN THIRTY (30) FEET OF THE EDGE OF THE TRAVELED WAY BEFORE OR AFTER USE UNLESS PROTECTED BY GUARDRAIL, BRIDGE RAIL, AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL INCREASE TO FORTY-FIVE (45) FEET FOR ROADWAYS WITH CURRENT ADT'S OF 1500 OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. THESE DEVICES SHALL BE REMOVED FROM THE CONSTRUCTION WORK ZONE WHEN THE ENGINEER DETERMINES THEY ARE NO LONGER NEEDED. WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK, THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.
- (6) THE CONTRACTOR SHALL NOT BE PERMITTED TO PARK ANY VEHICLES OR CONSTRUCTION EQUIPMENT DURING PERIODS OF INACTIVITY, WITHIN THIRTY (30) FEET OF THE EDGE OF PAVEMENT WHEN THE LANE IS OPEN TO TRAFFIC UNLESS PROTECTED BY GUARDRAIL, BRIDGE RAIL, AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL BE INCREASED TO FORTY-FIVE (45) FEET FOR ROADWAYS WITH CURRENT ADT'S OF 1500 OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. PRIVATELY OWNED VEHICLES SHALL NOT BE ALLOWED TO PARK WITHIN THIRTY (30) FEET OF A OPEN TRAFFIC LANE AT ANY TIME UNLESS PROTECTED AS DESCRIBED ABOVE FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL BE INCREASED TO FORTY-FIVE (45) FEET FOR ROADWAYS WITH CURRENT ADT'S OF 1500

OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE.. WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK, THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.

- (7) ALL DETOUR AND CONSTRUCTION SIGNING SHALL BE IN STRICT ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- (8) ALL DETOURS SHALL BE PAVED, STRIPED, SIGNED AND THE VERTICAL PANELS ARE TO BE IN PLACE BEFORE IT IS OPENED TO TRAFFIC.

6-185.00 LIGHTING

- (1) INSTALLATION AND MATERIALS SHALL COMPLY WITH SECTIONS 714 AND 917 OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED MARCH 1, 2006 AND WITH THE LATEST REVISIONS TO THE NATIONAL ELECTRIC CODE, NFPA 70.
- (2) ALL WIRING SHALL BE CONCEALED UNDERGROUND IN 2-INCH SCHEDULE 40 PVC RIGID CONDUIT.
- (3) THE GROUND WIRE SHALL BE RUN INSIDE CONDUIT WITHIN STRUCTURES, SHALL BE COLORED GREEN AND HAVE THW INSULATION.
- (4) EXISTING FOUNDATIONS TO BE REMOVED A MINIMUM OF SIX INCHES BELOW GRADE.
- (5) ALL INCIDENTAL EQUIPMENT AND MATERIAL REQUIRED FOR THE SUCCESSFUL EXECUTION OF THIS WORK SHALL BE FURNISHED IN 714 ITEMS WHETHER SPECIFICALLY NOTED OR NOT.
- (6) LIGHT STANDARDS SHALL BE ROUND TAPERED POLES. LENGTH SHALL BE DETERMINED BY REQUIRED MOUNTING HEIGHT.
- (7) STANDARDS SHALL BE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORT FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.
- (8) STANDARDS SHALL BE DESIGNED FOR 80-MPH WIND PRESSURE AND SHALL SUPPORT A 62-POUND LUMINAIRE ON A 15-FOOT ARM.
- (9) ALL NEW ROADWAY LIGHT STANDARDS SHALL BE MOUNTED ON BASES WITH ACCESS DOOR. TRANSFORMER BASES SHALL MEET AASHTO SPECIFICATIONS AND HAVE FHWA APPROVAL. STANDARDS SHALL BE ALUMINUM WITH TRANSFORMER BASES.

- (10) BRACKET ARMS SHALL BE ROUND TAPERED TRUSS TYPE WITH STRAP MOUNTING AND LENGTHS AS SCHEDULED.
- (11) BRACKET ARM UPSWEEP SHALL BE THE SAME FOR ALL LIGHT STANDARDS OF THE SAME TYPE.

6-190.00 EROSION PREVENTION AND SEDIMENT CONTROL

6-190.01 DISTURBED AREA

- (1) PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED (I.E. CLEARING AND GRUBBING INITIATED) MORE THAN 10 CALENDAR DAYS PRIOR TO GRADING OR EARTH MOVING ACTIVITIES UNLESS THE AREA IS MULCHED, SEEDED WITH MULCH, OR OTHER TEMPORARY COVER IS INSTALLED.
- (2) CLEARING, GRUBBING, AND OTHER DISTURBANCE TO RIPARIAN VEGETATION SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR SLOPE CONSTRUCTION AND EQUIPMENT OPERATIONS. UNNECESSARY VEGETATION REMOVAL IS PROHIBITED.
- (3) ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE. PRIORITY SHALL BE GIVEN TO FINISHING OPERATIONS AND PERMANENT EPSC MEASURES OVER TEMPORARY EPSC MEASURES ON ALL PROJECTS.
- (4) CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF GRADED OR DENUDED SOIL AREAS AND SHALL BE PHASED FOR PROJECTS THAT HAVE OVER 50 ACRES OF SOIL DISTURBANCE. NO MORE THAN 50 ACRES OF ACTIVE SOIL DISTURBANCE IS ALLOWED AT ANY TIME DURING THE CONSTRUCTION PROJECT, UNLESS APPROVED IN WRITING BY THE ENVIRONMENTAL DIVISION.

6-190.02 SEDIMENT CONTROL

- (5) EPSC MEASURES SHALL BE INSTALLED CONCURRENTLY WITH CLEARING OPERATIONS, SHALL BE FUNCTIONAL PRIOR TO ANY EARTH MOVING OPERATIONS, AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
- (6) THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A PROACTIVE METHOD TO PREVENT THE OFF-SITE MIGRATION OR DEPOSIT OF SEDIMENT ON ROADWAYS USED BY THE GENERAL PUBLIC. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT THAT HAVE NOT REACHED A STREAM MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS (E.G.,

FUGITIVE SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN A STREET MUST BE REMOVED SO THAT IT IS NOT SUBSEQUENTLY WASHED INTO STORM SEWERS AND STREAMS BY THE NEXT RAIN AND/OR SO THAT IT DOES NOT POSE A SAFETY HAZARD TO USERS OF PUBLIC STREETS). ARRANGEMENTS CONCERNING REMOVAL OF SEDIMENT ON ADJOINING PROPERTY MUST BE SETTLED WITH THE ADJOINING PROPERTY OWNER BEFORE REMOVAL OF SEDIMENT.

- (7) WATER PUMPED FROM WORK AREAS AND EXCAVATION MUST BE HELD IN SETTLING BASINS OR TREATED BY FILTRATION PRIOR TO ITS DISCHARGE INTO SURFACE WATERS. WATER MUST BE HELD IN SETTLING BASINS UNTIL AT LEAST AS CLEAR AS THE RECEIVING WATERS. SETTLING BASINS SHALL NOT BE LOCATED CLOSER THAN 20 FEET FROM THE TOP BANK OF A STREAM. SETTLING BASINS AND SEDIMENT TRAPS SHALL BE PROPERLY DESIGNED ACCORDING TO THE SIZE OF THE DRAINAGE AREAS OR VOLUME OF WATER TO BE TREATED. TREATED WATER MUST BE DISCHARGED THROUGH A PIPE OR WELL-VEGETATED OR LINED CHANNEL, SO THAT THE DISCHARGE DOES NOT CAUSE EROSION OR SEDIMENT TRANSPORT.
- (8) CHECK DAMS SHALL BE USED WHERE RUNOFF IS CONCENTRATED. CLEAN ROCK, BRUSH, GABION, OR SANDBAG CHECK DAMS SHALL BE PROPERLY CONSTRUCTED TO REDUCE VELOCITY AND CONTROL EROSION.
- (9) FOR AN OUTFALL IN A DRAINAGE AREA OF 10 ACRES OR MORE, A TEMPORARY (OR PERMANENT) SEDIMENT BASIN OR EQUIVALENT CONTROL MEASURES THAT PROVIDES STORAGE FOR A CALCULATED VOLUME OF RUNOFF FROM A MINIMUM 2-YEAR/ 24-HOUR STORM EVENT, SHALL BE PROVIDED UNTIL FINAL STABILIZATION OF THE SITE. THE ENVIRONMENTAL AND DESIGN DIVISIONS MAY BE CONTACTED TO REVIEW AND CONCUR WITH ANY REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE OUTFALL PROCEEDS.
- (10) IF PERMANENT OR TEMPORARY VEGETATION IS TO BE USED AS AN EPSC MEASURE, THEN THE TIMING OF PLANTING OF VEGETATION SHALL BE SHOWN IN THE SWPPP. DELAYING PLANTING OF COVER VEGETATION UNTIL WINTER MONTHS OR DRY MONTHS SHOULD BE AVOIDED, IF POSSIBLE.
- (11) OFFSITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST SHALL BE MINIMIZED. A STABILIZED CONSTRUCTION ACCESS (A POINT OF ENTRANCE/EXIT TO THE CONSTRUCTION PROJECT) SHALL BE PROVIDED, AS NEEDED, TO REDUCE THE TRACKING OF MUD AND DIRT ONTO PUBLIC ROADS BY CONSTRUCTION VEHICLES.
- (12) TEMPORARY EPSC MEASURES MAY BE REMOVED AT THE BEGINNING OF THE WORKDAY, BUT MUST BE REPLACED AT THE END OF THE WORKDAY.

6-190.03 STREAM/WETLAND

- (13) SOIL MATERIALS MUST BE PREVENTED FROM ENTERING WATERS OF THE STATE/U.S. EPSC MEASURES TO PROTECT WATER QUALITY MUST BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. APPROPRIATE EPSC MEASURES MUST BE INSTALLED ALONG THE BASE OF ALL FILLS AND CUTS, ON THE DOWNHILL SIDE OF STOCKPILED SOIL, AND ALONG STREAM BANKS IN CLEARED AREAS TO PREVENT SEDIMENT MIGRATION INTO STREAMS IN ACCORDANCE WITH TDOT STANDARDS. THEY MUST BE INSTALLED ON THE CONTOUR, ENTRENCHED AND STAKED, AND EXTEND THE WIDTH OF THE AREA TO BE CLEARED.
- (14) NEW CHANNEL CONSTRUCTION SHALL BE COMPLETED IN THE DRY AND STABILIZED FOR AT LEAST 72 HOURS PRIOR TO DIVERTING WATER FROM THE EXISTING AND/OR TEMPORARY CHANNEL.
- (15) INSTREAM EPSC DEVICES ARE NOT APPROVED, UNLESS SPECIFIED IN WRITING BY THE ENVIRONMENTAL DIVISION.
- (16) THE OPERATION OF EQUIPMENT IN WATERS OF THE STATE/U.S., INCLUDING WETLANDS, SHALL BE ONLY AS SHOWN ON THE PROJECT PLANS AND/OR AS SO SPECIFIED IN THE ARAP/401, SECTION 404 PERMIT(S) AND/OR TVA26(A), IF APPLICABLE. ANY ADDITIONAL PERMITS REQUIRED BY THE CONTRACTOR'S METHOD OF OPERATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN, AFTER RECEIVING THE APPROVAL OF TDOT ENVIRONMENTAL DIVISION.
- (17) THE WIDTH OF THE FILL ASSOCIATED WITH TEMPORARY CROSSINGS SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR THE ACTUAL CROSSING.
- (18) STREAM BEDS SHALL NOT BE USED AS TRANSPORTATION ROUTES FOR CONSTRUCTION EQUIPMENT. TEMPORARY CROSSINGS MUST BE LIMITED TO ONE POINT PER STREAM AND EPSC MEASURES MUST BE USED WHERE THE STREAM BANKS ARE DISTURBED. WHERE THE STREAMBED IS NOT COMPOSED OF BEDROCK, A PAD OF CLEAN ROCK MUST BE USED AT THE CROSSING POINT AND CULVERTED TO PREVENT THE IMPOUNDMENT OF WATER FLOW. CLEAN ROCK IS ROCK OF VARIOUS TYPE AND SIZE, DEPENDING UPON APPLICATION, WHICH CONTAINS NO FINES, SOILS, OR OTHER WASTES OR CONTAMINANTS. OTHER MATERIALS USED FOR ALL TEMPORARY FILLS MUST BE COMPLETELY REMOVED IN THEIR ENTIRETY AFTER THE WORK IS COMPLETED AND THE AFFECTED AREAS RETURNED TO THEIR PREEXISTING ELEVATION. ALL TEMPORARY CROSSINGS MUST BE CONSTRUCTED IN ACCORDANCE WITH STD. DWG. EC-STR-25 UNLESS SPECIFICALLY ADDRESSED IN THE EPSC PLANS. ALTERNATIVELY, PLACING A TEMPORARY BRIDGE (BAILEY BRIDGE OR EQUIVALENT,

TIMBERS, ETC.) FROM TOP OF BANK TO TOP OF BANK OR THE APPROPRIATE USE OF BARGES AT THE CROSSING TO AVOID DISTURBANCE OF THE STREAMBED IS AN ACCEPTABLE OPTION.

- (19) HEAVY EQUIPMENT WORKING IN WETLANDS MUST BE PLACED ON MATS, OR OTHER MEASURES MUST BE TAKEN TO MINIMIZE SOIL DISTURBANCE UNLESS SPECIFICALLY ADDRESSED IN THE EPSC PLANS. ANY MATS AND OTHER MEASURES USED FOR HEAVY EQUIPMENT MUST BE REMOVED IN THEIR ENTIRETY AFTER THE WORK IS COMPLETED.
- (20) WETLANDS SHALL NOT BE USED AS EQUIPMENT STORAGE, STAGING, OR TRANSPORTATION AREAS, UNLESS PROVIDED FOR IN THE PLANS.

6-190.04 SPECIES

- (21) NO ACTIVITY MAY SUBSTANTIALLY DISRUPT THE MOVEMENT OF THOSE SPECIES OF AQUATIC LIFE INDIGENOUS TO THE WATER BODY, INCLUDING THOSE SPECIES THAT NORMALLY MIGRATE THROUGH THE AREA. THE SWPPP SHALL BE MODIFIED TO INCLUDE EPSC MEASURES TO PREVENT NEGATIVE IMPACTS TO LEGALLY PROTECTED STATE OR FEDERAL FAUNA OR FLORA OR AS INDICATED IN THE ECOLOGICAL STUDIES OR ON THE PERMIT(S).

6-190.05 INSPECTION, MAINTENANCE, REPAIR

- (22) INSPECTION, REPAIR, AND MAINTENANCE OF EPSC MEASURES/STRUCTURES IS TO BE PERFORMED ON A REGULAR BASIS. SEDIMENT SHALL BE REMOVED FROM SEDIMENT CONTROL STRUCTURES WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT (50%). DURING SEDIMENT REMOVAL, THE CONTRACTOR SHALL TAKE CARE TO ENSURE THAT STRUCTURAL COMPONENTS OF EPSC MEASURES ARE NOT DAMAGED AND THUS MADE INEFFECTIVE. IF DAMAGE DOES OCCUR, THE CONTRACTOR SHALL REPAIR THE STRUCTURES AT THE CONTRACTOR'S OWN EXPENSE.
- (23) SEDIMENT REMOVED FROM SEDIMENT CONTROL STRUCTURES SHALL BE PLACED AND BE TREATED IN A MANNER SO THAT THE SEDIMENT IS CONTAINED WITHIN THE PROJECT LIMITS AND DOES NOT MIGRATE INTO WATERS OF THE STATE/U.S. COST FOR THIS TREATMENT IS TO BE INCLUDED IN PRICE BID FOR ITEM NO. 209-05 SEDIMENT REMOVAL, C.Y.
- (24) THE CONTRACTOR SHALL INSTALL A RAIN GAUGE EVERY LINEAR MILE AT ALL SITES WHERE CLEARING, GRUBBING, EXCAVATION, GRADING CUTTING OR FILLING IS BEING ACTIVELY PERFORMED, OR EXPOSED SOIL HAS NOT YET BEEN PERMANENTLY STABILIZED. IF THE PROJECT LENGTH IS LESS THAN ONE LINEAR MILE, ONE RAIN GAUGE SHALL BE INSTALLED AT THE CENTER OF THE PROJECT OR AS INDICATED BY THE TDOT EPSC INSPECTOR. THE CONTRACTOR SHALL ENSURE THAT EACH

GAUGE IS MAINTAINED IN GOOD WORKING CONDITION. TDOT AND/OR THE CONTRACTOR SHALL RECORD DAILY PRECIPITATION AND FORECASTED PERCENTAGE OF PRECIPITATION IN DETAILED RECORDS OF RAINFALL EVENTS INCLUDING DATES, AMOUNTS OF RAINFALL PER GAUGE, THE ESTIMATED DURATION (OR STARTING AND ENDING TIMES), AND FORECASTED PERCENTAGE OF PRECIPITATION FOR THE PROJECT. THIS INFORMATION SHALL BE PROVIDED TO THE ENGINEER ON A MONTHLY BASIS. THE COST FOR THE RAIN GAUGES IS TO BE INCLUDED IN THE UNIT BID PRICES FOR OTHER ITEMS. RAIN GAUGES SHALL BE AS SPECIFIED IN THE APPROVED TDOT RAINFALL MONITORING PLAN.

- (25) INSPECTION OF EPSC MEASURES SHALL BE DONE AT LEAST TWICE PER CALENDAR WEEK AT LEAST 72 HOURS APART. A CALENDAR WEEK IS DEFINED AS SUNDAY THROUGH SATURDAY.
- (26) OUTFALL POINTS SHALL BE INSPECTED TO ASCERTAIN WHETHER EPSC MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO SURROUNDING WATERS. WHERE DISCHARGE LOCATIONS ARE INACCESSIBLE, NEARBY DOWNSTREAM LOCATIONS SHALL BE INSPECTED. LOCATIONS WHERE VEHICLES ENTER AND EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE ROADWAY SEDIMENT TRACKING.
- (27) UPON CONCLUSION OF THE INSPECTIONS, EPSC MEASURES FOUND TO BE INEFFECTIVE SHALL BE REPAIRED, REPLACED, OR MODIFIED BEFORE THE NEXT RAIN EVENT, IF POSSIBLE, BUT IN NO CASE MORE THAN 24 HOURS AFTER THE INSPECTION OR WHEN THE CONDITION IS IDENTIFIED. IF THE REPAIR, REPLACEMENT OR MODIFICATION IS NOT PRACTICAL WITHIN THE TIMEFRAME, WRITTEN DOCUMENTATION MUST BE PROVIDED IN THE FIELD BOOK AND AN ESTIMATED REPAIR, REPLACEMENT OR MODIFICATION SCHEDULE SHALL BE DOCUMENTED WITHIN 24 HOURS AFTER IDENTIFICATION.

6-190.06 MATERIALS

- (28) WASTE AND BORROW AREAS SHALL BE LOCATED IN NON-WETLAND AREAS AND ABOVE THE 100-YEAR, FEDERAL EMERGENCY MANAGEMENT AGENCY FLOODPLAIN. BORROW AND WASTE DISPOSAL AREAS SHALL NOT AFFECT ANY WATERS OF THE STATE/U.S. UNLESS THESE AREAS ARE SPECIFICALLY COVERED BY AN ARAP, 404, OR NPDES PERMIT, OBTAINED SOLELY BY THE CONTRACTOR.

6-190.07 SWPPP, PERMITS, PLANS, RECORDS

- (29) THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND OBTAIN ANY NECESSARY ENVIRONMENTAL PERMITS OR APPROVALS, INCLUDING BUT NOT LIMITED TO TDEC ARAP/401, USACE SECTION 404, TVA SECTION 26A, AND TDEC NPDES PERMITS, FROM FEDERAL, STATE

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- AND/OR LOCAL AGENCIES REGARDING THE OPERATION OF ANY PROJECT-DEDICATED ASPHALT AND/OR CONCRETE PLANTS.
- (30) ANY DISAGREEMENT BETWEEN THE PROJECT PLANS, THE PROJECT AS CONSTRUCTED, AND THE PERMIT(S) ISSUED FOR THE PROJECT, SHALL BE BROUGHT TO THE ATTENTION OF THE TDOT PROJECT ENGINEER. THE ENVIRONMENTAL DIVISION, DESIGN DIVISION, AND HEADQUARTERS CONSTRUCTION OFFICE SHALL BE CONTACTED IN THESE INSTANCES AND DECIDE WHICH HAS PRECEDENCE AND WHETHER PERMIT OR PLANS REVISIONS ARE NEEDED. IN GENERAL, PERMIT CONDITIONS WILL PREVAIL.
 - (31) THE FOLLOWING INFORMATION SHALL BE MAINTAINED ON OR NEAR THE SITE: DATES THAT MAJOR GRADING ACTIVITIES OCCUR, DATES WHERE CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE, DATES WHEN STABILIZATION MEASURES ARE INITIATED, EPSC INSPECTION RECORDS AND PRECIPITATION RECORDS.
 - (32) ALL WATER QUALITY AND STORM WATER PERMITS, INCLUDING THE LOCATION OF THE SWPPP, SHALL BE POSTED NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE ACCESSIBLE TO THE PUBLIC. IF POSTING THIS INFORMATION NEAR A MAIN ENTRANCE IS INFEASIBLE, THE INFORMATION SHALL BE PLACED IN A PUBLICLY ACCESSIBLE LOCATION NEAR WHERE THE CONSTRUCTION IS ACTIVELY UNDERWAY AND MOVED AS NECESSARY. THIS LOCATION SHALL BE POSTED AT THE CONSTRUCTION SITE.
 - (33) IF A CHANGE IN PROJECT SCOPE OCCURS DURING CONSTRUCTION, INCLUDING VALUE ENGINEERING, THE ENVIRONMENTAL DIVISION SHALL BE CONTACTED TO DETERMINE WHETHER PERMIT REVISIONS ARE NEEDED. THE DESIGN DIVISION SHALL BE CONTACTED TO DETERMINE IF ANY PLAN REVISIONS ARE NEEDED.
 - (34) THE SWPPP SHALL BE UPDATED BY CONSTRUCTION WHENEVER EPSC INSPECTIONS INDICATE EPSC MEASURES ARE PROVING INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANT SOURCES OR ARE OTHERWISE NOT ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS IN STORM WATER DISCHARGES ASSOCIATED WITH THE CONSTRUCTION ACTIVITY. THE ENVIRONMENTAL DIVISION SHALL BE CONTACTED WHEN MAJOR DESIGN REVISIONS ARE REQUESTED BY CONSTRUCTION. THE ENVIRONMENTAL DIVISION MAY BE CONTACTED FOR GUIDANCE ON SPECIFIC SWPPP NEEDS.
 - (35) PROJECT INSPECTORS AND SUPERVISORS (INCLUDING TDOT STAFF, CONSULTANTS AND CONTRACTOR STAFF) RESPONSIBLE FOR THE IMPLEMENTATION AND MAINTENANCE OF EPSC PLANS SHALL SUCCESSFULLY COMPLETE THE TDEC "LEVEL I - FUNDAMENTALS OF

EROSION PREVENTION AND SEDIMENT CONTROL FOR CONSTRUCTION SITES" COURSE OR EQUIVALENT COURSE. A COPY OF CERTIFICATION RECORDS FOR THIS COURSE SHALL BE KEPT ON SITE AND AVAILABLE UPON REQUEST.

6-190.08 LITTER, DEBRIS, WASTE, PETROLEUM

- (36) THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A PROACTIVE METHOD TO PREVENT LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION WASTES FROM ENTERING WATERS OF THE STATE/U.S.
- (37) THE CONTRACTOR SHALL TAKE APPROPRIATE STEPS TO ENSURE THAT PETROLEUM PRODUCTS OR OTHER CHEMICAL POLLUTANTS ARE PREVENTED FROM ENTERING WATERS OF THE STATE/U.S. ALL EQUIPMENT REFUELING, SERVICING, AND STAGING AREAS SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS, RULES, REGULATIONS, AND ORDINANCES, INCLUDING THOSE OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA). APPROPRIATE CONTAINMENT MEASURES FOR THESE AREAS SHALL BE USED. ALL SPILLS MUST BE REPORTED TO THE APPROPRIATE AGENCY, AND MEASURES SHALL BE TAKEN IMMEDIATELY TO PREVENT THE POLLUTION OF WATERS OF THE STATE/U.S., INCLUDING GROUNDWATER, SHOULD A SPILL OCCUR.

CHAPTER 2 – SPECIAL NOTES

6-200.00 GRADING

NOTE: THESE NOTES SHALL BE ADDED TO THE PLANS AS SPECIAL NOTES ON ALL PROJECTS FOR WHICH A GEOTECHNICAL REPORT IS PREPARED UNLESS OTHERWISE DIRECTED BY THE DESIGN MANAGER AFTER CONSULTATION WITH THE SOILS AND GEOLOGY SECTION OF THE MATERIALS AND TESTS DIVISION AND THE HEADQUARTERS CONSTRUCTION DIVISION. ALL GRADING QUANTITIES ON THE ESTIMATED ROADWAY QUANTITIES SHEET SHOULD ALSO BE FOOTNOTED "REFER TO SPECIAL NOTES."

- (1) THE GRADING TABULATIONS AND RESULTING EARTHWORK ASSOCIATED BID QUANTITIES WERE PREPARED UTILIZING AVAILABLE GEOTECHNICAL INFORMATION AND/OR REPORTS PREPARED FOR THIS PROJECT. THIS INFORMATION IS PROVIDED FOR GENERAL INFORMATION AND ESTIMATION GUIDANCE ONLY.
- (2) BORING DEPICTIONS SHOWN ON THE FOUNDATION DATA SHEETS, SOILS SHEETS, PLANS, AND CROSS-SECTIONS INDICATE SOIL AND ROCK CONDITIONS AT THE SPECIFIC BORING LOCATIONS. ANY SOIL PROFILE AND/OR ROCK LINE IS INTERPRETIVE BASED ON THE JUDGMENT OF THE GEOTECHNICAL ENGINEER/GEOLOGIST. THE TRANSITION BETWEEN BORINGS AND LAYERS MAY VARY SIGNIFICANTLY DEPENDING ON THE GEOLOGIC FORMATIONS ENCOUNTERED.
- (3) TO ASSIST IN BID PREPARATION FOR EARTHWORK AND FOUNDATION CONSTRUCTION, DETAIL ROCK AND SOIL DESCRIPTION AND ON SOME PROJECTS, ROCK CORE SAMPLES ARE AVAILABLE FOR INSPECTION AT THE MATERIALS AND TESTS HEADQUARTERS AT 6601 CENTENNIAL BOULEVARD, NASHVILLE, TN OR AT THE TDOT REGION 1 BUILDING IN KNOXVILLE, TN.
- (4) THE CONTRACTOR SHALL UTILIZE ALL INFORMATION PROVIDED IN THE PLANS, CROSS-SECTIONS AND CONTRACT DOCUMENTS INCLUDING ANY SPECIAL PROVISIONS AS WELL AS UTILIZING HIS PAST EXPERIENCE WITH PROJECTS OF SIMILAR NATURE, SCOPE AND LOCATION IN PREPARATION OF HIS BID FOR EARTHWORK ITEMS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE AND PROVIDE EQUIPMENT AND MEANS NECESSARY TO CONDUCT THE EXCAVATION ACTIVITIES IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.
- (5) EARTHWORK IS PAID FOR UNDER ITEM 203-01, ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED). NO ADDITIONAL PAYMENT WILL BE MADE FOR EARTHWORK QUANTITIES BASED SOLELY ON A CLAIM THAT THE QUANTITIES SHOWN IN THE GRADING TABULATION OR ELSEWHERE IN THE PLANS ARE INACCURATE WITH RESPECT TO THE TYPE OF

MATERIALS ENCOUNTERED DURING CONSTRUCTION EXCEPT AS PROVIDED FOR BY SECTION 104.02 IN THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OR AS AMENDED IN SUPPLEMENTAL SPECIFICATIONS.

6-250.00 PAVEMENT

6-250.02 RESURFACING

NOTE: NOTE (1) SHOULD BE ADDED TO THE SPECIAL NOTES ON INTERSTATE RESURFACING PLANS WHICH INCLUDE COLD PLANING ITEMS.

- (1) TRAFFIC WILL BE ALLOWED TO TEMPORARILY DRIVE ON THE MILLED SURFACE OF THE ROADWAY UNDER THE FOLLOWING CONDITIONS ONLY:
- A. THE MILLED SURFACE IS FINE TEXTURED. THE FINE TEXTURE SHALL BE OBTAINED BY A MILLING MACHINE UTILIZING A MILLING HEAD WITH TEETH SPACING 3/8" OR LESS OPERATING AT LESS THAN 80 FEET PER MINUTE.
 - B. THE SURFACE SHALL BE SWEEPED AND CLEANED OF ALL LOOSE MATERIALS.
 - C. THE DIFFERENCE IN ELEVATION BETWEEN THE MILLED SURFACE AND THE ADJACENT LANE SHALL NOT EXCEED 1 1/2 INCHES.
 - D. THE MILLED SURFACE SHALL BE PAVED WITHIN 48 HOURS.
 - E. RAIN OR INCLEMENT WEATHER IS NOT EXPECTED OR FORECASTED WITHIN 48 HOURS AFTER MILLING.
 - F. ALL APPLICABLE SIGNING IS INSTALLED IN ACCORDANCE WITH THE MUTCD SIGNING SHALL INCLUDE MOTORCYCLE WARNING SIGNS (TN-64) PLACED IN ADVANCE OF ANY MILLED AREAS.
 - G. IF RAVELING OR DETERIORATION OF THE MILLED SURFACE IS OCCURRING WHILE TRAFFIC IS DRIVING ON THE MILLED SURFACE, THEN THIS PRACTICE WILL NOT BE ALLOWED AND PAVING SHALL BE COMPLETED IMMEDIATELY AFTER MILLING.
 - H. ONLY ONE LANE IN EACH DIRECTION SHALL HAVE A MILLED SURFACE AT ONE TIME.

6-250.03 PAVEMENT EDGE DROP-OFF TRAFFIC CONTROL

NOTE: NOTES (A) THROUGH (C) SHALL BE SHOWN IN THE FORM OF TRAFFIC CONTROL NOTES ON THE ON THE TRAFFIC CONTROL SHEETS AND NOT ON THE GENERAL NOTES SHEETS. THE DESIGNER IS TO SHOW ONLY THOSE NOTES THAT APPLY TO THE SPECIFIC PHASE OF TRAFFIC CONTROL SHOWN

ON THE SHEET ON WHICH THE NOTE APPEARS. SEE SECTION 4-712.10 OF THE DESIGN GUIDELINES.

- A. DIFFERENCES IN ELEVATION BETWEEN ADJACENT TRAFFIC LANES OR TRAFFIC LANE AND SHOULDER WHERE THE TRAFFIC LANE IS BEING USED BY TRAFFIC, CAUSED BY BASE, PAVING OR RESURFACING:
 - 1. DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS GREATER THAN 0.75 INCH AND NOT EXCEEDING 2 INCHES:
 - a. WARNING SIGNS, UNEVEN PAVEMENT (W8-11) AND/OR SHOULDER DROP-OFF (W8-9A), SHALL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF 2 SIGNS PER EXPOSED AREA. WHERE UNEVEN PAVEMENT IS ENCOUNTERED, SIGNS SHALL BE PLACED ON EACH SIDE OF THE ROADWAY.
 - b. DIFFERENCES IN ELEVATION BETWEEN ADJACENT TRAFFIC LANES BEING UTILIZED BY TRAFFIC CAUSED BY ADDED PAVEMENT SHALL BE ELIMINATED WITHIN THREE WORKDAYS.
 - c. DIFFERENCES IN ELEVATION BETWEEN ADJACENT TRAFFIC LANES BEING UTILIZED BY TRAFFIC CAUSED BY COLD PLANING SHALL BE ELIMINATED WITHIN THREE WORKDAYS.
 - d. WHEN THE DIFFERENCE IN ELEVATION IS BETWEEN THE TRAFFIC LANE BEING UTILIZED BY TRAFFIC AND SHOULDER, THE DIFFERENCE IN ELEVATION SHALL BE ELIMINATED WITHIN SEVEN WORKDAYS AFTER THE CONDITION IS CREATED.
 - 2. DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS GREATER THAN 2 INCHES AND NOT EXCEEDING 6 INCHES, TRAFFIC IS NOT TO BE ALLOWED TO TRAVERSE THIS DIFFERENCE IN ELEVATION:
 - a. SEPARATION SHALL BE ACCOMPLISHED BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:
 - (1) WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.
 - (2) WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN

MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.

- b. IF THE DIFFERENCE IN ELEVATION IS ELIMINATED OR DECREASED TO 2 INCHES OR LESS BY THE END OF EACH WORKDAY, CONES MAY BE USED DURING DAYLIGHT HOURS IN LIEU OF DRUMS, BARRICADES OR OTHER APPROVED PROTECTIVE DEVICES MENTIONED IN PARAGRAPH A, PROVIDED WARNING SIGNS ARE ERECTED. WARNING SIGNS (UNEVEN PAVEMENT AND/OR LOW SHOULDER) SHALL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF TWO SIGNS PER EXPOSED AREA. WHERE UNEVEN PAVEMENT IS ENCOUNTERED, SIGNS SHALL BE PLACED ON EACH SIDE OF THE ROADWAY.

- c. WHEN THE DIFFERENCE IN ELEVATION IS BETWEEN THE THROUGH TRAFFIC LANE AND THE SHOULDER, AND THE ELEVATION DIFFERENCE IS LESS THAN 3.5 INCHES, THE CONTRACTOR MAY USE WARNING SIGNS AND/OR PROTECTIVE DEVICES AS APPLICABLE AND APPROVED BY THE ENGINEER. SEE PARAGRAPH A REGARDING USE OF DRUMS, BARRICADES OR OTHER APPROVED PROTECTIVE DEVICES. WARNING SIGNS (UNEVEN PAVEMENT AND/OR LOW SHOULDER) WILL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF 2 SIGNS PER EXPOSED AREA. WHERE UNEVEN PAVEMENT IS ENCOUNTERED, SIGNS SHALL BE PLACED ON EACH SIDE OF THE ROADWAY.

IN THESE SITUATIONS THE CONTRACTOR SHALL LIMIT HIS OPERATIONS TO ONE WORK ZONE NOT EXCEEDING 2 MILES IN LENGTH UNLESS OTHERWISE NOTED ON THE PLANS OR APPROVED BY THE ENGINEER. ONCE THE CONTRACTOR BEGINS WORK IN A WORK ZONE, A CONTINUOUS OPERATION SHALL BE MAINTAINED UNTIL THE DIFFERENCE IN ELEVATION IS ELIMINATED. SIMULTANEOUS WORK ON SEPARATE ROADWAYS OF DIVIDED HIGHWAYS WILL BE CONSIDERED INDEPENDENTLY IN REGARD TO RESTRICTION OF WORK ZONE ACTIVITY.

3. DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS GREATER THAN 6 INCHES, BUT NOT EXCEEDING 18 INCHES, THE CONTRACTOR, WITH THE ENGINEER'S APPROVAL, MAY UTILIZE ONE OF THE FOLLOWING:
 - a. THE CONTRACTOR SHALL ACCOMPLISH SEPARATION BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:
 - (1) WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.
 - (2) WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.

IN ORDER TO USE THIS METHOD, THE CONTRACTOR MUST REDUCE THE DIFFERENCE IN ELEVATION TO 6 INCHES OR LESS BY THE END OF THE WORK DAY THAT THE CONDITION IS CREATED.

- b. THE CONTRACTOR SHALL PROVIDE DRUMS, BARRICADES OR OTHER APPROVED SEPARATION DEVICES AS SPECIFIED IN PARAGRAPH A, AND CONSTRUCT A STONE WEDGE WITH A 4:1 SLOPE, OR FLATTER, TO ELIMINATE THE VERTICAL OFFSET IF THE LOWER ELEVATION IS AT OR BELOW SUBGRADE AT THE END OF EACH DAY.
- c. THE CONTRACTOR SHALL PROVIDE DRUMS, BARRICADES OR OTHER APPROVED SEPARATION DEVICES AS SPECIFIED IN PARAGRAPH A, AND IF THE LOWER ELEVATION IS BASE STONE OR ASPHALT PAVEMENT, PLACEMENT OF SUBSEQUENT LAYERS OF PAVEMENT MUST BEGIN THE NEXT WORK DAY AND PROGRESS CONTINUOUSLY UNTIL THE DIFFERENCE IN ELEVATION IS ELIMINATED OR REDUCED TO 6 INCHES OR LESS.
- d. THE CONTRACTOR SHALL PROVIDE SEPARATION BY PORTABLE BARRIER RAIL.

FOR PRECEDING CONDITIONS A, B, AND C, THE CONTRACTOR SHALL USE THE SHOULDER DROP-OFF WARNING SIGN (W8-9A). IT SHALL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF 2 SIGNS PER EXPOSED AREA. IN THESE SITUATIONS THE CONTRACTOR SHALL LIMIT HIS OPERATIONS TO ONE WORK ZONE NOT EXCEEDING 1 MILE

IN LENGTH, UNLESS OTHERWISE NOTED ON THE PLANS OR APPROVED BY THE ENGINEER. ONCE THE CONTRACTOR BEGINS WORK IN A WORK ZONE, A CONTINUOUS OPERATION SHALL BE MAINTAINED UNTIL THE DIFFERENCE IS ELIMINATED. SIMULTANEOUS WORK ON SEPARATE ROADWAYS OF DIVIDED HIGHWAYS WILL BE CONSIDERED INDEPENDENTLY IN REGARD TO RESTRICTION OF WORK ZONE ACTIVITY.

4. FOR DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS GREATER THAN 18 INCHES:

SEPARATION WILL BE PROVIDED BY THE USE OF PORTABLE BARRIER RAIL.

IN THIS SITUATION THE CONTRACTOR SHALL LIMIT HIS OPERATIONS TO ONE WORK ZONE NOT EXCEEDING 1 MILE IN LENGTH UNLESS OTHERWISE NOTED ON THE PLANS OR APPROVED BY THE ENGINEER. ONCE THE CONTRACTOR BEGINS WORK IN A WORK ZONE A CONTINUOUS OPERATION SHALL BE MAINTAINED UNTIL THE DIFFERENCE IN ELEVATION IS ELIMINATED. SIMULTANEOUS WORK ON SEPARATE ROADWAYS OF DIVIDED HIGHWAYS WILL BE CONSIDERED INDEPENDENTLY IN REGARD TO RESTRICTION OF WORK ZONE ACTIVITY.

- B. IF THE DIFFERENCE IN ELEVATION IS WITHIN 30 FEET OF THE NEAREST TRAFFIC LANE BEING USED BY TRAFFIC CAUSED BY GRADING, EXCAVATION FOR UTILITIES, DRAINAGE STRUCTURES, UNDERCUTTING, ETC:

1. IF THE DIFFERENCE IN ELEVATION IS WITHIN 8 FEET OF THE NEAREST TRAFFIC LANE WITH DIFFERENCE IN ELEVATION GREATER THAN 3/4 INCH AND NOT EXCEEDING 2 INCHES:

WARNING SIGNS (UNEVEN PAVEMENT AND/OR LOW SHOULDER) SHALL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF 2 SIGNS PER EXPOSED AREA. WHERE UNEVEN PAVEMENT IS ENCOUNTERED, SIGNS SHALL BE PLACED ON EACH SIDE OF THE ROADWAY.

2. IF THE DIFFERENCE IN ELEVATION IS WITHIN 8 FEET OF THE NEAREST TRAFFIC LANE WITH DIFFERENCE IN ELEVATION GREATER THAN 2 INCHES AND NOT EXCEEDING 6 INCHES:

- a. SEPARATION SHALL BE ACCOMPLISHED BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:

- (1) WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.
 - (2) WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.
3. IF THE DIFFERENCE IN ELEVATION IS WITHIN 8 FEET OF THE NEAREST TRAFFIC LANE WITH DIFFERENCE IN ELEVATION GREATER THAN 6 INCHES:
- a. SEPARATION SHALL BE ACCOMPLISHED BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:
 - (1) WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.
 - (2) WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.
 - b. ELIMINATE VERTICAL OFFSET BY CONSTRUCTING A STONE WEDGE OR GRADING TO A 4:1 SLOPE, OR FLATTER, OR USE PORTABLE BARRIER RAIL.
- THE CONTRACTOR SHALL SCHEDULE THE WORK SO AS TO MINIMIZE THE TIME TRAFFIC IS EXPOSED TO AN ELEVATION DIFFERENCE. ONCE THE CONTRACTOR BEGINS AN ACTIVITY THAT CREATES AN ELEVATION DIFFERENCE WITHIN 8 FEET OF A TRAFFIC LANE, THE ACTIVITY SHALL BE PURSUED AS A CONTINUOUS OPERATION UNTIL THE ELEVATION DIFFERENCE IS ELIMINATED.
- C. IF THE DIFFERENCE IN ELEVATION IS FARTHER THAN 8 FEET FROM THE NEAREST TRAFFIC LANE BUT NOT MORE THAN 30 FEET FROM THE NEAREST TRAFFIC LANE:
- SEPARATION SHALL BE ACCOMPLISHED BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:
1. WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.

2. WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.

THE CONTRACTOR SHALL SCHEDULE THE WORK SO AS TO MINIMIZE THE TIME TRAFFIC IS EXPOSED TO AN ELEVATION DIFFERENCE. ONCE THE CONTRACTOR BEGINS AN ACTIVITY THAT CREATES AN ELEVATION DIFFERENCE, THE ACTIVITY SHALL BE PURSUED AS A CONTINUOUS OPERATION UNTIL THE ELEVATION DIFFERENCE IS ELIMINATED.

6-270.00 SIGNALIZATION

NOTE: SEE SECTION 4-730.15 FOR PLACEMENT OF THIS NOTE.

- (1) THE DESIGN OF TRAFFIC SIGNAL SUPPORT POLES, MAST ARMS, STRAIN POLES, ETC. SHALL BE IN CONFORMANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, CURRENT EDITION. OVERHEAD CANTILEVERED TRAFFIC SIGNAL STRUCTURES SHALL BE DESIGNED FOR FATIGUE CATEGORY 1.

6-290.00 EROSION PREVENTION AND SEDIMENT CONTROL

NOTE: REFER TO SECTION 3-305.08 SPECIAL EPSC NOTES.

6-290.01 STREAM/WETLAND

NOTE: NOTE (1) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WITH MULTI-BARREL CULVERTS AND BRIDGES THAT INCLUDE PROPOSED WORK WITHIN A STREAM CHANNEL AREA. THIS NOTE PERTAINING TO WORK WITHIN THE STREAM CHANNEL AREA FOR CONSTRUCTION HAS BEEN DEVELOPED TO ELIMINATE SUPPLEMENTS AND PAYMENT CONCERNS FOR EROSION PREVENTION AND SEDIMENT CONTROL ITEMS USED FOR THIS PURPOSE. THE STRUCTURES DIVISION SHALL INCLUDE A SIMILAR NOTE IN THE STRUCTURES PLANS FOR BRIDGES.

- (1) ANY WORK WITHIN THE STREAM CHANNEL AREA (E.G., FOR PIER FOOTING, RIP-RAP PLACEMENT, MULTI-BARREL CULVERT/BRIDGE CONSTRUCTION, ETC.) SHALL BE SEPARATED FROM FLOWING WATER OR EXPECTED FLOW PATH AND PERFORMED DURING LOW FLOW CONDITIONS. ALL ITEMS USED WITHIN THE STREAM CHANNEL AREA FOR DIVERSION OF FLOW (OR EXPECTED FLOW), UNLESS SPECIFIED IN THE PLANS, SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE COST OF OTHER ITEMS. THIS NOTE EXCLUDES ANY

ITEMS SPECIFIED IN THE PLANS FOR THE TEMPORARY DIVERSION CHANNELS, EC-STR-31 AND TEMPORARY DIVERSION CULVERTS, EC-STR-32 FOR SINGLE BARREL CULVERT CONSTRUCTION.

6-290.02 HIGH QUALITY WATERS

NOTE: NOTES (2) AND (3) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WITH HIGH QUALITY WATERS OR WATERS IMPAIRED BY SILTATION.

- (2) FOR PROJECTS THAT DISCHARGE INTO HIGH QUALITY WATERS OR WATERS IMPAIRED BY SILTATION, AN OUTFALL IN A DRAINAGE AREA OF 5 ACRES OR MORE, A TEMPORARY (OR PERMANENT) SEDIMENT BASIN THAT PROVIDES STORAGE FOR A CALCULATED VOLUME OF RUNOFF FROM A 5-YEAR/ 24-HOUR STORM EVENT AND RUNOFF FROM EACH ACRE DRAINED, OR EQUIVALENT CONTROL MEASURES, SHALL BE PROVIDED UNTIL FINAL STABILIZATION OF THE SITE. THE ENVIRONMENTAL AND DESIGN DIVISIONS MAY BE CONTACTED TO REVIEW AND CONCUR WITH ANY REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE OUTFALL PROCEEDS, UNLESS PREVIOUSLY EXEMPT IN THE NPDES CONSTRUCTION GENERAL PERMIT.
- (3) FOR PROJECTS THAT DISCHARGE INTO HIGH QUALITY WATERS OR WATERS IMPAIRED BY SILTATION, A 60 FOOT NATURAL RIPARIAN BUFFER ZONE ADJACENT TO AND ON BOTH SIDES OF THE RECEIVING STREAM WITH THIS DESIGNATION SHALL BE PRESERVED, TO THE MAXIMUM EXTENT PRACTICABLE, DURING CONSTRUCTION ACTIVITIES AT THE SITE. BUFFER ZONES ARE NOT SEDIMENT CONTROL MEASURES AND SHOULD NOT BE RELIED UPON AS PRIMARY SEDIMENT CONTROL MEASURES. THE RIPARIAN BUFFER ZONE SHALL BE ESTABLISHED BETWEEN THE TOP OF THE STREAM BANK AND THE DISTURBED CONSTRUCTION AREA. THE 60 FOOT CRITERION FOR THE WIDTH OF THE BUFFER ZONE CAN BE ESTABLISHED ON AN AVERAGE WIDTH BASIS AT A PROJECT, AS LONG AS THE MINIMUM WIDTH OF THE BUFFER ZONE IS MORE THAN 25 FEET AT ANY MEASURED LOCATION. EVERY ATTEMPT SHALL BE MADE FOR CONSTRUCTION ACTIVITIES NOT TO TAKE PLACE WITHIN THE BUFFER ZONES. BEST MANAGEMENT PRACTICES (BMPS) PROVIDING EQUIVALENT PROTECTION AS THE NATURAL RIPARIAN ZONE MAY BE USED. A JUSTIFICATION FOR USE AND DESIGN EQUIVALENCY SHALL BE DOCUMENTED WITHIN THE SWPPP. THE ENVIRONMENTAL AND DESIGN DIVISIONS SHALL REVIEW AND APPROVE THIS REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE SITE PROCEEDS, UNLESS PREVIOUSLY EXEMPT IN THE NPDES CONSTRUCTION GENERAL PERMIT. WHERE ISSUED, ARAP/401 REQUIREMENTS WILL PREVAIL IF IN CONFLICT WITH THESE BUFFER ZONE REQUIREMENTS.

6-290.03 NPDES

NOTE: NOTES (4) THROUGH (7) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WHICH REQUIRE A NPDES PERMIT. REFER TO SECTION 3-305.06.

- (4) NO WORK SHALL BE STARTED UNTIL THE CONTRACTOR'S PLAN FOR THE STAGING OF THEIR OPERATIONS, INCLUDING THE PLAN FOR STAGING OF TEMPORARY AND PERMANENT EPSC MEASURES, HAS BEEN ACCEPTED BY THE ENGINEER. THE CONTRACTOR'S EPSC PLAN SHALL INCORPORATE AND SUPPLEMENT, AS ACCEPTABLE, THE BASIC EPSC DEVICES ON THE EPSC PLAN CONTAINED IN THE APPROVED SWPPP.
- (5) THE EPSC MEASURES AND/OR PLAN SHALL BE MODIFIED AS NECESSARY SO THAT THEY ARE EFFECTIVE AT ALL TIMES THROUGHOUT THE COURSE OF THE PROJECT.
- (6) THE ACCEPTED EPSC PLAN SHALL REQUIRE THAT EPSC MEASURES BE IN PLACE BEFORE CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING OCCURS, EXCEPT AS SUCH WORK MAY BE NECESSARY TO INSTALL EPSC MEASURES, INCLUDING WITHOUT LIMITATION AS FOLLOWS:
 - A. INITIAL CLEARING AND GRUBBING SHALL BE LIMITED TO THAT NECESSARY FOR THE INSTALLATION OF APPLICABLE EPSC MEASURES IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.
 - B. NO OTHER CLEARING AND GRUBBING OPERATIONS SHALL BE STARTED BEFORE APPLICABLE EPSC MEASURES ARE IN PLACE IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.
 - C. NO CULVERT OR BRIDGE CONSTRUCTION SHALL BE STARTED BEFORE APPLICABLE EPSC MEASURES ARE IN PLACE IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.
 - D. NO GRADING, EXCAVATION, CUTTING, FILLING, OR OTHER EARTHWORK SHALL BE STARTED BEFORE EPSC MEASURES ARE IN PLACE IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.
- (7) PERMANENT EPSC MEASURES SHALL BE INITIATED WITHIN 15 CALENDAR DAYS AFTER FINAL GRADING OF ANY SEQUENCE OR PHASE. TEMPORARY OR PERMANENT STABILIZATION SHALL BE INITIATED WITHIN 15 CALENDAR DAYS AFTER FINAL GRADING OR WHEN CONSTRUCTION ACTIVITIES ON A PORTION OF THE SITE ARE TEMPORARILY CEASED AND EARTH DISTURBING ACTIVITIES WILL NOT

RESUME UNTIL AFTER 15 CALENDAR DAYS. PERMANENT STABILIZATION WITH PERENNIAL VEGETATION OR OTHER PERMANENTLY STABLE NON-ERODING SURFACE SHALL REPLACE ANY TEMPORARY MEASURES AS SOON AS PRACTICABLE. UNPACKED GRAVEL CONTAINING FINES (SILT AND CLAY SIZED PARTICLES) OR CRUSHER RUNS WILL NOT BE CONSIDERED A NON-ERODIBLE SURFACE.

NOTE: FOR ALL PROJECTS WHICH REQUIRE A NPDES PERMIT, THE EPSC PLAN SHALL ADDRESS PERIODS OF THE YEAR DURING WHICH CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING WILL NOT OCCUR AND LIMITATIONS ON THE TOTAL AREA OF EXPOSED SOIL (AREAS THAT DO NOT HAVE TEMPORARY OR PERMANENT STABILIZATION) AT ANY TIME DURING CONSTRUCTION. AS SUCH, THE FOLLOWING GUIDANCE SHALL BE FOLLOWED.

IF THE COMBINED EARTHWORK QUANTITIES FOR COMMON EXCAVATION (NOT ROCK) AND UNCLASSIFIED BORROW EXCAVATION IS GREATER THAN 1,000,000 CY, OR THE PROJECT IS 1 MILE OR CLOSER TO THE NEAREST DESIGNATED TIER II STREAM, THE DESIGN MANAGER SHALL NOTIFY THE APPROPRIATE DESIGN DIVISION ASSISTANT DIRECTOR. THE DESIGN DIVISION ASSISTANT DIRECTOR SHALL IN TURN REQUEST ADDITIONAL GUIDANCE FROM THE ENVIRONMENTAL DIVISION PERMITS SECTION AND THE CONSTRUCTION DIVISION REGARDING APPROPRIATENESS OF SEASONAL LIMITATIONS AND LIMITATIONS ON THE TOTAL AREA OF EXPOSED SOIL.

IF THE COMBINED EARTHWORK QUANTITIES FOR COMMON EXCAVATION (NOT ROCK) AND UNCLASSIFIED BORROW EXCAVATION IS LESS THAN 1,000,000 CY OR THE PROJECT IS FURTHER THAN 1 MILE FROM THE NEAREST DESIGNATED TIER II STREAM, THE DESIGNER SHALL INCLUDE NOTE (8) IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET:

- (8) EXCEPT AS OTHERWISE SPECIFIED, THERE ARE NO KNOWN SPECIAL ENVIRONMENTAL FACTORS PRESENT ON THIS PROJECT THAT INDICATE A NEED FOR SEASONAL LIMITATIONS ON THE CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING OPERATIONS OR ON THE TOTAL AREA OF EXPOSED SOIL.

NOTE: NOTE (9) SHALL BE INCLUDED IN THE PROJECT SPECIAL NOTES ON THE SECOND SHEETS OF THE ROADWAY PLANS FOR ALL PROJECTS WHICH REQUIRE A NPDES PERMIT. FILL IN THE BLANK WITH THE APPROPRIATE SHEET NUMBER.

- (9) REFER TO THE EROSION PREVENTION AND SEDIMENT CONTROL PLAN, SHEET ____, FOR NOTES REGARDING SEASONAL WORK LIMITATION OR LIMITATION ON THE TOTAL AREA OF EXPOSED SOIL.

6-290.04 UTILITY RELOCATION

NOTE: NOTES (10) THROUGH (19) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS IN WHICH UTILITIES ARE IN THE CONTRACT. REFER TO SECTION 3-305.07.

- (10) RAIN WATER WHICH COLLECTS IN THE UTILITY TRENCH SHALL BE PUMPED INTO A DEWATERING STRUCTURE OR SEDIMENT FILTER BAG AND MAINTAINED.
- (11) SILT FENCE SHALL BE INSTALLED ON THE DOWNSTREAM SIDE OF STOCKPILED SOIL. TRENCHING ACROSS WET WEATHER CONVEYANCES SHALL BE DONE DURING NO FLOW CONDITIONS AND STABILIZED BY THE END OF THE WORK DAY.
- (12) UTILITY CROSSINGS FOR PERENNIAL STREAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TDOT STANDARDS AND NO WORK SHALL BE CONDUCTED IN FLOWING WATERS. TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) REGULATIONS APPLY TO UTILITIES IN THIS PROJECT IN REGARD TO EROSION PREVENTION AND SEDIMENT CONTROL (EPSC). THE STATE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE STORM WATER POLLUTION PREVENTION PLANS (SWPPP).
- (13) IT IS THE RESPONSIBILITY OF THE STATE UTILITY CONTRACTOR INSTALLER TO PROTECT FROM EROSION EXPOSED EARTH RESULTING FROM THEIR OPERATIONS AND TO PROVIDE FOR CONTAINMENT OF SEDIMENT THAT MAY RESULT FROM THEIR WORK. PRIOR TO BEGINNING WORK, ADEQUATE MEASURES MUST BE IN PLACE TO TRAP ANY SEDIMENT THAT MAY TRAVEL OFF-SITE IN THE EVENT OF RAIN. DURING THE PROGRESSION OF THEIR WORK, EXPOSED EARTH AREAS SHALL BE STABILIZED AS SOON AS POSSIBLE TO PREVENT EROSION. AT NO TIME SHALL EXPOSED EARTH RESULTING FROM THEIR OPERATIONS HAVE UNPROTECTED ACCESS TO FLOWING OFF-SITE AND ENTERING WATERS OF THE STATE/U.S.
- (14) FOR THE INSTALLATION OF BURIED UTILITIES (PIPES AND CABLES), TRENCHES SHALL BE BACKFILLED DAILY AS CONSTRUCTION PROCEEDS. BACKFILLED TRENCHES SHALL BE SEEDED AND MULCHED OR SODDED DAILY IF POSSIBLE, BUT NO LATER THAN SEVEN DAYS AFTER BEING BACKFILLED. ANY TEMPORARY SPOIL OF EXCAVATED EARTH SHALL BE LOCATED WITHIN TDOT EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES OR RECEIVE SEPARATE EPSC MEASURES. IF TRENCHES ARE NOT BACKFILLED OVERNIGHT, APPROPRIATE EPSC MEASURES WILL BE INSTALLED BY THE STATE UTILITY CONTRACTOR UNTIL SUCH TIME AS THE TRENCH IS BACKFILLED.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- (15) IN REGARD TO EROSION PREVENTION AND SEDIMENT CONTROL (EPSC), TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) REGULATIONS APPLY TO THE STATE UTILITY CONTRACTORS IN THIS PROJECT, THEREFORE, THE STATE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE STORM WATER POLLUTIONS PREVENTION PLANS (SWPPP). THE STATE CONTRACTOR IS RESPONSIBLE FOR EPSC MEASURES RELATED TO UTILITY CONSTRUCTION INCLUDED IN THE STATE CONTRACT WORK.
- (16) TRENCHES FORMED FOR THE INSTALLATION OF BURIED UTILITIES MAY CAUSE STORM WATER RUNOFF TO CONCENTRATE AT THE TRENCH LINE. ADDITIONAL EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES MAY BE REQUIRED TO BE INSTALLED AS APPROVED BY THE TDOT PROJECT ENGINEER.
- (17) FOR THE INSTALLATION OF UNDERGROUND UTILITIES OUTSIDE OF THE TDOT RIGHT-OF-WAY, EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) SHALL BE INSTALLED PRIOR TO CLEARING (TRENCHING AND ASSOCIATED BLASTING) IN THOSE AREAS NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE CONSTRUCTION AREA. THESE EPSC MEASURES SHALL REMAIN UNTIL THE BACKFILLED TRENCH IS STABILIZED WITH FINAL VEGETATIVE COVER.
- (18) THE UTILITY CONTRACTOR SHALL RESTORE ALL AFFECTED WET WEATHER CONVEYANCES TO THE EXISTING TOPOGRAPHIC CONDITIONS (AS APPROVED BY THE TDOT PROJECT ENGINEER).
- (19) THE UTILITY CONTRACTOR WILL PROVIDE APPROPRIATE EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES TO REPLACE IN-PLACE EPSC MEASURES REMOVED TO FACILITATE THE INSTALLATION OF UTILITIES. REPLACEMENT OF EPSC MEASURES WILL BE COORDINATED WITH THE TDOT PROJECT ENGINEER BEFORE COMMENCING WORK.

6-290.05 LITTER, DEBRIS, WASTE, PETROLEUM

NOTE: NOTE (21) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WHERE A BRIDGE IS BEING WIDENED, REPLACED, OR REHABILITATED OVER RAILROAD RIGHT-OF-WAY. FILL IN THE BLANK WITH THE NAME(S) OF THE APPROPRIATE RAILROAD(S) INVOLVED IN THE PROJECT.

- (20) THE CONTRACTOR SHALL MAINTAIN A COMPLETE AND COMPREHENSIVE EROSION PREVENTION AND SEDIMENT CONTROL PLAN TO PREVENT ROADWAY AND/OR CONSTRUCTION SEDIMENT OR DEBRIS AND ANY PETROLEUM BASED PRODUCTS OR CHLORINATED SOLVENTS, PAINTS OR COATINGS ETC. FROM FALLING ONTO THE RAILROAD'S RIGHTS-OF-WAY AND/OR FROM ENTERING THE DRAINAGE

DITCHES OR DRAINAGE STRUCTURES OF THE RAILROAD, AND ANY SEDIMENT OR DEBRIS OR PETROLEUM BASED PRODUCTS OR CHLORINATED SOLVENTS, ETC. THAT DO ENTER SUCH DRAINAGE AREAS OF THE RAILROAD'S RIGHTS-OF-WAY ARE TO BE REMOVED IN ACCORDANCE WITH RULES SET FORTH BY _____ AND AT THE CONTRACTOR'S EXPENSE.

6-290.06 POLYACRYLAMIDE

NOTE: NOTES (22) THROUGH (29) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WHERE POLYACRYLAMIDE (PAM) IS USED.

- (21) ENSURE POLYACRYLAMIDE (PAM) EMULSIONS AND POWDERS ARE OF THE ANIONIC TYPE AND MEET THE FOLLOWING REQUIREMENTS:
- (22) MEETS THE EPA AND FDA ACRYLABIDE MONOMER LIMITS OF EQUAL TO OR GREATER THAN 0.005% ACRYLAMIDE MONOMER
- (23) HAS A DENSITY OF 10% TO 55% BY WEIGHT AND A MOLECULAR WEIGHT OF 16 TO 24 MG/MOLE
- (24) MIXTURE IN NON-COMBUSTIBLE
- (25) CONTAINS ONLY MANUFACTURED RECOMMENDED ADDITIVES
- (26) PAM SHALL BE MIXED AND APPLIED IN ACCORDANCE WITH ALL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS AND THE MANUFACTURE'S RECOMMENDATIONS FOR THE SPECIFIED USED CONFORMING TO ALL FEDERAL, STATE, AND LOCAL LAWS, RULES, AND REGULATIONS.
- (27) ALL VENDERS AND SUPPLIERS OF PAM, PAM MIX, OR PAM BLENDS SHALL PRESENT OR SUPPLY A WRITTEN TOXICITY REPORT WHICH VERIFIES THAT THE PAM, PAM MIX, PAM BLEND EXHIBITS ACCEPTABLE TOXICITY PARAMETERS WHICH MEET OR EXCEED THE EPA REQUIREMENTS FOR THE STATE AND FEDERAL WATER QUALITY STANDARDS. WHOLE EFFLUENT TESTING DOES NOT MEET THIS REQUIREMENT AS PRIMARY REACTIONS HAVE OCCURRED AND TOXIT POTENTIALS HAVE BEEN REDUCED. CATIONIC FORMS OF PAM ARE NOT ALLOWED FOR UNDER THIS GUIDELINE DUE TO THEIR HIGH LEVELS OF TOXICITY TO AQUATIC ORGANISMS. PAM EMULSIONS SHALL NEVER BE APPLIED DIRECTLY TO STORMWATER RUNOFF OR RIPARIAN WATERS DUR TO SURFACTANT TOXITY. CONTRACTOR MUST SEEK THE APPROVAL OF THE EPSC DEISGN ENGINEER AND TDOT IF CHITOSAN IS PROPOSED FOR USE ON THIS PROJECT.
- (28) ALL VENDORS AND SUPPLIERS OF PAM, PAM MIX, OR PAM BLENDS SHALL SUPPLY WRITTEN "SITE SPECIFIC" TESTING RESULTS

SEMONSTRATING THAT A PERFORMANCE OF 95% OR GREATER REDUCTION OF NTU OR TSS FROM STORMWATER DISCHARGES.

- (29) EMULSION BATCHES SHALL BE MIXED FOLLOWIGN RECOMMENDATIONS OF A TESTING LABORATORY THAT DETERMINES THE PROPER PRODUCT AND RATE TO MEET SITE REQUIREMENTS. APPLICATION METHOD SHALL INSURE UNIFORM COVERAGE TO THE TARGET AREA. EMULSIONS SHALL NEVER BE APPLIED DIRECTLY TO STORMWATER FUNOFF OR RIPARIAN WATERS.
- (30) PAM POWDER MAY BE APPLIED BY A HAND SPREADER OR A MECHANICAL SPREADER. MIXING PAM POWDER WITH DRY DILICA SAND WILL AID IN SPREADING.
- (31) PREMIXING OF PAM POWDER INTO FERTILIXER, SEED, OR OTHER SOIL AMENDMENTS IS ALLOWED WHEN SPECIFIED IN THE DESIGN PLAN. APPLICATION METHDON SHALL INSURE UNIFORM COVERAGE TO THE TARGET AREA.
- (32) PAM LOGS OR BLOCKS SHALL BE APPLIED FOLLOWING SITE TESTING RESULTS TO ENSURE PROPER PLACEMENT AND PERFORMANCE AND SHALL MEET OR EXCEED STATE AND FEDERAL WATER QUALITY REQUIREMENTS.

6-295.00 ENVIRONMENTAL

6-295.01 ECOLOGY

NOTE: NOTES (1) THROUGH (3) SHALL BE INCLUDED IN THE PROJECT SPECIAL NOTES ON THE SECOND SHEETS OF THE ROADWAY PLANS FOR ALL PROJECTS WHICH HAVE THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT IDENTIFIED FOR BRIDGES.

- (1) STAFF FROM THE TDOT ENVIRONMENTAL DIVISION OR A DESIGNEE WILL ADVISE THE CONTRACTOR DURING THE PRE-CONSTRUCTION MEETING CONCERNING WHEN ENVIRONMENTAL DIVISION PERSONNEL OR DESIGNATED CONSULTANT WILL NEED TO BE ON-SITE FOR WORK BEING DONE WHICH COULD AFFECT THE STREAM OR SPECIES.
- (2) STAFF FROM THE TDOT ENVIRONMENTAL DIVISION OR A DESIGNEE WILL ATTEND THE PRE-CONSTRUCTION MEETING FOR ALL PROJECTS WHICH HAVE THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT PROXIMAL TO SCHEDULED BRIDGE WORK. THIS WILL PROVIDE THE OPPORTUNITY TO ENSURE THAT PERSONNEL INCLUDING THE CONTRACTOR'S PERSONNEL AND SUBCONTRACTORS ARE MADE AWARE OF THE NECESSARY PRECAUTIONS WHICH MUST BE FOLLOWED.

- (3) ALL BRIDGE PROJECTS WITH THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT IDENTIFIED MUST HAVE MEASURES IN PLACE TO CONTAIN CONCRETE DUST, CEMENT DUST AND ALL OTHER MATERIALS. THESE MATERIALS ARE NOT ALLOWED TO ENTER THE STREAM.

6-295.02 STREAM RELOCATION

NOTE: NOTE (4) SHALL BE INCLUDED IN THE PROJECT SPECIAL NOTES ON THE SECOND SHEETS OF THE ROADWAY PLANS FOR ALL PROJECTS WHICH CONTAIN A STREAM RELOCATION.

- (4) ONCE WATER IS DIVERTED INTO A NEWLY CONSTRUCTED AND STABILIZED RELOCATED STREAM / CHANNEL THE ECOLOGY SECTION MUST BE NOTIFIED. THE STREAM NAME, STREAM NUMBER, AND DATE THE WATER WAS DIVERTED INTO THE STREAM / CHANNEL IS TO BE SUPPLIED WITH THE NOTIFICATION.

