

Traffic Control Inspection Workbook

**Certified Inspector Training
Program**



Traffic Control Inspection Certification Workbook

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5. Part 805 – Height Differentials, Measurement & Payment
6. TE Standards
7. Detours & Common Sense

TRAFFIC CONTROL INSPECTION CIT PROGRAM

Computer (Written) Test: Open book – 30 multiple choice questions

Grading: Must score 70% or better to pass.

Exam Results: Exams will be graded in two to three weeks. Exam results are emailed to the student. Exam results are not given over the phone.

Exam Re-takes: Students who need to re-take either the written and/or performance exam need to register to do so. The re-take registration form can be found on the CIT website at www.citksu.com.

To be certified: Students must successfully pass the written exam. The student will be emailed a certification card and letter.

Reasons for Certified Inspector Training (CIT) Training Program

Overview

The Kansas Department of Transportation (KDOT) has established this training program to educate, test and certify those individuals responsible for performing inspection and testing functions on KDOT construction projects. KDOT's Bureau of Construction and Materials has responsibility for the establishment and administration of the materials portion of the KDOT's Quality Control/Quality Assurance (QC/QA) Program. The Bureau develops standards and specifications for materials, establishes sampling procedures and frequencies, and test procedures used in the laboratory and the field in order to assure compliance with specifications. It performs materials testing to assist each of the six KDOT districts in administering quality assurance functions of the QC/QA Program. Such testing includes tests on materials purchased by contractors or the State for use in maintenance or construction activities. The Bureau also conducts tests on soils, concrete, bituminous mixtures and numerous other specialized materials, the results of which are used by others for a variety of reasons.

Quality control and quality assurance activities involve the routine sampling, testing and analysis of various materials to determine the quality of a given product and to attain a quality product. The goal of the Certified Inspection and Testing Training Program (CIT²) is to provide persons engaged in the inspection and/or testing of KDOT construction projects specific training in, but not limited to, soils, aggregates, and concrete and/or asphalt disciplines.

Each student is required to demonstrate specific abilities as defined by the training modules described in the CIT² manual. The manual can be found online at: https://www.ksdot.org/Assets/wwwksdotorg/bureaus/burMatrRes/Documents/CIT_Manual_2019.pdf

Federal Funding

On projects involving federal funds, KDOT must certify to the Federal Highway Administration as to the quality of each type of material used on each project before the State is completely reimbursed by the federal government.

The certification and training requirements contained in this manual are intended to comply with the requirements of 23 CFR Part 637 which states, "After June 29, 2000, all sampling and testing data to be used in the acceptance decision or the IA (Independent Assurance) program shall be executed by qualified sampling and testing personnel."

Reasons for Quality Control/Quality Assurance

Inspectors fulfill a very important job on any project—they safeguard the public interest in a number of ways.

The primary reason for materials inspection, sampling and testing requirements is to verify that all materials incorporated into the work will meet the requirements of the contract documents, including the plans, specifications, and special provisions.

Plans and specifications are prepared to require the use of certain specific materials known or expected to perform satisfactorily with minimum maintenance throughout the life of the facility or infrastructure project. Any material that deviates appreciably from the specifications requirements will not perform as expected and, in all probability, will shorten the useful life of the facility or add unexpected costs in maintenance. Because there are limited dollars available for transportation infrastructure, the useful life and long-term maintenance costs of every project are critical considerations.

Secondly, all contractors bidding or furnishing materials to a project should be treated equally. That is, the contract documents provide a fair and uniform basis for bidding because they define the requirements to be met—ideally with the least possible difference of interpretation. The contractor commits to furnish materials and complete work that will equal or exceed such requirements. For this reason it is essential that quality assurance be correctly understood and applied uniformly by engineers and inspectors from project-to-project so that all contractors and suppliers are treated alike.

Thirdly, the expenditure of public funds must be documented to substantiate whether taxpayers actually received the quantity and quality of materials specified in exchange for tax dollars spent. Whether or not to pay the costs invoiced by contractors is a decision which relies heavily upon inspection reports and test results. In a fundamental way, inspectors play a key role in serving the public—to justify the expenditure of public monies and the acceptance of any contractor's work. Through the work of knowledgeable, competent and skilled inspectors, KDOT can verify and confirm whether or not the contractor has fulfilled its obligations to build the project as intended.

Finally, the specification requirements for materials are constantly evolving, based on new developments, past performance of material in the field, research and technological innovations. Accurate recordkeeping of materials and test results using consistent inspection practices provides a basis to compare results over time—an indispensable advantage for meaningful research. Data properly collected and recorded by inspectors can confirm whether or not changes in material specifications and testing requirements have, in fact, resulted in a better product, state-wide or in a particular location or application.

All inspectors should review the applicable clauses of the Standard Specifications at regular intervals to refresh their understanding of material and testing requirements.

Traffic Control



1

Why does this matter?

MoDOT worker dies after being hit by semi-truck on Highway 0 near Sedalia

Worker hit and killed in Interstate 40 work zone south of Raleigh early Friday

BY RICHARD STRADLING
UPDATED AUGUST 23, 2024 2:45 PM

Study shows a high rate of highway contractors experiencing work zone crashes

3 workers die in Pennsylvania highway construction zone crash

The fatalities occurred after a truck driver entered an active work area during the state's Work Zone Awareness Week.

Published April 18, 2024

4 Killed in Work Zone Crash Caused by Semi Truck in Minnesota

Don McLoud
Aug 19, 2024

Kansas
Department of Transportation

2



3

Why does this matter? Good traffic control improves:

1. **Safety** – everyone gets to their destination
2. **Commute Delays** – inevitable, but kept to a minimum
3. **Project** – Keeps cost down and on schedule
4. **Legal Liability** – Be beyond reproach



4

This course

1. Intro (this module)
2. KDOT Specs
3. Traffic Control Devices
4. KDOT Typicals
5. Mash/350 compliance
6. Practice test questions



5

Traffic Control Resources: Humans

This Course:

AJ Wilson, D5A3 Engineer

Andrew.Wilson@ks.gov

HQ Temp Traffic Control:

Nick Rogers, Temp Traffic Control Engineer

Nick.rogers@ks.gov

Office: (785) 817-6116



6

Traffic Control Resources: Documents_a

- 1.
- 2.
- 3.
- 4.
- 5.
6. **MUTCD**

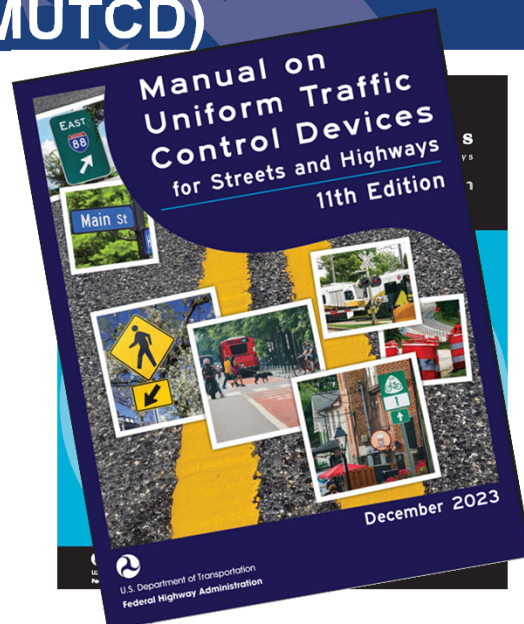


7

Manual on Uniform Traffic Control Devices (MUTCD)

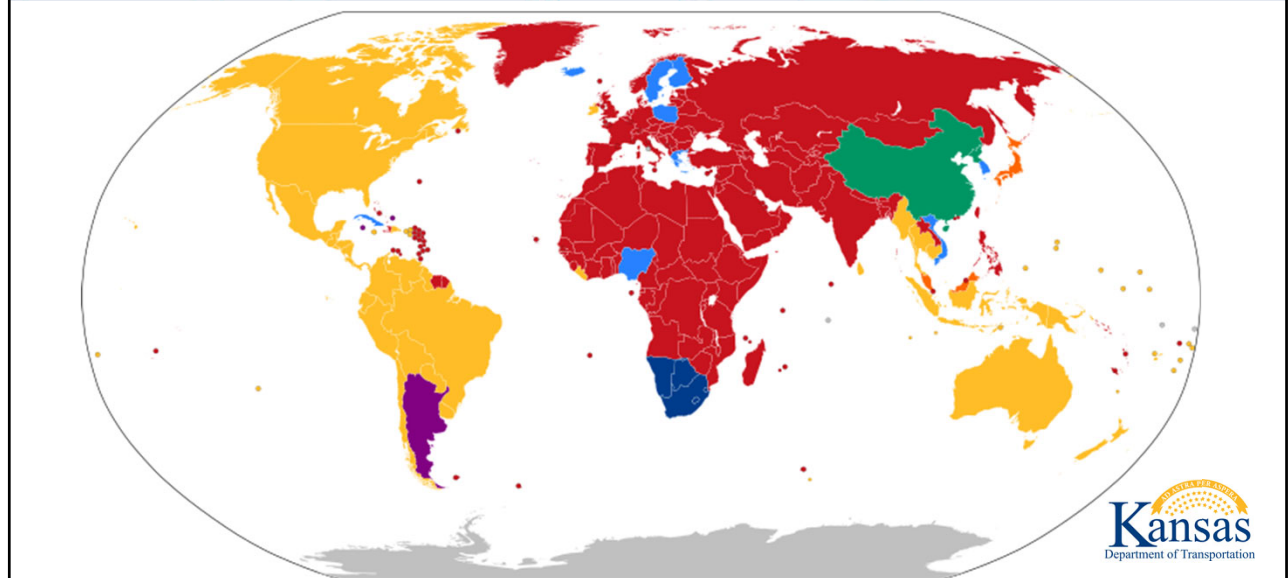
2009 Edition
KDOT adopted in 2011

11th Edition – 2023
KDOT adoption:2026?



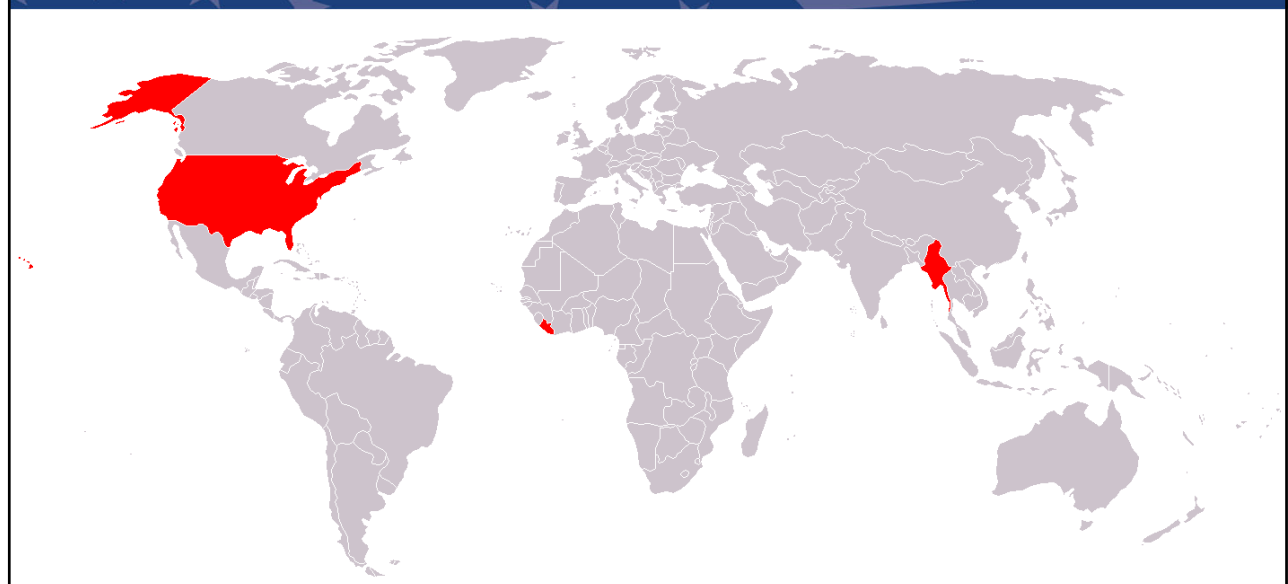
8

Countries that use the MUTCD



9

Countries that don't use METRIC



10

Countries that have SENT A MAN TO THE MOON



11

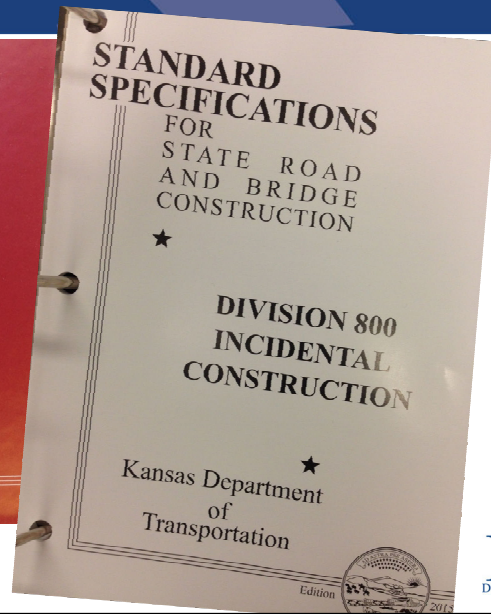
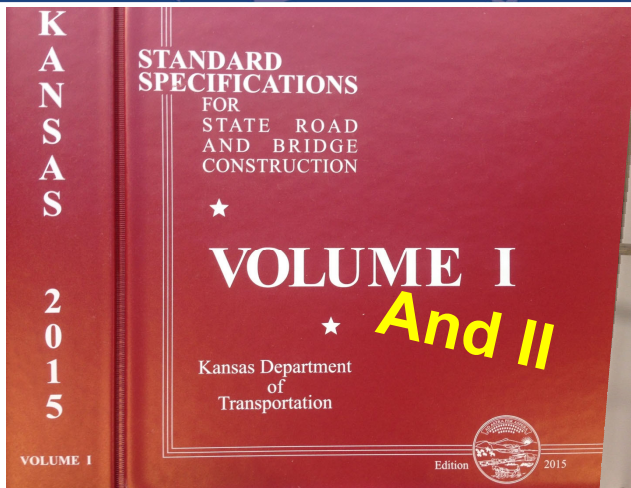
Traffic Control Resources: Documents_b

- 1.
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- 3.
- 4.
5. **Standard Specifications**
6. **MUTCD**



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2015 Standard Specifications



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Traffic Control Resources: Documents_c

- 1.
- 2.
- 3.
4. **Standard Drawings**
5. **Standard Specifications**
6. **MUTCD**

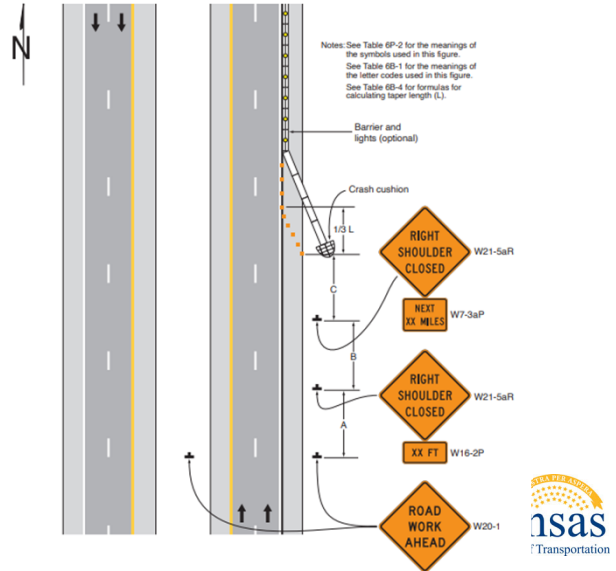


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Traffic Engineering Standards

MUTCD Typical →

Figure 6P-5. Shoulder Closure on a Freeway (TA-5)



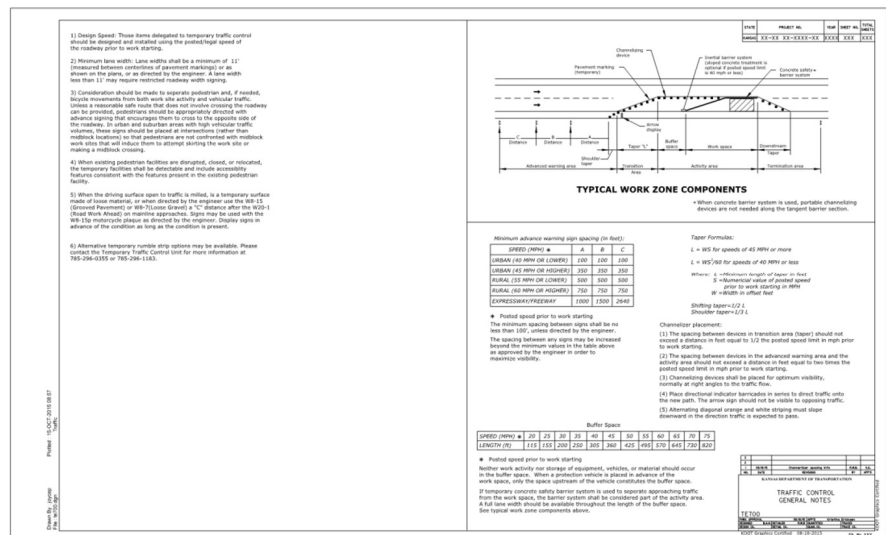
15

Traffic Engineering Standards

•Retain a copy of current standards.

•Standards available on Internet at KART

<http://kart.ksdot.org/>
and at WWW.KSDOT.org
under "Doing Business with Us" click "Info for Highway Contractors" then in the bottom Rt. corner under "Engineering Services" is "Standard Drawings"



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Traffic Engineering Standards ³

02	03-13-18	W8-15p usage changed to Shall	R.W.B.	E.K.G.
01	08-18-15	Channelizer spacing info	R.W.B.	K.E.
NO	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL GENERAL NOTES

TE700

KANSAS DEPARTMENT OF TRANSPORTATION		03-13-18	APP'D.	Eric Kocher
DESIGNED	B.A.H.	DETAILED	R.W.B.	QUANTITIES
DESIGN CK.		DETAIL CK.		QUAN.CK.
				TRACED
				TRACE CK.