SECTION VII - INDEX

SECTION INDEX

-A-

ABANDONMENT OF WATER WELLS 3-130.00, 4-202.13, 4-625.00
 ACCESS CONTROL..... 2-300.05, 2-300.10, 2-310.00, 3-330.00, 4-145.00, 4-713.05
 (CONT'D).....4-713.10, 4-713.20, 4-716.13, 4-716.15, 4-716.35
 ACQUISITION TABLE, RIGHT-OF-WAY.....2-320.05, 3-300.00, 3-400.00, 4-133.00
 ACTIVITY STATUS SHEET, PROJECT 1-110.00, 2-110.00, 4-110.00
 AGGREGATE BASE, BITUMINOUS COATED 4-308.00
 AGGREGATE BASE, MINERAL..... 4-303.00
 AGGREGATE-CEMENT BASE COURSE - GRAVEL 4-309.01
 AGGREGATE-CEMENT BASE COURSE - LIMESTONE 4-309.00
 AGGREGATE-LIME-FLY ASH STABILIZED BASE COURSE 4-312.00
 APPRAISALS..... 3-105.10, 3-400.00, 3-400.15, 3-400.20, 3-400.25, 3-400.35, 3-405.00
 APPROACHES, ROADWAY..... 4-203.25
 APRON FOR BOX CULVERT AND BRIDGE OUTLETS, PAVED 4-604.10
 AQUATIC RESOURCE ALTERATION PERMIT (ARAP) 3-410.00
 ASPHALTIC CONCRETE SURFACE (HOT MIX) 4-411.00
 AT-GRADE RAILROAD CROSSINGS..... 1-210.05
 AUTOMATIC TRAFFIC RECORDERS, LOCATION OF 2-180.00
 AVERAGE DAILY LOADING (ADL)..... 3-125.00, 2-120.00
 AVERAGE DAILY TRAFFIC (ADT)..... 1-200.05, 2-120.00, 3-125.00
 (CONT'D)..... 3-125.05, 4-712.00, 4-806.00

-B-

BALANCE, EARTHWORK.....2-145.05, 3-315.05, 3-315.15, 4-203.02, 4-203.45
 BALED HAY 4-209.01
 BASE, BITUMINOUS PLANT MIX 4-307.00
 BASE, BITUMINOUS COATED AGGREGATE 4-308.00
 BASE COURSE - AGGREGATE-LIME-FLY ASH STABILIZED 4-312.00
 BASE COURSE - GRAVEL, AGGREGATE-CEMENT 4-309.01
 BASE COURSE - LIMESTONE, AGGREGATE-CEMENT 4-309.00
 BASE, MINERAL AGGREGATE 4-303.00
 BASE, SOIL-CEMENT 4-304.00, 4-203.40
 BERM, TEMPORARY 4-209.01
 BITUMINOUS PLANT MIX BASE (HOT MIX)..... 4-307.00
 BITUMINOUS SEAL COAT (CHIP SEAL) 4-307.00
 BITUMINOUS SEAL COAT (CHIP SEAL) ALONG EDGE OF PAVED SHOULDERS
 WHILE MAKING LANE SHIFTS DURING CONSTRUCTION 4-405.00
 BITUMINOUS SEAL COAT (SPLIT APPLICATION) 4-406.00
 BITUMINOUS COATED AGGREGATE BASE (PLANT MIX)..... 4-308.00
 BOX CONCRETE CULVERTS 4-204.05, 4-604.00, 4-604.10, 4-604.20, 4-604.25, 4-705.00
 (CONT'D)..... 4-203.35, 2-155.05
 BOX CONCRETE SHALLOW FILLS 4-604.30
 BRIDGE CLEARANCES ON PAVING PROJECTS 4-125.00
 BRIDGE DECK PANELS 4-604.05

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

BRIDGE DECK SEALANT 4-617.00
 BRIDGE END DRAINS 3-200.10, 4-611.04
 BRIDGE LENGTHS, BOX AND SLAB-TYPE CULVERTS 2-155.05
 BRIDGES VERTICAL CLEARANCES 2-125.00
 BRUSH BARRIERS, TEMPORARY 4-209.01
 BUILDINGS, REMOVAL 4-202.10

-C-

CATCH BASIN, COMPUTATION OF SIZE FOR 3-236.00
 CATCH BASIN GRATE ELEVATIONS SHOWN ON THE PLANS 3-250.00
 CATCH BASIN, SPACING BETWEEN FOR MAINTENANCE CLEAN OUTS 3-255.00
 CATCH BASIN WITH STRUCTURAL STEEL GRATES 3-251.00
 CEMENT BASE, SOIL 4-203.40, 4-304.00
 CHANNEL CHANGES 2-155.05, 2-320.05
 CHANNEL EXCAVATION 4-203.35, 4-604.35
 CHANNELIZATION STRIPING 4-716.00
 CHECK DAMS 4-209.01
 CHECKLIST, ROADWAY DESIGN 1-105.00, 1-120.00
 CHIP SEAL 4-405.00, 4-405.01
 CIVIL ENGINEERING MANAGER I 2-115.00, 2-120.00, 2-300.00, 3-110.024, 3-110.05
 (CONT'D) 3-400.15, 3-410.00, 4-115.00, 4-140.00, 4-140.05, 4-712.20
 CLEARANCES, BRIDGE 4-125.00
 CLEARANCES, VERTICAL 2-125.00, 4-125.00
 CLEAR ROADSIDE 2-135.00, 2-135.05
 CLEAR ZONES 2-135.00, 2-135.05
 CLIMBING LANES 2-150.00
 COLD PLANING 4-415.00, 4-405.00, 4-712.10, 4-713.25, 4-730.08
 COMMISSIONER SIGNATURE 3-105.05, 4-115.05
 COMPUTATION
 AGGREGATE-CEMENT BASE COURSE - GRAVEL 4-309.01
 AGGREGATE-CEMENT BASE COURSE - LIMESTONE 4-309.00
 AGGREGATE-LIME-FLY ASH STABILIZED BASE 4-312.00
 ASPHALTIC CONCRETE SURFACE (HOT MIX) 4-411.00
 BASE AND SUBGRADE TREATMENT 4-301.00, 4-302.00
 BITUMINOUS COATED AGGREGATE BASE (PLANT MIX) 4-308.00
 BITUMINOUS PLANT MIX BASE (HOT MIX) 4-307.00
 BITUMINOUS SEAL COAT (CHIP SEAL) 4-405.00
 BITUMINOUS SEAL COAT (SPLIT APPLICATION) 4-406.00
 BRIDGE END DRAINS 3-200.10, 4-611.05
 CATCH BASINS 3-236.00
 DOUBLE BITUMINOUS SURFACE TREATMENT 4-404.00
 EROSION PREVENTION AND SEDIMENT CONTROL 4-209.00, 4-209.01
 MANHOLES, CIRCULAR 3-236.00
 MICRO-SURFACING 4-414.05
 MINERAL AGGREGATE BASE 4-303.00
 PRIME COAT 4-402.00
 RIGHT-OF-WAY 1-210.10, 2-315.05, 2-112.00, 2-2-115.00, 2-155.00, 2-155.02
 (CONT'D) 2-175.00, 1-220.00, 1-210.45, 1-206.10, 1-103.00, 1-210.10, 1-210.00
 (CONT'D) 1-120.00, 2-300.00, 2-300.05, 2-300.10, 2-315.00, 2-320.15, 2-315.05

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

(CONT'D)	2-320.00, 2-320.05, 2-320.10, 2-320.20
ROADWAY QUANTITY FINAL	1-103.00
SOIL-CEMENT BASE	4-304.00, 4-230.40
SUBGRADE TREATMENT (GRANULAR).....	4-301.00
SUBGRADE TREATMENT (LIME)	4-302.00, 4-203.40
TACK COAT	4-617.00, 4-405.00, 4-403.00, 4-414.05
UNDERSEALING CONCRETE PAVEMENT	4-502.00
WATER	4-203.40, 4-801.10
CONCRETE BOX CULVERTS	2-155.05, 4-204.05, 4-604.10, 4-604.25, 4-203.55, 4-604.00
(CONT'D)	4-604.00, 4-705.00
CONCRETE PAVEMENT, UNDERSEALING	4-502.00
CONCRETE RAMPS, PAVEMENT MARKING.....	4-716.15
CONSTRUCTION QUANTITY ESTIMATES.....	4-140.00
CONSTRUCTION QUANTITY ESTIMATES DATA FILE	4-140.05
CONSTRUCTION EASEMENT	2-320.15
CONSTRUCTION INDEX	4-133.00, 4-135.05
CONSTRUCTION PLANS AND ESTIMATES REVISIONS	4-140.00, 4-140.01, 4-140.05
(CONT'D)	4-140.02, 4-140.03, 4-140.09
CONSTRUCTION PLANS SUBMITTAL	4-140.00
CONSTRUCTION REVISIONS.....	4-150.00
CONSTRUCTION SIGNS ON INTERSTATE PROJECTS	4-713.20
CONSTRUCTION TITLE SHEET	4-115.00
CONSULTANT'S SEAL	3-105.10, 4-115.10
CONSULTANT'S SIGNATURE.....	3-105.10, 4-115.10
CONSULTANTS	1-105.00, 2-120.00, 2-118.00, 2-320.20, 3-400.30, 4-140.05
COORDINATE VALUES.....	1-205.15
CORRECTION FACTOR FOR COMPUTATION OF REINFORCING STEEL IN	
CONCRETE BOX OR SLAB-TYPE CULVERTS OR BRIDGES.....	4-604.20
CREDITS, SALVAGE	4-130.00
CROSS DRAIN PLANS FORMAT	3-215.00
CROSS DRAINS (UNDER MAINLINE AND PUBLIC SIDE ROADS)	3-215.05
CROSS DRAINS END TREATMENTS.....	3-215.10
CROSS-SECTIONS.....	1-210.10, 3-110.05, 3-400.25, 3-400.30, 3-410.00, 4-133.00, 4-203.03
(CONT'D)	4-115.10, 4-140.00
CROSS-SECTIONS (RIGHT-OF-WAY PLANS).....	3-400.25
CROSS-SECTIONS (SIZE OF FULL-SIZE SHEETS).....	2-112.00, 3-102.00, 4-112.00
CROWN VETCH (WITH MULCH).....	4-801.05
CROWN VETCH (WITHOUT MULCH)	4-805.00
CULVERT EXCAVATION (PIPE).....	4-204.00
CULVERT SHEET SUBMISSION.....	3-216.00
CULVERTS, BOX AND SLAB-TYPE	2-155.05, 4-604.00, 4-604.20, 4-604.30
(CONT'D)	4-604.35, 4-705.00
CULVERTS, PLACEMENT OF HEADWALLS ON	3-205.20

-D-

DATUM ADJUSTMENT FOR COORDINATE VALUES	1-205.15
--	----------

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

DELINEATORS, FLEXIBLE	4-713.00
DESCRIPTIONS, PROJECT	2-115.20, 4-115.30
DESIGN CHECKLIST, ROADWAY.....	1-105.00, 1-120.00
DESIGN ENGINEERING SUPERVISOR.....	2-115.00, 3-105.00, 4-115.00
DESIGN EXCEPTION REQUESTS	3-110.02
DESIGN RECORDS FOLDER.....	1-100.00
DESIGN SUPERVISORS (NAME ON TITLE SHEET)	2-115.00, 3-105.00, 4-115.00
DESIGNERS (NAME ON TITLE SHEET)	2-115.00, 3-105.00, 4-115.00
DIMENSIONS AND DIRECTIONS ON PLANS	1-205.20
DOUBLE BITUMINOUS SURFACE TREATMENT.....	3-125.05, 4-404.00
DRAINAGE	2-200.00, 2-200.05, 2-200.10, 2-320.05, 3-200.00, 3-261.00
(CONT'D).....	4-203.55, 4-611.00
DRAINAGE CHARTS.....	2-200.05
DRAINAGE EASEMENT.....	2-320.05
DRAINAGE PLANS, CHECKING PRIOR TO CONSTRUCTION	4-611.00
DRAINAGE PROBLEM EXAMPLES	2-200.10
DRAINAGE TABLES	2-200.05
DRAINS, BRIDGE END	4-611.05
DRAINS, CROSS.....	2-320.05, 3-205.05, 3-215.00, 3-205.00, 3-400.25
DRAINS, END TREATMENT FOR CROSS.....	3-205.05
DRAINS, END TREATMENT FOR MEDIAN	3-205.15
DRAINS, END TREATMENT FOR SIDE	3-205.10
DRAINS, MEDIAN	3-205.15
DRAINS, SIDE	3-205.10
DRIVEWAY APRONS.....	3-310.10
DRIVEWAY CONSTRUCTION AND RESURFACING POLICY	2-300.10
DRIVEWAY NOTES	2-300.05
DRIVEWAY PROFILES	2-300.05
DRIVEWAY TYPICAL SECTIONS.....	2-300.05
DRUMS, TRAFFIC CONTROL	4-712.00

-E-

EARTHWORK.....	2-145.05, 3-315.05, 3-315.15, 4-203.02, 4-203.45
EARTHWORK BALANCES.....	2-145.05, 3-315.05, 3-315.15, 4-203.02, 4-203.45
EASEMENT, PERMANENT DRAINAGE	2-320.05
EASEMENT, SLOPE	2-320.10
EASEMENTS.....	2-320.00, 2-320.05, 2-320.10, 2-320.15, 3-410.00
EASEMENTS CONSTRUCTION	2-320.15
END TREATMENTS - CROSS DRAINS UNDER MAINLINE	3-205.00
END TREATMENTS - CROSS DRAINS UNDER PUBLIC ROADS	3-205.05
END TREATMENTS - MEDIAN DRAINS	3-205.15
END TREATMENTS - SIDE DRAINS	3-205.10
ENERGY ABSORBING TERMINAL (PORTABLE).....	4-705.05
EQUATION BLOCKS.....	2-115.05
EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) NOTES	4-209.00
EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) QUANTITIES	4-209.01

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

EROSION CONTROL BLANKET..... 4-805.00
ESTIMATED ROADWAY GRADING QUANTITIES BLOCK FOR ROAD
AND DRAINAGE EXCAVATION (UNCLASSIFIED) 4-203.55
ESTIMATED ROADWAY QUANTITIES SHEET 1-200.00
ESTIMATES CONFIDENTIALITY 4-140.09
ESTIMATES, CONSTRUCTION QUANTITY..... 3-400.15, 4-140.00, 4-140.05
ESTIMATES, PRELIMINARY QUANTITY 3-400.15, 4-140.05
EXCAVATION 2-145.00, 3-315.00, 3-315.05, 4-203.00, 4-203.02, 4-203.35
EXCAVATION, CHANNEL..... 4-203.00, 4-203.35
EXCAVATION FOR BOX AND SLAB-TYPE CULVERTS AND BRIDGES..... 4-203.35, 4-204.05
EXCAVATION, PIPE CULVERT 4-204.00
EXCLUSIONS..... 2-115.10, 4-115.25
EXTENSION OF THROUGH LANES BEYOND INTERSECTIONS 2-160.00
EXCAVATION OR PLACEMENT OF RIP-RAP IN THE DRY..... 4-209.05
EXPRESSWAYS 2-165.00, 4-716.15

-F-

FERTILIZER (SUPPLEMENT APPLICATION) 4-801.20
FIELD REVIEW PROCEDURES 1-120.00, 2-330.00, 3-400.35, 4-145.00
FILLS, CAPPING ROCK..... 3-315.00
FILTER BARRIER, TEMPORARY 4-209.00
FINAL PREPARATION OF PLANS 1-103.00, 1-120.00
FLEXIBLE DELINEATORS 4-713.00
FLEXIBLE SURFACES..... 4-307.00
FLY ASH..... 4-312.00
FOLDER, PROJECT..... 1-100.00, 1-110.00
FREEWAYS..... 2-165.00
FULL-SIZE PLAN AND CROSS SECTION SHEETS (SIZE)..... 2-112.00, 3-102.00, 4-112.00
FUNDING APPROVAL REQUESTS, RIGHT-OF-WAY 3-400.20

-G-

GENERAL NOTES 4-135.00, 4-135.05, 4-716.20
GEOLOGY REPORTS, SOILS AND..... 3-110.05
GEOMEMBRANE 4-740.00
GEOTEXTILE FABRIC 4-740.00
GRADE COMPUTATIONS 1-103.00
GRADE COMPUTATIONS FINAL 1-103.00
GRADING QUANTITIES..... 1-103.00
GRADING QUANTITIES SHEET 2-145.07, 4-203.50, 3-315.20
GRANULAR BACKFILL FOR STRUCTURES..... 4-303.05
GRAVEL, AGGREGATE-CEMENT BASE COURSE 4-309.01
GRAVITY TYPE RETAINING WALLS 4-303.05
GUARDRAIL ACROSS CONCRETE BOX AND SLAB-TYPE
CULVERTS AND BRIDGES 4-705.00
GUARDRAIL ACROSS CONCRETE DECK BRIDGES..... 4-705.00
GUARDRAIL END TERMINALS 4-705.05
GUARDRAIL, INTERSTATE RESURFACING..... 4-145.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

-H-

HANDICAP RAMPS..... 3-310.05
HAUL ROADS..... 3-410.00, 4-120.00
HAZARDOUS MATERIAL STUDY 2-155.02
HEADQUARTERS, DESIGN 2-120.00, 3-400.00, 3-400.20
HEADWALLS ON CULVERTS 3-205.20
HERBICIDE 4-400.05
HORIZONTAL CLEARANCE 2-125.00, 3-110.02
HOT MIX, ASPHALTIC CONCRETE SURFACE 4-411.00
HYDRAULIC COMPUTATIONS 1-103.00, 3-225.00
HYDRAULIC GRADE APPROVAL 2-127.00

-I-

IMPROVED INLET 3-230.00
INCIDENTAL CONSTRUCTION..... 4-705.00
INCIDENTALS, PRINTING FOR..... 3-400.00
INDENTED RUMBLE STRIPS..... 4-411.03
INTERSECTIONS..... 2-160.00, 2-170.00, 2-300.10, 3-305.15, 4-400.00
INTERSECTIONS, DESIGN OF TURNING LANES 2-170.00
INTERSTATE - CONSTRUCTION SIGNS 4-712.00
INTERSTATES, MARKING AND SIGNING 3-330.00
ITEM NUMBER..... 4-140.01

-J-

JUNCTION BOXES..... 3-256.00, 4-611.00

-L-

LANE REDUCTION TRANSITION LENGTHS..... 2-160.00
LENGTHS, PROJECT 4-115.15
LETTING REVISIONS 4-140.03
LIGHTING 2-315.00, 2-315.05, 4-712.00, 4-714.00
LIGHTING DEVICES, TRAFFIC CONTROL..... 4-712.00, 4-714.00
LIME..... 4-302.00, 4-309.00, 4-312.00
LIMESTONE, AGGREGATE-CEMENT BASE COURSE 4-309.00
LIMITED SCOPE, PROJECTS OF 1-200.30
LOCAL PROGRAM..... 1-200.35
LOG MILE POST 2-115.20

-M-

MACHINED RIP-RAP 4-209.01, 4-209.05, 4-709.05
MANHOLES..... 3-235.00, 3-236.00
MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES..... 4-712.00
MARKINGS, CONCRETE RAMPS IN INTERCHANGE AREAS 4-712.10

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

MARKINGS, PAVEMENT3-330.00, 4-712.00, 4-712.10, 4-716.05
MARKINGS, PAVEMENT FOR TRAFFIC CONTROL..... 4-712.00
MEDIAN DRAINS 3-205.15
MEDIAN DRAINS, END TREATMENT FOR 3-205.15
MEDIAN OPENING SPACING 2-140.00, 2-140.05
MICRO SURFACING 4-414.05
MINERAL AGGREGATE BASE 4-303.00
MINERAL AGGREGATE (SIZE 57)..... 4-303.00
MITIGATION AREAS, PLACEMENT OF TREES 3-410.02

-N-

NOTES, GENERAL 4-135.00
NOTES, PAVEMENT MARKING 4-716.20
NOTICE OF INTENT (NOI) FORM 3-145.00

-O-

OBSTRUCTIONS, REMOVAL 4-202.01
OPENING SPACING, MEDIAN 2-140.00

-P-

PAVED APRON BOX CULVERT 4-604.10
PAVED APRON FOR BOX CULVERT AND BRIDGE OUTLETS 4-604.10
PAVEMENT, RIGID 4-501.00
PAVEMENT, UNDERSEALING CONCRETE 4-502.00
PAVEMENT DESIGN BRIDGE PROJECTS..... 3-125.00
PAVEMENT DESIGN REQUEST FORM..... 3-125.00
PAVEMENT DESIGN REQUESTS..... 3-125.00
PAVEMENT - DIFFERENCE IN ELEVATION DURING CONSTRUCTION 4-712.10
PAVEMENT MARKERS (SNOWPLOWABLE RAISED)..... 4-716.35
PAVEMENT MARKERS (RAISED)..... 4-716.36
PAVEMENT MARKING - CONCRETE RAMPS IN INTERCHANGE AREAS..... 4-716.15
PAVEMENT MARKING - CROSSWALK WITH LONGITUDINAL LINES 4-716.15
PAVEMENT MARKING GUIDELINES..... 4-716.15
PAVEMENT MARKING LINE (REMOVABLE)..... 4-716.30
PAVEMENT MARKING NOTES 4-716.20
PAVEMENT MARKING PLANS..... 4-716.13
PAVEMENT MARKINGS, PERMANENT..... 4-716.15
PAVEMENT MARKINGS, RESURFACING PLANS 4-716.16
PAVEMENT MARKINGS, MICRO SURFACE PAVMENTS..... 4-716.17
PAVEMENT MARKINGS, TEMPORARY 4-716.10
PAVING POLICY, RESURFACING 4-400.00
PERFORMANCE GRADE MIX (PAVING) 4-400.03
PERMANENT DRAINAGE EASEMENTS..... 2-320.05
PERMANENT PAVING MARKINGS ON CONCRETE BRIDGE DECKS 4-716.15
PERMANENT PAVING MARKINGS POLICY..... 4-716.15

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PIPE CULVERT EXCAVATION	4-204.00
PIPE MATERIALS, SELECTION OF	3-200.00
PIPE SELECTION OF MATERIALS	3-200.00
PLANS AND ESTIMATES REVISIONS (CONSTRUCTION).....	4-150.00
PLANS SHEET (SIZE OF FULL-SIZE)	2-112.00, 3-102.00, 4-112.00
PLANS SUBMITTAL	3-400.00
PLANS SUBMITTAL, SIZE 11" X 17"	4-140.02
PLANT MIX BASE, BITUMINOUS	4-307.00
PORTABLE BARRIER RAIL	4-712.00
PRECAST PRESTRESSED BRIDGE DECK PANELS	4-604.05
PRELIMINARY CONSTRUCTION QUANTITY ESTIMATE	3-400.15
PRELIMINARY PLANS	2-100.00
PRESPLITTING	4-203.15
PRIME COAT	4-402.00
PRINTING FOR APPRAISALS	3-400.25
PRINTING FOR INCIDENTALS.....	3-400.00
PRINTING FOR "UTILITIES ONLY"	3-400.05
PRIVATE DRIVES	3-305.10
PROFILES, DRIVEWAY	2-300.05
PROJECT ACTIVITY STATUS SHEET	1-110.00, 2-110.00, 4-110.00
PROJECT DESCRIPTIONS	4-115.30, 2-115.20
PROJECT FOLDER.....	1-100.00, 2-100.00
PROJECT LENGTH.....	4-115.15
PROJECT MOWING CYCLE	4-806.00
PROJECT RECORDS	1-100.00
PROJECTS LET TO CONTRACT	1-103.00
PUBLIC HEARING AND PUBLIC MEETING REQUIREMENTS, INSTRUCTIONS REGARDING	1-130.00

-Q-

QUANTITY ESTIMATES, CONSTRUCTION.....	3-400.15, 4-140.00, 4-140.05
QUANTITY ESTIMATES, PRELIMINARY	3-400.15, 4-140.00, 4-140.05

-R-

RAILROAD CROSSINGS AT-GRADE.....	1-210.05
RAILROAD CROSSINGS, GRADE SEPARATED	1-210.00
RAILROAD RIGHT-OF-WAY ENCROACHMENT	1-210.10
RAILROADS	3-325.00
RAISED BITUMINOUS RUMBLE STRIPS	4-411.02
RAISED PAVEMENT MARKERS.....	4-716.36
RAMPS, ENTRANCE.....	2-165.00
REFLECTIVE PAVEMENT MARKERS (SNOWPLOWABLE)	4-716.35
REGIONAL DESIGN OFFICE.....	2-300.00, 3-400.00, 3-400.30, 4-150.00
REMOVABLE PAVEMENT MARKING LINE	4-716.30
REMOVAL OF BUILDINGS AND OBSTRUCTIONS	4-202.10
REMOVAL OF STRUCTURES	4-202.00, 4-202.01
RESURFACING - PAVING POLICY	4-400.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

RESURFACING PROJECTS..... 1-200.10

RESURFACING PROJECTS, TRAFFIC DATA BLOCK..... 4-115.35

RETAINING WALLS, GRAVITY TYPE 4-303.05

REVISIONS, CONSTRUCTION..... 4-150.00, 1-220.00

REVISIONS, LETTING 4-140.03

REVISIONS, RIGHT-OF-WAY 3-405.00

REVISIONS, UNECONOMIC REMNANTS 3-120.00

RIDEABILITY SPECIFICATIONS 4-411.05

RIGHT-OF-WAY ACQUISITION TABLE..... 2-320.05

RIGHT-OF-WAY AREAS 2-320.05

RIGHT-OF-WAY FUNDING APPROVAL REQUESTS 3-400.20, 4-140.00

RIGHT-OF-WAY INCIDENTALS..... 3-400.00

RIGHT-OF-WAY NOTES 2-300.00, 3-305.00

RIGHT-OF-WAY NOTES FOR DRIVEWAYS..... 2-300.05, 3-305.05

RIGHT-OF-WAY PLANS..... 3-100.00

RIGHT-OF-WAY PLANS CHECKLIST 3-100.00

RIGHT-OF-WAY REVISIONS..... 3-405.00, 1-220.00

RIGID PAVEMENT 4-501.00

RIP-RAP 4-709.05

ROAD SAFETY AUDIT REVIEW (RSAR) PROJECTS 1-200.25

ROADWAY APPROACHES..... 4-203.25

ROADWAY DESIGN CHECKLIST..... 1-105.00

ROADWAY DESIGN STANDARDS & GUIDELINES 1-200.00

ROADWAY LIGHTING..... 4-714.00

ROADWAY SIGNING 4-713.05, 4-713.10, 4-713.15

ROADWAY SPECIALIST SUPERVISOR 2 1-105.00, 1-110.00

RUMBLE STRIPS 4-411.03

RUMBLE STRIPES..... 4-411.04

RWIS WEATHER STATIONS, LOCATION OF 2-180.00

-S-

SALVAGE CREDITS 4-130.00

SCORING SHOULDERS 4-411.03

SEAL COAT 4-405.00, 4-406.00

SEALANT, BRIDGE DECK..... 4-617.00

SEALANT, SILICONE 4-905.00

SEDIMENT TRAP..... 4-209.01

SEEDING (SUPPLEMENTAL APPLICATION) 4-801.15

SEEDING (WITH MULCH)..... 4-801.00

SEEDING (WITH MULCH), TEMPORARY 4-801.07

SHALLOW FILLS..... 4-604.20

SHOULDERS, SCORING 4-411.03

SHRINKAGE FACTORS..... 2-145.10, 3-315.10, 4-203.05

SIDE DRAINS, END TREATMENT FOR 3-205.10

SIDE ROAD, PUBLIC, PAVING POLICY..... 4-400.00

SIGNALIZATION..... 2-315.00

SIGNATURE, COMMISSIONER..... 3-105.05, 4-115.05

SIGNATURE, CHIEF ENGINEER..... 3-105.05, 4-115.05

SIGNING PLANS 3-330.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

SILICONE SEALANT.....	4-905.00
SILT FENCES, TEMPORARY	4-209.01
SLAB BRIDGE, CONCRETE - SHALLOW FILLS.....	4-604.20
SLAB CONCRETE CULVERTS.....	4-604.20
SLOPE EASEMENT	2-320.10
SLOTTED DRAIN PIPE	3-200.30
SNOWPLOWABLE RAISED PAVEMENT MARKERS	4-716.35
SOIL-CEMENT BASE.....	4-304.00
SOILS AND GEOLOGY REPORTS.....	3-110.05
SOLID ROCK BORROW	4-203.20
SOLID ROCK, GRADING LINE THROUGH	4-203.10
SPECIAL CONSTRUCTION SIGNS.....	4-712.15
SPECIAL NOTES ON TITLE SHEET	2-115.01
SPECIAL PAVEMENT MARKINGS	4-716.25
STATUS SHEET, PROJECT ACTIVITY	1-110.00
STEEL BAR REINFORCEMENT (ROADWAY).....	4-604.25
STOCK FENCE, ROW.....	4-707.00
STOCK PASSES	3-240.00, 4-604.40
STRIPING, CHANNELIZATION.....	4-716.00
STRIPING, INTERCHANGE RAMPs	4-716.15
STRIPING, PAVEMENT MARKING GUIDELINES.....	4-716.05
STRIPING, PERMANENT PAVEMENT MARKINGS.....	4-716.15
STRUCTURAL BACKFILL (GRANULAR).....	4-303.05
STRUCTURE, REMOVAL OF	4-202.00
STRUCTURES, TEMPORARY.....	4-621.00
SUBGRADE TREATMENT	4-300.00
SUBGRADE TREATMENT (GRANULAR).....	4-301.00
SUBGRADE TREATMENT (LIME)	4-302.00
SUBMITTAL OF PLANS FOR STRUCTURAL GRADE APPROVAL	2-127.00
SUPERELEVATION RATES.....	2-130.00
SUPERELEVATION RUN-OFF	2-130.00
SUPERVISORS (NAME ON TITLE SHEET)	2-115.00, 3-105.00, 4-115.00
SURFACE (HOT MIX), ASPHALTIC CONCRETE	4-411.00
SURFACES, FLEXIBLE.....	4-400.00
SURFACE TREATMENT, DOUBLE BITUMINOUS.....	4-404.00
SURVEY NOTES.....	1-100.00
SURVEY UPDATES	3-115.00
SWELL FACTORS.....	2-145.10, 3-315.10, 4-203.05

-T-

TABLE, RIGHT-OF-WAY ACQUISITION.....	2-320.00
TACK COAT	4-403.00
TEMPORARY PAVEMENT MARKINGS POLICY	4-716.10
TEMPORARY SEEDING (WITH MULCH).....	4-801.07
TEMPORARY SLOPE DRAIN PIPE	4-209.01
TEMPORARY STRUCTURES.....	4-621.00
TEMPORARY TRAFFIC SIGNALS USED AT TWO LANE BRIDGE RECONSTRUCTION PROJECTS	4-730.20
TITLE SHEET	2-115.00, 2-115.05, 2-115.10, 2-115.15, 3-105.00, 3-105.05, 3-105.10
(CONT'D).....	4-115.00, 4-115.05, 4-115.10, 4-115.20, 4-115.25, 4-115.35

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

TOPSOIL 3-315.05, 4-203.30
TRACT NUMBERS ON PLANS 1-206.10
TRAFFIC BLOCK..... 2-115.15
TRAFFIC CONTROL IN CONSTRUCTION ZONES
 ATTENUATORS (PORTABLE)..... 4-712.00
 BARRICADES AND DRUMS 4-712.00
 CONSTRUCTION SIGNING 4-712.00
 LIGHTING DEVICES 4-712.00
 MARKINGS..... 4-712.00
 PORTABLE BARRIER RAIL 4-712.00
 VERTICAL PANELS 4-712.00
TRAFFIC CONTROL - DIFFERENCES IN ELEVATION
 BETWEEN ADJACENT ROADWAY ELEMENTS 4-712.10
TRAFFIC DATA BLOCK (RESURFACING)..... 4-115.35
TRAFFIC DATA FOR DESIGN 2-120.00
TRAFFIC DATA FORM..... 2-120.00
TRAFFIC SIGNAL DETECTION LOOPS REPLACEMENT..... 4-730.08
TRAFFIC SIGNALS 2-315.00, 4-730.10, 4-730.15, 4-730.20
TREES IN MITIGATION AREAS 3-410.02
TRENCH DRAIN PIPE, USE OF 3-200.30
TRUCK CLIMBING LANES..... 2-150.00
TURNING LANES, DESIGN 2-170.00
TYPICAL SECTIONS DRIVEWAY..... 2-300.05

-U-

UNDERCUTTING 2-145.00, 4-203.00
UNDERDRAINS..... 4-710.00
UNDERSEALING CONCRETE PAVEMENT 4-502.00
UNECONOMIC REMNANTS 3-120.00
UTILITY PLANS 2-315.00, 2-315.05, 3-400.05, 4-137.00

-V-

VERTICAL CLEARANCES FOR BRIDGES 2-125.00, 3-110.02, 4-125.00
VERTICAL PANELS - TRAFFIC CONTROL 4-712.00

-W-

WATER (SEEDING AND SODDING) 4-801.10
WATER QUALITY PERMIT 3-410.00
WATER QUALITY PERMIT ACTIVITY SCHEDULES 3-410.00
WATER QUALITY PERMIT DRAWING CELLS 3-410.00
WATER WELLS..... 3-130.00, 4-202.13, 4-625.00
WETLANDS 1-215.00, 2-155.00, 2-155.05, 3-115.00, 3-410.00, 3-410.02
WETLANDS BOUNDARY DESIGNATION 2-155.00
"WORKERS PRESENT" SIGN 4-712.15

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

ITEM NUMBER INDEX

202-01	4-202.01
202-01.50	4-202.01
202-04.01: 202-04.49	4-202.00
202-04.50: 202-04.99	4-202.00
202-06.01: 202-06.99	4-202.01
202-13	4-202.13
203-01	4-203.00, 4-203.02, 4-203.55
203-02.01	4-203.20
203-05	4-203.00
203-06	4-203.40
203-08	4-203.35
203-30.01	4-203.25
203-30.02	4-203.25
204-10.01: 204-10.16	4-203.40
301-01	4-301.00
302-01.01	4-203.40, 4-302.00
302-02	4-302.00
303-01	4-303.00
303-01.02	4-303.05
303-01.03	4-303.00
303-01.08	4-303.00
303-01.09	4-303.00
303-02	4-303.00
303-10.01: 303-10.06	4-303.00
304-01.02	4-304.00
304-02	4-304.00
307-01.01	4-307.00
307-01.02	4-307.00
307-01.03	4-307.00
307-01.04	4-307.00
307-01.05	4-307.00
307-01.06	4-307.00
307-01.07	4-307.00
307-01.08	4-307.00
307-01.09	4-307.00
307-01.10	4-307.00
307-01.13	4-307.00
307-01.14	4-307.00
307-01.15	4-307.00
307-02.01	4-307.00
307-02.02	4-307.00
307-02.03	4-307.00
307-02.04	4-307.00
307-02.05	4-307.00
307-02.06	4-307.00
307-02.07	4-307.00
307-02.08	4-307.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

307-02.13.....	4-307.00
307-02.14.....	4-307.00
307-03.01.....	4-307.00
307-03.02.....	4-307.00
307-03.03.....	4-307.00
307-03.04.....	4-307.00
307-03.05.....	4-307.00
307-03.06.....	4-307.00
307-03.07.....	4-307.00
307-03.08.....	4-307.00
307-03.09.....	4-307.00
307-03.13.....	4-307.00
307-03.14.....	4-307.00
307-04.08.....	4-307.00
307-20.01.....	4-307.00
308-01.....	4-308.00
308-01.01.....	4-308.00
308-01.02.....	4-308.00
308-02.....	4-308.00
308-02.01.....	4-308.00
308-02.02.....	4-308.00
309-01.01.....	4-309.00, 4-309.01
309-01.02.....	4-309.00, 4-309.01
309-02.....	4-309.00, 4-309.01
312-01.....	4-312.00
312-02.....	4-312.00
312-03.....	4-312.00
312-04.....	4-312.00
402-01.....	4-402.00
402-02.....	4-402.00
403-01.....	4-403.00
403-02.....	4-403.00
404-01.01.....	4-404.00
404-01.02.....	4-404.00
405-01.01.....	4-405.00
405-01.02.....	4-405.00
406-01.01.....	4-406.00
406-01.02.....	4-406.00
411-01.....	4-411.00
411-01.03.....	4-411.00
411-01.04.....	4-411.00
411-01.07.....	4-411.00
411-02.....	4-411.00
411-02.03.....	4-411.00
411-02.04.....	4-411.00
411-03.....	4-411.00
411-03.03.....	4-411.00
411-03.04.....	4-411.00
411-04.....	4-411.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

411-12.01.....	4-411.03, 4-716.15
411-12.02.....	4-411.03, 4-716.15
411-12.03.....	4-411.04, 4-716.15
411-12.04.....	4-411.04, 4-716.15
414-03.01.....	4-414.05
414-03.02.....	4-414.05
415-01.01.....	4-415.00
415-01.02.....	4-415.00
415-01.03.....	4-415.00
501.03.03.....	4-411.03, 4-716.15
502-02.....	4-502.00
502-05.....	4-303.00
502-10.....	4-502.00
604-02.02.....	4-604.25
604-15.01.....	4-202.13
610-07.03.....	4-611.05
617-01.....	4-617.00
621-01.01: 621-01.10.....	4-621.00
625-01.01.....	4-625.00
705-01.01.....	4-705.00
705-01.04.....	4-705.00
705-02.02.....	4-705.00
705-04.02.....	4-705.05
705-04.04.....	4-705.05
705-04.07.....	4-705.05
705-08.51.....	4-712.00
705-10.30.....	4-705.00
705-10.31.....	4-705.00
709-01.01.....	4-611.05
709-05.05.....	4-709.05
709-05.06.....	4-709.05
709-05.07.....	4-709.05
709-05.08.....	4-709.05
709-05.09.....	4-709.05
709-05.10: 709-05.13.....	4-709.05
712-06.01.....	4-712.00
712-06.16.....	4-712.15
712-09.01.....	4-716.30
713-16.20: 713-16.29.....	4-713.15
716-01.11.....	4-716.15
716-01.12.....	4-716.15
716-01.21.....	4-716.15
716-01.22.....	4-716.15
716-02.04.....	4-716.00
716-02.07.....	4-716.00
716-02.08.....	4-716.25
716-02.09.....	4-716.25
716.04.04.....	4-716.00
716-05.01.....	4-716.15, 4-716.30

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

716-05.04.....	4-716.00
716-05.07.....	4-716.00
716-08.04.....	4-716.00
716-10.01.....	4-716.10
716-10.15.....	4-716.10
716-12.01.....	4-716.15
716-12.02.....	4-716.15
716-13.01.....	4-716.15
716-13.06.....	4-716.15
730-14.02.....	4-730.08
730-14.03.....	4-730.08
730-40.....	4-730.20
730-50.....	4-730.20
801-01.....	4-801.00
801-01.02.....	4-801.00
801-01.07.....	4-801.07
801-02.....	4-801.07
801-03.....	4-801.10
801-07.....	4-801.15
801-07.01.....	4-801.15
801-08.....	4-801.20

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

SECTION VIII - INSTRUCTIONAL BULLETINS

<u>Number</u>	<u>Date</u>	<u>Subject</u>
04-17	August 13, 2004	Signatures on Title Sheet
08-13	August 20, 2008	Regarding Intersection Site Distance
08-15	October 13, 2008	Regarding Metric Roadway Design Guidelines and Standard Drawings
09-02	April 03, 2009	Regarding File Net Archiving
09-03	April 03, 2009	Regarding New Intersection Sight Distance Standard Drawings
09-05	April 03, 2009	Regarding Revised Traffic Control for Lane Closure Standard Drawings
09-06	July 17, 2009	Regarding Minimum Traffic Control Requirements For Roadway Plans
09-07	July 17, 2009	Regarding Total Lane Mile Information for Resurfacing Projects
09-08	July 17, 2009	Stamp Required on Roadway Plans and Electronic Files
09-09	July 17, 2009	Regarding Turn-In-Dates and Letting Schedules for 2010
09-10	September 24, 2009	Regarding Handicap Ramps on Resurfacing Projects
09-11	September 24, 2009	Regarding Labeling Storm Water Outfalls on EPSC Plans
09-12	September 24, 2009	Regarding Additional Information for Grade Separated Railroad Crossings
09-13	September 24, 2009	Regarding Notifying the Railroad Coordinator Of Plans Availability on Filenet

09-15	December 1, 2009	Regarding Road Safety Audit review Projects (RSAR)
09-16	December 1, 2009	Regarding Revised Section 4 – Construction Plans Including Pavement Marking, Rumble Strip, and Rumble Stripe Guidelines
09-17	December 1, 2009	Regarding Revised Section 6 – General Notes and Special Notes



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION**
NASHVILLE, TENNESSEE 37243-0348

INSTRUCTIONAL BULLETIN NO. 04-17

Regarding Signatures on Title Sheets

Signatures on the title sheets for lettings, right-of-way submittals, and utility submittals shall be as shown on the attached sheet.

This bulletin renumbers and voids Instructional Bulletin 03-07.

Original signed by Jeff C. Jones
Jeff C. Jones, C.E. Director
Design Director

JW

Attachment

August 13, 2004

APPROVED:

Paul D. Deegan

CHIEF ENGINEER

DATE:

APPROVED:

Donald F. Kelly

COMMISSIONER



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 08-13

Regarding Intersection Sight Distance

Effective immediately, for all new construction and reconstruction projects, designers should ensure that intersection sight distance is provided in addition to adequate stopping sight distance at all intersections, railroad crossings without train activated warning devices, and commercial drives. Design information and values for intersection sight distance at intersections and railroad crossings can be found in the 2001 "A Policy on Geometric Design of Highways and Streets" (AASHTO Green Book), Chapter 9, Intersections.

Intersection sight distance should also be provided at all private drives and field entrances when feasible. In the event that intersection sight distance cannot be achieved the designer shall verify that stopping sight distance is provided. Intersection sight distance should always be provided for a left turn movement from the major road into a private drive or field entrance.

Designers should consider all features that could limit adequate sight distance including buildings, parked vehicles, highway structures, roadside hardware, hedges, trees, bushes, unmowed grass, tall crops, walls, fences, slopes, and the terrain itself. The determination of whether an object constitutes a sight obstruction should consider the horizontal and vertical alignment of both intersecting roadways, as well as the height and position of the object. In making this determination, it should be assumed that the driver's eye is 3.5 ft. above the roadway surface and that the object to be seen is 3.5 ft. above the surface of the intersecting road for passenger cars. For landscaping, the mature size of the item shall be used.

In areas of limited right-of-way acquisition such as a curb and gutter section, adequate right-of-way may need to be acquired to ensure that intersection sight distance can be achieved or maintained. In the event that it is not feasible to obtain minimum intersection sight distance or to acquire adequate right-of-way to ensure intersection sight distance can be maintained, the Design Manager will document the project file the reason and steps taken to mitigate. Intersection sight distance is not one of the thirteen controlling elements of design as detailed in Section 3-110.02 of the Design Guidelines; therefore, design exceptions should not be submitted.

Designers shall show sight lines for all intersections in the design CADD file. Sight lines shall only be shown on the present and proposed layout sheets when right-of-way is required for the purpose of establishing or maintaining intersection sight distance. Sight lines should also be shown for all intersections and drives on all landscaping plans.

Original signed by Jeff C. Jones

Jeff C. Jones, Civil Engineering Director
Design Division

August 20, 2008JCJ:MJA:mja



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 08-15

Regarding **Metric** Roadway Design Guidelines and Standard Drawings

Effective immediately, the Design Division will no longer be updating or revising existing Metric Roadway Design Guidelines, General Notes, and Standard Drawings. As a result of this decision, these documents will no longer be distributed in hard copy or posted on TDOT web site. Designers needing access to metric documents should contact the Design Division, Quality Assurance and Standards Office at (615)741-2806 to obtain guidance for preparing metric plans.

This bulletin voids the following Instructional Bulletins:

IB Number	Date	Subject
06-20	August 1, 2006	Regarding Metric Design Guidelines Updates and Revisions
07-09	February 27, 2007	Regarding Metric General Notes on Plans
08-03	January 28, 2008	Regarding METRIC Standard Roadway Drawings

Original signed by Jeff C. Jones

Jeff C. Jones, Civil Engineering Director
Design Division

October 13, 2008
JCJ:arh



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348
INSTRUCTIONAL BULLETIN NO. 09-02

Regarding File Net Archiving

Attached is an updated **File Net Project Deliverables and Plan Sets Table** which should be used as a guide for project deliverables or plan sets that are to be loaded on the File Net server.

Effective immediately, Design Managers will be responsible archiving project development files for all new construction, reconstruction and resurfacing projects on the File Net server utilized by the Department. This includes any consultant design projects being monitored by the Design Manager. For guidance in creating a composite plan set in the *.pdf format, please download the document entitled "Creating PDFs from DGNs.pdf" from the TDOT Design Division website at the following address:

http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/v8/v8design.htm

File Net archiving will be required for all projects (including resurfacing plan sets) and shall include project deliverables or plan sets completed from this point in time forward. However, at the minimum, **all** projects should have the most recently completed plan set (hydraulic grade approval, preliminary, ROW or construction), estimate file, approved Design Exception and Transportation Management Plan added to the File Net Server.

A complete plan set (including cross-sections) in *.pdf format and any required *.xls, *.dgn, *.sht, *.tin, and *.gpk files will be required for archiving as defined in the attached table. The project design files (*.dgn, *.sht, *.tin, and *.gpk) will be archived with a software program having capable of making a self-extracting (*.exe) file. This self-extracting (*.exe) file shall not be password protected.

Plan sets in *.pdf format shall include all roadway plans sheets normally found in the deliverable. For construction field review and construction plans plan sets should include any signal, lighting, signing, geotechnical, landscaping, mitigation sheets, retaining wall or other sheets supplied by structures to be placed in the roadway plans. Structure plans, standard structure drawings and standard drawings are not required. Preliminary structure layout sheets should be included in right-of-way and construction field review plans sets. Utility plans will be placed on File Net by the Utility Section of the Right-of-Way Division.

This bulletin voids Instructional Bulletin 09-01.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

April 3, 2009
JCJ:MJA:arh

File Net Project Deliverables and Plans Sets

Deliverable / Plan Set	File Format	File Naming Convention (<i>nnnnn-nn</i> is the project PIN)	Comments	PPRM Activity
Hydraulic Grade Approval Plans	*.pdf Only	<i>nnnnn-nn-HydraulicGradeApproval.pdf</i>		340
Preliminary Field Review Plans	*.pdf Only	<i>nnnnn-nn-PreliminaryFieldReview.pdf</i>		375
Preliminary Plans	*.pdf and *.exe (Includes: *.dgn, *.sht, *.tin, *.gpk)	<i>nnnnn-nn-Preliminary.pdf</i> <i>nnnnn-nn-Preliminary.exe</i> The file naming convention for the Bentley MicroStation and Geopak files are defined in the TDOT CADD Standards document entitled “CADDV8.pdf” at the Design Division website.	See Footnotes 1, 2, and 3.	390
Right-of-Way Field Review Plans	*.pdf Only	<i>nnnnn-nn-ROWFieldReview.pdf</i>		540
Preliminary Estimate	*.xls Only	<i>nnnnn-nn-PreliminaryEstimate.xls</i> or <i>nnnnn-nn-PreliminaryEstimate-Rev-nm-dd-yy.xls</i>	See Design Guidelines Section 3-400.15	585
Right-of-Way Plans	*.pdf and *.exe (Includes: *.dgn, *.sht, *.tin, *.gpk)	<i>nnnnn-nn-ROW.pdf</i> <i>nnnnn-nn-ROW.exe</i> <i>nnnnn-nn-ROW-Rev-nm-dd-yy.pdf</i> The file naming convention for the Bentley MicroStation and Geopak files are defined in the TDOT CADD Standards document entitled “CADDV8.pdf” at the Design Division website.	See Footnotes 1,2, and 3 ROW Plans revisions, if any, will necessitate another uploaded plan set in entirety. (See naming conventions for revisions.)	600

Deliverable / Plan Set	File Format	File Naming Convention (<i>nnnnn-nn</i> is the project PIN)	Comments	PPRM Activity
Permit Sketches	*.pdf Only	<i>nnnnn-nn-PermitSketches.pdf</i>	See Design Guidelines Section 3-4.10.00	575
Permit Application Plan Set	*.pdf Only	<i>nnnnn-nn-ROW.pdf</i> or <i>nnnnn-nn-ROW-Rev-mm-dd-yy.pdf</i>	This will be either the original or as revised ROW plans which have incorporated the ecology and permit assessment.	575
Construction Field Review Plans	*.pdf Only	<i>nnnnn-nn-ConstructionFieldReview.pdf</i>	This plans set will be used for NPDES application and for NEPA Reevaluation.	710
Construction Plans	*.pdf and *.exe (Includes: *.dgn, *.sht, *.tun, *.gpk)	<i>nnnnn-nn-Construction.pdf</i> <i>nnnnn-nn-Construction.exe</i> <i>nnnnn-nn-Construction-Rev-mm-dd-yy.pdf</i> <i>nnnnn-nn-Construction-Rev-mm-dd-yy.exe</i> The file naming convention for the Bentley MicroStation and Geopak files are defined in the TDOT CADD Standards document entitled “CADDV8.pdf” at the Design Division website.	See Footnotes 1, 2, and 3. These plans will be the final sealed plans set. Construction Plans revisions, if any, will necessitate another uploaded plan set in entirety. See naming convention for revisions. Signal and Signing Sheets developed for roadway projects should be submitted to the Design Manager for inclusion in this deliverable.	715
Construction Estimate	*.xls Only	<i>nnnnn-nn-ConstructionEstimate.xls</i> or <i>nnnnn-nn-ConstructionEstimate-Rev-mm-dd-yy.xls</i>	See Design Guidelines Section 4-140.05	715

Deliverable / Plan Set	File Format	File Naming Convention (<i>nnnnnn-nn</i> is the project PIN)	Comments	PPRM Activity
Utility Plans	*.pdf Only *.exe (Includes: *.dgn, *.sht, *.tin, *.gpk)	nnnnnn-nn-Utility.pdf nnnnnn-nn-Utility-Rev-mm-dd-yy.pdf nnnnnn-nn-Utility.exe nnnnnn-nn-Utility-Rev-mm-dd-yy.exe The file naming convention for the Bentley MicroStation and Geopak files are defined in the TDOT CADD Standards document entitled "CADDV8.pdf" at the Design Division website	See Footnotes 1, 2, and 3. These plans will be the final sealed plans set. Utility Plans revisions, if any, will necessitate another uploaded plan set in entirety. See naming convention for revisions	755
Utility Specifications	*.pdf Only	nnnnnn-nn-UtilitySpecs.pdf or nnnnnn-nn-UtilitySpecs-Rev-mm-dd-yy.pdf	Utility Plans, CADD , Specifications, and Estimate Files Will Be Loaded onto File Net by the Utility Section of the Right-of-Way Division. The Design Division will be responsible for loading Estimated Utility Quantity Sheets developed by the Design Division and included in the Construction Plans.	
Utility Estimate	*.xls Only	nnnnnn-nn-UtilityEstimate.xls or nnnnnn-nn-UtilityEstimate-Rev-mm-dd-yy.xls		

Deliverable / Plan Set	File Format	File Naming Convention (<i>nnnnn-nn</i> is the project PIN)	Comments	PPRM Activity
Initial Work Zone Significance Determination & Transportation Management Plan	*.pdf Only	<i>nnnnn-nn-InitialTMP.pdf</i>	Signed copy. See TDOT Work Zone Safety and Mobility manual and Transportation Management Plan Workbook.	n/a
Secondary Work Zone Significance Determination & Transportation Management Plan	*.pdf Only	<i>nnnnn-nn-SecondaryTMP.pdf</i>	Signed copy. See TDOT Work Zone Safety and Mobility manual and Transportation Management Plan Workbook.	n/a
Approved Design Exceptions (if any)	*.pdf Only	<i>nnnnn-nn-DesignExceptions.pdf</i>	Signed copy. See Design Guideline section 3-110.02	n/a

Footnotes:

1 The Bentley MicroStation files required for placement on the File Net Server are all sheet files (*.sht) that make up a plan set and all reference files to those sheet files including, but not limited to, the *Survey.dgn, *Alignments.dgn, *Proposed.dgn, and *MainlineXSections.dgn files.

2 The Bentley Geopak *.gpk file required for placement on the File Net Server is the project *.gpk file containing all project geometry including, but not limited to, all existing and proposed alignments, existing and proposed profiles, and proposed ROW and easements. Documentation concerning how to create proposed ROW and easements in Bentley's Geopak software can be found at the following link:
http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/v8/ProposedROW.pdf

3 The Bentley Geopak *.tin files required for placement on the File Net Server are the existing ground surface, and all proposed surfaces for the project.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348

INSTRUCTIONAL BULLETIN NO. 09-03

Regarding New Intersection Sight Distance Standard Drawings

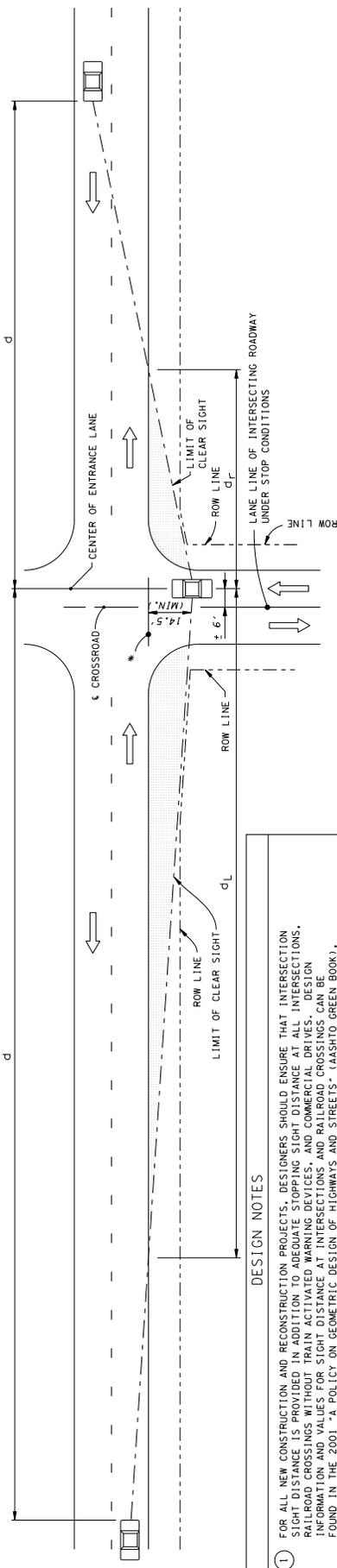
Effective immediately, for all new construction and reconstruction projects, designers should use the new Intersection Sight Distance Standard Drawings to ensure that intersection sight distance is provided in addition to adequate stopping sight distance at all intersections, railroad crossings without train activated warning devices, and commercial drives. Refer to IB 08-13 for an additional guidance.

Copies of the new standard drawings are attached.

<u>DRAWING NUMBER</u>	<u>CURRENT REVISION DATE</u>	<u>DESCRIPTION</u>
RD01-SD-1		Intersection Sight Distance Design and General Notes
RD01-SD-2		Intersection Sight Distance Landscape for Obstructions
RD01-SD-3		Intersection Sight Distance 2-Lane Roadways
RD01-SD-4		Intersection Sight Distance 5-Lane and 4-Lane Undivided Roadways
RD01-SD-5		Intersection Sight Distance 4-Lane Divided Highways
RD01-SD-6		Intersection Sight Distance 6-Lane Divided Highways
RD01-SD-7		Intersection Sight Distance For Passive Railroad Highway Grade Crossings

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

April 3, 2009
JCJ:MJA:arh



DEFINITIONS

d = CLEAR LINE SIGHT DISTANCE

d_R = CLEAR LINE OF SIGHT DISTANCE TO THE RIGHT

d_L = CLEAR LINE OF SIGHT DISTANCE TO THE LEFT

d_m = DISTANCE MEASURED FROM THE CENTERLINE OF THE ENTRANCE LANE OF THE MINOR ROADWAY TO A POINT ON THE MEDIAN CLEAR ZONE LIMIT OR HORIZONTAL CLEARANCE LIMIT FOR THE FAR SIDE ROADWAY OF THE MAJOR ROADWAY (SEE SHEET R001-SD-5)

ORIGIN OF CLEAR SIGHT LINE ON MINOR ROAD, STOP CONDITIONS

d = CLEAR LINE SIGHT DISTANCE

d_R = CLEAR LINE OF SIGHT DISTANCE TO THE RIGHT

d_L = CLEAR LINE OF SIGHT DISTANCE TO THE LEFT

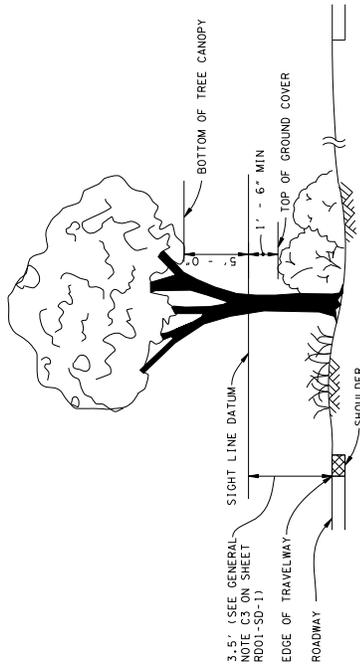
d_m = DISTANCE MEASURED FROM THE CENTERLINE OF THE ENTRANCE LANE OF THE MINOR ROADWAY TO A POINT ON THE MEDIAN CLEAR ZONE LIMIT OR HORIZONTAL CLEARANCE LIMIT FOR THE FAR SIDE ROADWAY OF THE MAJOR ROADWAY (SEE SHEET R001-SD-5)

- DESIGN NOTES**
- FOR ALL NEW CONSTRUCTION AND RECONSTRUCTION PROJECTS, DESIGNERS SHOULD ENSURE THAT INTERSECTION SIGHT DISTANCE IS PROVIDED IN ADDITION TO ADEQUATE STOPPING SIGHT DISTANCE AT ALL INTERSECTIONS. CROSSROADS, SIDEWAYS, DRIVEWAYS, AND DRIVEWAYS AT INTERSECTIONS, AND PARKING CROSSINGS CAN BE ON THE MAJOR ROADWAY. A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS (AASHTO GREEN BOOK), CHAPTER 9, INTERSECTIONS.
 - INTERSECTION SIGHT DISTANCE SHOULD ALSO BE PROVIDED AT ALL PRIVATE DRIVES AND FIELD ENTRANCES WHEN FEASIBLE. IN THE EVENT THAT INTERSECTION SIGHT DISTANCE CANNOT BE ACHIEVED, THE DESIGNER SHALL VERIFY THAT STOPPING SIGHT DISTANCE IS PROVIDED. INTERSECTION SIGHT DISTANCE SHOULD ALWAYS BE PROVIDED FOR A LEFT TURN MOVEMENT FROM THE MAJOR ROAD INTO A PRIVATE DRIVE OR FIELD ENTRANCE.
 - DESIGNERS SHOULD CONSIDER ALL FEATURES THAT COULD LIMIT ADEQUATE SIGHT DISTANCE INCLUDING BUILDINGS, PARKED VEHICLES, HIGHWAY STRUCTURES, ROADSIDE HARDWARE, HEDGES, TREES, BUSHES, UNMOWED GRASS, TALL CROPS, WALLS, FENCES, SLOPES, AND THE TERRAIN ITSELF. THE DETERMINATION OF WHETHER AN OBJECT CONSTITUTES A SIGHT OBSTRUCTION SHOULD CONSIDER THE HORIZONTAL AND VERTICAL ALIGNMENT OF BOTH INTERSECTING ROADWAYS, AS WELL AS THE HEIGHT AND POSITION OF THE OBJECT. IN MAKING THIS DETERMINATION, THE ASSUMED DRIVER'S EYE SHOULD BE 3.5 FT. ABOVE THE SURFACE OF THE INTERSECTING ROAD FOR PASSENGER CARS. FOR LANDSCAPING, THE MATURE SIZE OF THE ITEM SHALL BE USED.
 - IN AREAS OF LIMITED RIGHT-OF-WAY ACQUISITION SUCH AS A CORB AND GUTTER SECTION, ADDITIONAL RIGHT-OF-WAY SHOULD BE PROVIDED TO ENSURE ADEQUATE SIGHT DISTANCE. WHERE SIGHT DISTANCE CANNOT BE MAINTAINED BEYOND THE MAJOR ROAD, THE DESIGNER SHOULD OBTAIN MAINTENANCE CONTRACTS TO MAINTAIN OR TO ACQUIRE ADEQUATE RIGHT-OF-WAY TO ENSURE INTERSECTION SIGHT DISTANCE CAN BE MAINTAINED. THE DESIGN MANAGER WILL DOCUMENT IN THE PROJECT FILE THE REASON AND STEPS TAKEN TO MITIGATE. INTERSECTION SIGHT DISTANCE IS NOT ONE OF THE THIRTEEN CONTROLLING ELEMENTS OF DESIGN AS DETAILED IN SECTION 3-110.02 OF THE ROADWAY DESIGN GUIDELINES; THEREFORE, DESIGN EXCEPTIONS NEED NOT BE SUBMITTED.
 - DESIGNERS SHALL SHOW SIGHT LINES FOR ALL INTERSECTIONS IN THE DESIGN CAD FILE. SIGHT LINES SHALL ONLY BE SHOWN ON THE PRESENT AND PROPOSED LAYOUT SHEETS WHEN RIGHT-OF-WAY IS REQUIRED FOR THE PURPOSE OF ESTABLISHING OR MAINTAINING INTERSECTION SIGHT DISTANCE. SIGHT LINES SHOULD ALSO BE SHOWN FOR ALL INTERSECTIONS AND DRIVES ON ALL LANDSCAPING PLANS.
 - THE MINIMUM DRIVER EYE SETBACK OF 14.5' FROM THE EDGE OF THE TRAVELED WAY MAY BE ADJUSTED ON ANY INTERSECTION LEG ONLY WHEN JUSTIFIED BY A SITE SPECIFIC FIELD STUDY OF VEHICLE STOPPING POSITION AND DRIVER EYE POSITION.
 - FOR SIGNALIZED INTERSECTIONS SIGHT DISTANCES SHOULD BE DEVELOPED BASED ON AASHTO "CASE D" INTERSECTIONS WITH TRAFFIC SIGNAL CONTROL. AT SIGNALIZED INTERSECTIONS, THE FIRST VEHICLE STOPPED ON ONE APPROACH SHOULD BE VISIBLE TO THE DRIVER OF THE FIRST VEHICLE STOPPED ON EACH OF THE OTHER APPROACHES. LEFT TURN VEHICLES SHOULD BE STOPPED FROM THESE CONDITIONS. THERE BE GENERALY ONCOMING TRAFFIC AND COMPLETELY STOPPED FROM THESE CONDITIONS. HOWEVER, IF THE NO OTHER APPROACH OR DEPARTURE SIGHT TRIANGLES NEEDED FOR SIGNALIZED INTERSECTIONS. HOWEVER, IF THE TRAFFIC SIGNAL IS TO BE PLACED ON TWO-WAY FLASHING OPERATION (I.E. FLASHING YELLOW ON NIGHTTIME CONDITIONS, APPROACHES AND FLASHING RED ON THE MINOR-ROAD APPROACHES) UNDER OFF-PEAK OR NIGHTTIME CONDITIONS, THEN THE APPROPRIATE DEPARTURE SIGHT TRIANGLES FOR CASE B, BOTH TO THE LEFT AND TO THE RIGHT, SHOULD BE PROVIDED FOR THE MINOR-ROAD APPROACHES. IN ADDITION, IF RIGHT TURNS ON A RED SIGNAL ARE TO BE PERMITTED FROM ANY APPROACH, THEN THE APPROPRIATE DEPARTURE SIGHT TRIANGLE TO THE LEFT FOR CASE B2 SHOULD BE PROVIDED TO ACCOMMODATE RIGHT TURNS FROM THAT APPROACH.
 - WHERE CURVATURE, SUPERELEVATION, ADVERSE SPLIT PROFILES OR OTHER CONDITIONS PRECLUDE THE USE OF STANDARD TREE SIZES AND SPACING, PROOF OF VIEW AND SIGHT DISTANCE RESTRAINTS SHOULD BE DETAILED IN THE PLANS.
 - INTERSECTION SIGHT DISTANCE VALUES ARE PROVIDED FOR PASSENGER VEHICLES, SINGLE UNIT (SU) VEHICLES AND COMBINATION VEHICLES. INTERSECTION SIGHT DISTANCE BASED ON THE PASSENGER VEHICLE IS SUITABLE FOR MOST INTERSECTIONS. WHERE SUBSTANTIAL VOLUMES OF HEAVY VEHICLES ENTER THE MAJOR-ROAD, SUCH AS FROM RAMP TERMINALS WITH STOP CONTROL OR ROADWAYS SERVING TRUCK TERMINALS, THE USE OF TABULATED VALUES FOR (SU) VEHICLES OR COMBINATION VEHICLES SHOULD BE CONSIDERED.
 - THE INFORMATION SHOWN IS INTENDED SOLELY FOR THE PURPOSE OF CLEAR SIGHT DEVELOPMENT AND MAINTENANCE AT INTERSECTIONS, HIGHWAYS, ROADS AND STREETS, AND IS NOT INTENDED TO BE USED TO ESTABLISH ROADWAY AND ROADSIDE SAFETY EXCEPT AS RELATED TO INTERSECTION SIGHT CORRIDORS.
 - THE INTERSECTION SIGHT DISTANCE TABLES DO NOT SUPERSEDE AASHTO STOPPING SIGHT DISTANCE REQUIREMENTS. THE DESIGNER MUST ENSURE THAT STOPPING SIGHT DISTANCES ARE MET.
 - DETAILS ARE BASED ON THE AASHTO "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, 2001". CHAPTER 9, INTERSECTION SIGHT DISTANCE, CASES B AND F, AND THE DEPARTMENT PRACTICES FOR CHANNELLED MEDIAN OPENINGS (LEFT TURNS ON MAJOR ROADWAYS).

- GENERAL NOTES**
- DETAILS APPLY TO BOTH RURAL AND URBAN INTERSECTIONS UNDER STOP SIGN CONTROL OR FLASHING BEACON CONTROL. FOR FULL SIGNAL CONTROL INTERSECTIONS SEE DESIGN NOTE NO. 7.
 - INTERSECTION SIGHT DISTANCE (d) APPLIES TO NORMAL AND SKEWED INTERSECTIONS (INTERSECTING ANGLES BETWEEN 60° AND 120°), AND WHERE VERTICAL AND/OR HORIZONTAL CURVES ARE PRESENT. SIGHT DISTANCE (d) IS MEASURED ALONG THE MAJOR ROADWAY FROM THE CENTER OF THE ENTRANCE LANE OF THE MINOR ROADWAY TO THE CENTER OF THE NEAR APPROACH ROAD (RIGHT OR LEFT) OF THE MAJOR ROADWAY. DISTANCES d_L AND d_R ARE MEASURED FROM THE CENTERLINE OF THE ENTRANCE LANE (CROSS ROAD) OF THE MINOR ROADWAY FROM THE EDGE OF THE NEAR SIDE LANE TO THE CENTERLINE OF THE MAJOR ROADWAY. DISTANCES d_L AND d_R ARE MEASURED FROM THE ENTRANCE LANE OF THE MINOR ROADWAY TO A POINT ON THE MEDIAN CLEAR ZONE LIMIT OR HORIZONTAL CLEARANCE LIMIT FOR THE FAR SIDE ROADWAY OF THE MAJOR ROADWAY.
 - THE LIMITS OF CLEAR SIGHT DEFINE A CORRIDOR THROUGHOUT WHICH A CLEAR LINE OF SIGHT MUST BE PRESERVED. SEE VERTICAL LIMITS OF CLEAR SIGHT DETAIL ON SHEET R001-SD-2.
 - CLEAR SIGHT MUST BE PROVIDED BETWEEN VEHICLES AT INTERSECTION STOP LOCATIONS AND VEHICLES ON THE MAJOR ROADWAY WITHIN DIMENSION "d".
 - SINCE OBSERVATIONS ARE MADE IN BOTH DIRECTIONS ALONG THE LINE OF SIGHT, THE REFERENCE DATUM BETWEEN ROADWAYS IS 3'-6" ABOVE RESPECTIVE PAVEMENTS.
 - BARRIER SYSTEMS WITHIN INTERSECTION SIGHT CORRIDORS, WHERE PENETRATION INTO THE CLEAR LINE OF SIGHT MIGHT OCCUR, SHALL BE LOCATED TO PROVIDE THE LEAST ADVERSE AFFECT PRACTICAL.
 - ALL PROPERTY NEEDED TO ACHIEVE SIGHT DISTANCE AT INTERSECTIONS SHOULD BE ACQUIRED AS RIGHT-OF-WAY.
 - SIGHT DISTANCE VALUES IN THESE STANDARD DRAWINGS ARE APPROXIMATE FOR GENERALLY FLAT AREAS WHERE THE ROADWAY GRADES ARE IN THE APPROXIMATE RANGE OF 0% TO 8%. FOR LOCATIONS WHERE ROADWAYS ARE CURVED OR WITH GRADES GREATER THAN 6%, THE DESIGNER IS DIRECTED TO ENSURE THAT STOPPING SIGHT DISTANCES COMPLY WITH AASHTO "A POLICY FOR GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" AS CURRENTLY ADOPTED BY TDOT.

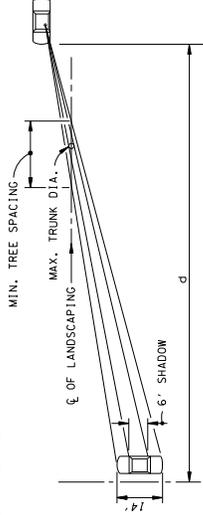
LEGEND

□ AREAS FREE OF SIGHT OBSTRUCTIONS

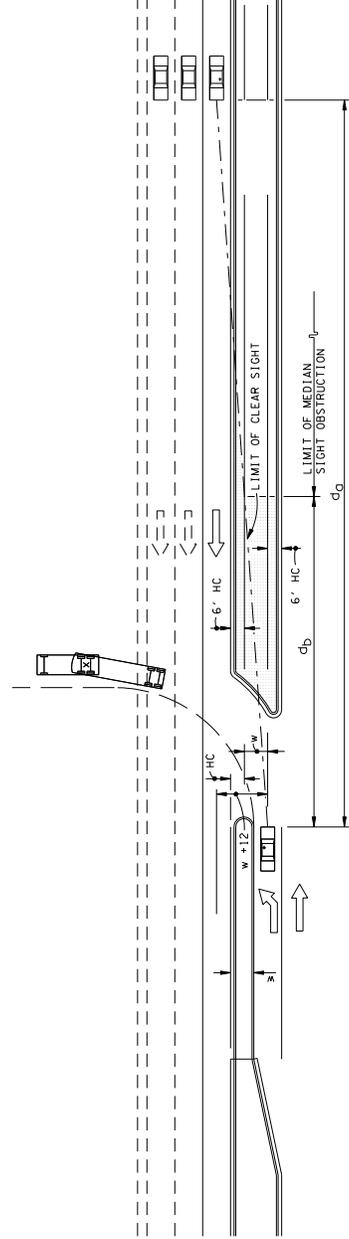


THE INTENT OF THIS STANDARD IS TO PROVIDE A WINDOW WITH VERTICAL LIMITS OF NOT LESS THAN 5' ABOVE AND 1' - 6" BELOW THE SIGHT LINE DATUM, AND HORIZONTAL LIMITS DEFINED BY THE LIMITS OF CLEAR SIGHT.

VERTICAL LIMITS OF CLEAR SIGHT DISTANCE
(SEE GENERAL NOTE C1 ON SHEET RD01-SD-1)



HORIZONTAL LIMITS OF CLEAR SIGHT DISTANCE



CHANNELIZED DIRECTIONAL MEDIAN OPENINGS

LEGEND
 AREAS FREE OF SIGHT OBSTRUCTIONS

DESIGN NOTES

THE CORRIDOR DEFINED BY THE LIMITS OF CLEAR SIGHT IS A RESTRICTED PLANTING AREA. DRIVERS OF VEHICLES ON THE INTERSECTING ROADWAY AND VEHICLES ON THE MAJOR ROADWAY SHOULD BE ABLE TO SEE EACH OTHER CLEARLY THROUGHOUT THE LIMITS OF "d" AND "d_o". IF IN THE ENGINEERS JUDGEMENT, LANDSCAPING INTERFERES WITH THE LINE OF SIGHT CORRIDOR PRESCRIBED BY THESE STANDARDS THE ENGINEER MAY REARRANGE, RELOCATE OR ELIMINATE PLANTINGS. PLANTS WITHIN THE RESTRICTED AREAS ARE LIMITED TO SELECTIONS AS FOLLOWS:

- GROUND COVER & TRUNKED PLANTS (SEPARATE OR COMBINED):
 - GROUND COVERS - PLANT SELECTION OF LOW GROWING VEGETATION WHICH AT MATURITY DOES NOT ATTAIN A HEIGHT GREATER THAN 18" BELOW THE SIGHT LINE DATUM.
 - FOR GROUND COVER IN COMBINATION WITH TREES, THE FOLLOWING HEIGHTS BELOW THE SIGHT LINE DATUM WILL APPLY: 24" FOR TREES < 11" DIA.

TRUNKED PLANTS - PLANT SELECTION OF A MATURE TRUNK DIAMETER 4" OR LESS MEASURED AT 6" ABOVE THE GROUND SURFACE OR THIS GROUND SURFACE SHALL BE LOWER THAN 5' ABOVE THE SIGHT LINE DATUM. THESE SELECTIONS SHALL BE SPACED NO CLOSER THAN 20'.

TREES: TREES CAN BE USED WITH LAWN; PAVEMENT; GRAVEL; BARK OR WOOD CHIP BEDS; GROUND COVERS OR OTHER DEPARTMENT APPROVED MATERIAL. THE CLEAR SIGHT WINDOW MUST BE IN CONFORMANCE WITH THE 'WINDOW DETAIL' MODIFIED TO ATTAIN THE HEIGHT REQUIREMENTS LISTED IN 'GROUND COVERS' ABOVE. TREE SIZE AND SPACING SHALL CONFORM TO THE FOLLOWING TABULAR VALUES:

DESIGN SPEED (MPH)	30	35	40	45	50	55	60
MINIMUM SPACING	4'0"x11'	22'	27'	33'	40'	45'	60'
(C.C. TO C. OF TRUCK)	12'0"x18'	91'	108'	126'	146'	165'	193'

Ø = DIAMETER WITHIN LIMITS OF SIGHT WINDOW (INCHES)

SIZES AND SPACINGS ARE BASED ON THE FOLLOWING CONDITIONS:

- (A) A SINGLE LINE OF TREES IN THE MEDIAN PARALLEL TO BUT NOT NECESSARILY COLINEAR WITH THE CENTERLINE, APPROACHING MAINLINE, WITHIN SKEW LIMITS AS DESCRIBED IN GENERAL NOTE B.
- (B) TREES ≤ 11" IN DIAMETER CASTING A VERTICAL 6' WIDE SHADOW BAND ON A VEHICLE ENTERING AT STOP BAR LOCATION WHEN VIEWED BY MAINLINE DRIVER BEGINNING AT DISTANCE "d"; SEE SHADOW DIAGRAM.
- (C) TREES WITH DIAMETERS ≤ 11" INTERMIXED WITH TREES WITH DIAMETERS 11" ≤ 18" ARE TO BE SPACED BASED ON TREES WITH DIAMETERS > 11" ≤ 18".

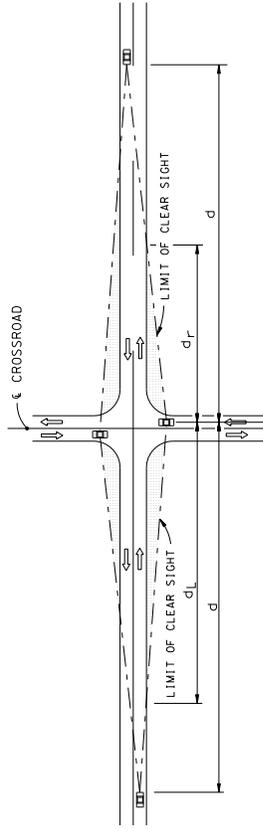
FOR ANY OTHER CONDITIONS THE TREE SIZES, SPACINGS AND LOCATIONS SHALL BE DETAILED IN THE PLANS; SEE DESIGN NOTE NO. 8.

CHANNELIZED DIRECTIONAL MEDIAN OPENINGS

Design Speed MPH	1 LANE CROSSED		2 LANE CROSSED		3 LANE CROSSED	
	P	SU COMB.	P	SU COMB.	P	SU COMB.
30	245	285	330	265	320	360
35	285	335	385	310	370	420
40	325	380	440	355	425	480
45	365	430	495	395	475	540
50					430	520
55						590

THE d_o VALUES IN THE TABLE WERE ESTABLISHED BY THE METHOD REFERENCED IN DESIGN NOTE 12, AND ARE APPLICABLE TO URBAN, PREDOMINANTLY CURVED ROADWAYS. THE d_b VALUES ARE BASED ON A 6' HORIZONTAL CLEARANCE OF SIX FEET (6'). THE VALUES FOR d_b MAY BE DETERMINED BY THE EQUATION d_b = d_o(w/(w+12)). FOR ROADWAYS WITH NONRESTRICTED CONDITIONS, d_o AND d_b SHOULD BE BASED ON THE GEOMETRY FOR THE LEFT TURN STORAGE AND ON CLEAR ZONE WIDTHS.

P = PASSENGER VEHICLE
 SU = SINGLE UNIT TRUCK
 COMB. = COMBINATION
 d = CLEAR LINE SIGHT DISTANCE
 d_o = CLEAR LINE SIGHT DISTANCE



2 LANE UNDIVIDED ROADWAY - SYMMETRICAL

Speed (mph)	d	d _L	d _r
15	165	120	75
20	220	160	100
25	275	195	125
30	335	240	150
35	390	275	175
40	445	315	200
45	500	350	225
50	555	390	250
55	610	430	275
60	665	470	300
65	720	510	325
70	775	550	350

PASSENGER VEHICLE

Speed (mph)	d	d _L	d _r
15	210	150	95
20	280	200	125
25	350	250	160
30	420	295	190
35	490	345	220
40	560	395	250
45	630	445	280
50	700	495	310
55	770	545	345
60	840	595	375
65	910	645	405
70	980	695	440

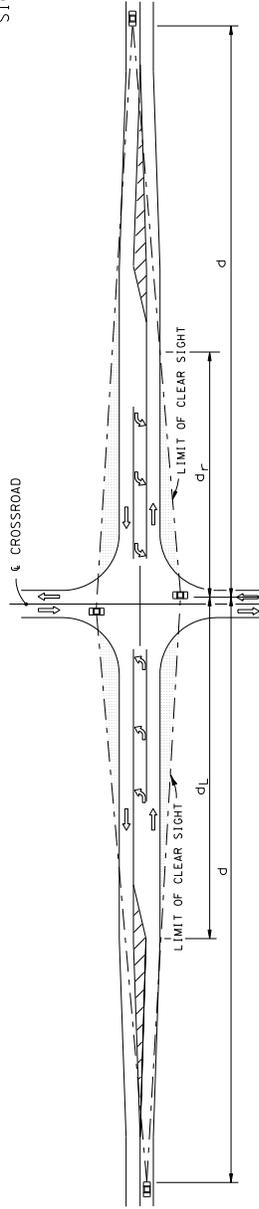
SU VEHICLE

Speed (mph)	d	d _L	d _r
15	255	180	115
20	340	240	155
25	425	300	190
30	510	360	225
35	595	420	265
40	680	480	305
45	765	540	340
50	845	600	375
55	930	660	415
60	1015	720	450
65	1100	780	490
70	1185	840	530

COMBINATION VEHICLE

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_r, d_L) (FEET)

2 LANE UNDIVIDED



FLARED FOR OPPOSING LEFT TURN CENTERED ON ALIGNMENT - 2 LANE 2 WAY

Speed (mph)	d	d _L	d _r
15	180	100	70
20	235	130	90
25	295	165	115
30	355	195	135
35	415	225	155
40	475	260	180
45	530	290	200
50	590	325	220
55	650	355	245
60	710	390	265
65	765	420	290
70	825	455	315

PASSENGER VEHICLE

Speed (mph)	d	d _L	d _r
15	225	125	85
20	300	165	115
25	375	205	145
30	450	250	170
35	525	290	200
40	600	330	225
45	675	370	255
50	750	410	285
55	825	450	310
60	900	490	340
65	975	530	370
70	1050	575	400

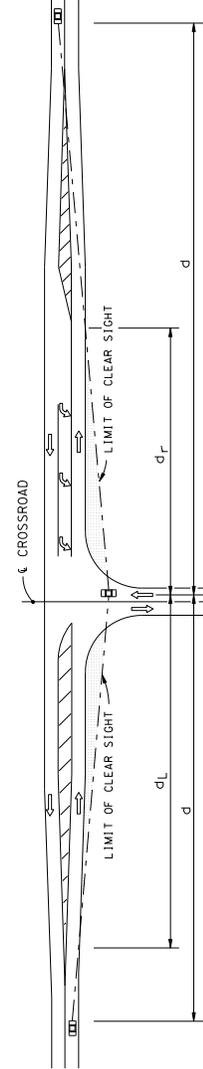
SU VEHICLE

Speed (mph)	d	d _L	d _r
15	270	150	105
20	360	200	140
25	450	250	170
30	540	295	205
35	630	345	240
40	720	395	270
45	810	445	305
50	900	495	340
55	990	540	375
60	1080	590	405
65	1170	640	440
70	1255	690	475

COMBINATION VEHICLE

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_r, d_L) (FEET)

2 LANE 2 WAY - FLARED FOR LEFT TURNS

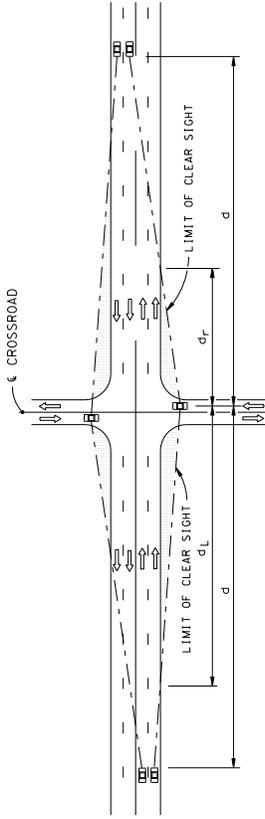


FLARED FOR SINGLE SIDE LEFT TURN CENTERED ON ALIGNMENT - 2 LANE 2 WAY

NOTE: SEE RD01-SD-1 FOR INTERSECTING ROADWAY ORIGIN OF CLEAR SIGHT AND QUADRANT CORNER CLIPS.