KDOT Graphics Certified 07-18-2022 Sh. No. 0

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Traffic Engineering Standards ⁴

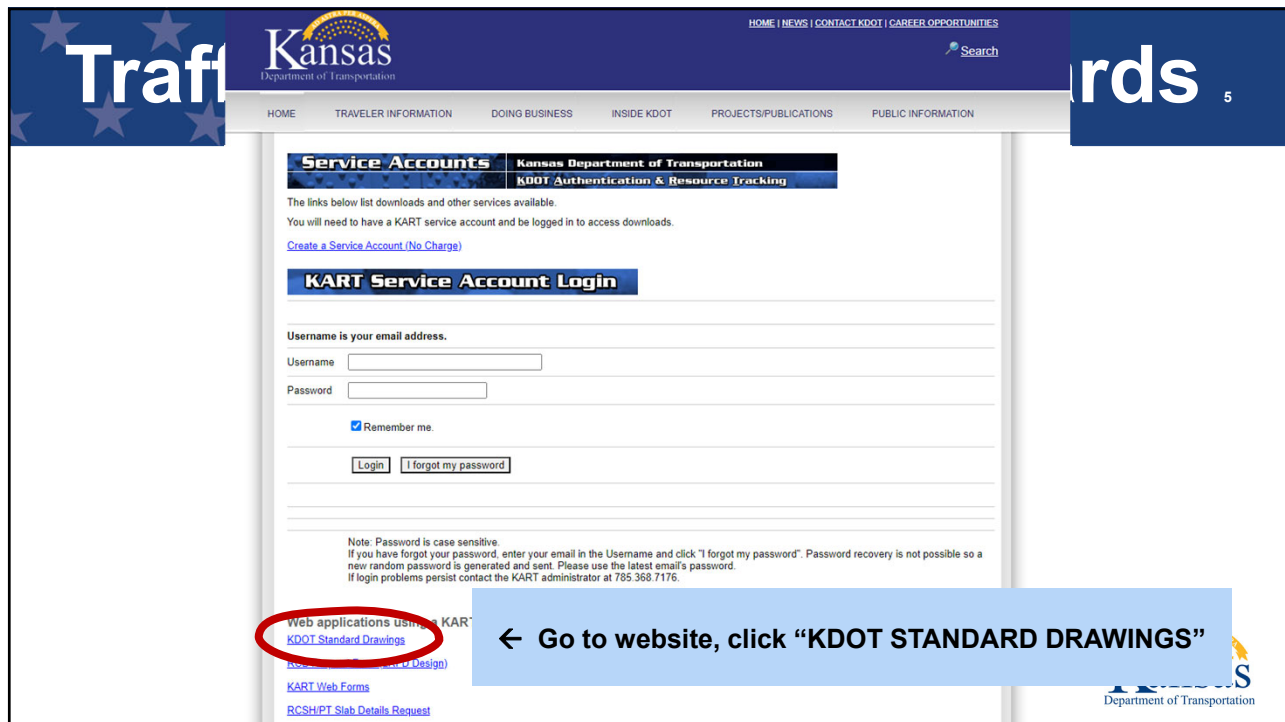
How to get Traffic Control standards

Available on Internet at KART
<http://kart.ksdot.org/>

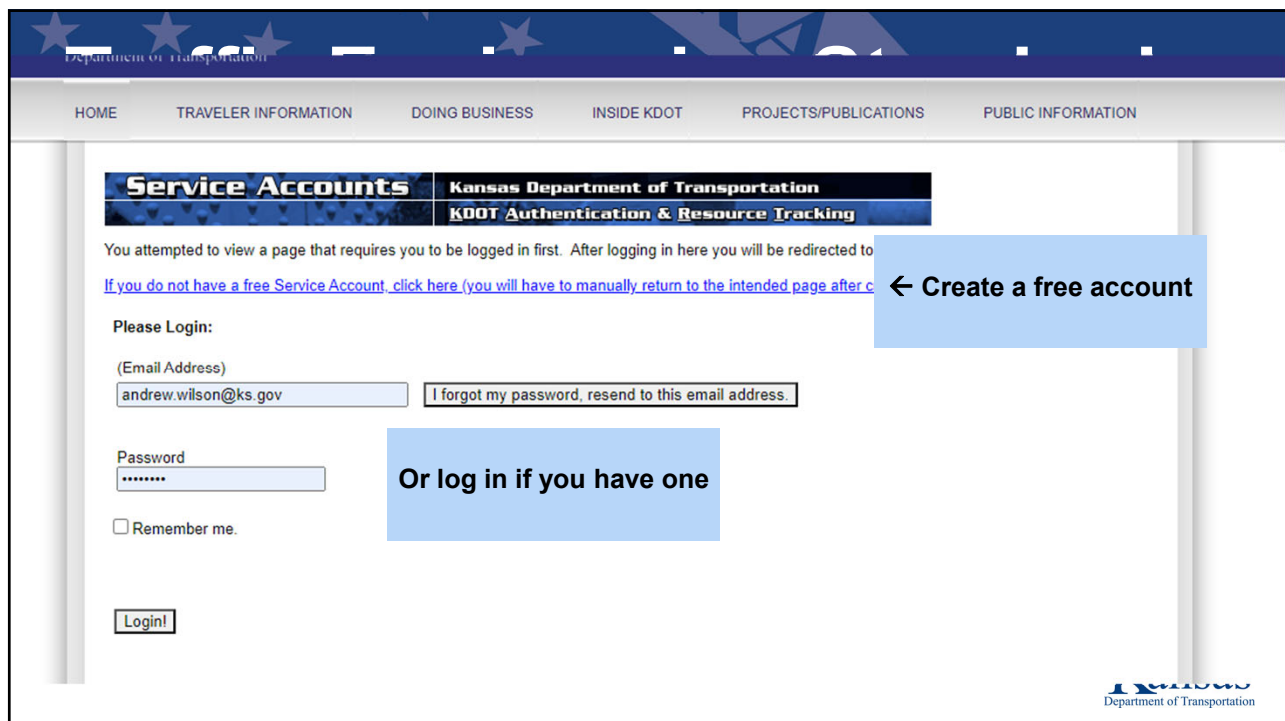
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20

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Standards Info.

The above menu items are described below:

- [Home](#) - This page.
- [Prepackaged](#) - Pre built zip files are found here. All standards for a given section (Bridge, Landscape, Local Projects, Road, and Traffic Engineering) are prepackaged into a downloadable zip file.
- [Standards Browser](#) - **← Standards Browser** Standard drawings. Each standard can be added or removed from the custom download package. There is a link shown (📄) intended to give the user a chance to inspect a file before downloading if desired. If you directly save the pdf from the pdf viewer you wish to know if a standard has been modified since you last got a copy, please note that files added and downloaded through our "Download Package" and other predefined packages are the only files recorded in your download history.
- [Download Package](#) - Will list the contents of the download package as built from action in the "Standards Browser" and "Synch My Downloads" pages. The selections for the package will expire in twenty minutes of no activity. Provides a "Download" button to actually initiate the download of your selections.
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- [Synch My Downloads](#) - Scans your download records and checks to see if any of the standards you have downloaded in the past have been modified. The page will list all files out of date and give opportunity to add them to the "Download Package".

Note: If your Service Account is subscribed to the "Standard Notes and Drawings" email group you will receive automated emails whenever a standard drawing you downloaded has been modified. There is a link in the automated email that will take you to the "Synch My Downloads" page.

- [Reports](#) - PDF versions of KDOT Standard Drawing lists suitable for printing

Go to main [KART](#) site.

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Traffic Engineering Standards ⁷

Standards Browser

Standard Section Groups

Grp	Title
BR	Bridge
BM	Bridge Management
ITS	Intelligent Transportation Systems
LA	Landscape
LP	Local Projects
RD	Road
SL	Signing and Marking
TE	Traffic ← TE Standards

Word Search

(Searches standard name, sheet title, and sheet descriptions)

Search

☒ Return Any Word
☐ Match All Words
☐ Match Phrase

WORD SEARCH

Recent Revisions

Months Ago

6

GET RECENT

22

TE730	TE	US	Traffic Control Flagger or Pilot Car	(R) 6/3/2022
☐ PDF	☐ DGN		Typical: Flagger or Pilot Car Two-Lane one lane closed	(A) 6/1/2015
TE731	TE	US	Traffic Control Flagger or Pilot Car Concrete Shoulders > 8 FT	(R) 6/3/2022
☒ PDF	☐ DGN		Typical: Flagger or Pilot Car Two-Lane one lane closed with Concrete Shoulders > 8 FT	(A) 6/1/2015
TE732	TE	US	Traffic Control Temporary Traffic Signals	(R) 6/3/2022
☒ PDF	☐ DGN		Typical: Two-Lane one lane closed using Temporary Traffic Signals	(A) 6/1/2015
TE733	TE	US	Traffic Control Temporary Traffic Signal Details	(R) 6/3/2022
☒ PDF	☐ DGN		Temporary Traffic Signal Typical Installation	(A) 6/1/2015
TE734	TE	US	Traffic Control Temporary Traffic Signal Details	(R) 6/3/2022
☒ PDF	☐ DGN		Temporary Traffic Signal Phasing and Timings	(A) 6/1/2015
TE736	TE	US	Traffic Control Shoofly Diversion	(R) 6/3/2022
☒ PDF	☐ DGN		Typical: Shoofly Diversion	
TE737	TE	US	Traffic Control Temporary Traffic Signal Details	(R) 6/3/2022
☒ PDF	☐ DGN		Temporary Traffic Signal Typical Installation	(A) 6/1/2015
TE740	TE	US	Traffic Control Shoofly Diversion	(R) 6/3/2022
☒ PDF	☐ DGN		Typical: Shoofly Diversion	
TE742	TE	US	Traffic Control Divided Highway Crossover From Right Lane	(R) 6/3/2022
☒ PDF	☐ DGN		Typical: Four Lane Divided Highway One Road Way Closed Crossover From Right Lane	(A) 6/1/2015
TE744	TE	US	Traffic Control Lane Closure On Multilane Hwy	(R) 6/3/2022
☒ PDF	☐ DGN		Typical: Four-Lane Highway One Lane Closed	(A) 3/13/2018
TE746	TE	US	Traffic Control Two Lanes Closed	(R) 6/3/2022
☒ PDF	☐ DGN		Typical: Multi-Lane Highway Two Lanes Closed	(A) 6/1/2015
TE748	TE	US	Traffic Control Crossover on Undivided Roadway	(R) 6/3/2022
☒ PDF	☐ DGN		Typical: Four-Lane Undivided Highway One-Half Roadway Closed	(A) 6/1/2015
TE780	TE	US	KDOT Detour Requirements	(R) 7/20/2023
☒ PDF	☐ DGN		KDOT Detour Requirements for projects designed after Nov.2023	(A)
TE795	TE	US	Traffic Control Summary of Devices Recapitulation of Quantities	(R) 6/3/2022
☒ PDF	☐ DGN		Summary of Devices & Recapitulation of Quantities	(A) 6/1/2015

← Scroll down, select PDF for each one between TE 700 – TE 795

DOT Standard Drawings Home Prepackaged Standards Browser **Download Package** ← Scroll up, click “Download Package”

Standards Browser

Standard Section Groups

Grp	Title
BR	Bridge
BM	Bridge Management
ITS	Intelligent Transportation Systems
LA	Landscape
LP	Local Projects
RD	Road
SL	Signing and Lighting
TF	Traffic

Word Search

(Searches standard name, sheet title, and sheet descriptions)

Search

☒ Return Any Word
☐ Match All Words
☐ Match Phrase

WORD SEARCH

Recent Revisions

Months Ago

6

GET RECENT

Kansas Department of Transportation

DOT Standard Drawings Home Prepackaged Standards Browser Download Package My History Synch My Downloads Reports

← Click “Build Download”

age when build is complete.

Standard Name	Sheet Title	File	Approval Date	Revision Date	REMOVE ALL
TE700	Traffic Control General Notes	pdf	3/13/2018	6/3/2022	REMOVE
TE702	Traffic Control Channelizing Devices	pdf	6/1/2015	6/3/2022	REMOVE
TE704	Traffic Control Closures	pdf	6/1/2015	6/3/2022	REMOVE
TE705	Traffic Control Access Through The Work Area	pdf	6/1/2015	6/3/2022	REMOVE
TE710	Traffic Control Sign Information	pdf	6/1/2015	6/3/2022	REMOVE
TE712	Traffic Control Sign Posts	pdf	6/1/2015	6/3/2022	REMOVE
TE720	Traffic Control Shoulder Work Undivided Roadway	pdf	6/1/2015	6/3/2022	REMOVE

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Zip File Built! File Size: 12.64 MB

Disclaimer: These standard drawings are provided for use by persons outside of the Kansas Department of Transportation as information only. The Kansas Department of Transportation, the State of Kansas, its officers or employees do not undertake any duties or responsibilities of any such person or entity who chooses to use these drawings. They should not be substituted for the exercise of a person's own professional judgment nor the determination by contractors of the appropriate manner and method of construction on projects under their control. It is the user's obligation to make sure that he/she uses the appropriate practices. Any person using these documents agrees that KDOT will not be liable for any commercial loss; inconvenience; loss of use, time, data, goodwill, revenues, profits, or savings; or any other special, incidental, indirect, or consequential damages in any way related to or arising from use of these documents.

Package Name

Custom

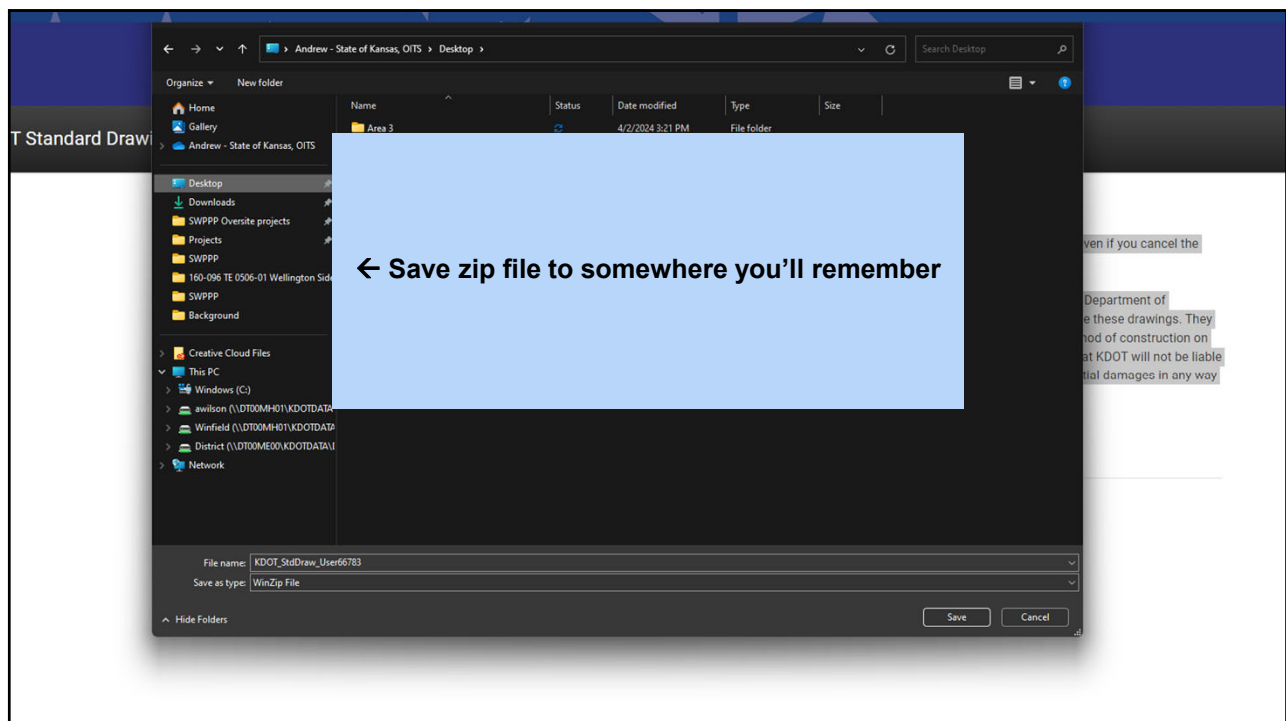
I HAVE READ, UNDERSTAND AND ACCEPT. DOWNLOAD NOW

← Click “I have read, understand and accept. Download now”

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Name	Type	Compressed size	Password ...	Size	Ratio	Date modified
te700	Adobe Acrobat Document	1,117 KB	No	1,124 KB	1%	8/9/2022 11:44 AM
te702	Adobe Acrobat Document	538 KB	No	545 KB	2%	8/9/2022 11:45 AM
te704	Adobe Acrobat Document	857 KB	No	864 KB	1%	8/9/2022 11:45 AM
te705	Adobe Acrobat Document	278 KB	No	286 KB	3%	8/9/2022 11:44 AM
te710	Adobe Acrobat Document					8/9/2022 11:03 PM
te712	Adobe Acrobat Document					8/9/2022 11:45 AM
te720	Adobe Acrobat Document					8/9/2022 11:45 AM
te722	Adobe Acrobat Document					8/9/2022 11:45 AM
te724	Adobe Acrobat Document					8/9/2022 11:45 AM
te730	Adobe Acrobat Document					8/9/2022 11:45 AM
te731	Adobe Acrobat Document					8/9/2022 11:45 AM
te732	Adobe Acrobat Document					8/9/2022 11:45 AM
te733	Adobe Acrobat Document					8/9/2022 11:45 AM
te734	Adobe Acrobat Document					8/9/2022 11:45 AM
te736	Adobe Acrobat Document					8/9/2022 11:45 AM
te737	Adobe Acrobat Document					8/9/2022 11:45 AM
te740	Adobe Acrobat Document					8/9/2022 11:46 AM
te742	Adobe Acrobat Document					8/9/2022 11:46 AM
te744	Adobe Acrobat Document					8/9/2022 11:45 AM
te746	Adobe Acrobat Document					8/9/2022 11:46 AM
te748	Adobe Acrobat Document	342 KB	No	349 KB	2%	8/9/2022 11:46 AM
TE780	Adobe Acrobat Document	813 KB	No	821 KB	1%	7/20/2023 7:01 PM
te795	Adobe Acrobat Document	521 KB	No	530 KB	2%	8/9/2022 11:46 AM

Enjoy your TE Standards!
(use a PDF stapler if you want it in one file)

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Traffic Control Resources: Documents

1. Project Special Provisions
2. Special Provisions
3. Plans
4. Standard Drawings
5. Standard Specifications
6. MUTCD



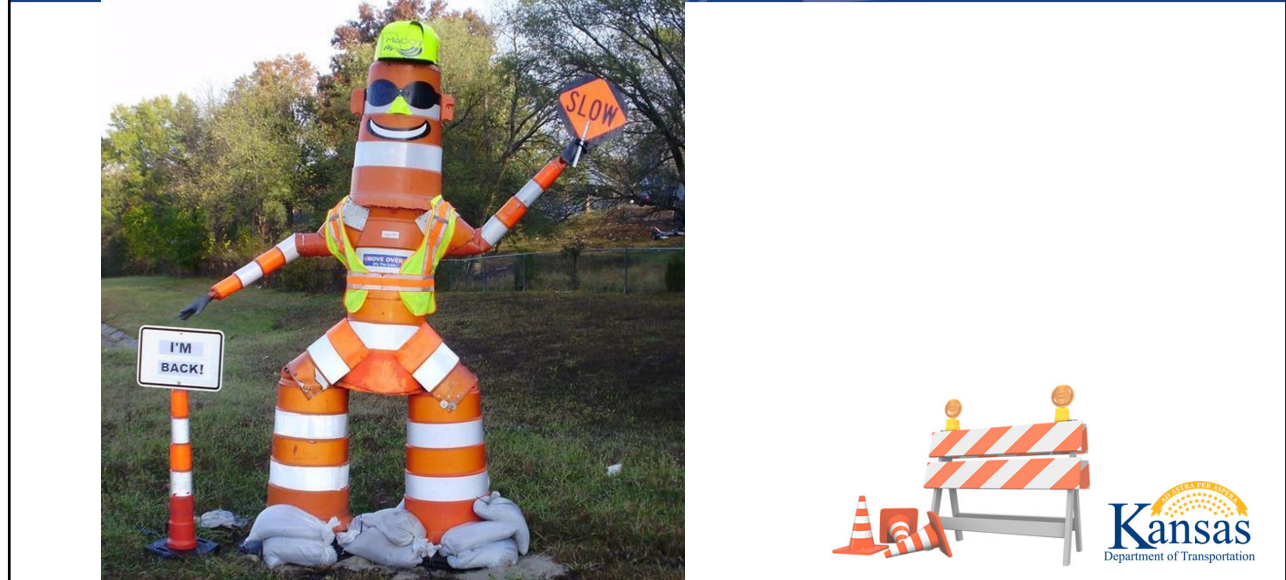
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Traffic Control, last