LEGEND

▨ AREAS FREE OF SIGHT OBSTRUCTIONS



Speed (mi/hr)	d	d _L	d _R
30	395	260	115
35	415	295	135
40	475	335	155
45	530	375	175
50	590	415	195
55	650	460	210
60	705	500	230
65	765	540	250
70	825	585	270

Speed (mi/hr)	d	d _L	d _R
30	450	320	150
35	525	370	170
40	600	425	195
45	675	475	220
50	750	530	245
55	825	585	270
60	900	635	295
65	975	690	320
70	1050	745	345

PASSENGER VEHICLE

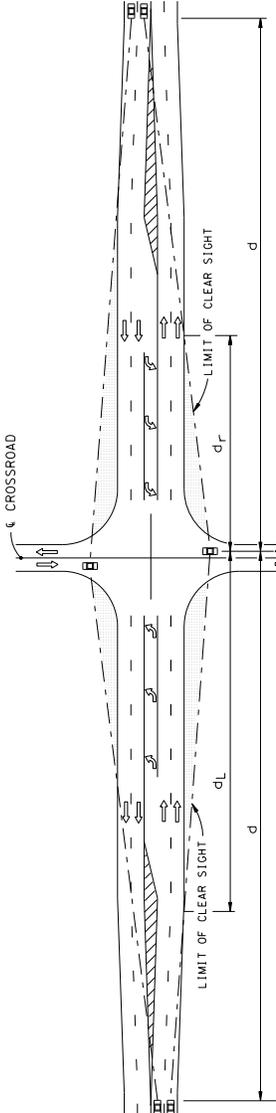
SU VEHICLE

COMBINATION VEHICLE

4 LANE UNDIVIDED - SYMMETRICAL

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_L, d_R) (FEET)

4 LANE UNDIVIDED



Speed (mi/hr)	d	d _L	d _R
30	375	205	120
35	440	240	145
40	500	275	165
45	565	310	185
50	625	340	205
55	690	375	225
60	750	410	245
65	815	445	265
70	880	480	285

Speed (mi/hr)	d	d _L	d _R
30	480	220	155
35	560	255	180
40	640	290	210
45	720	330	235
50	800	365	260
55	880	400	285
60	960	440	310
65	1040	480	340
70	1120	520	365

PASSENGER VEHICLE

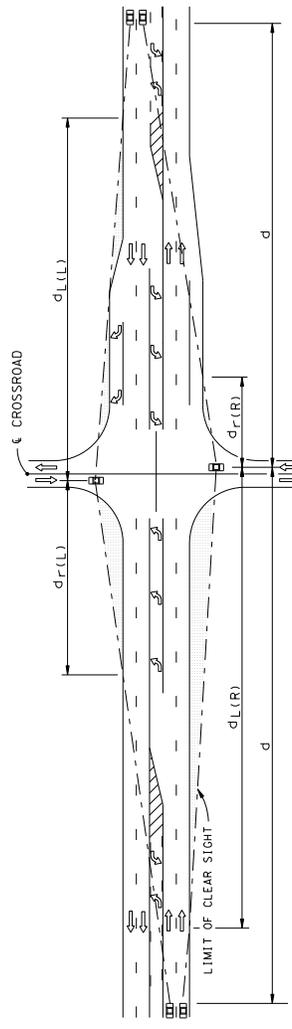
SU VEHICLE

COMBINATION VEHICLE

4 LANE UNDIVIDED FLARED - SYMMETRICAL

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_L, d_R) (FEET)

4 LANE UNDIVIDED FLARED - SYMMETRICAL



Speed (mi/hr)	d	d _{L(R)}	d _{R(R)}	d _{L(L)}	d _{R(L)}
30	375	265	95	170	120
35	440	310	115	195	145
40	500	355	130	225	165
45	565	400	145	250	185
50	625	440	160	280	205
55	690	490	172	310	225
60	750	530	195	335	245
65	815	575	210	365	265
70	880	625	230	385	285

Speed (mi/hr)	d	d _{L(R)}	d _{R(R)}	d _{L(L)}	d _{R(L)}
30	480	340	125	215	155
35	565	410	145	250	180
40	640	480	165	285	210
45	720	550	185	320	235
50	800	620	205	360	260
55	880	690	225	395	285
60	960	760	245	430	310
65	1040	835	265	465	340
70	1120	910	285	500	365

PASSENGER VEHICLE

SU VEHICLE

COMBINATION VEHICLE

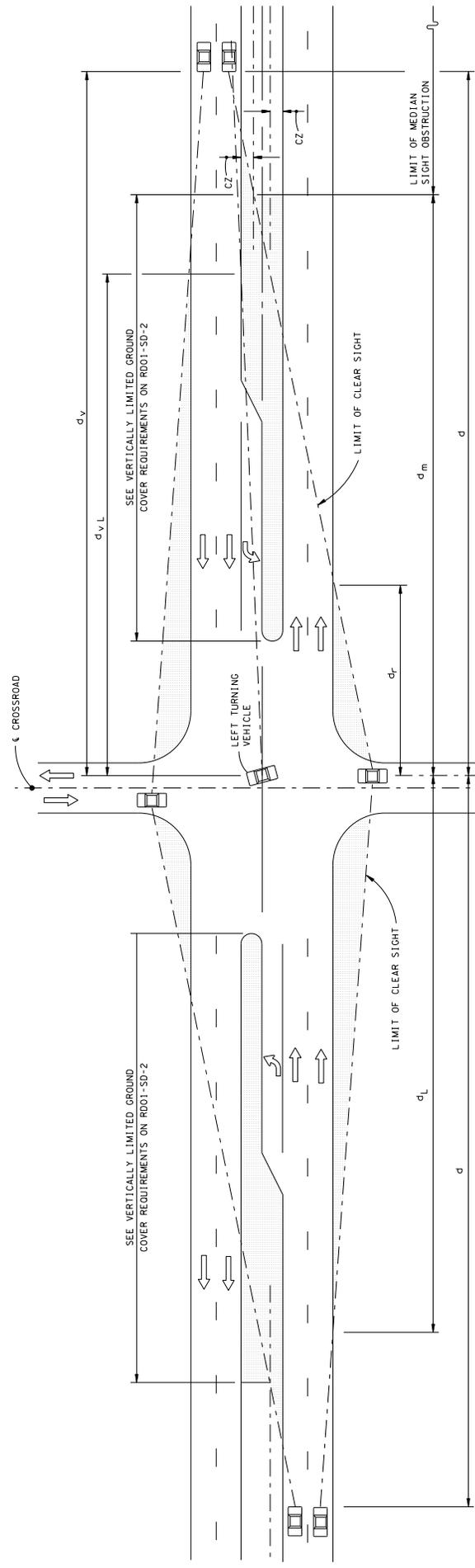
5 LANE FLARED WITH RIGHT TURNS

SIGHT DISTANCE (d) AND RELATED DISTANCES (d_L, d_R) (FEET)

5 LANE FLARED WITH RIGHT TURN LANES

LEGEND

AREAS FREE OF SIGHT OBSTRUCTIONS



WHERE THE MEDIAN IS SUFFICIENTLY WIDE FOR THE DESIGN VEHICLE TO PAUSE IN THE MEDIAN (VEHICLE LENGTH TABLE PLUS 6' MIN.) THE CLEAR LINE OF SIGHT TO THE RIGHT (d_v) IS MEASURED FROM THE VEHICLE PAUSE LOCATION, I.E., NOT FROM THE CROSS ROAD STOP POSITION; DISTANCES d AND d_m DO NOT APPLY.

LEGEND

- AREAS FREE OF SIGHT OBSTRUCTIONS
- CZ CLEAR ZONE WIDTH FOR NONRESTRICTED CONDITIONS (6' MIN. FOR RESTRICTED CONDITIONS)

GENERAL NOTES FOR 4-LANE DIVIDED ROADWAY

- SEE R001-SD-1 FOR ORIGIN OF CLEAR SIGHT LINE ON THE ROAD.
- VALUES SHOWN IN THE TABLES ARE THE GOVERNING (CONTROLLING) SIGHT DISTANCES FOR CLEAR SIGHT BASED ON CASE B - INTERSECTION WITH STOP CONTROL ON THE MINOR ROAD.
- DEFINITIONS:
 d_v THE CLEAR LINE OF SIGHT TO THE RIGHT IS THE DISTANCE MEASURED FROM THE VEHICLE PAUSE LOCATION TO THE EDGE OF THE INSIDE TRAVEL LANE
 CZ CLEAR ZONE
 d_m DISTANCE MEASURED FROM THE CENTERLINE OF THE ENTRANCE LANE OF THE MINOR ROADWAY TO A POINT ON THE MEDIAN CLEAR ZONE LIMIT OR HORIZONTAL CLEARANCE LIMIT FOR THE FAR SIDE ROADWAY OF THE MAJOR ROADWAY
 SEE SHEET R001-SD-2 FOR MEDIAN LANDSCAPE REQUIREMENTS.

MEDIAN 35' OR LESS				40'-64' MEDIAN				MEDIAN 22' OR LESS				25'-64' MEDIAN							
Speed	d	d_L	d_r	d_m	Speed	d	d_L	d_r	d_m	Speed	d	d_L	d_r	d_m	Speed	d	d_L	d_r	d_m
30	540	380	100	460	30	370	260	420	300	30	350	280	90	320	30	290	210	330	230
35	630	450	110	530	35	440	310	490	350	35	460	330	100	380	35	330	230	390	280
40	720	510	130	610	40	500	350	560	400	40	520	370	110	430	40	380	270	440	310
45	810	570	150	690	45	560	400	630	450	45	590	420	130	480	45	430	300	500	350
50	900	640	160	760	50	620	440	700	500	50	650	460	140	530	50	480	340	550	390
55	990	700	180	840	55	690	490	770	540	55	720	510	160	590	55	530	370	610	430
60	1080	760	200	920	60	750	530	840	590	60	780	550	170	640	60	570	400	660	470
65	1170	830	210	990	65	810	570	910	640	65	850	600	190	700	65	620	440	720	510
70	1260	890	230	1070	70	875	620	980	690	70	920	650	200	760	70	670	475	770	550

PASSENGER VEHICLE (P)

MEDIAN 30' OR LESS				35'-50' MEDIAN				64' MEDIAN				VEHICLE LENGTH (FT.)			
Speed	d	d_L	d_r	d_m	Speed	d	d_L	d_v	d_vL	Speed	d	d_L	d_v	d_vL	Vehicle Type
30	620	440	120	520	30	670	470	100	580	30	460	330	510	360	PASSENGER (P)
35	720	510	140	600	35	780	550	120	680	35	540	380	590	420	SINGLE UNIT (SU)
40	820	580	160	690	40	890	630	140	780	40	620	440	680	480	LARGE SCHOOL BUS
45	930	660	180	780	45	1000	710	150	870	45	690	490	760	540	WB-40
50	1030	730	200	860	50	1110	790	170	970	50	770	540	850	600	WB-50
55	1130	800	220	950	55	1220	860	190	1070	55	850	600	930	660	
60	1240	880	240	1040	60	1330	940	200	1160	60	920	650	1020	720	
65	1340	950	260	1120	65	1440	1020	220	1260	65	1000	710	1100	780	
70	1440	1020	280	1200	70	1550	1100	240	1360	70	1080	770	1180	840	

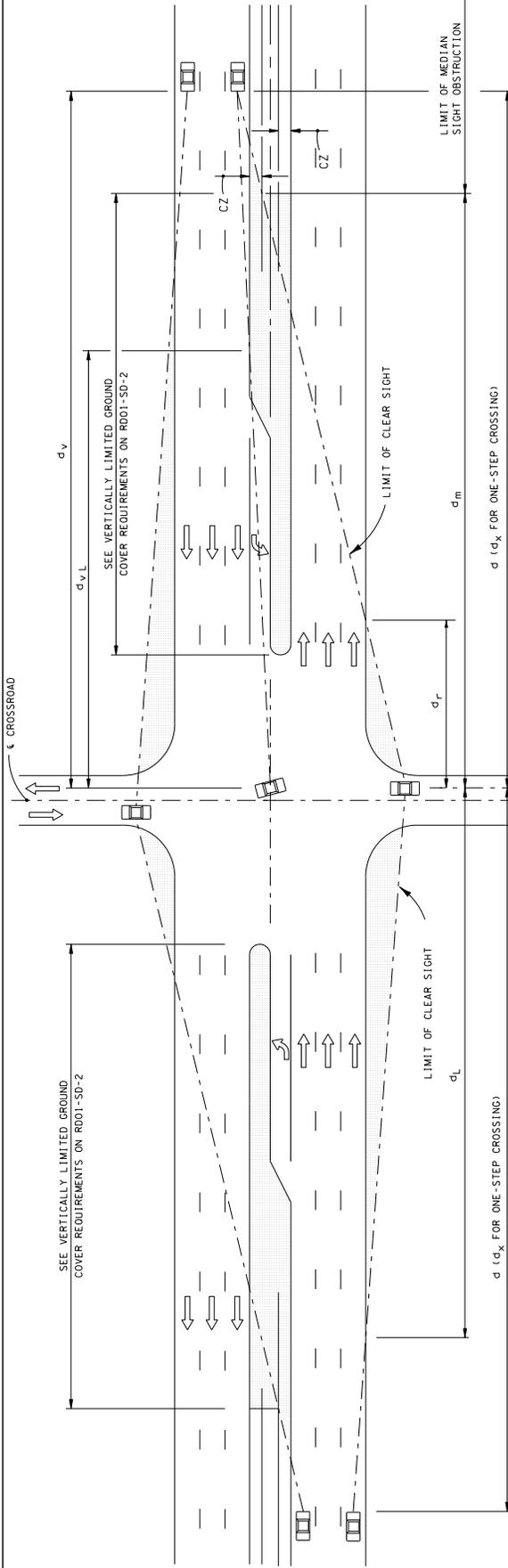
SINGLE-UNIT TRUCK (SU)

INTERMEDIATE SEMI-TRAILERS (WB-40 & WB-50)

VEHICLE LENGTH TABLE

SIGHT DISTANCES (d) & (d_v) AND RELATED DISTANCES (d_L , d_r , d_m & d_vL) (FEET)

4 LANE DIVIDED HIGHWAYS



WHERE THE MEDIAN IS SUFFICIENTLY WIDE FOR THE DESIGN VEHICLE TO PAUSE IN THE MEDIAN, THE CLEAR ZONE WIDTH SHALL BE MINIMUM. THE SIGHT DISTANCE TO THE MEDIAN SHALL BE MEASURED FROM THE VEHICLE PAUSE LOCATION, I.E., NOT FROM THE CROSS ROAD STOP POSITION. DISTANCES d AND d_m DO NOT APPLY.

LEGEND
 AREAS FREE OF SIGHT OBSTRUCTIONS
 CZ CLEAR ZONE WIDTH FOR NONRESTRICTED CONDITIONS (6' MIN. FOR RESTRICTED CONDITIONS)

Design Speed	25'-64' MEDIAN		
	d	d_L	d_v
30	310	220	330
35	360	250	390
40	410	290	440
45	460	330	500
50	510	360	550
55	570	400	610
60	620	440	660
65	670	470	720
70	720	505	775

Design Speed	MEDIAN 22' OR LESS		
	d	d_L	d_r
30	410	290	80
35	480	340	90
40	550	390	100
45	620	440	110
50	690	490	130
55	760	540	140
60	830	590	150
65	900	640	170
70	970	690	185

Design Speed	40'-64' MEDIAN		
	d	d_L	d_v
30	410	290	420
35	470	330	490
40	540	380	560
45	610	430	630
50	680	480	700
55	740	520	770
60	810	570	840
65	880	620	910
70	950	670	980

Design Speed	MEDIAN 35' OR LESS		
	d	d_L	d_r
30	590	420	90
35	690	490	110
40	780	550	120
45	880	620	140
50	980	690	160
55	1080	760	170
60	1170	830	190
65	1270	900	200
70	1365	970	215

PASSENGER VEHICLE (P)

Design Speed	64' MEDIAN		
	d	d_L	d_v
30	490	350	510
35	580	410	590
40	660	470	680
45	740	520	760
50	820	580	850
55	910	640	930
60	990	700	1020
65	1070	760	1100
70	1150	820	1185

Design Speed	35'-50' MEDIAN		
	d	d_L	d_v
30	720	510	100
35	830	590	110
40	950	670	130
45	1070	760	150
50	1190	840	160
55	1310	930	180
60	1430	1010	190
65	1550	1100	210
70	1670	1185	230

Design Speed	MEDIAN 30' OR LESS		
	d	d_L	d_r
30	670	470	110
35	780	550	130
40	890	630	150
45	1000	710	170
50	1110	790	190
55	1220	860	200
60	1330	940	220
65	1440	1020	240
70	1550	1100	260

SINGLE-UNIT TRUCK (SU)

Design Speed	VEHICLE LENGTH (FT.)		
	Passenger (P)	Single Unit (SU)	Large School Bus
19			
30			
40			
45.5			
55			

Design Speed	INTERMEDIATE SEMI-TRAILERS (WB-40 & WB-50)		
	d	d_L	d_x
30	1150	820	1185
35	1270	900	1270
40	1390	980	1350
45	1510	1060	1430
50	1630	1140	1510
55	1750	1220	1590
60	1870	1300	1670
65	1990	1380	1750
70	2110	1460	1830

Design Speed	VEHICLE LENGTH TABLE		
	WB-40	WB-50	WB-50
45.5			
55			

VEHICLE LENGTH TABLE

INTERMEDIATE SEMI-TRAILERS (WB-40 & WB-50)

SIGHT DISTANCES (d), (d_v) & (d_x) AND RELATED DISTANCES (d , d_L , d_r , d_m & d_vL) (FEET)

6 LANE DIVIDED HIGHWAY

- GENERAL NOTES FOR 6-LANE DIVIDED ROADWAY**
- SEE RD01-SD-1 FOR ORIGIN OF CLEAR SIGHT LINE ON THE MINOR ROAD.
 - VALUES SHOWN IN THE TABLES ARE THE GOVERNING (CONTROLLING) SIGHT DISTANCES CALCULATED BASED ON 'ASHTO CASE B' INTERSECTION WITH STOP CONTROL ON THE MINOR ROAD.
 - DEFINITIONS:
 d_vL THE CLEAR LINE OF SIGHT TO THE RIGHT IS THE DISTANCE MEASURED FOR THE VEHICLE PAUSE LOCATION TO THE EDGE OF THE INSIDE TRAVEL LANE
 d CLEAR ZONE
 d_m DISTANCE MEASURED FROM THE CENTERLINE OF THE ENTRANCE LANE OF THE MINOR ROADWAY TO A POINT ON THE MEDIAN CLEAR ZONE LIMIT OR NORMAL CLEARANCE LIMIT FOR THE FAR SIDE ROADWAY OF THE MAJOR ROADWAY
 - SEE SHEET RD01-SD-2 FOR MEDIAN LANDSCAPE REQUIREMENTS

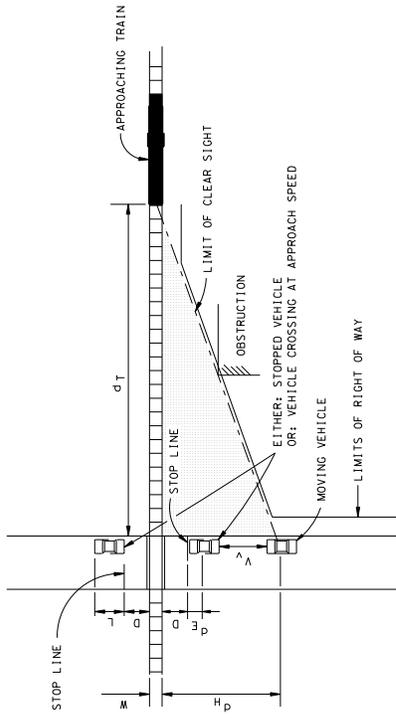
MINOR REVISION - PER APPROVAL NO. REQUIRED.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

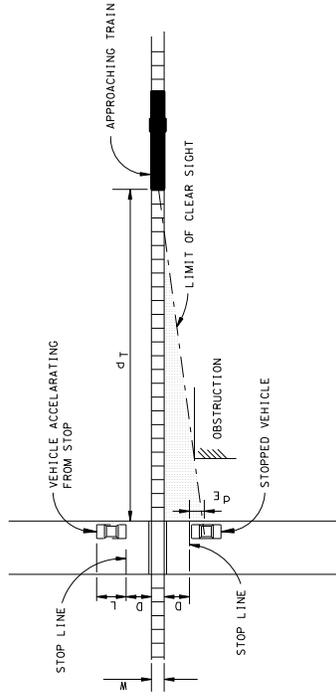
INTERSECTION SIGHT DISTANCE 6-LANE DIVIDED HIGHWAYS

RD01-SD-6

NOT TO SCALE



CASE A
 APPROACHING VEHICLE TO SAFELY CROSS OR STOP AT RAILROAD CROSSING
 (FOR CLARITY RIGHT OF WAY LINES ARE NOT SHOWN FOR THE OTHER QUADRANTS)



CASE B
 VEHICLE DEPARTING FROM STOPPED POSITION TO SAFELY CROSS RAILROAD TRACK
 (FOR CLARITY RIGHT OF WAY LINES ARE NOT SHOWN FOR THE OTHER QUADRANTS)

LEGEND
 [Hatched Box] AREAS FREE OF SIGHT OBSTRUCTIONS

DESIGN SIGHT DISTANCES FOR COMBINATIONS
 OF TRAIN AND HIGHWAY VEHICLE SPEEDS

CONDITIONS: SINGLE RR TRACK 90° CROSSING
 DESIGN VEHICLE WB-67
 FLAT-HIGHWAY GRADES
 PASSIVE CROSSING

TRAIN SPEED (MPH)	CASE B VEHICLE DEPARTURE FROM STOP		CASE A MOVING VEHICLE					
	0	10	10	20	30	40	50	60
10	240	146	146	106	99	100	105	111
20	480	293	212	198	200	209	222	222
30	721	439	318	297	300	314	333	333
40	961	585	424	396	401	419	444	444
50	1201	732	530	494	501	524	555	555
60	1441	878	636	593	601	628	666	666
70	1681	1024	742	692	701	733	777	777
80	1921	1171	848	791	801	838	888	888
90	2162	1317	954	890	901	943	999	999

STOPPING SIGHT DISTANCE ALONG HIGHWAY FROM RR CROSSING, d_H (FT)

69	135	220	324	447	589
----	-----	-----	-----	-----	-----

GENERAL NOTES

- SIGHT DISTANCES ARE REQUIRED IN ALL QUADRANTS OF THE CROSSING.
- CORRECTIONS MUST BE FOR CONDITIONS OTHER THAN SHOWN IN THE TABLE, SUCH AS, MULTIPLE RAILS, SKEW, ASCENDING AND DESCENDING GRADES, AND CURVATURE OF HIGHWAYS AND RAILS. FOR CONDITION ADJUSTMENTS AND ADDITIONAL INFORMATION REFER TO RAILROAD-HIGHWAY GRADE CROSSINGS UNDER CHAPTER 9 OF "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS", AASHTO 2001.
- DEFINITIONS
 d_H = SIGHT-DISTANCE LEG ALONG HIGHWAY ALONG A VEHICLE PROCEEDING TO SPEED V_V TO CROSS TRACKS EVEN THOUGH A TRAIN IS OBSERVED AT A DISTANCE d_T FROM THE CROSSING OR TO STOP THE VEHICLE WITHOUT ENCROACHMENT OF THE CROSSING AREA (FT)
 V_V = SPEED OF THE VEHICLE (MPH)
 W = DISTANCE BETWEEN OUTER RAILS (FOR A SINGLE TRACK, THIS VALUE IS 5 FT.)
 D = DISTANCE FROM THE STOP LINE OR FRONT OF THE VEHICLE TO THE NEAREST RAIL, WHICH IS ASSUMED TO BE 15 FT.
 d_e = DISTANCE FROM THE DRIVER TO THE FRONT OF THE VEHICLE, WHICH IS ASSUMED TO BE 8 FT.
 L = LENGTH OF VEHICLE, WHICH IS ASSUMED TO BE 65 FT.
 d = SIGHT DISTANCE ALONG RR TRACK
 TS = DESIGNER SHOULD OBTAIN THIS INFORMATION FROM THE UTILITIES OFFICE



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
NASHVILLE, TENNESSEE 37243-0348

INSTRUCTIONAL BULLETIN NO. 09-05

Regarding Revised Traffic Control for Lane Closure Standard Drawings
T-WZ-11, 12, 13, 14, 15, 16, 18, and 19

Effective for the August 7, 2009 letting, the revised Traffic Control for Lane Closure Standard Drawings T-WZ-11, 12, 13, 14, 15, 16, 18, and 19 are to be printed with the plans. These drawings shall be identified on the lower left side of the index sheet **“To be printed with plans”** until the drawings are formally distributed.

Copies of the revised standard drawings are attached.

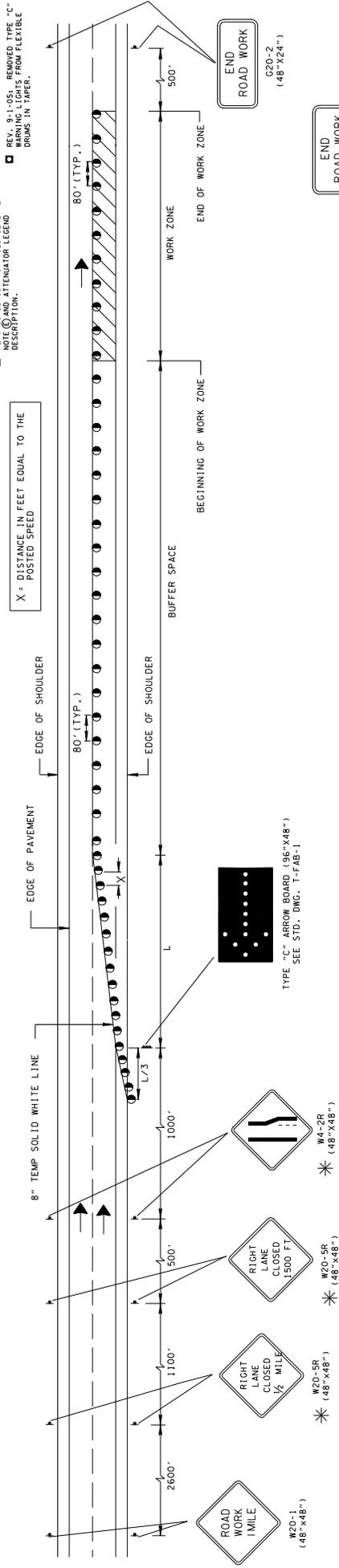
<u>DRAWING NUMBER</u>	<u>CURRENT REVISION DATE</u>	<u>DESCRIPTION</u>
T-WZ-11	03/13/2009	One Lane Closure on Divided Highways
T-WZ-12	03/13/2009	One Lane Closure Detail for Bridges on Divided Highways
T-WZ-13	03/13/2009	Two-Outside Lane Closure on Freeway or Expressway
T-WZ-14	03/13/2009	Two-Outside Lane Closure on Interstates or Expressways
T-WZ-15	03/13/2009	Interior Lane Closure on Freeways or Expressways
T-WZ-16	03/13/2009	Lane Shift on Divided Highways and Freeways
T-WZ-18	03/13/2009	Shoulder Closure Detail for Freeways and Divided Highways
T-WZ-19	03/13/2009	Median Cross-Over Detail on Divided Highways

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

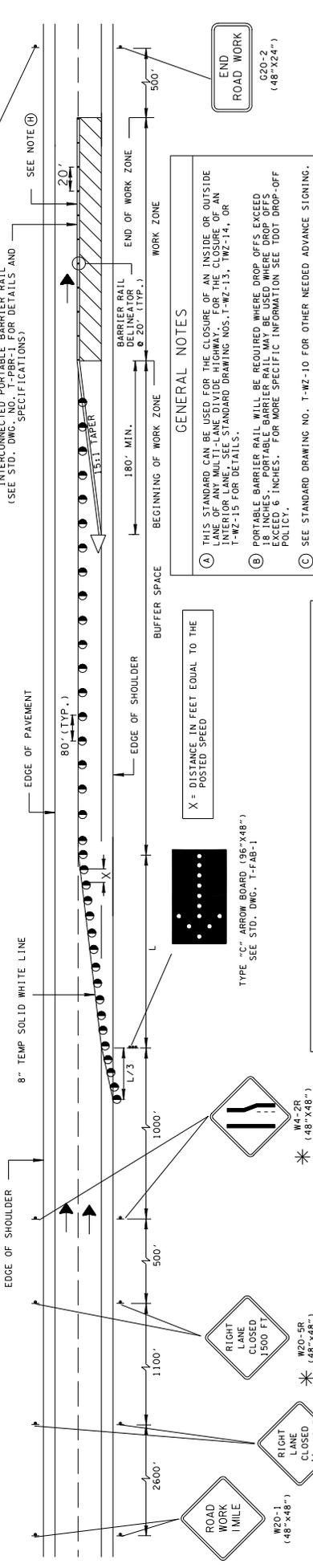
April 3, 2009
JCJ:MJA:arh
Attachment

- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES (A) & (C).
- REV. 12-18-99: MODIFIED GENERAL NOTE (C).
- REV. 7-29-03: CHANGED GENERAL NOTE (C).
- REV. 4-15-04: CHANGED W4-2 SIGN WITH 2003 MUTCD. NOTE (C) TO COMPLY WITH 2003 MUTCD.
- REV. 8-1-05: REVISED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 03-13-09: CHANGES GENERAL NOTE (C) AND ATTENUATOR LEGEND DESCRIPTION.

TRAFFIC CONTROL FOR ONE LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY (NO PORTABLE BARRIER RAIL SETUP)



TRAFFIC CONTROL FOR ONE LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY (SHOWING PORTABLE BARRIER RAIL SETUP)



- #### GENERAL NOTES
- (A) THIS STANDARD CAN BE USED FOR THE CLOSURE OF AN INSIDE OR OUTSIDE LANE OF ANY MULTI-LANE DIVIDED HIGHWAY FOR THE CLOSURE OF AN INTERIOR LANE. SEE STANDARD DRAWING NOS. T-WZ-13, T-WZ-14, OR T-WZ-15 FOR DETAILS.
 - (B) PORTABLE BARRIER RAIL WILL BE REQUIRED WHERE DROP-OFFS EXCEED 18 INCHES. PORTABLE BARRIER RAIL MAY BE USED WHERE DROP-OFFS EXCEED 6 INCHES. FOR MORE SPECIFIC INFORMATION SEE TOOT DROP-OFF POLICY.
 - (C) SEE STANDARD DRAWING NO. T-WZ-10 FOR OTHER NEEDED ADVANCE SIGNING.
 - (D) SEE TABLE 66-2 OF PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR RECOMMENDED LENGTHS OF BUFFER SPACE WHICH ARE BASED ON STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED.
 - (E) TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED WITH ATTENUATOR WHEN IT IS NOT FEASIBLE TO EXCEED CLEAR ZONE DISTANCE. SEE STANDARD DRAWING R01-5-12 FOR CLEAR ZONE DISTANCE.
 - (F) A SECOND ARROW BOARD MAY BE USED WHEN GEOMETRIC CONDITIONS LIMITS THE VISIBILITY OF A LANE CLOSURE.
 - (G) BARRIER RAIL DELINEATORS (ITEM NO. 712-04-50) SHALL BE USED ON APPROVED BARRIER RAIL DELINEATORS. DIFFERENT TYPES OF BARRIER RAIL DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE.
 - (H) MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE CONCRETE BARRIER IS REQUIRED. THE MAXIMUM POSSIBLE OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER MUST BE OBTAINED. TWO FEET (2') OFFSET MAY BE ELIMINATED WHERE PHYSICAL CONDITIONS DO NOT ALLOW.
 - (I) RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.

CHANNELIZATION DEVICE LEGEND

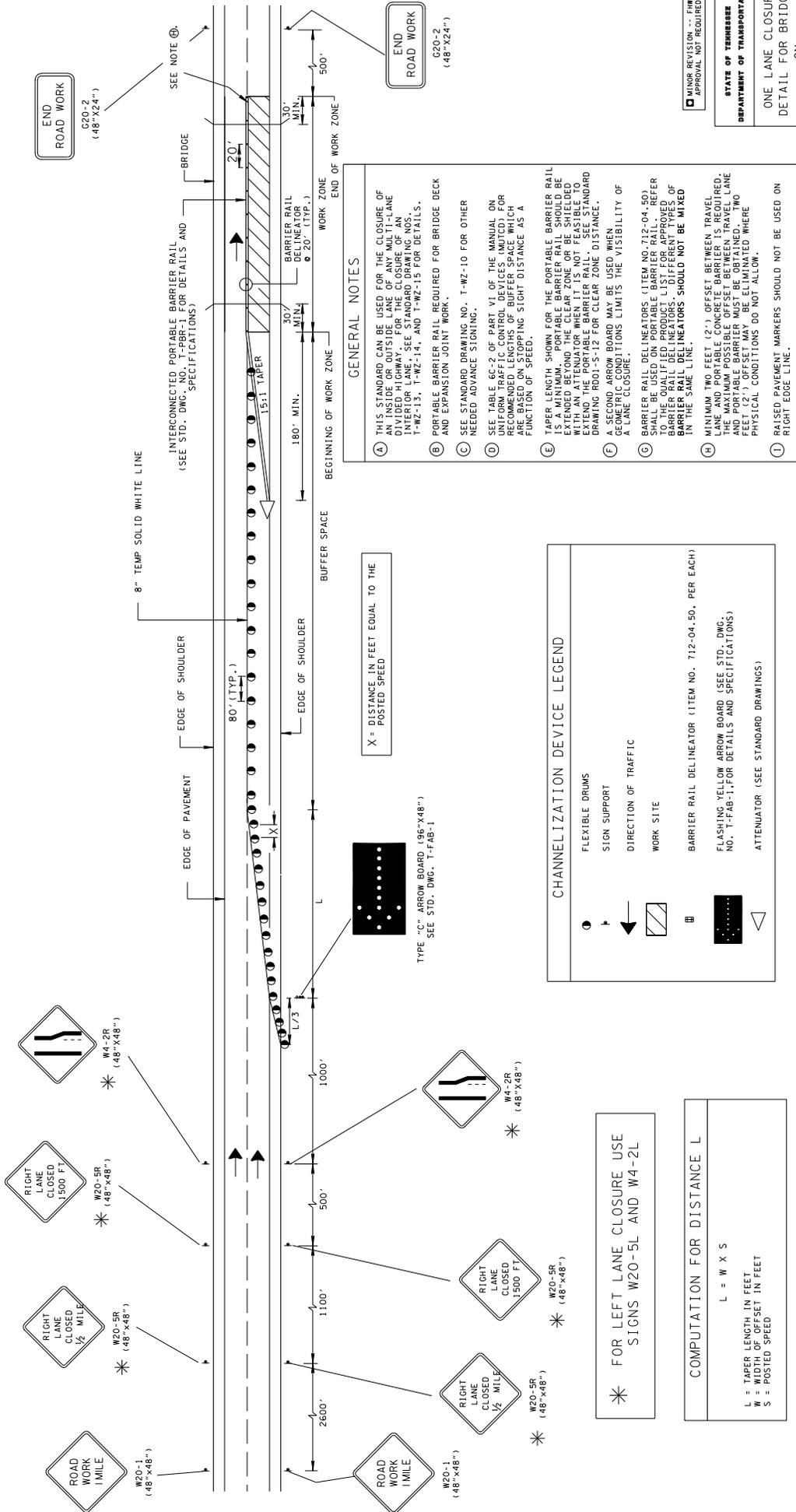
	FLEXIBLE DRUMS
	SIGN SUPPORT
	DIRECTION OF TRAFFIC
	WORK SITE
	BARRIER RAIL DELINEATOR (ITEM NO. 712-04-50, PER EACH)
	FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-FAB-1, OR DETAILS AND SPECIFICATIONS)
	ATTENUATOR (SEE STANDARD DRAWINGS)

* FOR LEFT LANE CLOSURE USE SIGNS W20-5L AND W4-2L

* COMPUTATION FOR DISTANCE L
 $L = W \times S$
 L = TAPER LENGTH IN FEET
 W = WIDTH OF OFFSET IN FEET
 S = POSTED SPEED

- REV. 10-06-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR. CHANGED GENERAL NOTE (C) TO CHANGED GENERAL NOTE (E).
- REV. 12-18-99: MODIFIED GENERAL NOTE (E).
- REV. 03-13-09: CHANGED GENERAL NOTE (E) AND ATTENUATOR LEGEND DESCRIPTION.
- REV. 4-15-99: ADDED GENERAL NOTE (C).
- REV. 7-29-03: CHANGED GENERAL NOTE (E).
- REV. 4-15-04: CHANGED W4-2 SIGN. CHANGED GENERAL NOTE (E) TO COMPLY WITH 2003 MUTCD.
- REV. 9-1-05: REMOVED TYPE "C" DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES (C) & (E).

TRAFFIC CONTROL FOR ONE LANE (RIGHT OR LEFT) CLOSURE FOR BRIDGES ON DIVIDED HIGHWAYS



- GENERAL NOTES**
- (A) THIS STANDARD CAN BE USED FOR THE CLOSURE OF AN INSIDE OR OUTSIDE LANE OF ANY MULTI-LANE DIVIDED HIGHWAY. SEE STANDARD DRAWING NOS. T-WZ-13, T-WZ-14, AND T-WZ-15 FOR DETAILS.
 - (B) PORTABLE BARRIER RAIL REQUIRED FOR BRIDGE DECK AND EXPANSION JOINT WORK.
 - (C) SEE STANDARD DRAWING NO. T-WZ-10 FOR OTHER NEEDED ADVANCE SIGNING.
 - (D) SEE TABLE 60-2 OF PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR RECOMMENDED LENGTHS OF BUFFER SPACE WHICH ARE BASED ON STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED.
 - (E) TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED BY A SECOND ARROW BOARD. SEE STANDARD DRAWING R001-5-12 FOR CLEAR ZONE DISTANCE.
 - (F) A SECOND ARROW BOARD MAY BE USED WHEN GEOMETRIC CONDITIONS LIMITS THE VISIBILITY OF A LANE CLOSURE.
 - (G) BARRIER RAIL DELINEATORS (ITEM NO. 712-04-50) SHALL BE USED ON PORTABLE BARRIER RAIL. REFER TO STANDARD DRAWING R001-5-12 FOR DETAILS OF BARRIER RAIL DELINEATORS. DIFFERENT TYPES OF BARRIER RAIL DELINEATORS SHOULD NOT BE MIXED IN THE SAME LANE.
 - (H) MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE CONCRETE BARRIER IS REQUIRED. PORTABLE BARRIER MUST BE OBTAINED WITH TWO FEET (2') OFFSET MAY BE ELIMINATED WHERE PHYSICAL CONDITIONS DO NOT ALLOW.
 - (I) RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.

CHANNELIZATION DEVICE LEGEND

	FLEXIBLE DRUMS
	SIGN SUPPORT
	DIRECTION OF TRAFFIC
	WORK SITE
	BARRIER RAIL DELINEATOR (ITEM NO. 712-04-50, PER EACH)
	FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-FAB-1, FOR DETAILS AND SPECIFICATIONS)
	ATTENUATOR (SEE STANDARD DRAWINGS)

* FOR LEFT LANE CLOSURE USE SIGNS W20-5L AND W4-2L

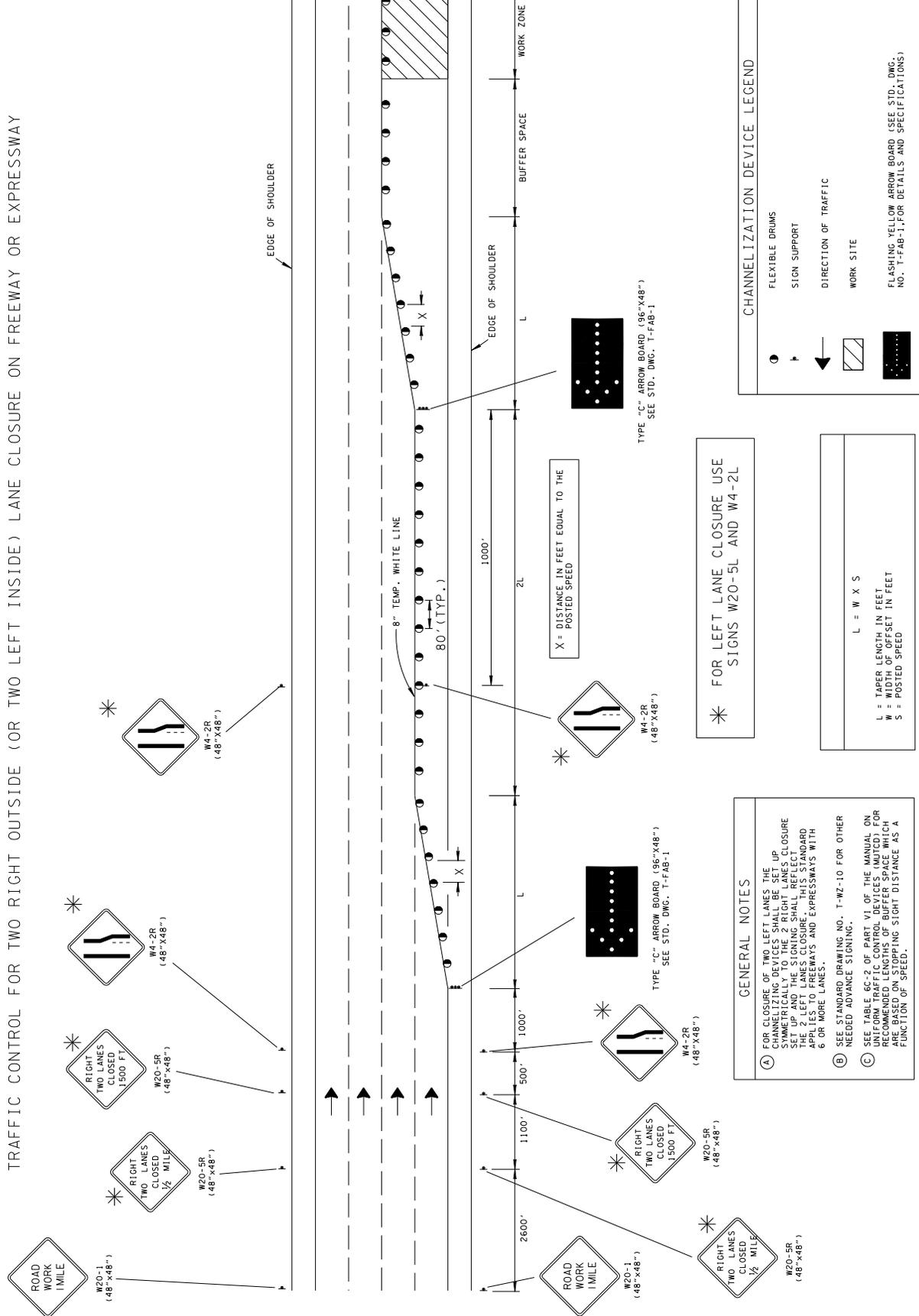
COMPUTATION FOR DISTANCE L

$L = W \times S$

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED

TRAFFIC CONTROL FOR TWO RIGHT OUTSIDE (OR TWO LEFT INSIDE) LANE CLOSURE ON FREEWAY OR EXPRESSWAY

- REV. 12-18-99: MODIFIED HEADING AND ADDED BLOCKED IN NOTE FOR TWO LEFT INSIDE LANE CLOSURE.
- REV. 4-15-04: CHANGED W4-2 SIGN WITH 2003 MUTCD. NOTE TO COMPLY WITH 2003 MUTCD.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 03-13-09: MODIFIED FLEXIBLE DRUM SPACING.



CHANNELIZATION DEVICE LEGEND

- FLEXIBLE DRUMS
- SIGN SUPPORT
- DIRECTION OF TRAFFIC
- WORK SITE

FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-FAB-1, FOR DETAILS AND SPECIFICATIONS)

* FOR LEFT LANE CLOSURE USE SIGNS W20-5L AND W4-2L

L = W X S
 L = TAPER LENGTH IN FEET
 W = WIDTH OF OFFSET IN FEET
 S = POSTED SPEED

GENERAL NOTES

- A FOR CLOSURE OF TWO LEFT LANES THE CHANNELIZING DEVICES SHALL BE SET UP SYMMETRICALLY TO THE 2 RIGHT LANES CLOSURE SET UP AND THE SIGNING SHALL REFLECT APPLICABLE TO FREEWAYS AND EXPRESSWAYS WITH 6 OR MORE LANES.
- B SEE STANDARD DRAWING NO. T-WZ-10 FOR OTHER REEDED ADVANCE SIGNING.
- C SEE TABLE 6C-2 OF PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES MUTCD FOR DIMENSIONS AND SPACING. DIMENSIONS AND SPACING ARE BASED ON STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED.

TRAFFIC CONTROL FOR TWO RIGHT OUTSIDE (OR TWO LEFT INSIDE) LANE CLOSURE ON INTERSTATES OR EXPRESSWAYS (WITH INTERCONNECTED PORTABLE BARRIER RAIL)

- REV. 12-18-99: ADDED BLOCKED IN NOTE FOR BARRIER RAIL DELINEATOR.
- REV. 7-29-03: CHANGED GENERAL NOTE TO GENERAL NOTE.
- REV. 4-15-04: CHANGED W4-2 SIGN, 2003 NOTED. GENERAL NOTE TO COMPLY WITH 2003 NOTED.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES TO.

- REV. 10-05-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR.
- REV. 02-13-09: CHANGED GENERAL NOTE TO GENERAL NOTE.
- REV. 03-13-09: CHANGED GENERAL NOTE AND ATTENUATOR LEGEND DESCRIPTION.

- REV. 12-18-99: ADDED BLOCKED IN NOTE FOR BARRIER RAIL DELINEATOR.
- REV. 7-29-03: CHANGED GENERAL NOTE TO GENERAL NOTE.
- REV. 4-15-04: CHANGED W4-2 SIGN, 2003 NOTED. GENERAL NOTE TO COMPLY WITH 2003 NOTED.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES TO.

- REV. 10-05-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR.
- REV. 02-13-09: CHANGED GENERAL NOTE TO GENERAL NOTE.
- REV. 03-13-09: CHANGED GENERAL NOTE AND ATTENUATOR LEGEND DESCRIPTION.

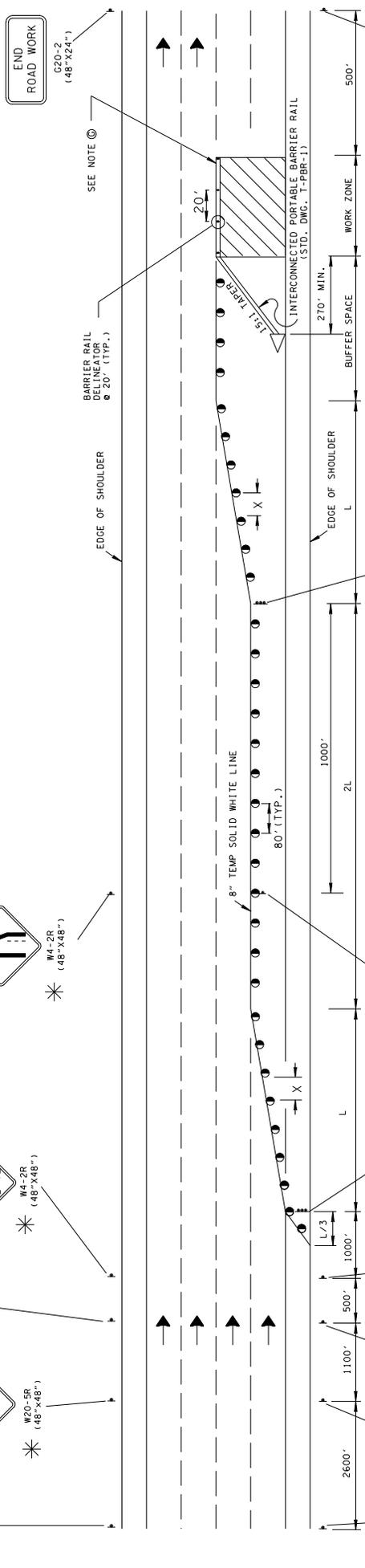
- REV. 12-18-99: ADDED BLOCKED IN NOTE FOR BARRIER RAIL DELINEATOR.
- REV. 7-29-03: CHANGED GENERAL NOTE TO GENERAL NOTE.
- REV. 4-15-04: CHANGED W4-2 SIGN, 2003 NOTED. GENERAL NOTE TO COMPLY WITH 2003 NOTED.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES TO.

- REV. 10-05-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR.
- REV. 02-13-09: CHANGED GENERAL NOTE TO GENERAL NOTE.
- REV. 03-13-09: CHANGED GENERAL NOTE AND ATTENUATOR LEGEND DESCRIPTION.

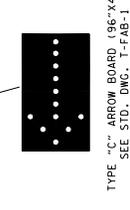
- REV. 12-18-99: ADDED BLOCKED IN NOTE FOR BARRIER RAIL DELINEATOR.
- REV. 7-29-03: CHANGED GENERAL NOTE TO GENERAL NOTE.
- REV. 4-15-04: CHANGED W4-2 SIGN, 2003 NOTED. GENERAL NOTE TO COMPLY WITH 2003 NOTED.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES TO.

- REV. 10-05-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR.
- REV. 02-13-09: CHANGED GENERAL NOTE TO GENERAL NOTE.
- REV. 03-13-09: CHANGED GENERAL NOTE AND ATTENUATOR LEGEND DESCRIPTION.

- REV. 12-18-99: ADDED BLOCKED IN NOTE FOR BARRIER RAIL DELINEATOR.
- REV. 7-29-03: CHANGED GENERAL NOTE TO GENERAL NOTE.
- REV. 4-15-04: CHANGED W4-2 SIGN, 2003 NOTED. GENERAL NOTE TO COMPLY WITH 2003 NOTED.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES TO.



- ### GENERAL NOTES
- A FOR CLOSURE OF TWO LEFT LANES THE SET UP AND THE SIGNING SHALL REFLECT THE 2 LEFT LANES CLOSURE. THIS STANDARD IS APPLICABLE TO INTERSTATES AND EXPRESSWAYS WITH 6 OR MORE LANES.
 - B PORTABLE BARRIER RAIL WILL BE REQUIRED WHERE DROP OFFS EXCEED 18 INCHES. PORTABLE BARRIER RAIL MAY BE USED WHERE DROP OFFS EXCEED 6 INCHES. FOR MORE SPECIFIC INFORMATION SEE DOT DROP-OFF POLICY.
 - C TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL OR BE SHIELDED WITH AN ATTENUATOR WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING R001-S-12 FOR CLEAR ZONE DIMENSIONS.
 - D SEE STANDARD DRAWING NO. T-WZ-10 FOR OTHER NEEDED ADVANCE SIGNING.
 - E SEE TABLE 6C-2 OF PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR ADVANCE STOPPING DISTANCE WHICH IS BASED ON STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED.
 - F BARRIER RAIL DELINEATORS (ITEM NO. 712-04-50) SHALL BE USED ON PORTABLE BARRIER RAIL. REFER TO THE QUALIFIED PRODUCT LIST FOR APPROVED BARRIER RAIL DELINEATORS. DELINEATORS OF BARRIER RAIL DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE.
 - G MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE CONCRETE BARRIER IS REQUIRED. THE MAXIMUM POSSIBLE OFFSET BETWEEN TRAVEL LANE AND PORTABLE CONCRETE BARRIER IS TWO FEET (2'). OFFSET MAY BE ESTIMATED WHERE PHYSICAL CONDITIONS DO NOT ALLOW.
 - H RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.



X = DISTANCE IN FEET EQUAL TO THE POSTED SPEED

* FOR LEFT LANE CLOSURE USE SIGNS W20-5L AND W4-2L

CHANNELIZATION DEVICE LEGEND

	FLEXIBLE DRUMS
	SIGN SUPPORT
	DIRECTION OF TRAFFIC
	WORK SITE
	BARRIER RAIL DELINEATOR (ITEM NO. 712-04-50, PER EACH)
	FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-FAB-1, FOR DETAILS AND SPECIFICATIONS)
	ATTENUATOR (SEE STANDARD DRAWINGS)

COMPUTATION FOR DISTANCE L

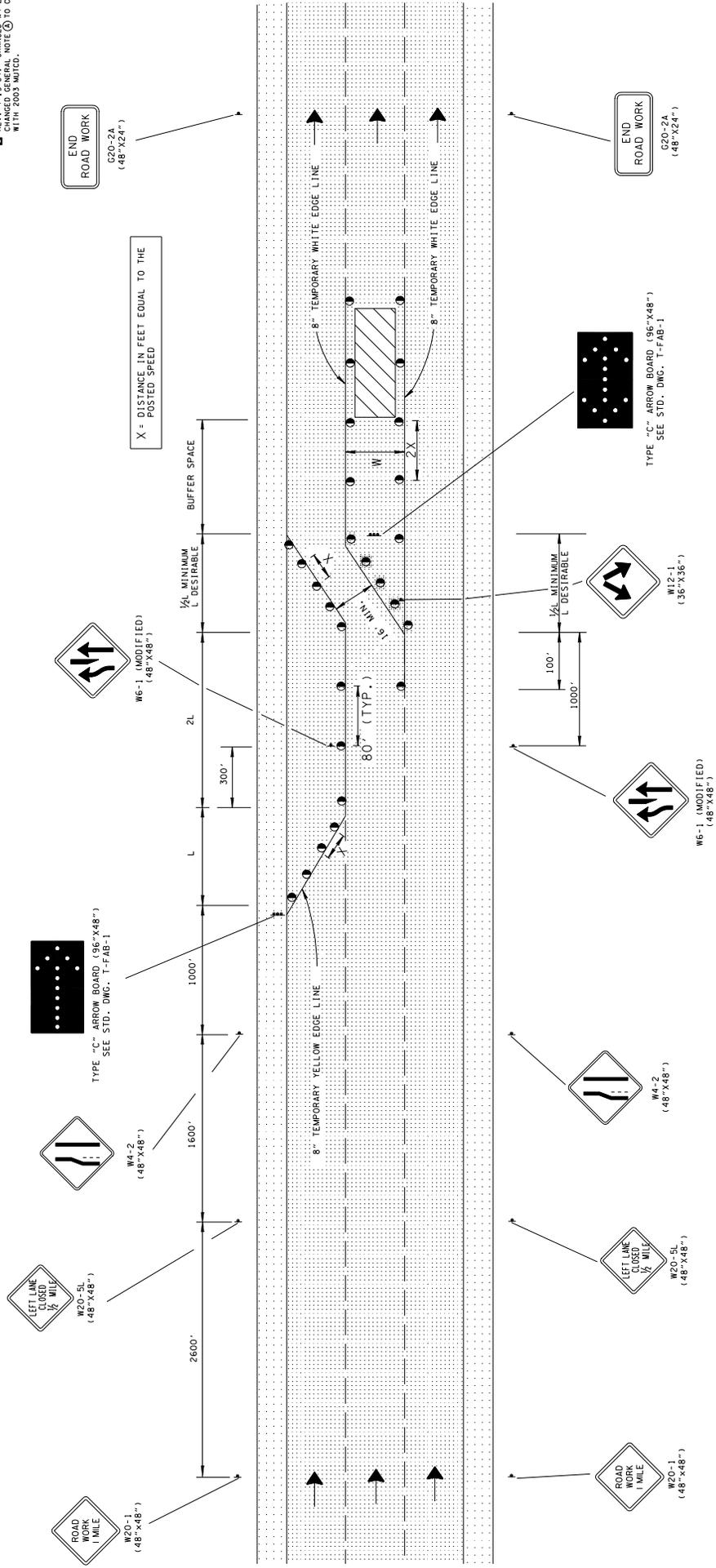
L = W X S

L = TAPER LENGTH IN FEET
W = TAPER OFFSET IN FEET
S = POSTED SPEED

- REV. 2-28-98; ADDED CHANNELIZATION DEVICE LEGEND.
- REV. 5-27-98; CHANGED DRAWING NO. T-WZ-10 TO T-WZ-15. ADDED GENERAL NOTES.
- REV. 12-18-94; CHANGED SIGN, CHANGED SYMBOL, AND CHANGED GENERAL NOTE TO COMPLY WITH 2003 MUTCD.

- REV. 9-1-05; REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS. MODIFIED HEADING AND SHEET NAME.
- REV. 5-27-98; CHANGED DRAWING NO. T-WZ-10 TO T-WZ-15. ADDED GENERAL NOTES.
- REV. 12-18-94; CHANGED SIGN, CHANGED SYMBOL, AND CHANGED GENERAL NOTE TO COMPLY WITH 2003 MUTCD.

TRAFFIC CONTROL FOR INTERIOR LANE CLOSURE ON FREEWAYS OR EXPRESSWAYS



CHANNELIZATION DEVICE LEGEND

- FLEXIBLE DRUMS
- SIGN SUPPORT
- DIRECTION OF TRAFFIC
- WORK SITE
- FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-FAB-1 FOR DETAILS AND SPECIFICATIONS.)

GENERAL NOTES

(A) SEE TABLE 6C-2 OF PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR RECOMMENDED LEVELS OF BUFFER SPACE WHICH FUNCTION AS A FUNCTION OF SPEED.

(B) SEE STANDARD DRAWING NO. T-WZ-10 FOR OTHER NEEDED ADVANCE SIGNING.

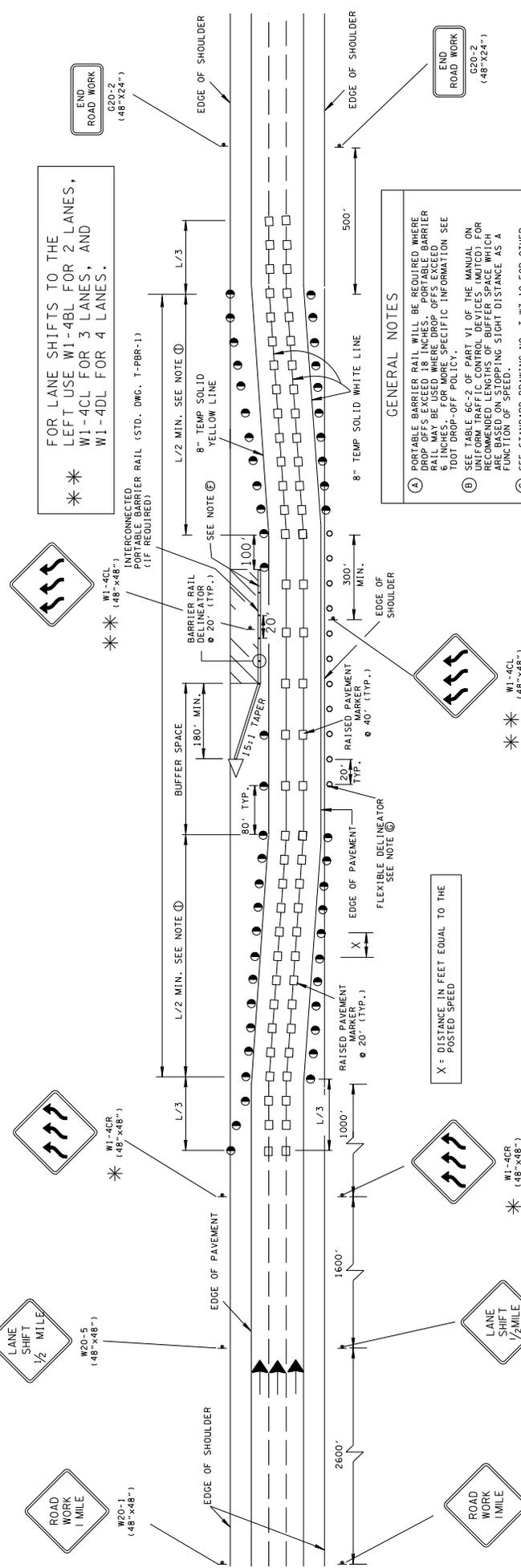
COMPUTATION FOR DISTANCE L

$L = W \times S$

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET.
S = POSTED SPEED

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

- REV. 10-06-06: REPLACED VERTICAL PANELS WITH GROUND MOUNTED FLEXIBLE DELINEATORS. ADDED GENERAL NOTE (C) AND (D).
- REV. 12-18-99: CHANGED OUT FLEXIBLE DRUMS FOR VERTICAL PANELS ALONG OUTSIDE EDGE OF BUFFER SPACE. ADDED GENERAL NOTE (E).
- REV. 1-29-03: CHANGED GENERAL NOTE (C) TO COMPLY WITH 2003 MUTCD. WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 4-15-99: MODIFIED CHANNELIZATION DEVICE LEGEND.
- REV. 4-15-04: CHANGED GENERAL NOTE (C) TO COMPLY WITH 2003 MUTCD.
- REV. 5-12-06: REPLACED VERTICAL PANELS WITH PORTABLE BARRIER RAIL DELINEATORS. ADDED GENERAL NOTE (F).



**
FOR LANE SHIFTS TO THE LEFT USE W1-4BL FOR 2 LANES, W1-4CL FOR 3 LANES, AND W1-4DL FOR 4 LANES.

- ### GENERAL NOTES
- (A) PORTABLE BARRIER RAIL WILL BE REQUIRED WHERE DROP OFFS EXCEED 18 INCHES. PORTABLE BARRIER RAIL MAY BE USED WHERE DROP OFFS EXCEED 6 INCHES. FOR MORE SPECIFIC INFORMATION SEE FOOT DROP-OFF POLICY.
 - (B) SEE STANDARD DRAWING NO. T-WZ-10 FOR OTHER RECOMMENDED LENGTHS OF BUFFER SPACE WHICH ARE BASED ON STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED.
 - (C) SEE STANDARD DRAWING NO. T-WZ-10 FOR OTHER NEEDED ADVANCE SIGNING.
 - (D) TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE USED WITH AN ATTENUATOR WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING T-PBR-2 FOR CLEAR ZONE DISTANCE.
 - (E) BARRIER RAIL DELINEATORS (ITEM NO. 712-04.50) SHALL BE USED ON PORTABLE BARRIER RAIL. REFER TO STANDARD DRAWING T-PBR-2 FOR DIFFERENT TYPES OF BARRIER RAIL DELINEATORS. DIFFERENT TYPES OF BARRIER RAIL DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE.
 - (F) MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE CONCRETE BARRIER IS REQUIRED. PORTABLE BARRIER MUST BE OBTAINED WITH TWO FEET (2') OFFSET MAY BE ELIMINATED WHERE PHYSICAL CONDITIONS DO NOT ALLOW.
 - (G) SEE STANDARD DRAWING T-PBR-2 FOR GROUND MOUNTED FLEXIBLE DELINEATORS (ITEM NO. 713-02.14). REFER TO THE OPL FOR APPROVED FLEXIBLE DELINEATORS.
 - (H) RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.
 - (I) L/2 IS A MINIMUM TAPER LENGTH. IF CONDITION ALLOW, IT MAY BE INCREASED TO L.

CHANNELIZATION DEVICE LEGEND

	FLEXIBLE DRUMS
	GROUND OR SURFACE MOUNTED FLEXIBLE DELINEATOR (ITEM NO. 713-02.14 PER EACH)
	SIGN SUPPORT
	DIRECTION OF TRAFFIC
	WORK SITE
	BARRIER RAIL DELINEATOR (ITEM NO. 712-04.50, PER EACH)
	ATTENUATOR (SEE STANDARD DRAWINGS)
	RAISED PAVEMENT MARKER (SEE APPROVED QUALIFIED PRODUCT LIST)

*
FOR LANE SHIFTS TO THE RIGHT USE W1-4BR FOR 2 LANES, W1-4CR FOR 3 LANES, AND W1-4DR FOR 4 LANES.

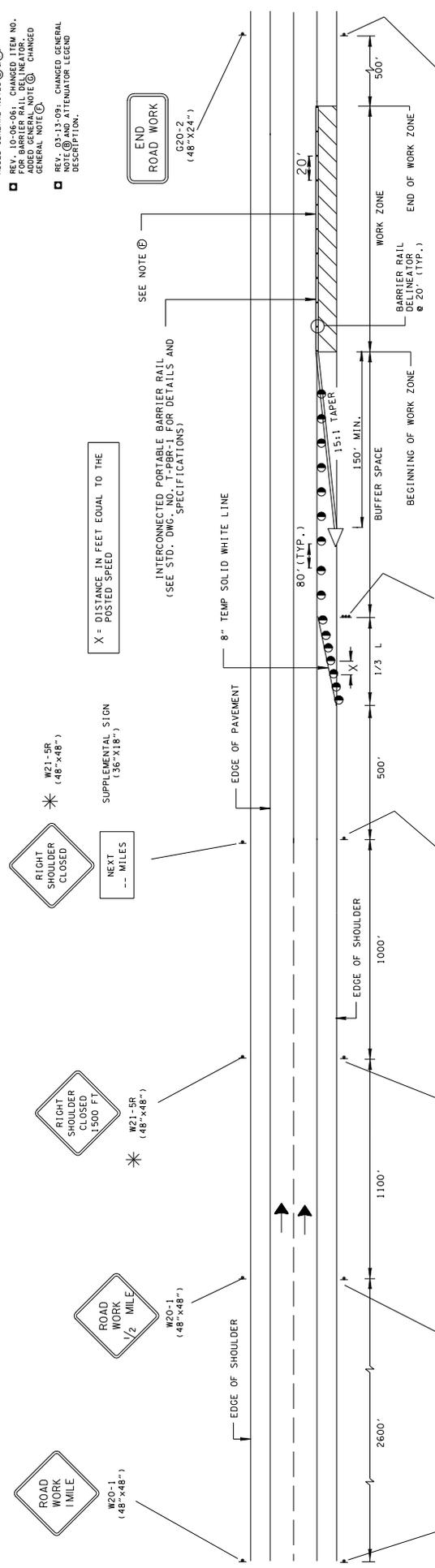
COMPUTATION FOR DISTANCE L

L = W X S

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED

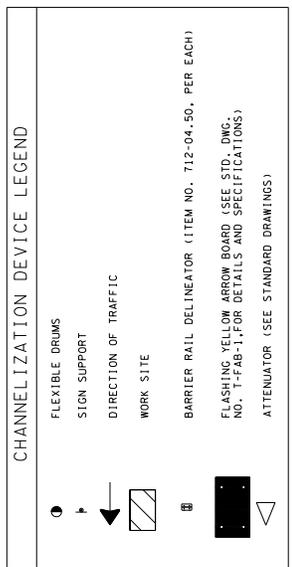
- REV. 4-15-99: MODIFIED CHANNELIZATION DEVICE LEGEND.
- REV. 12-18-99: MODIFIED GENERAL NOTE (A).
- REV. 7-29-03: CHANGED GENERAL NOTE (A) TO COMPLY WITH 2003 MTCO.
- REV. 4-15-04: CHANGED GENERAL NOTE (A) TO COMPLY WITH 2003 MTCO.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES (A) & (C).
- REV. 10-06-06: CHANGED ITEM NO. FROM 10-06-06 TO 10-06-06. ADDED GENERAL NOTE (C). CHANGED GENERAL NOTE (A).
- REV. 03-13-09: CHANGED GENERAL NOTE (A) AND ATTENUATOR LEGEND DESCRIPTION.

TRAFFIC CONTROL FOR SHOULDER CLOSURE FOR FREEWAYS AND DIVIDED HIGHWAYS



END ROAD WORK
G20-2
(48"x24")

- GENERAL NOTES**
- (A) PORTABLE BARRIER RAIL WILL BE REQUIRED WHERE DROP OFFS EXCEED 18 INCHES. PORTABLE BARRIER RAIL MAY BE USED WHERE DROP OFFS EXCEED 6 INCHES. FOR MORE SPECIFIC INFORMATION SEE DOT DROP-OFF POLICY.
 - (B) TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS 150' MIN. THE TAPER LENGTH SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED WITH AN ATTENUATOR WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING RD01-5-12 FOR CLEAR ZONE DISTANCE.
 - (C) SEE STANDARD DRAWING NO. T-WZ-10 FOR OTHER NEEDED ADVANCE SIGNING.
 - (D) SEE TABLE 6C-2 OF PART VI OF THE MANUAL ON UNIFORM CONTROLLED ACCESS HIGHWAYS FOR RECOMMENDED LENGTHS OF BUFFER SPACE WHICH ARE BASED ON STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED.
 - (E) BARRIER RAIL DELINEATORS (ITEM NO. 712-04-50) SHALL BE USED ON PORTABLE BARRIER RAIL. REFER TO THE QUALIFIED PRODUCT LIST FOR APPROVED BARRIER RAIL DELINEATORS. BARRIER RAIL DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE.
 - (F) MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE CONCRETE BARRIER IS REQUIRED. THE MAXIMUM POSSIBLE OFFSET BETWEEN TRAVEL LANE AND PORTABLE CONCRETE BARRIER IS 18 INCHES. NO FEET (2') OFFSET MAY BE MAINTAINED WHERE PHYSICAL CONDITIONS DO NOT ALLOW.
 - (G) RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.



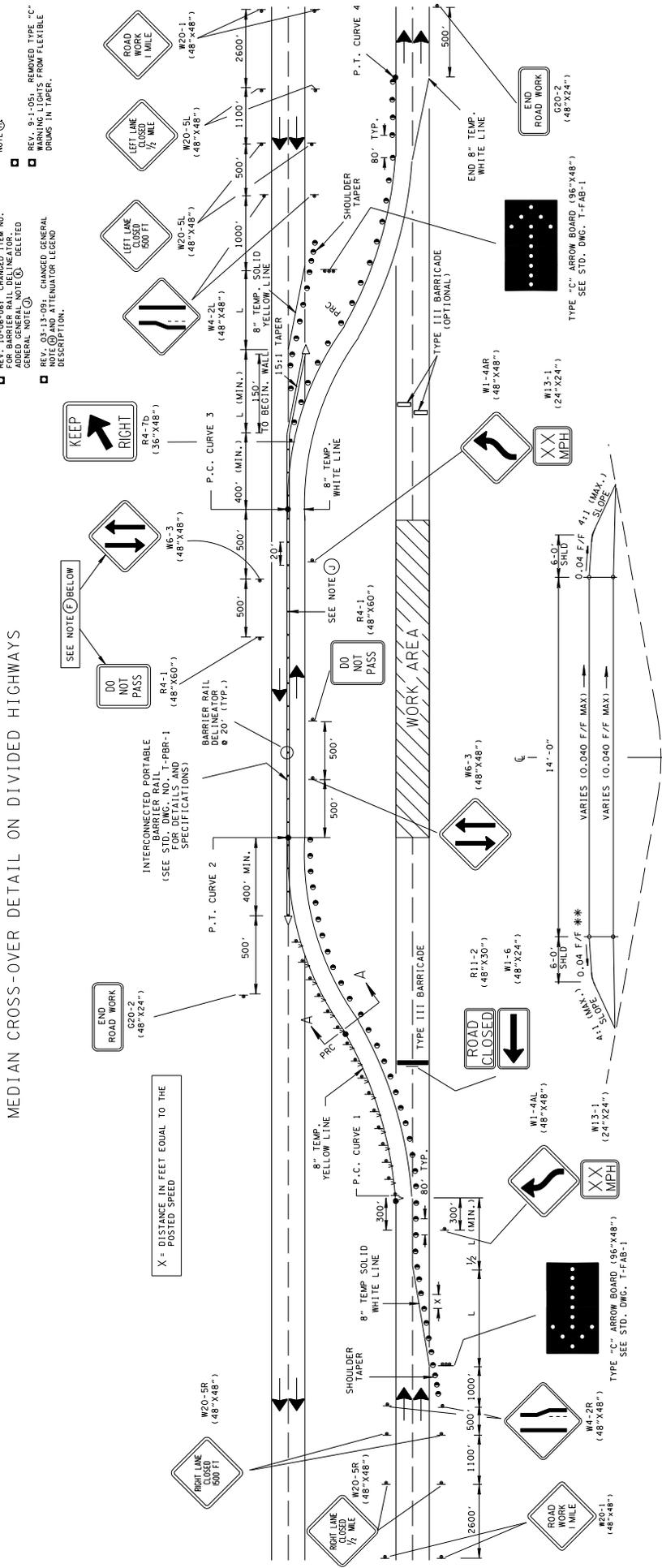
* FOR LEFT SHOULDER CLOSURES USE SIGNS W21-5L (LEFT SHOULDER CLOSED 1500 FT AND LEFT SHOULDER CLOSED)

COMPUTATION FOR DISTANCE L

$L = W \times S$

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED

SECTION A-A
TYPICAL SECTION OF TEMPORARY
MEDIAN CROSS-OVER



GENERAL NOTES

A CROSS-OVER SHALL BE DESIGNED FOR SPEEDS NOT LESS THAN 10 MILES PER HOUR BELOW THE POSTED SPEED. THE GEOMETRY DETAIL FOR CROSS-OVER SHOWN ON STANDARD DRAWING T-WZ-20 IS FOR A TANGENT DIVIDED HIGHWAY SECTION ONLY. THE DESIGNER SHALL PROVIDE GEOMETRIC DETAILS OF CROSS-OVER(S) ON CURVED DIVIDED HIGHWAY SECTIONS.

B ADVISORY SPEED PLATES ON REVERSE CURVE SIGNS (W1-4) SHALL BE 10 MILES PER HOUR LESS THAN THE DESIGN SPEED OF THE CROSS-OVER.

C TEMPORARY CROSSDRAINS SHALL BE PROVIDED WHERE CROSS-OVER CROSSES THE LOW POINT OF THE DEPRESSED MEDIAN. THE DESIGNER WILL PROVIDE THE LENGTH AND SIZE OF THESE CROSSDRAINS ON THE PLANS. THESE CROSSDRAINS SHALL BE PAID FOR UNDER ITEM NOS. 621-03.02 THROUGH 621-03.10.

D PAVEMENT SECTION OF TEMPORARY MEDIAN CROSS-OVER IS SHOWN ON TYPICAL SECTION SHEETS OF PLANS.

E SEE STANDARD DRAWING T-WZ-10 FOR OTHER NEEDED ADVANCE SIGNING.

F TWO-WAY TRAFFIC SYMBOL SIGN (W6-3) AND DO NOT PASS SIGN (R4-1) TO BE PLACED AT 1/2 MILE INTERVALS ON TWO-WAY TEMPORARY TRAFFIC SECTION.

G A SECOND ARROW BOARD MAY BE USED WHEN GEOMETRIC CONDITIONS LIMITS THE VISIBILITY OF A LANE CLOSURE.

H TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED WITH AN ATTENUATOR WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING R001-S-12 FOR CLEAR ZONE DISTANCE.

I BARRIER RAIL DELINEATORS (ITEM NOS. 046-30R) SHOULD BE USED ON PORTABLE BARRIER RAIL. REFER TO RAIL DELINEATORS (ITEM NOS. 046-30R) FOR DETAILS AND SPECIFICATIONS. DIFFERENT TYPES OF BARRIER RAIL DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE.

J RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.

- REVISIONS:**
- REV. 5-12-06: REPLACED VERTICAL ALIGNMENT DELINEATORS. ADDED GENERAL NOTES (1) & (2).
 - REV. 02-29-03: CHANGED GENERAL NOTE (3).
 - REV. 10-06-01: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR. ADDED GENERAL NOTE (4). DELETED GENERAL NOTE (5).
 - REV. 9-1-01: REMOVED TYPE "C" DELINEATORS FROM FLEXIBLE DRUMS IN TABLE.
 - REV. 03-13-09: CHANGED GENERAL NOTE (1) ATTENUATOR LEGEND DESCRIPTION.

CHANNELIZATION DEVICE LEGEND

	FLEXIBLE DRUMS
	VERTICAL PANELS
	SIGN SUPPORT
	DIRECTION OF TRAFFIC
	WORK SITE
	BARRIER RAIL DELINEATOR (ITEM NO. 712-04.50, PER EACH)
	FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-FAB-1, FOR DETAILS AND SPECIFICATIONS)
	ATTENUATOR (SEE STANDARD DRAWINGS)

COMPUTATION FOR DISTANCE L

$L = W \times S$

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED

GENERAL NOTES

* THE SLOPES OF THE SHOULDER AND THE ROADWAY PAVEMENT SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 0.07 FOOT PER FOOT.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

MEDIAN CROSS-OVER
DETAIL ON DIVIDED HIGHWAYS

10-26-98 T-WZ-19



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 09-06

Regarding Minimum Traffic Control Requirements for Roadway Plans

For compliance with Title 23 Code of Federal Regulations, Part 630, Subpart J – Work Zone Safety and Mobility, all federally funded projects must have a Traffic Management Plan, which, at the minimum must include a temporary traffic control plan. Further, the temporary traffic control plan shall either be a project specific temporary traffic control plan, approved TDOT standard drawings or a reference to specific temporary traffic control elements in the MUTCD.

Effective immediately, construction plans for any federally funded project developed without a project specific temporary traffic control plan (such as a resurfacing project), shall include the following special note to ensure compliance with the 23 CFR 630 Subpart J requirements.

"The Contractor shall comply with Section 712 of the Standard Specifications for Road and Bridge Construction regarding Temporary Traffic Control and the current Edition of the Manual on Uniform Traffic Control Devices."

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

July 17, 2009
JCJ:MA:ma



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348

INSTRUCTIONAL BULLETIN NO. 09-07

Regarding Total Lane Mile Information for Resurfacing Projects

Effective for the October 30, 2009 letting, add section 4-400.01, Total Lane Mile pavement quantity to the Roadway Design Guidelines.

4-400.01 Total Lane Miles Paved for Resurfacing Projects

The title sheet of **all resurfacing projects** shall include the length of the proposed lane miles to be paved. The length will be located under Project Length information as "**Total Lane Miles Resurfaced**" and be shown to the nearest tenth of a mile.

The total lane mile length should include all traffic lanes and continuous turning lanes paved. Side roads, paved shoulders, private drives, field entrances, and business entrances, ramps, and turn lanes located at intersections less than 1000 ft. in length do not need to be included in the length.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

July 17, 2009
JCJ:MA:ma



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 09-08

Stamps Required on Roadway Plans and Electronic Files

Effective immediately, all roadway plans sets and sheets plotted and .pdf files placed on File Net or supplied to others shall have a stamp identifying the appropriate deliverable or stage of development on each sheet.

The stamp should be located on the right side above the signature block on the title sheet and on the right side above the description block on all other sheets in the plans. If adequate space is not available above the description block, the stamp may be placed where space is available. No stamp is required on the final construction plans or revisions to the construction plans.

Stamps shall match the name of the File Net deliverable as shown below.

- 1) HYDRAULIC GRADE APPROVAL
- 2) PRELIMINARY FIELD REVIEW
- 3) PRELIMINARY PLANS
- 4) ROW FIELD REVIEW
- 5) ROW PLANS
- 6) ROW PLANS – PERMIT APPLICATION PLAN SET
- 7) CONSTRUCTION FIELD REVIEW PLANS
- 8) CONSTRUCTION PLANS (STAMP IS NOT REQUIRED)

For ROW plans and ROW Field Review Plans where no right-of-way is to be acquired and plans are being submitted for “Utilities Only”, the designer should use the following stamp.

ROW FIELD REVIEW (UTILITIES ONLY)
ROW PLANS (UTILITIES ONLY)

Sheets sent outside the Department may also have the following stamp added when clarification that the plans are subject to change is needed.