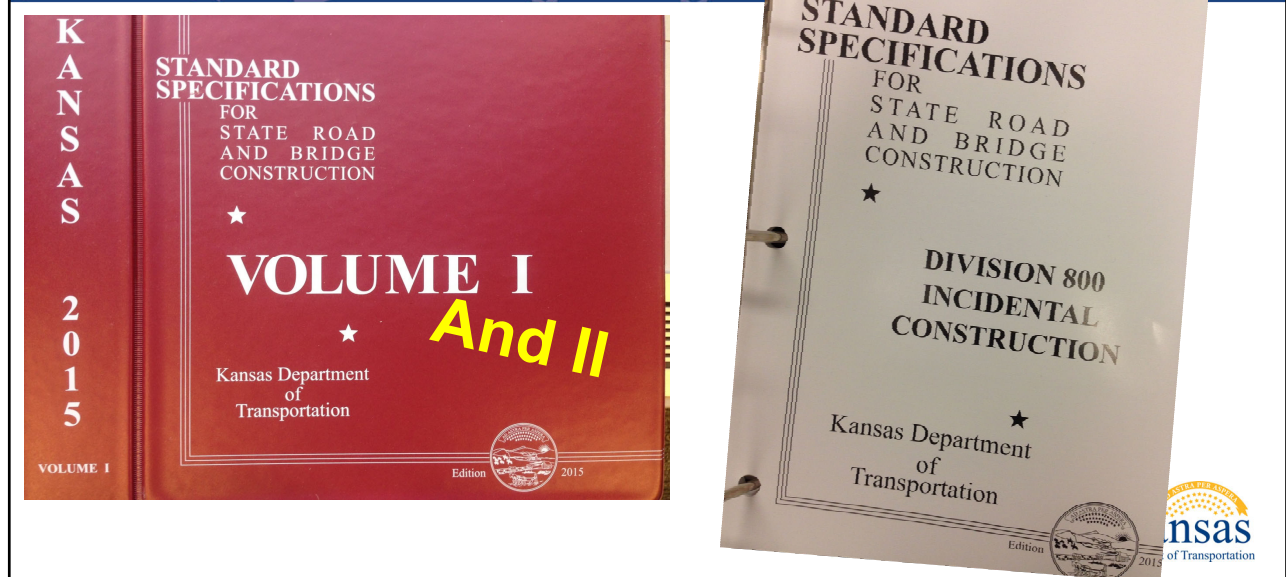
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Temporary Traffic Control Standard Spec - 805



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Temporary Traffic Control Standard Spec - 805



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805 - WORK ZONE TRAFFIC CONTROL AND SAFETY.....	800-13
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807 - PAINTED PAVEMENT MARKING.....	800-30
808 - REMOVAL OF EXISTING PAVEMENT MARKINGS.....	800-32
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Temporary Traffic Control	
St	
805 - WORK ZONE TRAFFIC CONTROL & SAFETY	
SECTION 805	
WORK ZONE TRAFFIC CONTROL AND SAFETY	
805.1 DESCRIPTION	
Provide, erect, maintain and remove traffic control devices as shown in the Contract Documents.	
BID ITEMS	UNITS
Work Zone Signs (0 to 9.25 Sq. Ft.)	Each Per Day
Work Zone Signs (9.26 to 16.25 Sq. Ft.)	Each Per Day
Work Zone Signs (16.26 Sq. Ft. and over)	Each Per Day
Work Zone Sign (Special) (**)	Each
Work Zone Barricades (Type 3 - 4 to 12 Lin. Ft.)	Each Per Day
Work Zone Barricades (Pedestrian)	Each per Day
Arrow Display	Each Per Day
Portable Changeable Message Sign	Each Per Day
Channelizer (Fixed)	Each Per Day
Channelizer (Portable)	Each Per Day
Channelizer (Pedestrian)	Each per Day
Work Zone Warning Light (Type "A" Low Intensity)	Each Per Day
Work Zone Warning Light (Red Type "B" High Intensity)	Each Per Day
Pavement Marking (Temporary)	
4" Solid (*)	Sta./Line
4" Broken (8 ft.) (*)	Sta./Line
4" Broken (3 ft.) (*)	Sta./Line
4" Dotted Extension (*)	Sta./Line
Broken (Line Masking Tape)	Sta./Line
Solid (Line Masking Tape)	Sta./Line
Symbol (*)	Each
Flexible Raised Pavement Marker (4" Broken (8 ft.))	Sta./Line
Flexible Raised Pavement Marker (4" Broken (3 ft.))	Sta./Line
Rigid Raised Pavement Marker (*)	Each
Flagger (Set Price)	Hour
Traffic Signal Installation (Temporary)	Lump Sum
Traffic Control	Lump Sum
Traffic Control (Initial Setup)	Lump Sum

800-13

4

805.1 DESCRIPTION

Provide, erect, maintain and remove traffic control devices as shown in the Contract Documents.

BID ITEMS

Work Zone Signs (0 to 9.25 Sq. Ft.)
Work Zone Signs (9.26 to 16.25 Sq. Ft.)
Work Zone Signs (16.26 Sq. Ft. and over)
Work Zone Sign (Special) (**)
Work Zone Barricades (Type 3 – 4 to 12 Lin. Ft.)
Work Zone Barricades (Pedestrian)
Arrow Display
Portable Changeable Message Sign
Channelizer (Fixed)
Channelizer (Portable)

UNITS

Each Per Day
Each Per Day
Each Per Day
Each
Each Per Day
Each per Day
Each Per Day
Each Per Day
Each Per Day

5 Arrow Displays x 10 Days =

800-15 1

4" Dotted Extension (*)

Sta./Line

5

Channelizer (Pedestrian)
Work Zone Warning Light (Type "A" Low Intensity)
Work Zone Warning Light (Red Type "B" High Intensity)
Pavement Marking (Temporary)
4" Solid (*)
4" Broken (8 ft.) (*)
4" Broken (3 ft.) (*)
4" Dotted Extension (*)
Broken (Line Masking Tape)
Solid (Line Masking Tape)
Symbol (*)
Flexible Raised Pavement Marker (4" Broken (8 ft.))
Flexible Raised Pavement Marker (4" Broken (3 ft.))
Rigid Raised Pavement Marker (*)
Flagger (Set Price)

Each per Day
Each Per Day
Each Per Day
Sta./Line
Sta./Line
Sta./Line
Sta./Line
Sta./Line
Sta./Line
Each
Sta./Line
Sta./Line
Each
Hour

100 feet = 1 sta

5,309 feet ÷ 100 feet/StaL=

800-15 2

Department of Transportation

6

4" Broken (3 ft.) (*)	Sta./Line
4" Dotted Extension (*)	Sta./Line
Broken (Line Masking Tape)	Sta./Line
Solid (Line Masking Tape)	Sta./Line
Symbol (*)	Each
Flexible Raised Pavement Marker (4" Broken (8 ft.))	Sta./Line
Flexible Raised Pavement Marker (4" Broken (3 ft.))	Sta./Line
Rigid Raised Pavement Marker (*)	Each
Flagger (Set Price)	Hour
Traffic Signal Installation (Temporary)	Lump Sum
Traffic Control	Lump Sum
Traffic Control (Initial Setup)	Lump Sum
*Type (Type I or II)	
**Size	

805.2 MATERIALS

Provide materials as shown in the Contract Documents that comply with the following requirements.

Retroreflective Sheeting	DIVISION 2200
Portable Changeable Message Signs.....	DIVISION 1700
Work Zone Warning Lights.....	DIVISION 1700
Temporary Pavement Marking/Line Masking Tape.....	DIVISION 2200
Traffic Line Paint.....	DIVISION 2200
Raised Pavement Markers.....	DIVISION 2200

a. General. The size, shape, color, placement, installation, and maintenance of all traffic control devices and appurtenances shall comply with the details shown in the Contract Documents and the Manual on Uniform Traffic Control Devices (MUTCD).

Use crashworthy supports used for mounting signs or devices for temporary conditions that comply with AASHTO MASH. All traffic control devices shall be tested and found acceptable using test methods compliant with

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Temporary Traffic Control Standard Spec - 805

805 - WORK ZONE TRAFFIC CONTROL & SAFETY

Provide pedestrian channelizers with Type III orange and white retroreflective sheeting on the side meant to face vehicular traffic. The side facing pedestrians must have high contrast orange and white sheeting that may be Type III retroreflective sheeting.

f. Automated Flagging Assistance Devices (AFAD). At Contractor's option, provide an AFAD that complies with the MUTCD.

805.3 CONSTRUCTION REQUIREMENTS

General. The safe and satisfactory movement of traffic through the project is a high priority and is the responsibility of the Contractor. Use reasonable and appropriate devices and methods to safeguard the persons and property of the traveling public on roads on which construction work is in progress. Failure of the Contractor to notify the Contractor to maintain such devices or use such methods does not relieve the Contractor of responsibility.

Traffic Control must be in place and in acceptable condition as shown in the Contract Documents for work to progress.

While working within the right-of-way limits on KDOT projects, all workers shall wear high visibility garments which comply with ANSI Class II during Daylight Hours and ANSI Class I retroreflective pants with an ANSI Class II vest during all other times.

Obtain the Engineer's approval before erecting, changing or removing traffic control devices, except if an emergency situation requires immediate action. Erect signs and traffic control devices as shown in the Contract Documents or Traffic Control Plan, unless directed otherwise by the Engineer. When directed by the Engineer, move any traffic control device from one location to another and re-erect it. The Engineer may require additional traffic control devices or flaggers at any time, or at any place. When the Contract Documents provide that traffic be closed through construction, posting of traffic on a detour is prohibited without written approval from the Engineer.

At all times during the progress or temporary suspension of work, provide, erect, remove, relocate, clean, replace and maintain acceptable signs, barricades, channelizers or other necessary traffic control devices and pavement marking shown in the Contract Documents. With the Engineer, determine the frequency of inspections based on the needs of every project. Designate an employee who can be contacted 24 hours a day and can be on site within an agreed upon amount of time to repair, replace, remove, relocate, clean and maintain any traffic control device required as directed by the Engineer. Advise the Engineer of the name, address and telephone number of the person given this responsibility. Compliance with minimum inspections and providing a person to be contacted does not relieve the Contractor of the responsibility to inspect and maintain all required traffic control devices.

If traffic control issues come to the attention of the Engineer, the Engineer will notify the Contractor of any required repairs or replacement, which shall be addressed within the time specified in the notification. KDOT Rejected vehicles may be used to identify unacceptable traffic control devices. When the Engineer determines an immediate repair or replacement is required, and the Contractor is unable to make the repair or replacement, the work may be performed by KDOT, and the associated cost deducted from the contract. This is no way relieves the Contractor of responsibility to inspect and maintain traffic control.

Immediately upon discovering or receiving notification of unacceptable traffic control devices, either repair or remove and replace the unacceptable traffic control devices. Record unacceptable traffic control devices and when the condition has been corrected.

Perform all work during Daylight Hours unless otherwise approved.

In order to minimize inconvenience for the traveling public and to increase the effectiveness of signs and traffic control devices, move the devices ahead as the work allows. When no work is in progress, remove from the road or completely cover all devices that are required only when work is actually being performed.

An alternate traffic control plan may be developed. Such plan requires approval from the District Office or the Bureau of Transportation Safety & Technology before installation. Such approval may take up to 30 business days.

Provide access (including the use of temporary surfacing, SECTION 546) for the field access, driveways, business access, and side roads that tie into the work area on roads closed to through traffic. When 2-way access is required, provide sufficient width to maintain 2-way traffic as shown in the Contract Documents or as directed by the Engineer.

Park and store all vehicles, equipment, tools, debris and materials off the right-of-way or 10 feet from the edge of the traveled way, whichever is less. When this cannot be achieved, place appropriate signs, use positive



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Kansas
Department of Transportation

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Temporary Traffic Control Standard Spec - 805

QUIZ:

Whose responsibility is it to ensure that traffic moves safely and satisfactorily through a project?

- A. The Inspector**
- B. The Construction Engineer**
- C. The Secretary of Transportation**
- D. The Contractor**

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Kansas
Department of Transportation

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805.3 CONSTRUCTION REQUIREMENTS

a. General. The safe and satisfactory movement of traffic through the project is a high priority and is the responsibility of the Contractor. Use reasonable and appropriate devices and methods to safeguard the persons and property of the traveling public on roads on which construction work is in progress. Failure of the Engineer to notify the Contractor to maintain such devices or use such methods does not relieve the Contractor of responsibility.

Traffic Control must be in place and in acceptable condition as shown in the Contract Documents for work to progress.

While working within the right-of-way limits on KDOT projects, all workers shall wear high visibility garments which comply with ANSI Class II during Daylight Hours and ANSI Class E retroreflectORIZED pants with an ANSI Class II vest during all other times.

Obtain the Engineer's approval before erecting, changing or removing traffic control devices, except if an emergency situation requires immediate action. Erect signs and traffic control devices as shown in the Contract Documents or Traffic Control Plan, unless directed otherwise by the Engineer. When directed by the Engineer, move any traffic control devices from one location to another and re-erect it. The Engineer may require additional traffic control devices or flaggers at any time, or at any place. When the Contract Documents provide that traffic be carried through construction, routing of traffic on a detour is prohibited without written approval from the Engineer.

At all times during the progress or temporary suspension of work, provide, erect, remove, relocate, clean, replace and maintain acceptable signs, barricades, channelizers or other necessary traffic control devices and pavement marking shown in the Contract Documents. With the Engineer, determine the frequency of inspections based on the needs of every project. Designate an employee who can be contacted 24 hours a day and can be on site within an agreed upon amount of time to repair, replace, remove, relocate, clean and maintain any traffic control device required as directed by the Engineer. Advise the Engineer of the name, address and telephone number of the person given this responsibility. Compliance with minimum inspections and providing a person to be contacted does not relieve the Contractor of the responsibility to inspect and maintain all required traffic control devices.

If traffic control issues come to the attention of the Engineer, the Engineer will notify the Contractor of any required repairs or replacements, which shall be addressed within the time specified in the notification. KDOT Rejected stickers may be used to identify unacceptable traffic control devices. When the Engineer determines an immediate repair or replacement is required, and the Contractor is unable to make the repair or replacement, the

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Temporary Traffic Control Standard Spec - 805

QUIZ:

Whose responsibility is it to ensure that traffic moves safely and satisfactorily through a project?

- A. The Inspector**
- B. The Construction Engineer**
- C. The Secretary of Transportation**
- D. The Contractor**

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805.3 CONSTRUCTION REQUIREMENTS

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Traffic Control must be in place and in acceptable condition as shown in the Contract Documents for work to progress.

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Immediately upon discovering or receiving notification of unacceptable traffic control devices, either repair

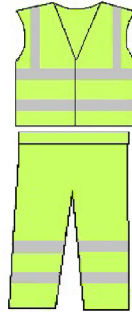
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vests



MORE!

Class 1 Garments	Class 2 Garments
 Work permits undivided attention to traffic and there is ample separation between worker and motor vehicles. Background is not complex and vehicle/equipment speeds do not exceed 25 mph. (Examples: parking attendants, warehouse workers, workers on sidewalks) Note: ANSI/ISEA 107 Class 1 garments do not provide compliance with 2009 MUTCD highway worker regulations.	 For work in inclement weather and/or areas with complex backgrounds. Worker's attention may be diverted from approaching traffic or worker is in closer proximity to traffic. Vehicles and equipment travel at speeds greater than those specified for Class 1. (Examples: roadway construction workers, utility workers, survey crews.) <i>These are guidelines for assessing conditions; other variables may apply.</i>
Class 3 Garments	Class E Garments
 For workers exposed to high speed traffic and/or conditions where visibility of workers may be reduced. For conditions where equipment operators perform tasks near pedestrian workers. Worker must be conspicuous through a full range of body motions at a minimum of 1,280 feet and identifiable as a person. (Examples: flaggers, roadway construction workers, utility workers, survey crews, emergency responders).	 The combination of a Class 2 (or 3) vest with Class E pants or shorts creates a Performance Class 3 ensemble. A possible use for this ensemble would be wearing a Class II vest during daylight hours, and adding the pants during night operations to create a Class III garment.

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ANSI/ISEA 107-2004
100% Polyester
3M Scotchlite™ Reflective Material
Model# OSS 39
Size L / X-LARGE

Class 2
Level 2

Washing Instructions

Wash warm-max 25xs
Do Not Bleach
Tumble-dry Low
Do not iron
Do not dry-clean

Vests 2



responsibility of the Contractor. Use reasonable and appropriate devices and methods to safeguard the persons and property of the traveling public on roads on which construction work is in progress. Failure of the Engineer to notify the Contractor to maintain such devices or use such methods does not relieve the Contractor of responsibility.

Traffic Control must be in place and in acceptable condition as shown in the Contract Documents for work to progress.

While working within the right-of-way limits on KDOT projects, all workers shall wear high visibility garments which comply with ANSI Class II during Daylight Hours and ANSI Class E retroreflectORIZED pants with an ANSI Class II vest during all other times.

Obtain the Engineer's approval before erecting, changing or removing traffic control devices, except if an emergency situation requires immediate action. Erect signs and traffic control devices as shown in the Contract Documents or Traffic Control Plan, unless directed otherwise by the Engineer. When directed by the Engineer, move any traffic control devices from one location to another and re-erect it. The Engineer may require additional traffic control devices or flaggers at any time, or at any place. When the Contract Documents provide that traffic be carried through construction, routing of traffic on a detour is prohibited without written approval from the Engineer.

At all times during the progress or temporary suspension of work, provide, erect, remove, relocate, clean, replace and maintain acceptable signs, barricades, channelizers or other necessary traffic control devices and pavement marking shown in the Contract Documents. With the Engineer, determine the frequency of inspections based on the needs of every project. Designate an employee who can be contacted 24 hours a day and can be on site within an agreed upon amount of time to repair, replace, remove, relocate, clean and maintain any traffic control device required as directed by the Engineer. Advise the Engineer of the name, address and telephone number of the person given this responsibility. Compliance with minimum inspections and providing a person to be contacted does not relieve the Contractor of the responsibility to inspect and maintain all required traffic control devices.

If traffic control issues come to the attention of the Engineer, the Engineer will notify the Contractor of any required repairs or replacements, which shall be addressed within the time specified in the notification. KDOT Rejected stickers may be used to identify unacceptable traffic control devices. When the Engineer determines an immediate repair or replacement is required, and the Contractor is unable to make the repair or replacement, the work may be performed by KDOT, and the associated cost deducted from the contract. This in no way relieves the Contractor of responsibility to inspect and maintain traffic control.

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PRECON = **PRE**construction **CONF**erence

PRECON MEETING = **PRE**construction **CONF**erence MEETING...

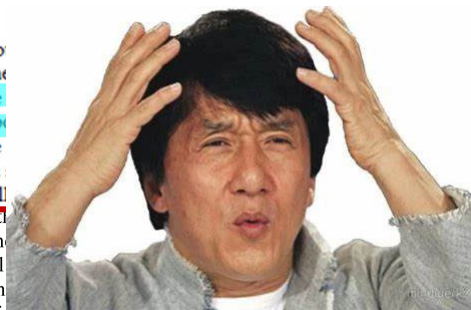
replace and maintain acceptable signs, barricades, channelizers or pavement marking shown in the Contract Documents. With the Engineer based on the needs of every project. Designate an employee who can be within an agreed upon amount of time to repair, replace, remove, relocate device required as directed by the Engineer. Advise the Engineer of the person given this responsibility. Compliance with minimum inspections not relieve the Contractor of the responsibility to inspect and maintain all

If traffic control issues come to the attention of the Engineer, the required repairs or replacements, which shall be addressed within the Rejected stickers may be used to identify unacceptable traffic control immediate repair or replacement is required, and the Contractor is unable work may be performed by KDOT, and the associated cost deducted from the contract. This in no way relieves the Contractor of responsibility to inspect and maintain traffic control.

Immediately upon discovering or receiving notification of unacceptable traffic control devices, either repair or remove and replace the unacceptable traffic control devices. Record unacceptable traffic control devices and when the condition has been corrected.

Perform all work during Daylight Hours unless otherwise approved.

In order to minimize inconvenience for the traveling public and to increase the effectiveness of signs and traffic control devices, move the devices ahead as the work allows. When no work is in progress, remove from the road or completely cover all devices that are required only when work is actually being performed.



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move any traffic control devices from one location to another and to erect in the Engineer may require additional traffic control devices or flaggers at any time, or at any place. When the Contract Documents provide that traffic be carried through construction, routing of traffic on a detour is prohibited without written approval from the Engineer.

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An alternate traffic control plan may be developed. Such plan requires approval from the District Office or the Bureau of Transportation Safety & Technology before installation. Such approval may take up to 10 business days.

Provide access (including the use of temporary surfacing, SECTION 840) for field accesses, driveways, business accesses, and side roads that tie into the work area on roads closed to through traffic. When 2-way access is required, provide sufficient width to maintain 2-way traffic as shown in the Contract Documents or as directed by the Engineer.

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Provide access (including the use of temporary surfacing, SECTION 840) for field accesses, driveways, business accesses, and side roads that tie into the work area on roads closed to through traffic. When 2-way access is required, provide sufficient width to maintain 2-way traffic as shown in the Contract Documents or as directed by the Engineer.

Park and store all vehicles, equipment, tools, debris and materials off the right-of-way or 50 feet from the edge of the travelled way, whichever is less. When this cannot be achieved, place appropriate signs, use positive

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If traffic control issues come to the attention of the Engineer, the Engineer will notify the Contractor of any required repairs or replacements, which shall be addressed within the time specified in the notification. KDOT Rejected stickers may be used to identify unacceptable traffic control devices. When the Engineer determines an immediate repair or replacement is required, and the Contractor is unable to make the repair or replacement, the work may be performed by KDOT, and the associated cost deducted from the contract. This in no way relieves the Contractor of responsibility to inspect and maintain traffic control.

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Park and store all vehicles, equipment, tools, debris and materials off the right-of-way or 30 feet from the edge of the travelled way, whichever is less. When this cannot be achieved, place appropriate signs, use positive protection or delineate with channelizers, as designated by the Engineer. Temporary traffic control devices required for this condition will be considered subsidiary to other bid items.

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805 - WORK ZONE TRAFFIC CONTROL & SAFETY

MASH testing requirements. Devices that were accepted under the NCHRP 350 testing requirements prior to the adoption of MASH criteria may remain in place and continue to be used. Provide the following to the Engineer for a case by case approval of traffic control devices not addressed in the Contract Documents:

- (1) A copy of the manufacturer's self certification stating that the Category 1 devices to be used on the project are crashworthy.
- (2) A copy of the entire FHWA acceptance letter for the Category 2 devices to be used on the project.
- (3) A copy of the entire FHWA acceptance letter for the Category 3 truck mounted attenuators (TMAs) to be used on the project and certification stating that the Category 3 items to be used on the project meet crashworthy specifications, as defined above.

b. Work Zone Signs. The size and layout of the sign message shall comply with the Contract Documents and the "Standard Highway Signs and Markings", latest edition. Use fluorescent orange Type IV or better sheeting for all work zone orange signs. Use standard colors in Type III sheeting or better for all other work zone signs. Opaque, fluorescent orange Type IV or better, roll up signs may be used in approved situations. Do not use mesh signs.

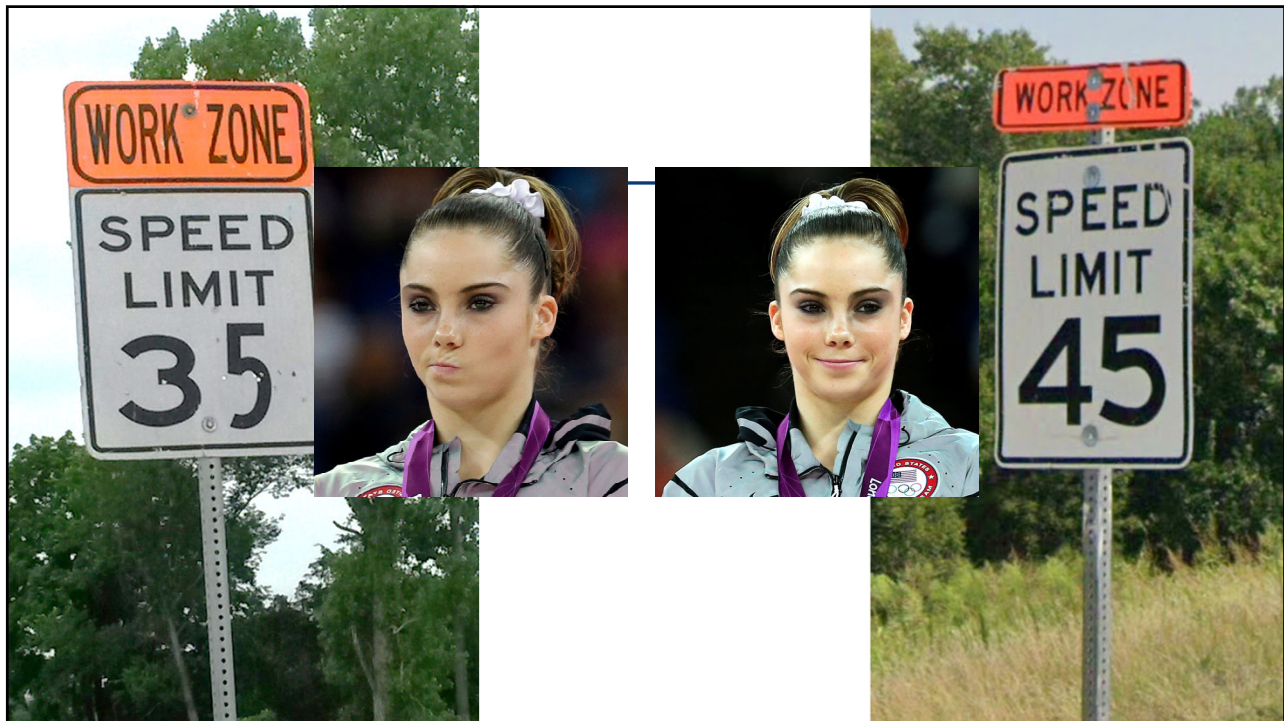
c. Work Zone Barricades. Size and design of all work zone barricades, including those used for pedestrian closures, shall comply with the Contract Documents. Provide Type 3 barricades with ASTM Type III orange and white retroreflective sheeting, as shown in the Contract Documents. Provide pedestrian barricades with orange and white high contrast sheeting as shown in the Contract Documents.

d. Flashing or Sequencing Arrow/Warning Display Signs. When specified, provide, install and maintain a flashing or sequencing arrow/warning display sign that complies with the Contract Documents and the MUTCD.

Provide a display that is capable of being legible for a minimum of ½ mile. Displays shall have an automatic control for lamp intensity, backed up by a manual switch and be capable of dimming 50% from the rated lamp voltage for nighttime operation. The display shall be capable of flashing lamps at a rate between 25 and 40 flashes per minute.

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The Engineer will establish all work zone speed limits, except for pilot car operations. Only use the Reduced Speed Ahead (W3-5) sign if the Engineer determines that a reduced speed is required on the project. Install Work Zone plaques (KM4-20) above all existing and temporary Speed Limit (R2-1) signs located between the Road

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Part 805 – General, Vests, Signs

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Part 805 – Posts, Barricades



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for this condition will be considered subsidiary to other bid items.

b. Work Zone Signs. Work Zone Signs (Special) are signs whose legends are specific to the project for which they are fabricated, and if used, will be designated in the Contract Documents. Do not place signs that restrict pedestrian and bicycle traffic on sidewalks or other areas designated for pedestrian or bicycle use. Signs that are anticipated to remain in place for 3 days or less are considered "portable". Mount portable signs on an approved support at least 12 inches above the edge of the traveled way. When directed by the Engineer, mount portable signs on an approved support at least 5 feet above the traveled way for increased visibility. Do not use the legend "Travel at Your Own Risk" on any sign.

When an existing Stop condition changes to a new location, or when a new Stop condition is created, attach 2 fluorescent-red flags and a Type "B" red high intensity warning light to the Stop sign posts. Leave flags and lights in place for at least 30 days after installation. Install or relocate the symbolic Stop Ahead sign (W3-1) an "A" distance in advance of the Stop sign if the Stop sign is not visible for a minimum "A" distance. See standard drawings to determine "A".

Remove, store and reset existing signs that interfere with the work, but are intended to remain in place after the project is complete. This work will be considered subsidiary to other bid items. Remove, turn away from all traffic or cover traffic signs or signals that conflict with or are not applicable to the traffic operations.

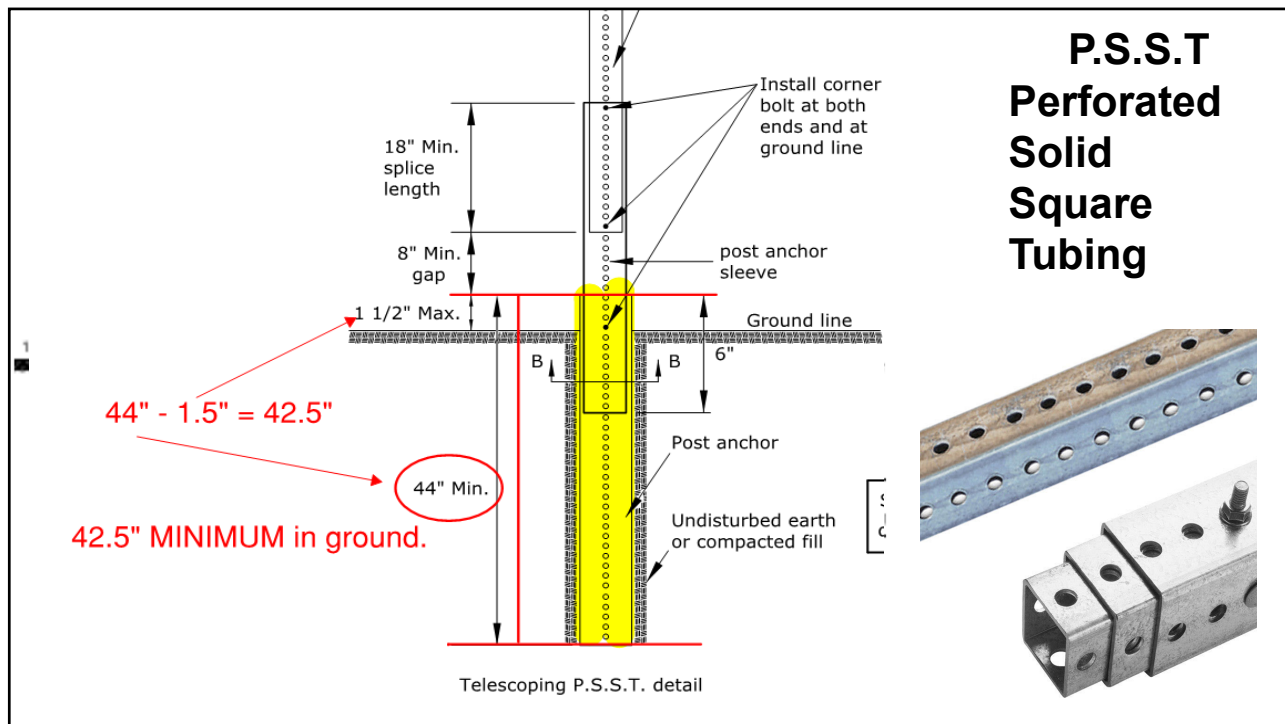
When existing signs need to be covered, use an opaque, breathable material. Do not use plastic bags, burlap or similar materials. Hanging or bolting rigid material to the sign is acceptable when approved by the Engineer and spacers are used to minimize contact between the rigid material and the sign face. Rigid components of the cover, such as a handle for lifting, shall not hang below the minimum sign height. Do not place tape directly to the face of any existing sign.

Install sign posts as shown in the Contract Documents. Mount signs that are anticipated to remain in place for more than 3 days on approved posts. Posts should extend to the top edge of the sign, but no more than 6 inches above the sign. In the case of hitting rock, or otherwise not being able to drive posts to comply with Contract Documents, shift sign location without violating minimum sign spacing or use a crashworthy sign stand, with the Engineer's approval.

The Engineer will establish all work zone speed limits, except for pilot car operations. Only use the Reduced Speed Ahead (W3-5) sign if the Engineer determines that a reduced speed is required on the project. Install Work Zone plaques (KM4-20) above all existing and temporary Speed Limit (R2-1) signs located between the Road

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16 Where two work zones are less than a mile apart in rural areas, or less than ¼ mile apart in urban areas, designate the End Road Work (KG20-2) for the first work zone and the Road Work Ahead (W20-1) for the second

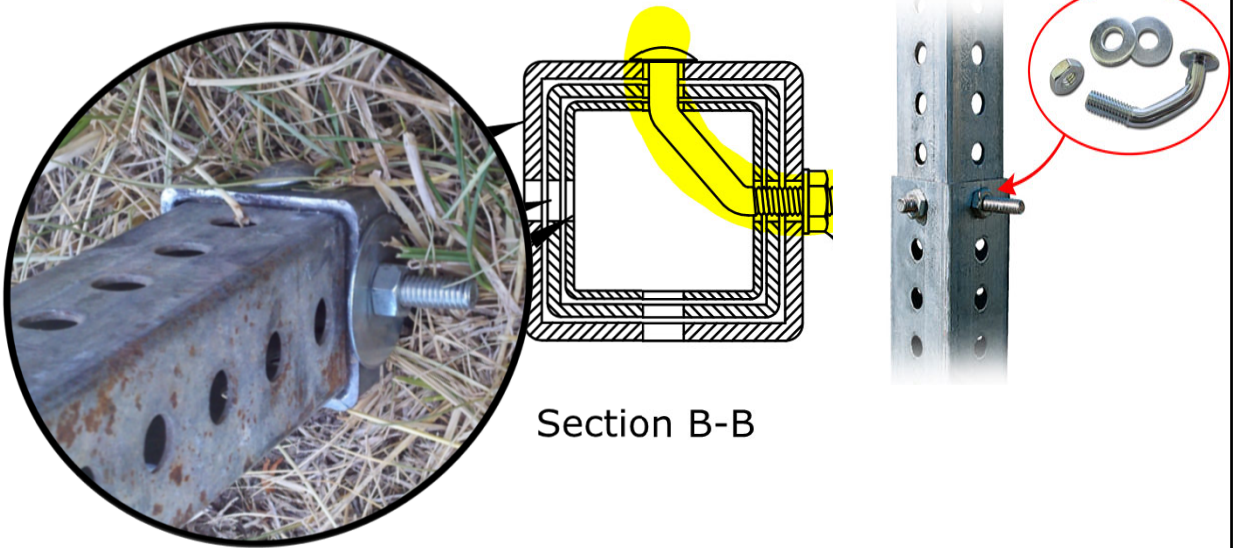


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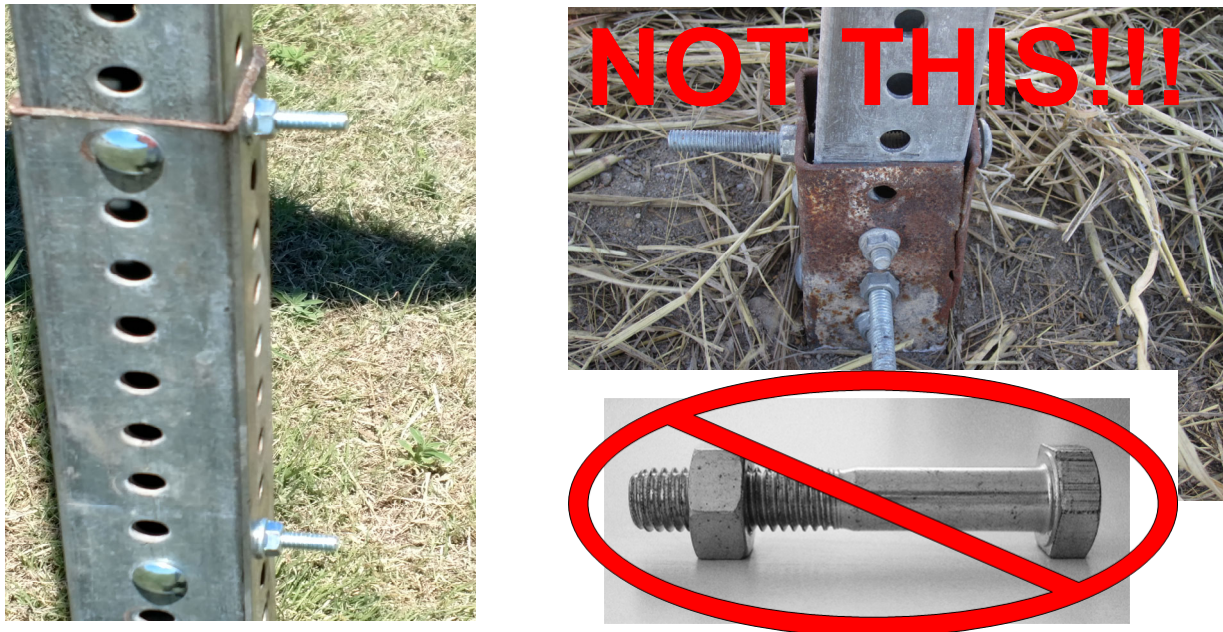
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TE 721 – TELES PAR - 1



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TE 721 – TELES PAR - 2



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DEFINITELY NOT THIS!!!



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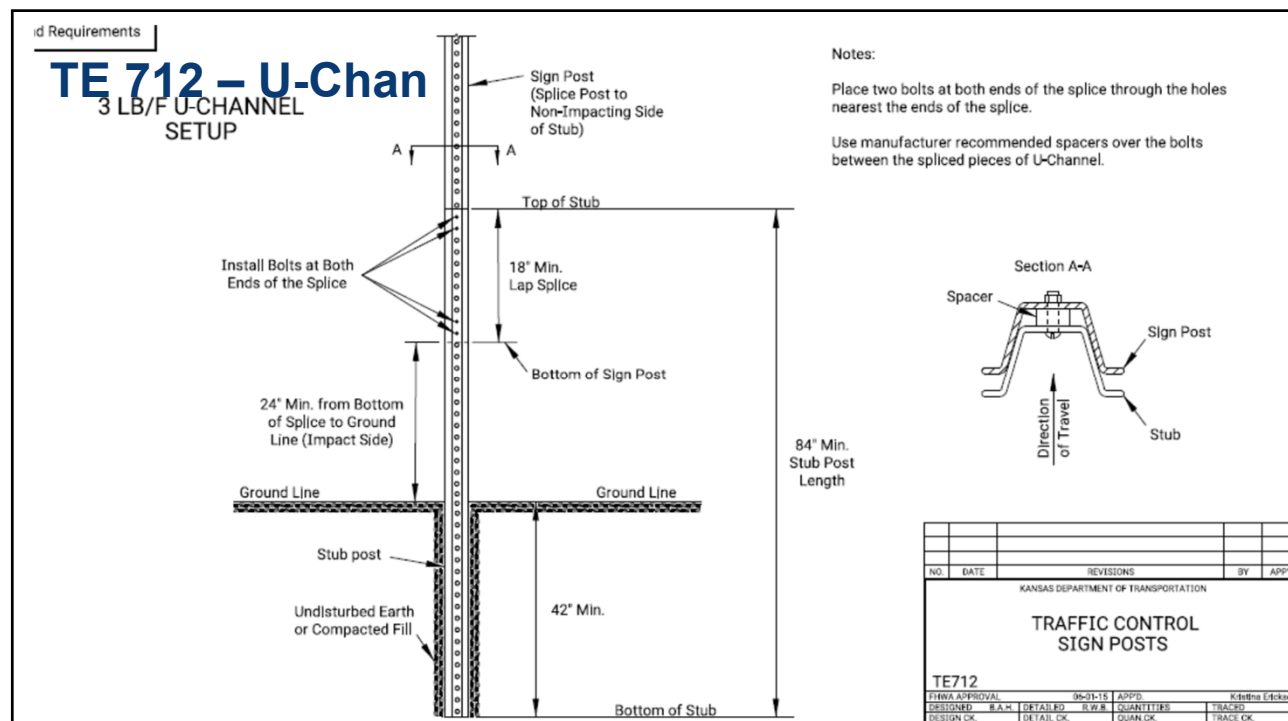
Portable Sign Stand