CAUTION - PRELIMINARY PLANS – SUBJECT TO CHANGE

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

July 17, 2009
JCJ:MA:ma



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 09-09

Regarding Turn-In Dates and Letting Schedules for 2010

Attached to this bulletin is the 2010 letting schedule with a chart showing dates to be met for various activities.

Plans and estimates for projects assigned to a letting should be turned into the Estimates and Bid Analysis Office no later than the turn-in date shown on the attached chart.

Instructional Bulletin 08-12 should be voided after the December 11, 2009 letting.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

July 27, 2009
JCJ:MA:ma
Attachment

2010 LETTING SCHEDULE

ACTIVITY	LETTING Feb 5	LETTING Mar 19	LETTING Apr 30	LETTING Jun 11	LETTING Aug 6	LETTING Sep 17	LETTING Oct 29	LETTING Dec 10	WEEKS BEFORE LETTING
TDOT Design Manager verifies all deliverables have been received to allow completion of plans in accordance with the roadway design checklist	Sep 2	Oct 14	Nov 25	Jan 6	Mar 3	Apr 14	May 26	Jul 7	22-1/2
TDOT Design Manager schedules and distributes prints for construction field review	Oct 2	Nov 13	Dec 22	Feb 5	Apr 2	May 14	Jun 25	Aug 6	18
Regional Construction Office furnishes information and logs to Design for development of resurfacing plans for State Routes	Oct 21	Dec 2	Jan 13	Feb 24	Apr 21	Jun 2	Jul 14	Aug 25	15-1/2
Consultant furnishes final roadway plans w/estimate to Design Division for review and checking	Oct 28	Dec 9	Jan 20	Mar 3	Apr 28	Jun 9	Jul 21	Sep 1	14 1/2
Regional ROW Office submits "removal of structures" letter to the Design Division or Regional Design Office	Nov 4	Dec 16	Jan 27	Mar 10	May 5	Jun 16	Jul 28	Sep 8	13 1/2
Consultant furnishes Structures Division final structure plans w/estimate for review and checking	Nov 11	Dec 21	Feb 3	Mar 17	May 12	Jun 23	Aug 4	Sep 15	12-1/2
Design Division or Reg. Design Office begins "in house" checking of final Roadway Plans prior to turn-in for letting	Nov 18	Dec 29	Feb 10	Mar 24	May 19	Jun 30	Aug 11	Sep 22	11-1/2
Regional Utility Engineer furnishes Estimating and Bid Analysis Office w/utility plans (mylar only)	Nov 18	Dec 29	Feb 10	Mar 24	May 19	Jun 30	Aug 11	Sep 22	11-1/2
Design Division or Reg. Design Office submits final roadway plans w/estimate to the Estimating and Bid Analysis Office	Dec 2	Jan 13	Feb 24	Apr 7	Jun 2	Jul 14	Aug 25	Oct 6	9-1/2
Structures Division submits final structure plans with estimate to the Estimating and Bid Analysis Office	Dec 2	Jan 13	Feb 24	Apr 7	Jun 2	Jul 14	Aug 25	Oct 6	9-1/2
Estimating and Bid Analysis Office submits final plans to the Construction Division, Contracts & Specifications Office	Dec 9	Jan 20	Mar 3	Apr 14	Jun 9	Jul 21	Sep 1	Oct 13	8-1/2



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 09-10

Regarding Handicap Ramps on Resurfacing Projects

The following section is added to Section 1, Chapter 2 of the Design Guidelines. This guidance applies to all resurfacing and maintenance projects.

1-200.12 HANDICAP RAMPS ON RESURFACING PROJECTS

In order to assist local governments with compliance with the Americans with Disabilities Act, it will now be the department's intent to repair or install handicap ramps which meet the Americans with Disabilities Act Accessibility Guidelines whenever possible when encountered on resurfacing projects.

Designers should refer to Section 3-310.05 and the RP-H-series standard drawings for additional guidance regarding design and placement of handicap ramps.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

September 24, 2009
JCJ:MJA:mja



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 09-11

Regarding Labeling Storm Water Outfalls on EPSC Plans

Effective for the December 3, 2009 turn-in date (February 5, 2010 letting), designers will be responsible for identifying and labeling storm water outfalls on all phases of the Erosion Prevention and Sediment Control (EPSC) Plan for projects which require a Storm Water Pollution Prevention Plan (SWPPP). Outfall labeling shall be included on right-of-way field review and all subsequent plans. The SWPPP Consultant shall be responsible for verifying the storm water outfalls during the right-of-way field review phase.

Outfalls are defined as storm water point sources discharges from construction sites which pollutants are or may be discharged into waters of the State of Tennessee (i.e. streams, wetlands). A point source is any discernible, confined, and discrete conveyance, including but not limited to, any pipe, culvert, ditch, or channel.

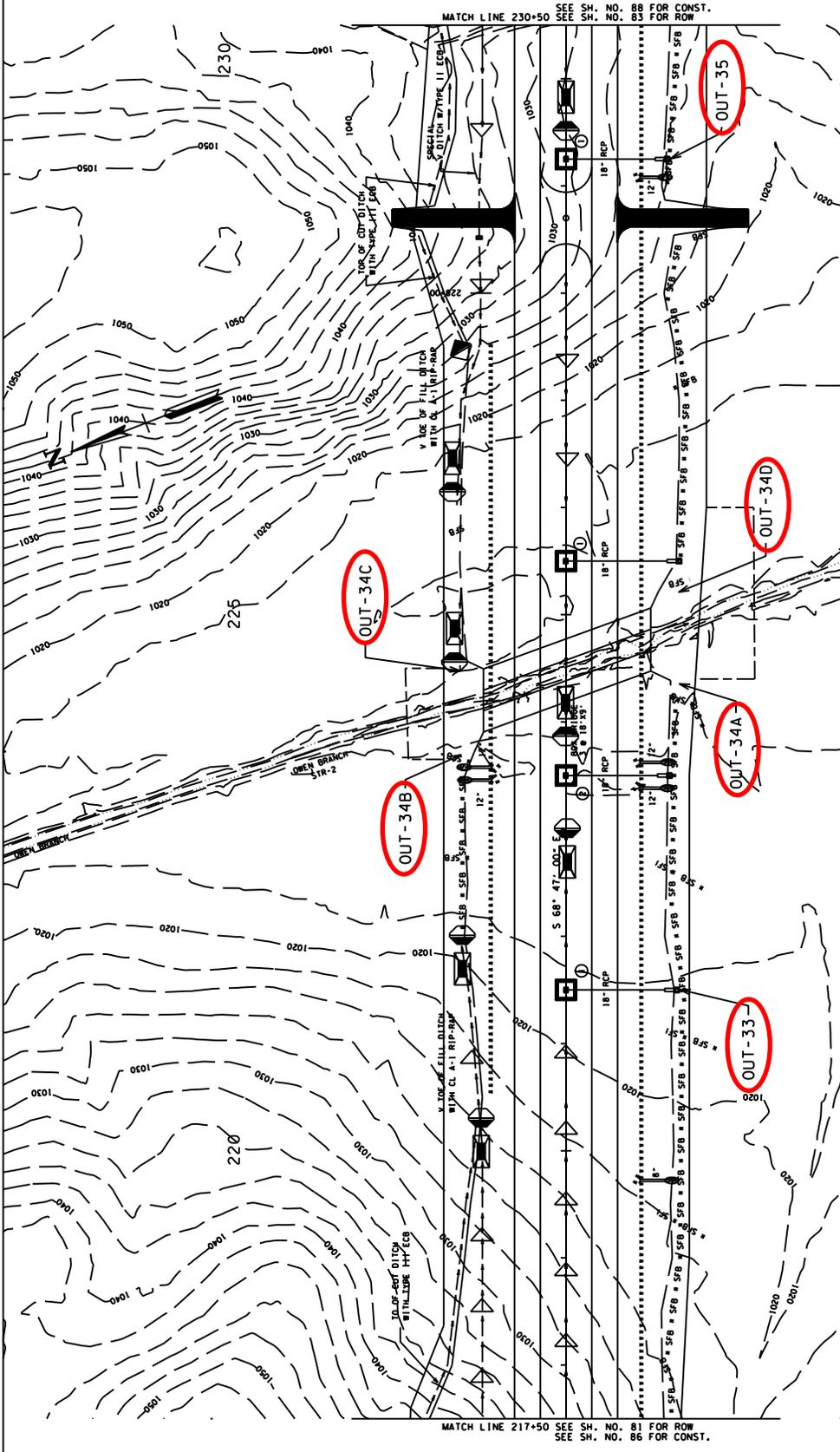
Outfalls may be subdivided so the drainage area to each suboutfall is below the sediment basin drainage area threshold and to allow drainage from undisturbed offsite areas to pass through a pipe, culvert, ditch, or channel without having to be treated.

See attachments for examples of outfall labeling.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

September 24, 2009
JCJ:MJA:jbs
Attachments

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2009	STP-NHE-11(112)	82
		HPP/STP-NHE-11(226)	87



OUT-33 & 35 - STORM WATER FROM THESE OUTFALLS DISCHARGE FROM THE CONSTRUCTION SITE BY MEANS OF A PIPE INTO A NATURAL DRAINAGE PATH.

OUT-34 - OUTFALL 34 IS LOCATED WHERE THE STREAM LEAVES THE CONSTRUCTION SITE. HOWEVER, OUTFALL 34 IS SUBDIVIDED INTO OUTFALLS 34A, 34B, 34C, & 34D AT THE LOCATIONS STORM WATER FROM THE DISTURBED AREA ON THE CONSTRUCTION SITE ENTERS THE STREAM. BY SUBDIVIDING OUTFALL 34 EACH OF THE DRAINAGE AREAS OF THE SUBOUTFALLS IS BELOW THE SEDIMENT BASIN THRESHOLD AND ALLOWS FOR DRAINAGE FROM UNDISTURBED OFFSITE AREAS TO PASS THROUGH THE CULVERT WITHOUT THE NEED FOR TREATMENT.

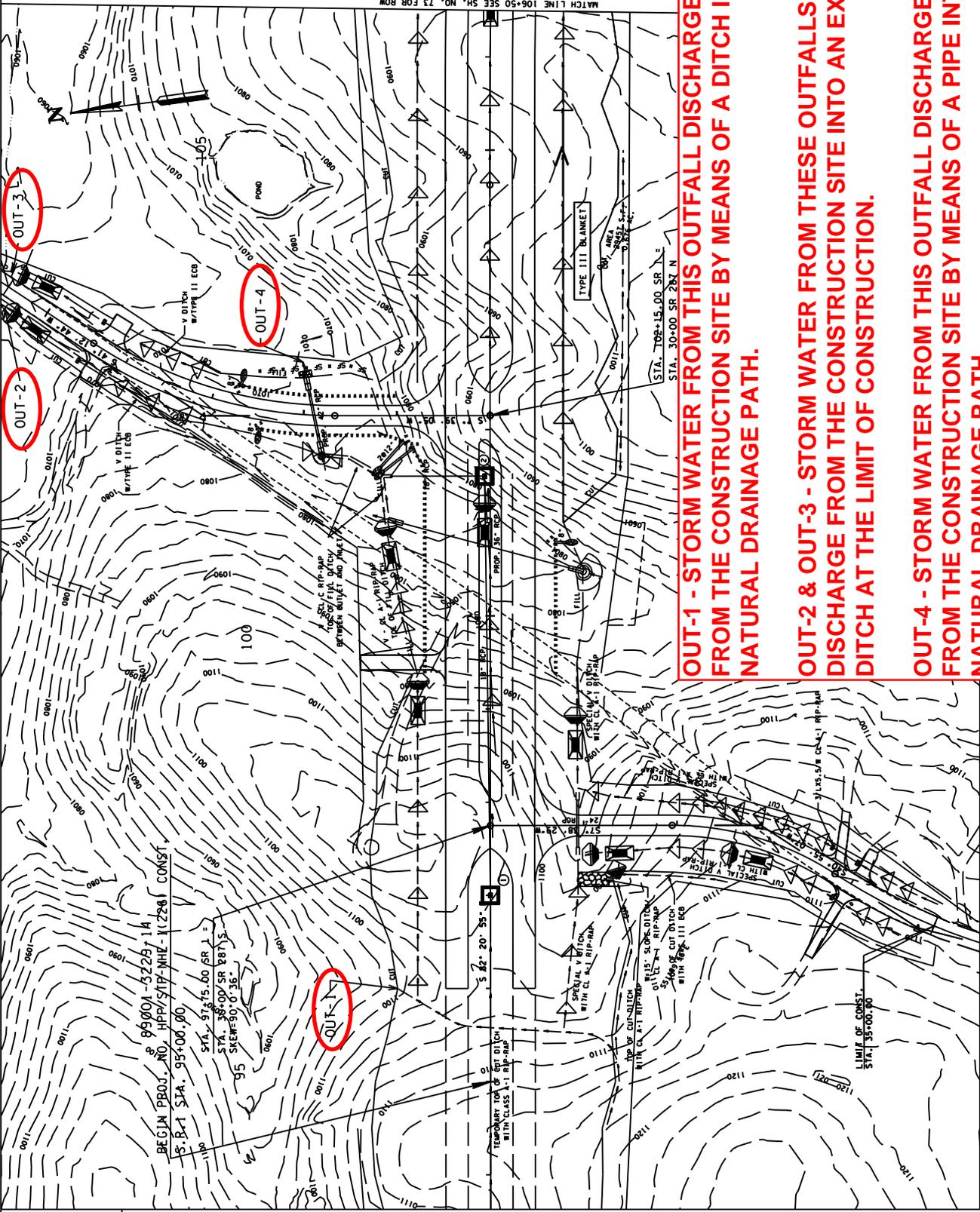
FILE NO.
DESIGN DIVISION
TENNESSEE D.O.T.

C:\Documents and Settings\j04187\over\res\Drawings\09-10\1817.dgn 9/6/2009 10:46 AM

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION
EPSC PLAN
STA. 217+50 TO STA. 230+50 SCALE: 1" = 50'

IB 09-11 FIGURE 1

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W. CONST.	2003	STP-NHE-11112	72A
		2009/HP/STP-NHE-11226	77



OUT-1 - STORM WATER FROM THIS OUTFALL DISCHARGES FROM THE CONSTRUCTION SITE BY MEANS OF A DITCH INTO A NATURAL DRAINAGE PATH.

OUT-2 & OUT-3 - STORM WATER FROM THESE OUTFALLS DISCHARGE FROM THE CONSTRUCTION SITE INTO AN EXISTING DITCH AT THE LIMIT OF CONSTRUCTION.

OUT-4 - STORM WATER FROM THIS OUTFALL DISCHARGES FROM THE CONSTRUCTION SITE BY MEANS OF A PIPE INTO A NATURAL DRAINAGE PATH.

9/6/2009 9:08 AM
 C:\Documents and Settings\jgortner\work\res\deskt\ib 09-11\w117.dgn
 FILE NO.
 DESIGN DIVISION
 TENNESSEE D.O.T.

IB 09-11 FIGURE 2

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION
EPSC PLAN
STA. 94+50 TO STA. 106+50 SCALE: 1" = 50'



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 09-12

Regarding Additional Information for Grade Separated Railroad Crossings

Effective Immediately, due to additional information needed by railroads to review impacts of roadway projects on rail lines at grade separated crossings, the following additional cross-sections and information shall be added to plans that include grade separated railroad crossings.

1. A minimum of five railroad cross-sections (perpendicular to the railroad alignment) shall be provided at the following locations. .
 - The roadway grade at the proposed bridge
 - Both faces of the proposed bridge
 - ROW limits (minimum 100 ft.) from face of the proposed bridge

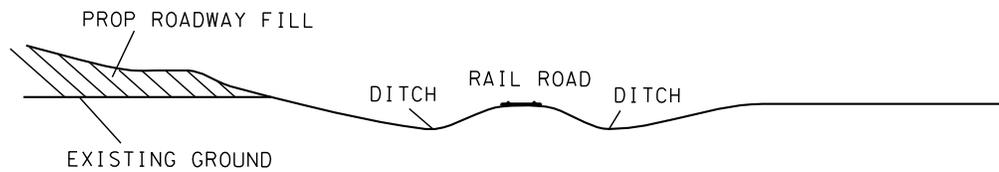
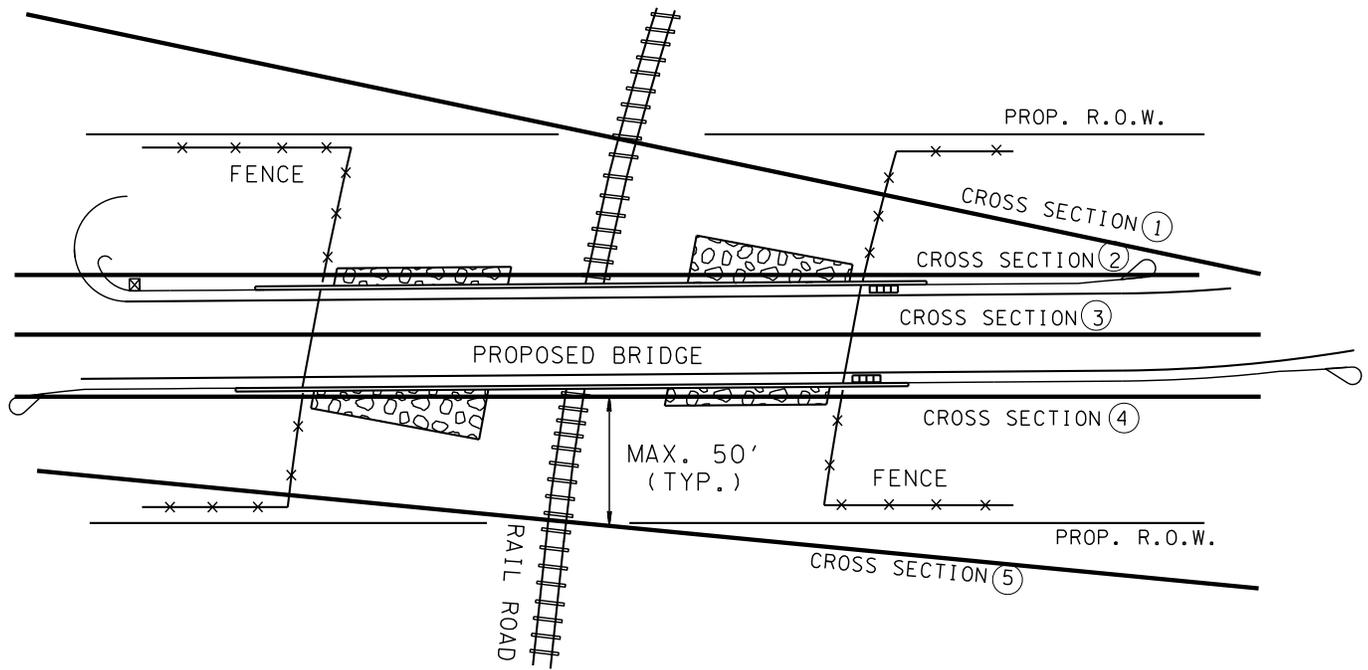
If the distance between the subject cross sections exceeds 50 feet an additional cross sections are required to adequately depict conditions along the tracks. See attachment.

2. The proposed bridge toe of abutment fill slopes, existing railroad drainage structures and ditches, and roadside ditches should be shown on applicable all cross-sections.
3. For any proposed structure (example: retaining wall, end wall); a cross section view showing the location of such structures in relation to the location of a railroad track shall be shown.
4. Cross sections need to show any changes proposed during grading operations to the railroad embankment, drainage ditches, or sub-track structures.

Information specified in Section 1-210.00 of the Roadway Design Guidelines shall continue to be included on the plans.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

September 24, 2009
JCJ:MJA:arh
Attachment



EXAMPLE CROSS SECTION

- | | |
|-----|--------------------------|
| ① ⑤ | ROW limits |
| ③ | Grade at proposed bridge |
| ② ④ | Face of proposed bridge |

IB 09-11

FIGURE-1



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 09-13

Regarding Notifying the Railroad Coordinator of Plans Availability on Filenet

Effective immediately, the Design Manager or Supervisor shall notify the Railroad Coordinator in the Headquarters Utilities Office, Right-of-Way Division, by e-mail for all field reviews and upon completion of preliminary, right-of-way, and construction plans for all projects which have railroad involvement. The notification will include information regarding project description, project PIN, the stage of plans development, and confirmation of plans availability on Filenet. The Utility Coordinator will be responsible for downloading plans from Filenet for distribution to the appropriate railroad officials.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

September 24, 2009
JCJ:MJA:mja



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 09-15

Regarding Road Safety Audit Review Projects (RSAR)

The primary purpose of Road Safety Audit Review program is to reduce the number of injuries and fatalities on public roads. A RSAR report is written for each RSAR project and should be used as guidance for the development of RSAR plans. Projects currently selected for the program are spot or section locations on interstates, state routes, and functionally classified local roads for the Highway Safety improvement Program list. Projects may also be selected if qualified for the High Risk Rural Roads funds. Currently project funding comes from either Highway Safety Improvement Program funds (\$1,000,000 limit per project) or High Risk Rural roads funds (approximately \$50,000 limit per project).

Scope of work for RSAR projects is developed by a RSAR Team and will consist of a Pre-Briefing Meeting, Onsite Visit, and Post Meeting or Conference Call of team members. A representative from either Headquarters Design or the Regional Design Office will be included on each team. The Assistant Director will coordinate with the Headquarters and Regional Design Managers to ensure Design is represented at each meeting. The representative will be responsible for ensuring design issues are addressed prior to finalizing and submitting the RSAR for approval.

Except as noted herein, guidance provided in the Design Guidelines do not apply to the development of RSAR projects. Proposed improvements should be designed in accordance with current design standards; however, it is not the intent of the RSAR program to bring all design elements up to current standards.

In order to provide consistency in the development of RSAR projects the following guidance should be used during the development of RSAR plans:

- 1) Plans should be developed in accordance with the approved RSAR report.
- 2) Scope of the project should be limited to items addressed in the RSAR report.
- 3) Any deviation from the RSAR report will require a revision to the report and estimate. Proposed changes should first be approved by the Design Division director prior to initiating a request to change the approved RSAR report.
- 4) Additional improvements should not be added to the project unless required to meet the objective outlined in the RSAR report.
- 5) Improvements to add additional capacity (except where identified in the RSAR report) should not to be added to RSAR projects.

- 6) Design Exceptions should only be requested when the proposed element to be improved cannot be brought up to current standard. Design Exceptions shall not be requested for other controlling elements of design that are not addressed in the RSAR report. Designers should document to the project file other controlling elements of design or design criteria identified that are not brought up to current standard.
- 7) Plans should be developed using the minimal amount of survey and plans detail necessary to provide sufficient detail to acquire right-of-way (if required) and construct the project. Example: Topography of adjacent properties is not needed when the improvement is going to be constructed inside existing right-of-way. However, erosion prevention and sediment control plan may need to be developed to the same detail as a typical roadway project.
- 8) The acquisition of additional right-of-way and easements and the relocation of utilities should be addressed in the RSAR report. Designs for RSAR projects not proposing additional right-of-way and/or easements or utility relocations acquisition should avoid additional right-of-way or utility relocations whenever possible. In the event that the need for additional right-of-way and/or utility relocation is identified during project development, the Design Manager shall immediately notify the Project Manager or RSAR Coordinator.
- 9) The Work Zone Significance Determination shall be completed and procedures in the Work Zone Safety and Mobility Manual shall be followed for all RSAR projects.
- 10) RSAR project development shall follow guidance regarding permits and submittals to the Environmental Division found in the Design Guidelines.
- 11) Signing and marking shall be in compliance with the current edition of the Manual on Uniform Traffic Control Devices.
- 12) The following note will be placed on the Title Sheet directly above the Chief Engineer's signature. **"RSAR Project - Project of Limited Scope"**

This bulletin updates and voids Instructional Bulletin 08-14.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

December 1, 2009
JCJ:MJA:mja



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
NASHVILLE, TENNESSEE 37243-0348**

INSTRUCTIONAL BULLETIN NO. 09-16

**Regarding Revised Section 4 – Construction Plans
Including Pavement Marking, Rumble Strip, and Rumble Stripe Guidelines**

Effective for the March 19, 2010 letting (January 13, 2010 Turn-In Date), Section 4 of the Design Guidelines is revised as follows. The entire Section 4 (Revised: December 1, 2009) is attached to replace the existing section in the Design Guidelines.

SECTION	REVISION
4-140.05 Construction Quantities Estimate File	Revised section.
4-411.02 Raised Bituminous Rumble Strips	Added section.
4-411.03 Rumble Strips	Renamed section and revised to include scored rumble strip guidance.
4-411.04 Rumble Stripe	Added section.
4-712.00 Traffic Control In Construction Zones	Deleted Freeway Work Zone Capacity. Deleted Tables 4-2a, 4-2b, and 4-2c.
4-716.05 Pavement Marking Guidelines	Updated section and web site link.
4-716.15 Permanent Pavement Markings	Revised permanent pavement marking guidelines. Added Table 4-3.
4-716.16 Striping Ramps on Resurfacing Plans	Added section.
4-716.17 Striping on Micro Surface Pavements	Added section.
4-716.20 Pavement Marking General Notes for Roadway Plans	Revised section title.
4-716.25 Specialty Pavement Markings	Revised section.
4-716.35 Snowplowable Raised Pavement Markers	Revised section title and sub-section.
4-716.36 Raised Pavement Markers	Added section.
4-730.20 Temporary Traffic Signal Systems Used at Two-Lane Bridge Reconstruction Sites	Revised section.

Permanent pavement marking guidelines are revised to reflect the use of enhanced flat line thermoplastic and spray thermoplastic on all interstate and state routes. The revision also reflects increased usage of snowplowable raised pavement markers and raised pavement markers and the placement of either rumble strips or rumble stripes on interstate routes and selected state routes. Details of the pavement marking guidelines can be found in Table 4-3 in Section 4-716.15.

This bulletin voids Instructional Bulletin 08-01.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

December 1, 2009
JCJ:MJA:mja

SECTION IV – CONSTRUCTION PLANS

CHAPTER 1 - GENERAL PROVISIONS

- 4-100.00 INTRODUCTION
- 4-105.00 ROADWAY DESIGN CHECKLIST - CONSTRUCTION PLANS
- 4-110.00 PROJECT ACTIVITY STATUS SHEET
- 4-112.00 SIZE OF FULL-SIZE PLAN AND CROSS-SECTION SHEETS
- 4-115.00 IDENTIFICATION OF SUPERVISORS, DESIGNERS, AND CHECKERS ON TITLE SHEET
- 4-115.05 SIGNATURES OF THE COMMISSIONER AND THE CHIEF ENGINEER ON TITLE SHEET
- 4-115.10 ENGINEER’S SEAL, SIGNATURE, AND DATE ON TITLE SHEET
- 4-115.15 PROJECT LENGTHS
- 4-115.20 EQUATION BLOCKS ON TITLE SHEET
- 4-115.25 EXCLUSIONS ON TITLE SHEET
- 4-115.30 PROJECT DESCRIPTIONS
- 4-115.35 TRAFFIC DATA BLOCK ON TITLE SHEET
- 4-120.00 HAUL ROADS ON ALL PROJECTS
- 4-125.00 BRIDGE CLEARANCES ON PAVING PROJECTS
- 4-130.00 SALVAGE CREDITS ON FEDERALLY-FUNDED PROJECTS
- 4-133.00 CONSTRUCTION PLANS INDEX
- 4-135.00 GENERAL NOTES ON CONTRACT PLANS
- 4-135.05 SPECIAL NOTES ON CONTRACT PLANS
- 4-137.00 ADDITION OF UTILITY SHEETS TO CONSTRUCTION PLANS
- 4-140.00 CONSTRUCTION PROJECT QUANTITY ESTIMATES AND PLANS SUBMITTAL
- 4-140.02 LETTING REVISIONS
- 4-140.03 ITEM NUMBERS

- 4-140.05 CONSTRUCTION QUANTITIES ESTIMATE DATA FILE
- 4-140.09 ESTIMATE CONFIDENTIALITY
- 4-145.00 FIELD REVIEW PROCEDURES
- 4-150.00 CONSTRUCTION REVISIONS

CHAPTER 2 - EARTHWORK

- 4-202.00 REMOVAL OF STRUCTURE
- 4-202.01 REMOVAL OF STRUCTURES AND OBSTRUCTIONS
- 4-202.10 REMOVAL OF BUILDINGS AND OBSTRUCTIONS
- 4-202.13 ABANDONMENT OF WATER WELLS
- 4-203.00 EXCAVATION AND UNDERCUTTING
- 4-203.02 DEFINITION OF TERMS USED FOR EARTHWORK GRADING CALCULATIONS
- 4-203.05 SHRINKAGE AND SWELL FACTORS
- 4-203.10 GRADING LINE THROUGH SOLID ROCK
- 4-203.15 PRESPLITTING OF ROCK EXCAVATION
- 4-203.20 GRADED SOLID ROCK BORROW
- 4-203.25 ROADWAY APPROACHES
- 4-203.30 TOPSOIL COMPUTATION
- 4-203.35 CHANNEL EXCAVATION FOR BOX AND SLAB TYPE CULVERTS AND BRIDGES
- 4-203.40 COMPUTATIONS FOR ITEM NO. 203-06 WATER
- 4-203.45 EARTHWORK BALANCES ON WIDENING OF EXISTING ROADWAYS
- 4-203.50 SUBMISSION OF GRADING QUANTITIES SHEETS FOR CONSTRUCTION
- 4-203.55 USE OF ESTIMATED GRADING QUANTITIES BLOCK FOR ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED)
- 4-204.00 PIPE CULVERT EXCAVATION AND BEDDING
- 4-204.05 EXCAVATION FOR CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- 4-209.00 EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) FOOTNOTE
- 4-209.01 COMPUTATIONS OF EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) QUANTITIES
- 4-209.05 EXCAVATION OR PLACEMENT OF RIP-RAP IN THE DRY

CHAPTER 3 - BASES AND SUBGRADE TREATMENT

- 4-300.00 CRITERIA FOR USE OF PERFORMANCE GRADE ASPHALT ON STATE RESURFACING AND CONSTRUCTION PROJECTS
- 4-301.00 COMPUTATION OF SUBGRADE TREATMENT (GRANULAR)
- 4-302.00 COMPUTATION OF SUBGRADE TREATMENT (LIME)
- 4-303.00 COMPUTATIONS FOR MINERAL AGGREGATE BASE
- 4-303.05 GRANULAR BACKFILL FOR STRUCTURES
- 4-304.00 COMPUTATIONS FOR SOIL-CEMENT BASE
- 4-307.00 COMPUTATIONS FOR BITUMINOUS PLANT MIX BASE (HOT MIX)
- 4-308.00 COMPUTATIONS FOR BITUMINOUS COATED AGGREGATE BASE (PLANT MIX)
- 4-309.00 COMPUTATIONS FOR AGGREGATE-CEMENT BASE COURSE - LIMESTONE
- 4-309.01 COMPUTATIONS FOR AGGREGATE-CEMENT BASE COURSE - GRAVEL
- 4-312.00 COMPUTATIONS FOR AGGREGATE-LIME-FLY ASH STABILIZED BASE COURSE

CHAPTER 4 - FLEXIBLE SURFACES

- 4-400.00 PAVING POLICY - RESURFACING
- 4-400.03 PERFORMANCE GRADE MIX
- 4-400.05 HERBICIDE USE IN EMULSIFIED ASPHALT - RESURFACING
- 4-402.00 COMPUTATIONS FOR PRIME COAT
- 4-403.00 COMPUTATIONS FOR TACK COAT
- 4-404.00 COMPUTATIONS FOR DOUBLE BITUMINOUS SURFACE TREATMENT
- 4-405.00 COMPUTATIONS FOR BITUMINOUS SEAL COAT (CHIP SEAL)

- 4-405.01 USE OF BITUMINOUS SEAL COAT (CHIP SEAL) ALONG EDGE OF PAVED SHOULDER WHILE MAKING LANE SHIFTS DURING CONSTRUCTION
- 4-406.00 COMPUTATIONS FOR BITUMINOUS SEAL COAT (SPLIT APPLICATION)
- 4-411.00 COMPUTATIONS FOR ASPHALTIC CONCRETE SURFACE (HOT MIX)
- 4-411.02 RAISED BITUMINOUS RUMBLE STRIPS
- 4-411.03 SCORED RUMBLE STRIPS
- 4-411.04 RUMBLE STRIPES
- 4-411.05 RIDEABILITY SPECIFICATIONS
- 4-414.05 COMPUTATIONS FOR MICRO-SURFACING
- 4-415.00 COLD PLANING OF BITUMINOUS PAVEMENT

CHAPTER 5 - RIGID PAVEMENT

- 4-501.00 PORTLAND CEMENT CONCRETE PAVEMENT
- 4-502.00 COMPUTATIONS FOR UNDERSEALING CONCRETE PAVEMENT

CHAPTER 6 - STRUCTURES

- 4-604.00 TYPE DESIGNATION FOR CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES
- 4-604.05 PRECAST, PRESTRESSED BRIDGE DECK PANELS
- 4-604.10 PAVED APRON FOR BOX CULVERT AND BRIDGE OUTLETS
- 4-604.20 CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES IN SHALLOW FILLS
- 4-604.25 STEEL BAR REINFORCEMENT (ROADWAY)
- 4-604.30 CULVERT EXCAVATION FOR BOX OR SLAB TYPE CULVERTS OR BRIDGES
- 4-604.35 CHANNEL EXCAVATION FOR BOX OR SLAB TYPE CULVERTS OR BRIDGES
- 4-604.40 STOCK PASSES
- 4-611.00 CHECKING OF DRAINAGE PLANS PRIOR TO CONSTRUCTION
- 4-611.05 BRIDGE END DRAINS
- 4-617.00 BRIDGE DECK SEALANT

4-621.00 TEMPORARY STRUCTURES

4-625.00 ABANDONMENT OF WATER WELLS

CHAPTER 7 - INCIDENTAL CONSTRUCTION

4-705.00 GUARDRAIL INSTALLATION ACROSS BOX OR SLAB TYPE CULVERTS
AND CONCRETE DECK BRIDGES

4-705.05 GUARDRAIL END TERMINALS

4-707.00 ROW STOCK FENCE

4-709.05 RIP-RAP

4-710.00 UNDERDRAINS

4-712.00 TRAFFIC CONTROL IN CONSTRUCTION ZONES

4-712.05 RECORD-A-COMMENT SIGN

4-712.10 DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY
ELEMENTS

4-712.15 SPECIAL CONSTRUCTION SIGNS

4-712.20 MERGE LEFT

4-712.25 USE OF LANE CLOSURE WITH LEFT HAND MERGE

4-713.00 FLEXIBLE DELINEATIONS

4-713.05 ROADWAY SIGNING ON INTERSTATE AND FULL ACCESS CONTROL
ROADWAYS

4-713.10 ROADWAY SIGNING EXCEPT INTERSTATE AND FULL-ACCESS CONTROL
ROADWAYS

4-713.15 ROADWAY SIGNING

4-713.20 ADVANCE GUIDE SIGNS AND EXIT DIRECTIONAL SIGNS ON TRAFFIC
CONTROL PLANS

4-713.25 NOTE ALLOWING TRAFFIC TO TEMPORARILY DRIVE ON MILLED
SURFACE TO BE PLACED IN INTERSTATE RESURFACING PLANS

4-714.00 ROADWAY LIGHTING

4-716.00 CHANNELIZATION STRIPING

4-716.05 PAVEMENT MARKING GUIDELINES

- 4-716.10 POLICY FOR TEMPORARY PAVEMENT MARKINGS
- 4-716.11 TEMPORARY PAVEMENT MARKING FOR USE ON PAVEMENT SURFACE OTHER THAN FINAL
- 4-716.13 PAVEMENT MARKING PLANS ON INTERSTATE AND FULL-ACCESS CONTROL ROADWAYS
- 4-716.15 PERMANENT PAVEMENT MARKINGS
- 4-716.16 STRIPING RAMPS ON RESURFACING PLANS
- 4-416.17 STRIPING ON MICRO SURFACE PAVEMENTS
- 4-716.20 PAVEMENT MARKING GENERAL NOTES FOR ROADWAY PLANS
- 4-716.25 SPECIALTY PAVEMENT MARKINGS
- 4-716.30 USE OF REMOVABLE PAVEMENT MARKING LINE
- 4-716.35 SNOWPLOWABLE RAISED PAVEMENT MARKERS
- 4-716.36 RAISED PAVEMENT MARKERS
- 4-730.08 REPLACEMENT OF TRAFFIC SIGNAL DETECTION LOOPS
- 4-730.10 TRAFFIC SIGNALS
- 4-730.15 STRUCTURAL SUPPORTS FOR TRAFFIC SIGNALS
- 4-730.20 TEMPORARY TRAFFIC SIGNAL SYSTEMS USED AT TWO-LANE BRIDGE RECONSTRUCTION SITES
- 4-740.00 GEOTEXTILE FABRIC AND GEOMEMBRANE

CHAPTER 8 - ROADSIDE DEVELOPMENT

- 4-801.00 SEEDING (WITH MULCH)
- 4-801.05 CROWN VETCH MIXTURE (WITH MULCH)
- 4-801.07 TEMPORARY SEEDING (WITH MULCH)
- 4-801.10 WATER (SEEDING AND SODDING)
- 4-801.15 SEEDING (SUPPLEMENTAL APPLICATION)
- 4-801.20 FERTILIZER (SUPPLEMENTAL APPLICATION)
- 4-805.00 EROSION CONTROL BLANKET
- 4-806.00 PROJECT MOWING CYCLE

CHAPTER 9 - MATERIALS

4-905.00 SILICONE SEALANT

SECTION IV – CONSTRUCTION PLANS

CHAPTER 1 - GENERAL PROVISIONS

4-100.00 INTRODUCTION

This chapter addresses construction matters, which do not fit neatly into any of the other chapters.

4-105.00 ROADWAY DESIGN CHECKLIST - CONSTRUCTION PLANS (See 1-105.00)

4-110.00 PROJECT ACTIVITY STATUS SHEET (See 1-110.00)

4-112.00 SIZE OF FULL-SIZE PLAN AND CROSS-SECTION SHEETS (See 2-112.00 and 3-102.00)

4-115.00 IDENTIFICATION OF SUPERVISORS, DESIGNERS, AND CHECKERS ON TITLE SHEET

On the lower left-hand corner of the project title sheet list the name of the TDOT Civil Engineering Manager 1, TDOT Design Manager 1 or TDOT Roadway Specialist Supervisor 2 in charge of the project, the name of the firm designing the project (if being done by a consultant), the name of the designer, the name of the person(s) who checked the plans and the Design Project (P.E.) number. See Figures 4-1a and 4-1b.

CONSULTANT DESIGN CONSTRUCTION

TDOT C.E. MANAGER 1 OR
TDOT DESIGN MANAGER 1: _____

DESIGNED BY: _____ (Firm Name)
DESIGNER: _____ (Responsible Person) CHECKED BY: _____

P.E. NO. _____
PIN NO. _____

**Figure 4-1a
Title Sheet Identification Format for Consultant Designed Construction**

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

T.D.O.T. DESIGN CONSTRUCTION

T.D.O.T. ROAD SP. SV. 2: _____

DESIGNER: _____ CHECKED BY : _____

P.E. NO. _____

PIN NO. _____

Figure 4-1b

Title Sheet Identification Format for TDOT Designed Construction

4-115.05 SIGNATURES OF THE COMMISSIONER AND THE CHIEF ENGINEER ON TITLE SHEET (See 3-105.05)

4-115.10 ENGINEER'S SEAL, SIGNATURE, AND DATE ON TITLE SHEET

When plans are submitted for Construction, the engineer's seal, signature, and date shall be placed on the right side of the title sheet above the Chief Engineer's signature. The engineer's seal, signature, and date must also be placed on every subsequent sheet of the Construction Plans (except the cross-sections), usually in the lower right-hand corner.

4-115.15 PROJECT LENGTHS

All projects shall show - "Roadway Length, Bridge Length, Box Bridge Length and Project Length" - on the title sheet. If there are no bridges or box bridges, show those lengths as "0.000 miles". If box bridges serve as a riding surface for vehicles, that length shall be added together in the same manner as roadway and regular bridge length for a total project length. If the box bridge does not serve as a riding surface, the box-bridge length will not be added in with the others, and a footnote to the Box Bridge Length will be added below the project length to say "Not included in the project length".

4-115.20 EQUATION BLOCKS ON TITLE SHEET (See 2-115.05)

4-115.25 EXCLUSIONS ON TITLE SHEET (See 2-115.10)

4-115.30 PROJECT DESCRIPTIONS (See 2-115.20)

4-115.35 TRAFFIC DATA BLOCK ON TITLE SHEET

The designer will place the traffic design data block on all construction title sheets, except for those used on 100% State Resurfacing Projects, as per Construction Plans checklist in Section 1-105.00 of the Design Guidelines. For an example of a traffic data block, see Section 2-115.15 of the Design Guidelines. This applies to both full-size 36-inch x 23-inch and 11-inch x 17-inch title sheets.

On 100% State Resurfacing Projects, the designer will be required to show only the current ADT as taken from the report prepared by the Bureau of Planning and Development titled *Traffic Flow Maps - Tennessee Roads and Streets* and the posted speed as submitted by the Regional Construction Office.

4-120.00 HAUL ROADS ON ALL PROJECTS

Haul roads shall be shown on the traffic control plans unless it is decided during the Construction Field Review that one is not required. All necessary construction items required to keep the road in satisfactory condition for the contractor shall be included in the plans.

4-125.00 BRIDGE CLEARANCES ON PAVING PROJECTS

The designer shall furnish the Structures Division with a list of all bridges under which the roadway passes. The Structures Division will check the vertical clearance records and furnish the designer with the maximum permissible thickness of overlay under the structure.

4-130.00 SALVAGE CREDITS ON FEDERALLY-FUNDED PROJECTS

Salvage credit (credit to Federal funds) is to be considered when there is a need to dispose of expendable and nonexpendable tangible personal property previously acquired with Federal funds. Such property may be unused construction materials, salvaged highway appurtenances or other equipment and/or material for which the useful life extends beyond the construction contract.

Salvage, for credit to Federal funds, need not be a consideration under the following circumstances:

1. The value of the item(s) is less than \$5,000.
2. Salvageable item(s) become the contractor's property by virtue of the contract provisions. (See last paragraphs Subsection 104.10 of the Standard Specifications.)
3. The item(s) will be reused on a future project eligible under Title 23 U.S.C.
4. The cost of salvaging an item(s) would exceed the value of the item(s) salvaged.

If salvage credits are to be applied, the FHWA shall be made aware so that a fair market value may be determined.

If items are to be considered under No. 3 above, maintenance personnel need to be made aware, because certain record keeping will be involved.

4-133.00 CONSTRUCTION PLANS INDEX

The format used in the following construction index is to be adhered to on all construction projects.

The sheet names and sequence of sheets shown in Figure 4-2 are intended to establish a general order for placement of the sheets in the plans. Actual sheet numbers will be determined based on the sheets used on a specific construction project.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

SHEET NAME	SHEET NO.
Title Sheet	1
Roadway Index and Standard Drawings Index	1A
Estimated Bridge Quantities and Bridge Index	2
Estimated Roadway Quantities	2A - 2A1
Estimated Utilities Quantities	2B - 2B1
Typical Sections and Paving Schedule	2C - 2F
General Notes and Special Notes	2G
Tabulated Quantities	2H - 2J
Detail Sheets	2K - 2L
Property Maps and Right-of-Way Acquisition Tables	3, 3A - 3B
Present Layouts	4 - 14
Proposed Layouts	4A - 14A
Proposed Profiles (if needed)	4B - 14B
Public Side Roads and Ramp Profiles	16 - 17
Private Drive and Field Ramp Profiles	18 - 21
Interchange Grading Plans	22 - 24
Drainage Maps	25 - 27
Culvert Sections	28 - 30
Erosion Prevention and Sediment Control (EPSC) Plans	31 - 33
Wetland Mitigation Plans	34 - 35
Traffic Control Plans with Construction Phasing Notes	36, 36A - 36Z
Signing and Pavement Marking Plans	37, 37A - 37Z
Sign Schedule Sheets	38, 38A - 38Z
Miscellaneous Signing Details (* see below)	39, 39A - 39Z
Signal Layouts	40, 40A - 40Z
Lighting Layouts	41, 41A - 41Z
Soils Sheets	42, 42A - 42Z
Roadway Cross-Sections	43 - 191
Side Road Cross-Sections	192 - 200
Utility Index, Utility Owners, and Utility Sheets	U1-1 - U1-xx

Figure 4-2
Typical Index of Sheets

* Unless otherwise contacted by the Design Traffic Engineering Section, Signing Office.

4-135.00 GENERAL NOTES ON CONTRACT PLANS (See 6-100)

A list of general notes frequently used on project plans is included in Section VI. The designer shall place these notes on the second sheet series of the plans under the heading of "General Notes."

Good engineering judgment is required in the use of these notes and any other notes in the plans. If notes are extracted from other parts of this document, refer to the appropriate part to determine the intent of the note.

These notes have been agreed upon by the various offices of the Department involved in the design, right-of-way acquisition, utility relocation and adjustment, construction, etc.; therefore, care shall be taken that the notes are reproduced on the plans exactly as they are in this document, unless there is an excellent reason for revising the wordage.

4-135.05 SPECIAL NOTES ON CONTRACT PLANS (See 6-200)

A list of special notes frequently used on project plans is included in Section VI. Special notes also include notes written specifically for the project or notes that vary in any way from the computerized list of general or special notes listed in Section VI. The designer shall place these notes on the second sheet series of the plans under the heading "Special Notes". The designer should also be aware that individual notes may be required to be included on specific plans sheets as indicated in Section VI.

Special Notes are to be placed and identified on the plans as follows:

1. Special Notes are to be placed immediately following General Notes in the plans.
2. Special Notes are to be identified with the header "Special Notes". The heading "Special Notes" should not be included as a sub-header under General Notes.
3. The Index Sheet should include "Special Notes" when applicable.
4. General Notes that are modified are to be included as Special Notes.
5. Special Notes are to be grouped together and sub-headers used. For modified general notes, the same sub-header found in the general notes should be used in the Special Notes. Special Notes specific to the project should be placed under the appropriate sub-header or an appropriate sub-header be created.
6. Notes requested by the Environmental Division should be included as Special Notes except for special circumstances that require the note to be shown on the specific plan sheet for which the note applies. In these cases, a special note should be included in the Special Notes indicating the location of the note.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

7. For notes added at the direction of the Environmental Division, the following sub-headers should be used:
 - A. Environmental - Air and Noise
 - B. Environmental – Archaeology
 - C. Environmental – Ecology
 - D. Environmental - Hazardous Materials
 - E. Environmental - Historic Preservation
 - F. Environmental – Mitigation
 - G. Environmental – Permits

Notes in the Design Guidelines and Instructional Bulletins specified to be placed in other locations in the plans should continue to be placed as directed.

DATE	ISSUE NO.	PROJECT NO.	SHEET NO.
CONSTR.	2007	BRLE-9999(11)	ZC

FILE NO.	DESIGN DIVISION	TENNESSEE D.O.T.

GENERAL NOTES	SPECIAL NOTES
<p>GRADING</p> <p>(1) ANY AREA THAT IS DISTURBED OUTSIDE LIMITS OF CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.</p> <p>(2) CERTIFICATION FOR ALL BORROW PITS MUST BE OBTAINED IN ACCORDANCE WITH SUBSECTION 107.06 OF THE STANDARD SPECIFICATIONS.</p> <p>(3) THE CONTRACTOR SHALL NOT DISPOSE OF ANY MATERIAL EITHER ON OR OFF STATE-OWNED R.O.W. IN A REGULATORY FLOOD WAY AS DEFINED BY THE STANDARD SPECIFICATIONS. MATERIALS TO BE REMOVED BY SAND, ALL MATERIAL SHALL BE ENCLOSED IN PLASTIC AND REMOVED TO WETLAND AREAS AND ABOVE ORDINARY HIGH WATER OF ANY ADJACENT WATERCOURSE. THIS DOES NOT ELIMINATE THE NEED TO OBTAIN ANY NECESSARY PERMITS THAT MAY BE REQUIRED BY ANY OTHER FEDERAL, STATE OR LOCAL AGENCY.</p> <p>SEEDING AND SODDING</p> <p>(4) ALL EXISTING ROADS WITHIN THE RIGHT-OF-WAY AND NOT IN THE GRADED AREA THAT ARE TO BE ABANDONED SHALL BE SCARIFIED AND REPAIRED TO ORIGINAL CONDITION. THE PAVEMENT WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS. TOPSOIL IN EXISTING AREAS SHALL BE MEASURED AND PAID FOR UNDER ITEM 203.04 AND/OR 203.07. SEEDING IN ACCORDANCE WITH SECTION 801 OF THE STANDARD SPECIFICATIONS. WILL BE MEASURED AND PAID FOR UNDER ITEM 801-01.</p> <p>(5) SOO SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLANS TO PREVENT DAMAGE TO ADJACENT FACILITIES AND PROPERTY DUE TO EROSION. ALL NEWLY GRADED CUT AND FILL SLOPES AS WORK PROGRESSES.</p> <p>(6) ITEM NO. 801-01, SEEDING (WITH MULCH), SHALL BE USED ON ALL SLOPES.</p> <p>GUARDRAIL</p> <p>(7) GUARDRAIL IS TO BE COMPLETE IN PLACE BEFORE THE MAINLINE ROADWAY IS OPENED TO TRAFFIC.</p> <p>DRAINAGE</p> <p>(8) THE CONTRACTOR SHALL SHARPEN DITCHES TO THE SPECIFIED DESIGN AND SHALL BE INCLUDED IN THE COST OF OTHER ITEMS.</p> <p>(9) CULVERT EXCAVATION FOR CONCRETE BOX OR SLAB TYPE CULVERTS OR BRIDGES WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS.</p> <p>(10) THE CUTTING OF INLET AND OUTLET DITCHES WHERE SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER WILL BE MEASURED AND PAID FOR AS ITEM NO. 203-01 ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED).</p> <p>(11) WHERE A CULVERT PIPE, SLAB OR BOX IS MOVED TO A NEW LOCATION OR WHERE A CULVERT IS MOVED TO A NEW LOCATION, THE AMOUNT OF PAYMENT WILL BE MADE DUE TO SUCH CHANGE IN THE AMOUNT OF CULVERT EXCAVATION, NO INCREASE OR DECREASE IN THE AMOUNT OF PAYMENT WILL BE MADE DUE TO SUCH CHANGE.</p> <p>(12) DURING CONSTRUCTION OF DRAINAGE STRUCTURES ALL COST ASSOCIATED WITH MAINTAINING THE FLOW OF WATER AND TRAFFIC AT THESE STRUCTURES, DURING THE PHASED CONSTRUCTION OF THIS STRUCTURE, SHALL BE INCLUDED IN THE BIDDING PRICE OF THE DRAINAGE STRUCTURES AND TRAFFIC CONTROL ITEMS.</p> <p>MISCELLANEOUS</p> <p>(13) THE CONTRACTOR SHALL BE REQUIRED TO REMOVE AND RESET MAILBOXES WHERE AND AS DIRECTED BY THE ENGINEER.</p> <p>(14) NOTHING IN THE GENERAL NOTES OR SPECIAL PROVISIONS SHALL RELIEVE THE CONTRACTOR FROM HIS RESPONSIBILITIES TOWARD THE PUBLIC AND THE STATE OF TENNESSEE IN THE PROPOSED CONSTRUCTION AREA.</p>	<p>ROAD CLOSURE NOTES</p> <p>(15) NO LESS THAN SEVEN (7) DAYS PRIOR TO THE CLOSURE OF THE ROAD, THE CONTRACTOR SHALL NOTIFY THE LOCAL AGENCIES DESCRIBING THE AFFECTED ROADS AND THE APPROXIMATE DURATION OF THE CONSTRUCTION. THESE PARTIES INCLUDE, BUT ARE NOT LIMITED TO: (1) LOCAL LAW ENFORCEMENT AGENCIES, (2) LOCAL AGENCIES WITH JURISDICTION OVER LOCAL SCHOOL SUPERINTENDENT, (3) UNITED STATES POSTAL SERVICE, AND (6) LOCAL ROAD SUPERINTENDENT.</p> <p>PAVEMENT MARKINGS</p> <p>(16) PERMANENT PAVEMENT MARKINGS SHALL BE REAPPLIED TO ALL ROAD MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-10-01. PAINTED PAVEMENT MARKING (4" LINE/LIN. IN.</p> <p>GRADED SOLID ROCK</p> <p>(17) THE ROCK FILL GRADED SOLID ROCK MATERIAL SHALL CONSIST OF SOUND, NON-DEGRADABLE LIMESTONE OR SANDSTONE WITH A MAXIMUM SIZE OF 3' 0" AT LEAST 50% BY WEIGHT OF THE ROCK SHALL BE GREATER THAN 10% (BY WEIGHT) SHALL BE LESS THAN 2" IN DIAMETER. THE MATERIAL SHALL BE TROUGHLY EQUIDIMENSIONAL, THIN, SLABBY AND FREE OF LUMPS. THE MATERIAL SHALL BE MECHANICALLY ACCEPTABLE MECHANICAL MEANS (A SCREENING PROCESS CAPABLE OF PRODUCING THE REQUIRED GRADATION). THE ROCK SHALL BE APPROVED BY A REPRESENTATIVE OF THE DIVISION OF MATERIALS AND TESTS BEFORE USE.</p> <p>(18) THIS GRADED SOLID ROCK MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING FIVE FEET IN DEPTH.</p> <p>CONSTRUCTION WORK ZONE & TRAFFIC CONTROL NOTES</p> <p>(19) IF THE CONTRACTOR MOVES OFF THE PROJECT, HE SHALL COVER OR REMOVE ALL UNNEEDED SIGNS AS DIRECTED BY THE ENGINEER. COSTS FOR TRAFFIC CONTROL DEVICES SHALL BE MEASURED AND PAID FOR SEPARATELY, BUT ALL COSTS SHALL BE INCLUDED IN THE ORIGINAL UNIT PRICE BID FOR ITEM NO. 712-06. SIGNS (CONSTRUCTION) PER SQUARE FOOT.</p> <p>(20) A LONG TERM BUT SPORADIC USE WARNING SIGN, SUCH AS A FLAGGER SIGN, MAY REMAIN IN PLACE WHEN NOT REQUIRED PROVIDED THE SIGN FACE IS FULLY COVERED.</p> <p>(21) TRAFFIC CONTROL DEVICES SHALL NOT BE DISPLAYED OR ERRECTED UNLESS PRELIMINARY CONDITIONS ARE PRESENT. NECESSARY TRAFFIC WARNING SIGNS, BARRIERS, PORTABLE BARRIERS, TRAFFIC CONE BARRIERS, AND CONES SHALL BE USED TO PROTECT THE WORK AREA FROM TRAFFIC WHERE A HAZARD IS PRESENT. THESE DEVICES SHALL NOT BE STORED ALONG THE ROADWAY WITHIN THIRTY (30) FEET OF THE EDGE OF THE ROADWAY. GUARDRAIL SHALL BE USED TO PROTECT THE WORK AREA FROM GUARDRAIL, ROADWAY RAIL AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL INCREASE OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. THESE DEVICES SHALL BE REMOVED FROM THE WORK AREA IMMEDIATELY UPON THE COMPLETION OF THE WORK. THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK. THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.</p>
<p>CONSTRUCTION WORK ZONE & TRAFFIC CONTROL NOTES</p> <p>(1) ADVANCED WARNING SIGNS SHALL NOT BE DISPLAYED MORE THAN 1000 FEET FROM THE WORK ZONE. SIGNS MAY BE ERRECTED UP TO ONE WEEK BEFORE NEEDED IF THE SIGN FACE IS FULLY COVERED.</p> <p>EROSION CONTROL</p> <p>(2) RECALCULATED EROSION CONTROL PLAN, SHEET 105, FOR NOTES REGARDING SEASONAL WORK LIMITATION OR LIMITATION ON THE TOTAL AREA OF EXPOSED SOIL.</p> <p>EXCAVATION OR PLACEMENT OF RIP-RAP IN THE DRY</p> <p>(3) ANY EXCAVATION OF THE STREAM CHANNEL AREA (e.g., FOR PIER WATER OR EXPECTED FLOW PATH) AND PERFORMED DURING LOW FLOW CONDITIONS, THIS SHALL BE ACCOMPLISHED BY THE USE OF SHEET PILES, FLUMES, DIVERSION PIPE WITH SAND BAG DAM AT PIPE INLET, JERSEY BARRIERS, ETC. ALL WORK FOR EXCAVATION IN THE STREAM CHANNEL AREA INCLUDING EROSION PREVENTION AND SEDIMENT CONTROL SHALL BE COMPLETED WITHIN 30 DAYS OF THE START DATE. SCOURING FOR CONSTRUCTION IN THE DRY DESCRIPTIONS THIS ITEM SHALL INCLUDE ALL COSTS FOR MATERIALS, LABOR, MAINTENANCE REMOVAL, SITE RESTORATION, AND OTHER MISCELLANEOUS ITEMS.</p> <p>ENVIRONMENTAL ECOLOGY</p> <p>(4) WITH THE ENVIRONMENTAL DIVISION AS A DESIGNER, WILL ADVISE THE CONTRACTOR DURING THE PRE-CONSTRUCTION MEETING CONCERNING WHEN ENVIRONMENTAL DIVISION PERSONNEL OR DESIGNATED CONSULTANT WILL NEED TO BE ON-SITE FOR WORK BEING DONE WHICH COULD AFFECT THE S TRIMMAGE SPECIES.</p> <p>(5) STAFF FROM THE TDOT ENVIRONMENTAL DIVISION OR A DESIGNER WILL BE ON-SITE TO OBSERVE AND RECORD ANY WORK THAT MAY BE THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT PROXIMAL TO SCHEDULED BRIDGE WORK. THIS WILL PROVIDE THE CONTRACTOR WITH THE NECESSARY PRECAUTIONS AND MAKE AWARE OF THE NECESSARY PRECAUTIONS WHICH MUST BE FOLLOWED.</p> <p>(6) ALL BRIDGE PROJECTS WITH THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT IDENTIFIED MUST HAVE MEASURES IN PLACE TO CONTAIN CONCRETE DUST, CEMENT DUST AND ALL OTHER MATERIALS. THESE MATERIALS ARE NOT ALLOWED TO ENTER THE STREAM.</p> <p>ENVIRONMENTAL-HISTORIC PRESERVATION</p> <p>(7) ANY DRIVEWAY WORK AT THE HISTORIC PROPERTY WILL BE AS MINIMAL AS POSSIBLE.</p>	<p>SPECIAL NOTES</p>

GENERAL NOTES	SPECIAL NOTES
<p>CONSTRUCTION WORK ZONE & TRAFFIC CONTROL NOTES</p> <p>(1) ADVANCED WARNING SIGNS SHALL NOT BE DISPLAYED MORE THAN 1000 FEET FROM THE WORK ZONE. SIGNS MAY BE ERRECTED UP TO ONE WEEK BEFORE NEEDED IF THE SIGN FACE IS FULLY COVERED.</p> <p>EROSION CONTROL</p> <p>(2) RECALCULATED EROSION CONTROL PLAN, SHEET 105, FOR NOTES REGARDING SEASONAL WORK LIMITATION OR LIMITATION ON THE TOTAL AREA OF EXPOSED SOIL.</p> <p>EXCAVATION OR PLACEMENT OF RIP-RAP IN THE DRY</p> <p>(3) ANY EXCAVATION OF THE STREAM CHANNEL AREA (e.g., FOR PIER WATER OR EXPECTED FLOW PATH) AND PERFORMED DURING LOW FLOW CONDITIONS, THIS SHALL BE ACCOMPLISHED BY THE USE OF SHEET PILES, FLUMES, DIVERSION PIPE WITH SAND BAG DAM AT PIPE INLET, JERSEY BARRIERS, ETC. ALL WORK FOR EXCAVATION IN THE STREAM CHANNEL AREA INCLUDING EROSION PREVENTION AND SEDIMENT CONTROL SHALL BE COMPLETED WITHIN 30 DAYS OF THE START DATE. SCOURING FOR CONSTRUCTION IN THE DRY DESCRIPTIONS THIS ITEM SHALL INCLUDE ALL COSTS FOR MATERIALS, LABOR, MAINTENANCE REMOVAL, SITE RESTORATION, AND OTHER MISCELLANEOUS ITEMS.</p> <p>ENVIRONMENTAL ECOLOGY</p> <p>(4) WITH THE ENVIRONMENTAL DIVISION AS A DESIGNER, WILL ADVISE THE CONTRACTOR DURING THE PRE-CONSTRUCTION MEETING CONCERNING WHEN ENVIRONMENTAL DIVISION PERSONNEL OR DESIGNATED CONSULTANT WILL NEED TO BE ON-SITE FOR WORK BEING DONE WHICH COULD AFFECT THE S TRIMMAGE SPECIES.</p> <p>(5) STAFF FROM THE TDOT ENVIRONMENTAL DIVISION OR A DESIGNER WILL BE ON-SITE TO OBSERVE AND RECORD ANY WORK THAT MAY BE THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT PROXIMAL TO SCHEDULED BRIDGE WORK. THIS WILL PROVIDE THE CONTRACTOR WITH THE NECESSARY PRECAUTIONS AND MAKE AWARE OF THE NECESSARY PRECAUTIONS WHICH MUST BE FOLLOWED.</p> <p>(6) ALL BRIDGE PROJECTS WITH THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT IDENTIFIED MUST HAVE MEASURES IN PLACE TO CONTAIN CONCRETE DUST, CEMENT DUST AND ALL OTHER MATERIALS. THESE MATERIALS ARE NOT ALLOWED TO ENTER THE STREAM.</p> <p>ENVIRONMENTAL-HISTORIC PRESERVATION</p> <p>(7) ANY DRIVEWAY WORK AT THE HISTORIC PROPERTY WILL BE AS MINIMAL AS POSSIBLE.</p>	<p>SPECIAL NOTES</p>

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
GENERAL NOTES AND SPECIAL NOTES

Figure 4-3
Example of General Notes and Special Notes Sheet
4-7

4-137.00 ADDITION OF UTILITY SHEETS TO CONSTRUCTION PLANS

The Commissioner is authorized to reimburse utilities for the cost of utility relocation as established by Tennessee Code Annotated, Title 54, Chapter 5, Part 8. As a result of this legislation, utilities will have the option of including their relocations in the Department's plans for certain projects. Construction plans for local controlled projects may include utility relocation plans if requested by the local government.

The Regional Utilities Office will submit the Utility Sheets, Utility Relocation Plans, and a Utilities Index Sheet directly to the Program Operations Office for letting, just as roadway and structure plans are submitted. If utilities are to be included in the construction contract, the Utilities Office will also submit estimated utility quantities to the Design Manager. The roadway designer will be responsible for developing the "Estimated Utility Quantities Sheet" to be included in the roadway plans, using quantities provided by the Design Manager.

In order to establish a uniform procedure for adding utility estimated quantities and sheets to the plans the following guidelines will be used:

1. The Design Manager shall contact the Regional Utilities Office approximately fourteen (14) weeks prior to the letting date to determine if utilities will be included as part of the construction contract. (Responsible Office: Design)
2. The Utilities Office will submit estimated utility quantities (in excel .xls format) with **assigned item numbers, units of measurement, and descriptions** to the Design Manager a minimum of twelve (12) weeks prior to the letting. (Responsible Office: Utilities)
3. Sheet No. 2B will be used for the "Estimated Utilities Quantities" sheet. If additional sheets are needed, sheet numbers 2B1, 2B2, etc. should be used. The following footnote should be added to sheet 2B: "See Sheet U1-1 for index of utility sheets. Applicable footnotes for Estimated Utilities Quantities will be on the utility tabulation blocks." (Responsible Office: Design)
4. The Utilities Office will be responsible for the Utility Estimate. The Utilities Office will supply the Estimates Section with the estimate file and unit prices for all utility items included in the plans. (Responsible Office: Utilities)
5. Sheet No. U1-1, "Utilities Index, Utility Owners, and Utility Sheets" will be shown in the "Roadway Index" after the Cross Sections. (Responsible Office: Design)
6. All utility sheets (including utility relocation sheets) and utility owners shall be listed on Sheet U1-1, "Utilities Index, Utility Owners, and Utility Sheets." This sheet may include the first utility sheet or it may follow as Sheet U1-2. See Figure 4-4. For format of Utility Owners see Figure 4-5. (Responsible Office: Utilities)
7. All utility sheets (including utility relocation sheets) will use the standard TDOT box in the upper right corner to identify the sheet. See Figure 4-6. (Responsible Office: Utilities)
8. All sheets shall be 36" X 22" and plotted on 4 mil mylar. (Responsible Office: Utilities)

9. An engineer licensed in the State of Tennessee shall seal utility relocation sheets. (Responsible Office: Utilities)
10. Revisions to utility sheets will be forwarded to the Design Manager to insure the “Estimated Utility Quantities” are updated and included in the revision distribution. (Responsible Office: Design and Utilities)
11. Utility quantities and item numbers will be consistent with the units of measurement used for the roadway plans. (Responsible Office: Utilities)

UTILITIES INDEX (EXAMPLE)

SHEET NAME	SHEET NUMBER
Utilities Index, Utility Owners, and Utility Sheets	U1-1 – U1-xx
Electrical Relocation Sheets	U2-1 – U2-xx
Water Relocation Sheets	U3-1 – U3-xx
Sewer Relocation Sheets	U4-1 – U4-xx
Gas Relocation Sheets	U5-1 – U5-xx
Cable TV Relocation Sheets	U6-1 – U6-xx
TVA Relocation Sheets	U7-1 – U7-xx

Figure 4-4
Typical Utilities Index

UTILITY OWNERS AND CONTACTS

Water:

Metro Water and Sewer
 P.O. Box 123
 Nashville, TN 37243
 Contact: John Smith
 Telephone: 615-555-1212
 Fax: (if available)
 E-mail: (if available)

Electrical:

Nashville Electric
 1000 Church Street
 Nashville, TN 37216
 Contact: Mike Jones
 Telephone: 615-555-1234
 Fax: (if available)
 E-mail: (if available)

Sewer:

Metro Water and Sewer
 P.O. Box 123
 Nashville, TN 37243
 Contact: Bill Williams
 Telephone: 615-555-1213
 Fax: (if available)
 E-mail: (if available)

**Figure 4-5
 Typical Format for Utility Owner Information**

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2003	NH-I-40-7(157)359	U1-1

**Figure 4-6
 Upper Right Hand Corner Box**

1. Use "**CONST.**" for the type project. The designation "ROW" should not be added since utility sheets are not included in the right-of-way plans.
2. Use year project is let.
3. Insert federal construction project number. If not a federal project, use the state construction project number.

4-140.00 CONSTRUCTION PROJECT QUANTITY ESTIMATES AND PLANS SUBMITTAL
(See 1-220.00 and 3-400.15)

The following shall be provided to the Program Operations Office, Estimates Section when submitting final Construction Plans:

1. The Right-of-Way title sheet that will be forwarded to the Plans Sales Office by the Estimates Section. The designer shall pencil both the federal and state construction project numbers along the left margin of the Right-of-Way title sheet prior to turning it in with the Final Construction Plans.
2. If the project includes grading quantities, six copies of the grading quantity calculation sheets will be furnished with the plans.
3. A complete construction quantity estimate (with item numbers) shall be submitted to the Estimates Section with the plans. (See Sections 3-400.15 and 4-140.05.)
4. If the project includes right-of-way removal items, the unit prices furnished by the Right-of-Way Office will be shown in the unit price column of the submitted estimate. A copy of the letter from the Right-of-Way Office stating the values of the various removal items shall be submitted with the plans. All other unit prices will be set by the Estimates Section.
5. If the project includes non-participating items, any information concerning price will be furnished to the Estimates Section.

Any and all changes to the items after submittal must be revised in accordance with the Plans and Estimates Revision guidelines. (See Section 4-140.02.)

To insure the proper and rapid processing of Construction Plans, the following transmittal letter, shown in Figure 4-7, shall accompany the Construction Plans submittal to the Estimating and Bid Analysis Office.

If further information is required, please contact the Estimating and Bid Analysis Office.

Note: Refer to Section 1-220.00 for the current plans revision distribution schedule.



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-1402**

MEMORANDUM

TO: Estimating and Bid Analysis Office
Attn: Estimates Section
Suite 400 J.K. Polk Bldg.
Nashville, TN. 37243-1402

FROM: James Iway, Roadway Specialist Supervisor
Design Office, Region 2

DATE: February 8, 2006

SUBJECT: Project No.: BR-STP-33 (10), 44004-3211-94
PIN 100300.00
Description: S.R. 50, Bridge & Approaches over Will Bee Creek (L.M. 0.23)
Jackson County

The following completed construction plan items for the referenced project are being transmitted for the June 2006 Letting Process.

<u> X </u>	Original Construction Drawings (38 Sheets)
<u> X </u>	Original Roadway Cross-Sections (52 Sheets)
<u> X </u>	Original R.O.W. Title Sheet
<u> X </u>	Copy Haul Distance Sheet
<u> X </u>	Copy Grading Quantity Sheets
<u> N/A </u>	Copy R.O.W. Office building removal letter
<u> N/A </u>	3 ½ " computer disk or CD w/ estimate
<u> X </u>	Estimate emailed
<u> </u>	11" X 17" Resurfacing Plans (<u> </u> Sheets)

Comments:

For further information, please contact William B. Dunn Phone: (615) 520-4556

cc: David Davis
James Johnston
File

**Figure 4-7
Example Construction Plans Transmittal Letter**

4-140.01 11 x 17-INCH PLANS SUBMITTAL

State resurfacing plans will be submitted on an 11” by 17” format and will be limited to a maximum of 12 sheets in this format. All plans requiring more than 12 sheets will be submitted on standard full size mylar plans sheets.

When submitting plans on 11” by 17” paper, a minimum margin shall be provided on all sheets. The minimum margin shall be 1-inch for the left margin and 0.2-inch for the top, bottom and right margin.

The original copy shall be submitted to the Estimating and Bid Analysis Office.

4-140.02 LETTING REVISIONS

The determination of a letting revision will be made by the Headquarters Construction Office. An estimate revision may or may not require a Letting Revision, if the plans have not been printed by the Printing Services Office.

All letting revisions generated in the Regional Design Offices will be submitted through the TDOT C.E. Manager 2 responsible for the project. The TDOT C.E. Manager 2 will be responsible for having the revision forwarded to the Estimating and Bid Analysis Office in an accurate and timely manner.

All letting revisions generated in the Headquarters Design Offices will be submitted through the TDOT Design Manager responsible for the project. They will be responsible for having the revision forwarded to the Estimating and Bid Analysis Office in an accurate and timely manner.

It will be the responsibility of the C.E. Manager 2 to retrieve any original reproducible mylars from “A” Level which are to be revised on projects generated in the regions. It will be the responsibility of the Design Manager responsible for the project to retrieve any original reproducible mylars from “A” Level which are to be revised on their own projects. The revised reproducible mylars will then be returned to “A” Level after the revision has been completed.

An “Estimate Revision Request” form, shown in Figure 4-8, must be filled out for each revision and it must be initialed by one of the members of the Estimates Section. After the “Estimate Revision Request” form has been initialed, one (1) copy of that form will remain with the Estimates Section and one (1) initialed copy of the form with the plans change will be taken to the Construction Office. This information is necessary in order to maintain a current and accurate state estimate.

4-140.03 ITEM NUMBERS

Item numbers, item descriptions, and units of measurement which are to be used with the March 1, 2006 Standard Specifications for Road and Bridge Construction Book are available at the following we site.

<http://www.tdot.state.tn.us/RoadItemLists/roaditemlist.htm>

The list is updated daily by the Construction Division. A list of the item numbers and descriptions is not printed in the Design Guidelines or Instructional Bulletins.

If an item number is needed, the Design Manager should contact the Contract Specifications Office, Suite 700, James K. Polk Building, Nashville, Tennessee 37243 to determine if an item number will be assigned or included in another item.

4-140.05 CONSTRUCTION QUANTITIES ESTIMATE DATA FILE

The construction quantities estimate is an Excel file, as shown in Figure 4-9, in the format as designated by the TDOT Excel templates.

For TDOT employees, the templates are available in the self-extracting archive, 2ndSheets.exe at

<http://home.tdot.state.tn.us/asstchiefengrdesign/Design/v8design/default.htm#MSOffice>

For consultants, the templates are available in the self-extracting archive, 2ndSheets.exe at

http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/v8/V8design.htm#MSOffice

Instructions for use of these templates are in **2ndSheetsV8.pdf**, also at the same site.

There are Excel templates for projects with one, two or three state project numbers. For jobs with more than three state project numbers, see CADDV8.pdf for instructions.

No prices are to be entered in the estimate. Quantities cannot contain commas.

All items shall be listed in numerical order, regardless of the order they are listed in the plans.

SUBTOTAL CODES: (See CADDV8.pdf for detailed instructions)

- a) Roadway items shall be listed on a sheet separate from the Box-Bridge items. The sheet name for Roadway items must start with **Col**.
- b) Box-Bridge items shall be listed on a sheet separate from the Roadway items. The sheet name for Box Bridge items must start with **Box**.
- c) Alternate Roadway items shall be listed after all of the other roadway items. The alternates will be designated in column C as Alternate AA1, Alternate AA2,

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Alternate AA3, Alternate AB1, Alternate AB2, etc. Alternates AA1 would alternate with AA2 and AA3. AB1 would alternate with AB2, etc.

- d) Non-participating items are listed by column as designated on the **Proj Data** sheet.

SUBMITTAL OF CONSTRUCTION QUANTITIES ESTIMATES

For in-house design projects, the designer shall forward the completed construction estimate Excel file via e-mail at the time final plans are submitted to the following Groupwise e-mail address:

Name: **Estimates, TDOT Construction** (User Id: JJCONST).

For consultant design projects, the completed Excel file is to be forwarded with the final construction plans to the Design Manager for submittal. Submittal may be on either CD, DVD, or via e-mail. The manager will forward the file via e-mail to:

Name: **Estimates, TDOT Construction** (User Id: JJCONST).

SUBMITTAL OF PRELIMINARY CONSTRUCTION QUANTITIES ESTIMATES (See 3-400.15)

For in-house design projects, the designer shall forward the completed construction estimate Excel file via e-mail to the following Groupwise e-mail address: Name: **Estimates, TDOT Preliminary** (User Id: JJPRELIM).

For consultant design projects, the completed excel file is to be forwarded to the Design Manager for submittal. Submittal may be on either CD, DVD, or via e-mail. The manager will forward the file via e-mail to: Name: **Estimates, TDOT Preliminary** (User Id: JJPRELIM).

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

	A	B	C	D
1		Project No. 1 Data	Project No. 2 Data	Project No. 3 Data
2	State Project Number			
3	Federal Project Number			
4	Non Participating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Project Description			
7	Letting Date			
9	Project Type of Work			
10	Unit (English or Metric):			
12	County			
13	Route			
14	Road Name			
15	Type of Road			
17	Project Length			
18	Beginning Station			
19	Ending Station			
20	Beginning Log Mile			
21	Ending Log Mile			
22	North Coordinate			
23	East Coordinate			
24	Longitude			
25	Latitude			
27	Roadway Designer			
28	Roadway CE Manager			
29	Date Turned In			
31	Bridge Required			
32	Bridge Designer			
33	Bridge CE Manager			

ESTIMATED ROADWAY QUANTITIES				
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	
307-02.08	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING B-W2	TOW	3182	
411-02.01	ASPHALT CEMENT (PG70-22) (ACS) GRADING D	TOW	112	
Alternate AA1				
303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TOW	35000	
307-02.01	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A	TOW	6477	
307-02.02	ASPHALT CEMENT (PG70-22) (BPMB-HM) GRADING A-5	TOW	165	
Alternate AA2				
303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TOW	25000	
307-02.01	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A	TOW	5667	
307-02.02	ASPHALT CEMENT (PG70-22) (BPMB-HM) GRADING A-5	TOW	124	
309-01.01	MINERAL AGGREGATE (A-CBC)	TOW	10653	
309-01.02	PORTLAND CEMENT (A-CBC)	TOW	411	
309-02	BITUMINOUS MATERIAL (A-CBC)	TOW	28	
Alternate AA3				
303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TOW	25000	
307-02.01	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A	TOW	5667	
307-02.02	ASPHALT CEMENT (PG70-22) (BPMB-HM) GRADING A-5	TOW	124	
312-01	MINERAL AGGREGATE (ALFSB)	TOW	7711	
312-02	LIME	TOW	293	
312-03	FLY ASH	TOW	921	
312-04	BITUMINOUS MATERIAL (ALFSB)	TOW	28	

Figure 4-9
Construction Quantities Estimate Data File Template

4-140.09 ESTIMATE CONFIDENTIALITY

The designer is hereby instructed to follow the TDOT guidelines regarding the handling of the construction cost estimates and unit bid prices as listed below.