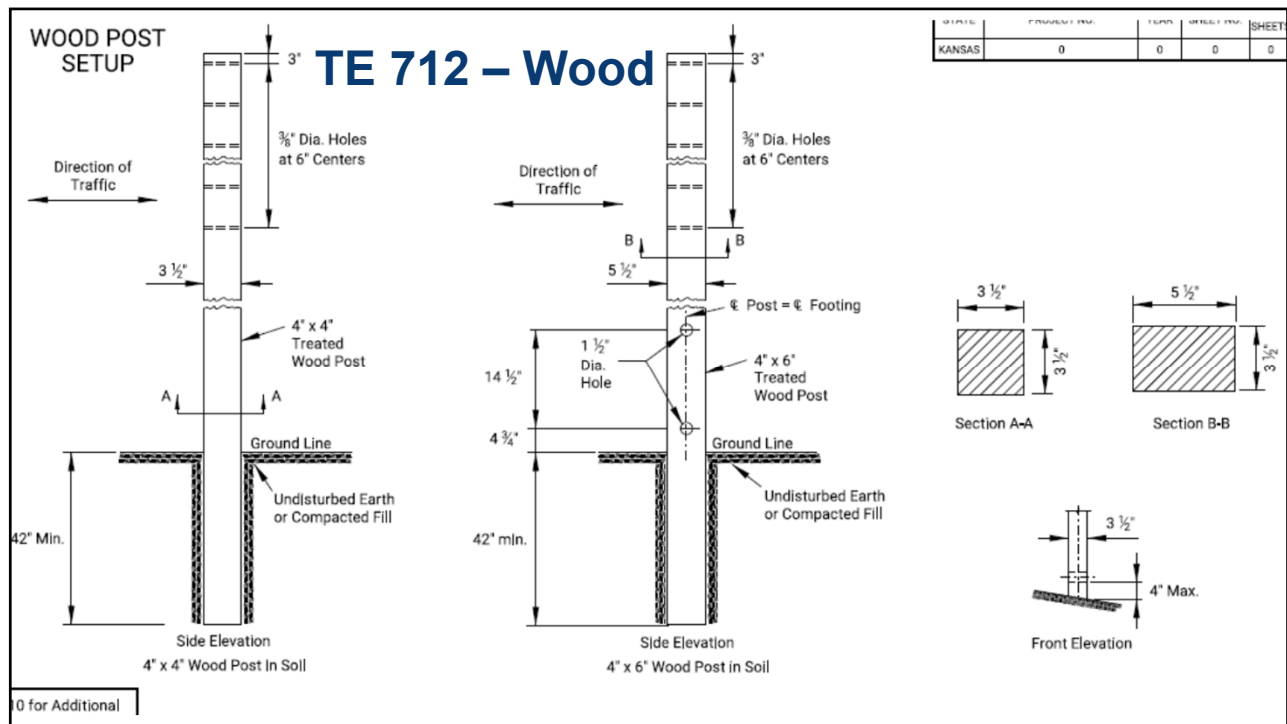
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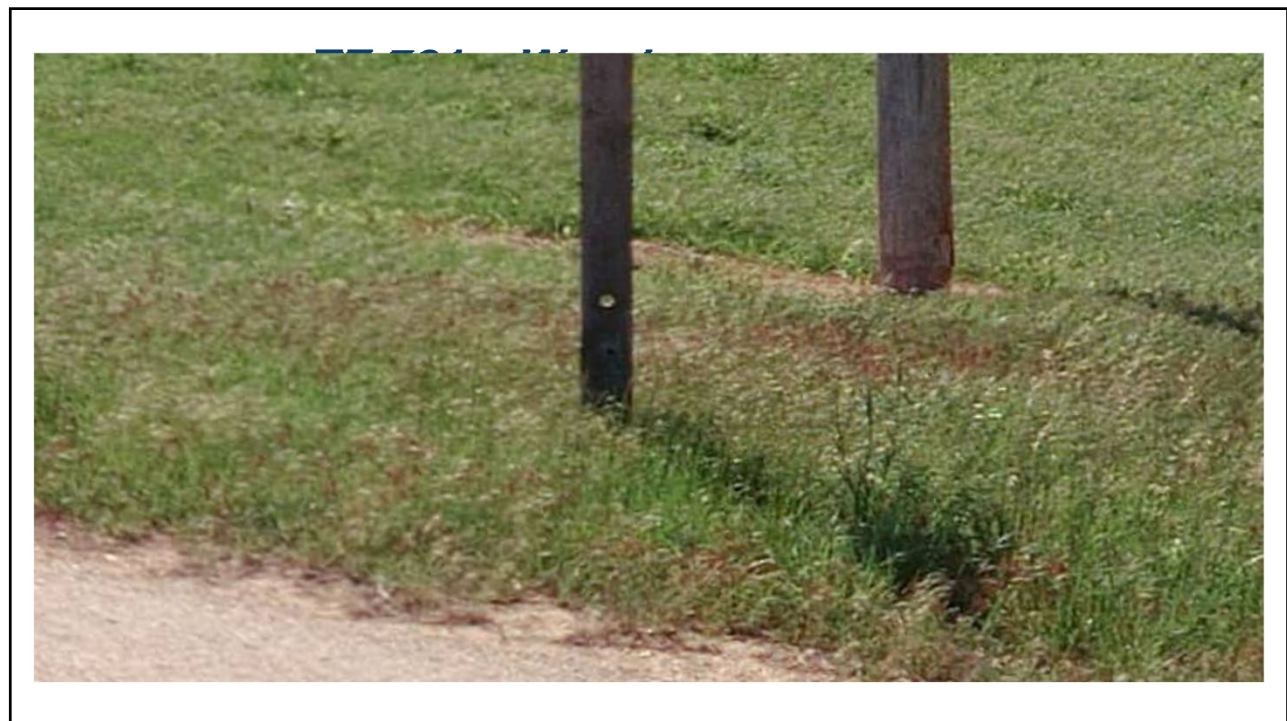
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case by case approval of traffic control devices not addressed in the Contract Documents:

(1) A copy of the manufacturer's self certification stating that the Category 1 devices to be used on the project are crashworthy.

(2) A copy of the entire FHWA acceptance letter for the Category 2 devices to be used on the project.

(3) A copy of the entire FHWA acceptance letter for the Category 3 truck mounted attenuators (TMAs) to be used on the project and certification stating that the Category 3 items to be used on the project meet crashworthy specifications, as defined above.

b. Work Zone Signs. The size and layout of the sign message shall comply with the Contract Documents and the "Standard Highway Signs and Markings", latest edition. Use fluorescent orange Type IV or better sheeting for all work zone orange signs. Use standard colors in Type III sheeting or better for all other work zone signs. Opaque, fluorescent orange Type IV or better, roll up signs may be used in approved situations. Do not use mesh signs.

c. Work Zone Barricades. Size and design of all work zone barricades, including those used for pedestrian closures, shall comply with the Contract Documents. Provide Type 3 barricades with ASTM Type III orange and white retroreflective sheeting, as shown in the Contract Documents. Provide pedestrian barricades with orange and white high contrast sheeting as shown in the Contract Documents.

d. Flashing or Sequencing Arrow/Warning Display Signs. When specified, provide, install and maintain a flashing or sequencing arrow/warning display sign that complies with the Contract Documents and the MUTCD.

Provide a display that is capable of being legible for a minimum of ½ mile. Displays shall have an automatic control for lamp intensity, backed up by a manual switch and be capable of dimming 50% from the rated lamp voltage for nighttime operation. The display shall be capable of flashing lamps at a rate between 25 and 40 flashes per minute.

The minimum lamp "on time" shall be 50% for the flashing arrow and 25% for the sequential chevron. Display lamps or lenses shall be recessed or alternately equipped with a minimum 180° upper hood. The color of light emitted shall be yellow or orange.

The following are allowable displays:

800-14

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BARRICADES – 3 TYPES

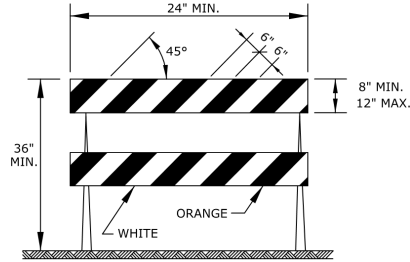


TYPE 1

Temp closures – City

54

BARRICADES – 3 TYPES ²



TYPE 2 BARRICADE

For rails less than 36" long, 4" wide stripes may be used.
All stripes shall slope downward to the traffic side for channelization.

TYPE 2

- Pedestrian + some highway applications

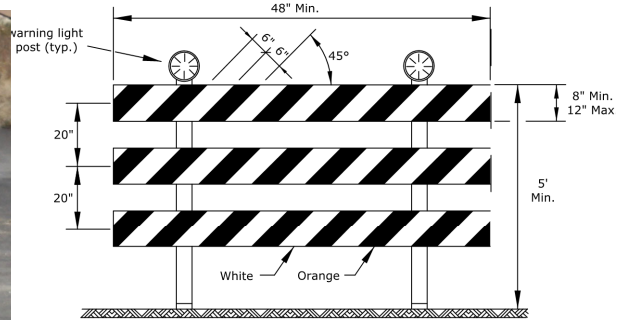
55

PEDESTRIAN BARRICADES



56

TYPE 3



TYPE 3 BARRICADE WITH LIGHTS

Approved signs mounted on Type 3 barricades should not cover more than 50% of the top two rails or 33% of the total area of the three rails.

When barricades are placed end-to-end or staggered, a Type "A" low intensity warning light shall be mounted to the vertical post near each outside corner of the end barricades.

57

Reduced Speed Ahead (W3-5) sign if the Engineer determines that a reduced speed is required on the project. Install Work Zone plaques (KM4-20) above all existing and temporary Speed Limit (R2-1) signs located between the Road Work Ahead (W20-1) and the End Road Work (KG20-2). Do not allow the plaque to overlap any portion of the Speed Limit sign.

Where two work zones are less than a mile apart in rural areas, or less than ¼ mile apart in urban areas, eliminate the End Road Work (KG20-2) for the first work zone and the Road Work Ahead (W20-1) for the second work zone.

c. Work Zone Barricades. To fully close a road, place Type 3 barricades end-to-end from pavement edge to pavement edge with striping sloped downward toward the center of the road. When Contractor access is required, stagger barricades longitudinally far enough apart that the intended vehicles can safely weave through while still maintaining the appearance of a full closure from the approach. Realign barricades end-to-end to fully close the road when construction activity has ceased for the day. When barricades are placed end-to-end or staggered, mount a Type "A" light to the top of the outside vertical post of each of the end barricades using crashworthy hardware.

Place winged Type 3 barricades in a level position off the pavement or on the shoulders when shown in the Contract Documents. Mount a Type "A" light to the top of each outside vertical post of each winged barricade using crashworthy hardware.

To fully close a sidewalk or other pedestrian pathway, place pedestrian barricades or pedestrian channelizers on the pathway from edge to edge.

d. Flashing or Sequencing Arrow/Warning Display Signs. Where specified, provide, install and maintain a lighted sign capable of displaying flashing or sequential arrows/warnings as shown in the Contract Documents. Mount on a portable chassis and operate continuously when required to divert or warn traffic. Adjust the lamp intensity for the display to prevent a blinding effect and to compensate for daytime and nighttime light conditions.

Use the arrow panel in Caution Mode or Alternating Diamonds Mode only for shoulder work, roadside work near the shoulder, blocking the shoulder or for temporary closure of 1-lane on a 2-lane 2-way roadway.

800-16 5

800-16

58

TYPE 3₄



59



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61

Reduced Speed Ahead (W3-5) sign if the Engineer determines that a reduced speed is required on the project. Install Work Zone plaques (KM4-20) above all existing and temporary Speed Limit (R2-1) signs located between the Road Work Ahead (W20-1) and the End Road Work (KG20-2). Do not allow the plaque to overlap any portion of the Speed Limit sign.

Where two work zones are less than a mile apart in rural areas, or less than ¼ mile apart in urban areas, eliminate the End Road Work (KG20-2) for the first work zone and the Road Work Ahead (W20-1) for the second work zone.

c. Work Zone Barricades. To fully close a road, place Type 3 barricades end-to-end from pavement edge to pavement edge with striping sloped downward toward the center of the road. When Contractor access is required, stagger barricades longitudinally far enough apart that the intended vehicles can safely weave through while still maintaining the appearance of a full closure from the approach. Realign barricades end-to-end to fully close the road when construction activity has ceased for the day. When barricades are placed end-to-end or staggered, mount a Type "A" light to the top of the outside vertical post of each of the end barricades using crashworthy hardware.

Place winged Type 3 barricades in a level position off the pavement or on the shoulders when shown in the Contract Documents. Mount a Type "A" light to the top of each outside vertical post of each winged barricade using crashworthy hardware.

To fully close a sidewalk or other pedestrian pathway, place pedestrian barricades or pedestrian channelizers on the pathway from edge to edge.

d. Flashing or Sequencing Arrow/Warning Display Signs. Where specified, provide, install and maintain a lighted sign capable of displaying flashing or sequential arrows/warnings as shown in the Contract Documents. Mount on a portable chassis and operate continuously when required to divert or warn traffic. Adjust the lamp intensity for the display to prevent a blinding effect and to compensate for daytime and nighttime light conditions.

Use the arrow panel in Caution Mode or Alternating Diamonds Mode only for shoulder work, roadside work near the shoulder, blocking the shoulder or for temporary closure of 1-lane on a 2-lane 2-way roadway.

800-16 7

800-16

62



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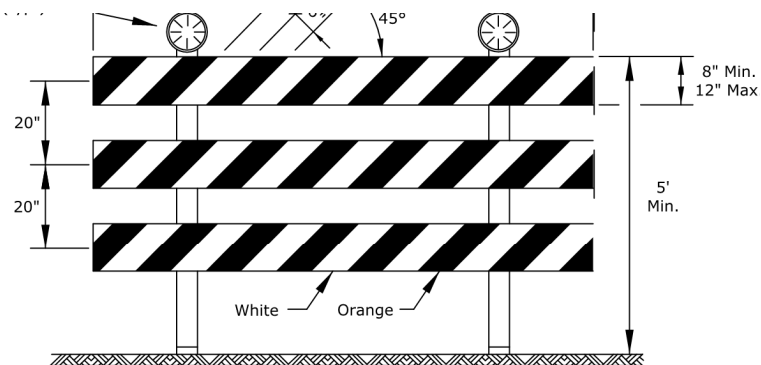
64

Barricades 4



65

TYPE 3



TYPE 3 BARRICADE WITH LIGHTS

Approved signs mounted on Type 3 barricades should not cover more than 50% of the top two rails or 33% of the total area of the three rails.

When barricades are placed end-to-end or staggered, a Type "A" low intensity warning light shall be mounted to the vertical post near each outside corner of the end barricades.

66



Barricades 5

67



Barricades 6

68

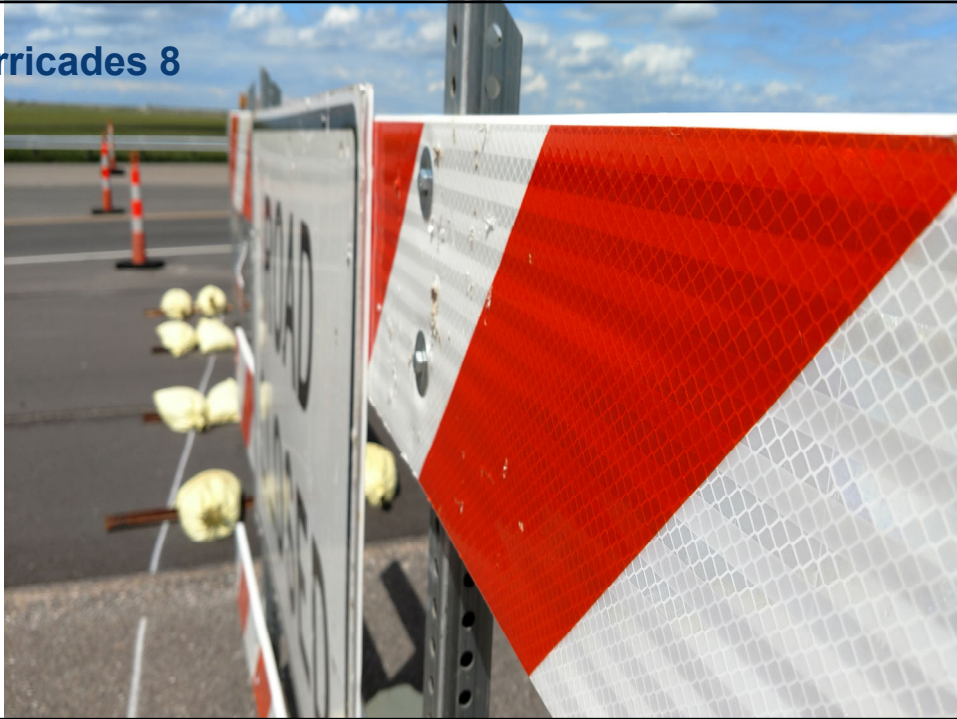


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Barricades 8



71

Barricades 9



72



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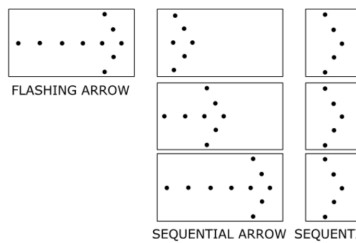


76

Part 805 – Arrow and Message Boards

77

c. Work Zone Barricades. Size and design of all work zone barricades, including those used for pedestrian closures, shall comply with the Contract Documents. Provide Type 3 barricades with ASTM Type III orange and white reflective sheeting. Provide pedestrian barricades with orange and white reflective sheeting.



Signs. When specified, provide, install and maintain signs with the Contract Documents and the MUTCD. Signs shall be in place for a minimum of ½ mile. Displays shall have an on/off switch and be capable of dimming 50% from the rated power of flashing lamps at a rate between 25 and 40

flashing arrow and 25% for the sequential chevron.



800-14.

78

Reduced Speed Ahead (W3-5) sign if the Engineer determines that a reduced speed is required on the project. Install Work Zone plaques (KM4-20) above all existing and temporary Speed Limit (R2-1) signs located between the Road Work Ahead (W20-1) and the End Road Work (KG20-2). Do not allow the plaque to overlap any portion of the Speed Limit sign.

Where two work zones are less than a mile apart in rural areas, or less than ¼ mile apart in urban areas, eliminate the End Road Work (KG20-2) for the first work zone and the Road Work Ahead (W20-1) for the second work zone.

c. Work Zone Barricades. To fully close a road, place Type 3 barricades end-to-end from pavement edge to pavement edge with striping sloped downward toward the center of the road. When Contractor access is required, stagger barricades longitudinally far enough apart that the intended vehicles can safely weave through while still maintaining the appearance of a full closure from the approach. Realign barricades end-to-end to fully close the road when construction activity has ceased for the day. When barricades are placed end-to-end or staggered, mount a Type "A" light to the top of the outside vertical post of each of the end barricades using crashworthy hardware.

Place winged Type 3 barricades in a level position off the pavement or on the shoulders when shown in the Contract Documents. Mount a Type "A" light to the top of each outside vertical post of each winged barricade using crashworthy hardware.

To fully close a sidewalk or other pedestrian pathway, place pedestrian barricades or pedestrian channelizers on the pathway from edge to edge.

d. Flashing or Sequencing Arrow/Warning Display Signs. Where specified, provide, install and maintain a lighted sign capable of displaying flashing or sequential arrows/warnings as shown in the Contract Documents. Mount on a portable chassis and operate continuously when required to divert or warn traffic. Adjust the lamp intensity for the display to prevent a blinding effect and to compensate for daytime and nighttime light conditions.

Use the arrow panel in Caution Mode or Alternating Diamonds Mode only for shoulder work, roadside work near the shoulder, blocking the shoulder or for temporary closure of 1-lane on a 2-lane 2-way roadway.

800-16

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800.16

79

805 - WORK ZONE TRAFFIC CONTROL & SAFETY

e. Portable Changeable Message Sign (PCMS). Where specified, provide, install and maintain a PCMS as shown in the Contract Documents. Mount on a portable chassis and operate continuously when required. Adjust the lamp intensity for the display to prevent a blinding effect and to compensate for daytime and nighttime light conditions. When feasible, place the PCMS behind guardrail or barrier, or delineate with channelizers. Messages must be approved by the Engineer prior to use.

f. Channelizers. Install the individual devices used for the channelization of traffic through the work area, as shown in the Contract Documents.

Channelizers (Fixed) are devices that are physically adhered to the road surface with an adhesive or mounting hardware, or are embedded into the ground.

Channelizer (Portable) devices are those that are self-standing and are held in place with deformable ballast material that is either integral with the device or is applied on or around the base of the device. When the Contract Documents specify Channelizer (Fixed), only fixed channelizers may be used. When the plans specify Channelizer (Portable), the Contractor has the option to use either fixed or portable devices, as approved by the Engineer.

Keep the devices clean and bright for maximum target value.

Traffic cones may be used as channelizing devices for daytime operations only.