1. **Construction Cost Estimates:** All designers are hereby instructed to keep the construction cost estimate confidential. These cost estimates shall never be made public and may only be revealed to the proper officials of TDOT. Should an inquiry be made by a person other than a TDOT official, refer the inquirer to a Manager in the Design Division. Secure the cost estimates at all times so that no unauthorized person may have access to them.

2. **Unit Bid Prices:** After a project is let, but prior to awarding it, all designers are hereby instructed not to divulge any unit prices bid on a project to anyone. When a project bid is rejected and not awarded, the unit prices are never to be made public. Any inquiry made in regard to bid prices shall be referred to your Manager for proper handling.

4-145.00 FIELD REVIEW PROCEDURES (See 1-120.00, 2-315.00 and 2-315.05)

On interstate resurfacing and controlled access resurfacing projects with interchanges, the designer shall inspect guardrail on all ramps and crossroads, which are State Routes within the access control limit of the interchange, and upgrade guardrail to current standards.

4-150.00 CONSTRUCTION REVISIONS (See 1-220.00)

When a project has been awarded to construction, and a change becomes necessary anywhere on the project, a Construction Plans revision is required. All construction revisions will be submitted through the TDOT Design Manager responsible for the project in an accurate and timely manner.

In the Regional Design Offices, the TDOT Design Manager responsible for the project will distribute the construction revision prints to the appropriate Regional personnel. They will submit construction revision prints for the appropriate Headquarters' personnel through the Plans Sales Office.

In the Headquarters Design Offices, the TDOT Design Manager responsible for the project will distribute the construction revision prints through the Plans Sales Office.

Note: Refer to Section 1-220.00 for the current plans revision distribution schedule.

CHAPTER 2 - EARTHWORK

4-202.00 REMOVAL OF STRUCTURE

When the proposed structure is a girder bridge, the removal items for the existing structure(s) shall be placed on the Estimated Structure Quantities sheet and numbered in sequence beginning with Item No. 202-04.01 and continuing through Item No. 202-04.49, as required.

When the proposed structure is a box bridge, the removal item for the existing structure(s) shall be placed on the Estimated Roadway Quantities sheet (in the Box Bridge block). When the proposed structure is a box culvert, the removal item for the existing structure(s) shall be placed on the Estimated Roadway Quantities sheet (in the Roadway block). The removal items shall be numbered in sequence beginning with Item No. 202-04.50 and continuing through Item No. 202-04.99, as required.

The removal items shall be footnoted as to whether the salvage shall become the property of the contractor, city, county or state.

4-202.01 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

When Item No. 202-01, Removal of Structures and Obstructions, Lump Sum, or Item No. 202-01.50, Removal of Structures and Obstructions, Each, is used on a project, the designer shall add a footnote detailing exactly what major items are included in the item (this includes, but is not limited to catch basins, manholes, junction boxes, etc.). This is done so the Department's estimators and contractors bidding on a project will be able to more accurately estimate the cost of this item.

Generally, all removals that belong with Item Nos. 202-06.01 through 202-06.99 shall be listed as such and shall not be included in Item No. 202-01 or 202-01.50.

4-202.10 REMOVAL OF BUILDINGS AND OBSTRUCTIONS

All existing buildings and/or obstructions to be removed within the project limits are to be paid for under the bid price for Item No. 202-06.01, Removal of Buildings (Tract No. ___) through Item No. 202-06.99, Removal of Buildings (Tract No. ___) per lump sum. All buildings and obstructions to be removed under these item numbers shall be so designated by the Regional Right-of-Way Office. The pay items in the Estimated Roadway Quantities Block shall be footnoted as follows:

“Bid price includes all salvage value of material. See tabulated quantities sheet No. 2___ for removal of buildings and obstructions description block.”

An example of a Removal of Buildings and Obstructions Description Block is shown in Figure 4-10.

REMOVAL OF BUILDINGS AND OBSTRUCTIONS DESCRIPTION BLOCK		
PAY ITEM	TRACT NO.	DESCRIPTION

NO ADDITIONAL COMPENSATION WILL BE MADE FOR THESE REMOVALS.

Figure 4-10
Removal of Buildings and Obstructions Description Block

4-202.13 ABANDONMENT OF WATER WELLS (See 4-625.00)

Item No. 202-13, Water Well Abandonment per Each, shall be used any time a water well is abandoned. This will cover all items necessary for the sealing of the well, except for grout. Item No. 604-15.01, Portland Cement Grout per cubic yard, shall be used to seal wells, and, for estimating purposes, shall be computed as shown below:

1. Wells with a diameter of 1 foot or less

The grout fill material shall extend from the bottom of the well to within 5 feet of the final surface, where the well is in a roadway cut, or to within 5 feet of the existing ground surface, where the well is located under roadway embankment or where the well is located outside of the construction limits.

2. Wells with a diameter greater than 1 foot

The bottom 5 feet of the well, or a depth equal to the depth of the water, whichever is greater, shall be filled with cement grout.

Information necessary to make these computations shall be requested when coordinating with the Tennessee Water Management Division, in accordance with Section 3-130.00 of these guidelines.

4-203.00 EXCAVATION AND UNDERCUTTING (See 2-145.00)

The Special Provision for Section 203 allows the use of Item No. 203-05, Undercutting, per Cubic Yard, as a pay item if the amount of undercutting needed, as specified in the soil report, is approximately 10% or more of Item No. 203-01, Road and Drainage Excavation (Unclassified).

All information regarding undercutting shall be clearly shown on the plans for the Construction Field Review. The decision to use the undercutting item shall be made on the Construction Field Review by the Design Division.

4-203.02 DEFINITION OF TERMS USED FOR EARTHWORK GRADING CALCULATIONS

The geotechnical report and geotechnical related drawings should be consulted by the roadway designer to determine what type of materials will be encountered during excavation and embankment construction for a project. The geotechnical report should provide enough information to determine the type materials described below and to determine appropriate shrink or swell factors. Some geotechnical reports may provide project specific recommendations for shrink and swell factors. It is recommended that the designer contact the Geotechnical Engineering Section as needed to clarify any questions arising regarding the nature of materials to be encountered and accounted for in the grading tabulations and bid quantities.

The following terms and definitions will be used by all TDOT Divisions so that a consistent definition is used in all phases of project development and in contract documents. Guidance to designers as to the material breakdown to be shown on the plans and cross-sections should be found in the geotechnical report.

A. SOIL MATERIAL Soil material is material that is predominantly made up of naturally occurring mineral particles which are fairly readily separated into relatively small pieces, and in which the mass may contain air, water, or organic materials. This material may contain rock pieces in the form of disconnected slabs, lenses, or boulders of less than approximately 0.5 cubic yards. The main soil groups consist of clay, silt, sand, gravel, cobbles, boulders (less than 0.5 cubic yard volume) or a combination of any of the constituents. For construction purposes, this material would typically be considered to be excavatable by conventional excavation machinery such as pans, track hoes, or front end excavators/loaders. This material would have a shrink factor as given in the shrink factors shown in Section 2-145.10 of the Design Guidelines or as recommended by the Geotechnical Engineering Section of the Materials and Tests Division.

B. SOLID ROCK MATERIAL Solid rock material is that naturally occurring material composed of mineral particles so firmly bonded together that relatively great effort is required to separate the particles (i.e. blasting or heavy crushing forces). For construction purposes, this material would typically have to be blasted to separate into pieces small enough to load and transport on earth moving trucks and which when subjected to proper pre-split and production blasting would result in a uniform stable rock cut face. Note that this material would not by definition necessarily be a proven source of any rock type aggregate such as solid rock, graded solid rock, rip rap, or other rock aggregate construction products. This material would have a significant swell factor as given in swell factors shown in Section 2-145.10 of the Design Guidelines or as recommended by the Geotechnical Engineering Section of the Materials and Tests Division.

C. SOFT ROCK OR DEGRADABLE ROCK This material is that naturally occurring material composed of mineral particles that are so firmly bonded such that they are not fairly readily separated into small pieces yet has such relatively low bonding strength that would allow for separating into small pieces through moderate to heavy crushing forces. For construction purposes this material would have to be subjected to ripping type equipment, hoe rams, or rugged use of a large bulldozer in order to separate the material such that it can be readily loaded into earth moving trucks. These materials would typically be shales, claystones, siltstones, weathered sandstones, weathered schist and weathered gneiss. This material would have a relatively small shrink or swell factor depending on the type material and the degree of weathering, disintegration, or degradation.

D. TRANSITIONAL MATERIALS This material is that material comprised of a combination of those materials described above occurring in either non-uniform interbedded layers of the above materials (i.e. shale material with relatively thin layers of solid rock such as hard limestone) or erratic localized changes of material types both laterally and with depth (such as a geologic formation resulting in pinnacled rock columns, floating boulders or lenses intercalated with clay soil, a common occurrence in certain regions of Tennessee). For construction purposes, this material may have to be excavated using a combination of excavation methods such as blasting of rock pinnacles, layers or boulders along with a ripping of weathered rock and excavating of soil with track hoes or loaders all within a localized area. This material would not be suitable for the use of excavating pan type equipment.

COMMON EXCAVATION Common excavation is that sum of materials excavated from a project inclusive of all those materials described in **A**, **C**, and **D** above. The grouping of these materials is to generally define those materials that would not generally be acceptable to permanently place on a pre-split, blasted face and also to define those materials that would not be considered a source of a defined fill material such as solid rock fill, graded solid rock, rip rap or other rock type aggregates. Typically the materials in this grouping would have either a shrink factor or a relatively low swell factor as compared to solid rock material described in **B** above.

UNCLASSIFIED EXCAVATION Unclassified excavation is that sum of materials excavated from a project inclusive of all those items described in **A**, **B**, **C**, and **D** above. On most projects, road and drainage excavation will be listed as unclassified and is to be bid as one item regardless of the type material encountered. See section 203.02 (a) of the Standard Specifications for Road and Bridge Construction.

Generally, all earthwork for roadway projects will be paid for under Item 203-01, Road and Drainage Excavation (Unclassified), C.Y., except in situations where special or unique conditions exist that would warrant bidding earthwork as either separate bid items or embankment in place bid items. For projects which earthwork items other than Road and Drainage Excavation (Unclassified) may be appropriate, the Design Manager will consult with both the Geotechnical Section and the Headquarters Construction Division to determine if other pay items are appropriate and what material type breakdown will be shown on the grading tabulation and earthwork balances in the plans.

See Section 6-200.00 for notes which shall be added to the plans as Special Notes on **ALL** projects for which a Geotechnical Report is prepared unless otherwise directed by the Design Manager after consultation with the Soils and Geology Section of the Materials and Tests Division and the Headquarters Construction Division. All grading quantities on the Estimated Roadway Quantities Sheet should also be footnoted "Refer to Special Notes."

4-203.05 SHRINKAGE AND SWELL FACTORS (See 2-145.10)

4-203.10 GRADING LINE THROUGH SOLID ROCK

Do not show a solid rock grading line on the typical sections. Specifications for excavation of rock at the subgrade, and where rock slopes are to be seeded, are covered in the Standard Specifications.

4-203.15 PRESPLITTING OF ROCK EXCAVATION

On all projects having rock excavation, a quantity shall be included for pre-splitting the rock at the outside limits of the cut areas containing the rock.

Pre-splitting shall not be required on slopes flatter than 1:1 as per Section 203 of the Standard Specifications.

The quantity of pre-splitting shall be computed from the roadway cross-sections.

4-203.20 GRADED SOLID ROCK BORROW

On all projects requiring graded (sized) solid rock borrow for rock buttresses, revetment, etc, the unit of payment shall be per ton instead of per cubic yard. This item shall be paid for as follows:

Item No. 203-02.01 - Borrow Excavation (Graded Solid Rock) - Ton

Use a factor of 1.7636 tons per cubic yard for estimating quantities.

4-203.25 ROADWAY APPROACHES

On bridge replacement projects with a minimal amount of roadway work on the approaches, the designer shall consider using Item No. 203-30.01, Roadway Approaches. This is a lump sum pay item to construct bridge approaches that have quantities that are too small to be accurately measured in the field. This item has been developed to replace those items, which, - 716 because of the small quantities, are uneconomical to measure and document for payment under present procedures.

Item No. 203-30.01 may include: road and drainage excavation, borrow excavation, channel and culvert excavation on box bridges, clearing and grubbing, topsoil, seeding, sodding and water. The required quantities need to be calculated and shown in a tabulated block for purposes of cost estimating and bidding. Other items may be included in this item, if appropriate, but shall be discussed and approved during the construction field review before inclusion.

As a guideline, it is recommended that Item No. 203-30.01 be considered anytime that the total excavation is approximately 1500 C.Y. or less. However, other items and factors may influence the decision to use this item. Designers shall use their best judgment on a project by project basis to determine the need for Item No. 203-30.01.

Figure 4-11, shown below, shall be used to itemize the quantities included in Roadway Approaches. The note, "No change in compensation will be made for normal variations in estimated quantities." is required.

ALL COSTS OF THESE ESTIMATED QUANTITIES TO BE INCLUDED IN PRICE BID FOR ROADWAY APPROACHES ITEM NO. 203-30.01							
Road & Drain Exc. (Uncl.)	Borrow Excavation (Uncl.)	Water	Placing & Spreading Topsoil	Channel Exc.	Seeding w/Mulch	Water Seeding & Sodding M.G.	Sodding (New Sod)
C.Y.	C.Y.	M.G.	C.Y.	C.Y.	Unit	M.G.	S.Y.
1508	169	4	283	440	20	2	38

NO CHANGE IN COMPENSATION WILL BE MADE FOR NORMAL VARIATIONS IN ESTIMATED QUANTITIES.

**Figure 4-11
Example of Estimated Quantities for Roadway Approaches Block**

For projects with more than one structure, each site shall be estimated, and an item per site used. Use the Roadway Approach Item No. 203-30.01 followed by 203-30.02, etc.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

4-203.30 TOPSOIL COMPUTATION (See 3-315.05)

4-203.35 CHANNEL EXCAVATION FOR BOX AND SLAB TYPE CULVERTS AND BRIDGES

The **channel excavation** must be computed by the roadway designers. The channel excavation will be included in the Estimated Roadway Quantities Block. DO NOT include the cost of this item in the unit cost of concrete. This item must be bid separately under the price bid for Item No. 203-08, Channel Excavation (Unclassified), per cubic yard. See Section 4-204.05 for limits of this item.

See Section 4-204.05, concerning **culvert excavation** for box and slab type culverts and bridges.

4-203.40 COMPUTATIONS FOR ITEM NO. 203-06 WATER

Embankment:

$$\frac{\text{Earth embankment (C.Y.)} \times 2.525 \text{ Gal/C.Y.}}{1000 \text{ Gal/M.G.}} = \text{M.G.}$$

Base material and granular backfill:

$$\frac{\text{Compacted volume (C.Y.)} \times 15.150 \text{ Gal/C.Y.}}{1000 \text{ Gal/M.G.}} = \text{M.G.}$$

Foundation preparation (Item No. 204-10.01 through 204-10.16):

$$\frac{\text{Width of subgrade (Ft)} \times 0.5 \text{ Ft} \times \text{Length of project (Ft)} \times 4 \text{ Gal/C.Y.}}{27 \text{ C.F./C.Y.} \times 1000 \text{ Gal/M.G.}} = \text{M.G.}$$

Subgrade treatment (lime) (Item Nos. 302-01.01):

$$\frac{\text{Subgrade treatment volume (C.Y.)} \times 40.400 \text{ Gal/C.Y.}}{1000 \text{ Gal/M.G.}} = \text{M.G.}$$

Soil-cement base (Item Nos. 304-01.02):

$$\frac{\text{Volume of base (C.Y.)} \times 15.150 \text{ Gal/C.Y.}}{1000 \text{ Gal/M.G.}} = \text{M.G.}$$

Aggregate-cement base (Item Nos. 309-01.01 and 309-01.02):

$$\frac{\text{Volume of base (C.Y.)} \times 15.150 \text{ Gal/C.Y.}}{1000 \text{ Gal/M.G.}} = \text{M.G.}$$

Lime fly-ash base (Item Nos. 312-01, 312-02, and 312-03):

$$\frac{\text{Volume of base (C.Y.)} \times 30.77 \text{ Gal/C.Y.}}{1000 \text{ Gal/M.G.}} = \text{M.G.}$$

NOTE: For urban-type projects, which require an unusually large amount of water for dust control, use a quantity of water six times the amount calculated.

4-203.45 EARTHWORK BALANCES ON WIDENING OF EXISTING ROADWAYS

When balancing the earthwork on a project that involves a grade change on the existing roadway, attention needs to be paid to the construction sequencing. It is not possible to maintain traffic on the existing roadway and, at the same time, use material from that roadway to lower the grade, or conversely, to add material to raise the grade of the existing roadway.

When the designer considers the need to stockpile material, detour traffic, or maintain traffic by other means, this shall be detailed in the traffic control plans, earthwork balances, or elsewhere as deemed appropriate.

4-203.50 SUBMISSION OF GRADING QUANTITIES SHEETS FOR CONSTRUCTION
(See 2-145.07 and 3-315.20)

4-203.55 USE OF ESTIMATED GRADING QUANTITIES BLOCK FOR ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED)

On all projects using Item No. 203-01, Road and Drainage Excavation (Unclassified), it is to be referred to as unclassified excavation. When the designer has received the Soils and Geology Report stating approximately what portion is common and what portion is solid rock, he or she is to use a block as shown in Figure 4-12a. If the designer does not know the composition of the material being excavated, he or she is to use a block as shown in Figure 4-12b.

ESTIMATED GRADING QUANTITIES							
STATION TO STATION	ROAD & DRAINAGE EXC. (UNCL.)		BORROW EXCAVATION		CHANNEL EXC. C.Y.	EXCESS EXC. WASTE C.Y.	EMB. C.Y.
	COMMON - C.Y.	S. ROCK - C.Y.	UNCL. - C.Y.	S. ROCK - C.Y.			

Figure 4-12a
Estimated Grading Quantities Block (Materials Composition Known)

ESTIMATED GRADING QUANTITIES							
STATION TO STATION	ROAD & DRAINAGE EXC. (UNCL.) C.Y.		BORROW EXCAVATION		CHANNEL EXC. C.Y.	EXCESS EXC. WASTE C.Y.	EMB. C.Y.
			UNCL. - C.Y.	S. ROCK - C.Y.			

Figure 4-12b
Estimated Grading Quantities Block (Materials Composition Unknown)

4-204.00 PIPE CULVERT EXCAVATION AND BEDDING

The cost of excavation for the installation of pipe culverts, sewers, conduits, all other culverts, all minor structures of any type and description are not to be measured and paid for directly, but will be included in the price bid per linear foot of pipe.

Designers shall include both standard drawings D-PB-1 and D-PB-2 in plans on projects allowing HDPE as a pipe alternate. Designers are to refer to the Design Division Drainage Manual, Chapter 6, Section 6.04.2.2 and Table 6A-1, for pipe selection criteria and allowed alternates for roadway classes and fill heights.

Designers should note that bedding material shall no longer be paid for as a separate item but will be included in the cost of the proposed pipe culvert.

See Standard Drawing No. D-PB-1 and D-PB-2 for additional details.

4-204.05 EXCAVATION FOR CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES (See 4-203.35)

Compute quantities of **culvert excavation** (Figure 4-13) for these structures only if directed to do so. If culvert excavation is not computed for these structures, include the following note in the plans:

“Culvert excavation for concrete box or slab type culverts or bridges will not be measured and paid for directly, but the cost will be included in the cost of other items.”

See Section 4-203.35, concerning **channel excavation** for box and slab type culverts and bridges.

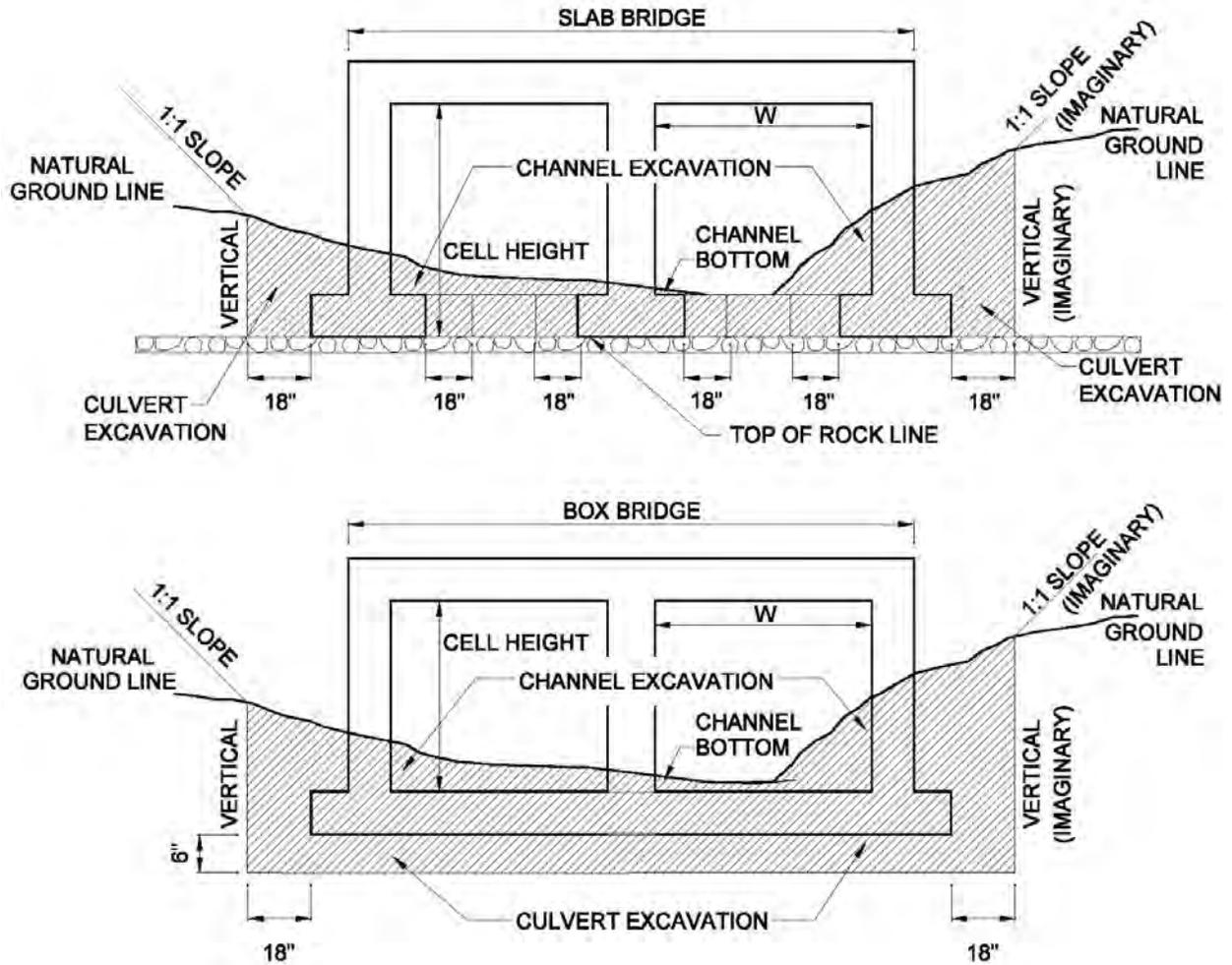


Figure 4-13
Quantities of Channel Excavation for Slab Type and Box Culverts and Bridges

4-209.00 EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) FOOTNOTE

The designer shall **footnote** all applicable erosion prevention and sediment control (EPSC) pay items as follows:

"See Subsection 209.07 of the Standard Specifications for Maintenance Replacement."

4-209.01 COMPUTATIONS OF EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) QUANTITIES

See Chapter 10 of the Drainage Manual.

4-209.05 EXCAVATION OR PLACEMENT OF RIP-RAP IN THE DRY

See Section 6-290.01 for a "Special Note" which shall be added to all plans with multi-barrel culverts or bridge structures.

CHAPTER 3 - BASES AND SUBGRADE TREATMENT

4-300.00 CRITERIA FOR USE OF PERFORMANCE GRADE ASPHALT ON STATE RESURFACING AND CONSTRUCTION PROJECTS

The type of performance grade asphalt used on all state resurfacing and construction projects shall adhere to the following criteria:

Performance Grade PG64-22 Asphalt is to be used on all state resurfacing projects and construction projects with current ADT less than 10,000.

Performance Grade PG70-22 Asphalt is to be used on all state resurfacing projects and construction projects with current ADT greater than 10,000, and on the NHS system on SR-15 (US-64), SR-5 (US-45W), SR-43 (US-45E), and SR-22 regardless of their traffic volume.

Performance Grade PG76-22 Asphalt is to be used on all interstate resurfacing projects and construction projects. It may also be used on state resurfacing and construction projects in cases of heavy truck traffic or severe rutting. However, in order to be used on these projects, prior approval by the Director of Materials and Tests, must be given.

Performance Grade PG82-22 Asphalt is to be used on selected urban interstate projects with extremely high volumes. These projects will always be designated by the Pavement Design Section.

On all construction projects where the pavement design has been supplied by the Pavement Design Section, the designer shall check the pavement design to ensure that it concurs with this policy. This will be particularly critical on older projects when the pavement design has been supplied some time ago. If the designer finds a deviation between the pavement design and this policy, they are to contact the Pavement Design Section to clarify the problem and, if necessary, to get the pavement design modified.

4-301.00 COMPUTATION OF SUBGRADE TREATMENT (GRANULAR)

Item No. 301-01 Aggregate for Subgrade Treatment

$$\text{Compacted volume (C.Y.)} \times 2.03 \text{ Tons/C.Y.} = \text{Tons}$$

4-302.00 COMPUTATION OF SUBGRADE TREATMENT (LIME)

Item No. 302-01.01 Hydrated Lime

$$\frac{\text{Subgrade treatment volume (C.Y.)} \times \text{*Weight (Lb./C.Y.)} \times \text{* \%}}{2,000 \text{ Lb./Ton}} = \text{Tons}$$

* Weight to be supplied by the Pavement Design Section in Lb./C.Y.

* % to be supplied by the Pavement Design Section to be used in decimal form (for example, 5% = 0.05).

NOTE: To be used only when specifically recommended.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Item No. 302-02 Bituminous Material (S. T. Lime)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.20 \text{ Gal./Sq. Yd.}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

INFORMATIONAL: Subsection 302.08 of the Standard Specifications requires slurry application unless otherwise shown on plans. If dry application is specified by the Pavement Design Section, it shall be necessary to footnote pay items.

4-303.00 COMPUTATIONS FOR MINERAL AGGREGATE BASE

Item Nos. 303-01, *303-01.08, *303-01.09 and 303-02

Loose weight of material = 2,900 Lb./C.Y.

$$\frac{2,900 \text{ Lb./C.Y.} \times 1.4}{2,000 \text{ Lb./ Ton}} = 2.03 \text{ Tons/C.Y.}$$

Compacted volume (C.Y.) x 2.03 Tons/C.Y. = Tons

* To be used normally when the blending of two or more materials (for example, gravel and chert, etc.) is specified.

Item No. 303-01.01 Granular Backfill (Roadway)

Compacted volume (C.Y.) x 1.75 Tons/C.Y. = Tons

Item No. 303-01.03 Granular Backfill (Retaining Walls)

Compacted volume (C.Y.) x 1.75 Tons/C.Y. = Tons

Item No. 502-05 Calcium Chloride Type 1

Total aggregate (Tons) x 0.06 Bag/ Ton = Bags

Item No. 303-10.01 Mineral Aggregate (Size 57)

Loose weight of material = 2,619 Lbs./C.Y.

$$\frac{2,619 \text{ Lb./C.Y.} \times 1.02}{2,000 \text{ Lb./ Ton}} = 1.34 \text{ Tons/C.Y.}$$

Uncompacted volume (C.Y.) x 1.34 Tons/C.Y. = *Tons

* To be used for fill material between concrete median barriers at areas requiring bridge pier protection in the median (See Standard Drawing Nos. S-MB-2 and S-MB-4).

$$\frac{2,619 \text{ Lb./C.Y.} \times 1.14}{2,000 \text{ Lb./ Ton}} = 1.49 \text{ Tons/C.Y.}$$

Compacted volume (C.Y.) x 1.49 Tons/C.Y. = **Tons

** To be used when called for with erosion prevention and sediment control structures.

Item No. 303-10.03 through 303-10.06 Mineral Aggregate (Specify Size)

Compacted volume (C.Y.) x 1.75 Tons/C.Y. = Tons

4-303.05 GRANULAR BACKFILL FOR STRUCTURES

It will no longer be necessary to obtain backfill quantities from the Structures Division. Item Nos. 303-01.01, Granular Backfill (Roadway) and 303-01.03, Granular Backfill (Retaining Walls), will be used for backfilling structures that are included on the Estimated Roadway Quantities sheet only (such as box and slab type culverts and bridges, gravity type retaining walls, etc.). If there is a separate Box Bridge Quantity Block, do not list the item in that block.

For backfilling of structures, where the structure quantities are included in estimated structure items, Item No. 303-01.02, Granular Backfill (Bridges) will be used, and it will be listed on the Estimated Structures Quantity sheet only. It cannot be used in the roadway quantities.

4-304.00 COMPUTATIONS FOR SOIL-CEMENT BASE

Item No. 304-01.02 Cement (Soil-Cement Base)

Volume of New Material x 1.300 (Shrinkage Factor) = Volume of Select Material (C.Y.)

$$\frac{94 \text{ Lb./C.F.} \times 27 \text{ C.F./C.Y.}}{2,000 \text{ Lb./Ton}} = 1.269 \text{ Tons/C.Y.}$$

Total Volume C.Y. x 1.269 Tons/C.Y. x 9% (Volume of Select Material) = Tons
12% (In-place Soil)

Item No. 304-02 Bituminous Material (Soil-Cement Base)

$$\frac{\text{Surface area (Sq.Yd.)} \times 0.2 \text{ Gal./ Sq. Yd.}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

4-307.00 COMPUTATIONS FOR BITUMINOUS PLANT MIX BASE (HOT MIX)

PG64-22 Base Mixes (Grading "A")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-01.01}$$

NOTE: 1 inch per square yard weighs 115 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG64-22 Base Mixes (Grading "A-S")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons} \text{ Item 307-01.02} \\ \times 0.9675 = \text{Tons} \text{ Item 307-01.03} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

PG64-22 Base Mixes (Grading "A-CRL")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons} \text{ Item 307-01.04} \\ \times 0.9675 = \text{Tons} \text{ Item 307-01.05} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

PG64-22 Base Mixes (Grading "B")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-01.06}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG64-22 Base Mixes (Grading "B-M")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-01.07}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG64-22 Base Mixes (Grading "B-M2")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-01.08}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG64-22 Base Mixes (Grading "C")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,960 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-01.09}$$

NOTE: 1 inch per square yard weighs 110 ± pounds

PG64-22 Base Mixes (Grading "C-W")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,960 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-01.10}$$

NOTE: 1 inch per square yard weighs 110 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG64-22 Base Mixes (Grading "CS")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons Item 307-01.15}$$

NOTE: Application rate of 40 pounds (depth of 0.35") per square yard shall be used unless otherwise specified.

NOTE: 1 inch per square yard weighs 115 ± pounds

PG64-22 Base Mixes (For 0.75" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons Item 307-01.13}$$

NOTE: 1 inch per square yard weighs 106 ± pound

PG64-22 Base Mixes (For 1" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons Item 307-01.14}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG70-22 Base Mixes (Grading "A")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons Item 307-02.01}$$

NOTE: 1 inch per square yard weighs 115 ± pounds

PG70-22 Base Mixes (Grading "A-S")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons Item 307-02.02} \\ \times 0.9675 = \text{Tons Item 307-02.03} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

PG70-22 Base Mixes (Grading "A-CRL")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons Item 307-02.04} \\ \times 0.9675 = \text{Tons Item 307-02.05} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG70-22 Base Mixes (Grading "B")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-02.06}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG70-22 Base Mixes (Grading "B-M")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-02.07}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG70-22 Base Mixes (Grading "B-M2")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-02.08}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG70-22 Base Mixes (For 0.75" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307.02.13}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

PG70-22 Base Mixes (For 1" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-02.14}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG76-22 Base Mixes (Grading "A")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.01}$$

NOTE: 1 inch per square yard weighs 115 ± pounds

PG76-22 Base Mixes (Grading "A-S")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons} \quad \text{Item 307-03.02} \\ \times 0.9675 = \text{Tons} \quad \text{Item 307-03.03} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG76-22 Base Mixes (Grading "A-CRL")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.0325 = \text{Tons} \text{ Item 307-03.04} \\ \times 0.9675 = \text{Tons} \text{ Item 307-03.05} \end{array}$$

NOTE: One inch per square yard weighs 90 ± pounds

PG76-22 Base Mixes (Grading "B")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.06}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG76-22 Base Mixes (Grading "B-M")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.07}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG76-22 Base Mixes (Grading "B-M2")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.08}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

PG76-22 Base Mixes (Grading "C")

$$\frac{\text{Compacted volume (C.Y.)} \times 3,960 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.09}$$

NOTE: 1 inch per square yard weighs 110 ± pounds

PG76-22 Base Mixes (For 0.75" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307.03.13}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

PG76-22 Base Mixes (For 1" Superpave Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-03.14}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PG82-22 Base Mixes (Grading "B-M2")

$$\frac{\text{Compacted volume (C.Y.)} \times 4,068 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-04.08}$$

NOTE: 1 inch per square yard weighs 113 ± pounds

Crumb Rubber Mod. Base Mixes (GAP Grading Mix)

$$\frac{\text{Compacted volume (C.Y.)} \times 4,140 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 307-20.01}$$

NOTE: 1 inch per square yard weighs 115 ± pounds

4-308.00 COMPUTATIONS FOR BITUMINOUS COATED AGGREGATE BASE (PLANT MIX)

Item Nos. 308-01 (Mix No. 1) and 308-02 (Mix No. 2) Cold Mixes

$\frac{\text{Compacted volume (C.Y.)} \times 3240 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}}$	= Tons	x 0.965 = Tons	Item 308-01.01
			Item 308-02.01
		x 0.035 = Tons	Item 308-01.02
			Item 308-02.02

NOTE: 1 inch per square yard weighs 90 ± pounds

Place a footnote under the quantity block referring to Item No. 308-01.01 reading as follows:

"Includes approximately 40 pounds per square yard of choker stone for each 3.5 inch layer."

Place a footnote under the quantity block referring to Item No. 308-02.01 reading as follows:

"Includes approximately 30 pounds per square yard of choker stone for each 2.5 inch layer."

Mix No. 1 shall be specified for layers 3 inch thick or more and Mix No. 2 for layers less than 3 inches.

4-309.00 COMPUTATIONS FOR AGGREGATE-CEMENT BASE COURSE - LIMESTONE

Item No. 309-01.01 Mineral Aggregate (A-CBC)

Compacted volume (C.Y.) x 1.9456 Tons/C.Y. = Tons

Item No. 309-01.02 Portland Cement (A-CBC)

Compacted volume (C.Y.) x 0.0751 Tons/C.Y. = Tons

Item No. 309-02 Bituminous Material (A-CBC)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.20 \text{ Gal./Sq. Yd.}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

4-309.01 COMPUTATIONS FOR AGGREGATE-CEMENT BASE COURSE - GRAVEL

Item No. 309-01.01 Mineral Aggregate (A-CBC)

Compacted volume (C.Y.) x 1.8145 Tons/C.Y. = Tons

Item No. 309-01.02 Portland Cement (A-CBC)

Compacted volume (C.Y.) x 0.0884 Tons/C.Y. = Tons

Item No. 309-02 Bituminous Material (A-CBC)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.20 \text{ Gal./Sq. Yd.}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

4-312.00 COMPUTATIONS FOR AGGREGATE-LIME-FLY ASH STABILIZED BASE COURSE

Item No. 312-01 Mineral Aggregate (ALFSB)

Compacted volume (C.Y.) x 1.690 Tons/C.Y. = Tons

Item No. 312-02 Lime

Compacted volume (C.Y.) x 0.0643 Tons/C.Y. = Tons

Item No. 312-03 Fly-Ash

Compacted volume (C.Y.) x 0.2019 Tons/C.Y. = Tons

Item No. 312-04 Bituminous Material (ALFSB)

$$\frac{\text{Surface area (Sq. Yd.)} \times 0.20 \text{ Gal./Sq. Yd.}}{231 \text{ Gal./ Ton}}$$

CHAPTER 4 - FLEXIBLE SURFACES

4-400.00 PAVING POLICY - RESURFACING

This policy is for paving on intersections with public roads, private drives, field entrances and business entrances.

1. Public Roads (non curb and gutter)

Public road intersections will be resurfaced a paver width through the intersection as a minimum. Should the pavement of the intersecting road be distressed, the resurfacing width may be increased to the normal right-of-way.

2. Public Roads (curb and gutter section)

On curb and gutter sections, public road intersections will be resurfaced to the end of radius.

3. Private drives, field entrances and business entrances (no curb and gutter).

Private driveways, field entrances, and business entrances will be resurfaced a paver width (lane width) as a minimum. A pavement taper to transition the new pavement shall be required, it shall be based on an additional 1 foot of width per 1 inch depth of pavement. If the shoulder is narrow enough that the sum of the shoulder and transition is less than a paver width (lane width), the transition shall occur within the paver width. If the sum of the shoulder and the transition is greater than a paver width (lane width), the transition shall occur outside of the paver width.

4. Private drives and business entrances (curb and gutter section).

For urban typical sections (curb and gutter), a minimum width of material not to exceed 1 foot will be used to feather the pavement edge.

4-400.03 PERFORMANCE GRADE MIX

When a Performance Grade Mix is called for on resurfacing plans, the Item Number on the Quantity Sheet shall be referenced with the following footnote:

"The contractor has the option of using the Performance Grade Mix or regular asphalt on the paving of driveways and business entrances."

4-400.05 HERBICIDE USE IN EMULSIFIED ASPHALT - RESURFACING

The following note shall be used on all State resurfacing projects (except those using any latex modified products) which have bituminous surface treatment on the shoulders.

"The contractor is to furnish the herbicide, PRIMATOL 25-E, and add it to the asphalt emulsion used in constructing the first course on bituminous surface treated shoulders. The Primatol shall be added at the rate of 15 gallons per 1,200 gallons of emulsion. Empty containers of herbicide are to be properly disposed of by the contractor outside the project site area. All costs associated with the addition of the herbicide shall be included in the cost of other items."

This note applies to double bituminous surface treatment and/or single bituminous surface treatment only. This note will not apply for the use of regular hot mix on the shoulders.

4-402.00 COMPUTATIONS FOR PRIME COAT

Item No. 402-01 Bituminous Material for Prime Coat (PC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./Sq. Yd)}}{**231 \text{ Gal./ Ton}} = \text{Tons}$$

* Rate 0.30 - .35 Gal./Sq. Yd.

** When Tar only is specified use 213 Gal./ Ton

Item No. 402-02 Aggregate for Cover Material (PC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Lb./ Sq. Yd.)}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

* Rate 8 - 12 Lb./Sq. Yd.

4-403.00 COMPUTATIONS FOR TACK COAT

Item No. 403-01 Bituminous Material for Tack Coat (TC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{0.02 (Gal./Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

Item No. 403-02 Asphalt Cement for Tack Coat (TC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{0.05 (Gal./Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

4-404.00 COMPUTATIONS FOR DOUBLE BITUMINOUS SURFACE TREATMENT

Item No. 404-01.01 Bituminous Material for Double Bituminous Surface Treatment (DBST)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./ Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

* Rate 0.68 - 0.84 Gal./ Sq. Yd.

Item No. 404-01.02 Mineral Aggregate for Double Bituminous Surface Treatment (DBST)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*Rate (Lb./ Sq. Yd.)}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

* Rate 40 - 58 Lb./ Sq. Yd.

4-405.00 COMPUTATIONS FOR BITUMINOUS SEAL COAT (CHIP SEAL)

Item No. 405-01.01 Bituminous Material for Bituminous Seal Coat (BSC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./ Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

* Rate 0.26 - 0.36 Gal./ Sq. Yd. (GENERAL USE)

* Rate 0.10 - 0.25 Gal./ Sq. Yd. (MILLING - COLD PLANING)

Item No. 405-01.02 Mineral Aggregate for Bituminous Seal Coat (BSC)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Lb./Sq. Yd.)}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

* Rate 16 - 26 Lb./Sq. Yd. (GENERAL USE)

* Rate 0 - 12 Lb./Sq. Yd. (MILLING - COLD PLANING)

On all projects where a bituminous seal coat is placed after milling of the existing surface, use rate as specified above unless otherwise advised in pavement design as submitted from the Special Design Section. After the bituminous seal coat is placed, a tack coat (see section 4-403.00, Item No. 403-01) is to be used prior to the placement of the first lift of proposed pavement.

4-405.01 USE OF BITUMINOUS SEAL COAT (CHIP SEAL) ALONG EDGE OF PAVED SHOULDER WHILE MAKING LANE SHIFTS DURING CONSTRUCTION

Application shall begin at point where the stone touches paved shoulder and extend outwardly from the paved shoulder to the point where the stone meets the subgrade. Application rate shall be computed based on 1.5 times maximum application rate for general use shown in Section 4-405.00. This will allow a quantity large enough for contractor to reapply chip seal as needed during the course of the construction operations.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Chip seal to be paid for under Item Nos. 405-01.01, Bituminous Material for Bituminous Seal Coat (BSC) per Ton, and 405-01.02, Mineral Aggregate for Bituminous Seal Coat (BSC) per Ton. Pay items to be footnoted as follows:

"Includes quantity to be used along edge of paved shoulder while making lane shifts during the course of construction in order to reduce rutting along edge of shoulder."

4-406.00 COMPUTATIONS FOR BITUMINOUS SEAL COAT (SPLIT APPLICATION)

Item No.406-01.01 Bituminous Material for Bituminous Seal Coat, Split Application (BSC-SA)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./Sq. Yd.)}}{231 \text{ Gal./ Ton}} = \text{Tons}$$

* Rate 0.46 - 0.54 Gal./ Sq. Yd.

Item No. 406-01.02 Aggregate for Bituminous Seal Coat, Split Application (BSC-SA)

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Lb./ Sq. Yd.)}}{2,000/ \text{Ton}} = \text{Tons}$$

* Rate 36 - 44 Lb./ Sq. Yd.

4-411.00 COMPUTATIONS FOR ASPHALTIC CONCRETE SURFACE (HOT MIX)

Item No. 411-01 Grading "D" Surface (Performance Grade PG64-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 411-01.10}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-01 Superpave Surface (Performance Grade PG64-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.06 = \text{Tons} \quad \text{Item 411-01.03} \\ \times 0.94 = \text{Tons} \quad \text{Item 411-01.04} \end{array}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-01 Grading "E" Surface (Performance Grade PG64-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,870 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 411-01.11}$$

NOTE: 1 inch per square yard weighs 107.5 ± pounds

Item No. 411-01 Grading "E" Shoulders (Performance Grade PG64-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,708 \text{ Lb./C.Y.}}{2,000 \text{ Lb./ Ton}} = \text{Tons} \quad \text{Item 411-01.07}$$

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

NOTE: 1 inch per square yard weighs 103 ± pounds
Item No. 411-02 Grading "D" Surface (Performance Grade PG70-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 411-02.10}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-02 Superpave Surface (Performance Grade PG70-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.06 = \text{Tons} \quad \text{Item 411-02.03} \\ \times 0.94 = \text{Tons} \quad \text{Item 411-02.04} \end{array}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-02 Grading "E" Surface (Performance Grade PG70-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,870 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 411-02.11}$$

NOTE: 1 inch per square yard weighs 107.5 ± pounds

Item No. 411-03 Grading "D" Surface (Performance Grade PG76-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 411-03.10}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-03 Superpave Surface (Performance Grade PG76-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \begin{array}{l} \times 0.06 = \text{Tons} \quad \text{Item 411-03.03} \\ \times 0.94 = \text{Tons} \quad \text{Item 411-03.04} \end{array}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

Item No. 411-04 Grading "D" Surface (Performance Grade PG82-22)

$$\frac{\text{Compacted volume (C.Y.)} \times 3,816 \text{ Lb./C.Y.}}{2,000 \text{ Lb./Ton}} = \text{Tons} \quad \text{Item 411-04.10}$$

NOTE: 1 inch per square yard weighs 106 ± pounds

4-411.02 RAISED BITUMINOUS RUMBLE STRIPS

Raised bituminous rumble strips are a traffic warning device. Raised bituminous rumble strips will require a detail to be furnished in the plans. This type of rumble strip is to be used for warning or unexpected stop conditions and shall not be used routinely as a shoulder treatment. At approaches to narrow bridges, where the shoulder width is less than the normal roadway shoulder width, the raised bituminous rumble strip may be used to warn the motoring public of this roadway condition.

4-411.03 RUMBLE STRIPS

Scored rumble strips are a traffic warning device, and when required, shall be constructed in accordance with Standard Drawings T-M-15 and T-M-15A or as shown on the plans. Raised bituminous rumble strips and scored rumble strips are the two types of rumble strips normally used in Tennessee.

Scored rumble strips and scored rumble stripes provide an audible warning to vehicles leaving the travel lane. Unlike a scored rumble stripe which is placed at the edge line location, a scored rumble strip is placed on the shoulder adjacent to the travel lane and edge line.

Refer to Section 4-716.15 for guidelines for placement of rumble strips on shoulders. Scored shoulders will be constructed on asphalt or concrete shoulders. Asphalt shoulders must have a minimum depth of pavement of one and one-half inches. Scored shoulders should also be omitted adjacent to ramps, acceleration and deceleration lanes including tapers and along the radius of side road approaches, entrances and median crossovers.

Rumble strips shall be specified on all new construction and resurfacing projects on the Interstate System and access controlled state routes. Both the inside and the outside shoulders shall be scored. The scored rumble strip shall be constructed in accordance with Standard Drawing T-M-15. Rumble strips are to be paid for under Item No. 411-12.01, Scoring Shoulders (Continuous) (16 inch Width), L.M. For estimating purposes, the item will be measured longitudinally along the edge of each shoulder and will usually be four (4) times the project length less deductions for entrance and exit ramps, public roads, and bridges. When concrete shoulders are present rumble strips are to be constructed in accordance with Standard Drawing RP-CS-1 or RP-CS-2. Rumble strips on concrete shoulders shall be paid for under Item No. 501-03.03, Scoring Concrete Shoulders (Non-Continuous) (36 inch Width), L.F. The item will be measured as the actual length of pavement scored along each shoulder.

Refer to Section 4-716.15 for guidelines for placement of rumble strips on non-access controlled state routes. When rumble strips are placed on non-access controlled routes, paved shoulders should be 8ft. or wider. A 30 foot rumble will be followed by a 10 foot gap in the rumble to allow for bicycles to cross without having to traverse the rumble strip. Rumble strips should normally only be placed on rural routes with posted speeds of 45 mph or greater. Rumble strips may be used on urban routes where accident history or other factors warrant the placement. When placed on urban routes, designers should give consideration to expected bicycle traffic and noise generated. The scored rumble strip shall be constructed in accordance with Standard Drawing T-M-15A. Rumble strips are to be paid for under Item No. 411-12.02, Scoring Shoulders (Non-continuous) (16 inch Width), L.M. The item will be measured and paid as the actual length of pavement scored along each shoulder. Rumble strips should be omitted on shoulders adjacent to

designated bike lanes and may also be omitted from locations recommended by the TDOT bicycle coordinator.

4-411.04 RUMBLE STRIPES

Rumble stripes are a traffic warning device, and when required, shall be constructed in accordance with Standard Drawing T-M-16. A scored rumble stripe is a scored rumble placed along the outside edge line of the travel lane with the edge line placed along the scored rumble.

Refer to Section 4-716.15 for guidelines for the placement of rumble stripes. Rumble strips should normally only be placed on rural routes with posted speeds of 40 mph or greater. The rumble stripe shall consist of a 30 foot scored rumble followed by a 10 gap to allow for bicycles to cross without having to traverse the rumble. Rumble stripes may be used on urban routes where accident history or other factors warrant the placement. When placed on urban routes, designers should give consideration to expected bicycle traffic and noise generated.

Scored rumble stripes are to be paid for under Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8 inch Width), L.M. or Item No. 411-12.04, Scoring for Rumble Stripe (Non-Continuous (4 inch Width), L.M. The item will be measured and paid as the actual length of pavement scored along each shoulder.

When rumble stripes are specified, pavement markings shall be Spray Thermoplastic (60 mil). Enhanced Flatline Thermoplastic Markings shall not be used. Striping is to be paid for under the appropriate pavement marking item number. Rumble stripes should be omitted on shoulders adjacent to designated bike lanes and may also be omitted from locations recommended by the TDOT bicycle coordinator.

4-411.05 RIDEABILITY SPECIFICATIONS

For all projects having asphaltic concrete surface Grading "D", a determination shall be made as to whether or not the rideability specification shall be included in the contract. This determination will be made by the State Construction Office after the plans have been submitted.

4-414.05 COMPUTATIONS FOR MICRO-SURFACING

Item No. 414-03.01 Emulsified Asphalt for Micro-Surfacing

$$0.12 \times \text{Below aggregate quantity} = \text{Tons}$$

NOTE: Application rate based on 12 percent of the dry weight of the aggregate.

Item No. 414-03.02 Aggregate for Micro-Surfacing

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{XX Lb./ Sq. Yd.}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

NOTE: Application rate of 30 pounds (approximate depth 0.375") per square yard shall be used if plans require a leveling mixture (14 pounds per square yard) and a surface

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

mixture (16 pounds per square yard) to be placed, or 22 pounds (approximate depth 0.275") per square yard if only a surface mixture is to be placed, unless otherwise specified.

Item No. 403-01 Bituminous Material for Tack Coat (TC) to be used with Micro-Surfacing

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{*rate (Gal./ Sq. Yd.)}}{231 \text{ Gal./ Sq. Yd.}} = \text{Tons}$$

* Rate 0.05 - 0.10 (Gal./Sq. Yd.)

4-415.00 COLD PLANING OF BITUMINOUS PAVEMENT

On projects having 2,000 Tons or more of cold planed material, it shall be paid for by the Ton. This shall be calculated using 105 Lb./S.Y./Inch of estimated depth to be cold planed, converted to Tons.

This shall be measured and paid for under Item No. 415-01.01, Cold Planing of Bituminous Pavement per Ton.

On projects where the required depth of cold planing is known and the quantity is less than 2,000 Tons, it may be paid for by the square yard. The Regional Construction Office shall be consulted prior to using this unit of measure. Depth of Cold Planing must be specified on the plans.

This shall be measured and paid for under Item No. 415-01.02 Cold Planing of Bituminous Pavement per Square Yard.

On projects having less than 2,000 Tons of cold planed material, and where no scales are readily available (check with the Regional Construction Office), and the required depth is not known, it shall be paid for by the cubic yard.

This shall be measured and paid for under Item No. 415-01.03, Cold Planing of Bituminous Pavement per Cubic Yard.

CHAPTER 5 - RIGID PAVEMENT

4-501.00 PORTLAND CEMENT CONCRETE PAVEMENT (See 4-905.00)

4-502.00 COMPUTATIONS FOR UNDERSEALING CONCRETE PAVEMENT

NOTE: The quantities are listed in the order of computation procedure.

Item No. 502-02 Holes

$$\frac{\text{Length of project (ft) x number of lanes x 4 holes/slab}}{\text{Length of slabs}} = \text{Each}$$

Item No. 502-10 Cement-Fly Ash Grout

- (a) Cubic feet/hole x number of holes = Cubic Feet
- (b) Use one of the following values as directed on the Construction Field Review:
 - 1. Concrete pavement in worse than average condition.
0.4 - 0.5 cubic feet/hole
 - 2. Concrete pavement in average condition.
0.4 cubic feet/hole
 - 3. Concrete pavement in better than average condition.
0.3 - 0.4 cubic feet/hole

NOTE: Pavement with cement-treated bases shall fall within the better than average range.

CHAPTER 6 - STRUCTURES

4-604.00 TYPE DESIGNATION FOR CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES

The plans must clearly indicate for each culvert or bridge, the type (box or slab) on which the quantities are based. This should be accomplished by showing a column in the tabulation block for culverts or bridges, indicating the type.

The current Standard Drawings for box or slab type culverts or bridges are found in the Standard Structure Drawings. Special or new designs may be requested through the proper channels from the Structures Division.

The Standard Drawing Index Sheet for all projects having either concrete box and/or slab culverts or bridges shall include the following:

Standard Drawing numbers STD-15-1 through STD-15-6, STD-15-8, STD-15-9, STD-15-12 through STD-15-15, STD-15-19, STD-15-20, and STD-15-25 through STD-15-29 will be used on all structures.

Standard Drawing STD-15-10 will be used when the structure is on 90 or 75 degree skew.

Standard Drawing STD-15-11 will be used when the structure is on 60 or 45 degree skew.

Standard Drawing STD-15-24 will be used for all skews other than 90 degrees.

In addition to these drawings, the designer will use the appropriate STD-15 series of drawings showing the particular structures that apply to the project.

4-604.05 PRECAST, PRESTRESSED BRIDGE DECK PANELS

Precast, prestressed bridge deck panels will not be allowed to be used on concrete box or slab type culverts.

4-604.10 PAVED APRON FOR BOX CULVERT AND BRIDGE OUTLETS

Use Standard Drawing STD-15-16 on all concrete box culverts and bridges in Region IV. This drawing may be used in selected locations in Regions I, II, and III, if requested by the Structures or Design Division during the Construction Field Review.

The quantities shall be added to the concrete and steel quantities for the box culvert or bridge. Footnote these quantities to show the amount of concrete and steel bar reinforcement included for the paved aprons. The steel bar reinforcement may be computed using a weight of 58 pounds per 100 square feet of apron, plus the weight of the A-400 bars.

4-604.20 CONCRETE BOX AND SLAB TYPE CULVERTS AND BRIDGES IN SHALLOW FILLS

On concrete box and slab type culverts and bridges where there is little or no fill to be placed on top of the structure and/or there are significant effects on construction due to grades, superelevation or curvature, the designer shall place information on the plans as follows:

- A. Where the horizontal curvature of the roadway, as opposed to the normally straight nature of the inlet and outlet, is sufficient that the guardrail may encroach on the shoulder and/or roadway (Figure 4-14), the designer shall investigate the need to have the inlet and outlet constructed on a curve parallel to the centerline of the roadway.

If curved inlets and/or outlets are required, a note similar to the one below shall be placed on the culvert section.

"The inlet and outlet ends of the box culvert at Sta. ____ shall be curved parallel to the centerline of the roadway."

- B. Where grades and/or superelevation cause significant effects on construction, the designer shall show the following additional details and elevations on the culvert drainage section as shown in Figure 4-15:
 1. Add detail of box showing flow line, top of wall and top of slab adjacent to vertical walls on both inlet and outlet ends.
 2. Show elevations of top of curb and top of wingwalls to suit roadway grades and superelevation. The height of curb may vary; but shall not exceed a height of 2.5 feet above the top of the box. In the event this occurs, the designer will contact the Structures Division (Hydraulics Section) to work out the problem.
 3. Provide a cross-section of the roadway on top of the box showing the asphalt paving needed on the box to obtain the roadway grade and proper pavement cross slope. See Figure 4-16.
 4. Show crown or superelevation when the concrete top slab is to be the riding surface.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- C. On box and slab type culverts and bridges with less than 1 foot of fill (with fill defined as embankment, base and pavement), the designer will be responsible for computing all concrete and reinforcing steel quantities accordingly. The correction factor for the adjustment of reinforcing steel quantities, based on the modifications of vertical height by the designer, is included in Table 4-1 (See associated Figure 4-17). The Structures Division will assist the designer in these calculations, if he or she requires assistance.

- D. If the top slab is to be used as the riding surface, and the Design Speed is less than 40 mph, the following note shall be added to the plans.

“Bridge deck finish to be burlap drag in accordance with method “A” as specified in Subsection 604.23 of the *Tennessee Department of Transportation Standard Specifications*.”

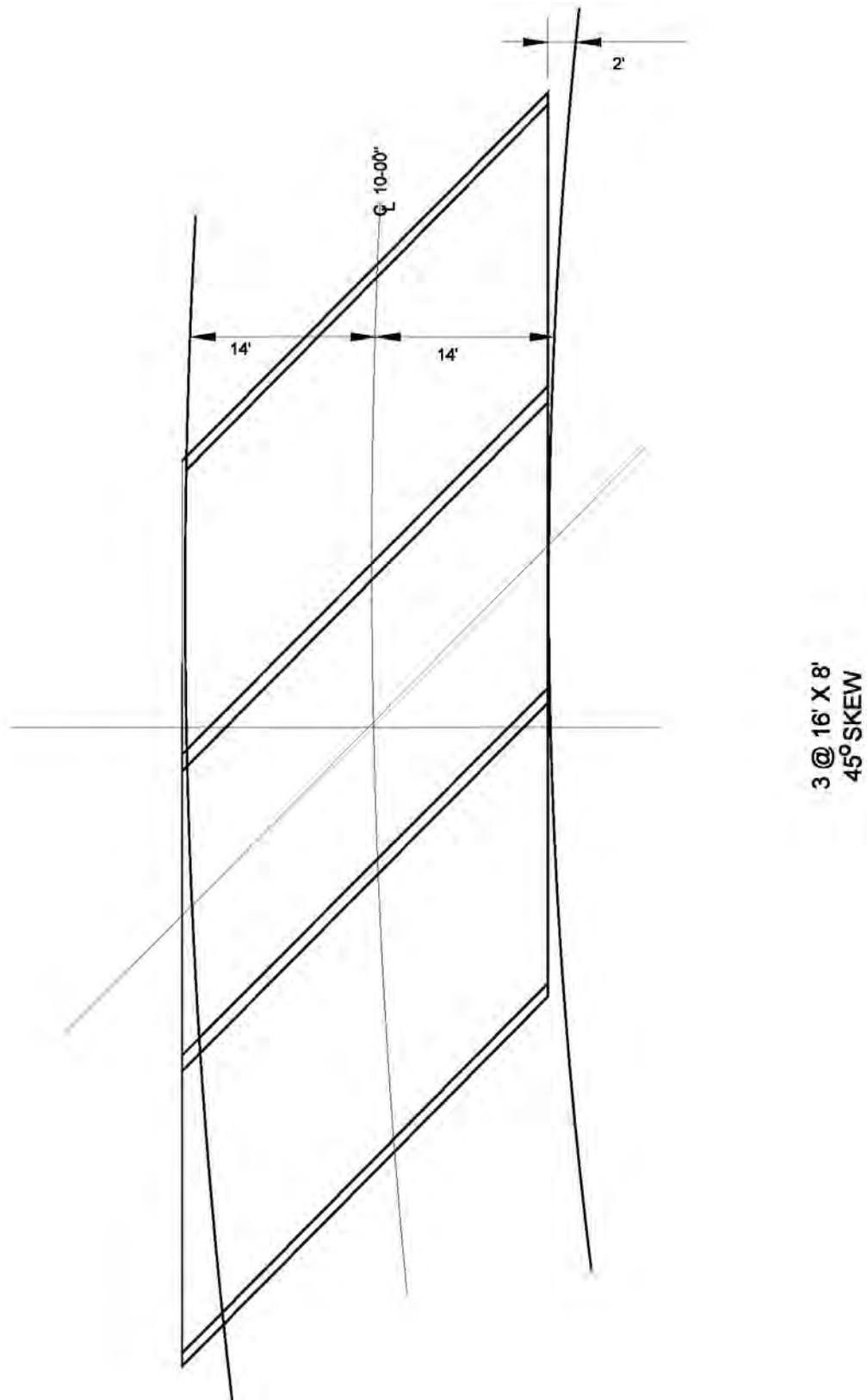


Figure 4-14
Potential Guardrail Encroachment

BOX BRIDGE OR CULVERT ELEVATIONS																
STATION	TOP OF CURB ELEV.				TOP OF SLAB ELEV.				FLOW LINE ELEV.				TOP OF WING ELEV.			
	ELEV. A-1	ELEV. A-2	ELEV. A-3	ELEV. A-4	ELEV. B-1	ELEV. B-2	ELEV. B-3	ELEV. B-4	ELEV. C-1	ELEV. C-2	ELEV. C-3	ELEV. C-4	ELEV. D-1	ELEV. D-2	ELEV. D-3	ELEV. D-4

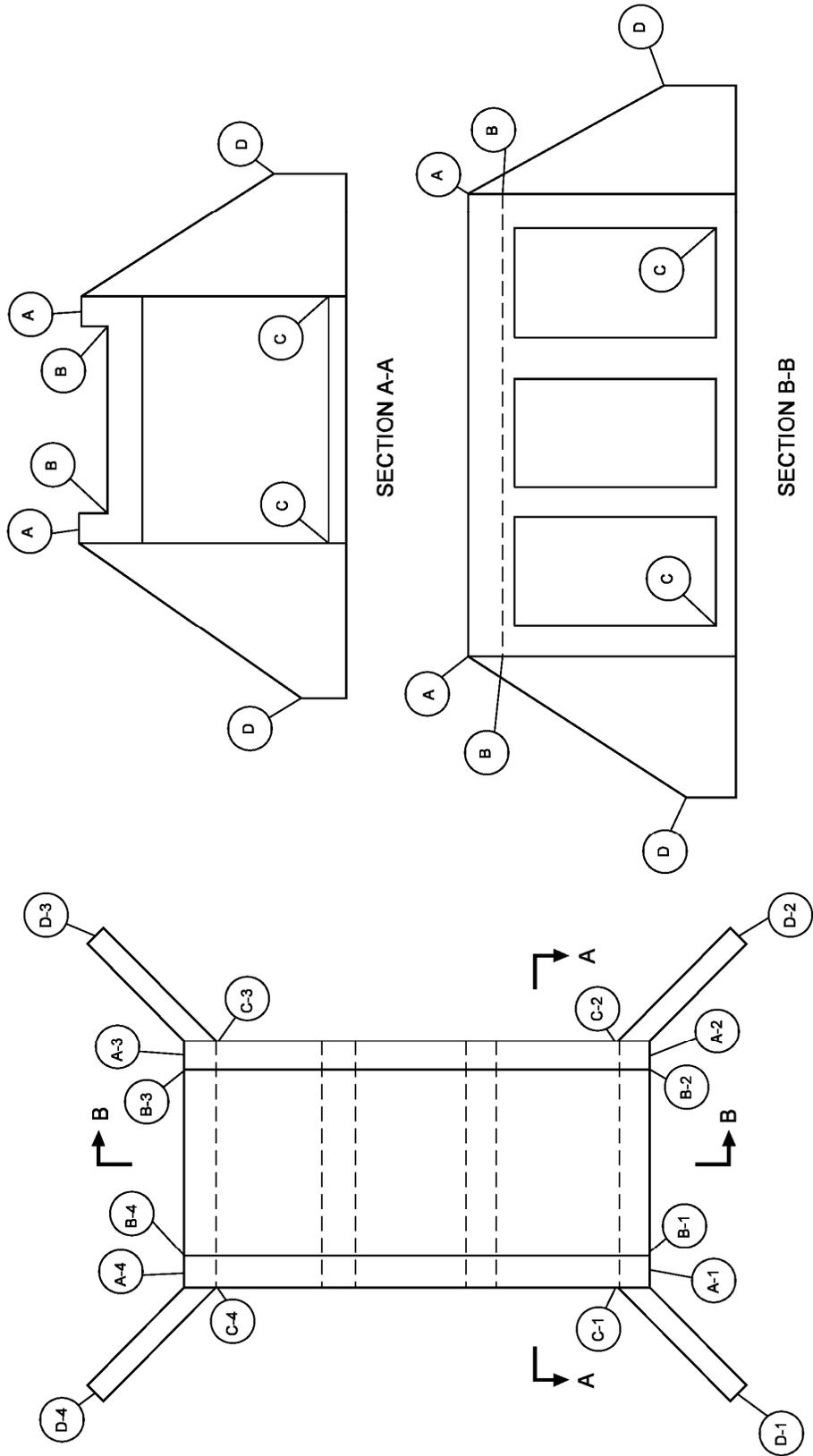


Figure 4-15
Box Bridge or Culvert Elevation Details

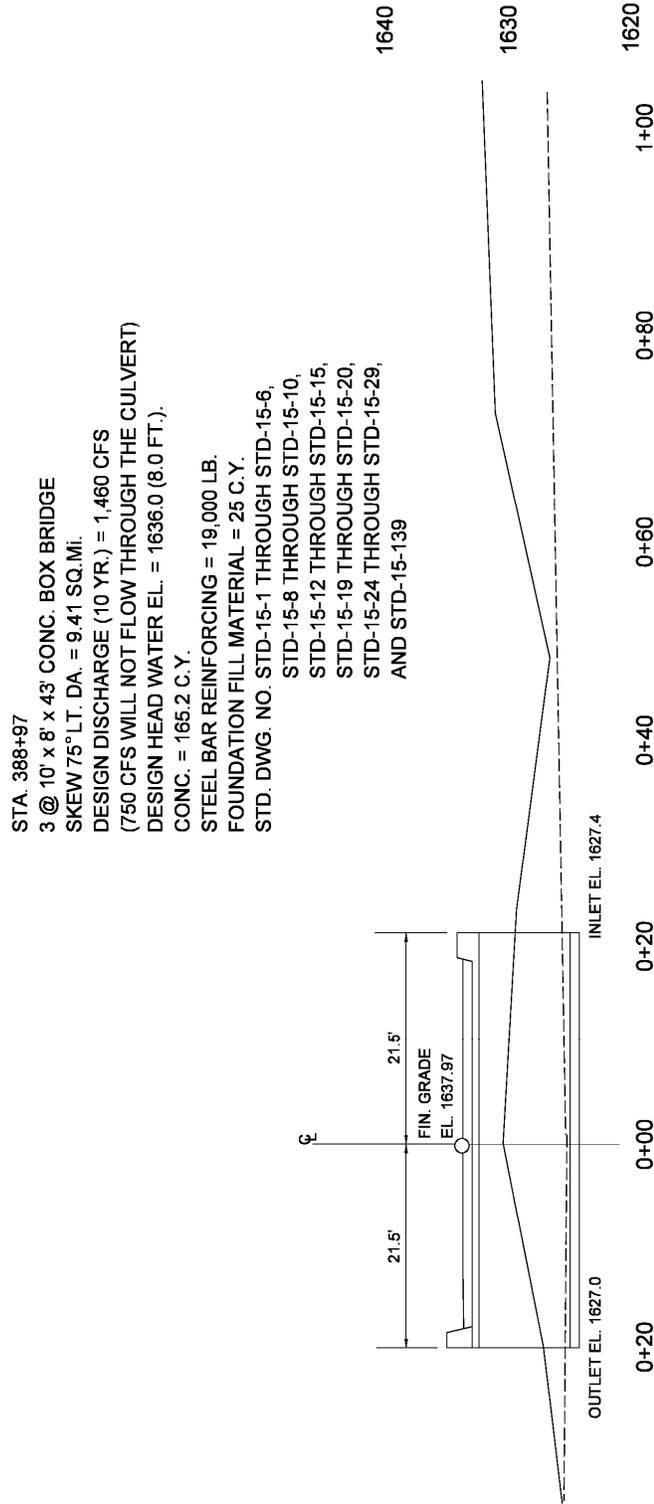


Figure 4-16
 Typical Cross-Section Information for Box and Slab Type Culverts and Bridges

ADJUSTMENT FACTOR FOR ESTIMATING ADDITIONAL REINFORCING STEEL QUANTITIES IN THE VERTICAL WALLS OF CONCRETE BOX OR SLAB TYPE CULVERTS OR BRIDGES		
SPAN WIDTH IN FEET	*EXTERIOR WALL IN LB./L.F./V.F.	*INTERIOR WALL IN LB./L.F./V.F.
8	2.27	1.33
10	2.45	1.50
12	2.94	1.71
14	3.94	2.17
16	3.94	2.17
18	3.94	2.17

* ADDITIONAL POUNDS OF REINFORCING STEEL IN VERTICAL WALLS BASED ON POUNDS PER LINEAR FOOT ONE FOOT IN HEIGHT FOR ANY NUMBER OF BARRELS ON ANY SKEW. THIS TABLE IS GOOD FOR AN INCREASE IN WALL HEIGHT NOT EXCEEDING TWO FEET AND FILL HEIGHTS NOT EXCEEDING TWO FEET.

Table 4-1
Adjustment Factor for Estimating Additional Reinforcing Steel Quantities in the Vertical Walls of Concrete Box or Slab Type Culverts or Bridges

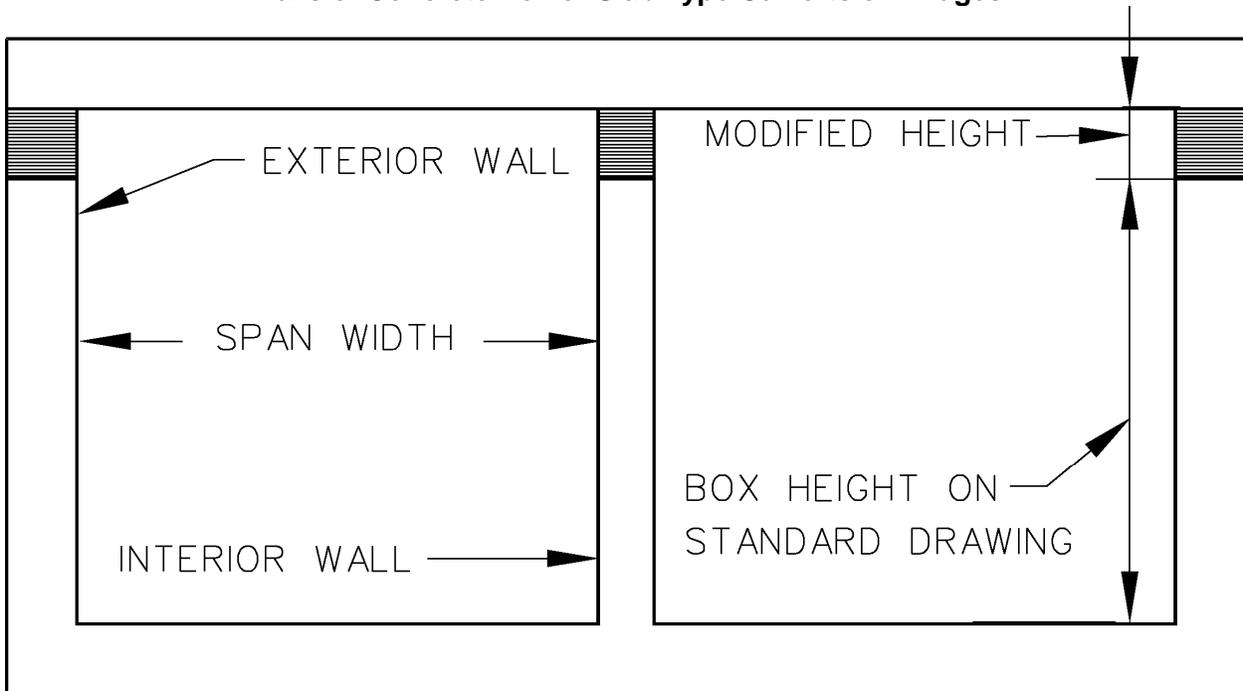


Figure 4-17
Typical Concrete Box or Slab Type Culvert or Bridge Modification

4-604.25 STEEL BAR REINFORCEMENT (ROADWAY)

On all projects which include reinforced concrete box or slab type culverts or bridges, Standard Drawing No. STD-9-1, Standard Reinforcing Bar Support Details for Concrete Slabs, shall be listed on the appropriate culvert sheets and in the index.

If the top slab used on concrete box or slab type culverts or bridges is to be used as a riding surface or has less than 1 foot of fill over it, then epoxy-coated reinforcing steel is to be used in the top mat of the top slab and curbs, including tie bars for curbs and corner bars of the exterior walls. All other steel is to be in the form of black bars. The unit cost bid for Item No. 604-02.02, Steel Bar Reinforcement (Box Bridges), is to include any additional cost for epoxy-coated steel as noted on plans details or Standard Drawings.

If the project has a reinforced concrete deck bridge, this drawing will appear in the bridge index and it will not be necessary to list it again in the roadway index.

4-604.30 CULVERT EXCAVATION FOR BOX OR SLAB TYPE CULVERTS OR BRIDGES
(See 4-203.35 and 4-204.05)

4-604.35 CHANNEL EXCAVATION FOR BOX OR SLAB TYPE CULVERTS OR BRIDGES
(See 4-203.35)

4-604.40 STOCK PASSES (See 3-240.00)

4-611.00 CHECKING OF DRAINAGE PLANS PRIOR TO CONSTRUCTION

Before finalizing drainage plans, the designer is to ensure that the drainage portion of their Construction Plans is consistent with current standard drawings. This will consist of making sure that the invert elevations shown on the proposed plan sheets facilitate the use of standard small drainage structures. The designer is to use the same invert drop across the structures that are used on the standard drawings. This check must be completed prior to submitting the Construction Plans to the Estimating and Bid Analysis Office. It is necessary to make this adjustment in order to eliminate costly construction changes to the catch basins, manholes, junction boxes, etc.

Invert elevations are to be shown in the plans for all pipes entering and leaving these small drainage structures. The grate elevation is to be shown for all catch basins. The top of lid elevation is to be shown for all manholes. The top of slab elevation is to be shown for all junction boxes. The proper tabulation of these structures is shown in section 3-200.00.

4-611.05 BRIDGE END DRAINS

When bridge end drains are included on a project, the designer will only have to calculate quantities for **drain pipe** and **end treatment**. The Structures Division Standard Drawings STD-1-6 through STD-1-9 show a bridge end drain for structures, which have concrete approach slabs and Standard Drawings STD-1-10 through STD-1-13 show a bridge end drain for structures without concrete approach slabs. The designer shall check the preliminary structures layout sheet to see which drawings are included. On some structures, such as those having open bridge railing, bridge end drains will not be used. If there are questions about these drawings or the type of bridge end drain to use, check with the appropriate Structures Division personnel.

The length of the outlet pipe is to be measured from the outside limits of the bridge end drain pipe, which is included in the cost of the bridge drain box (as shown on Standard Drawings STD-1-7 or STD-1-11), down the slope to the end of the outlet pipe. Actual length for payment will come from measurement taken from the appropriate sheet in the Roadway Plans. It shall be paid for as Item No. 610-07.03, 18-inch Pipe Drain (Bridge Drain) per linear foot. The cost of the bridge drain outlet pipe endwall shall be paid for as Item No. 709-01.01, Rubble-Stone Rip-Rap per cubic yard. These pay items in the Estimated Roadway Quantities Block shall be footnoted as follows:

“Standard Drawing STD-1-7 (or STD-1-11) is to be used for burial of the outlet pipe and for end treatment details.”

The designer shall reference only the appropriate Standard Drawing in the above note. Standard Drawing STD-1-7 will be used in the note when the structure has a concrete approach slab. Standard Drawing STD-1-11 will be used in the note when the structure does not have a concrete approach slab.

When bridge-end drains are not required, the shoulder shall be paved full width for a distance of 25 feet past the end of the parapet, and rip-rap shall be hand placed around the guardrail for an equal distance.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

The bridge deck sealant and the wearing surface over the sealant will continue to be roadway items with the Structures Division furnishing the quantity of deck sealant as part of the bridge design.