Place channelizers according to the following:

(1) Tapers. Space devices in merging and shifting tapers so they do not exceed a distance in feet equal to ½ the posted speed limit (mph) prior to work starting.

(2) Advanced Warning Area and Activity Area. Space devices in the advanced warning area and the activity area so they do not exceed a distance in feet equal to 2 times the posted speed limit (mph) prior to work starting. Spacing should be reduced in some situations, such as to delineate access points or to maintain positive guidance when traffic regularly moves slowly in the work zone.

800-17

(3) Visibility. Place channelizing devices for optimum visibility, normally at right angles to the traffic flow.

(4) Diagonal Striping. Alternating diagonal orange and white striping must slope downward in the direction

80



81

Part 805 – Channelizers, AFADs, Warning Lights

82

must be approved by the Engineer prior to use.

f. Channelizers. Install the individual devices used for the channelization of traffic through the work area, as shown in the Contract Documents.

Channelizers (Fixed) are devices that are physically adhered to the road surface with an adhesive or mounting hardware, or are embedded into the ground.

Channelizer (Portable) devices are those that are self-standing and are held in place with deformable ballast material that is either integral with the device or is applied on or around the base of the device. When the Contract Documents specify Channelizer (Fixed), only fixed channelizers may be used. When the plans specify Channelizer (Portable), the Contractor has the option to use either fixed or portable devices, as approved by the Engineer.

Keep the devices clean and bright for maximum target value.

Traffic cones may be used as channelizing devices for daytime operations only.

Place channelizers according to the following:

(1) Tapers. Space devices in merging and shifting tapers so they do not exceed a distance in feet equal to $\frac{1}{2}$ the posted speed limit (mph) prior to work starting.

(2) Advanced Warning Area and Activity Area. Space devices in the advanced warning area and the activity area so they do not exceed a distance in feet equal to 2 times the posted speed limit (mph) prior to work starting. Spacing should be reduced in some situations, such as to delineate access points or to maintain positive guidance when traffic regularly moves slowly in the work zone.

(3) Visibility. Place channelizing devices for optimum visibility, normally at right angles to the traffic flow.

(4) Diagonal Striping. Alternating diagonal orange and white striping must slope downward in the direction that traffic is expected to pass.

(5) Directional Barricades. Place direction indicator barricades in series to direct traffic onto the new path.

(6) Pedestrian Channelizers. Place pedestrian channelizers, as shown in the Contract Documents, along entire intended route, and end to end so that there are no gaps in the detectable edging or in the hand trailing surfaces.

800-17

g. Automated Flagger Assistance Devices (AFADs). The Contractor may choose to use a trained flagger operating an AFAD in lieu of a flagger at any time. Such use of AFADs will be subsidiary to other contract items.

83

DRUM
For rolls less than 36" long, 4" wide stripes may be used. All stripes shall slope downward to the traffic side for channelization.

CONICAL DELINEATOR

TUBULAR MARKER
Striping as shown for up to 42".

TRAFFIC CONE

E2 BARRICADE
For rolls less than 36" long, 4" wide stripes may be used. All stripes shall slope downward to the traffic side for channelization.

VERTICAL PANEL
The stripes shall slope downward to the traffic side for channelization.

DIRECTION INDICATOR BARRICADE
The stripes shall slope downward in the direction traffic is to pass. The direction indicator (arrows) shall be used in series to direct the motorist into the intended lane of travel.

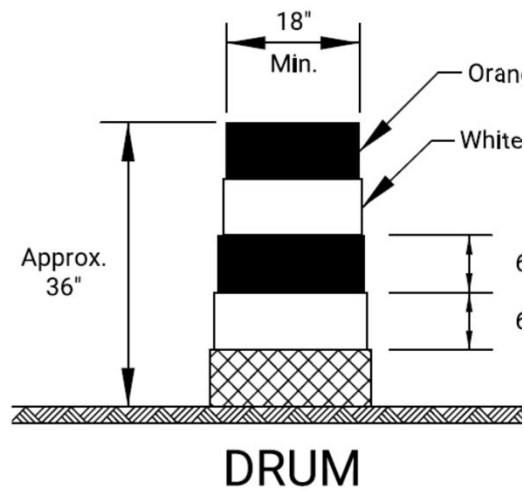
PEDESTRIAN CHANNELIZER
1. Support (skirt) shall not project beyond the detection plate into the pathway.
2. Hand trailing edges and detection plates are optional for continuous walls.
3. Interconnect pedestrian channelizers to prevent displacement and to provide continuous guidance through or around work.
4. Alternate pathways shall be firm, stable, and slip resistant.
5. Treat top of alternate path with a firm, stable, and slip resistant temporary ramp having a slope of 12:1 or flatter and having a width equal to the alternate path.
6. Use alternating orange/white on interconnected devices.

Item	Location	Channelization	Activity Area	Temporary	Daytime	Night	Weather	Other
Drum	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes
Conical Delineator	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes
Vertical Panel	(2)	(2)	(2)	(2)	(2)	(1, 2)	Yes	(2)
Direction Indicator Barricade	No	No	No	Yes	No	No	No	No
Type 2 Barricade	(2)	(2)	(2)	(2)	No	No	Yes	No
Traffic Cone	No	No	(4)	(4)	(4)	No	(4)	(4)
Tubular Marker	(3)	(3)	(3)	No	(3)	Yes	No	Yes
Vertical Panel	(3)	(3)	(3)	(3)	(3)	Yes	(3, 4)	(2)

TE 702

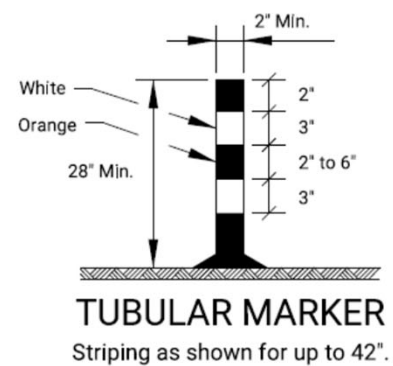
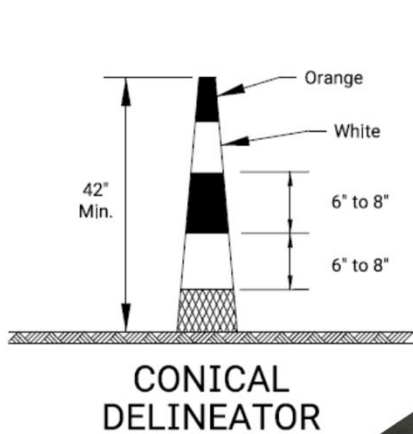
TRAFFIC CONTROL CHANNELIZING DEVICES

84



TE 702 (2)

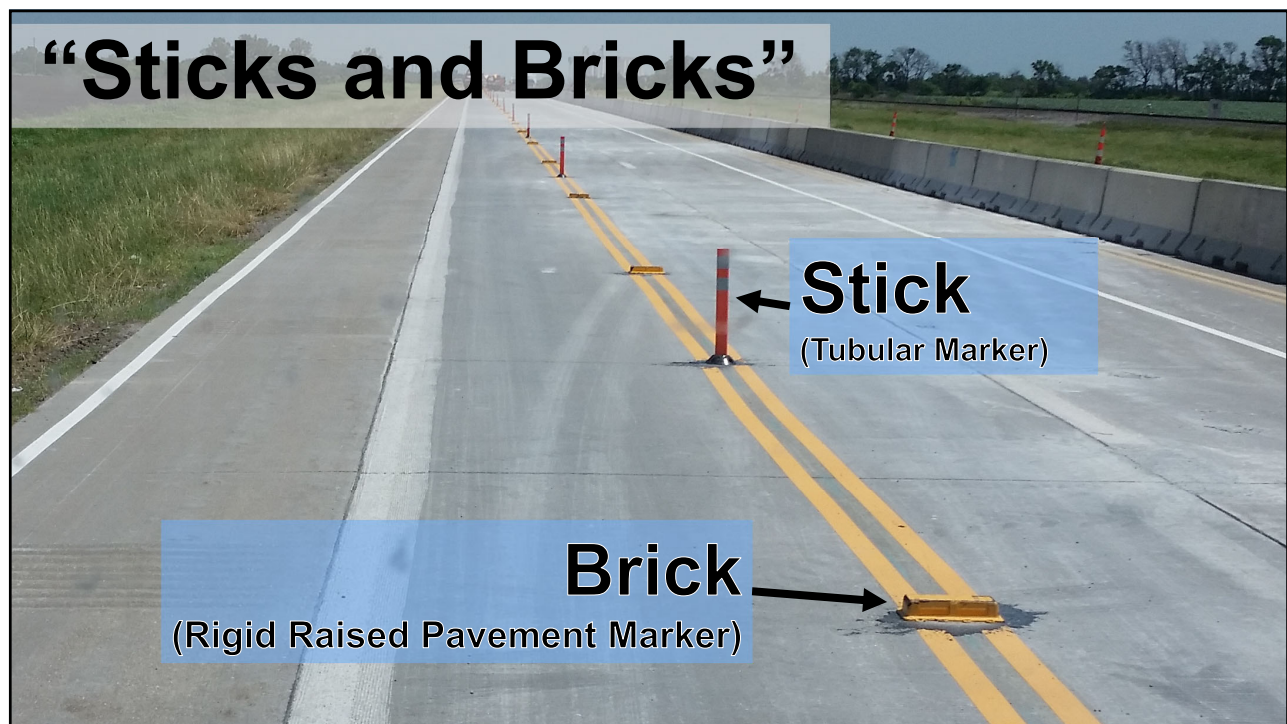
85



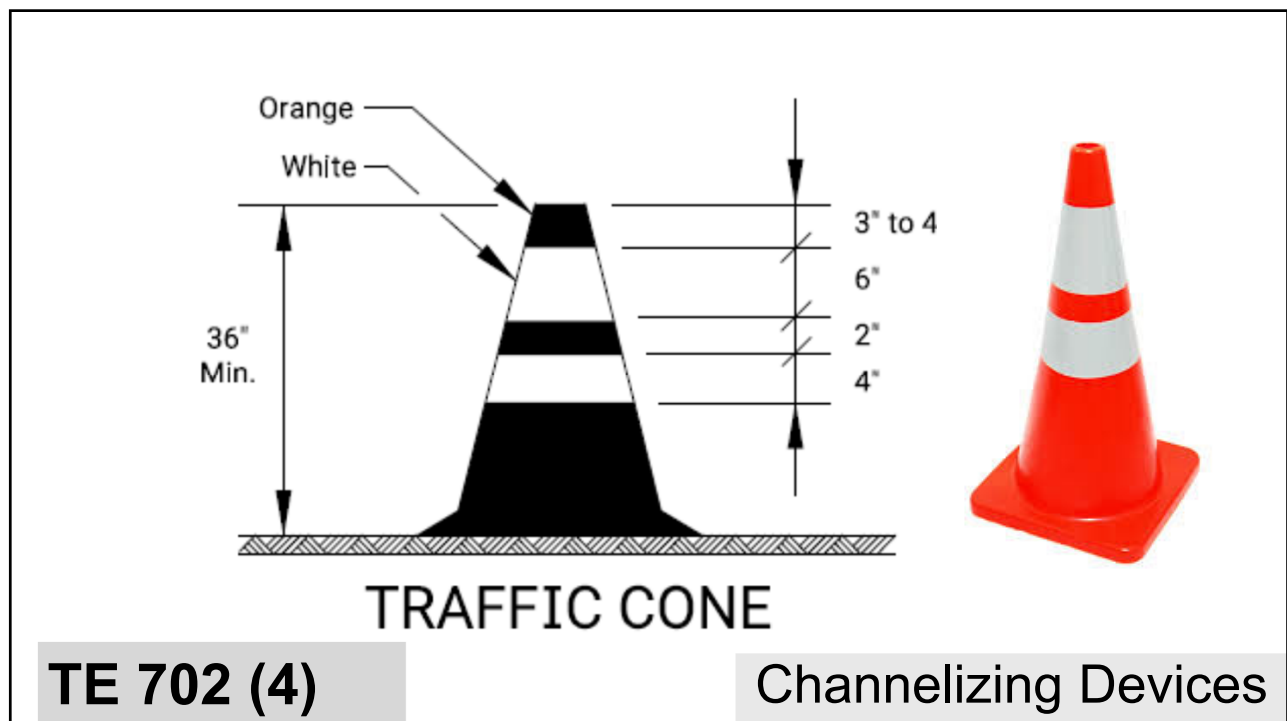
TE 702 (3)

Channelizing Devices

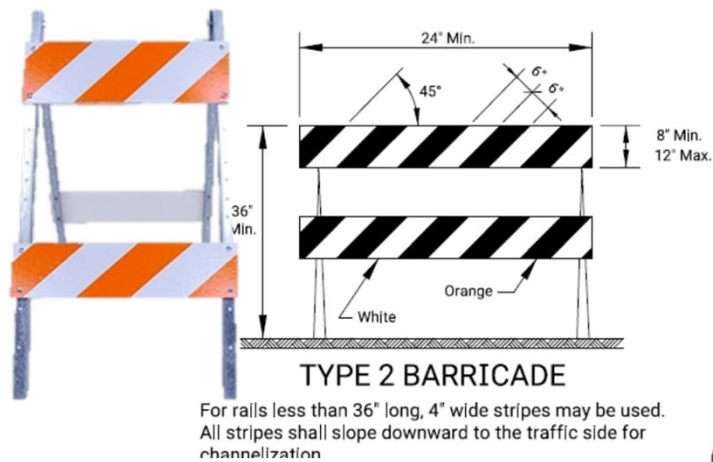
86



87

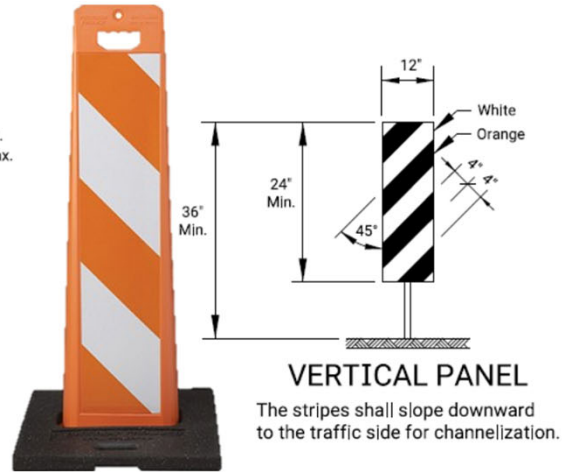


88



TYPE 2 BARRICADE

For rails less than 36" long, 4" wide stripes may be used.
All stripes shall slope downward to the traffic side for channelization.



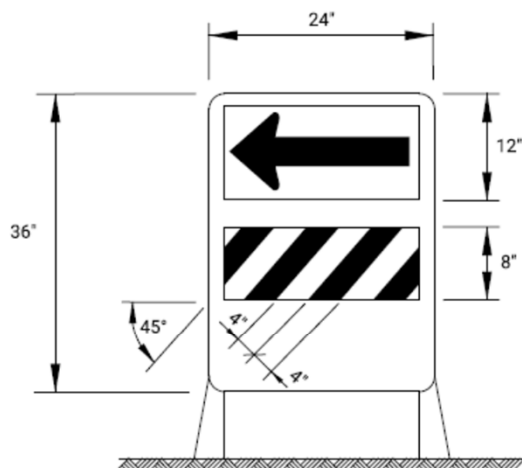
VERTICAL PANEL

The stripes shall slope downward to the traffic side for channelization.

Channelizing Devices

TE 702 (5)

89



DIRECTION INDICATOR BARRICADE

The stripes shall slope downward in the direction traffic is to pass.
The direction indicator barricade shall be used in series to direct the motorist into the intended lane of travel.



Channelizing Devices

TE 702 (6)

90

Can we use portable Type 2 Barricades for Head-to-Head traffic?

ITEM \ LOCATION		Cross-overs	Shoofly Divisions	Tangents	Tapers	Ramps	Head to Head	Object Identifier	Lead-in Devices	Gores
PORTABLE										
	Drums	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Conical Delineators	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Vertical Panels	(2)	(2)	(2)	(2)	(2)	(1,2)	YES	(2)	(2)
	Direction Indicator Barricade	NO	NO	NO	Yes	NO	NO	NO	NO	NO
	Type 2 Barricade	(2)	(2)	(2)	(2)	NO	NO	Yes	NO	NO
FIXED										
	Tubular Markers	(3)	(3)	(3)	NO	(3)	Yes	NO	Yes	Yes
	Vertical Panels	(3)	(3)	(3)	(3)	(3)	(3)	Yes	(2,3)	(2)

- (1) Not allowed on centerline delineation along freeways or expressways.
 (2) The stripes shall slope downward to the traffic side for channelization.
 (3) May be used upon the approval of the engineer.
 (4) Daytime operations only.

TE 702 (7)

Channelizing Devices

91

Can we use portable Traffic Cones on tapers in a TC Setup?

ITEM \ LOCATION		Cross-overs	Shoofly Divisions	Tangents	Tapers	Ramps	Head to Head	Object Identifier	Lead-in Devices	Gores
PORTABLE										
	Drums	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Conical Delineators	Yes	Yes	Yes	Yes	Yes	(1)	Yes	Yes	Yes
	Vertical Panels	(2)	(2)	(2)	(2)	(2)	(1,2)	YES	(2)	(2)
	Direction Indicator Barricade	NO	NO	NO	Yes	NO	NO	NO	NO	NO
	Type 2 Barricade	(2)	(2)	(2)	NO	NO	NO	Yes	NO	NO
FIXED										
	Tubular Markers	(3)	(3)	(3)	NO	(3)	Yes	NO	Yes	Yes
	Vertical Panels	(3)	(3)	(3)	(3)	(3)	(3)	Yes	(2,3)	(2)

- (1) Not allowed on centerline delineation along freeways or expressways.
 (2) The stripes shall slope downward to the traffic side for channelization.
 (3) May be used upon the approval of the engineer.
 (4) Daytime operations only.

TE 702 (8)

Channelizing Devices

92

starting. Spacing should be reduced in some situations, such as to delineate access points or to maintain positive guidance when traffic regularly moves slowly in the work zone.

(3) Visibility. Place channelizing devices for optimum visibility, normally at right angles to the traffic flow.

(4) Diagonal Striping. Alternating diagonal orange and white striping must slope downward in the direction that traffic is expected to pass.

(5) Directional Barricades. Place direction indicator barricades in series to direct traffic onto the new path.

(6) Pedestrian Channelizers. Place pedestrian channelizers, as shown in the Contract Documents, along entire intended route, and end to end so that there are no gaps in the detectable edging or in the hand trailing surfaces.

g. Automated Flagger Assistance Devices (AFADs). The Contractor may choose to use a trained flagger operating an AFAD in lieu of a flagger at any time. Such use of AFADs will be subsidiary to other contract items.

h. Warning Lights. Use the required type warning lights as shown in the Contract Documents.

Provide, install, and maintain Type "A" warning lights which are lighted from sunset to sunrise. Use Type "A" warning lights on all post mounted action warning signs greater than 5 feet high. Do not use lights on portable signs.

Provide, install, and maintain red Type "B" (high intensity) lights lighted 24 hours per day. Use Type "B" lights on all changed and new Stop conditions.

Maintain lights so they are visible on a clear night from a distance of 3000 feet.

Mount warning lights on action warning signs, as shown in the Contract Documents, on the top of the sign post nearest to the traveled way such that moving flags will not interfere with the visibility of the warning light.

Mount the battery case, for warning lights whose batteries are located in a separate case, no higher than 1 foot above the ground and on the back side of the post holding the light.

Signs that require warning lights also require 2 flags. Flags are made of 18-inch square fluorescent red-orange cloth-like material. Do not use rigid material for the flags. Mount the flags as shown on the Contract Documents on flag staffs that are long enough to allow the flag to flutter without obscuring the warning light or sign.

800-17 (3)

93

AFAD – Automated Flagger Assistance Device



800-17 (4)

94

starting. Spacing should be reduced in some situations, such as to delineate access points or to maintain positive guidance when traffic regularly moves slowly in the work zone.

(3) Visibility. Place channelizing devices for optimum visibility, normally at right angles to the traffic flow.