Unless otherwise directed, the appropriate pay item for bridge deck sealant is:

Item No. 617-01 Bridge Deck Sealant per square yard

4-621.00 TEMPORARY STRUCTURES

On all construction projects having detours requiring temporary drainage structures, the designer shall use Item Nos. 621-01.01 through 621-01.10, Temporary Structures (Description-STA) per lump sum, as opposed to using the specific item numbers for each type of structure (pipe, box culvert, etc.). Item Nos. 621-01.01 through 621-01.10 shall be footnoted as follows:

"Quantity is based on minimum calculated length. Actual length required will be determined based on field conditions encountered. The bidder is responsible for verifying estimated lengths prior to submitting their bid. Additional length, if any, required by actual field measurements will be installed at no additional cost. All costs shall be included in the bid price for these items."

This footnote is for Item Nos. 621-01.01 through 621-01.10, which have been identified by the Structures Division or as needed by the design. The above footnote does not apply to any temporary structure used for a channel change or erosion prevention and sediment control.

4-625.00 ABANDONMENT OF WATER WELLS (See 4-202.13)

Item No. 625-01.01, Well Abandonment per Lump Sum, will no longer be used.

CHAPTER 7 - INCIDENTAL CONSTRUCTION

4-705.00 GUARDRAIL INSTALLATION ACROSS BOX OR SLAB TYPE CULVERTS AND CONCRETE DECK BRIDGES

The designers of the roadway plans will calculate and show estimated quantities of all W-beam guardrail across the subject structures. Some coordination may be required with the Structures Division to find out if the culvert rail is concrete parapet or W-beam guardrail.

Concrete Box or Slab Type Culverts and Bridges

If the embankment depth at the point where the guardrail post is driven is greater than or equal to 3.67 feet, use Item No. 705-02.02, "Single Guardrail (Type 2)".

If the top of the concrete slab is used as the riding surface, use Item No. 705-01.04, "Metal Beam Guard Fence", with the post bolted to the slab per Standard Drawing S-GR-22.

If the embankment depth at the point where the guardrail would normally be driven is less than 42 inches, use Item No. 705-01.04, "Metal Beam Guard Fence", with the post bolted to the top of the slab.

Note that post spacing of 3 feet-1-1/2 inches is required for Item No. 705-01.04, and that the pay length will be the sum of the number of posts bolted plus one multiplied by 3 feet-1-1/2 inches.

See Standard Drawing S-GR-22 for details of bolting post to the bridge deck or top slab.

Concrete Deck Bridges

If a concrete deck bridge has a concrete parapet wall, it shall be connected to the metal approach guardrail with Item No. 705-01.01, "Guardrail at Bridge Ends", shown on Standard Drawing S-GR-23.

If the designer has a project that has an existing concrete slope face end post as detailed on Standard Drawing SBR-2-131 and SBR-2-132, the metal rail shall be attached with Item No. 705-10.30, Guardrail Attachment to Slope Face Endpost, L.F., or an existing concrete vertical face endpost, as detailed on SBR-2-133 and SBR-2-134. The metal rail shall be attached with Item No. 705-10.31 Guardrail Attachment to Vertical Face Endpost, L.F.

If a concrete deck bridge has metal guardrail, it shall be Item No. 705-01.04, "Metal Beam Guard Fence", as shown on Standard Drawing S-GR-22.

4-705.05 GUARDRAIL END TERMINALS

On the designated state highway system, when using gating type approach end terminals, it is required to specify an end terminal that meets NCHRP 350 crash criteria. Tangential Energy Absorbing Guardrail End Terminals shall be used per Standard Drawing S-GR-43 and S-GR-44, Item No. 705-04.07.

The most desirable approach end terminal continues to be buried in backslope, Guardrail End Terminal (Type 12), Item No. 705-04.02. When it is not applicable to use this type of end terminal, a gating type, tangential energy absorbing guardrail end terminal (type 38) shall be used.

On all other roads not on the designated state highway system, including side roads to state and U.S. highways, when the current design speed exceeds 40 miles per hour, the same type of terminals meeting the NCHRP 350 crash criteria are required as stated above.

On all low speed roads not on the designated state highway system, including side roads to state and U.S. routes, when the current design speed is 40 miles per hour or less, the Slotted Rail Terminal - SRT 75 (Type 21) terminal anchor, or equal shall be used. Payment is to be made under Item No. 705-04.04 Guardrail Terminal (Type 21).

On all low speed, low volume local bridge replacement projects, standard drawing S-GR-23A should be used. The standard details the guardrail attachment at bridge ends and the minimum length of installation for low volume (current ADT \leq 400) local roads with speeds of 40 mph or less. The use of the earth pad as shown on standard drawing S-GR-39 is not required for this installation.

4-707.00 ROW STOCK FENCE

On projects where right-of-way stock fence is required use standard drawing S-F-10. Standard drawing S-F-10C is approved for use on ROW Fence for Bridge and Culverts and S-F-10D is approved for use on ROW Fence Locations at Interchanges.

4-709.05 RIP-RAP

For estimating purposes, multiply cubic yards by 1.75 to convert to tons.

Machined rip-rap (Class A-1, A-2, A-3, B, and C) will be measured by the ton (1.75 Tons/C.Y.) as designed and completed in place (unless revised by the sequence of construction, which may require reconstruction and remeasurement.)

Computed Quantity (C.Y.) x 1.75 Tons/C.Y. = Total (Tons)

Classifications of machined rip-rap and their pay item nos. are as follows:

709-05.05	Machined Rip-Rap (Class A-3)
709-05.06	Machined Rip-Rap (Class A-1)
709-05.07	Machined Rip-Rap (Class A-2)
709-05.08	Machined Rip-Rap (Class B)
709-05.09	Machined Rip-Rap (Class C)

These classifications are detailed in Subsection 709.03 of the Standard Specifications.

If a gradation of machined rip-rap other than these is required, use Item No. 709-05.10 through 709-05.13, Machined Rip-Rap (Description), and use the rip-rap notes in Section VI, General Notes and Special Notes.

All machined rip-rap quantities are to be shown in the Estimated Roadway Quantities Block. Those quantities supplied by the Structures Division shall be added to any roadway quantities for the same item number, and they shall be footnoted. Footnote each structure separately identifying all quantities and the structures with which they are used.

4-710.00 UNDERDRAINS

The designer will use underdrains, with or without filter cloth, as detailed on Standard Drawings RD-UD-3 and RD-UD-4, on all new paving projects and rehabilitation projects as directed by the Pavement Design Section.

The designer will need only to show the underdrain on the roadway typical section and refer to it as "Detail _____" using the proper detail identification letter shown on Standard Drawing RD-UD-3.

4-712.00 TRAFFIC CONTROL IN CONSTRUCTION ZONES

As a result of statewide reviews of traffic control in construction zones conducted by the Department and the FHWA, the following guidelines are suggested for consideration in the development of traffic control plans.

CONSTRUCTION SIGNING

The use of advisory speed plates shall be limited to locations where the traffic control design warrants a 10 miles per hour or more reduction in speed, such as an approach into a median crossover on a divided highway. The designer shall make every effort to achieve a traffic control design that would avoid the use of these plates.

Detour signs shall be used only when traffic is rerouted onto another road and not used for diversions (runarounds), lane shifts, etc. on the road under construction. A Road Work Next XX sign shall be used on road work more than 1 mile in length and shall be rounded to the next mile up (example: 5.4 miles in road work shall be shown as 6 miles on the Road Work Next XX sign).

BARRICADES AND DRUMS

Plastic drums shall be used in lieu of Type II barricades due to better performance in terms of durability and target value.

LIGHTING DEVICES

1. Where plastic drums are used, there are certain situations where additional delineation provided by lighting devices is not necessary. Type C (steady burn) lamps are not recommended for use with plastic drums along tangent sections following a lane closure taper or along a line of drums delineating the edge of the traveled way. The large target area of reflective sheeting on drums has been shown to provide adequate delineation for these conditions. However, the use of Type C lamps is still recommended for use with drums on tapers. Also, Type C lamps on drums, including tangent sections, might be considered when climatic conditions (for example fog) dictate the need for additional delineation.
2. Where portable concrete barrier rails are used, vertical panels are recommended in lieu of Type C lamps. These devices have provided adequate delineation at a much lower cost, while requiring much less maintenance effort as compared to Type C lamps.
3. High intensity (Type B) lamps, the use of which is optional according to the *MUTCD*, are frequently attached to the initial set of road work signs in advance of the work zone (Road Work Ahead, Road Work ½ Mile, etc.). These lamps do not add any significant degree of attention to these signs. Furthermore, they are costly to provide and maintain. The use of Type B lamps shall be limited to just those situations where a "spot" hazard is anticipated and additional delineation of a channelizing device is considered necessary.

MARKINGS

1. Wide (8 inch) solid lane lines are recommended for use as temporary marking at lane transitions and lane shifts. Wide lines provide better guidance through changes in alignment, especially where conflicting traces of removed marking may remain.
2. Wide-edge line marking is also recommended for use next to portable concrete barrier rail.

TEMPORARY RAISED PAVEMENT MARKERS

Raised pavement markers should be placed on lane lines for lane shifts on divided highways and freeways and 2-lane two-way diversion (run-arounds), as shown on the T-WZ-series Standard Drawings.

Temporary raised pavement markers should also be considered for use through construction projects on major facilities and locations where the lane visibility is an issue. The use of temporary raised pavement markers should be addressed at the construction field review on projects involving major facilities

Designers should ensure that the appropriate 716 series of pay items are included in the construction plans for temporary raised pavement markers.

VERTICAL PANELS

1. The designer shall use the pay Item No. 712-06.01, vertical panels per square foot, when using vertical panels on a project.
2. Vertical panels are covered in Section 6F-5 of the *MUTCD*.
3. When developing a Traffic Control Plan for a project, the designer shall make a preliminary decision whether to use drums, barricades or vertical panels, depending on the length of time they need to remain in place. A final determination as to which shall be used will be made at the Construction Field Review.
4. It shall be necessary to specify the size of the panels and how many square feet are "right" panels and how many are "left" panels.
5. Vertical panels on "U" posts shall be used adjacent to the outside shoulders of divided highways when shifting traffic to the outside onto the shoulders (resulting in a reduced outside shoulder). Spacing of these panels shall be 200 feet maximum.

PORTABLE BARRIER RAIL

Taper rates shall be 10:1 or flatter for designs where posted speeds are less than or equal to 40 mph, and 15:1 or flatter for designs where posted speeds are greater than 40 mph. The approach ends of the portable barrier rail shall be located outside the clear zone or be shielded with a portable energy absorbing terminal. The energy absorbing terminals shall be paid for under Item No. 705-08.51, Portable Impact Attenuator NCHRP350 TL-3 per each, and footnoted as follows:

"This item shall be a portable energy absorbing terminal meeting the requirements of NCHRP 350 for Test Level 3. Examples would be a Quad-Guard, a React 350 or a TRACC. The pay item will include furnishing and installing all components as shown on the manufacturer's drawing."

BARRIER RAIL DELINEATORS

Barrier rail delineators (item no. 705-04.50) shall be used on portable barrier rail in accordance with the T-WZ-SERIES standard drawings and Section 4-716.11 of these guidelines. Barrier rail delineators should meet the following specifications:

1. Portable barrier rail delineator reflective sheeting shall meet ASTM D4956, Type V specifications.
2. Delineator should have 4" x 3" dimensions. Delineators with dimensions other than 4" x 3" may be used if the product is on the approved products list. The variations in delineator dimension should not exceed $\pm 10\%$.
3. Different types of barrier rail delineators should not be mixed in the same line.
4. Portable Barrier Rail Delineators shall be high impact, UV-stabilized, engineered thermoplastic or polycarbonate substrate.

The TDOT approved qualified product list will be used to identify acceptable products.

FREEWAY WORK ZONE CAPACITY

Guidance will be added at a later date regarding freeway work zone capacity.

4-712.05 RECORD-A-COMMENT SIGN

The "**Record-A-Comment**" sign shall be used on all interstate and freeway projects with a current ADT of 30,000 vehicles/day or greater. Signs should be located, in each direction, approximately 1000 feet beyond the "End of Road Work" sign. The signs will be paid for under item 712-06, Signs Construction, S.F.

The "Record-A-Comment" sign should be footnoted in the tabulated block as follows: 96"X48" (Blue Background with White Copy) 0.100" sheet aluminum.

The sign is included in the Tennessee Supplement to the MUTCD as TN-55a.

4-712.10 DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS

In order to minimize the hazard to traffic where differences in elevations between adjacent roadway elements exist, the following procedures shall apply, unless otherwise shown on the Plans or directed by the Engineer. **The designer is advised that the following procedures be presented in the form of traffic control notes shown on the traffic control sheets and not the general notes sheet. In addition, the designer is to show only those notes that apply to the specific phase of traffic control shown on the sheet on which the note appears.**

- A. Differences in elevation between adjacent traffic lanes or traffic lane and shoulder where the traffic lane is being used by traffic, caused by base, paving or resurfacing:
 1. Differences in elevation between adjacent roadway elements greater than 0.75 inch and not exceeding 2 inches:

- a. Warning signs, UNEVEN PAVEMENT (W8-11) and/or SHOULDER DROP-OFF (W8-9a), shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.
 - b. Differences in elevation between adjacent traffic lanes being utilized by traffic caused by added pavement shall be eliminated within three workdays.
 - c. Differences in elevation between adjacent traffic lanes being utilized by traffic caused by cold planing shall be eliminated within three workdays.
 - d. When the difference in elevation is between the traffic lane being utilized by traffic and shoulder, the difference in elevation shall be eliminated within seven workdays after the condition is created.
2. Differences in elevation between adjacent roadway elements greater than 2 inches and not exceeding 6 inches, traffic is not to be allowed to traverse this difference in elevation:
- a. Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:
 - (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
 - (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.
 - b. If the difference in elevation is eliminated or decreased to 2 inches or less by the end of each workday, cones may be used during daylight hours in lieu of drums, barricades or other approved protective devices mentioned in Paragraph A, provided warning signs are erected. Warning signs (uneven pavement and/or low shoulder) shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of two signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.
 - c. When the difference in elevation is between the through traffic lane and the shoulder, and the elevation difference is less than 3.5 inches, the Contractor may use warning signs and/or protective devices as applicable and approved by the Engineer. See Paragraph A regarding use of drums, barricades or other approved protective devices. Warning signs (uneven pavement and/or low

shoulder) will be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.

In these situations the Contractor shall limit his operations to one work zone not exceeding 2 miles in length unless otherwise noted on the plans or approved by the Engineer. Once the Contractor begins work in a work zone, a continuous operation shall be maintained until the difference in elevation is eliminated. Simultaneous work on separate roadways of divided highways will be considered independently in regard to restriction of work zone activity.

3. Differences in elevation between adjacent roadway elements greater than 6 inches, but not exceeding 18 inches, the Contractor, with the Engineer's approval, may utilize one of the following:
 - a. The Contractor shall accomplish separation by drums, barricades or other approved devices in accordance with the following:
 - (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
 - (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

In order to use this method, the contractor must reduce the difference in elevation to 6 inches or less by the end of the work day that the condition is created.

- b. The Contractor shall provide drums, barricades or other approved separation devices as specified in Paragraph A, and construct a stone wedge with a 4:1 slope, or flatter, to eliminate the vertical offset if the lower elevation is at or below subgrade at the end of each day.
- c. The Contractor shall provide drums, barricades or other approved separation devices as specified in Paragraph A, and if the lower elevation is base stone or asphalt pavement, placement of subsequent layers of pavement must begin the next work day and progress continuously until the difference in elevation is eliminated or reduced to 6 inches or less.
- d. The Contractor shall provide separation by portable barrier rail.

For preceding conditions a, b, and c, the Contractor shall use the shoulder drop-off warning sign (W8-9a). It shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. In these situations

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

the Contractor shall limit his operations to one work zone not exceeding 1 mile in length, unless otherwise noted on the Plans or approved by the Engineer. Once the Contractor begins work in a work zone, a continuous operation shall be maintained until the difference is eliminated. Simultaneous work on separate roadways of divided highways will be considered independently in regard to restriction of work zone activity.

4. For differences in elevation between adjacent roadway elements greater than 18 inches:

Separation will be provided by the use of portable barrier rail.

In this situation the Contractor shall limit his operations to one work zone not exceeding 1 mile in length unless otherwise noted on the Plans or approved by the Engineer. Once the Contractor begins work in a work zone a continuous operation shall be maintained until the difference in elevation is eliminated. Simultaneous work on separate roadways of divided highways will be considered independently in regard to restriction of work zone activity.

- B. If the difference in elevation is within 30 feet of the nearest traffic lane being used by traffic caused by grading, excavation for utilities, drainage structures, undercutting, etc:

1. If the difference in elevation is within 8 feet of the nearest traffic lane with difference in elevation greater than 3/4 inch and not exceeding 2 inches:

Warning signs (uneven pavement and/or low shoulder) shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.

2. If the difference in elevation is within 8 feet of the nearest traffic lane with difference in elevation greater than 2 inches and not exceeding 6 inches:

- a. Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:

- (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.

- (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

3. If the difference in elevation is within 8 feet of the nearest traffic lane with difference in elevation greater than 6 inches:

- a. Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:

- (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
- (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

- b. Eliminate vertical offset by constructing a stone wedge or grading to a 4:1 slope, or flatter, or use portable barrier rail.

The Contractor shall schedule the work so as to minimize the time traffic is exposed to an elevation difference. Once the Contractor begins an activity that creates an elevation difference within 8 feet of a traffic lane, the activity shall be pursued as a continuous operation until the elevation difference is eliminated.

- C. If the difference in elevation is farther than 8 feet from the nearest traffic lane but not more than 30 feet from the nearest traffic lane:

Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:

1. Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
2. Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

The contractor shall schedule the work so as to minimize the time traffic is exposed to an elevation difference. Once the contractor begins an activity that creates an elevation difference, the activity shall be pursued as a continuous operation until the elevation difference is eliminated.

4-712.15 SPECIAL CONSTRUCTION SIGNS (See 4-712.10)

“WORKERS PRESENT” SIGN

A pay item for the “Workers Present” (TN-44) sign is to be used on all Interstate construction projects in the event that reduced speed limits for the construction zone are requested and established by the contractor. This sign is to be placed 1,000 feet in advance of the reduced speed limit sign, which is to be located at the beginning of the active construction work zone. These signs shall be located on the right side and on the median side of the roadway (except on the concrete median barrier wall sections). The signs shall be located only on the right side downstream of each interchange on-ramp within the active construction work zone.

The “Workers Present” sign will be paid for under Item No. 712-06.16, Signs (Construction) (Reduced Speed Warning) per each. This item will be footnoted as follows:

“Item to be used only when the contractor establishes a reduced speed limit within the project construction work zone limits. Item includes sign face, supports, and two type “B” flashers per the standard specifications. The contractor shall be responsible for turning on the type “B” flashers when workers are in the construction work zone and turning them off when workers are no longer in the construction work zone.”

4-712.20 MERGE LEFT

Controlled access projects which utilize lane closure details shall be reviewed for the inclusion of Merge Left. Interstate construction or maintenance projects where traffic is reduced to one lane of traffic through the work zone are the primary candidates.

The following criteria will be used for determining Merge Left use:

- Projects on rural interstates should include Merge Left.
- Projects on urban interstates will be reviewed for Merge Left considering factors such as number of lanes, interchange spacing, and proximity to major splits.
- Other controlled access facilities will be considered on a case-by-case basis.

Any interstate or controlled access facility with lane closures not utilizing Merge Left shall be brought to the attention of the appropriate Civil Engineering Manager 2 prior to finalizing the traffic control.

4-712.25 USE OF LANE CLOSURE WITH LEFT HAND MERGE

Controlled access projects which utilize lane closure details shall be reviewed for the inclusion of Merge Left. Interstate construction or maintenance projects where traffic is reduced to one lane of traffic through the work zone are the primary candidates.

The following criteria will be used for determining Merge Left use:

1. Projects on rural interstates should include Merge Left.
2. Projects on urban interstates will be reviewed for Merge Left considering factors such as number of lanes, interchange spacing, and proximity to major splits.
3. Other controlled access facilities will be considered on a case-by-case basis.

The Assistant Director, Design Division, shall be notified in writing for any interstate or controlled access facility with lane closures not utilizing Merge Left prior to finalizing the traffic control. The memorandum shall contain the reasons left merge would be inappropriate.

Standard Drawing T-WZ-21 details Merge Left. The layout and signage may require modification depending on site and field conditions.

The designer will provide quantities for a uniformed police officer which will be paid for under Item No. 712-08.06 Uniformed Police Officer per hour. The Region Construction Supervisor is to be contacted in order to establish the number of hours to be shown in the plans on a case-to-case basis by the Design Manager.

4-713.00 FLEXIBLE DELINEATIONS

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

On resurfacing projects (4R, etc.), the Design Office will be responsible for computing the quantity of flexible delineators and shall refer to Standard Drawing T-S-11 for the proper procedure in figuring these quantities.

If the resurfacing is tapered out before reaching the ramp terminal, the designer shall look at the need for delineators along the ramp as well as along the main line. On projects that already have flexible delineators, this would mean replacing any broken or missing delineators. On projects that have the button delineator on metal posts, this would mean complete replacement with flexible delineators.

The designer does not need to show the location of the proposed delineators, but must make sure Standard Drawing T-S-11 is included in the contract plans so the proper location can be determined by the engineer and contractor.

On projects, which the Design Traffic Engineering Section, Signing Office will be developing the marking and signing plans, the flexible delineators will also be included in these plans.

4-713.05 ROADWAY SIGNING ON INTERSTATE AND FULL ACCESS CONTROL ROADWAYS (See 3-330.00)

4-713.10 ROADWAY SIGNING EXCEPT INTERSTATE AND FULL-ACCESS CONTROL ROADWAYS

When there is signing on a project, the designer shall notify the Design Traffic Engineering Section, Signing Office a minimum of four weeks prior to printing plans for the Construction Field Review.

On non-access controlled highways, when the proposed signing is located on the designer's proposed layout sheets or on the designer's pavement marking sheets, the Design Traffic Engineering Section, Signing Office will no longer be responsible for applying the proposed signing to these sheets.

A marked-up set of prints will be sent to the TDOT Design Manager in charge of the project for their review of the proposed signing. The designer of the project will then be responsible for putting the proposed signing on their sheets. An updated "Signing Cell Library" will be furnished if needed.

The Design Traffic Engineering Section, Signing Office will still furnish the sign schedule sheets, quantities, recommended standard drawings and general notes for the proposed signing plan.

This will alleviate some of the problems with coordinating the proposed signing with the increased revising and changing of the designer's layouts.

4-713.15 ROADWAY SIGNING

On projects (resurfacing, bridge replacement, etc.) requiring no more than three different types of permanent signs, the designer will use Standard Drawing T-S-20 in the Index of Standard Drawings.

The designer will need to show the proposed location and designate the type of sign (R1-1, R1-2, TN-5, etc.) on the plans. These signs will be paid for per each under Item No. 713-16.20 through 713-16.29. Appropriate General Notes and Standard Drawings will also need to be included.

If any particular sign needed for a project is not included on Standard Drawing T-S-20, or if there are any questions, contact the Design Traffic Engineering Section, Signing Office.

See Traffic Design Manual, Chapter 6, Signing and Pavement Marking.

4-713.20 ADVANCE GUIDE SIGNS AND EXIT DIRECTIONAL SIGNS ON TRAFFIC CONTROL PLANS

The designer shall include advance guide signs and exit directional signs (green and white signs) on all phases of the traffic control plan for projects on access controlled highways including interchange cross streets. Advance guide signs and exit directional signs should also be shown on the traffic control plan on access controlled resurfacing projects when the traffic control phasing requires the placement of temporary pavement markings which conflict with directional signs or requires directional signs to be relocated or adjusted. It will be the designer's responsibility to prepare any required traffic control base sheets for all phases showing the layout and location of all directional and guide signs. Supplemental signing is not required to be shown.

Existing signs should be used as part of the traffic control plan for as long as possible throughout the different construction phases provided signs are located in accordance with MUTCD and does not provide inaccurate information. The most common conflict of existing signing with new construction occurs when overhead guide signs with down arrows or diagrammatic signs displaying lane lines are over lanes that are closed during certain construction phases. Once existing signs cannot be used at the original location, the designer should attempt to relocate the existing sign or place the permanent sign. If relocation or placement of the permanent sign is not feasible, a new temporary advance guide sign or exit directional sign shall be shown on the traffic control plan for the affected construction phase and for any other construction phase the sign is needed. Sign location shall conform to the MUTCD. Sign size should be the same as the sign removed if feasible. There shall be at least one temporary advance directional and temporary exit directional for each exit on the project.

For signs located on overhead structures, the designer should contact the Signing Section of the Design Division Signal and Signing Office for additional guidance.

The following guidance should be used when it is necessary to install temporary exit directional signs or temporary advanced guide signs. The designer should contact the Signing Section of the Design Division Signal and Signing Office for any additional technical questions or guidance required.

1. In the event it is not feasible to replace an exit directional sign with the existing sign size, the new sign shall be 48" x 96", 0.100" sheet aluminum. The letters will be minimum 8 inch "D" (all capital) letters and there will be a 3/4" border with a 2" radius. The color will be a reflective green background with a reflective white copy. The supports will be included in the sq. ft. of the sign face as it is with other construction signs.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

2. The information on exit directional signs should be the same as the information on the existing signs that were removed. There shall be no more than four lines of copy on these signs. The layout of these signs should look as close to the existing as possible.
3. On advanced guide signs; the first line shall be the exit number for the interchange (i.e. EXIT 234), the second line will be the first destination (i.e. OLD HICKORY BLVD), the third line will be the second (i.e. MADISON), the fourth line will be NEXT RIGHT (Center all lines of copy). These signs should be located no closer than one half mile from the exit directional sign.
4. The exit directional sign shall have the same exit number and destinations as the advance guide but in lieu of NEXT RIGHT there will be a type "B" arrow at a 45 degree angle to the right. (Center all lines of copy.) These signs should be located at the beginning of the taper for the appropriate exit ramp.
5. If an interchange has a TN. (TN-6a -TN-6d) or U.S. (M1-4) route shield on the directional signing, then a shield and if needed a cardinal direction (M3-1 –M3-4) shield, will be show mounted to the left support under both the advance and exit directional signs.
6. If more lines of copy are needed, then the designer can add a 24" x 96" or another 48"x 96" sheet of aluminum to the bottom of the first sign but the size shall not be larger than a total of 96"x96".
7. Removal of existing signs shall be paid for under item number 713-15, Removal of Signs, Posts, and Footings, Lump Sum. New signs shall be paid for under item number 712-06.10, New Signs (Construction), per S.F. Design Managers should contact the construction office to have item numbers assigned when the traffic control plan involves relocating existing signs.

One set of traffic control plans shall be sent to the Signing Section of the Design Division Signal and Signing Office a minimum of twelve weeks prior to the construction field review for review when advance guide signs or exit directional signs are included in the traffic control plan. For resurfacing projects, plans should be sent as soon as possible. **No other traffic control plans shall be sent for review.**

See Section 6-170.00 for notes to be placed in the general notes on all access controlled and interstate projects and on access controlled and interstate resurfacing projects when the traffic control phasing requires placement of temporary pavement markings which conflict with directional signs or requires directional signs to be relocated or adjusted.

4-713.25 NOTE ALLOWING TRAFFIC TO TEMPORARILY DRIVE ON MILLED SURFACE TO BE PLACED IN INTERSTATE RESURFACING PLANS

See Section 6-250.02 for a note to be added to interstate resurfacing plans for all projects which include cold planing items. The note should be added as a Special Note.

Designers should also include the motorcycle warning sign (TN-64) on interstate resurfacing projects. Two (2) signs should be placed on the interstate in advance of the cold

planned section. A motorcycle warning sign should also be placed on entrance ramps located within the limits of a cold planned section.

4-714.00 ROADWAY LIGHTING (See 2-315.05)

See Traffic Design Manual, Chapter 7, Roadway Lighting.

4-716.00 CHANNELIZATION STRIPING

For all channelization markings detailed on Standard Drawing T-M-7, the following pay items and methods of measurement shall be used:

- A. 716-02.04, Plastic Pavement Marking (Channelization Striping) - Sq. Yd.
716-05.04, Painted Pavement Marking (Channelization Striping) - Sq. Yd.
The unit of payment is per square yard of striping material applied including the boundary lines of the channelized area. This is applicable for 8 inch wide border lines only. All other border lines (edgelines and double yellow centerline) are paid for under their respective pay items and measured by the linear foot. This is used on medians, pavement transitions, obstruction approaches and traffic islands with areas greater than 400 Sq. ft.
- B. 716-04.04, Plastic Pavement Marking (Transverse Shoulder) - Linear ft
The unit of payment is per linear foot of diagonal marking. The 4 inch edge line is paid for under a "Pavement Marking (Line)" item.
- C. 716-02.07, Plastic Pavement Marking (24-inch Barrier Line) - Linear ft
716-05.07, Painted Pavement Marking (24-inch Barrier Line) - Linear ft
The unit of payment is per linear foot of boundary line (with no diagonal marking used).

Note that the unit of payment for Item No. 716-08.04, Removal of Pavement Marking (Channelization Striping), has been changed from per linear foot to per square yard of striping material removed.

4-716.05 PAVEMENT MARKING GUIDELINES

These guidelines are general in nature for average-type projects. It is not intended that these guidelines supersede the exercise of good engineering judgment in the development of a good pavement marking plan for a project. Special problem areas may require special treatment, which shall be determined on the Construction Field Review.

Traffic volumes may be found in the Project Planning Division's latest Traffic Flow Maps book. The information is available at:

<http://www.tdot.state.tn.us/projectplanning/adt.asp>.

Generally, centerlines and edgelines shall be placed on all pavements with a minimum total width of 16 feet.

If there are no centerline pavement markings on the existing roadway before the proposed construction or resurfacing project begins, no temporary centerline pavement markings will be

required on the roadway during construction. A centerline on the final surface may be required depending on the surface materials.

If surface materials other than hot plant mix asphalt (such as cold mix asphalt, DBST, etc.) are applied, no temporary or permanent centerline markings will be required, since these surface materials would be incapable of retaining the pavement markings.

See the sections 4-716.10 through 4-716.36 for guidance for temporary and permanent pavement marking and section 6-145.00 for pavement marking general notes.

See Traffic Design Manual, Chapter 6, Signing and Pavement Marking.

4-716.10 TEMPORARY PAVEMENT MARKINGS

Temporary pavement markings on the intermediate layers of pavement open to traffic will be installed to permanent standards daily with reflective tape or reflectorized paint.

No temporary striping is required on the final surface if preformed plastic (716-10.01 or 716-10.15) or reflectorized paint (716-05.01) is the permanent marking material, since these permanent markings are to be installed daily as the final surface paving operations proceed.

If the permanent marking material is thermoplastic, the contractor may elect to mark the final layer of pavement with reflectorized paint to permanent standards daily and wait until the paving operation has been completed before the permanent markings are installed. In this case, the temporary markings for the final layer will not be measured and paid for directly, but the costs are to be included in the price bid for the permanent markings.

4-716.11 TEMPORARY PAVEMENT MARKING FOR USE ON PAVEMENT SURFACE OTHER THAN FINAL

1. ON ALL INTERSTATES AND EXPRESSWAYS (Duration of Marking > 1 month)

A. On Non-Transition Sections:

- a. **Lane lines** – use 8” painted white skip lines and white raised pavement markers on 40” spacing.
- b. **Left edge lines** (yellow) – Use 8” painted solid yellow lines and yellow raised pavement markers on 20’ spacing.
- c. **Right edge lines** (white) – **Allow as equals:**

(1) Use 8” solid white wet-reflective temporary tape (according to manufacturer’s specifications).

(2) Use 8” painted solid white lines with an approved white barrier rail delineator on top of barrier rail on 20’ spacing,

Or

Use 8" painted solid white lines only or with white flexible delineators at outside edge of shoulder on 20' spacing when no barrier rail is present.

B. On Transition Sections:

- a. **Lane lines** – Use 8" painted solid white lines and white raised pavement markers on 20' spacing.
- b. **Left edge lines** (yellow) – Use 8" painted solid yellow lines and yellow raised pavement markers on 20' spacing.
- c. **Right edge lines** (white) – Allow as equals:
 - (1) Use 8" solid white wet-reflective temporary tape (according to manufacturer's specifications)
 - (2) Use 8" painted solid white lines with an approved white barrier rail delineator on top of barrier rail on 20' spacing.

Or

Use 8" painted solid white lines only or with white flexible delineators at outside edge of shoulder on 20' spacing when no barrier rail is present.

NOTES:

- (1) Raised pavement markers are to be placed in a single row, not staggered, under all applications.
- (2) If Project Engineer has specific recommendations they should be discussed at the Construction Field Review.
- (3) Missing raised pavement markers shall be replaced:
 - a) at least monthly or b) at the instruction of the engineer.
- (4) All raised pavement markers shall be removed before placement of the final pavement surface. The cost of removal shall be included in the price bid for raised pavement markers.

2. STATE ROUTES WITH 4 OR MORE LANES (Unlit During Construction)

- A. **Lane Lines** – Use white painted skip lines, 2" wider than prescribed permanent lines, and raised pavement markers on 80' spacing.
- B. **Edge and center lines** – Use solid lines (yellow or white, as appropriate) 2" wider than prescribed permanent lines. Raised pavement markers (yellow or white, as appropriate) may be specified for use on a case-by-case basis, as determined at the Construction Field Review. Raised pavement markers should not be used on right edge line. When raised pavement markers are used for the left edge line, spacing shall be 20'.

NOTES:

- (1) Raised pavement markers are to be placed in a single row, not staggered, under all applications.
- (2) If Project Engineer has specific recommendations they should be discussed at the Construction Field Review.
- (3) Missing raised pavement markers shall be replaced:
 - a) at least monthly or b) at the instruction of the engineer.
- (4) All raised pavement markers shall be removed before placement of the final pavement surface. The cost of removal shall be included in the price bid for raised pavement markers.

3. ALL OTHER STATE ROUTES

All Lines – Use regular 4” marking lines. Centerline yellow raised pavement markers may be considered on a case-by-case basis. Discuss need at Construction Field Review.

NOTES:

- (1) Raised pavement markers are to be placed in a single row, not staggered, under all applications.
- (2) If Project Engineer has specific recommendations they should be discussed at the Construction Field Review.
- (3) Missing raised pavement markers shall be replaced:
 - a) at least monthly or b) at the instruction of the engineer.
- (4) All raised pavement markers shall be removed before placement of the final pavement surface. The cost of removal shall be included in the price bid for raised pavement markers.

4-716.13 PAVEMENT MARKING PLANS ON INTERSTATE AND FULL-ACCESS CONTROL ROADWAYS (See 3-330.00)

4-716.15 PERMANENT PAVEMENT MARKINGS (See 4-411.03 and 4-411.04)

Designers should refer to Table 4-3 for pavement marking guidelines for all interstate and state routes. In addition to pavement marking guidelines, Table 4-3 provides guidance for the placement of rumble strips and rumble stripes. This guidance shall be used on all new, reconstruction, and resurfacing projects except in areas which require special treatment as determined on the Construction Field Review and approved by the Director of the Design Division.

Items numbers for pavement markings are available at the TDOT web site.

http://www.tdot.state.tn.us/RoadItemLists/roaditem_index.htm

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Permanent Pavement Markings, Raised Pavement Markers, Rumble Strip and Rumble Stripe Guidelines

Roadway Classification		Interstate and Full Access Controlled Roadways (Includes Ramps)		
Current ADT		All ADT's		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
All shoulder Widths	6" Enhanced Flatline Thermoplastic Item No. 716-12.02, Enhanced Flatline Thermo Pvmt Mrkng (6 In Line), L.M.	6" Enhanced Flatline Thermoplastic with Snowplowable Raised Pavement Markers (SRPM's) Item No. 716-12.02, Enhanced Flatline Thermo Pvmt Mrkng (6 In Line), L.M. and Item No. 716-01.22, Snwplwble Pvmt Mrkrs (Mono-Dir) (1 Color), Each.	Continuous 16" Rumble Strip on Inside and Outside Shoulder. Dwg. T-M-15. Item No. 411-12.01, Scoring Shoulders (Continuous) (16 In Width), L.M. See notes 7 & 9.	1, 2, 5, 7, 9

Roadway Classification		Multilane State Routes (Four or More Lanes)		
Current ADT		All ADT's		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
Less than 2'	4" Enhanced Flatline Thermoplastic Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M.	4" Enhanced Flatline Thermoplastic with Raised Pavement Markers (RPM's) Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	None	1, 2, 4, 6
2' - 6'	Use 4" Spray Thermoplastic (60 mil) when Rumble Stripes are specified. Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M.	Use 4" Spray Thermoplastic (60 mil) with Raised Pavement Markers (RPM's) when Rumble Stripes are Specified. Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	8" Rumble Stripe on Shoulders (Rural Only). Dwg. T-M-16. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8 In Width), L.M. See notes 7 & 9.	1, 2, 4, 6, 7, 8, 9
8' or Wider	4" Enhanced Flatline Thermoplastic Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M.	4" Enhanced Flatline Thermoplastic with Raised Pavement Markers (RPM's) Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	16" Rumble Strip on Outside Shoulders (Rural Only). Dwg. T-M-15A. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8 In Width), L.M. Continuous 16" Rumble Strip on Inside Shoulders (Rural Only) (If Present). Dwg. T-M-15. Item No. 411-12.01, Scoring Shoulders (Continuous) (16 In Width), L.M. See notes 7 & 9.	1, 2, 4, 6, 7, 9

Table 4-3 (Sheet 1 of 4)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Roadway Classification		Two and Three Lane State Routes		
Current ADT		12,000 or Greater		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
Less than 2'	4" Enhanced Flatline Thermoplastic Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M.	4" Enhanced Flatline Thermoplastic with Raised Pavement Markers (RPM's) Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	None	1, 2, 4, 6
2'-6'	Use 4" Spray Thermoplastic (60 mil) when Rumble Stripes are specified. Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M.	Use 4" Spray Thermoplastic (60 mil) with Raised Pavement Markers (RPM's) when Rumble Stripes are Specified. Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	8" Rumble Stripe on Shoulders (Rural Only). Dwg. T-M-16. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8 In Width), L.M. See notes 7 & 9.	1, 2, 4, 6, 8, 9
8' or Wider	4" Enhanced Flatline Thermoplastic Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M.	4" Enhanced Flatline Thermoplastic with Raised Pavement Markers (RPM's). Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	16" Rumble Strip on Shoulders (Rural Only). Dwg. T-M-15A. Item No. 411-12.02, Scoring for Rumble Stripe (Non-Continuous) (16 In Width), L.M. See notes 7 & 9.	1, 2, 4, 6, 9

Roadway Classification		Two and Three Lane State Routes		
Current ADT		2,000 to 12,000		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
Less than 2'	4" Spray Thermoplastic (60 mil) Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M.	4" Spray Thermoplastic (60 mil) with Raised Pavement Markers (RPM's) Item No. 716-13.01, Spray Thermo Pvmt Mrkng (60 mil) (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.	None	1, 2, 4, 6, 9
2'-6'			8" Rumble Stripe on Shoulders (Rural Only). Dwg. T-M-16. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8" Width), L.M. See notes 7 & 9.	
8' or Wider			8" Rumble Stripe on Shoulders (Rural Only). Dwg. T-M-16. Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8" Width), L.M. See notes 7 & 9.	

Table 4-3 (Sheet 2 of 4)

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

Roadway Classification		Two and Three Lane State Routes		
Current ADT		Under 2,000		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
Less than 2'	4" Spray Thermoplastic (40 mil)	4" Spray Thermoplastic (40 mil) with Raised Pavement Markers (RPM's)	None	1, 2, 4, 6
2'-6'	Item No. 716-13.06, Spray Thermo Pvmr Mrkng (40 mil) (4" Line), L.M.	Item No. 716-13.06, Spray Thermo Pvmr Mrkng (40 mil) (4 In Line), L.M. See notes 4 & 6 for raised pavement markers.		
8' or Wider				

Roadway Classification		Off-System Routes - Includes Off-System Bridge Replacement , Intersection, Signal, RSAR, and SIA		
Current ADT		1,000 or Greater		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
All Shoulder Widths	4" Spray Thermoplastic (40 mil)	4" Spray Thermoplastic (40 mil)	None	1, 2
	Item No. 716-13.06, Spray Thermo Pvmr Mrkng (40 mil) (4 In Line), L.M.	Item No. 716-13.06, Spray Thermo Pvmr Mrkng (40 mil) (4 In Line), L.M.		

Roadway Classification		Off-System Routes - Includes Off-System Bridge Replacement , Intersection, Signal, RSAR, and SIA		
Current ADT		Under 1,000		
Pavement Type		Asphalt and Concrete		
Width of Outside Paved Shoulder	Edge Lines	Centerline / Skip Lines / Lane Lines	Rumble Strip / Rumble Stripe	Notes
All Shoulder Widths	4" Paint	4" Paint	None	3
	Item No. 716-05.01, Painted Pavement Marking (4" Line), L.M.	Item No. 716-05.01, Painted Pavement Marking (4" Line), L.M.		

Table 4-3 (Sheet 3 of 4)

**Permanent Pavement Markings, Raised Pavement Markers,
Rumble Strip and Rumble Stripe Guidelines Notes**

1. The contractor may elect to use either thermoplastic or preformed plastic for specialty striping items. These items include stop lines, cross walks, arrows, words, channelization, and other specialty striping items except lines.
2. The following footnote shall be added to all Specialty Striping Items: **“The contractor may elect to substitute Preformed Plastic for Thermoplastic. Preformed Plastic shall be paid for at the same unit price as bid for Thermoplastic.”**
3. Specialty striping items may be either paint or thermoplastic.
4. Due to increased plowing considerations, snowplowable raised pavement markers (SRPM's) should be used in Claiborne, Sullivan, Carter, Cumberland, Putnam, Overton, Montgomery, Robertson, Sumner, Henry, Obion, and Weakley Counties instead of raised pavement markers. Bi-directional snowplowable raised pavement marker (reflector on both sides) shall be paid for under Item No. 716-01.21, Snowplowable Pvmnt Mrkrs (Bi-Dir) (1 Color), Each. Mono-directional snowplowable raised pavement markers (reflector on one side only) shall be paid for under Item No. 716-01.22, Snowplowable Pvmnt Mrkrs (Mono-Dir) (1 Color), Each. Refer to T-M-series standard drawings for details. Three lane and multilane roads with 2-way traffic will normally require both mono-directional and bi-directional raised pavement markers. Two lane roads will normally require bi-directional raised pavement markers.
5. Rumble strips are not required on ramps.
6. Bi-directional raised pavement marker (reflector on both sides) shall be paid for under Item No. 716-01.11, Raised Pvmnt Markers (Bi Directional) (1 Color Lens), Each. Mono-directional raised pavement markers (reflector on one side only) shall be paid for under Item No. 716-01.12, Raised Pvmnt Markers (Mono-Directional) (1 Color Lens), Each. Refer to T-M-series standard drawings for details. Three lane and multilane roads with 2-way traffic will normally require both mono-directional and bi-directional raised pavement markers. Two lane roads will normally require bi-directional raised pavement markers.
7. For concrete shoulders, the rumble strip is to be placed in accordance with standard drawings RP-CS-1 or RP-CS-2. Item No. 501-03.03, Scoring Concrete Shoulders (Non-Continuous) (36 In Width), L.F. Length of scoring shall be measured as the actual length of pavement scored.
8. When Rumble Stripes are not used Pavement Markings should be 4" Enhanced Flatline Pavement Markings. Item No. 716-12.01, Enhanced Flatline Thermo Pvmnt Mrkng (4 In Line), L.M.
9. See 4-411.03 and 4-411.04 for additional guidance regarding rumble strip and rumble stripe placement.

Table 4-3 (Sheet 4 of 4)

4-716.16 STRIPING RAMPS ON RESURFACING PLANS

In the process of preparing plans for construction or resurfacing projects involving roadways that abut connecting ramps, consideration shall be given to striping these ramps. When work is not being done on the entire ramp, this ramp would not normally be re-striped beyond where the work is being done. The roadway designer shall contact the Regional Traffic Engineer to determine the need to re-stripe these ramps in their entirety. Stop bars, turn lane arrows and other pavement instructive markings may be included at the discretion of the Regional Traffic Engineer applying the appropriate standard drawings that shall be included in the plans. The decision to re-stripe shall be made based on the condition of the pavement markings and consideration may be given to compliance with the standards. If this striping is done, the ramps shall be marked using current standards for pavement markings as shown on Standard Drawings T-M-6 and T-M-9 and other appropriate standard drawings and marked up to the connecting roadway. Add the following to the plans:

“Ramps shall be marked up to where they connect to the intersecting roadway.”

4-716.17 STRIPING ON MICRO SURFACE PAVEMENTS

Pavement markings on micro surface pavements should follow guidance provided in Table 4-3 for lane lines and edge lines.

4-716.20 PAVEMENT MARKING GENERAL NOTES FOR ROADWAY PLANS

See section 6-145.00 for General Pavement Marking Notes.

4-716.25 SPECIALTY PAVEMENT MARKINGS

Contractors will have the option of using either Thermoplastic or Preformed Plastic Pavement Markings specialty markings. For plan development and bidding purposes, designers will use the appropriate Thermoplastic Pavement Marking items numbers. All specialty pavement marking item numbers shall be footnoted:

“Contractor may elect to substitute Preformed Plastic for Thermoplastic. Preformed Plastic shall be paid for at the same unit price as bid for Thermoplastic.”

On projects where plastic specialty pavement items are being used, the following items will be used:

1. Crosswalk with longitudinal lines as shown on Standard Drawing T-M-4 will use the following pay item:

716-02.09, Plastic Pavement Marking (Longitudinal Cross-walk) per linear foot.

The measurement for this marking is identical to that for standard crosswalk, for example, one measurement along the centerline of the crosswalk (perpendicular to curbs).

2. Dotted white line for vehicle double turn path delineation requires an 8-inch stripe. Pay item will be as follows:

716-02.08, Plastic Pavement Marking (8" Dotted Line) per linear foot.

4-716.30 USE OF REMOVABLE PAVEMENT MARKING LINE

Item No. 712-09.01, Removable Pavement Marking Line per linear foot, shall be used as temporary marking for directional or separation of traffic during the traffic control phases of construction when these lines are used on a roadway surface that is to remain in place and undisturbed.

Item No. 716-05.01, Painted Pavement Marking (4" Line) per linear mile, shall be used as temporary marking for directional or separation of traffic during the traffic control phases of construction when these lines are used on a roadway surface that is to be paved, cold planed or otherwise removed.

4-716.35 SNOWPLOWABLE RAISED PAVEMENT MARKERS

Snowplowable raised pavement markers shall be included on all Interstate and full-access controlled roadways. See Table 4-3 for guidance.

On interstate and full-access control resurfacing projects, the designer shall be responsible for verifying the existence of snowplowable raised pavement markers and for computing the quantity of these markers for removal. The designer shall also compute the quantity for new snowplowable raised pavement markers to be installed for these projects.

On projects which the Design Division, Signals, Signing and Lighting Section will be developing the marking and signing plans, the snowplowable raised pavement markers will also be included in these plans.

4-716.36 RAISED PAVEMENT MARKERS

Raised pavement markers should be included on state routes. Reflective pavement markers are to be placed in accordance with the T-M- series standard drawings and the current edition of the MUTCD.

On resurfacing projects, the designer shall be responsible for verifying the existence of raised pavement markers and for computing the quantity of these markers for removal. The designer shall also compute the quantity for new raised pavement markers to be installed for these projects.

Spacing of raised pavement markers may be reduced or additional raised pavement markers added in areas that require special treatment as determined by the design manager or on the construction field review. When additional raised pavement markers are used, the markers shall be placed in accordance with the current edition of the MUTCD. Raised pavement markers may be omitted on urban roadways where roadway lighting is present. Raised pavement markers should not be used on the right edge line.

See Table 4-3 for guidance regarding type of markers to be used.

4-730.08 REPLACEMENT OF TRAFFIC SIGNAL DETECTION LOOPS

When there are existing traffic signals on a cold planing project, contact shall be made with the City or County to determine the presence and location of detection loops. If loops are present, and there is no way to avoid them in the cold planing process, then add Item Nos. 730-14.02, Saw Slot, and 730-14.03, Loop Wire, to the plans.

The designer will obtain as-built plans from the maintaining agency to utilize for quantity calculations. These plans shall then be forwarded to the Regional Construction Office for submission to the contractor at the Pre-construction Conference.

See Section 6-175.00 for notes which shall be added to all plans with the replacement of traffic signal detection loops.

Standard Drawings T-SG-2 and T-SG-3 shall be included.

The Designer shall be aware that other pavement rehabilitation and resurfacing projects may affect the detection loops, in which case procedures described above will be required. Another type of project is the resealing of concrete pavement joints when a signal is controlling interstate ramp terminals with a local street.

4-730.10 TRAFFIC SIGNALS (See 2-315.00)

See Traffic Design Manual, Chapter 4, Traffic Signal Design.

4-730.15 STRUCTURAL SUPPORTS FOR TRAFFIC SIGNALS

See Section 6-270.00 for a "Special Note" which shall be added to all plans with proposed signal poles, mast arms, strain poles, etc.

The Traffic Signals, Lighting, and Signing Section will forward all signal designs to the Structures Division for pole design. Design Managers should contact the Traffic Signals, Lighting, and Signing Section on projects the design consultant is performing signal design to coordinate this requirement.

4-730.20 TEMPORARY TRAFFIC SIGNAL SYSTEMS USED AT TWO-LANE BRIDGE RECONSTRUCTION SITES

When using Item No. 730-40, Temporary Traffic Signal System per each, to provide traffic control for one-lane alternating flow at two-lane bridge reconstruction sites, alternate this item with Item No. 730-50, Temporary Traffic Signal System (Radio Controlled) per each. (See Standard Drawing Nos. T-WZ-32, T-WZ-33, T-WZ-34, and T-WZ-35 details and general notes)

4-740.00 GEOTEXTILE FABRIC AND GEOMEMBRANE

See Chapter 10 of the Drainage Manual.

shall be marked using current standards for pavement markings as shown on Standard Drawings T-M-6 and T-M-9 and other appropriate standard drawings and marked up to the connecting roadway. Add the following to the plans:

“Ramps shall be marked up to where they connect to the intersecting roadway.”

4-716.17 STRIPING ON MICRO SURFACE PAVEMENTS

Pavement markings on micro surface pavements should follow guidance provided in Table 4-3 for lane lines and edge lines.

4-716.20 PAVEMENT MARKING GENERAL NOTES FOR ROADWAY PLANS

See section 6-145.00 for General Pavement Marking Notes.

4-716.25 SPECIALTY PAVEMENT MARKINGS

Contractors will have the option of using either Thermoplastic or Preformed Plastic Pavement Markings specialty markings. For plan development and bidding purposes, designers will use the appropriate Thermoplastic Pavement Marking items numbers. All specialty pavement marking item numbers shall be footnoted:

“Contractor may elect to substitute Preformed Plastic for Thermoplastic. Preformed Plastic shall be paid for at the same unit price as bid for Thermoplastic.”

On projects where plastic specialty pavement items are being used, the following items will be used:

1. Crosswalk with longitudinal lines as shown on Standard Drawing T-M-4 will use the following pay item:

716-02.09, Plastic Pavement Marking (Longitudinal Cross-walk) per linear foot.

The measurement for this marking is identical to that for standard crosswalk, for example, one measurement along the centerline of the crosswalk (perpendicular to curbs).

2. Dotted white line for vehicle double turn path delineation requires an 8-inch stripe. Pay item will be as follows:

716-02.08, Plastic Pavement Marking (8" Dotted Line) per linear foot.

4-716.30 USE OF REMOVABLE PAVEMENT MARKING LINE

Item No. 712-09.01, Removable Pavement Marking Line per linear foot, shall be used as temporary marking for directional or separation of traffic during the traffic control phases of construction when these lines are used on a roadway surface that is to remain in place and undisturbed.

Item No. 716-05.01, Painted Pavement Marking (4" Line) per linear mile, shall be used as temporary marking for directional or separation of traffic during the traffic control phases of construction when these lines are used on a roadway surface that is to be paved, cold planed or otherwise removed.

4-716.35 SNOWPLOWABLE RAISED PAVEMENT MARKERS

Snowplowable raised pavement markers shall be included on all Interstate and full-access controlled roadways. See Table 4-3 for guidance.

On interstate and full-access control resurfacing projects, the designer shall be responsible for verifying the existence of snowplowable raised pavement markers and for computing the quantity of these markers for removal. The designer shall also compute the quantity for new snowplowable raised pavement markers to be installed for these projects.

On projects which the Design Division, Signals, Signing and Lighting Section will be developing the marking and signing plans, the snowplowable raised pavement markers will also be included in these plans.

4-716.36 RAISED PAVEMENT MARKERS

Raised pavement markers should be included on state routes. Reflective pavement markers are to be placed in accordance with the T-M- series standard drawings and the current edition of the MUTCD.

On resurfacing projects, the designer shall be responsible for verifying the existence of raised pavement markers and for computing the quantity of these markers for removal. The designer shall also compute the quantity for new raised pavement markers to be installed for these projects.

Spacing of raised pavement markers may be reduced or additional raised pavement markers added in areas that require special treatment as determined by the design manager or on the construction field review. When additional raised pavement markers are used, the markers shall be placed in accordance with the current edition of the MUTCD. Raised pavement markers may be omitted on urban roadways where roadway lighting is present. Raised pavement markers should not be used on the right edge line.

See Table 4-3 for guidance regarding type of markers to be used.

4-730.08 REPLACEMENT OF TRAFFIC SIGNAL DETECTION LOOPS

When there are existing traffic signals on a cold planing project, contact shall be made with the City or County to determine the presence and location of detection loops. If loops are present, and there is no way to avoid them in the cold planing process, then add Item Nos. 730-14.02, Saw Slot, and 730-14.03, Loop Wire, to the plans.

The designer will obtain as-built plans from the maintaining agency to utilize for quantity calculations. These plans shall then be forwarded to the Regional Construction Office for submission to the contractor at the Pre-construction Conference.

See Section 6-175.00 for notes which shall be added to all plans with the replacement of traffic signal detection loops.

Standard Drawings T-SG-2 and T-SG-3 shall be included.

The Designer shall be aware that other pavement rehabilitation and resurfacing projects may affect the detection loops, in which case procedures described above will be required. Another type of project is the resealing of concrete pavement joints when a signal is controlling interstate ramp terminals with a local street.

4-730.10 TRAFFIC SIGNALS (See 2-315.00)

See Traffic Design Manual, Chapter 4, Traffic Signal Design.

4-730.15 STRUCTURAL SUPPORTS FOR TRAFFIC SIGNALS

See Section 6-270.00 for a "Special Note" which shall be added to all plans with proposed signal poles, mast arms, strain poles, etc.

The Traffic Signals, Lighting, and Signing Section will forward all signal designs to the Structures Division for pole design. Design Managers should contact the Traffic Signals, Lighting, and Signing Section on projects the design consultant is performing signal design to coordinate this requirement.

4-730.20 TEMPORARY TRAFFIC SIGNAL SYSTEMS USED AT TWO-LANE BRIDGE RECONSTRUCTION SITES

When using Item No. 730-40, Temporary Traffic Signal System per each, to provide traffic control for one-lane alternating flow at two-lane bridge reconstruction sites, alternate this item with Item No. 730-50, Temporary Traffic Signal System (Radio Controlled) per each. (See Standard Drawing Nos. T-WZ-32, T-WZ-33, T-WZ-34, and T-WZ-35 details and general notes)

4-740.00 GEOTEXTILE FABRIC AND GEOMEMBRANE

See Chapter 10 of the Drainage Manual.

CHAPTER 8 - ROADSIDE DEVELOPMENT

4-801.00 SEEDING (WITH MULCH) (See 4-801.05)

Method for computation of seeding on right-of-way.

$$\frac{\text{Area to be seeded (Sq. ft)}}{1,000 \text{ Sq. ft/unit}} \times 1.25 = \text{_____ units}$$

Item No. 801-01
and/or
Item No. 801-01.02

Method for computation of seeding on waste areas and borrow pits outside right-of-way.

$$\frac{\text{Excess material to be wasted (C.Y.)}}{500 \text{ C.Y./unit}} = \text{_____ units}$$

Item No. 801-01
and/or
Item No. 801-01.02

$$\frac{\text{Borrow material (C.Y.)}}{500 \text{ C.Y./unit}} = \text{_____ units}$$

Item No. 801-01
and/or
Item No. 801-01.02

4-801.05 CROWN VETCH MIXTURE (WITH MULCH)

See Section 4-801.00 for computations.

Item 801-01.02, Crown Vetch Mixture (with Mulch), shall be used on slopes 3:1 or steeper and other areas that are inaccessible for mowing.

Crown vetch mixture shall be used, unless otherwise directed on the Construction Field Review, in all areas of Tennessee except Region IV.

On any project requiring crown vetch, the following note shall be put in the general notes with the parentheses being replaced by the proper item.

"Item No. 801-01.02, Crown Vetch Mixture (with mulch), and description shall be used on slopes 3:1 or steeper and other areas, as indicated in the plans, that are inaccessible for mowing."

4-801.07 TEMPORARY SEEDING (WITH MULCH)

The use of Temporary Seeding (with Mulch) is strongly recommended on projects.

Item No. 801-01.07 Temporary Seeding (With Mulch)

Item No. 801-02 Seeding (Without Mulch)

Temporary seeding (with mulch), and seeding (without mulch) will be measured by the unit (1,000 Sq. Ft.) as designed and completed in place, unless revised by the sequence of construction, in which case complete replacement and remeasurement may be required.

$$\frac{\text{Total area of seeding (Sq. ft) x number of effective phases of the sequence of construction}}{1,000 \text{ (Sq. ft) / unit}} = \text{Total seeding (units)}$$

Exceptional locations where the slopes are flatter than 3:1, but where crown vetch is requested on the Construction Field Review, shall be outlined on the proposed layout sheet in a manner similar to Figure 4-18.

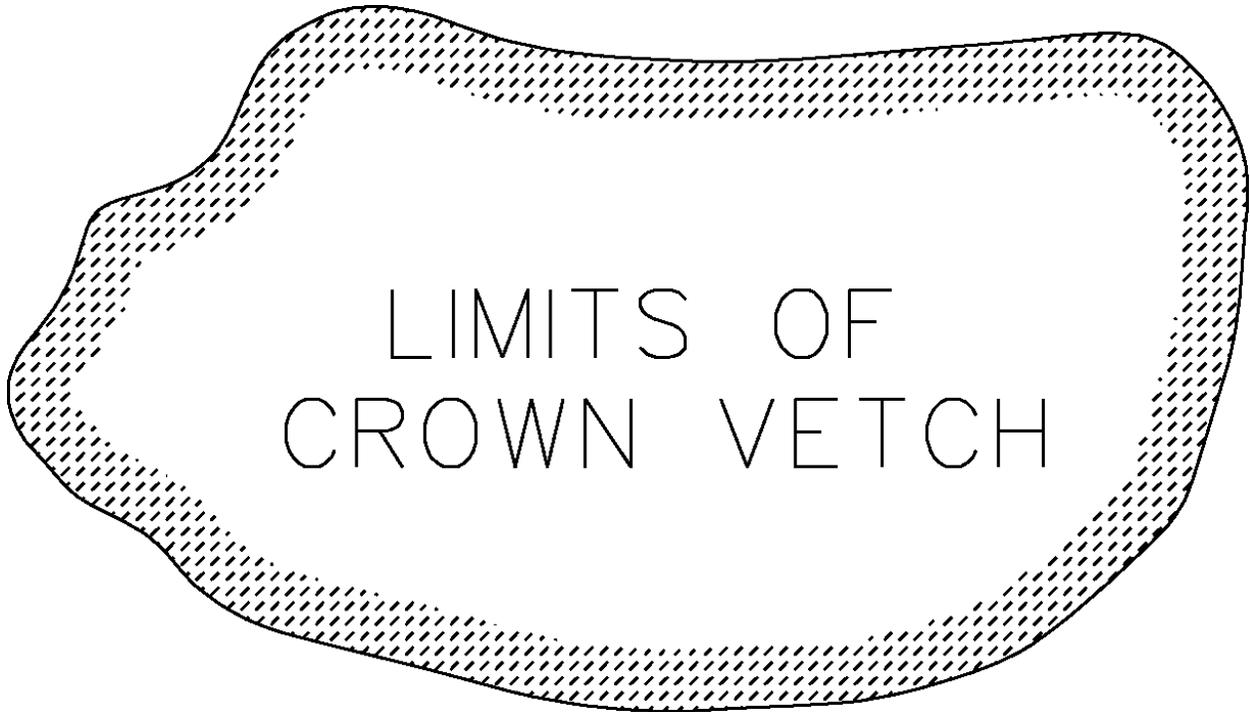


Figure 4-18
Typical Limits of Crown Vetch

4-801.10 WATER (SEEDING AND SODDING)

Item No. 801-03 Water (Seeding and Sodding)

Water for seeding, sodding, crown vetch mixture or sprigging (crown vetch):

Water will be measured by the thousand gallon (M.G.) as designed and completed in place, unless revised by the sequence of construction, in which case complete replacement and remeasurement may be required.

Seeding-
(all areas) $\frac{\text{Surface area (Sq. ft.) x 0.1 M.G. /unit}}{1,000 \text{ Sq. ft./unit}} = \text{_____ M. Gal. Item No. 801-03}$

Total seeding (units) x 0.1 M.G./ unit = Total Water (M.G.)

The designer shall **footnote** pay item as follows:

"Includes _____ thousand gallons for erosion prevention and sediment control."

Sodding $\frac{\text{Surface area (Sq. Yd.)} \times 10 \text{ Gal./Sq. Yd.}}{1,000 \text{ Gal./M.G.}} = \text{_____ M. Gal.}$ Item No. 801-03

4-801.15 SEEDING (SUPPLEMENTAL APPLICATION)

10 pound Minimum Quantity

Units of 801-01 x 1.5 Lbs/Unit x 15% = _____ Lbs. Item No. 801-07

Units of 801-01.02 x 1.5 Lbs/Unit x 15% = _____ Lbs. Item No. 801-07.01

4-801.20 FERTILIZER (SUPPLEMENTAL APPLICATION)

1 Ton Minimum Quantity

Units of 801-01 x $\frac{23 \text{ Lb./Unit} \times 15\%}{2,000 \text{ Lb./Ton}}$ and/or 801-01.02 = _____ Tons Item No. 801-08

4-805.00 EROSION CONTROL BLANKET

See Chapter 10 of the Drainage Manual.

4-806.00 PROJECT MOWING CYCLE

Projects on State Routes with high traffic volumes and high visibility shall include Item No. 806-02.03, Project Mowing, Cycle, on their construction plans. This item is not intended for use on resurfacing projects.

For the purpose of determining applicable projects, designers will include Project Mowing on **new construction projects, reconstruction projects** (including widening) or **on-system bridge replacement projects where one or more of the following apply:**

- Expected project duration is one year or greater
- Project is in a urban area (for purposes of this bulletin an urban area is defined as any city with a population of 5,000 or greater)
- The current Average Daily Traffic (ADT) is 20,000 or greater

The quantity to be set up for a project should be based on a minimum of 2 mowing cycles per year of construction. Since most projects fall into the 2 to 3 year range, a minimum of 4-6 cycles would be needed. The number of mowing cycles per year of construction may be increased based upon input received at the construction field review. Design Managers should check with the Construction Division to determine the length of the contract.

Item no. 806-02.03, Project Mowing, Cycl., shall include the following footnote: "Item includes litter and trash removal. This work will not be measured and paid for directly but will be included in the cost of Item No. 806-02.03, Project Mowing, Cycl."

CHAPTER 9 - MATERIALS

4-905.00 SILICONE SEALANT

Silicone sealant shall be used on all new projects using Portland cement concrete pavement as a primary pavement for the main line or ramps, excluding rehabilitation of all old concrete pavement or joint repair. The silicone sealant is specified in Subsection 905.05 of the *Tennessee Department of Transportation Standard Specifications*.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0348

INSTRUCTIONAL BULLETIN NO. 09-17

Regarding Revised Sections 6 & 7 - General Notes and Special Notes & Index

Effective for the March 10, 2010 letting (January 13, 2009 Turn-in), Sections 6 & 7 of the Design Guidelines are revised. The entire Section 6 (Revised: December 1, 2009) and Section 7 (Revised: December 1, 2009) is attached to replace the existing sections in the Design Guidelines.

The following sections of Section 6 have been revised as part of the December 1, 2009 revision.

Section	Revision
6-145.00 Pavement Markings	Notes added and revised to address changes to pavement marking guidelines.
6-295.02 Stream Relocation	Note (4) revised.

The following sections of Section 6 were revised as part of the previous revision to Section 6 dated September 28, 2009 and is provided for information to designers to document recently revised general notes.

Section	Revision
6-105.00 Seeding and Sodding	Note (5) revised
6-110.00 Guardrail	Note to designer added prior to Note (2)
6-115.00 Drainage	Note (2) revised
6-175.00 Signalization	Notes (15) thru (18) deleted
6-190.05 Inspection, Maintenance, and Repair	Note (25) revised
6-290.00 Erosion Prevention and Sediment Control	Note to designer added
6-290.01 Stream/ Wetland	Note to designer revised prior to Note (1)
6-290.02 High Quality Waters	Note to designer revised prior to Note (2)
6-290.03 NPDES	Note to designer revised prior to Note (4) Note to designer revised prior to Note (8) Note to designer revised prior to Note (9)
6-290.04 Utility Relocation	Note to designer revised prior to Note (10)
6-290.05 Litter, Debris, Waste, Petroleum	New section added
6-290.06 Polyacrylamide	New section added
6-295.01 Ecology	Note to designer revised prior to Note (1)
6-295.02 Stream Relocation	New section added

This bulletin voids Instructional Bulletin 09-14.

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

December 1, 2009
JCJ:MA:ma

SECTION VI – GENERAL NOTES AND SPECIAL NOTES

CHAPTER 1 – GENERAL NOTES

6-100.00	GRADING
6-105.00	SEEDING AND SODDING
6-110.00	GUARDRAIL
6-115.00	DRAINAGE
6-120.00	UTILITIES
6-125.00	FENCING
6-130.00	MISCELLANEOUS
6-135.00	ROAD CLOSURE
6-140.00	RIGHT – OF – WAY
6-145.00	PAVEMENT MARKINGS
6-150.00	PAVEMENT
6-150.01	PAVING
6-150.02	RESURFACING
6-155.00	GRADED SOLID ROCK
6-160.00	RIPRAP
6-165.00	SIGNING
6-170.00	TRAFFIC CONTROL DIRECTIONAL SIGNING
6-175.00	SIGNALIZATION
6-180.00	CONSTRUCTION WORK ZONE & TRAFFIC CONTROL
6-185.00	LIGHTING
6-190.00	EROSION PREVENTION AND SEDIMENT CONTROL
6-190.01	DISTURBED AREA
6-190.02	SEDIMENT CONTROL
6-190.03	STREAM/WETLAND

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- 6-190.04 SPECIES
- 6-190.05 INSPECTION, MAINTENANCE, REPAIR
- 6-190.06 MATERIALS
- 6-190.07 SWPPP, PERMITS, PLANS, RECORDS
- 6-190.08 LITTER, DEBRIS, WASTE, PETROLEUM

CHAPTER 2 – SPECIAL NOTES

- 6-200.00 GRADING
- 6-250.00 PAVEMENT
 - 6-250.02 RESURFACING
 - 6-250.03 PAVEMENT EDGE DROP-OFF TRAFFIC CONTROL
- 6-270.00 SIGNALIZATION
- 6-290.00 EROSION PREVENTION AND SEDIMENT CONTROL
 - 6-290.01 STREAM/WETLAND
 - 6-290.02 HIGH QUALITY WATERS
 - 6-290.03 NPDES
 - 6-290.04 UTILITY RELOCATION
 - 6-290.05 LITTER, DEBRIS, WASTE, PETROLEUM
 - 6-290.06 POLYACRYLAMIDE
- 6-295.00 ENVIRONMENTAL
 - 6-295.01 ECOLOGY
 - 6-295.02 STREAM RELOCATION

SECTION VI – GENERAL NOTES AND SPECIAL NOTES

CHAPTER 1 – GENERAL NOTES

6-100.00 GRADING

- (1) ANY AREA THAT IS DISTURBED OUTSIDE LIMITS OF CONSTRUCTION DURING THE LIFE OF THIS PROJECT SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
- (2) CERTIFICATION FOR ALL BORROW PITS MUST BE OBTAINED IN ACCORDANCE WITH SUBSECTION 107.06 OF THE STANDARD SPECIFICATIONS.
- (3) THE CONTRACTOR SHALL NOT DISPOSE OF ANY MATERIAL EITHER ON OR OFF STATE-OWNED R.O.W. IN A REGULATORY FLOOD WAY AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY WITHOUT APPROVAL BY SAME. ALL MATERIAL SHALL BE DISPOSED OF IN UPLAND (NON-WETLAND) AREAS AND ABOVE ORDINARY HIGH WATER OF ANY ADJACENT WATERCOURSE. THIS DOES NOT ELIMINATE THE NEED TO OBTAIN ANY OTHER LICENSES OR PERMITS THAT MAY BE REQUIRED BY ANY OTHER FEDERAL, STATE OR LOCAL AGENCY.
- (4) ARCHAEOLOGICAL SITE NO. _____ MUST BE AVOIDED AS A SOURCE OF FILL OR HEAVY MACHINERY STAGING AREA. EARTH FILL WILL BE REQUIRED FROM AREAS OUTSIDE THE PROPOSED RIGHT-OF-WAY. CERTIFICATION MUST BE OBTAINED IN ACCORDANCE WITH SUBSECTION 107.06 OF THE STANDARD SPECIFICATIONS.

6-105.00 SEEDING AND SODDING

- (1) ALL EXISTING ROADS WITHIN THE RIGHT-OF-WAY AND NOT IN THE GRADED AREA THAT ARE TO BE ABANDONED SHALL BE SCARIFIED, OBLITERATED, TOPSOILED AND SEEDED. SCARIFYING AND OBLITERATING THE PAVEMENT WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS. TOPSOIL, IN ACCORDANCE WITH SECTION 203 OF THE STANDARD SPECIFICATIONS, WILL BE MEASURED AND PAID FOR UNDER ITEMS 203-04 AND/OR 203-07. SEEDING, IN ACCORDANCE WITH SECTION 801 OF THE STANDARD SPECIFICATIONS, WILL BE MEASURED AND PAID FOR UNDER ITEM 801-01.
- (2) SOD SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLANS TO PREVENT DAMAGE TO ADJACENT FACILITIES AND PROPERTY DUE TO EROSION ON ALL NEWLY GRADED CUT AND FILL SLOPES AS WORK PROGRESSES.

NOTE: SEE SECTION 4-801.05. NOTE (3) SHALL BE PLACED IN THE GENERAL NOTES WITH THE BLANK BEING FILLED IN WITH THE PROPER ITEM NUMBER

- (3) ITEM NO. ____ SHALL BE USED ON SLOPES 3:1 OR STEEPER AND OTHER AREAS AS INDICATED IN THE PLANS THAT ARE INACCESSIBLE FOR MOWING.
- (4) ITEM NO. 801-01, SEEDING (WITH MULCH), SHALL BE USED WHERE EROSION CONTROL BLANKET OR SOD ARE NOT APPLIED.
- (5) ITEM NO. 801-02, SEEDING (WITHOUT MULCH) AND EROSION CONTROL BLANKET, SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLANS AS WELL AS LOCATIONS DIRECTED BY THE ENGINEER.

6-110.00 GUARDRAIL

- (1) THE CONTRACTOR SHALL NOT REMOVE ANY SECTIONS OF EXISTING GUARDRAIL TO REWORK SHOULDERS OR FLATTEN SLOPES UNTIL THE ENGINEER CONCURS IN THE NECESSITY OF REMOVAL DUE TO CONSTRUCTION REQUIREMENTS AND THE APPROPRIATE WARNING DEVICES ARE INSTALLED. THE PROPOSED GUARDRAIL, INCLUDING ANY ANCHOR SYSTEM, SHALL BE INSTALLED QUICKLY TO MINIMIZE TRAFFIC EXPOSURE TO ANY HAZARD. NO PAYMENT WILL BE MADE FOR A SECTION OF PROPOSED GUARDRAIL, INCLUDING ANCHORS, UNTIL IT IS COMPLETE IN PLACE.

NOTE: NOTE (2) NOT NECESSARY IF NOTE (1) IS USED.

- (2) THE PROPOSED GUARDRAIL, INCLUDING ANY ANCHOR SYSTEM, SHALL BE INSTALLED QUICKLY TO MINIMIZE TRAFFIC EXPOSURE TO ANY HAZARD. NO PAYMENT WILL BE MADE FOR A SECTION OF PROPOSED GUARDRAIL, INCLUDING ANCHORS, UNTIL IT IS COMPLETE IN PLACE.

NOTE: NOTE (3) NOT NECESSARY IF NOTE (2) IS USED. IF BARRICADES OR DRUMS AND TYPE "A" LIGHTS ARE NOT ALREADY IN THE CONTRACT, BE SURE TO PROVIDE FOR PAYMENT.

- (3) IF ANY APPROACH END OF A SECTION OF GUARDRAIL OR BRIDGE RAIL MUST TEMPORARILY BE LEFT INCOMPLETE AND EXPOSED TO TRAFFIC, THE CONTRACTOR SHALL USE TWO (2) TEMPORARY BARRICADES OR DRUMS WITH TYPE A LIGHTS AND ROUNDED END ELEMENTS AS MINIMUM MEASURES TO PROTECT TRAFFIC FROM THE HAZARD OF AN EXPOSED END. ALL COST OF FURNISHING AND INSTALLING A TEMPORARY ROUNDED END ELEMENT SHALL BE INCLUDED IN THE COST OF THE PROPOSED GUARDRAIL.

NOTE: NOTE (4) TO BE USED ON NEW ALIGNMENT ONLY.

- (4) GUARDRAIL IS TO BE COMPLETE IN PLACE BEFORE THE MAINLINE ROADWAY IS OPENED TO TRAFFIC.

6-115.00 DRAINAGE

- (1) THE CONTRACTOR SHALL SHAPE DITCHES TO THE SPECIFIED DESIGN. THIS WORK WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS.

NOTE: SEE SECTION 4-204.00

- (2) EXCAVATION FOR _____ WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT WILL BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PIPE (PIPE CULVERTS, STORM SEWERS, CONDUITS, ALL OTHER CULVERTS AND MINOR STRUCTURES).

NOTE: SEE SECTION 4-204.05

- (3) CULVERT EXCAVATION FOR CONCRETE BOX OR SLAB TYPE CULVERTS OR BRIDGES WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN THE COST OF OTHER ITEMS.
- (4) THE CUTTING OF INLET AND OUTLET DITCHES WHERE SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER WILL BE MEASURED AND PAID FOR AS ITEM NO. 203-01 ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED).
- (5) WHERE A CULVERT (PIPE, SLAB OR BOX) IS MOVED TO A NEW LOCATION OTHER THAN THAT SHOWN ON THE PLANS, INCREASING OR DECREASING THE AMOUNT OF CULVERT EXCAVATION, NO INCREASE OR DECREASE IN THE AMOUNT OF PAYMENT WILL BE MADE DUE TO SUCH CHANGE.
- (6) DURING CONSTRUCTION OF DRAINAGE STRUCTURES ALL COST ASSOCIATED WITH MAINTAINING THE FLOW OF WATER AND TRAFFIC, AT THESE STRUCTURES, DURING THE PHASED CONSTRUCTION OF THIS PROJECT ARE TO BE INCLUDED IN THE UNIT PRICE OF THE DRAINAGE STRUCTURES AND TRAFFIC CONTROL ITEMS.