(4) Diagonal Striping. Alternating diagonal orange and white striping must slope downward in the direction that traffic is expected to pass.

(5) Directional Barricades. Place direction indicator barricades in series to direct traffic onto the new path.

(6) Pedestrian Channelizers. Place pedestrian channelizers, as shown in the Contract Documents, along entire intended route, and end to end so that there are no gaps in the detectable edging or in the hand trailing surfaces.

g. Automated Flagger Assistance Devices (AFADs). The Contractor may choose to use a trained flagger operating an AFAD in lieu of a flagger at any time. Such use of AFADs will be subsidiary to other contract items.

h. Warning Lights. Use the required type warning lights as shown in the Contract Documents.

Provide, install, and maintain Type "A" warning lights which are lighted from sunset to sunrise. Use Type "A" warning lights on all post mounted action warning signs greater than 5 feet high. Do not use lights on portable signs.

Provide, install, and maintain red Type "B" (high intensity) lights lighted 24 hours per day. Use Type "B" lights on all changed and new Stop conditions.

Maintain lights so they are visible on a clear night from a distance of 3000 feet.

Mount warning lights on action warning signs, as shown in the Contract Documents, on the top of the sign post nearest to the traveled way such that moving flags will not interfere with the visibility of the warning light.

Mount the battery case, for warning lights whose batteries are located in a separate case, no higher than 1 foot above the ground and on the back side of the post holding the light.

Signs that require warning lights also require 2 flags. Flags are made of 18-inch square fluorescent red-orange cloth-like material. Do not use rigid material for the flags. Mount the flags as shown on the Contract Documents on flag staffs that are long enough to allow the flag to flutter without obscuring the warning light or sign.

800-17-(5)

(6) Pedestrian Channelizers. Place pedestrian channelizers, as shown in the Contract Documents, along

Type "A" = Nighttime only

Type "B" = Daytime + Night: [B for Bright]

h. Warning Lights. Use the required type warning lights as shown in the Contract Documents.

Provide, install, and maintain Type "A" warning lights which are lighted from sunset to sunrise. Use Type "A" warning lights on all post mounted action warning signs greater than 5 feet high. Do not use lights on portable signs.

Provide, install, and maintain red Type "B" (high intensity) lights lighted 24 hours per day. Use Type "B" lights on all changed and new Stop conditions.

Maintain lights so they are visible on a clear night from a distance of 3000 feet.

Mount warning lights on action warning signs, as shown in the Contract Documents, on the top of the sign post nearest to the traveled way such that moving flags will not interfere with the visibility of the warning light.

Mount the battery case, for warning lights whose batteries are located in a separate case, no higher than 1 foot above the ground and on the back side of the post holding the light.

Signs that require warning lights also require 2 flags. Flags are made of 18-inch square fluorescent red-orange cloth-like material. Do not use rigid material for the flags. Mount the flags as shown on the Contract Documents on flag staffs that are long enough to allow the flag to flutter without obscuring the warning light or sign.

i. Temporary Pavement Marking and Temporary Raised Pavement Markers (RPMs). When traffic is carried through construction, provide and maintain temporary pavement marking and temporary RPMs as shown in the Contract Documents. When work will occupy a location more than 3 days, remove or mask all conflicting pavement marking and any markings specified in the Contract Documents, according to SECTION 808, and mark all position tapers, crossovers, relocated lane lines and relocated edge lines with temporary pavement marking. Use temporary pavement markings according to TABLE 805-1.

800-17-(6)



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**Part 805 – Temporary Pavement Marking,
One Way Traffic (flaggers), Pilot Cars**



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99



100

lights on all changed and new Stop conditions.

Maintain lights so they are visible on a clear night from a distance of 3000 feet.

Mount warning lights on action warning signs, as shown in the Contract Documents, on the top of the sign post nearest to the traveled way such that moving flags will not interfere with the visibility of the warning light.

Mount the battery case, for warning lights whose batteries are located in a separate case, no higher than 1 foot above the ground and on the back side of the post holding the light.

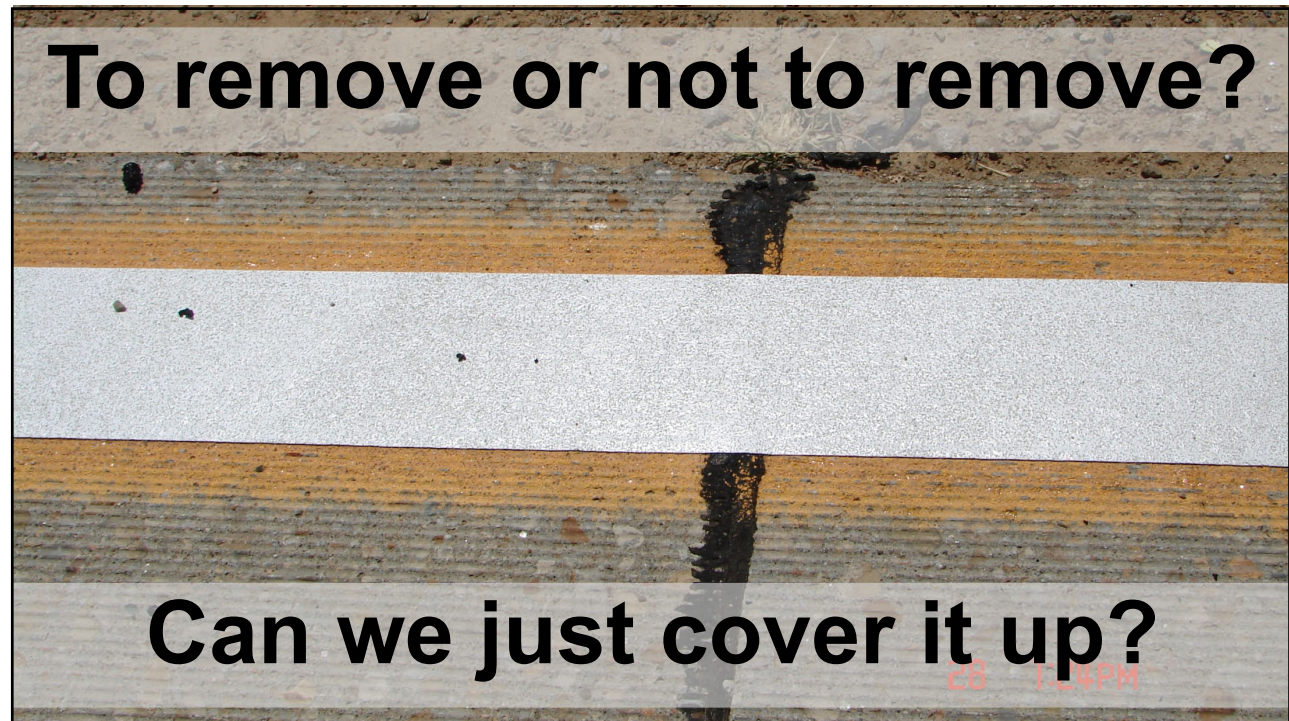
Signs that require warning lights also require 2 flags. Flags are made of 18-inch square fluorescent red-orange cloth-like material. Do not use rigid material for the flags. Mount the flags as shown on the Contract Documents on flag staffs that are long enough to allow the flag to flutter without obscuring the warning light or sign.

i. **Temporary Pavement Marking and Temporary Raised Pavement Markers (RPMs).** When traffic is carried through construction, provide and maintain temporary pavement marking and temporary RPMs as shown in the Contract Documents. When work will occupy a location more than 3 days, remove or mask all conflicting pavement marking and any markings specified in the Contract Documents, according to **SECTION 808**, and mark all transition tapers, crossovers, relocated lane lines and relocated edge lines with temporary pavement marking. Use temporary pavement markings according to **TABLE 805-1**.

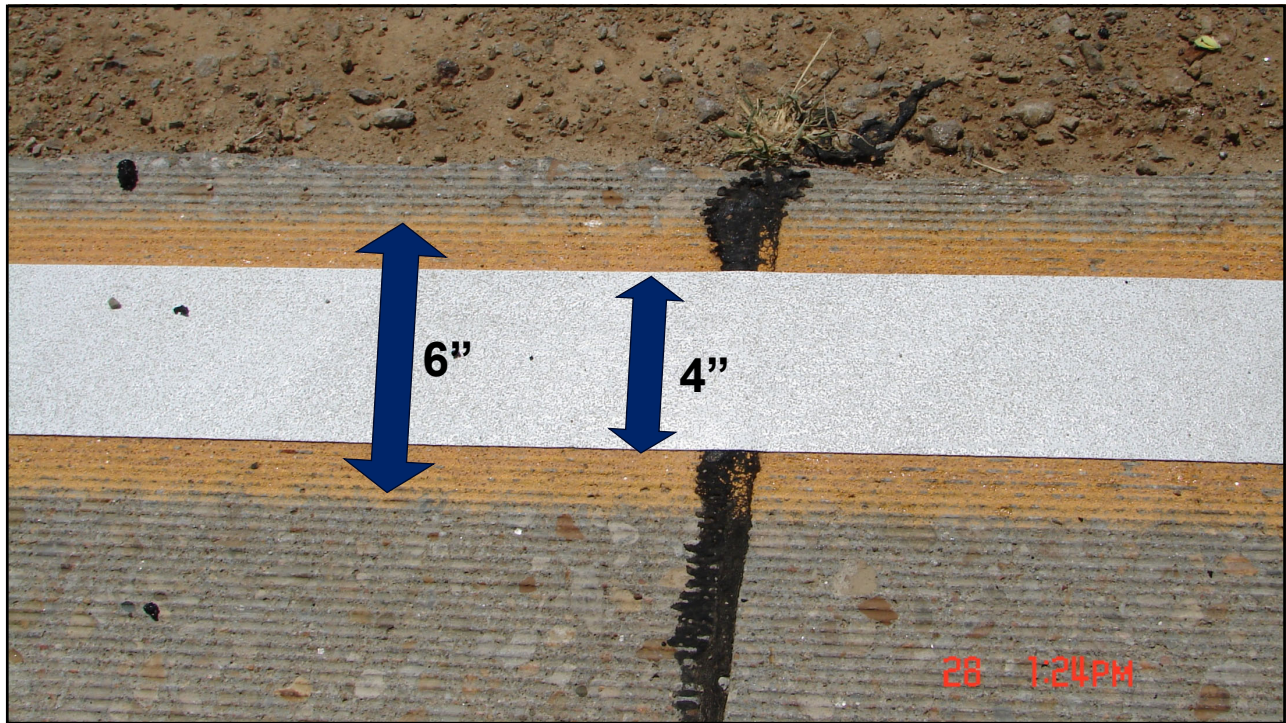
800-17

800-17 (10)

101



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103



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TABLE 805-1: TEMPORARY PAVEMENT MARKING ***	
Type	Use
Type I	Final surface (new pavement or any surface that will remain when the project is complete). When Type I is specified and in areas where permanent pavement marking will be placed in the same layout/location as the temporary markings, the Contractor has the option to use either Type I tape or paint. Do not use paint on final surfaces where the markings will not follow the same layout/location.
Type II	Any surface that is to be removed or covered by future construction. When Type II is specified, the Contractor has the option to use Type I tape, Type II tape, or paint.

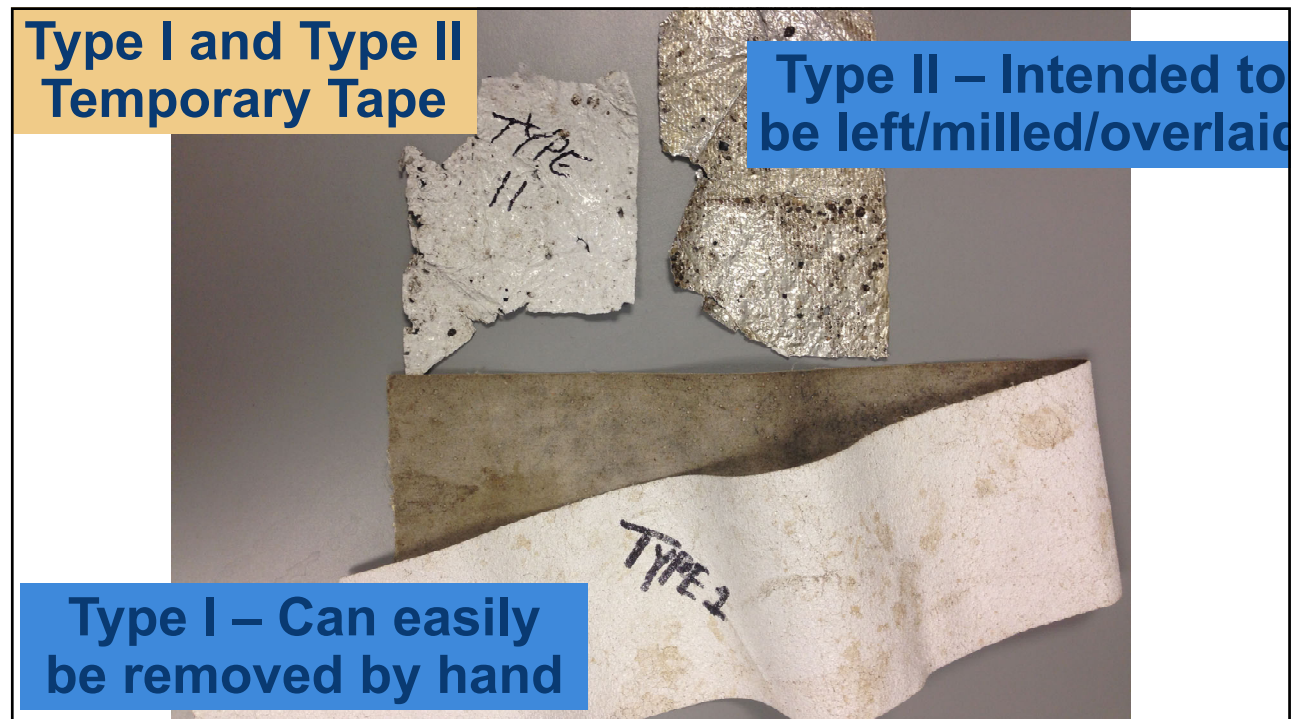
***Do not use paint on Ultrathin Bonded Asphalt Surfaces to remain in place.

(1) Configuration. The following are general guidelines for temporary pavement marking and temporary RPM configurations. Use **TABLE 805-2** and **TABLE 805-3** to determine broken pavement marking dimensions.

- Solid and Broken (8 ft.) markings are intended for use on expressways, freeways, and for traffic configurations in place longer than 45 days, where the markings are different from the original or final pavement markings.
- Broken (3 ft.) markings are intended for use on intermediate lifts of asphalt surfacing projects where movement of traffic through the project is required, and on final surfaces that are opened to traffic prior to placing the permanent pavement markings.
- Flexible Raised Pavement Markers (Broken (8 ft.)), for use on expressways and freeways, and Flexible Raised Pavement Markers (Broken (3 ft.)) are for use in place of tape or paint for resurfacing projects where the permanent pavement marking is expected to be in place within 14 days.
- Dotted extension lines may be used to provide extra guidance through intersections or interchanges.
- Use the severe curve pattern on curves with less than a 1000-foot radius.
- Rigid Raised Pavement Markers (Type II) with Tubular Markers (Channelizer (Fixed)) in a repeating cycle according to the Contract Documents are used to separate opposing traffic in a normally divided roadway that is head to head during construction.

800-18

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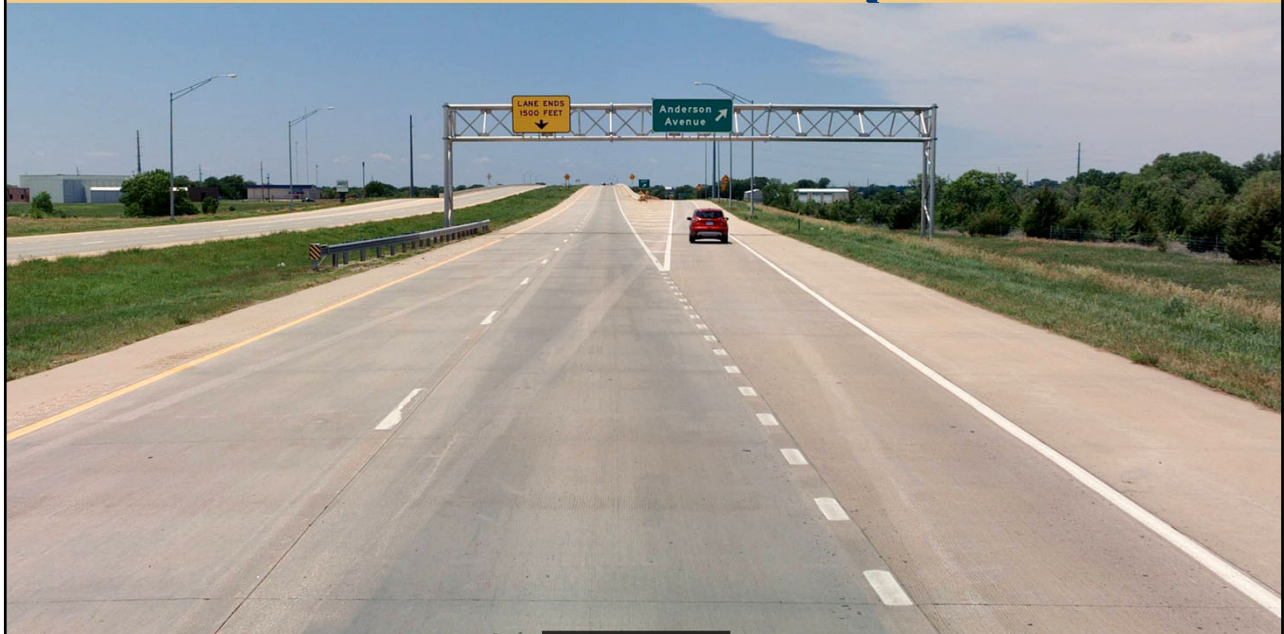
Downsides of Tape

- Time consuming to put down.
- Can get pulled up by traffic.
- Can meander.
- Higher relative cost.



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Downsides of Temp Paint



108

Downsides of Paint



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TABLE 805-1: TEMPORARY PAVEMENT MARKING ***	
Type	Use
Type I	Final surface (new pavement or any surface that will remain when the project is complete). When Type I is specified and in areas where permanent pavement marking will be placed in the same layout/location as the temporary markings, the Contractor has the option to use either Type I tape or paint. Do not use paint on final surfaces where the markings will not follow the same layout/location.
Type II	Any surface that is to be removed or covered by future construction. When Type II is specified, the Contractor has the option to use Type I tape, Type II tape, or paint.

***Do not use paint on Ultrathin Bonded Asphalt Surfaces to remain in place.

(1) Configuration. The following are general guidelines for temporary pavement marking and temporary RPM configurations. Use **TABLE 805-2** and **TABLE 805-3** to determine broken pavement marking dimensions.

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- Flexible Raised Pavement Markers (Broken (8 ft.)), for use on expressways and freeways, and Flexible Raised Pavement Markers (Broken (3 ft.)) are for use in place of tape or paint for resurfacing projects where the permanent pavement marking is expected to be in place within 14 days.
- Dotted extension lines may be used to provide extra guidance through intersections or interchanges.
- Use the severe curve pattern on curves with less than a 1000-foot radius.
- Rigid Raised Pavement Markers (Type II) with Tubular Markers (Channelizer (Fixed)) in a repeating cycle according to the Contract Documents are used to separate opposing traffic in a normally divided roadway that is head to head during construction.