6-120.00 UTILITIES

- (1) THE LOCATIONS OF UTILITIES SHOWN WITHIN THESE PLANS ARE APPROXIMATE ONLY. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD BY CONTACTING THE UTILITY COMPANIES INVOLVED. NOTIFICATION BY CALLING THE TENNESSEE ONE CALL SYSTEM, INC., AT 1-800-351-1111 AS REQUIRED BY TCA 65-31-106 WILL BE REQUIRED.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- (2) UNLESS OTHERWISE NOTED, ALL UTILITY ADJUSTMENTS WILL BE PERFORMED BY THE UTILITY OR IT'S REPRESENTATIVE. THE CONTRACTOR AND UTILITY OWNERS WILL BE REQUIRED TO COOPERATE WITH EACH OTHER IN ORDER TO EXPEDITE THE WORK REQUIRED BY THIS CONTRACT. ON CONTRACTS WHERE CONSTRUCTION STAKES, LINES, AND GRADES ARE CONTRACT ITEMS, THE CONTRACTOR WILL BE REQUIRED TO PROVIDE RIGHT-OF-WAY OR SLOPE STAKES, DITCH OR STREAM BED GRADES, OR OTHER ESSENTIAL SURVEY STAKING TO PREVENT CONFLICTS WITH THE HIGHWAY CONSTRUCTION. FREQUENTLY, THIS WILL BE REQUIRED AS THE FIRST ITEM OF WORK AND AT ANY LOCATION ON THE PROJECT DIRECTED BY THE ENGINEER.
- (3) THE CONTRACTOR WILL PROVIDE ALL NECESSARY PROTECTIVE MEASURES TO SAFEGUARD EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION OF THIS PROJECT. IN THE EVENT THAT SPECIAL EQUIPMENT IS REQUIRED TO WORK OVER AND AROUND THE UTILITIES, THE CONTRACTOR WILL BE REQUIRED TO FURNISH SUCH EQUIPMENT. THE COST OF PROTECTING UTILITIES FROM DAMAGE AND FURNISHING SPECIAL EQUIPMENT WILL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF CONSTRUCTION.
- (4) PRIOR TO SUBMITTING HIS BID, THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR CONTACTING OWNERS OF ALL AFFECTED UTILITIES IN ORDER TO DETERMINE THE EXTENT TO WHICH UTILITY RELOCATIONS AND/OR ADJUSTMENTS WILL HAVE UPON THE SCHEDULE OF WORK FOR THE PROJECT. WHILE SOME WORK MAY BE REQUIRED 'AROUND' UTILITY FACILITIES THAT WILL REMAIN IN PLACE, OTHER UTILITY FACILITIES MAY NEED TO BE ADJUSTED CONCURRENTLY WITH THE CONTRACTOR'S OPERATIONS. ADVANCE CLEAR CUTTING MAY BE REQUIRED BY THE ENGINEER AT ANY LOCATION WHERE CLEARING IS CALLED FOR IN THE SPECIFICATIONS AND CLEAR CUTTING IS NECESSARY FOR A UTILITY RELOCATION. ANY ADDITIONAL COST WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE CLEARING ITEM SPECIFIED IN THE PLANS.
- (5) THE CONTRACTOR SHALL NOTIFY EACH INDIVIDUAL UTILITY OWNER OF HIS PLAN OF OPERATION IN THE AREA OF THE UTILITIES. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL CONTACT THE UTILITY OWNERS AND REQUEST THEM TO PROPERLY LOCATE THEIR RESPECTIVE UTILITY ON THE GROUND. THIS NOTIFICATION SHALL BE GIVEN AT LEAST THREE (3) BUSINESS DAYS PRIOR TO COMMENCEMENT OF OPERATIONS AROUND THE UTILITY IN ACCORDANCE WITH TCA 65-31-106.

6-125.00 FENCING

- (1) LOCATION OF THE FENCE SHALL BE ONE FOOT INSIDE THE RIGHT-OF-WAY EXCEPT WHERE SHOWN ON THE PLANS.
- (2) FENCES SHALL BE TURNED IN AT DRAINAGE STRUCTURES, STOCK PASSES AND BRIDGES WHERE DIRECTED BY THE ENGINEER SO AS TO ABUT WINGWALLS AND/OR ABUTMENTS.
- (3) THE CONTRACTOR SHALL GIVE THE AFFECTED PROPERTY OWNERS TWO WEEKS NOTICE PRIOR TO CUTTING FENCES.
- (4) THE CONTRACTOR SHALL BE REQUIRED TO INSTALL ACCESS CONTROL FENCES PRIOR TO CUTTING EXISTING STOCK FENCES IN AREAS UTILIZED BY DOMESTIC LIVESTOCK OR OTHER AREAS AS DIRECTED BY THE ENGINEER.

6-130.00 MISCELLANEOUS

- (1) ALL DETOUR, ACCESS, SERVICE AND FRONTAGE ROADS SHALL BE CONSTRUCTED WITH A MINIMUM OF ONE (1) COURSE OF BASE MATERIAL BEFORE TRAFFIC IS INTERRUPTED ON EXISTING ROADS.
- (2) THE CONTRACTOR SHALL BE REQUIRED TO REMOVE AND RESET MAILBOXES WHERE AND AS DIRECTED BY THE ENGINEER.
- (3) NOTHING IN THE GENERAL NOTES OR SPECIAL PROVISIONS SHALL RELIEVE THE CONTRACTOR FROM HIS RESPONSIBILITIES TOWARD THE SAFETY AND CONVENIENCE OF THE GENERAL PUBLIC AND THE RESIDENTS ALONG THE PROPOSED CONSTRUCTION AREA

6-135.00 ROAD CLOSURE

- (1) NO LESS THAN SEVEN (7) DAYS PRIOR TO THE CLOSURE OF THE ROAD, THE CONTRACTOR SHALL NOTIFY THE FOLLOWING INDIVIDUALS OR AGENCIES COMPLETELY DESCRIBING THE AFFECTED ROADS AND THE APPROXIMATE DURATION OF THE CONSTRUCTION: THESE PARTIES INCLUDE, BUT ARE NOT LIMITED TO: (1) LOCAL LAW ENFORCEMENT OFFICE, (2) LOCAL FIRE DEPARTMENT, (3) AMBULANCE SERVICE, (4) LOCAL SCHOOL SUPERINTENDENT, (5) UNITED STATES POSTAL SERVICE, AND (6) LOCAL ROAD SUPERINTENDENT.

6-140.00 RIGHT – OF – WAY

NOTE: SEE SECTION 2-300.00. NOTES (1) OR (2) TO BE USED ON ALL ROW PROJECTS.

NOTE: NOTE (1) TO BE USED FOR PLANS PREPARED OR MANAGED IN THE HEADQUARTERS DESIGN OFFICE.

- (1) IT IS INTENDED THAT ALL BUILDINGS AND/OR PORTIONS OF BUILDINGS THAT ARE WITHIN THE PROPOSED RIGHT-OF-WAY AND/OR EASEMENT LINES FOR THE PROJECT BE REMOVED THERE FROM IN THE PROCESS OF RIGHT-OF-WAY ACQUISITION. IF ANY SUCH BUILDINGS OR IMPROVEMENTS ARE NOT REMOVED IN THE COURSE OF RIGHT-OF-WAY ACQUISITION, THE CIVIL ENGINEERING MANAGER 2, DESIGN DIVISION IS TO BE NOTIFIED IN SUFFICIENT TIME TO PERMIT HAVING SUCH REMOVALS DESIGNATED AS A PART OF THE CONSTRUCTION CONTRACT.

NOTE: NOTE (2) TO BE USED FOR PLANS PREPARED OR MANAGED IN THE REGIONAL DESIGN OFFICES.

- (2) IT IS INTENDED THAT ALL BUILDINGS AND/OR PORTIONS OF BUILDINGS THAT ARE WITHIN THE PROPOSED RIGHT-OF-WAY AND/OR EASEMENT LINES FOR THE PROJECT BE REMOVED THERE FROM IN THE PROCESS OF RIGHT-OF-WAY ACQUISITION. IF ANY SUCH BUILDINGS OR IMPROVEMENTS ARE NOT REMOVED IN THE COURSE OF RIGHT-OF-WAY ACQUISITION, THE CIVIL ENGINEERING MANAGER 2, DESIGN DIVISION AND THE CIVIL ENGINEERING MANAGER 1, REGIONAL DESIGN OFFICE, ARE TO BE NOTIFIED IN SUFFICIENT TIME TO PERMIT HAVING SUCH REMOVALS DESIGNATED AS A PART OF THE CONSTRUCTION CONTRACT.
- (3) ALL RAMPS MUST CONFORM TO THE DEPARTMENT'S "POLICY ON FINANCING CONSTRUCTION OF PUBLIC ROAD INTERSECTIONS AND DRIVEWAYS ON HIGHWAY RESURFACING, RECONSTRUCTION AND CONSTRUCTION PROJECTS ON NEW LOCATIONS", THE MANUAL ON RULES AND REGULATIONS FOR CONSTRUCTING DRIVEWAYS ON STATE HIGHWAY RIGHT-OF-WAY, STANDARD DRAWING RP-R-1, AND OTHER ACCEPTED DESIGN AND SAFETY STANDARDS.

NOTE: SEE SECTION 2-300.05. NOTES (4) THROUGH (8) ARE TO BE USED ON NEW OR RECONSTRUCTION PROJECTS WITH PARTIAL ACCESS CONTROL. NOTES (4) THROUGH (7) AND NOTE (9) GO ON ALL NEW OR RECONSTRUCTION PROJECTS WITH NO ACCESS CONTROL.

- (4) EXISTING PAVED DRIVEWAY PER TRACT REMAINDER WILL BE REPLACED IN KIND TO A TOUCHDOWN POINT.
- (5) WHERE THE EXISTING DRIVEWAY IS UNPAVED AND THE PROPOSED DRIVEWAY EXCEEDS 7 PERCENT IN GRADE, EACH DRIVEWAY WILL BE PAVED TO A TOUCHDOWN POINT OR UNTIL THE GRADE IS LESS THAN 7 PERCENT.
- (6) WHERE THE EXISTING DRIVEWAY IS UNPAVED AND THE PROPOSED DRIVEWAY IS LESS THAN 7 PERCENT IN GRADE, EACH DRIVEWAY WILL BE PAVED A SHOULDER WIDTH FROM THE EDGE OF PAVEMENT AND

THE REMAINDER OF THAT DRIVEWAY REPLACED IN KIND TO A TOUCHDOWN POINT.

- (7) ANY NECESSARY PAVING OF DRIVEWAYS WILL BE DONE DURING PAVING OPERATIONS ON THE MAIN ROADWAY.
- (8) TRACT REMAINDERS NOT HAVING AN EXISTING DRIVEWAY WILL BE PROVIDED ONE 50-FOOT OPENING IN THE ACCESS CONTROL FENCE AND A DRIVEWAY WILL BE CONSTRUCTED UNLESS ACCESS IS PROVIDED FROM AN INTERSECTING ROAD OR BASED ON PHYSICAL CONDITIONS AND/OR CONFLICTS WITH OTHER DESIGN CONSIDERATIONS WHICH PREVENT AN ACCESS OPENING. PAVING OF THESE NEW DRIVEWAYS WILL BE IN ACCORDANCE TO THE 7 PERCENT CRITERIA PREVIOUSLY MENTIONED FOR EXISTING DRIVEWAYS.
- (9) NEW DRIVEWAYS PROVIDED IN THE PLANS WILL BE PAVED BASED ON THE 7 PERCENT CRITERIA. THOSE 7 PERCENT OR STEEPER IN GRADE WILL BE PAVED AND THOSE FLATTER THAN 7 PERCENT WILL BE COVERED WITH BASE STONE.

NOTE: SEE SECTION 2-300.05. NOTES (10) AND (11) GO ON PROJECTS THAT ARE ON STATE ROUTES AND NOTE (12) GOES ON PROJECTS THAT ARE NOT ON STATE ROUTES.

- (10) ON PROJECTS WITHOUT CURB AND GUTTER THAT ARE ON STATE ROUTES, IT WILL BE THE RESPONSIBILITY OF THE OWNER TO SECURE A PERMIT AND TO CONSTRUCT ADDITIONAL DRIVEWAYS AND FIELD ENTRANCES OTHER THAN THOSE PROVIDED IN THE PLANS.
- (11) ON PROJECTS WITH CURB AND GUTTER THAT ARE ON STATE ROUTES, IT WILL BE THE RESPONSIBILITY OF THE OWNER TO SECURE A PERMIT. AFTER THE PERMIT HAS BEEN GRANTED, THE DEPARTMENT WILL CONSTRUCT THE DRIVEWAY OR FIELD ENTRANCE THROUGH THE CURB AND SIDEWALK, PROVIDED THE CURB AND SIDEWALK HAVE NOT BEEN CONSTRUCTED. IT WILL BE THE RESPONSIBILITY OF THE PROPERTY OWNER TO CONSTRUCT THE DRIVEWAY OR FIELD ENTRANCE FROM BACK OF SIDEWALK TO TOUCHDOWN POINT FOR ANY ADDITIONAL DRIVEWAYS OR FIELD ENTRANCES OTHER THAN THOSE PROVIDED IN THE PLANS.
- (12) ON NON-STATE ROUTES, ADDITIONAL DRIVEWAYS AND FIELD ENTRANCES OTHER THAN THOSE PROVIDED IN THE PLANS SHALL REQUIRE A PERMIT ONLY IF THE LOCAL AGENCY SPECIFIES THE NEED FOR THAT PERMIT.

NOTE: SEE SECTION 1-210.05.

- (13) EASEMENT REQUIRED FOR THE RAILROAD CROSSING IS TO BE OBTAINED BY THE UTILITIES ENGINEER BY PROVISIONS CONTAINED IN THE CROSSING AGREEMENT NEGOTIATED WITH THE RAILROAD.

6-145.00 PAVEMENT MARKINGS

NOTE: SEE SECTION 4-716.05 THROUGH 4-716.36.

TEMPORARY PAVEMENT MARKING ON INTERMEDIATE LAYERS

- (1) TEMPORARY PAVEMENT LINE MARKINGS ON INTERMEDIATE LAYERS OF PAVEMENT SHALL BE REFLECTIVE TAPE OR REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAYS WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.01, PAINTED PAVEMENT MARKING (4" LINE), L.M.
- (2) TEMPORARY PAVEMENT LINE MARKINGS ON INTERMEDIATE LAYERS OF PAVEMENT SHALL BE REFLECTIVE TAPE OR REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAYS WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.20, PAINTED PAVEMENT MARKING (6" LINE), L.M.
- (3) TEMPORARY PAVEMENT LINE MARKINGS ON INTERMEDIATE LAYERS OF PAVEMENT SHALL BE REFLECTIVE TAPE OR REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAYS WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.02, PAINTED PAVEMENT MARKING (8" BARRIER LINE), L.F.
- (4) WIDE (8 INCH) TEMPORARY PAVEMENT MARKING LINE WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.02 PAINTED PAVEMENT MARKING (8" BARRIER LINE), LIN. FT.

FINAL PAVEMENT MARKING IF 4" ENHANCED FLATLINE THERMOPLASTIC IS USED

- (5) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 4" ENHANCED FLATLINE THERMOPLASTIC INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-12.01, ENHANCED FLATLINE THERMO PVMT MRKNG (4IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 6" ENHANCED FLATLINE THERMOPLASTIC IS USED

- (6) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 6" ENHANCED FLATLINE THERMOPLASTIC INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-12.02, ENHANCED FLATLINE THERMO PVMT MRKNG (6IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 8" ENHANCED FLATLINE THERMOPLASTIC IS USED

- (7) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 8" ENHANCED FLATLINE THERMOPLASTIC INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-12.03, ENHANCED FLATLINE THERMO PVMT MRKNG (8IN BARRIER LINE), L.F. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN

INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 4" SPRAY THERMOPLASTIC (60 mil) IS USED

- (8) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 4" SPRAY THERMOPLASTIC (60 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.01, SPRAY THERMO PVMT MRKNG (60 mil) (4IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 6" SPRAY THERMOPLASTIC (60 mil) IS USED

- (9) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 6" SPRAY THERMOPLASTIC (60 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.02, SPRAY THERMO PVMT MRKNG (60 mil) (6IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 8" SPRAY THERMOPLASTIC (60 mil) IS USED

- (10) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 8" SPRAY THERMOPLASTIC (60 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.03, SPRAY THERMO PVMT MRKNG (60 mil) (8IN BARRIER LINE), L.F. THE CONTRACTOR SHALL HAVE THE

OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 4" SPRAY THERMOPLASTIC (40 mil) IS USED

- (11) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 4" SPRAY THERMOPLASTIC (40 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.06, SPRAY THERMO PVMT MRKNG (40 mil) (4IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 6" SPRAY THERMOPLASTIC (40 mil) IS USED

- (12) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 6" SPRAY THERMOPLASTIC (40 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.07, SPRAY THERMO PVMT MRKNG (40 mil) (6IN LINE), L.M. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF 8" SPRAY THERMOPLASTIC (40 mil) IS USED

- (13) PERMANENT PAVEMENT LINE MARKINGS SHALL BE 8" SPRAY THERMOPLASTIC (40 mil) INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT UNMARKED SECTIONS SHALL

NOT BE ALLOWED. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-13.08, SPRAY THERMO PVMT MRKNG (40 mil) (8IN BARRIER LINE), L.F. THE CONTRACTOR SHALL HAVE THE OPTION OF USING REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK AND THEN INSTALLING THE PERMANENT MARKINGS AFTER THE PAVING OPERATION IS COMPLETED. THE TEMPORARY MARKINGS FOR THE FINAL SURFACE WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR THE PERMANENT MARKINGS.

FINAL PAVEMENT MARKING IF REFLECTORIZED PAINT IS USED

- (14) PERMANENT PAVEMENT LINE MARKINGS SHALL BE REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.01 PAINTED PAVEMENT MARKING (4IN LINE), L.M.
- (15) PERMANENT PAVEMENT LINE MARKINGS SHALL BE REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.20 PAINTED PAVEMENT MARKING (6IN LINE), L.M.
- (16) PERMANENT PAVEMENT LINE MARKINGS SHALL BE REFLECTORIZED PAINT INSTALLED TO PERMANENT STANDARDS AT THE END OF EACH DAY'S WORK. SHORT, UNMARKED SECTIONS SHALL NOT BE ALLOWED. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. 716-05.02 PAINTED PAVEMENT MARKING (8IN BARRIER LINE), L.F.

DETOURS, LANE SHIFTS AND MEDIAN CROSS-OVERS

- (17) THE PAVEMENT MARKING ON THE _____(C)_____ FOR _____(D)_____ WILL BE INSTALLED AND MAINTAINED TO THE SAME STANDARDS AS FOR PERMANENT MARKINGS ON THE MAIN ROADWAY. THESE MARKINGS SHALL BE IN PLACE PRIOR TO ALLOWING TRAFFIC ONTO THE PAVEMENT. THESE PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM NO. _____(E)_____, LIN. MI.

(C) NOTE: FILL IN THE BLANK WITH APPROPRIATE WORDS(S) FOR THE SPECIAL ROADWAY(S): DETOUR, LANE SHIFT, MEDIAN CROSSOVER, ETC.

(D) NOTE: FILL IN THE BLANK WITH APPROPRIATE WORD(S) FOR THE KIND OF PAVEMENT MARKING(S) NEEDED: CENTERLINE, EDGELINES, LANE LINES.

(E) NOTE: SEE SECTIONS 4-712.10 AND 4-716.11. FILL IN THE BLANK WITH ITEM NO. 716-05.01 PAINTED PAVEMENT MARKING (4IN LINE), L.M., 716-05.20 PAINTED PAVEMENT MARKING (6IN LINE), L.M., OR ITEM NO. 716-05.02 PAINTED PAVEMENT MARKING (8IN BARRIER LINE), L.F.

(18) BEFORE OPENING THE _____(C)_____ TO TRAFFIC, THE TRANSITIONAL MARKINGS ON THE EXISTING ROADWAY MUST BE IN PLACE. THESE MARKINGS WILL BE MEASURED AND PAID FOR UNDER ITEM 712-09.01 REMOVABLE PAVEMENT MARKING LINE, LIN. FT. ALL EXISTING MARKINGS IN THE AREA OF THESE TRANSITIONAL MARKINGS SHALL BE OBLITERATED AND ALL EXISTING RAISED PAVEMENT MARKERS SHALL BE REMOVED TO ELIMINATE CONFLICTING MARKINGS. REMOVAL OF THE EXISTING CONFLICTING MARKINGS AND RAISED PAVEMENT MARKERS WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN ITEM NO. 712-01 TRAFFIC CONTROL, LUMP SUM.

(C) NOTE: FILL IN THE BLANK WITH APPROPRIATE WORDS(S) FOR THE SPECIAL ROADWAY(S): DETOUR, LANE SHIFT, MEDIAN CROSSOVER, ETC.

(19) BEFORE OPENING THE _____(C)_____ TO TRAFFIC, THE TRANSITIONAL MARKINGS ON THE EXISTING ROADWAY MUST BE IN PLACE. ALL EXISTING MARKINGS IN THE AREA OF THESE TRANSITIONAL MARKINGS SHALL BE OBLITERATED AND ALL EXISTING RAISED PAVEMENT MARKERS SHALL BE REMOVED TO ELIMINATE CONFLICTING MARKINGS. REMOVAL OF THE EXISTING CONFLICTING MARKINGS AND RAISED PAVEMENT MARKERS WILL NOT BE MEASURED AND PAID FOR DIRECTLY, BUT THE COST WILL BE INCLUDED IN ITEM NO. 712-01 TRAFFIC CONTROL, LUMP SUM.

(C) NOTE: FILL IN THE BLANK WITH APPROPRIATE WORDS(S) FOR THE SPECIAL ROADWAY(S): DETOUR, LANE SHIFT, MEDIAN CROSSOVER, ETC.

6-150.00 PAVEMENT

NOTE: NOTES (1), (2), (3), (4), (5), AND (8) ARE TO BE PLACED ON ALL RESURFACING PROJECTS ON ROADWAYS WITH SHOULDERS AND DITCHES (NO CURB AND GUTTER).

NOTE: NOTES (1), (2), (3), (6), (7), AND (8) ARE TO BE PLACED ON ALL RESURFACING PROJECTS ON ROADWAYS WITH URBAN CURB AND GUTTERS.

6-150.01 PAVING

- (1) THE CONTRACTOR SHALL BE REQUIRED TO PAVE IN THE DIRECTION OF TRAFFIC.
- (2) THE CONTRACTOR SHALL BE REQUIRED TO COLD PLANE AND PAVE IN THE DIRECTION OF TRAFFIC.

6-150.02 RESURFACING

NOTES (3) THROUGH (8) FOR RESURFACING ONLY

- (3) WHERE DIRECTED BY THE TDOT ENGINEER, THE CONTRACTOR SHALL BE REQUIRED TO SHAPE PUBLIC SIDE ROADS, BUSINESS ENTRANCES, AND PRIVATE DRIVES, AS WELL AS CLEANING OF EXISTING DRAINS BEFORE PLACING MATERIALS. ALL COSTS ARE TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF CONSTRUCTION.
- (4) ALL PUBLIC SIDE ROADS SHALL BE PAVED ONE PAVER WIDTH THROUGH THE INTERSECTION AS A MINIMUM. A SATISFACTORY TRANSITION FROM THE NEW PAVEMENT TO THE EXISTING GRADE OF THE INTERSECTING PUBLIC ROAD OR BUSINESS ENTRANCE SHALL BE PROVIDED. SHOULD THE PAVEMENT OF THE INTERSECTING PUBLIC ROAD BE DISTRESSED, THE RESURFACING WIDTH MAY BE INCREASED TO THE NORMAL RIGHT OF WAY LINE.
- (5) PRIVATE DRIVEWAYS, FIELD ENTRANCES, AND BUSINESS ENTRANCES WILL BE RESURFACED A PAVER WIDTH (LANE WIDTH) AS A MINIMUM. A PAVEMENT TAPER TO TRANSITION THE NEW PAVEMENT SHALL BE REQUIRED, IT SHALL BE BASED ON AN ADDITIONAL ONE FOOT OF WIDTH PER ONE INCH DEPTH OF PAVEMENT. IF THE SHOULDER IS NARROW ENOUGH THAT THE SUM OF THE SHOULDER AND THE TRANSITION ARE LESS THAN A PAVER WIDTH, THE TRANSITION SHALL OCCUR WITHIN THE PAVER WIDTH. IF THE SUM OF THE SHOULDER AND THE TRANSITION IS GREATER THAN A PAVER WIDTH (LANE WIDTH), THE TRANSITION SHALL OCCUR OUTSIDE OF THE PAVER WIDTH.
- (6) ON CURB AND GUTTER SECTIONS, PUBLIC ROAD INTERSECTIONS SHALL BE RESURFACED TO THE END OF RADIUS. A SATISFACTORY TRANSITION FROM THE NEW PAVEMENT TO THE EXISTING GRADE OF THE INTERSECTING PUBLIC ROAD SHALL BE PROVIDED.
- (7) ON URBAN TYPICAL SECTIONS, (CURB AND GUTTER), RESIDENTIAL DRIVEWAYS AND BUSINESS ENTRANCES SHALL HAVE A MINIMUM WIDTH OF MATERIAL NOT LESS THAN ONE FOOT USED IN THE TRANSITION TO FEATHER THE PAVEMENT EDGE.
- (8) IN ALL CASES, THE LENGTH OF THE PAVEMENT TRANSITION, THE THICKNESS AND WIDTH OF THE RESURFACING AND ANY ADDITIONAL

PAVEMENT MATERIALS SHALL BE AS DIRECTED BY THE TDOT ENGINEER.

6-155.00 GRADED SOLID ROCK

NOTE: IF A NOTE WORDED DIFFERENTLY FROM (1) IS SUPPLIED, THAT NOTE SHOULD BE USED. IF A MAXIMUM DIMENSION TWO FEET OR LESS IS SPECIFIED, NOTE (2) IS NOT NECESSARY; HOWEVER, IF A MAXIMUM DIMENSION GREATER THAN TWO FEET BUT NOT THREE FEET IS SPECIFIED, IT SHALL BE NECESSARY TO CONTACT THE CONSTRUCTION OFFICE FOR THE APPROPRIATE MAXIMUM DEPTH TO BE USED IN NOTE (2).

- (1) THE ROCK FILL (GRADED SOLID ROCK) MATERIAL SHALL CONSIST OF SOUND, NON-DEGRADABLE LIMESTONE OR SANDSTONE WITH A MAXIMUM SIZE OF 3'-0". AT LEAST 50% (BY WEIGHT) OF THE ROCK SHALL BE UNIFORMLY DISTRIBUTED BETWEEN 1'-0" AND 3'-0" IN DIAMETER, AND NO GREATER THAN 10% (BY WEIGHT) SHALL BE LESS THAN 2" IN DIAMETER. THE MATERIAL SHALL BE ROUGHLY EQUIDIMENSIONAL; THIN, SLABBY MATERIALS WILL NOT BE ACCEPTED. THE CONTRACTOR SHALL BE REQUIRED TO PROCESS THE MATERIAL WITH AN ACCEPTABLE MECHANICAL MEANS (A SCREENING PROCESS CAPABLE OF PRODUCING THE REQUIRED GRADATION). THE ROCK SHALL BE APPROVED BY A REPRESENTATIVE OF THE DIVISION OF MATERIALS AND TESTS BEFORE USE.
- (2) THIS GRADED SOLID ROCK MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING FIVE FEET IN DEPTH.

6-160.00 RIPRAP

NOTES (1) AND (2) ARE NOT REQUIRED IF CLASS A-1, A-2, B, OR C MACHINED RIPRAP IS USED.

- (1) MACHINED RIPRAP SHALL BE IN ACCORDANCE WITH SECTION 709 OF THE STANDARD SPECIFICATIONS EXCEPT AS MODIFIED BY THIS NOTE. MACHINED RIPRAP SHALL BE CLEAN SHOT ROCK CONTAINING NO SAND, DUST, OR ORGANIC MATERIALS AND SHALL VARY IN SIZE FROM ___" TO ___'-___". THE STONE SIZES SHALL BE DISTRIBUTED UNIFORMLY THROUGHOUT THE SIZE RANGE WITH NO MORE THAN 20% OF THE MATERIAL (BY WEIGHT) LESS THAN ___". THE THICKNESS OF THE STONE LAYER SHALL BE ___'-___" (+/-3") AND THE SIZE GRADATION SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT THE LAYER THICKNESS AND FROM TOP TO BOTTOM OF THE SLOPE.

UPON COMPLETION OF THE PROJECT, A VISUAL INSPECTION SHALL REVEAL THAT APPROXIMATELY 50% OF THE SURFACE AREA CONSISTS OF STONES ___" OR LARGER. PAYMENT WILL BE MADE UNDER ITEM

709-05.10 MACHINED RIPRAP (DESCRIPTION), C.Y., AND QUANTITIES WILL BE BASED ON THE AVERAGE THICKNESS OF ___'- ___".

- (2) RIPRAP SHALL CONSIST OF FURNISHING AND PLACING EITHER RUBBLE STONES BY HAND OR MACHINED. RUBBLE STONE SHALL MEET THE REQUIREMENTS OF SECTION 709 OF THE STANDARD SPECIFICATIONS AND SHALL BE CLEAN (FREE FROM ORGANIC MATTER), DURABLE, ANGULAR WITH FRACTURED FACES, NEARLY RECTANGULAR IN SHAPE WITH A BREADTH OR THICKNESS AT LEAST ONE-THIRD ITS LENGTH.

IF THE CONTRACTOR ELECTS TO USE MACHINED RIPRAP, IT SHALL BE IN ACCORDANCE WITH SECTION 709 OF THE STANDARD SPECIFICATIONS EXCEPT AS MODIFIED BY THIS NOTE. MACHINED RIPRAP SHALL BE CLEAN SHOT ROCK CONTAINING NO SAND, DUST, OR ORGANIC MATERIALS, AND SHALL VARY IN SIZE FROM ___" TO ___'- ___". THE STONE SIZES SHALL BE DISTRIBUTED UNIFORMLY THROUGHOUT THE SIZE RANGE WITH NO MORE THAN 20% OF THE MATERIAL (BY WEIGHT) LESS THAN ___". THE THICKNESS OF THE STONE LAYER SHALL BE ___'- ___" (+/-3") AND THE SIZE GRADATION SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT THE LAYER THICKNESS AND FROM TOP TO BOTTOM OF THE SLOPE. UPON COMPLETION OF THE PROJECT, A VISUAL INSPECTION SHALL REVEAL THAT APPROXIMATELY 50% OF THE SURFACE AREA CONSISTS OF STONES ___" OR LARGER. PAYMENT WILL BE MADE UNDER ITEM ___(A)_____ AND QUANTITIES WILL BE BASED ON A THICKNESS OF ___'- ___".

(A) NOTE: FILL IN THE BLANK WITH APPROPRIATE RIPRAP ITEM NUMBER.

6-165.00 SIGNING

- (1) THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL FLAT SHEET SIGNS SHALL BE APPLIED BY SILK SCREENING PROCESS, EXCEPT THAT CUTOUT DIRECT APPLIED COPY SHALL BE USED ON ALL FLAT SHEET SIGNS WITH A GREEN BACKGROUND. THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL EXTRUDED PANEL SIGNS SHALL BE DEMOUNTABLE AND ATTACHED TO THE SIGN FACE, AS OUTLINED IN THE STANDARD SPECIFICATIONS. ALL SHIELDS ON GUIDE SIGNS SHALL BE DEMOUNTABLE AND ATTACHED TO THE SIGN FACE AS OUTLINED IN THE STANDARD SPECIFICATIONS.
- (2) THE LENGTHS OF ALL SIGN SUPPORTS SHOWN ON THE SIGN SCHEDULE ARE APPROXIMATE AND ARE FOR ESTIMATING PURPOSES ONLY. THE LENGTHS WERE COMPUTED FROM THE CROSS-SECTIONS CONTAINED IN THE CONSTRUCTION PLANS. IN THE EVENT THE SUPPORT LENGTHS ARE 2 FEET SHORTER OR LONGER THAN SHOWN ON THE PLANS, THE ENGINEER SHALL VERIFY THE SUPPORT TYPE WITH THE DESIGN

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- DIVISION, SIGNING AND MARKING SECTION, TELEPHONE NO. (615)-741-0982. THE CONTRACTOR SHALL VERIFY ALL SUPPORT LENGTHS AT THE SITE PRIOR TO ORDERING MATERIAL.
- (3) THE TOP OF THE SIGN FOOTINGS SHALL BE PLACED LEVEL WITH THE GROUND LINE.
 - (4) AFTER THE SIGN LOCATIONS HAVE BEEN STAKED, BUT PRIOR TO ORDERING ANY MATERIAL FOR THE SUPPORTS, THERE SHALL BE A FIELD INSPECTION AND APPROVAL BY THE REGIONAL CONSTRUCTION OFFICE.
 - (5) THE CONTRACTOR SHALL BE REQUIRED TO FURNISH LAYOUT DRAWINGS (3 SETS) OF ALL EXTRUDED PANEL SIGNS WITH SPACING OF ALL LETTERS, NUMERALS, SHIELDS, AND ARROWS. THE LAYOUT DRAWINGS SHALL BE SENT TO THE DESIGN DIVISION, SIGNING AND MARKING SECTION, SUITE 1000, J. K. POLK BUILDING, NASHVILLE, TN 37243-0350.
 - (6) ALL SIGNS MARKED "TO BE REMOVED" ARE TO BE REMOVED BY THE CONTRACTOR AND PAID FOR UNDER ITEM 713-15 AND BECOME THE PROPERTY OF THE CONTRACTOR.
 - (7) THE EXISTING FOOTINGS ARE TO BE REMOVED 6 INCHES BELOW GROUND LINE.
 - (8) THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL FLAT SHEET SIGNS SHALL BE APPLIED BY SILK SCREENING PROCESS, EXCEPT THAT CUT-OUT DIRECT APPLIED COPY SHALL BE USED ON ALL FLAT SHEET SIGNS WITH A GREEN BACKGROUND, OR BROWN BACKGROUND.
 - (9) THE LENGTHS OF ALL SIGN SUPPORTS SHOWN ON THE SIGN SCHEDULE ARE APPROXIMATE AND ARE FOR ESTIMATING PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY ALL SUPPORT LENGTHS AT THE SITE PRIOR TO ERECTION.
 - (10) THE LETTERS, DIGITS, ARROWS, BORDERS, AND ALPHABET ACCESSORIES ON ALL FLAT SHEET SIGNS SHALL BE APPLIED BY SILK SCREENING PROCESS.

6-170.00 TRAFFIC CONTROL DIRECTIONAL SIGNING

NOTE: NOTES (1) THROUGH (5) ARE TO BE PLACED ON ALL ACCESS CONTROLLED AND INTERSTATE RECONSTRUCTION PROJECTS AND ACCESS CONTROLLED AND INTERSTATE RESURFACING PROJECTS WHEN THE TRAFFIC CONTROL PHASING REQUIRES PLACEMENT OF TEMPORARY PAVEMENT MARKINGS WHICH CONFLICT DIRECTIONAL SIGNS OR REQUIRES DIRECTIONAL SIGNS TO BE RELOCATED OR ADJUSTED.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- (1) ON ALL ACCESS CONTROLLED AND INTERSTATE RECONSTRUCTION AND NEW CONSTRUCTION PROJECTS, THE CONTRACTOR SHALL UTILIZE ALL EXISTING DIRECTIONAL SIGNING FOR AS LONG AS POSSIBLE. THESE EXISTING SIGNS CAN BE MOVED USING TEMPORARY SUPPORTS AS NEEDED. AS SOON AS THESE EXISTING DIRECTIONAL SIGNS COME DOWN PERMANENTLY, THE CONTRACTOR SHALL HAVE UP AT LEAST ONE NEW TEMPORARY "ADVANCE GUIDE SIGN" AND ONE NEW TEMPORARY "EXIT DIRECTIONAL SIGN" AT ALL EXIT RAMPS. THESE SIGNS ARE TO BE MAINTAINED WITHIN CLEAR VIEW OF THE PUBLIC ON THE RIGHT SIDE OF THE HIGHWAY AND SHALL BE REPLACED IF DAMAGED, DURING ALL PHASES OF CONSTRUCTION, AS DIRECTED BY THE ENGINEER.
- (2) THE SIZE OF THESE NEW TEMPORARY SIGNS WILL BE DETERMINED BY THE MESSAGE. THE MESSAGE SHALL BE THE SAME AS THE EXISTING SIGN THAT THESE NEW TEMPORARY SIGNS WILL BE REPLACING. THE LETTER SIZE SHALL BE A MINIMUM OF 8 INCH, "D" UPPER CASE LETTER. THE DIRECTIONAL ARROW WILL BE A "B" ARROW AT A 45 DEGREE ANGLE (SAME ANGLE AS THE EXISTING ARROW). THE MATERIAL SHALL BE 0.100 INCH SHEET ALUMINUM; THE COLOR SHALL BE A REFLECTIVE GREEN BACKGROUND WITH REFLECTIVE WHITE COPY.
- (3) ALL WORK AND MATERIAL TO MAKE THESE NEW TEMPORARY DIRECTIONAL SIGNS ALONG WITH ADEQUATE SUPPORTS AND TO MOVE THEM AS NEEDED DURING EACH PHASE OF CONSTRUCTION WILL BE PAID FOR UNDER ITEM NO. _____ (A) _____, AS DIRECTED BY THE ENGINEER.

(A) NOTE: FILL IN THE BLANK WITH APPROPRIATE 712-SERIES ITEM NUMBER.

- (4) SOME OF THESE DIRECTIONAL SIGNS WILL NEED AN INTERSTATE, U.S., OR A STATE HIGHWAY SHIELD, A CARDINAL DIRECTION, AND A DIRECTION ARROW TO ACCOMPANY THE DIRECTIONAL SIGN. THESE SIGNS SHALL BE MOUNTED BELOW THE DIRECTIONAL SIGN.
- (5) ALL EXISTING "EMERGENCY REFERENCE MARKERS" AND "HOSPITAL SIGNS" SHALL BE MAINTAINED WITHIN FULL VIEW OF THE MOTORING PUBLIC THROUGHOUT ALL PHASES OF CONSTRUCTION. ALL WORK IN MOVING AND TEMPORARY SUPPORTS SHALL BE PAID FOR UNDER ITEM NO. _____ (B) _____.

(B) NOTE: FILL IN THE BLANK WITH APPROPRIATE 712-SERIES ITEM NUMBER.

NOTE: NOTE (6) SHOULD BE PLACED ON ACCESS CONTROL AND INTERSTATE PROJECTS WITH EXISTING "LOGO" SIGNS.

- (6) WHEN "LOGO" SIGNS ARE ON ACCESS CONTROLLED AND INTERSTATE RECONSTRUCTION AND NEW CONSTRUCTION PROJECTS, THE

CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THESE SIGNS IN FULL VIEW TO THE MOTORING PUBLIC DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL BE HELD RESPONSIBLE TO THE DEPARTMENT FOR THE REIMBURSEMENT OF THE SIGN FACE IF IT IS DAMAGED. ALL WORK IN MOVING THESE "LOGO" SIGNS AND THE TEMPORARY SUPPORTS ARE TO BE PAID FOR UNDER ITEM NO. _____(C)_____, AS DIRECTED BY THE ENGINEER. THE SUPPORTS FOR THE FINAL LOCATION OF THESE SIGNS WILL BE PAID FOR UNDER OTHER ITEMS OF CONSTRUCTION.

(C) NOTE: FILL IN THE BLANK WITH APPROPRIATE 712-SERIES ITEM NUMBER.

NOTE: NOTE (7) SHOULD BE PLACED ON NON-ACCESS CONTROLLED PROJECTS.

- (7) WHEN EXISTING "TOURIST ORIENTED DIRECTIONAL SIGNS" (TODS) ARE ON NON-ACCESS CONTROLLED CONSTRUCTION PROJECTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THESE SIGNS IN FULL VIEW TO THE MOTORING PUBLIC DURING ALL PHASES OF CONSTRUCTION. ALL WORK IN MOVING THESE "TODS" AND TEMPORARY SUPPORTS ARE TO BE PAID FOR UNDER ITEM NO. _____(D)_____, AS DIRECTED BY THE ENGINEER. NEW SUPPORTS AND SIGN FACE FOR FINAL LOCATION WILL BE PAID FOR UNDER OTHER ITEMS OF CONSTRUCTION.

(D) NOTE: FILL IN THE BLANK WITH APPROPRIATE 712-SERIES ITEM NUMBER.

6-175.00 SIGNALIZATION

- (1) EQUIPMENT AND INSTALLATION OF TRAFFIC SIGNALS SHALL COMPLY WITH TDOT STANDARD SPECIFICATIONS, SECTION 730.

NOTE: NOTE (2) IS FOR USE IN HAMILTON COUNTY, AS DIRECTED.

- (2) EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE TDOT "SPECIAL PROVISIONS REGARDING SECTION 730C-TRAFFIC SIGNALS."

NOTE: NOTE (3) IS FOR USE IN KNOX COUNTY, AS DIRECTED.

- (3) EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE TDOT "SPECIAL PROVISIONS REGARDING SECTION 730K-TRAFFIC SIGNALS."

NOTE: NOTE (4) IS FOR USE IN SHELBY COUNTY, AS DIRECTED.

- (4) EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE TDOT "SPECIAL PROVISIONS REGARDING SECTION 730M-TRAFFIC SIGNALS."

NOTE: NOTE (5) IS FOR USE IN DAVIDSON COUNTY, AS DIRECTED.

- (5) EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE TDOT "SPECIAL PROVISIONS REGARDING SECTION 730N-TRAFFIC SIGNALS."
- (6) SALVAGEABLE EQUIPMENT SHALL BECOME THE PROPERTY OF THE (CITY OR COUNTY) AND SHALL BE STOCKPILED AT A LOCATION DESIGNATED BY THE ENGINEER FOR PICKUP BY THE (CITY OR COUNTY).
- (7) IF RESURFACING IS INCLUDED IN THE PROJECT, SIGNAL DETECTION LOOPS SHALL BE INSTALLED BEFORE THE FINAL SURFACE IS APPLIED.
- (8) ANY SIGNAL HEADS, WHEN VISIBLE TO DRIVERS BUT NOT OPERATIONAL, SHALL BE COMPLETELY COVERED.
- (9) SIGNAL HEADS SHALL FLASH A MINIMUM OF SEVEN (7) DAYS PRIOR TO ACTIVATION OF THE SIGNAL.
- (10) THE CONTRACTOR SHALL CONTACT _____ A MINIMUM OF THIRTY (30) DAYS PRIOR TO ACTIVATION OF THE SIGNAL TO OBTAIN THE INITIAL SIGNAL TIMINGS.

NOTE: FOR NOTES (11) THROUGH (18) SEE SECTION 4-730.08.

- (11) THE PROJECT ENGINEER SHALL NOTIFY THE LOCAL GOVERNMENTAL AGENCY RESPONSIBLE FOR TRAFFIC CONTROL MAINTENANCE AT LEAST ONE DAY IN ADVANCE OF THE COLD PLANING ACTIVITY AT SIGNALIZED INTERSECTIONS WHERE DETECTOR LOOPS ARE ON THE PAVEMENT. THE MAINTAINING AGENCY WILL THEN BE RESPONSIBLE FOR DISCONNECTING THE LOOP DETECTORS AND MAKING ANY NECESSARY TIMING ADJUSTMENTS IN THE SIGNAL CONTROLLER PRIOR TO THE CONSTRUCTION.
- (12) THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR SUPPLYING THE CONTRACTOR WITH AS BUILT SIGNAL PLANS AT THE PRE-CONSTRUCTION CONFERENCE. THESE PLANS WILL PROVIDE THE CONTRACTOR WITH THE DESIRED LOCATION FOR DETECTOR LOOP REPLACEMENT.
- (13) LOOPS SHALL BE INSTALLED IN THE LEVELING COURSE IF A LEVELING COURSE IS PROVIDED.
- (14) LOOP REPLACEMENT SHALL BE IN ACCORDANCE WITH SECTION 730 OF THE STANDARD SPECIFICATIONS.

6-180.00 CONSTRUCTION WORK ZONE & TRAFFIC CONTROL

- (1) ADVANCED WARNING SIGNS SHALL NOT BE DISPLAYED MORE THAN FORTY-EIGHT (48) HOURS BEFORE PHYSICAL CONSTRUCTION BEGINS. SIGNS MAY BE ERECTED UP TO ONE WEEK BEFORE NEEDED, IF THE SIGN FACE IS FULLY COVERED.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- (2) IF THE CONTRACTOR MOVES OFF THE PROJECT, HE SHALL COVER OR REMOVE ALL UNNEEDED SIGNS AS DIRECTED BY THE ENGINEER. COSTS OF REMOVAL, COVERING, AND REINSTALLING SIGNS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT ALL COSTS SHALL BE INCLUDED IN THE ORIGINAL UNIT PRICE BID FOR ITEM NO 712-06, SIGNS (CONSTRUCTION) PER SQUARE FOOT.
- (3) A LONG TERM BUT SPORADIC USE WARNING SIGN, SUCH AS A FLAGGER SIGN, MAY REMAIN IN PLACE WHEN NOT REQUIRED PROVIDED THE SIGN FACE IS FULLY COVERED.
- (4) TRAFFIC CONTROL DEVICES SHALL NOT BE DISPLAYED OR ERECTED UNLESS RELATED CONDITIONS ARE PRESENT NECESSITATING WARNING.
- (5) USE OF BARRICADES, PORTABLE BARRIER RAILS, VERTICAL PANELS, AND DRUMS SHALL BE LIMITED TO THE IMMEDIATE AREAS OF CONSTRUCTION WHERE A HAZARD IS PRESENT. THESE DEVICES SHALL NOT BE STORED ALONG THE ROADWAY WITHIN THIRTY (30) FEET OF THE EDGE OF THE TRAVELED WAY BEFORE OR AFTER USE UNLESS PROTECTED BY GUARDRAIL, BRIDGE RAIL, AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL INCREASE TO FORTY-FIVE (45) FEET FOR ROADWAYS WITH CURRENT ADT'S OF 1500 OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. THESE DEVICES SHALL BE REMOVED FROM THE CONSTRUCTION WORK ZONE WHEN THE ENGINEER DETERMINES THEY ARE NO LONGER NEEDED. WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK, THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.
- (6) THE CONTRACTOR SHALL NOT BE PERMITTED TO PARK ANY VEHICLES OR CONSTRUCTION EQUIPMENT DURING PERIODS OF INACTIVITY, WITHIN THIRTY (30) FEET OF THE EDGE OF PAVEMENT WHEN THE LANE IS OPEN TO TRAFFIC UNLESS PROTECTED BY GUARDRAIL, BRIDGE RAIL, AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL BE INCREASED TO FORTY-FIVE (45) FEET FOR ROADWAYS WITH CURRENT ADT'S OF 1500 OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE. PRIVATELY OWNED VEHICLES SHALL NOT BE ALLOWED TO PARK WITHIN THIRTY (30) FEET OF A OPEN TRAFFIC LANE AT ANY TIME UNLESS PROTECTED AS DESCRIBED ABOVE FOR ROADWAYS WITH CURRENT ADT'S LESS THAN 1500 AND DESIGN SPEED OF LESS THAN 60 MPH. THIS DISTANCE SHALL BE INCREASED TO FORTY-FIVE (45) FEET FOR ROADWAYS WITH CURRENT ADT'S OF 1500

OR GREATER AND DESIGN SPEED OF 60 MPH OR GREATER OR ON THE OUTSIDE OF A HORIZONTAL CURVE.. WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS REQUIRED SETBACK, THE CONTRACTOR SHALL DETERMINE THE ALTERNATE LOCATIONS AND REQUEST THE ENGINEER'S APPROVAL TO USE THEM.

- (7) ALL DETOUR AND CONSTRUCTION SIGNING SHALL BE IN STRICT ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- (8) ALL DETOURS SHALL BE PAVED, STRIPED, SIGNED AND THE VERTICAL PANELS ARE TO BE IN PLACE BEFORE IT IS OPENED TO TRAFFIC.

6-185.00 LIGHTING

- (1) INSTALLATION AND MATERIALS SHALL COMPLY WITH SECTIONS 714 AND 917 OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED MARCH 1, 2006 AND WITH THE LATEST REVISIONS TO THE NATIONAL ELECTRIC CODE, NFPA 70.
- (2) ALL WIRING SHALL BE CONCEALED UNDERGROUND IN 2-INCH SCHEDULE 40 PVC RIGID CONDUIT.
- (3) THE GROUND WIRE SHALL BE RUN INSIDE CONDUIT WITHIN STRUCTURES, SHALL BE COLORED GREEN AND HAVE THW INSULATION.
- (4) EXISTING FOUNDATIONS TO BE REMOVED A MINIMUM OF SIX INCHES BELOW GRADE.
- (5) ALL INCIDENTAL EQUIPMENT AND MATERIAL REQUIRED FOR THE SUCCESSFUL EXECUTION OF THIS WORK SHALL BE FURNISHED IN 714 ITEMS WHETHER SPECIFICALLY NOTED OR NOT.
- (6) LIGHT STANDARDS SHALL BE ROUND TAPERED POLES. LENGTH SHALL BE DETERMINED BY REQUIRED MOUNTING HEIGHT.
- (7) STANDARDS SHALL BE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORT FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.
- (8) STANDARDS SHALL BE DESIGNED FOR 80-MPH WIND PRESSURE AND SHALL SUPPORT A 62-POUND LUMINAIRE ON A 15-FOOT ARM.
- (9) ALL NEW ROADWAY LIGHT STANDARDS SHALL BE MOUNTED ON BASES WITH ACCESS DOOR. TRANSFORMER BASES SHALL MEET AASHTO SPECIFICATIONS AND HAVE FHWA APPROVAL. STANDARDS SHALL BE ALUMINUM WITH TRANSFORMER BASES.

- (10) BRACKET ARMS SHALL BE ROUND TAPERED TRUSS TYPE WITH STRAP MOUNTING AND LENGTHS AS SCHEDULED.
- (11) BRACKET ARM UPSWEEP SHALL BE THE SAME FOR ALL LIGHT STANDARDS OF THE SAME TYPE.

6-190.00 EROSION PREVENTION AND SEDIMENT CONTROL

6-190.01 DISTURBED AREA

- (1) PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED (I.E. CLEARING AND GRUBBING INITIATED) MORE THAN 10 CALENDAR DAYS PRIOR TO GRADING OR EARTH MOVING ACTIVITIES UNLESS THE AREA IS MULCHED, SEEDED WITH MULCH, OR OTHER TEMPORARY COVER IS INSTALLED.
- (2) CLEARING, GRUBBING, AND OTHER DISTURBANCE TO RIPARIAN VEGETATION SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR SLOPE CONSTRUCTION AND EQUIPMENT OPERATIONS. UNNECESSARY VEGETATION REMOVAL IS PROHIBITED.
- (3) ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE. PRIORITY SHALL BE GIVEN TO FINISHING OPERATIONS AND PERMANENT EPSC MEASURES OVER TEMPORARY EPSC MEASURES ON ALL PROJECTS.
- (4) CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF GRADED OR DENUDED SOIL AREAS AND SHALL BE PHASED FOR PROJECTS THAT HAVE OVER 50 ACRES OF SOIL DISTURBANCE. NO MORE THAN 50 ACRES OF ACTIVE SOIL DISTURBANCE IS ALLOWED AT ANY TIME DURING THE CONSTRUCTION PROJECT, UNLESS APPROVED IN WRITING BY THE ENVIRONMENTAL DIVISION.

6-190.02 SEDIMENT CONTROL

- (5) EPSC MEASURES SHALL BE INSTALLED CONCURRENTLY WITH CLEARING OPERATIONS, SHALL BE FUNCTIONAL PRIOR TO ANY EARTH MOVING OPERATIONS, AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
- (6) THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A PROACTIVE METHOD TO PREVENT THE OFF-SITE MIGRATION OR DEPOSIT OF SEDIMENT ON ROADWAYS USED BY THE GENERAL PUBLIC. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT THAT HAVE NOT REACHED A STREAM MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS (E.G.,

FUGITIVE SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN A STREET MUST BE REMOVED SO THAT IT IS NOT SUBSEQUENTLY WASHED INTO STORM SEWERS AND STREAMS BY THE NEXT RAIN AND/OR SO THAT IT DOES NOT POSE A SAFETY HAZARD TO USERS OF PUBLIC STREETS). ARRANGEMENTS CONCERNING REMOVAL OF SEDIMENT ON ADJOINING PROPERTY MUST BE SETTLED WITH THE ADJOINING PROPERTY OWNER BEFORE REMOVAL OF SEDIMENT.

- (7) WATER PUMPED FROM WORK AREAS AND EXCAVATION MUST BE HELD IN SETTLING BASINS OR TREATED BY FILTRATION PRIOR TO ITS DISCHARGE INTO SURFACE WATERS. WATER MUST BE HELD IN SETTLING BASINS UNTIL AT LEAST AS CLEAR AS THE RECEIVING WATERS. SETTLING BASINS SHALL NOT BE LOCATED CLOSER THAN 20 FEET FROM THE TOP BANK OF A STREAM. SETTLING BASINS AND SEDIMENT TRAPS SHALL BE PROPERLY DESIGNED ACCORDING TO THE SIZE OF THE DRAINAGE AREAS OR VOLUME OF WATER TO BE TREATED. TREATED WATER MUST BE DISCHARGED THROUGH A PIPE OR WELL-VEGETATED OR LINED CHANNEL, SO THAT THE DISCHARGE DOES NOT CAUSE EROSION OR SEDIMENT TRANSPORT.
- (8) CHECK DAMS SHALL BE USED WHERE RUNOFF IS CONCENTRATED. CLEAN ROCK, BRUSH, GABION, OR SANDBAG CHECK DAMS SHALL BE PROPERLY CONSTRUCTED TO REDUCE VELOCITY AND CONTROL EROSION.
- (9) FOR AN OUTFALL IN A DRAINAGE AREA OF 10 ACRES OR MORE, A TEMPORARY (OR PERMANENT) SEDIMENT BASIN OR EQUIVALENT CONTROL MEASURES THAT PROVIDES STORAGE FOR A CALCULATED VOLUME OF RUNOFF FROM A MINIMUM 2-YEAR/ 24-HOUR STORM EVENT, SHALL BE PROVIDED UNTIL FINAL STABILIZATION OF THE SITE. THE ENVIRONMENTAL AND DESIGN DIVISIONS MAY BE CONTACTED TO REVIEW AND CONCUR WITH ANY REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE OUTFALL PROCEEDS.
- (10) IF PERMANENT OR TEMPORARY VEGETATION IS TO BE USED AS AN EPSC MEASURE, THEN THE TIMING OF PLANTING OF VEGETATION SHALL BE SHOWN IN THE SWPPP. DELAYING PLANTING OF COVER VEGETATION UNTIL WINTER MONTHS OR DRY MONTHS SHOULD BE AVOIDED, IF POSSIBLE.
- (11) OFFSITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST SHALL BE MINIMIZED. A STABILIZED CONSTRUCTION ACCESS (A POINT OF ENTRANCE/EXIT TO THE CONSTRUCTION PROJECT) SHALL BE PROVIDED, AS NEEDED, TO REDUCE THE TRACKING OF MUD AND DIRT ONTO PUBLIC ROADS BY CONSTRUCTION VEHICLES.
- (12) TEMPORARY EPSC MEASURES MAY BE REMOVED AT THE BEGINNING OF THE WORKDAY, BUT MUST BE REPLACED AT THE END OF THE WORKDAY.

6-190.03 STREAM/WETLAND

- (13) SOIL MATERIALS MUST BE PREVENTED FROM ENTERING WATERS OF THE STATE/U.S. EPSC MEASURES TO PROTECT WATER QUALITY MUST BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. APPROPRIATE EPSC MEASURES MUST BE INSTALLED ALONG THE BASE OF ALL FILLS AND CUTS, ON THE DOWNHILL SIDE OF STOCKPILED SOIL, AND ALONG STREAM BANKS IN CLEARED AREAS TO PREVENT SEDIMENT MIGRATION INTO STREAMS IN ACCORDANCE WITH TDOT STANDARDS. THEY MUST BE INSTALLED ON THE CONTOUR, ENTRENCHED AND STAKED, AND EXTEND THE WIDTH OF THE AREA TO BE CLEARED.
- (14) NEW CHANNEL CONSTRUCTION SHALL BE COMPLETED IN THE DRY AND STABILIZED FOR AT LEAST 72 HOURS PRIOR TO DIVERTING WATER FROM THE EXISTING AND/OR TEMPORARY CHANNEL.
- (15) INSTREAM EPSC DEVICES ARE NOT APPROVED, UNLESS SPECIFIED IN WRITING BY THE ENVIRONMENTAL DIVISION.
- (16) THE OPERATION OF EQUIPMENT IN WATERS OF THE STATE/U.S., INCLUDING WETLANDS, SHALL BE ONLY AS SHOWN ON THE PROJECT PLANS AND/OR AS SO SPECIFIED IN THE ARAP/401, SECTION 404 PERMIT(S) AND/OR TVA26(A), IF APPLICABLE. ANY ADDITIONAL PERMITS REQUIRED BY THE CONTRACTOR'S METHOD OF OPERATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN, AFTER RECEIVING THE APPROVAL OF TDOT ENVIRONMENTAL DIVISION.
- (17) THE WIDTH OF THE FILL ASSOCIATED WITH TEMPORARY CROSSINGS SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR THE ACTUAL CROSSING.
- (18) STREAM BEDS SHALL NOT BE USED AS TRANSPORTATION ROUTES FOR CONSTRUCTION EQUIPMENT. TEMPORARY CROSSINGS MUST BE LIMITED TO ONE POINT PER STREAM AND EPSC MEASURES MUST BE USED WHERE THE STREAM BANKS ARE DISTURBED. WHERE THE STREAMBED IS NOT COMPOSED OF BEDROCK, A PAD OF CLEAN ROCK MUST BE USED AT THE CROSSING POINT AND CULVERTED TO PREVENT THE IMPOUNDMENT OF WATER FLOW. CLEAN ROCK IS ROCK OF VARIOUS TYPE AND SIZE, DEPENDING UPON APPLICATION, WHICH CONTAINS NO FINES, SOILS, OR OTHER WASTES OR CONTAMINANTS. OTHER MATERIALS USED FOR ALL TEMPORARY FILLS MUST BE COMPLETELY REMOVED IN THEIR ENTIRETY AFTER THE WORK IS COMPLETED AND THE AFFECTED AREAS RETURNED TO THEIR PREEXISTING ELEVATION. ALL TEMPORARY CROSSINGS MUST BE CONSTRUCTED IN ACCORDANCE WITH STD. DWG. EC-STR-25 UNLESS SPECIFICALLY ADDRESSED IN THE EPSC PLANS. ALTERNATIVELY, PLACING A TEMPORARY BRIDGE (BAILEY BRIDGE OR EQUIVALENT,

TIMBERS, ETC.) FROM TOP OF BANK TO TOP OF BANK OR THE APPROPRIATE USE OF BARGES AT THE CROSSING TO AVOID DISTURBANCE OF THE STREAMBED IS AN ACCEPTABLE OPTION.

- (19) HEAVY EQUIPMENT WORKING IN WETLANDS MUST BE PLACED ON MATS, OR OTHER MEASURES MUST BE TAKEN TO MINIMIZE SOIL DISTURBANCE UNLESS SPECIFICALLY ADDRESSED IN THE EPSC PLANS. ANY MATS AND OTHER MEASURES USED FOR HEAVY EQUIPMENT MUST BE REMOVED IN THEIR ENTIRETY AFTER THE WORK IS COMPLETED.
- (20) WETLANDS SHALL NOT BE USED AS EQUIPMENT STORAGE, STAGING, OR TRANSPORTATION AREAS, UNLESS PROVIDED FOR IN THE PLANS.

6-190.04 SPECIES

- (21) NO ACTIVITY MAY SUBSTANTIALLY DISRUPT THE MOVEMENT OF THOSE SPECIES OF AQUATIC LIFE INDIGENOUS TO THE WATER BODY, INCLUDING THOSE SPECIES THAT NORMALLY MIGRATE THROUGH THE AREA. THE SWPPP SHALL BE MODIFIED TO INCLUDE EPSC MEASURES TO PREVENT NEGATIVE IMPACTS TO LEGALLY PROTECTED STATE OR FEDERAL FAUNA OR FLORA OR AS INDICATED IN THE ECOLOGICAL STUDIES OR ON THE PERMIT(S).

6-190.05 INSPECTION, MAINTENANCE, REPAIR

- (22) INSPECTION, REPAIR, AND MAINTENANCE OF EPSC MEASURES/STRUCTURES IS TO BE PERFORMED ON A REGULAR BASIS. SEDIMENT SHALL BE REMOVED FROM SEDIMENT CONTROL STRUCTURES WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT (50%). DURING SEDIMENT REMOVAL, THE CONTRACTOR SHALL TAKE CARE TO ENSURE THAT STRUCTURAL COMPONENTS OF EPSC MEASURES ARE NOT DAMAGED AND THUS MADE INEFFECTIVE. IF DAMAGE DOES OCCUR, THE CONTRACTOR SHALL REPAIR THE STRUCTURES AT THE CONTRACTOR'S OWN EXPENSE.
- (23) SEDIMENT REMOVED FROM SEDIMENT CONTROL STRUCTURES SHALL BE PLACED AND BE TREATED IN A MANNER SO THAT THE SEDIMENT IS CONTAINED WITHIN THE PROJECT LIMITS AND DOES NOT MIGRATE INTO WATERS OF THE STATE/U.S. COST FOR THIS TREATMENT IS TO BE INCLUDED IN PRICE BID FOR ITEM NO. 209-05 SEDIMENT REMOVAL, C.Y.
- (24) THE CONTRACTOR SHALL INSTALL A RAIN GAUGE EVERY LINEAR MILE AT ALL SITES WHERE CLEARING, GRUBBING, EXCAVATION, GRADING CUTTING OR FILLING IS BEING ACTIVELY PERFORMED, OR EXPOSED SOIL HAS NOT YET BEEN PERMANENTLY STABILIZED. IF THE PROJECT LENGTH IS LESS THAN ONE LINEAR MILE, ONE RAIN GAUGE SHALL BE INSTALLED AT THE CENTER OF THE PROJECT OR AS INDICATED BY THE TDOT EPSC INSPECTOR. THE CONTRACTOR SHALL ENSURE THAT EACH

GAUGE IS MAINTAINED IN GOOD WORKING CONDITION. TDOT AND/OR THE CONTRACTOR SHALL RECORD DAILY PRECIPITATION AND FORECASTED PERCENTAGE OF PRECIPITATION IN DETAILED RECORDS OF RAINFALL EVENTS INCLUDING DATES, AMOUNTS OF RAINFALL PER GAUGE, THE ESTIMATED DURATION (OR STARTING AND ENDING TIMES), AND FORECASTED PERCENTAGE OF PRECIPITATION FOR THE PROJECT. THIS INFORMATION SHALL BE PROVIDED TO THE ENGINEER ON A MONTHLY BASIS. THE COST FOR THE RAIN GAUGES IS TO BE INCLUDED IN THE UNIT BID PRICES FOR OTHER ITEMS. RAIN GAUGES SHALL BE AS SPECIFIED IN THE APPROVED TDOT RAINFALL MONITORING PLAN.

- (25) INSPECTION OF EPSC MEASURES SHALL BE DONE AT LEAST TWICE PER CALENDAR WEEK AT LEAST 72 HOURS APART. A CALENDAR WEEK IS DEFINED AS SUNDAY THROUGH SATURDAY.
- (26) OUTFALL POINTS SHALL BE INSPECTED TO ASCERTAIN WHETHER EPSC MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO SURROUNDING WATERS. WHERE DISCHARGE LOCATIONS ARE INACCESSIBLE, NEARBY DOWNSTREAM LOCATIONS SHALL BE INSPECTED. LOCATIONS WHERE VEHICLES ENTER AND EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE ROADWAY SEDIMENT TRACKING.
- (27) UPON CONCLUSION OF THE INSPECTIONS, EPSC MEASURES FOUND TO BE INEFFECTIVE SHALL BE REPAIRED, REPLACED, OR MODIFIED BEFORE THE NEXT RAIN EVENT, IF POSSIBLE, BUT IN NO CASE MORE THAN 24 HOURS AFTER THE INSPECTION OR WHEN THE CONDITION IS IDENTIFIED. IF THE REPAIR, REPLACEMENT OR MODIFICATION IS NOT PRACTICAL WITHIN THE TIMEFRAME, WRITTEN DOCUMENTATION MUST BE PROVIDED IN THE FIELD BOOK AND AN ESTIMATED REPAIR, REPLACEMENT OR MODIFICATION SCHEDULE SHALL BE DOCUMENTED WITHIN 24 HOURS AFTER IDENTIFICATION.

6-190.06 MATERIALS

- (28) WASTE AND BORROW AREAS SHALL BE LOCATED IN NON-WETLAND AREAS AND ABOVE THE 100-YEAR, FEDERAL EMERGENCY MANAGEMENT AGENCY FLOODPLAIN. BORROW AND WASTE DISPOSAL AREAS SHALL NOT AFFECT ANY WATERS OF THE STATE/U.S. UNLESS THESE AREAS ARE SPECIFICALLY COVERED BY AN ARAP, 404, OR NPDES PERMIT, OBTAINED SOLELY BY THE CONTRACTOR.

6-190.07 SWPPP, PERMITS, PLANS, RECORDS

- (29) THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND OBTAIN ANY NECESSARY ENVIRONMENTAL PERMITS OR APPROVALS, INCLUDING BUT NOT LIMITED TO TDEC ARAP/401, USACE SECTION 404, TVA SECTION 26A, AND TDEC NPDES PERMITS, FROM FEDERAL, STATE

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- AND/OR LOCAL AGENCIES REGARDING THE OPERATION OF ANY PROJECT-DEDICATED ASPHALT AND/OR CONCRETE PLANTS.
- (30) ANY DISAGREEMENT BETWEEN THE PROJECT PLANS, THE PROJECT AS CONSTRUCTED, AND THE PERMIT(S) ISSUED FOR THE PROJECT, SHALL BE BROUGHT TO THE ATTENTION OF THE TDOT PROJECT ENGINEER. THE ENVIRONMENTAL DIVISION, DESIGN DIVISION, AND HEADQUARTERS CONSTRUCTION OFFICE SHALL BE CONTACTED IN THESE INSTANCES AND DECIDE WHICH HAS PRECEDENCE AND WHETHER PERMIT OR PLANS REVISIONS ARE NEEDED. IN GENERAL, PERMIT CONDITIONS WILL PREVAIL.
 - (31) THE FOLLOWING INFORMATION SHALL BE MAINTAINED ON OR NEAR THE SITE: DATES THAT MAJOR GRADING ACTIVITIES OCCUR, DATES WHERE CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE, DATES WHEN STABILIZATION MEASURES ARE INITIATED, EPSC INSPECTION RECORDS AND PRECIPITATION RECORDS.
 - (32) ALL WATER QUALITY AND STORM WATER PERMITS, INCLUDING THE LOCATION OF THE SWPPP, SHALL BE POSTED NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE ACCESSIBLE TO THE PUBLIC. IF POSTING THIS INFORMATION NEAR A MAIN ENTRANCE IS INFEASIBLE, THE INFORMATION SHALL BE PLACED IN A PUBLICLY ACCESSIBLE LOCATION NEAR WHERE THE CONSTRUCTION IS ACTIVELY UNDERWAY AND MOVED AS NECESSARY. THIS LOCATION SHALL BE POSTED AT THE CONSTRUCTION SITE.
 - (33) IF A CHANGE IN PROJECT SCOPE OCCURS DURING CONSTRUCTION, INCLUDING VALUE ENGINEERING, THE ENVIRONMENTAL DIVISION SHALL BE CONTACTED TO DETERMINE WHETHER PERMIT REVISIONS ARE NEEDED. THE DESIGN DIVISION SHALL BE CONTACTED TO DETERMINE IF ANY PLAN REVISIONS ARE NEEDED.
 - (34) THE SWPPP SHALL BE UPDATED BY CONSTRUCTION WHENEVER EPSC INSPECTIONS INDICATE EPSC MEASURES ARE PROVING INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANT SOURCES OR ARE OTHERWISE NOT ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS IN STORM WATER DISCHARGES ASSOCIATED WITH THE CONSTRUCTION ACTIVITY. THE ENVIRONMENTAL DIVISION SHALL BE CONTACTED WHEN MAJOR DESIGN REVISIONS ARE REQUESTED BY CONSTRUCTION. THE ENVIRONMENTAL DIVISION MAY BE CONTACTED FOR GUIDANCE ON SPECIFIC SWPPP NEEDS.
 - (35) PROJECT INSPECTORS AND SUPERVISORS (INCLUDING TDOT STAFF, CONSULTANTS AND CONTRACTOR STAFF) RESPONSIBLE FOR THE IMPLEMENTATION AND MAINTENANCE OF EPSC PLANS SHALL SUCCESSFULLY COMPLETE THE TDEC "LEVEL I - FUNDAMENTALS OF

EROSION PREVENTION AND SEDIMENT CONTROL FOR CONSTRUCTION SITES" COURSE OR EQUIVALENT COURSE. A COPY OF CERTIFICATION RECORDS FOR THIS COURSE SHALL BE KEPT ON SITE AND AVAILABLE UPON REQUEST.

6-190.08 LITTER, DEBRIS, WASTE, PETROLEUM

- (36) THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A PROACTIVE METHOD TO PREVENT LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION WASTES FROM ENTERING WATERS OF THE STATE/U.S.
- (37) THE CONTRACTOR SHALL TAKE APPROPRIATE STEPS TO ENSURE THAT PETROLEUM PRODUCTS OR OTHER CHEMICAL POLLUTANTS ARE PREVENTED FROM ENTERING WATERS OF THE STATE/U.S. ALL EQUIPMENT REFUELING, SERVICING, AND STAGING AREAS SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS, RULES, REGULATIONS, AND ORDINANCES, INCLUDING THOSE OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA). APPROPRIATE CONTAINMENT MEASURES FOR THESE AREAS SHALL BE USED. ALL SPILLS MUST BE REPORTED TO THE APPROPRIATE AGENCY, AND MEASURES SHALL BE TAKEN IMMEDIATELY TO PREVENT THE POLLUTION OF WATERS OF THE STATE/U.S., INCLUDING GROUNDWATER, SHOULD A SPILL OCCUR.

CHAPTER 2 – SPECIAL NOTES

6-200.00 GRADING

NOTE: THESE NOTES SHALL BE ADDED TO THE PLANS AS SPECIAL NOTES ON ALL PROJECTS FOR WHICH A GEOTECHNICAL REPORT IS PREPARED UNLESS OTHERWISE DIRECTED BY THE DESIGN MANAGER AFTER CONSULTATION WITH THE SOILS AND GEOLOGY SECTION OF THE MATERIALS AND TESTS DIVISION AND THE HEADQUARTERS CONSTRUCTION DIVISION. ALL GRADING QUANTITIES ON THE ESTIMATED ROADWAY QUANTITIES SHEET SHOULD ALSO BE FOOTNOTED "REFER TO SPECIAL NOTES."

- (1) THE GRADING TABULATIONS AND RESULTING EARTHWORK ASSOCIATED BID QUANTITIES WERE PREPARED UTILIZING AVAILABLE GEOTECHNICAL INFORMATION AND/OR REPORTS PREPARED FOR THIS PROJECT. THIS INFORMATION IS PROVIDED FOR GENERAL INFORMATION AND ESTIMATION GUIDANCE ONLY.
- (2) BORING DEPICTIONS SHOWN ON THE FOUNDATION DATA SHEETS, SOILS SHEETS, PLANS, AND CROSS-SECTIONS INDICATE SOIL AND ROCK CONDITIONS AT THE SPECIFIC BORING LOCATIONS. ANY SOIL PROFILE AND/OR ROCK LINE IS INTERPRETIVE BASED ON THE JUDGMENT OF THE GEOTECHNICAL ENGINEER/GEOLOGIST. THE TRANSITION BETWEEN BORINGS AND LAYERS MAY VARY SIGNIFICANTLY DEPENDING ON THE GEOLOGIC FORMATIONS ENCOUNTERED.
- (3) TO ASSIST IN BID PREPARATION FOR EARTHWORK AND FOUNDATION CONSTRUCTION, DETAIL ROCK AND SOIL DESCRIPTION AND ON SOME PROJECTS, ROCK CORE SAMPLES ARE AVAILABLE FOR INSPECTION AT THE MATERIALS AND TESTS HEADQUARTERS AT 6601 CENTENNIAL BOULEVARD, NASHVILLE, TN OR AT THE TDOT REGION 1 BUILDING IN KNOXVILLE, TN.
- (4) THE CONTRACTOR SHALL UTILIZE ALL INFORMATION PROVIDED IN THE PLANS, CROSS-SECTIONS AND CONTRACT DOCUMENTS INCLUDING ANY SPECIAL PROVISIONS AS WELL AS UTILIZING HIS PAST EXPERIENCE WITH PROJECTS OF SIMILAR NATURE, SCOPE AND LOCATION IN PREPARATION OF HIS BID FOR EARTHWORK ITEMS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE AND PROVIDE EQUIPMENT AND MEANS NECESSARY TO CONDUCT THE EXCAVATION ACTIVITIES IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.
- (5) EARTHWORK IS PAID FOR UNDER ITEM 203-01, ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED). NO ADDITIONAL PAYMENT WILL BE MADE FOR EARTHWORK QUANTITIES BASED SOLELY ON A CLAIM THAT THE QUANTITIES SHOWN IN THE GRADING TABULATION OR ELSEWHERE IN THE PLANS ARE INACCURATE WITH RESPECT TO THE TYPE OF

MATERIALS ENCOUNTERED DURING CONSTRUCTION EXCEPT AS PROVIDED FOR BY SECTION 104.02 IN THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OR AS AMENDED IN SUPPLEMENTAL SPECIFICATIONS.

6-250.00 PAVEMENT

6-250.02 RESURFACING

NOTE: NOTE (1) SHOULD BE ADDED TO THE SPECIAL NOTES ON INTERSTATE RESURFACING PLANS WHICH INCLUDE COLD PLANING ITEMS.

- (1) TRAFFIC WILL BE ALLOWED TO TEMPORARILY DRIVE ON THE MILLED SURFACE OF THE ROADWAY UNDER THE FOLLOWING CONDITIONS ONLY:
- A. THE MILLED SURFACE IS FINE TEXTURED. THE FINE TEXTURE SHALL BE OBTAINED BY A MILLING MACHINE UTILIZING A MILLING HEAD WITH TEETH SPACING 3/8" OR LESS OPERATING AT LESS THAN 80 FEET PER MINUTE.
 - B. THE SURFACE SHALL BE SWEEPED AND CLEANED OF ALL LOOSE MATERIALS.
 - C. THE DIFFERENCE IN ELEVATION BETWEEN THE MILLED SURFACE AND THE ADJACENT LANE SHALL NOT EXCEED 1 1/2 INCHES.
 - D. THE MILLED SURFACE SHALL BE PAVED WITHIN 48 HOURS.
 - E. RAIN OR INCLEMENT WEATHER IS NOT EXPECTED OR FORECASTED WITHIN 48 HOURS AFTER MILLING.
 - F. ALL APPLICABLE SIGNING IS INSTALLED IN ACCORDANCE WITH THE MUTCD SIGNING SHALL INCLUDE MOTORCYCLE WARNING SIGNS (TN-64) PLACED IN ADVANCE OF ANY MILLED AREAS.
 - G. IF RAVELING OR DETERIORATION OF THE MILLED SURFACE IS OCCURRING WHILE TRAFFIC IS DRIVING ON THE MILLED SURFACE, THEN THIS PRACTICE WILL NOT BE ALLOWED AND PAVING SHALL BE COMPLETED IMMEDIATELY AFTER MILLING.
 - H. ONLY ONE LANE IN EACH DIRECTION SHALL HAVE A MILLED SURFACE AT ONE TIME.

6-250.03 PAVEMENT EDGE DROP-OFF TRAFFIC CONTROL

NOTE: NOTES (A) THROUGH (C) SHALL BE SHOWN IN THE FORM OF TRAFFIC CONTROL NOTES ON THE ON THE TRAFFIC CONTROL SHEETS AND NOT ON THE GENERAL NOTES SHEETS. THE DESIGNER IS TO SHOW ONLY THOSE NOTES THAT APPLY TO THE SPECIFIC PHASE OF TRAFFIC CONTROL SHOWN

ON THE SHEET ON WHICH THE NOTE APPEARS. SEE SECTION 4-712.10 OF THE DESIGN GUIDELINES.

- A. DIFFERENCES IN ELEVATION BETWEEN ADJACENT TRAFFIC LANES OR TRAFFIC LANE AND SHOULDER WHERE THE TRAFFIC LANE IS BEING USED BY TRAFFIC, CAUSED BY BASE, PAVING OR RESURFACING:
 - 1. DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS GREATER THAN 0.75 INCH AND NOT EXCEEDING 2 INCHES:
 - a. WARNING SIGNS, UNEVEN PAVEMENT (W8-11) AND/OR SHOULDER DROP-OFF (W8-9A), SHALL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF 2 SIGNS PER EXPOSED AREA. WHERE UNEVEN PAVEMENT IS ENCOUNTERED, SIGNS SHALL BE PLACED ON EACH SIDE OF THE ROADWAY.
 - b. DIFFERENCES IN ELEVATION BETWEEN ADJACENT TRAFFIC LANES BEING UTILIZED BY TRAFFIC CAUSED BY ADDED PAVEMENT SHALL BE ELIMINATED WITHIN THREE WORKDAYS.
 - c. DIFFERENCES IN ELEVATION BETWEEN ADJACENT TRAFFIC LANES BEING UTILIZED BY TRAFFIC CAUSED BY COLD PLANING SHALL BE ELIMINATED WITHIN THREE WORKDAYS.
 - d. WHEN THE DIFFERENCE IN ELEVATION IS BETWEEN THE TRAFFIC LANE BEING UTILIZED BY TRAFFIC AND SHOULDER, THE DIFFERENCE IN ELEVATION SHALL BE ELIMINATED WITHIN SEVEN WORKDAYS AFTER THE CONDITION IS CREATED.
 - 2. DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS GREATER THAN 2 INCHES AND NOT EXCEEDING 6 INCHES, TRAFFIC IS NOT TO BE ALLOWED TO TRAVERSE THIS DIFFERENCE IN ELEVATION:
 - a. SEPARATION SHALL BE ACCOMPLISHED BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:
 - (1) WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.
 - (2) WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN

MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.

- b. IF THE DIFFERENCE IN ELEVATION IS ELIMINATED OR DECREASED TO 2 INCHES OR LESS BY THE END OF EACH WORKDAY, CONES MAY BE USED DURING DAYLIGHT HOURS IN LIEU OF DRUMS, BARRICADES OR OTHER APPROVED PROTECTIVE DEVICES MENTIONED IN PARAGRAPH A, PROVIDED WARNING SIGNS ARE ERECTED. WARNING SIGNS (UNEVEN PAVEMENT AND/OR LOW SHOULDER) SHALL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF TWO SIGNS PER EXPOSED AREA. WHERE UNEVEN PAVEMENT IS ENCOUNTERED, SIGNS SHALL BE PLACED ON EACH SIDE OF THE ROADWAY.

- c. WHEN THE DIFFERENCE IN ELEVATION IS BETWEEN THE THROUGH TRAFFIC LANE AND THE SHOULDER, AND THE ELEVATION DIFFERENCE IS LESS THAN 3.5 INCHES, THE CONTRACTOR MAY USE WARNING SIGNS AND/OR PROTECTIVE DEVICES AS APPLICABLE AND APPROVED BY THE ENGINEER. SEE PARAGRAPH A REGARDING USE OF DRUMS, BARRICADES OR OTHER APPROVED PROTECTIVE DEVICES. WARNING SIGNS (UNEVEN PAVEMENT AND/OR LOW SHOULDER) WILL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF 2 SIGNS PER EXPOSED AREA. WHERE UNEVEN PAVEMENT IS ENCOUNTERED, SIGNS SHALL BE PLACED ON EACH SIDE OF THE ROADWAY.

IN THESE SITUATIONS THE CONTRACTOR SHALL LIMIT HIS OPERATIONS TO ONE WORK ZONE NOT EXCEEDING 2 MILES IN LENGTH UNLESS OTHERWISE NOTED ON THE PLANS OR APPROVED BY THE ENGINEER. ONCE THE CONTRACTOR BEGINS WORK IN A WORK ZONE, A CONTINUOUS OPERATION SHALL BE MAINTAINED UNTIL THE DIFFERENCE IN ELEVATION IS ELIMINATED. SIMULTANEOUS WORK ON SEPARATE ROADWAYS OF DIVIDED HIGHWAYS WILL BE CONSIDERED INDEPENDENTLY IN REGARD TO RESTRICTION OF WORK ZONE ACTIVITY.

3. DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS GREATER THAN 6 INCHES, BUT NOT EXCEEDING 18 INCHES, THE CONTRACTOR, WITH THE ENGINEER'S APPROVAL, MAY UTILIZE ONE OF THE FOLLOWING:
 - a. THE CONTRACTOR SHALL ACCOMPLISH SEPARATION BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:
 - (1) WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.
 - (2) WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.

IN ORDER TO USE THIS METHOD, THE CONTRACTOR MUST REDUCE THE DIFFERENCE IN ELEVATION TO 6 INCHES OR LESS BY THE END OF THE WORK DAY THAT THE CONDITION IS CREATED.

- b. THE CONTRACTOR SHALL PROVIDE DRUMS, BARRICADES OR OTHER APPROVED SEPARATION DEVICES AS SPECIFIED IN PARAGRAPH A, AND CONSTRUCT A STONE WEDGE WITH A 4:1 SLOPE, OR FLATTER, TO ELIMINATE THE VERTICAL OFFSET IF THE LOWER ELEVATION IS AT OR BELOW SUBGRADE AT THE END OF EACH DAY.
- c. THE CONTRACTOR SHALL PROVIDE DRUMS, BARRICADES OR OTHER APPROVED SEPARATION DEVICES AS SPECIFIED IN PARAGRAPH A, AND IF THE LOWER ELEVATION IS BASE STONE OR ASPHALT PAVEMENT, PLACEMENT OF SUBSEQUENT LAYERS OF PAVEMENT MUST BEGIN THE NEXT WORK DAY AND PROGRESS CONTINUOUSLY UNTIL THE DIFFERENCE IN ELEVATION IS ELIMINATED OR REDUCED TO 6 INCHES OR LESS.
- d. THE CONTRACTOR SHALL PROVIDE SEPARATION BY PORTABLE BARRIER RAIL.

FOR PRECEDING CONDITIONS A, B, AND C, THE CONTRACTOR SHALL USE THE SHOULDER DROP-OFF WARNING SIGN (W8-9A). IT SHALL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF 2 SIGNS PER EXPOSED AREA. IN THESE SITUATIONS THE CONTRACTOR SHALL LIMIT HIS OPERATIONS TO ONE WORK ZONE NOT EXCEEDING 1 MILE

IN LENGTH, UNLESS OTHERWISE NOTED ON THE PLANS OR APPROVED BY THE ENGINEER. ONCE THE CONTRACTOR BEGINS WORK IN A WORK ZONE, A CONTINUOUS OPERATION SHALL BE MAINTAINED UNTIL THE DIFFERENCE IS ELIMINATED. SIMULTANEOUS WORK ON SEPARATE ROADWAYS OF DIVIDED HIGHWAYS WILL BE CONSIDERED INDEPENDENTLY IN REGARD TO RESTRICTION OF WORK ZONE ACTIVITY.

4. FOR DIFFERENCES IN ELEVATION BETWEEN ADJACENT ROADWAY ELEMENTS GREATER THAN 18 INCHES:

SEPARATION WILL BE PROVIDED BY THE USE OF PORTABLE BARRIER RAIL.

IN THIS SITUATION THE CONTRACTOR SHALL LIMIT HIS OPERATIONS TO ONE WORK ZONE NOT EXCEEDING 1 MILE IN LENGTH UNLESS OTHERWISE NOTED ON THE PLANS OR APPROVED BY THE ENGINEER. ONCE THE CONTRACTOR BEGINS WORK IN A WORK ZONE A CONTINUOUS OPERATION SHALL BE MAINTAINED UNTIL THE DIFFERENCE IN ELEVATION IS ELIMINATED. SIMULTANEOUS WORK ON SEPARATE ROADWAYS OF DIVIDED HIGHWAYS WILL BE CONSIDERED INDEPENDENTLY IN REGARD TO RESTRICTION OF WORK ZONE ACTIVITY.

- B. IF THE DIFFERENCE IN ELEVATION IS WITHIN 30 FEET OF THE NEAREST TRAFFIC LANE BEING USED BY TRAFFIC CAUSED BY GRADING, EXCAVATION FOR UTILITIES, DRAINAGE STRUCTURES, UNDERCUTTING, ETC:

1. IF THE DIFFERENCE IN ELEVATION IS WITHIN 8 FEET OF THE NEAREST TRAFFIC LANE WITH DIFFERENCE IN ELEVATION GREATER THAN 3/4 INCH AND NOT EXCEEDING 2 INCHES:

WARNING SIGNS (UNEVEN PAVEMENT AND/OR LOW SHOULDER) SHALL BE PLACED IN ADVANCE OF AND THROUGHOUT THE EXPOSED AREA. MAXIMUM SPACING BETWEEN SIGNS SHALL BE 2,000 FEET WITH A MINIMUM OF 2 SIGNS PER EXPOSED AREA. WHERE UNEVEN PAVEMENT IS ENCOUNTERED, SIGNS SHALL BE PLACED ON EACH SIDE OF THE ROADWAY.

2. IF THE DIFFERENCE IN ELEVATION IS WITHIN 8 FEET OF THE NEAREST TRAFFIC LANE WITH DIFFERENCE IN ELEVATION GREATER THAN 2 INCHES AND NOT EXCEEDING 6 INCHES:

- a. SEPARATION SHALL BE ACCOMPLISHED BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:

- (1) WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.
 - (2) WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.
3. IF THE DIFFERENCE IN ELEVATION IS WITHIN 8 FEET OF THE NEAREST TRAFFIC LANE WITH DIFFERENCE IN ELEVATION GREATER THAN 6 INCHES:
- a. SEPARATION SHALL BE ACCOMPLISHED BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:
 - (1) WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.
 - (2) WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.
 - b. ELIMINATE VERTICAL OFFSET BY CONSTRUCTING A STONE WEDGE OR GRADING TO A 4:1 SLOPE, OR FLATTER, OR USE PORTABLE BARRIER RAIL.
- THE CONTRACTOR SHALL SCHEDULE THE WORK SO AS TO MINIMIZE THE TIME TRAFFIC IS EXPOSED TO AN ELEVATION DIFFERENCE. ONCE THE CONTRACTOR BEGINS AN ACTIVITY THAT CREATES AN ELEVATION DIFFERENCE WITHIN 8 FEET OF A TRAFFIC LANE, THE ACTIVITY SHALL BE PURSUED AS A CONTINUOUS OPERATION UNTIL THE ELEVATION DIFFERENCE IS ELIMINATED.
- C. IF THE DIFFERENCE IN ELEVATION IS FARTHER THAN 8 FEET FROM THE NEAREST TRAFFIC LANE BUT NOT MORE THAN 30 FEET FROM THE NEAREST TRAFFIC LANE:
- SEPARATION SHALL BE ACCOMPLISHED BY DRUMS, BARRICADES OR OTHER APPROVED DEVICES IN ACCORDANCE WITH THE FOLLOWING:
1. WHERE POSTED SPEEDS ARE 50 MPH OR GREATER, SPACING OF THE PROTECTIVE DEVICES SHALL NOT EXCEED 100 FEET.

2. WHERE POSTED SPEEDS ARE LESS THAN 50 MPH, THE MAXIMUM SPACING OF THE PROTECTIVE DEVICES IN FEET SHALL NOT EXCEED TWICE THE POSTED SPEED IN MILES PER HOUR OR 50 FEET, WHICHEVER SPACING IS GREATER.

THE CONTRACTOR SHALL SCHEDULE THE WORK SO AS TO MINIMIZE THE TIME TRAFFIC IS EXPOSED TO AN ELEVATION DIFFERENCE. ONCE THE CONTRACTOR BEGINS AN ACTIVITY THAT CREATES AN ELEVATION DIFFERENCE, THE ACTIVITY SHALL BE PURSUED AS A CONTINUOUS OPERATION UNTIL THE ELEVATION DIFFERENCE IS ELIMINATED.

6-270.00 SIGNALIZATION

NOTE: SEE SECTION 4-730.15 FOR PLACEMENT OF THIS NOTE.

- (1) THE DESIGN OF TRAFFIC SIGNAL SUPPORT POLES, MAST ARMS, STRAIN POLES, ETC. SHALL BE IN CONFORMANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, CURRENT EDITION. OVERHEAD CANTILEVERED TRAFFIC SIGNAL STRUCTURES SHALL BE DESIGNED FOR FATIGUE CATEGORY 1.

6-290.00 EROSION PREVENTION AND SEDIMENT CONTROL

NOTE: REFER TO SECTION 3-305.08 SPECIAL EPSC NOTES.

6-290.01 STREAM/WETLAND

NOTE: NOTE (1) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WITH MULTI-BARREL CULVERTS AND BRIDGES THAT INCLUDE PROPOSED WORK WITHIN A STREAM CHANNEL AREA. THIS NOTE PERTAINING TO WORK WITHIN THE STREAM CHANNEL AREA FOR CONSTRUCTION HAS BEEN DEVELOPED TO ELIMINATE SUPPLEMENTS AND PAYMENT CONCERNS FOR EROSION PREVENTION AND SEDIMENT CONTROL ITEMS USED FOR THIS PURPOSE. THE STRUCTURES DIVISION SHALL INCLUDE A SIMILAR NOTE IN THE STRUCTURES PLANS FOR BRIDGES.

- (1) ANY WORK WITHIN THE STREAM CHANNEL AREA (E.G., FOR PIER FOOTING, RIP-RAP PLACEMENT, MULTI-BARREL CULVERT/BRIDGE CONSTRUCTION, ETC.) SHALL BE SEPARATED FROM FLOWING WATER OR EXPECTED FLOW PATH AND PERFORMED DURING LOW FLOW CONDITIONS. ALL ITEMS USED WITHIN THE STREAM CHANNEL AREA FOR DIVERSION OF FLOW (OR EXPECTED FLOW), UNLESS SPECIFIED IN THE PLANS, SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE COST OF OTHER ITEMS. THIS NOTE EXCLUDES ANY

ITEMS SPECIFIED IN THE PLANS FOR THE TEMPORARY DIVERSION CHANNELS, EC-STR-31 AND TEMPORARY DIVERSION CULVERTS, EC-STR-32 FOR SINGLE BARREL CULVERT CONSTRUCTION.

6-290.02 HIGH QUALITY WATERS

NOTE: NOTES (2) AND (3) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WITH HIGH QUALITY WATERS OR WATERS IMPAIRED BY SILTATION.

- (2) FOR PROJECTS THAT DISCHARGE INTO HIGH QUALITY WATERS OR WATERS IMPAIRED BY SILTATION, AN OUTFALL IN A DRAINAGE AREA OF 5 ACRES OR MORE, A TEMPORARY (OR PERMANENT) SEDIMENT BASIN THAT PROVIDES STORAGE FOR A CALCULATED VOLUME OF RUNOFF FROM A 5-YEAR/ 24-HOUR STORM EVENT AND RUNOFF FROM EACH ACRE DRAINED, OR EQUIVALENT CONTROL MEASURES, SHALL BE PROVIDED UNTIL FINAL STABILIZATION OF THE SITE. THE ENVIRONMENTAL AND DESIGN DIVISIONS MAY BE CONTACTED TO REVIEW AND CONCUR WITH ANY REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE OUTFALL PROCEEDS, UNLESS PREVIOUSLY EXEMPT IN THE NPDES CONSTRUCTION GENERAL PERMIT.

- (3) FOR PROJECTS THAT DISCHARGE INTO HIGH QUALITY WATERS OR WATERS IMPAIRED BY SILTATION, A 60 FOOT NATURAL RIPARIAN BUFFER ZONE ADJACENT TO AND ON BOTH SIDES OF THE RECEIVING STREAM WITH THIS DESIGNATION SHALL BE PRESERVED, TO THE MAXIMUM EXTENT PRACTICABLE, DURING CONSTRUCTION ACTIVITIES AT THE SITE. BUFFER ZONES ARE NOT SEDIMENT CONTROL MEASURES AND SHOULD NOT BE RELIED UPON AS PRIMARY SEDIMENT CONTROL MEASURES. THE RIPARIAN BUFFER ZONE SHALL BE ESTABLISHED BETWEEN THE TOP OF THE STREAM BANK AND THE DISTURBED CONSTRUCTION AREA. THE 60 FOOT CRITERION FOR THE WIDTH OF THE BUFFER ZONE CAN BE ESTABLISHED ON AN AVERAGE WIDTH BASIS AT A PROJECT, AS LONG AS THE MINIMUM WIDTH OF THE BUFFER ZONE IS MORE THAN 25 FEET AT ANY MEASURED LOCATION. EVERY ATTEMPT SHALL BE MADE FOR CONSTRUCTION ACTIVITIES NOT TO TAKE PLACE WITHIN THE BUFFER ZONES. BEST MANAGEMENT PRACTICES (BMPS) PROVIDING EQUIVALENT PROTECTION AS THE NATURAL RIPARIAN ZONE MAY BE USED. A JUSTIFICATION FOR USE AND DESIGN EQUIVALENCY SHALL BE DOCUMENTED WITHIN THE SWPPP. THE ENVIRONMENTAL AND DESIGN DIVISIONS SHALL REVIEW AND APPROVE THIS REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE SITE PROCEEDS, UNLESS PREVIOUSLY EXEMPT IN THE NPDES CONSTRUCTION GENERAL PERMIT. WHERE ISSUED, ARAP/401 REQUIREMENTS WILL PREVAIL IF IN CONFLICT WITH THESE BUFFER ZONE REQUIREMENTS.

6-290.03 NPDES

NOTE: NOTES (4) THROUGH (7) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WHICH REQUIRE A NPDES PERMIT. REFER TO SECTION 3-305.06.

- (4) NO WORK SHALL BE STARTED UNTIL THE CONTRACTOR'S PLAN FOR THE STAGING OF THEIR OPERATIONS, INCLUDING THE PLAN FOR STAGING OF TEMPORARY AND PERMANENT EPSC MEASURES, HAS BEEN ACCEPTED BY THE ENGINEER. THE CONTRACTOR'S EPSC PLAN SHALL INCORPORATE AND SUPPLEMENT, AS ACCEPTABLE, THE BASIC EPSC DEVICES ON THE EPSC PLAN CONTAINED IN THE APPROVED SWPPP.
- (5) THE EPSC MEASURES AND/OR PLAN SHALL BE MODIFIED AS NECESSARY SO THAT THEY ARE EFFECTIVE AT ALL TIMES THROUGHOUT THE COURSE OF THE PROJECT.
- (6) THE ACCEPTED EPSC PLAN SHALL REQUIRE THAT EPSC MEASURES BE IN PLACE BEFORE CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING OCCURS, EXCEPT AS SUCH WORK MAY BE NECESSARY TO INSTALL EPSC MEASURES, INCLUDING WITHOUT LIMITATION AS FOLLOWS:
 - A. INITIAL CLEARING AND GRUBBING SHALL BE LIMITED TO THAT NECESSARY FOR THE INSTALLATION OF APPLICABLE EPSC MEASURES IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.
 - B. NO OTHER CLEARING AND GRUBBING OPERATIONS SHALL BE STARTED BEFORE APPLICABLE EPSC MEASURES ARE IN PLACE IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.
 - C. NO CULVERT OR BRIDGE CONSTRUCTION SHALL BE STARTED BEFORE APPLICABLE EPSC MEASURES ARE IN PLACE IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.
 - D. NO GRADING, EXCAVATION, CUTTING, FILLING, OR OTHER EARTHWORK SHALL BE STARTED BEFORE EPSC MEASURES ARE IN PLACE IN ACCORDANCE WITH THE ACCEPTED EPSC PLAN INCORPORATED INTO THE SWPPP.
- (7) PERMANENT EPSC MEASURES SHALL BE INITIATED WITHIN 15 CALENDAR DAYS AFTER FINAL GRADING OF ANY SEQUENCE OR PHASE. TEMPORARY OR PERMANENT STABILIZATION SHALL BE INITIATED WITHIN 15 CALENDAR DAYS AFTER FINAL GRADING OR WHEN CONSTRUCTION ACTIVITIES ON A PORTION OF THE SITE ARE TEMPORARILY CEASED AND EARTH DISTURBING ACTIVITIES WILL NOT

RESUME UNTIL AFTER 15 CALENDAR DAYS. PERMANENT STABILIZATION WITH PERENNIAL VEGETATION OR OTHER PERMANENTLY STABLE NON-ERODING SURFACE SHALL REPLACE ANY TEMPORARY MEASURES AS SOON AS PRACTICABLE. UNPACKED GRAVEL CONTAINING FINES (SILT AND CLAY SIZED PARTICLES) OR CRUSHER RUNS WILL NOT BE CONSIDERED A NON-ERODIBLE SURFACE.

NOTE: FOR ALL PROJECTS WHICH REQUIRE A NPDES PERMIT, THE EPSC PLAN SHALL ADDRESS PERIODS OF THE YEAR DURING WHICH CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING WILL NOT OCCUR AND LIMITATIONS ON THE TOTAL AREA OF EXPOSED SOIL (AREAS THAT DO NOT HAVE TEMPORARY OR PERMANENT STABILIZATION) AT ANY TIME DURING CONSTRUCTION. AS SUCH, THE FOLLOWING GUIDANCE SHALL BE FOLLOWED.

IF THE COMBINED EARTHWORK QUANTITIES FOR COMMON EXCAVATION (NOT ROCK) AND UNCLASSIFIED BORROW EXCAVATION IS GREATER THAN 1,000,000 CY, OR THE PROJECT IS 1 MILE OR CLOSER TO THE NEAREST DESIGNATED TIER II STREAM, THE DESIGN MANAGER SHALL NOTIFY THE APPROPRIATE DESIGN DIVISION ASSISTANT DIRECTOR. THE DESIGN DIVISION ASSISTANT DIRECTOR SHALL IN TURN REQUEST ADDITIONAL GUIDANCE FROM THE ENVIRONMENTAL DIVISION PERMITS SECTION AND THE CONSTRUCTION DIVISION REGARDING APPROPRIATENESS OF SEASONAL LIMITATIONS AND LIMITATIONS ON THE TOTAL AREA OF EXPOSED SOIL.

IF THE COMBINED EARTHWORK QUANTITIES FOR COMMON EXCAVATION (NOT ROCK) AND UNCLASSIFIED BORROW EXCAVATION IS LESS THAN 1,000,000 CY OR THE PROJECT IS FURTHER THAN 1 MILE FROM THE NEAREST DESIGNATED TIER II STREAM, THE DESIGNER SHALL INCLUDE NOTE (8) IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET:

- (8) EXCEPT AS OTHERWISE SPECIFIED, THERE ARE NO KNOWN SPECIAL ENVIRONMENTAL FACTORS PRESENT ON THIS PROJECT THAT INDICATE A NEED FOR SEASONAL LIMITATIONS ON THE CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING OPERATIONS OR ON THE TOTAL AREA OF EXPOSED SOIL.

NOTE: NOTE (9) SHALL BE INCLUDED IN THE PROJECT SPECIAL NOTES ON THE SECOND SHEETS OF THE ROADWAY PLANS FOR ALL PROJECTS WHICH REQUIRE A NPDES PERMIT. FILL IN THE BLANK WITH THE APPROPRIATE SHEET NUMBER.

- (9) REFER TO THE EROSION PREVENTION AND SEDIMENT CONTROL PLAN, SHEET ____, FOR NOTES REGARDING SEASONAL WORK LIMITATION OR LIMITATION ON THE TOTAL AREA OF EXPOSED SOIL.

6-290.04 UTILITY RELOCATION

NOTE: NOTES (10) THROUGH (19) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS IN WHICH UTILITIES ARE IN THE CONTRACT. REFER TO SECTION 3-305.07.

- (10) RAIN WATER WHICH COLLECTS IN THE UTILITY TRENCH SHALL BE PUMPED INTO A DEWATERING STRUCTURE OR SEDIMENT FILTER BAG AND MAINTAINED.
- (11) SILT FENCE SHALL BE INSTALLED ON THE DOWNSTREAM SIDE OF STOCKPILED SOIL. TRENCHING ACROSS WET WEATHER CONVEYANCES SHALL BE DONE DURING NO FLOW CONDITIONS AND STABILIZED BY THE END OF THE WORK DAY.
- (12) UTILITY CROSSINGS FOR PERENNIAL STREAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TDOT STANDARDS AND NO WORK SHALL BE CONDUCTED IN FLOWING WATERS. TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) REGULATIONS APPLY TO UTILITIES IN THIS PROJECT IN REGARD TO EROSION PREVENTION AND SEDIMENT CONTROL (EPSC). THE STATE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE STORM WATER POLLUTION PREVENTION PLANS (SWPPP).
- (13) IT IS THE RESPONSIBILITY OF THE STATE UTILITY CONTRACTOR INSTALLER TO PROTECT FROM EROSION EXPOSED EARTH RESULTING FROM THEIR OPERATIONS AND TO PROVIDE FOR CONTAINMENT OF SEDIMENT THAT MAY RESULT FROM THEIR WORK. PRIOR TO BEGINNING WORK, ADEQUATE MEASURES MUST BE IN PLACE TO TRAP ANY SEDIMENT THAT MAY TRAVEL OFF-SITE IN THE EVENT OF RAIN. DURING THE PROGRESSION OF THEIR WORK, EXPOSED EARTH AREAS SHALL BE STABILIZED AS SOON AS POSSIBLE TO PREVENT EROSION. AT NO TIME SHALL EXPOSED EARTH RESULTING FROM THEIR OPERATIONS HAVE UNPROTECTED ACCESS TO FLOWING OFF-SITE AND ENTERING WATERS OF THE STATE/U.S.
- (14) FOR THE INSTALLATION OF BURIED UTILITIES (PIPES AND CABLES), TRENCHES SHALL BE BACKFILLED DAILY AS CONSTRUCTION PROCEEDS. BACKFILLED TRENCHES SHALL BE SEEDED AND MULCHED OR SODDED DAILY IF POSSIBLE, BUT NO LATER THAN SEVEN DAYS AFTER BEING BACKFILLED. ANY TEMPORARY SPOIL OF EXCAVATED EARTH SHALL BE LOCATED WITHIN TDOT EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES OR RECEIVE SEPARATE EPSC MEASURES. IF TRENCHES ARE NOT BACKFILLED OVERNIGHT, APPROPRIATE EPSC MEASURES WILL BE INSTALLED BY THE STATE UTILITY CONTRACTOR UNTIL SUCH TIME AS THE TRENCH IS BACKFILLED.

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

- (15) IN REGARD TO EROSION PREVENTION AND SEDIMENT CONTROL (EPSC), TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) REGULATIONS APPLY TO THE STATE UTILITY CONTRACTORS IN THIS PROJECT, THEREFORE, THE STATE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE STORM WATER POLLUTIONS PREVENTION PLANS (SWPPP). THE STATE CONTRACTOR IS RESPONSIBLE FOR EPSC MEASURES RELATED TO UTILITY CONSTRUCTION INCLUDED IN THE STATE CONTRACT WORK.
- (16) TRENCHES FORMED FOR THE INSTALLATION OF BURIED UTILITIES MAY CAUSE STORM WATER RUNOFF TO CONCENTRATE AT THE TRENCH LINE. ADDITIONAL EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES MAY BE REQUIRED TO BE INSTALLED AS APPROVED BY THE TDOT PROJECT ENGINEER.
- (17) FOR THE INSTALLATION OF UNDERGROUND UTILITIES OUTSIDE OF THE TDOT RIGHT-OF-WAY, EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) SHALL BE INSTALLED PRIOR TO CLEARING (TRENCHING AND ASSOCIATED BLASTING) IN THOSE AREAS NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE CONSTRUCTION AREA. THESE EPSC MEASURES SHALL REMAIN UNTIL THE BACKFILLED TRENCH IS STABILIZED WITH FINAL VEGETATIVE COVER.
- (18) THE UTILITY CONTRACTOR SHALL RESTORE ALL AFFECTED WET WEATHER CONVEYANCES TO THE EXISTING TOPOGRAPHIC CONDITIONS (AS APPROVED BY THE TDOT PROJECT ENGINEER).
- (19) THE UTILITY CONTRACTOR WILL PROVIDE APPROPRIATE EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES TO REPLACE IN-PLACE EPSC MEASURES REMOVED TO FACILITATE THE INSTALLATION OF UTILITIES. REPLACEMENT OF EPSC MEASURES WILL BE COORDINATED WITH THE TDOT PROJECT ENGINEER BEFORE COMMENCING WORK.

6-290.05 LITTER, DEBRIS, WASTE, PETROLEUM

NOTE: NOTE (21) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WHERE A BRIDGE IS BEING WIDENED, REPLACED, OR REHABILITATED OVER RAILROAD RIGHT-OF-WAY. FILL IN THE BLANK WITH THE NAME(S) OF THE APPROPRIATE RAILROAD(S) INVOLVED IN THE PROJECT.

- (20) THE CONTRACTOR SHALL MAINTAIN A COMPLETE AND COMPREHENSIVE EROSION PREVENTION AND SEDIMENT CONTROL PLAN TO PREVENT ROADWAY AND/OR CONSTRUCTION SEDIMENT OR DEBRIS AND ANY PETROLEUM BASED PRODUCTS OR CHLORINATED SOLVENTS, PAINTS OR COATINGS ETC. FROM FALLING ONTO THE RAILROAD'S RIGHTS-OF-WAY AND/OR FROM ENTERING THE DRAINAGE

DITCHES OR DRAINAGE STRUCTURES OF THE RAILROAD, AND ANY SEDIMENT OR DEBRIS OR PETROLEUM BASED PRODUCTS OR CHLORINATED SOLVENTS, ETC. THAT DO ENTER SUCH DRAINAGE AREAS OF THE RAILROAD'S RIGHTS-OF-WAY ARE TO BE REMOVED IN ACCORDANCE WITH RULES SET FORTH BY _____ AND AT THE CONTRACTOR'S EXPENSE.

6-290.06 POLYACRYLAMIDE

NOTE: NOTES (22) THROUGH (29) SHALL BE INCLUDED IN THE EPSC SPECIAL NOTES ON THE FIRST SHEET OF THE EPSC PLAN SET FOR ALL PROJECTS WHERE POLYACRYLAMIDE (PAM) IS USED.

- (21) ENSURE POLYACRYLAMIDE (PAM) EMULSIONS AND POWDERS ARE OF THE ANIONIC TYPE AND MEET THE FOLLOWING REQUIREMENTS:
- (22) MEETS THE EPA AND FDA ACRYLABIDE MONOMER LIMITS OF EQUAL TO OR GREATER THAN 0.005% ACRYLAMIDE MONOMER
- (23) HAS A DENSITY OF 10% TO 55% BY WEIGHT AND A MOLECULAR WEIGHT OF 16 TO 24 MG/MOLE
- (24) MIXTURE IN NON-COMBUSTIBLE
- (25) CONTAINS ONLY MANUFACTURED RECOMMENDED ADDITIVES
- (26) PAM SHALL BE MIXED AND APPLIED IN ACCORDANCE WITH ALL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS AND THE MANUFACTURE'S RECOMMENDATIONS FOR THE SPECIFIED USED CONFORMING TO ALL FEDERAL, STATE, AND LOCAL LAWS, RULES, AND REGULATIONS.
- (27) ALL VENDERS AND SUPPLIERS OF PAM, PAM MIX, OR PAM BLENDS SHALL PRESENT OR SUPPLY A WRITTEN TOXICITY REPORT WHICH VERIFIES THAT THE PAM, PAM MIX, PAM BLEND EXHIBITS ACCEPTABLE TOXICITY PARAMETERS WHICH MEET OR EXCEED THE EPA REQUIREMENTS FOR THE STATE AND FEDERAL WATER QUALITY STANDARDS. WHOLE EFFLUENT TESTING DOES NOT MEET THIS REQUIREMENT AS PRIMARY REACTIONS HAVE OCCURRED AND TOXIT POTENTIALS HAVE BEEN REDUCED. CATIONIC FORMS OF PAM ARE NOT ALLOWED FOR UNDER THIS GUIDELINE DUE TO THEIR HIGH LEVELS OF TOXICITY TO AQUATIC ORGANISMS. PAM EMULSIONS SHALL NEVER BE APPLIED DIRECTLY TO STORMWATER RUNOFF OR RIPARIAN WATERS DUR TO SURFACTANT TOXITY. CONTRACTOR MUST SEEK THE APPROVAL OF THE EPSC DEISGN ENGINEER AND TDOT IF CHITOSAN IS PROPOSED FOR USE ON THIS PROJECT.
- (28) ALL VENDORS AND SUPPLIERS OF PAM, PAM MIX, OR PAM BLENDS SHALL SUPPLY WRITTEN "SITE SPECIFIC" TESTING RESULTS

SEMONSTRATING THAT A PERFORMANCE OF 95% OR GREATER REDUCTION OF NTU OR TSS FROM STORMWATER DISCHARGES.

- (29) EMULSION BATCHES SHALL BE MIXED FOLLOWIGN RECOMMENDATIONS OF A TESTING LABORATORY THAT DETERMINES THE PROPER PRODUCT AND RATE TO MEET SITE REQUIREMENTS. APPLICATION METHOD SHALL INSURE UNIFORM COVERAGE TO THE TARGET AREA. EMULSIONS SHALL NEVER BE APPLIED DIRECTLY TO STORMWATER FUNOFF OR RIPARIAN WATERS.
- (30) PAM POWDER MAY BE APPLIED BY A HAND SPREADER OR A MECHANICAL SPREADER. MIXING PAM POWDER WITH DRY DILICA SAND WILL AID IN SPREADING.
- (31) PREMIXING OF PAM POWDER INTO FERTILIXER, SEED, OR OTHER SOIL AMENDMENTS IS ALLOWED WHEN SPECIFIED IN THE DESIGN PLAN. APPLICATION METHDON SHALL INSURE UNIFORM COVERAGE TO THE TARGET AREA.
- (32) PAM LOGS OR BLOCKS SHALL BE APPLIED FOLLOWING SITE TESTING RESULTS TO ENSURE PROPER PLACEMENT AND PERFORMANCE AND SHALL MEET OR EXCEED STATE AND FEDERAL WATER QUALITY REQUIREMENTS.

6-295.00 ENVIRONMENTAL

6-295.01 ECOLOGY

NOTE: NOTES (1) THROUGH (3) SHALL BE INCLUDED IN THE PROJECT SPECIAL NOTES ON THE SECOND SHEETS OF THE ROADWAY PLANS FOR ALL PROJECTS WHICH HAVE THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT IDENTIFIED FOR BRIDGES.

- (1) STAFF FROM THE TDOT ENVIRONMENTAL DIVISION OR A DESIGNEE WILL ADVISE THE CONTRACTOR DURING THE PRE-CONSTRUCTION MEETING CONCERNING WHEN ENVIRONMENTAL DIVISION PERSONNEL OR DESIGNATED CONSULTANT WILL NEED TO BE ON-SITE FOR WORK BEING DONE WHICH COULD AFFECT THE STREAM OR SPECIES.
- (2) STAFF FROM THE TDOT ENVIRONMENTAL DIVISION OR A DESIGNEE WILL ATTEND THE PRE-CONSTRUCTION MEETING FOR ALL PROJECTS WHICH HAVE THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT PROXIMAL TO SCHEDULED BRIDGE WORK. THIS WILL PROVIDE THE OPPORTUNITY TO ENSURE THAT PERSONNEL INCLUDING THE CONTRACTOR'S PERSONNEL AND SUBCONTRACTORS ARE MADE AWARE OF THE NECESSARY PRECAUTIONS WHICH MUST BE FOLLOWED.

- (3) ALL BRIDGE PROJECTS WITH THREATENED OR ENDANGERED SPECIES OR CRITICAL HABITAT IDENTIFIED MUST HAVE MEASURES IN PLACE TO CONTAIN CONCRETE DUST, CEMENT DUST AND ALL OTHER MATERIALS. THESE MATERIALS ARE NOT ALLOWED TO ENTER THE STREAM.

6-295.02 STREAM RELOCATION

NOTE: NOTE (4) SHALL BE INCLUDED IN THE PROJECT SPECIAL NOTES ON THE SECOND SHEETS OF THE ROADWAY PLANS FOR ALL PROJECTS WHICH CONTAIN A STREAM RELOCATION.

- (4) ONCE WATER IS DIVERTED INTO A NEWLY CONSTRUCTED AND STABILIZED RELOCATED STREAM / CHANNEL THE ECOLOGY SECTION MUST BE NOTIFIED. THE STREAM NAME, STREAM NUMBER, AND DATE THE WATER WAS DIVERTED INTO THE STREAM / CHANNEL IS TO BE SUPPLIED WITH THE NOTIFICATION.

SECTION VII - INDEX

SECTION INDEX

-A-

ABANDONMENT OF WATER WELLS 3-130.00, 4-202.13, 4-625.00
 ACCESS CONTROL..... 2-300.05, 2-300.10, 2-310.00, 3-330.00, 4-145.00, 4-713.05
 (CONT'D).....4-713.10, 4-713.20, 4-716.13, 4-716.15, 4-716.35
 ACQUISITION TABLE, RIGHT-OF-WAY.....2-320.05, 3-300.00, 3-400.00, 4-133.00
 ACTIVITY STATUS SHEET, PROJECT 1-110.00, 2-110.00, 4-110.00
 AGGREGATE BASE, BITUMINOUS COATED 4-308.00
 AGGREGATE BASE, MINERAL..... 4-303.00
 AGGREGATE-CEMENT BASE COURSE - GRAVEL 4-309.01
 AGGREGATE-CEMENT BASE COURSE - LIMESTONE 4-309.00
 AGGREGATE-LIME-FLY ASH STABILIZED BASE COURSE 4-312.00
 APPRAISALS..... 3-105.10, 3-400.00, 3-400.15, 3-400.20, 3-400.25, 3-400.35, 3-405.00
 APPROACHES, ROADWAY..... 4-203.25
 APRON FOR BOX CULVERT AND BRIDGE OUTLETS, PAVED 4-604.10
 AQUATIC RESOURCE ALTERATION PERMIT (ARAP) 3-410.00
 ASPHALTIC CONCRETE SURFACE (HOT MIX) 4-411.00
 AT-GRADE RAILROAD CROSSINGS..... 1-210.05
 AUTOMATIC TRAFFIC RECORDERS, LOCATION OF 2-180.00
 AVERAGE DAILY LOADING (ADL)..... 3-125.00, 2-120.00
 AVERAGE DAILY TRAFFIC (ADT)..... 1-200.05, 2-120.00, 3-125.00
 (CONT'D)..... 3-125.05, 4-712.00, 4-806.00

-B-

BALANCE, EARTHWORK.....2-145.05, 3-315.05, 3-315.15, 4-203.02, 4-203.45
 BALED HAY 4-209.01
 BASE, BITUMINOUS PLANT MIX 4-307.00
 BASE, BITUMINOUS COATED AGGREGATE 4-308.00
 BASE COURSE - AGGREGATE-LIME-FLY ASH STABILIZED 4-312.00
 BASE COURSE - GRAVEL, AGGREGATE-CEMENT 4-309.01
 BASE COURSE - LIMESTONE, AGGREGATE-CEMENT 4-309.00
 BASE, MINERAL AGGREGATE 4-303.00
 BASE, SOIL-CEMENT 4-304.00, 4-203.40
 BERM, TEMPORARY 4-209.01
 BITUMINOUS PLANT MIX BASE (HOT MIX)..... 4-307.00
 BITUMINOUS SEAL COAT (CHIP SEAL) 4-307.00
 BITUMINOUS SEAL COAT (CHIP SEAL) ALONG EDGE OF PAVED SHOULDERS
 WHILE MAKING LANE SHIFTS DURING CONSTRUCTION 4-405.00
 BITUMINOUS SEAL COAT (SPLIT APPLICATION) 4-406.00
 BITUMINOUS COATED AGGREGATE BASE (PLANT MIX)..... 4-308.00
 BOX CONCRETE CULVERTS 4-204.05, 4-604.00, 4-604.10, 4-604.20, 4-604.25, 4-705.00
 (CONT'D)..... 4-203.35, 2-155.05
 BOX CONCRETE SHALLOW FILLS 4-604.30
 BRIDGE CLEARANCES ON PAVING PROJECTS 4-125.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

BRIDGE DECK PANELS	4-604.05
BRIDGE DECK SEALANT	4-617.00
BRIDGE END DRAINS	3-200.10, 4-611.04
BRIDGE LENGTHS, BOX AND SLAB-TYPE CULVERTS	2-155.05
BRIDGES VERTICAL CLEARANCES	2-125.00
BRUSH BARRIERS, TEMPORARY	4-209.01
BUILDINGS, REMOVAL	4-202.10

-C-

CATCH BASIN, COMPUTATION OF SIZE FOR	3-236.00
CATCH BASIN GRATE ELEVATIONS SHOWN ON THE PLANS	3-250.00
CATCH BASIN, SPACING BETWEEN FOR MAINTENANCE CLEAN OUTS	3-255.00
CATCH BASIN WITH STRUCTURAL STEEL GRATES	3-251.00
CEMENT BASE, SOIL	4-203.40, 4-304.00
CHANNEL CHANGES	2-155.05, 2-320.05
CHANNEL EXCAVATION	4-203.35, 4-604.35
CHANNELIZATION STRIPING	4-716.00
CHECK DAMS	4-209.01
CHECKLIST, ROADWAY DESIGN	1-105.00, 1-120.00
CHIP SEAL	4-405.00, 4-405.01
CIVIL ENGINEERING MANAGER I	2-115.00, 2-120.00, 2-300.00, 3-110.024, 3-110.05
(CONT'D)	3-400.15, 3-410.00, 4-115.00, 4-140.00, 4-140.05, 4-712.20
CLEARANCES, BRIDGE	4-125.00
CLEARANCES, VERTICAL	2-125.00, 4-125.00
CLEAR ROADSIDE	2-135.00, 2-135.05
CLEAR ZONES	2-135.00, 2-135.05
CLIMBING LANES	2-150.00
COLD PLANING	4-415.00, 4-405.00, 4-712.10, 4-713.25, 4-730.08
COMMISSIONER SIGNATURE	3-105.05, 4-115.05
COMPUTATION	
AGGREGATE-CEMENT BASE COURSE - GRAVEL	4-309.01
AGGREGATE-CEMENT BASE COURSE - LIMESTONE	4-309.00
AGGREGATE-LIME-FLY ASH STABILIZED BASE	4-312.00
ASPHALTIC CONCRETE SURFACE (HOT MIX)	4-411.00
BASE AND SUBGRADE TREATMENT	4-301.00, 4-302.00
BITUMINOUS COATED AGGREGATE BASE (PLANT MIX)	4-308.00
BITUMINOUS PLANT MIX BASE (HOT MIX)	4-307.00
BITUMINOUS SEAL COAT (CHIP SEAL)	4-405.00
BITUMINOUS SEAL COAT (SPLIT APPLICATION)	4-406.00
BRIDGE END DRAINS	3-200.10, 4-611.05
CATCH BASINS	3-236.00
DOUBLE BITUMINOUS SURFACE TREATMENT	4-404.00
EROSION PREVENTION AND SEDIMENT CONTROL	4-209.00, 4-209.01
MANHOLES, CIRCULAR	3-236.00
MICRO-SURFACING	4-414.05
MINERAL AGGREGATE BASE	4-303.00
PRIME COAT	4-402.00
RIGHT-OF-WAY	1-210.10, 2-315.05, 2-112.00, 2-2-115.00, 2-155.00, 2-155.02

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

(CONT'D)	2-175.00, 1-220.00, 1-210.45, 1-206.10, 1-103.00, 1-210.10, 1-210.00
(CONT'D)	1-120.00, 2-300.00, 2-300.05, 2-300.10, 2-315.00, 2-320.15, 2-315.05
(CONT'D)	2-320.00, 2-320.05, 2-320.10, 2-320.20
ROADWAY QUANTITY FINAL	1-103.00
SOIL-CEMENT BASE	4-304.00, 4-230.40
SUBGRADE TREATMENT (GRANULAR).....	4-301.00
SUBGRADE TREATMENT (LIME)	4-302.00, 4-203.40
TACK COAT	4-617.00, 4-405.00, 4-403.00, 4-414.05
UNDERSEALING CONCRETE PAVEMENT	4-502.00
WATER	4-203.40, 4-801.10
CONCRETE BOX CULVERTS	2-155.05, 4-204.05, 4-604.10, 4-604.25, 4-203.55, 4-604.00
(CONT'D)	4-604.00, 4-705.00
CONCRETE PAVEMENT, UNDERSEALING	4-502.00
CONCRETE RAMPS, PAVEMENT MARKING.....	4-716.15
CONSTRUCTION QUANTITY ESTIMATES.....	4-140.00
CONSTRUCTION QUANTITY ESTIMATES DATA FILE	4-140.05
CONSTRUCTION EASEMENT	2-320.15
CONSTRUCTION INDEX	4-133.00, 4-135.05
CONSTRUCTION PLANS AND ESTIMATES REVISIONS	4-140.00, 4-140.01, 4-140.05
(CONT'D)	4-140.02, 4-140.03, 4-140.09
CONSTRUCTION PLANS SUBMITTAL	4-140.00
CONSTRUCTION REVISIONS.....	4-150.00
CONSTRUCTION SIGNS ON INTERSTATE PROJECTS	4-713.20
CONSTRUCTION TITLE SHEET	4-115.00
CONSULTANT'S SEAL	3-105.10, 4-115.10
CONSULTANT'S SIGNATURE.....	3-105.10, 4-115.10
CONSULTANTS	1-105.00, 2-120.00, 2-118.00, 2-320.20, 3-400.30, 4-140.05
COORDINATE VALUES.....	1-205.15
CORRECTION FACTOR FOR COMPUTATION OF REINFORCING STEEL IN CONCRETE BOX OR SLAB-TYPE CULVERTS OR BRIDGES.....	4-604.20
CREDITS, SALVAGE	4-130.00
CROSS DRAIN PLANS FORMAT	3-215.00
CROSS DRAINS (UNDER MAINLINE AND PUBLIC SIDE ROADS)	3-215.05
CROSS DRAINS END TREATMENTS.....	3-215.10
CROSS-SECTIONS.....	1-210.10, 3-110.05, 3-400.25, 3-400.30, 3-410.00, 4-133.00, 4-203.03
(CONT'D)	4-115.10, 4-140.00
CROSS-SECTIONS (RIGHT-OF-WAY PLANS).....	3-400.25
CROSS-SECTIONS (SIZE OF FULL-SIZE SHEETS)	2-112.00, 3-102.00, 4-112.00
CROWN VETCH (WITH MULCH).....	4-801.05
CROWN VETCH (WITHOUT MULCH)	4-805.00
CULVERT EXCAVATION (PIPE).....	4-204.00
CULVERT SHEET SUBMISSION.....	3-216.00
CULVERTS, BOX AND SLAB-TYPE	2-155.05, 4-604.00, 4-604.20, 4-604.30
(CONT'D)	4-604.35, 4-705.00
CULVERTS, PLACEMENT OF HEADWALLS ON	3-205.20

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

-D-

DATUM ADJUSTMENT FOR COORDINATE VALUES 1-205.15

DELINEATORS, FLEXIBLE 4-713.00

DESCRIPTIONS, PROJECT 2-115.20, 4-115.30

DESIGN CHECKLIST, ROADWAY 1-105.00, 1-120.00

DESIGN ENGINEERING SUPERVISOR 2-115.00, 3-105.00, 4-115.00

DESIGN EXCEPTION REQUESTS 3-110.02

DESIGN RECORDS FOLDER 1-100.00

DESIGN SUPERVISORS (NAME ON TITLE SHEET) 2-115.00, 3-105.00, 4-115.00

DESIGNERS (NAME ON TITLE SHEET) 2-115.00, 3-105.00, 4-115.00

DIMENSIONS AND DIRECTIONS ON PLANS 1-205.20

DOUBLE BITUMINOUS SURFACE TREATMENT 3-125.05, 4-404.00

DRAINAGE 2-200.00, 2-200.05, 2-200.10, 2-320.05, 3-200.00, 3-261.00

(CONT'D) 4-203.55, 4-611.00

DRAINAGE CHARTS 2-200.05

DRAINAGE EASEMENT 2-320.05

DRAINAGE PLANS, CHECKING PRIOR TO CONSTRUCTION 4-611.00

DRAINAGE PROBLEM EXAMPLES 2-200.10

DRAINAGE TABLES 2-200.05

DRAINS, BRIDGE END 4-611.05

DRAINS, CROSS 2-320.05, 3-205.05, 3-215.00, 3-205.00, 3-400.25

DRAINS, END TREATMENT FOR CROSS 3-205.05

DRAINS, END TREATMENT FOR MEDIAN 3-205.15

DRAINS, END TREATMENT FOR SIDE 3-205.10

DRAINS, MEDIAN 3-205.15

DRAINS, SIDE 3-205.10

DRIVEWAY APRONS 3-310.10

DRIVEWAY CONSTRUCTION AND RESURFACING POLICY 2-300.10

DRIVEWAY NOTES 2-300.05

DRIVEWAY PROFILES 2-300.05

DRIVEWAY TYPICAL SECTIONS 2-300.05

DRUMS, TRAFFIC CONTROL 4-712.00

-E-

EARTHWORK 2-145.05, 3-315.05, 3-315.15, 4-203.02, 4-203.45

EARTHWORK BALANCES 2-145.05, 3-315.05, 3-315.15, 4-203.02, 4-203.45

EASEMENT, PERMANENT DRAINAGE 2-320.05

EASEMENT, SLOPE 2-320.10

EASEMENTS 2-320.00, 2-320.05, 2-320.10, 2-320.15, 3-410.00

EASEMENTS CONSTRUCTION 2-320.15

END TREATMENTS - CROSS DRAINS UNDER MAINLINE 3-205.00

END TREATMENTS - CROSS DRAINS UNDER PUBLIC ROADS 3-205.05

END TREATMENTS - MEDIAN DRAINS 3-205.15

END TREATMENTS - SIDE DRAINS 3-205.10

ENERGY ABSORBING TERMINAL (PORTABLE) 4-705.05

EQUATION BLOCKS 2-115.05

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

EROSION PREVENTION AND SEDIMENT CONTROL
 (EPSC) NOTES 4-209.00
 EROSION PREVENTION AND SEDIMENT CONTROL
 (EPSC) QUANTITIES 4-209.01
 EROSION CONTROL BLANKET 4-805.00
 ESTIMATED ROADWAY GRADING QUANTITIES BLOCK FOR ROAD
 AND DRAINAGE EXCAVATION (UNCLASSIFIED) 4-203.55
 ESTIMATED ROADWAY QUANTITIES SHEET 1-200.00
 ESTIMATES CONFIDENTIALITY 4-140.09
 ESTIMATES, CONSTRUCTION QUANTITY 3-400.15, 4-140.00, 4-140.05
 ESTIMATES, PRELIMINARY QUANTITY 3-400.15, 4-140.05
 EXCAVATION 2-145.00, 3-315.00, 3-315.05, 4-203.00, 4-203.02, 4-203.35
 EXCAVATION, CHANNEL 4-203.00, 4-203.35
 EXCAVATION FOR BOX AND SLAB-TYPE CULVERTS AND BRIDGES 4-203.35, 4-204.05
 EXCAVATION, PIPE CULVERT 4-204.00
 EXCLUSIONS 2-115.10, 4-115.25
 EXTENSION OF THROUGH LANES BEYOND INTERSECTIONS 2-160.00
 EXCAVATION OR PLACEMENT OF RIP-RAP IN THE DRY 4-209.05
 EXPRESSWAYS 2-165.00, 4-716.15

-F-

FERTILIZER (SUPPLEMENT APPLICATION) 4-801.20
 FIELD REVIEW PROCEDURES 1-120.00, 2-330.00, 3-400.35, 4-145.00
 FILLS, CAPPING ROCK 3-315.00
 FILTER BARRIER, TEMPORARY 4-209.00
 FINAL PREPARATION OF PLANS 1-103.00, 1-120.00
 FLEXIBLE DELINEATORS 4-713.00
 FLEXIBLE SURFACES 4-307.00
 FLY ASH 4-312.00
 FOLDER, PROJECT 1-100.00, 1-110.00
 FREEWAYS 2-165.00
 FULL-SIZE PLAN AND CROSS SECTION SHEETS (SIZE) 2-112.00, 3-102.00, 4-112.00
 FUNDING APPROVAL REQUESTS, RIGHT-OF-WAY 3-400.20

-G-

GENERAL NOTES 4-135.00, 4-135.05, 4-716.20
 GEOLOGY REPORTS, SOILS AND 3-110.05
 GEOMEMBRANE 4-740.00
 GEOTEXTILE FABRIC 4-740.00
 GRADE COMPUTATIONS 1-103.00
 GRADE COMPUTATIONS FINAL 1-103.00
 GRADING QUANTITIES 1-103.00
 GRADING QUANTITIES SHEET 2-145.07, 4-203.50, 3-315.20
 GRANULAR BACKFILL FOR STRUCTURES 4-303.05
 GRAVEL, AGGREGATE-CEMENT BASE COURSE 4-309.01
 GRAVITY TYPE RETAINING WALLS 4-303.05

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

GUARDRAIL ACROSS CONCRETE BOX AND SLAB-TYPE
CULVERTS AND BRIDGES 4-705.00
GUARDRAIL ACROSS CONCRETE DECK BRIDGES..... 4-705.00
GUARDRAIL END TERMINALS 4-705.05
GUARDRAIL, INTERSTATE RESURFACING..... 4-145.00

-H-

HANDICAP RAMPS..... 3-310.05
HAUL ROADS..... 3-410.00, 4-120.00
HAZARDOUS MATERIAL STUDY 2-155.02
HEADQUARTERS, DESIGN 2-120.00, 3-400.00, 3-400.20
HEADWALLS ON CULVERTS 3-205.20
HERBICIDE 4-400.05
HORIZONTAL CLEARANCE 2-125.00, 3-110.02
HOT MIX, ASPHALTIC CONCRETE SURFACE 4-411.00
HYDRAULIC COMPUTATIONS 1-103.00, 3-225.00
HYDRAULIC GRADE APPROVAL 2-127.00

-I-

IMPROVED INLET 3-230.00
INCIDENTAL CONSTRUCTION..... 4-705.00
INCIDENTALS, PRINTING FOR..... 3-400.00
INDENTED RUMBLE STRIPS..... 4-411.03
INTERSECTIONS..... 2-160.00, 2-170.00, 2-300.10, 3-305.15, 4-400.00
INTERSECTIONS, DESIGN OF TURNING LANES 2-170.00
INTERSTATE - CONSTRUCTION SIGNS 4-712.00
INTERSTATES, MARKING AND SIGNING 3-330.00
ITEM NUMBER..... 4-140.01

-J-

JUNCTION BOXES..... 3-256.00, 4-611.00

-L-

LANE REDUCTION TRANSITION LENGTHS..... 2-160.00
LENGTHS, PROJECT 4-115.15
LETTING REVISIONS 4-140.03
LIGHTING 2-315.00, 2-315.05, 4-712.00, 4-714.00
LIGHTING DEVICES, TRAFFIC CONTROL..... 4-712.00, 4-714.00
LIME..... 4-302.00, 4-309.00, 4-312.00
LIMESTONE, AGGREGATE-CEMENT BASE COURSE 4-309.00
LIMITED SCOPE, PROJECTS OF 1-200.30
LOCAL PROGRAM..... 1-200.35
LOG MILE POST 2-115.20

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

-M-

MACHINED RIP-RAP 4-209.01, 4-209.05, 4-709.05
MANHOLES 3-235.00, 3-236.00
MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES 4-712.00
MARKINGS, CONCRETE RAMPS IN INTERCHANGE AREAS 4-712.10
MARKINGS, PAVEMENT 3-330.00, 4-712.00, 4-712.10, 4-716.05
MARKINGS, PAVEMENT FOR TRAFFIC CONTROL 4-712.00
MEDIAN DRAINS 3-205.15
MEDIAN DRAINS, END TREATMENT FOR 3-205.15
MEDIAN OPENING SPACING 2-140.00, 2-140.05
MICRO SURFACING 4-414.05
MINERAL AGGREGATE BASE 4-303.00
MINERAL AGGREGATE (SIZE 57) 4-303.00
MITIGATION AREAS, PLACEMENT OF TREES 3-410.02

-N-

NOTES, GENERAL 4-135.00
NOTES, PAVEMENT MARKING 4-716.20
NOTICE OF INTENT (NOI) FORM 3-145.00

-O-

OBSTRUCTIONS, REMOVAL 4-202.01
OPENING SPACING, MEDIAN 2-140.00

-P-

PAVED APRON BOX CULVERT 4-604.10
PAVED APRON FOR BOX CULVERT AND BRIDGE OUTLETS 4-604.10
PAVEMENT, RIGID 4-501.00
PAVEMENT, UNDERSEALING CONCRETE 4-502.00
PAVEMENT DESIGN BRIDGE PROJECTS 3-125.00
PAVEMENT DESIGN REQUEST FORM 3-125.00
PAVEMENT DESIGN REQUESTS 3-125.00
PAVEMENT - DIFFERENCE IN ELEVATION DURING CONSTRUCTION 4-712.10
PAVEMENT MARKERS (SNOWPLOWABLE RAISED) 4-716.35
PAVEMENT MARKERS (RAISED) 4-716.36
PAVEMENT MARKING - CONCRETE RAMPS IN INTERCHANGE AREAS 4-716.15
PAVEMENT MARKING - CROSSWALK WITH LONGITUDINAL LINES 4-716.15
PAVEMENT MARKING GUIDELINES 4-716.15
PAVEMENT MARKING LINE (REMOVABLE) 4-716.30
PAVEMENT MARKING NOTES 4-716.20
PAVEMENT MARKING PLANS 4-716.13
PAVEMENT MARKINGS, PERMANENT 4-716.15
PAVEMENT MARKINGS, RESURFACING PLANS 4-716.16

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

PAVEMENT MARKINGS, MICRO SURFACE PAVMENTS.....4-716.17

PAVEMENT MARKINGS, TEMPORARY 4-716.10

PAVING POLICY, RESURFACING 4-400.00

PERFORMANCE GRADE MIX (PAVING)..... 4-400.03

PERMANENT DRAINAGE EASEMENTS..... 2-320.05

PERMANENT PAVING MARKINGS ON CONCRETE BRIDGE DECKS 4-716.15

PERMANENT PAVING MARKINGS POLICY..... 4-716.15

PIPE CULVERT EXCAVATION 4-204.00

PIPE MATERIALS, SELECTION OF 3-200.00

PIPE SELECTION OF MATERIALS 3-200.00

PLANS AND ESTIMATES REVISIONS (CONSTRUCTION)..... 4-150.00

PLANS SHEET (SIZE OF FULL-SIZE) 2-112.00, 3-102.00, 4-112.00

PLANS SUBMITTAL 3-400.00

PLANS SUBMITTAL, SIZE 11" X 17" 4-140.02

PLANT MIX BASE, BITUMINOUS 4-307.00

PORTABLE BARRIER RAIL 4-712.00

PRECAST PRESTRESSED BRIDGE DECK PANELS 4-604.05

PRELIMINARY CONSTRUCTION QUANTITY ESTIMATE..... 3-400.15

PRELIMINARY PLANS..... 2-100.00

PRESPLITTING 4-203.15

PRIME COAT..... 4-402.00

PRINTING FOR APPRAISALS 3-400.25

PRINTING FOR INCIDENTALS..... 3-400.00

PRINTING FOR "UTILITIES ONLY" 3-400.05

PRIVATE DRIVES 3-305.10

PROFILES, DRIVEWAY 2-300.05

PROJECT ACTIVITY STATUS SHEET 1-110.00, 2-110.00, 4-110.00

PROJECT DESCRIPTIONS 4-115.30, 2-115.20

PROJECT FOLDER..... 1-100.00, 2-100.00

PROJECT LENGTH..... 4-115.15

PROJECT MOWING CYCLE 4-806.00

PROJECT RECORDS 1-100.00

PROJECTS LET TO CONTRACT 1-103.00

PUBLIC HEARING AND PUBLIC MEETING REQUIREMENTS,
INSTRUCTIONS REGARDING 1-130.00

-Q-

QUANTITY ESTIMATES, CONSTRUCTION..... 3-400.15, 4-140.00, 4-140.05

QUANTITY ESTIMATES, PRELIMINARY 3-400.15, 4-140.00, 4-140.05

-R-

RAILROAD CROSSINGS AT-GRADE..... 1-210.05

RAILROAD CROSSINGS, GRADE SEPARATED..... 1-210.00

RAILROAD RIGHT-OF-WAY ENCROACHMENT 1-210.10

RAILROADS 3-325.00

RAISED BITUMINOUS RUMBLE STRIPS 4-411.02

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

RAISED PAVEMENT MARKERS.....4-716.36
RAMPS, ENTRANCE..... 2-165.00
REFLECTIVE PAVEMENT MARKERS (SNOWPLOWABLE) 4-716.35
REGIONAL DESIGN OFFICE.....2-300.00, 3-400.00, 3-400.30, 4-150.00
REMOVABLE PAVEMENT MARKING LINE 4-716.30
REMOVAL OF BUILDINGS AND OBSTRUCTIONS 4-202.10
REMOVAL OF STRUCTURES 4-202.00, 4-202.01
RESURFACING - PAVING POLICY 4-400.00
RESURFACING PROJECTS..... 1-200.10
RESURFACING PROJECTS, TRAFFIC DATA BLOCK..... 4-115.35
RETAINING WALLS, GRAVITY TYPE 4-303.05
REVISIONS, CONSTRUCTION..... 4-150.00, 1-220.00
REVISIONS, LETTING 4-140.03
REVISIONS, RIGHT-OF-WAY 3-405.00
REVISIONS, UNECONOMIC REMNANTS 3-120.00
RIDEABILITY SPECIFICATIONS 4-411.05
RIGHT-OF-WAY ACQUISITION TABLE..... 2-320.05
RIGHT-OF-WAY AREAS 2-320.05
RIGHT-OF-WAY FUNDING APPROVAL REQUESTS 3-400.20, 4-140.00
RIGHT-OF-WAY INCIDENTALS..... 3-400.00
RIGHT-OF-WAY NOTES 2-300.00, 3-305.00
RIGHT-OF-WAY NOTES FOR DRIVEWAYS 2-300.05, 3-305.05
RIGHT-OF-WAY PLANS..... 3-100.00
RIGHT-OF-WAY PLANS CHECKLIST 3-100.00
RIGHT-OF-WAY REVISIONS..... 3-405.00, 1-220.00
RIGID PAVEMENT 4-501.00
RIP-RAP 4-709.05
ROAD SAFETY AUDIT REVIEW (RSAR) PROJECTS 1-200.25
ROADWAY APPROACHES..... 4-203.25
ROADWAY DESIGN CHECKLIST..... 1-105.00
ROADWAY DESIGN STANDARDS & GUIDELINES 1-200.00
ROADWAY LIGHTING..... 4-714.00
ROADWAY SIGNING 4-713.05, 4-713.10, 4-713.15
ROADWAY SPECIALIST SUPERVISOR 2 1-105.00, 1-110.00
RUMBLE STRIPS 4-411.03
RUMBLE STRIPES..... 4-411.04
RWIS WEATHER STATIONS, LOCATION OF 2-180.00

-S-

SALVAGE CREDITS 4-130.00
SCORING SHOULDERS..... 4-411.03
SEAL COAT 4-405.00, 4-406.00
SEALANT, BRIDGE DECK..... 4-617.00
SEALANT, SILICONE 4-905.00
SEDIMENT TRAP..... 4-209.01
SEEDING (SUPPLEMENTAL APPLICATION) 4-801.15
SEEDING (WITH MULCH)..... 4-801.00
SEEDING (WITH MULCH), TEMPORARY 4-801.07

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

SHALLOW FILLS.....	4-604.20
SHOULDERS, SCORING.....	4-411.03
SHRINKAGE FACTORS.....	2-145.10, 3-315.10, 4-203.05
SIDE DRAINS, END TREATMENT FOR.....	3-205.10
SIDE ROAD, PUBLIC, PAVING POLICY.....	4-400.00
SIGNALIZATION.....	2-315.00
SIGNATURE, COMMISSIONER.....	3-105.05, 4-115.05
SIGNATURE, CHIEF ENGINEER.....	3-105.05, 4-115.05
SIGNING PLANS.....	3-330.00
SILICONE SEALANT.....	4-905.00
SILT FENCES, TEMPORARY.....	4-209.01
SLAB BRIDGE, CONCRETE - SHALLOW FILLS.....	4-604.20
SLAB CONCRETE CULVERTS.....	4-604.20
SLOPE EASEMENT.....	2-320.10
SLOTTED DRAIN PIPE.....	3-200.30
SNOWPLOWABLE RAISED PAVEMENT MARKERS.....	4-716.35
SOIL-CEMENT BASE.....	4-304.00
SOILS AND GEOLOGY REPORTS.....	3-110.05
SOLID ROCK BORROW.....	4-203.20
SOLID ROCK, GRADING LINE THROUGH.....	4-203.10
SPECIAL CONSTRUCTION SIGNS.....	4-712.15
SPECIAL NOTES ON TITLE SHEET.....	2-115.01
SPECIAL PAVEMENT MARKINGS.....	4-716.25
STATUS SHEET, PROJECT ACTIVITY.....	1-110.00
STEEL BAR REINFORCEMENT (ROADWAY).....	4-604.25
STOCK FENCE, ROW.....	4-707.00
STOCK PASSES.....	3-240.00, 4-604.40
STRIPING, CHANNELIZATION.....	4-716.00
STRIPING, INTERCHANGE RAMPS.....	4-716.15
STRIPING, PAVEMENT MARKING GUIDELINES.....	4-716.05
STRIPING, PERMANENT PAVEMENT MARKINGS.....	4-716.15
STRUCTURAL BACKFILL (GRANULAR).....	4-303.05
STRUCTURE, REMOVAL OF.....	4-202.00
STRUCTURES, TEMPORARY.....	4-621.00
SUBGRADE TREATMENT.....	4-300.00
SUBGRADE TREATMENT (GRANULAR).....	4-301.00
SUBGRADE TREATMENT (LIME).....	4-302.00
SUBMITTAL OF PLANS FOR STRUCTURAL GRADE APPROVAL.....	2-127.00
SUPERELEVATION RATES.....	2-130.00
SUPERELEVATION RUN-OFF.....	2-130.00
SUPERVISORS (NAME ON TITLE SHEET).....	2-115.00, 3-105.00, 4-115.00
SURFACE (HOT MIX), ASPHALTIC CONCRETE.....	4-411.00
SURFACES, FLEXIBLE.....	4-400.00
SURFACE TREATMENT, DOUBLE BITUMINOUS.....	4-404.00
SURVEY NOTES.....	1-100.00
SURVEY UPDATES.....	3-115.00
SWELL FACTORS.....	2-145.10, 3-315.10, 4-203.05

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

-T-

TABLE, RIGHT-OF-WAY ACQUISITION..... 2-320.00

TACK COAT 4-403.00

TEMPORARY PAVEMENT MARKINGS POLICY 4-716.10

TEMPORARY SEEDING (WITH MULCH)..... 4-801.07

TEMPORARY SLOPE DRAIN PIPE 4-209.01

TEMPORARY STRUCTURES..... 4-621.00

TEMPORARY TRAFFIC SIGNALS USED AT TWO LANE BRIDGE
RECONSTRUCTION PROJECTS 4-730.20

TITLE SHEET 2-115.00, 2-115.05, 2-115.10, 2-115.15, 3-105.00, 3-105.05, 3-105.10
(CONT'D)..... 4-115.00, 4-115.05, 4-115.10, 4-115.20, 4-115.25, 4-115.35

TOPSOIL 3-315.05, 4-203.30

TRACT NUMBERS ON PLANS 1-206.10

TRAFFIC BLOCK..... 2-115.15

TRAFFIC CONTROL IN CONSTRUCTION ZONES

 ATTENUATORS (PORTABLE)..... 4-712.00

 BARRICADES AND DRUMS 4-712.00

 CONSTRUCTION SIGNING 4-712.00

 LIGHTING DEVICES 4-712.00

 MARKINGS 4-712.00

 PORTABLE BARRIER RAIL..... 4-712.00

 VERTICAL PANELS 4-712.00

TRAFFIC CONTROL - DIFFERENCES IN ELEVATION
 BETWEEN ADJACENT ROADWAY ELEMENTS 4-712.10

TRAFFIC DATA BLOCK (RESURFACING)..... 4-115.35

TRAFFIC DATA FOR DESIGN 2-120.00

TRAFFIC DATA FORM..... 2-120.00

TRAFFIC SIGNAL DETECTION LOOPS REPLACEMENT..... 4-730.08

TRAFFIC SIGNALS 2-315.00, 4-730.10, 4-730.15, 4-730.20

TREES IN MITIGATION AREAS 3-410.02

TRENCH DRAIN PIPE, USE OF 3-200.30

TRUCK CLIMBING LANES..... 2-150.00

TURNING LANES, DESIGN 2-170.00

TYPICAL SECTIONS DRIVEWAY..... 2-300.05

-U-

UNDERCUTTING 2-145.00, 4-203.00

UNDERDRAINS..... 4-710.00

UNDERSEALING CONCRETE PAVEMENT 4-502.00

UNECONOMIC REMNANTS 3-120.00

UTILITY PLANS..... 2-315.00, 2-315.05, 3-400.05, 4-137.00

-V-

VERTICAL CLEARANCES FOR BRIDGES 2-125.00, 3-110.02, 4-125.00

VERTICAL PANELS - TRAFFIC CONTROL 4-712.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

W-

WATER (SEEDING AND SODDING) 4-801.10
WATER QUALITY PERMIT 3-410.00
WATER QUALITY PERMIT ACTIVITY SCHEDULES 3-410.00
WATER QUALITY PERMIT DRAWING CELLS 3-410.00
WATER WELLS 3-130.00, 4-202.13, 4-625.00
WETLANDS 1-215.00, 2-155.00, 2-155.05, 3-115.00, 3-410.00, 3-410.02
WETLANDS BOUNDARY DESIGNATION 2-155.00
"WORKERS PRESENT" SIGN 4-712.15

ITEM NUMBER INDEX

202-01	4-202.01
202-01.50	4-202.01
202-04.01: 202-04.49	4-202.00
202-04.50: 202-04.99	4-202.00
202-06.01: 202-06.99	4-202.01
202-13	4-202.13
203-01	4-203.00, 4-203.02, 4-203.55
203-02.01	4-203.20
203-05	4-203.00
203-06	4-203.40
203-08	4-203.35
203-30.01	4-203.25
203-30.02	4-203.25
204-10.01: 204-10.16	4-203.40
301-01	4-301.00
302-01.01	4-203.40, 4-302.00
302-02	4-302.00
303-01	4-303.00
303-01.02	4-303.05
303-01.03	4-303.00
303-01.08	4-303.00
303-01.09	4-303.00
303-02	4-303.00
303-10.01: 303-10.06	4-303.00
304-01.02	4-304.00
304-02	4-304.00
307-01.01	4-307.00
307-01.02	4-307.00
307-01.03	4-307.00
307-01.04	4-307.00
307-01.05	4-307.00
307-01.06	4-307.00
307-01.07	4-307.00
307-01.08	4-307.00
307-01.09	4-307.00
307-01.10	4-307.00
307-01.13	4-307.00
307-01.14	4-307.00
307-01.15	4-307.00
307-02.01	4-307.00
307-02.02	4-307.00
307-02.03	4-307.00
307-02.04	4-307.00
307-02.05	4-307.00
307-02.06	4-307.00
307-02.07	4-307.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

307-02.08.....	4-307.00
307-02.13.....	4-307.00
307-02.14.....	4-307.00
307-03.01.....	4-307.00
307-03.02.....	4-307.00
307-03.03.....	4-307.00
307-03.04.....	4-307.00
307-03.05.....	4-307.00
307-03.06.....	4-307.00
307-03.07.....	4-307.00
307-03.08.....	4-307.00
307-03.09.....	4-307.00
307-03.13.....	4-307.00
307-03.14.....	4-307.00
307-04.08.....	4-307.00
307-20.01.....	4-307.00
308-01.....	4-308.00
308-01.01.....	4-308.00
308-01.02.....	4-308.00
308-02.....	4-308.00
308-02.01.....	4-308.00
308-02.02.....	4-308.00
309-01.01.....	4-309.00, 4-309.01
309-01.02.....	4-309.00, 4-309.01
309-02.....	4-309.00, 4-309.01
312-01.....	4-312.00
312-02.....	4-312.00
312-03.....	4-312.00
312-04.....	4-312.00
402-01.....	4-402.00
402-02.....	4-402.00
403-01.....	4-403.00
403-02.....	4-403.00
404-01.01.....	4-404.00
404-01.02.....	4-404.00
405-01.01.....	4-405.00
405-01.02.....	4-405.00
406-01.01.....	4-406.00
406-01.02.....	4-406.00
411-01.....	4-411.00
411-01.03.....	4-411.00
411-01.04.....	4-411.00
411-01.07.....	4-411.00
411-02.....	4-411.00
411-02.03.....	4-411.00
411-02.04.....	4-411.00
411-03.....	4-411.00
411-03.03.....	4-411.00

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

411-03.04.....	4-411.00
411-04.....	4-411.00
411-12.01.....	4-411.03, 4-716.15
411-12.02.....	4-411.03, 4-716.15
411-12.03.....	4-411.04, 4-716.15
411-12.04.....	4-411.04, 4-716.15
414-03.01.....	4-414.05
414-03.02.....	4-414.05
415-01.01.....	4-415.00
415-01.02.....	4-415.00
415-01.03.....	4-415.00
501.03.03.....	4-411.03, 4-716.15
502-02.....	4-502.00
502-05.....	4-303.00
502-10.....	4-502.00
604-02.02.....	4-604.25
604-15.01.....	4-202.13
610-07.03.....	4-611.05
617-01.....	4-617.00
621-01.01: 621-01.10.....	4-621.00
625-01.01.....	4-625.00
705-01.01.....	4-705.00
705-01.04.....	4-705.00
705-02.02.....	4-705.00
705-04.02.....	4-705.05
705-04.04.....	4-705.05
705-04.07.....	4-705.05
705-08.51.....	4-712.00
705-10.30.....	4-705.00
705-10.31.....	4-705.00
709-01.01.....	4-611.05
709-05.05.....	4-709.05
709-05.06.....	4-709.05
709-05.07.....	4-709.05
709-05.08.....	4-709.05
709-05.09.....	4-709.05
709-05.10: 709-05.13.....	4-709.05
712-06.01.....	4-712.00
712-06.16.....	4-712.15
712-09.01.....	4-716.30
713-16.20: 713-16.29.....	4-713.15
716-01.11.....	4-716.15
716-01.12.....	4-716.15
716-01.21.....	4-716.15
716-01.22.....	4-716.15
716-02.04.....	4-716.00
716-02.07.....	4-716.00
716-02.08.....	4-716.25

TDOT - ROADWAY DESIGN GUIDELINES

English

Revised: 12/01/09

716-02.09.....	4-716.25
716.04.04.....	4-716.00
716-05.01.....	4-716.15, 4-716.30
716-05.04.....	4-716.00
716-05.07.....	4-716.00
716-08.04.....	4-716.00
716-10.01.....	4-716.10
716-10.15.....	4-716.10
716-12.01.....	4-716.15
716-12.02.....	4-716.15
716-13.01.....	4-716.15
716-13.06.....	4-716.15
730-14.02.....	4-730.08
730-14.03.....	4-730.08
730-40.....	4-730.20
730-50.....	4-730.20
801-01.....	4-801.00
801-01.02.....	4-801.00
801-01.07.....	4-801.07
801-02.....	4-801.07
801-03.....	4-801.10
801-07.....	4-801.15
801-07.01.....	4-801.15
801-08.....	4-801.20