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Type II	Any surface that is to be removed or covered by future construction. When Type II is specified, the Contractor has the option to use Type I tape, Type II tape, or paint.
---------	---

***Do not use paint on Ultrathin Bonded Asphalt Surfaces to remain in place.

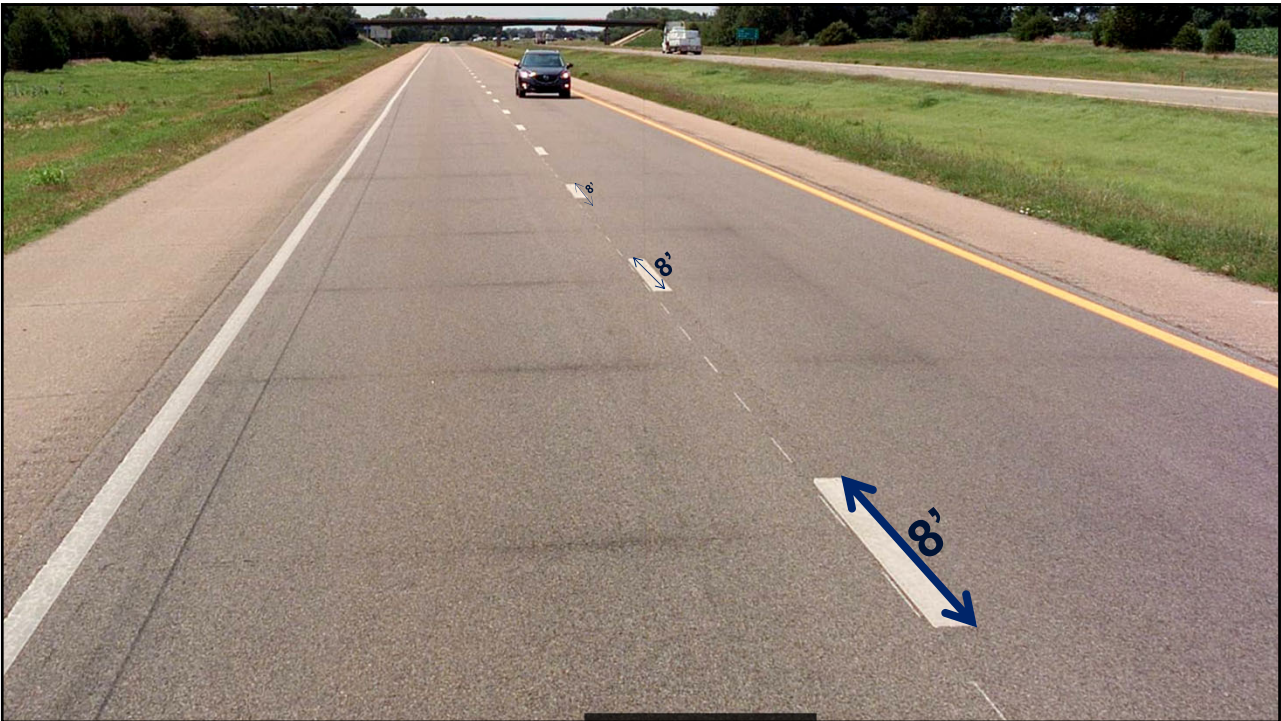
(1) Configuration. The following are general guidelines for temporary pavement marking and temporary RPM configurations. Use **TABLE 805-2** and **TABLE 805-3** to determine broken pavement marking dimensions.

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- Dotted extension lines may be used to provide extra guidance through intersections or interchanges.
- Use the severe curve pattern on curves with less than a 1000-foot radius.
- Rigid Raised Pavement Markers (Type II) with Tubular Markers (Channelizer (Fixed)) in a repeating cycle according to the Contract Documents are used to separate opposing traffic in a normally divided roadway that is head to head during construction.

TABLE 805-2: BROKEN MARKING DIMENSIONS			
Type	Approximate Length (ft.)	Gap (ft.)	Repeating Cycle (ft.)
Broken (8 ft.)	8	24	32
Broken (3 ft.)	3	29	32
Dotted Extension	2	4	6
Severe Curve	2	14	16

800-18 (1)

800-18 (1)



Flexible Raised Pavement Markers



TABLE 805-2: BROKEN MARKING DIMENSIONS

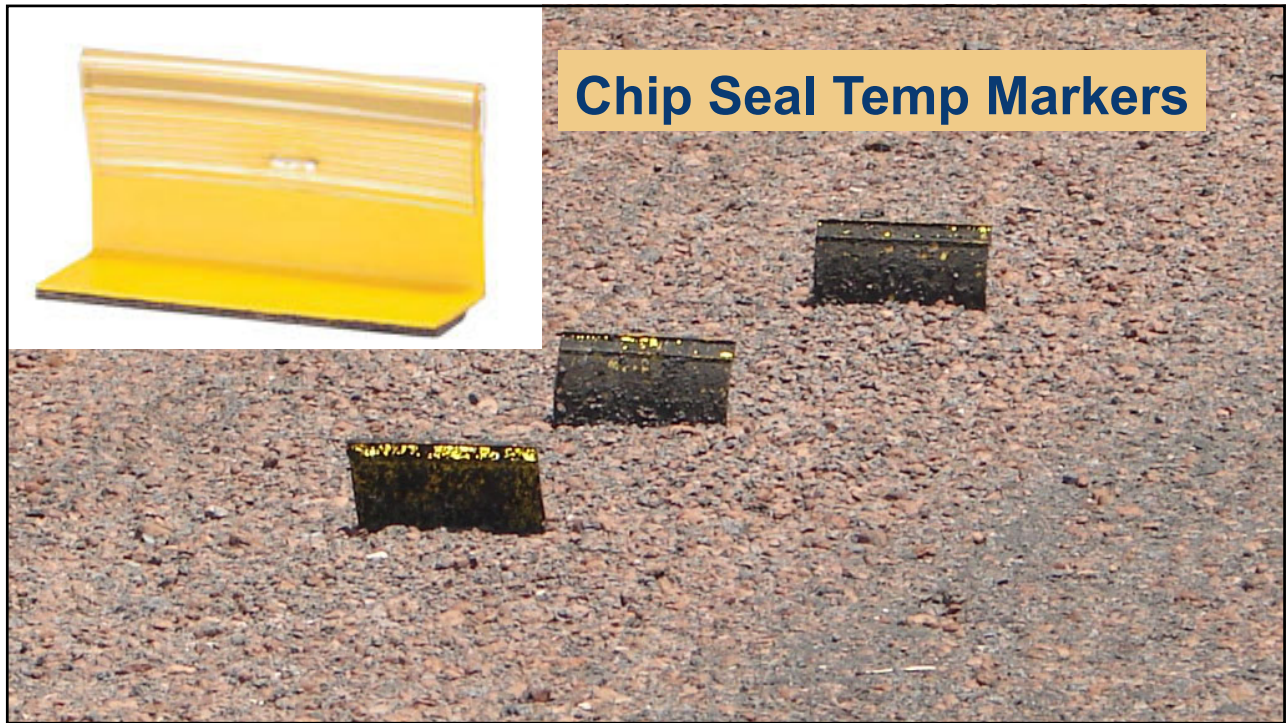
Type	Approximate Length (ft.)	Gap (ft.)	Repeating Cycle (ft.)
Broken (8 ft.)	8	24	32
Broken (3 ft.)	3	29	32
Dotted Extension	2	4	6
Severe Curve	2	14	16

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805 - WORK ZONE TRAFFIC CONTROL & SAFETY

Place either temporary or permanent pavement markings or temporary RPMs the same day the existing markings are removed, and before opening to traffic, at the following locations: yellow skip line on undivided roads, white skip lines on multi-lane sections, white gore lines, white intersection dotted extension lines, and solid yellow ramp edge lines. Fixed tubular markers or conical delineators may be placed, and if used shall be maintained, in lieu of temporary gore lines with the Engineer's approval. If used, space the devices at 5-foot intervals on the gore edge line. They are subsidiary to other temporary pavement marking bid items.

(3) Maintenance. Maintain all temporary pavement markings and temporary RPMs for the duration of the project and for 14 days after the work is complete. Temporary pavement marking and temporary RPMs must be in an acceptable condition and location, as described in the Contract Documents.

When temporary pavement markings or temporary RPMs are deemed deficient by the Engineer (no longer retroreflective, damaged, displaced, etc.), the Engineer will notify the Contractor in writing of areas requiring replacement.

Replacement of temporary pavement marking or temporary RPMs could be required as soon as 24 hours from notification and will be noted in the notification. Failure to replace the temporary pavement marking or temporary RPMs within the allotted time could result in a deduct of \$500 per day. Deduct assessments are cumulative until deficiencies are corrected, and could be assessed even if the project is in liquidated damages for failure to complete work within the specified time.

Conditions considered for deduct include, but are not limited to the following:

- Visibility less than 300 feet in daytime or nighttime conditions.
- Retroreflectivity less than what is specified for the specific type of pavement marking (SECTIONS 806 and 807) or temporary RPM (DIVISION 2200).
- Loss of material.

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Yellow SKIPS on a 2-way undivided

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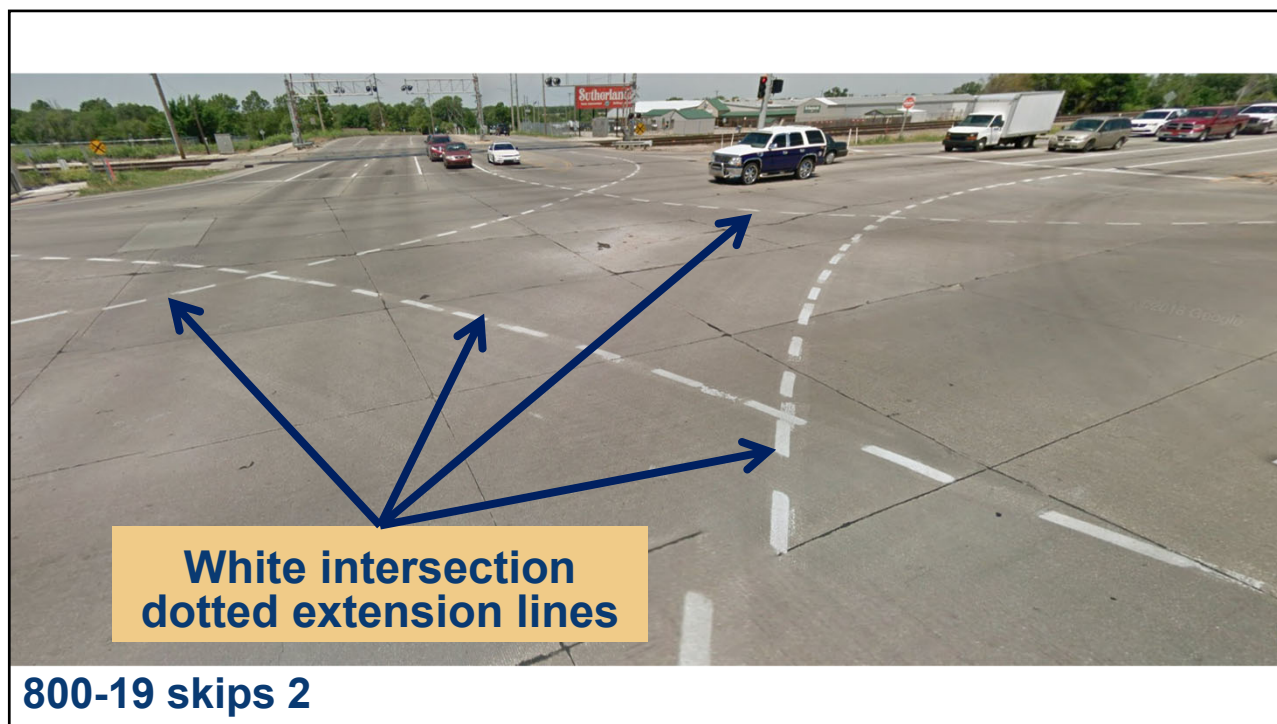


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800-19 skips

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- Loss of material.

Temporary pavement marking or temporary RPMs exceeding the following loss thresholds are subject to the indicated daily deduct:

- Continuous markings cannot have deficiencies of more than 10% of the total feet of pavement marking. Also, no more than 50 consecutive feet can be deficient nor can any deficiency be within 10 feet of another deficiency.
- Intermittent markings, including but not limited to RPMs and broken markings, cannot have deficiencies of more than 10% of the total number of devices (or 10% of the broken markings required) and no more than 2 consecutive devices or markings can be deficient.
- No more than 10% of any temporary marking or temporary RPMs in a curve can be deficient.

(4) Temporary Pavement Marking Tape. Apply pavement marking tape according to the manufacturer's recommendations. If solid lane markings are required, cut through the entire width and thickness of the tape at approximately 100-foot intervals after it is applied to the pavement.

When shown in the Contract Documents, or with the Engineer's approval, apply line masking tape to the surface to temporarily cover the existing pavement markings in widths or sizes sufficient to extend approximately 1 inch beyond the edges of the existing pavement markings.

(5) Traffic Line Paint. When paint is approved, comply with SECTION 807.

(6) Flexible Raised Pavement Markers. With the Engineer's approval, the Contractor may place flexible RPMs in lieu of temporary skip lines and solid lines as shown in the Contract Documents. Adhere according to manufacturer's recommendations.

When used on asphalt seals, place the flexible RPMs on the roadway prior to the sealing operation and remove the cover protecting the retroreflective material after the sealing operation.

The adhesive used shall allow the markers to be removed without damage to the roadway surface. Acquire the Engineer's approval before using epoxy as an adhesive.

(7) Rigid Raised Pavement Markers (Type I or Type II). Install and maintain rigid RPMs at locations shown in the Contract Documents. Install and maintain according to the manufacturer's recommendations.

800-19 (9)

j. One Way Traffic. Provide 2-way traffic and avoid 1-way traffic, where reasonable. When 1-way traffic

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- Intermittent markings, including but not limited to RPMs and broken markings, cannot have deficiencies of more than 10% of the total number of devices (or 10% of the broken markings required) and no more than 2 consecutive devices or markings can be deficient.
- No more than 10% of any temporary marking or temporary RPMs in a curve can be deficient.

(4) Temporary Pavement Marking Tape. Apply pavement marking tape according to the manufacturer's recommendations. If solid lane markings are required, cut through the entire width and thickness of the tape at approximately 100-foot intervals after it is applied to the pavement.

When shown in the Contract Documents, or with the Engineer's approval, apply line masking tape to the surface to temporarily cover the existing pavement markings in widths or sizes sufficient to extend approximately 1 inch beyond the edges of the existing pavement markings.

(5) Traffic Line Paint. When paint is approved, comply with SECTION 807.

(6) Flexible Raised Pavement Markers. With the Engineer's approval, the Contractor may place flexible RPMs in lieu of temporary skip lines and solid lines as shown in the Contract Documents. Adhere according to manufacturer's recommendations.

When used on asphalt seals, place the flexible RPMs on the roadway prior to the sealing operation and remove the cover protecting the retroreflective material after the sealing operation.

The adhesive used shall allow the markers to be removed without damage to the roadway surface. Acquire the Engineer's approval before using epoxy as an adhesive.

(7) Rigid Raised Pavement Markers (Type I or Type II). Install and maintain rigid RPMs at locations shown in the Contract Documents. Install and maintain according to the manufacturer's recommendations.

j. One Way Traffic. Provide 2-way traffic and avoid 1-way traffic, where reasonable. When 1-way traffic is required, do so according to the following:

(1) Flaggers. Provide courteous, competent flaggers, able to communicate with the traveling public, to direct traffic in a one-way traffic operation. Flaggers must be trained once every 3 years on the flagger procedures outlined in Part VI of the MUTCD and on the flagger procedures outlined in the KDOT Flagger Handbook, latest

800-19 (10)

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j. **One Way Traffic.** Provide 2-way traffic and avoid 1-way traffic, where reasonable. When 1-way traffic is required, do so according to the following:

(1) **Flaggers.** Provide courteous, competent flaggers, able to communicate with the traveling public, to direct traffic in a one-way traffic operation. Flaggers must be trained once every 3 years on the flagger procedures outlined in Part VI of the MUTCD and on the flagger procedures outlined in the KDOT Flagger Handbook, latest version. Trained flaggers are expected to behave in accordance with the previously stated flagger procedures regardless of the source of the training. Once trained, flaggers shall carry certification cards showing the flagger's name and date of training. Copies of the KDOT Flagger Handbook are available on the KDOT website, from the Engineer or from the Bureau of Transportation Safety and Technology.

In addition to being trained in flagger procedures, flaggers shall have and use the following equipment:

- **Stop/Slow Paddles:** Equip flaggers with a minimum 18-inch wide Stop/Slow sign mounted on a rigid staff that is a minimum of 60 inches long from the end to the bottom of the sign.
- **Flags:** In emergency situations, equip flaggers with flags that are bright red, a minimum of 24 inches square, and attached to a minimum 36-inch long staff. Flags used at night shall be retroreflective.
- **Apparel:** Flaggers shall wear high visibility headgear and an ANSI Class II vest while on duty during daytime operations. When nighttime work is required, flaggers shall wear ANSI Class E retroreflectorized pants in addition to the high visibility headgear and ANSI Class II vest.
- **Illumination:** When nighttime work is required, illuminate flagger stations and equipment crossings with temporary lighting. Place all lighting so that it does not create a disabling glare for approaching road users, flaggers or workers. To determine if lighting is adequate and if disabling glare exists, drive toward the flagger station from all approaches at night.

800-19

(2) **Law Enforcement.** The Contractor may use uniformed enforcement officers as flaggers. When used as a flagger by the Contractor, law enforcement officers shall wear their official uniform with badge and meet the requirements for Flagger Apparel as shown in the Contract Documents.

800-20

(3) **Traffic Signal Installation (Temporary).** Install temporary traffic signals as shown in the Contract Documents. Place temporary signals on the shoulder when feasible, and in all cases, delineate with channelizers.

Temporary traffic signals may be used in lieu of flaggers and left unattended when each approach is visible to the other, and when approved by the Engineer. When each approach is not visible to the other, or if unattended

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Required Equipment

- Stop/Slow paddle
- Flags (emergency only)
- Reflective Vest & ORANGE hat
- Illumination (night work)
- *Radio/Walkie-Talkie

* AJ's recommendation

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with temporary lighting. Place all lighting so that it does not create a disabling glare for approaching road users, flaggers or workers. To determine if lighting is adequate and if disabling glare exists, drive toward the flagger station from all approaches at night.

(2) Law Enforcement. The Contractor may use uniformed enforcement officers as flaggers. When used as a flagger by the Contractor, law enforcement officers shall wear their official uniform with badge and meet the requirements for Flagger Apparel as shown in the Contract Documents.

(3) Traffic Signal Installation (Temporary). Install temporary traffic signals as shown in the Contract Documents. Place temporary signals on the shoulder when feasible, and in all cases, delineate with channelizers.

Temporary traffic signals may be used in lieu of flaggers and left unattended when each approach is visible to the other, and when approved by the Engineer. When each approach is not visible to the other, or if unattended signals are not approved by the Engineer, then the signal shall be manually operated, directly or by remote, by a Flagger trained in the operation of the signal. Temporary signals may be used at night. When signals are controlled by flaggers at night, comply with all nighttime flagger requirements. A single flagger may simultaneously operate multiple signals when:

- The flagger has an unobstructed view of the signals
- The flagger has an unobstructed view of approaching traffic in each direction; and
- The flagger is accurately able to read the signals' indicators.

(4) Automated Flagger Assistance Device (AFAD). AFADs may be used in the same manner as temporary traffic signals, except that they cannot be left unattended. Manually operate the AFAD directly or by remote, by a Flagger trained in the operation of the AFAD. AFADs may be used at night when the AFAD station is illuminated with temporary lighting and all other nighttime flagger requirements are met. A single flagger may simultaneously operate multiple AFADs when:

- The flagger has an unobstructed view of the AFADs;
- The flagger has an unobstructed view of approaching traffic in each direction; and
- The flagger is accurately able to read the AFADs' indicators.

800-20

(5) Pilot Cars. A pilot car may be used to assist and lead traffic between flaggers or flagger-manned AFADs. Maintain pilot car operations continuously, causing no delay to traffic for reasons such as refueling and

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AFAD – Automated Flagger Assistance Device



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- The flagger is accurately able to read the signals' indicators.

(4) Automated Flagger Assistance Device (AFAD). AFADs may be used in the same manner as temporary traffic signals, except that they cannot be left unattended. Manually operate the AFAD directly or by remote, by a Flagger trained in the operation of the AFAD. AFADs may be used at night when the AFAD station is illuminated with temporary lighting and all other nighttime flagger requirements are met. A single flagger may simultaneously operate multiple AFADs when:

- The flagger has an unobstructed view of the AFADs;
- The flagger has an unobstructed view of approaching traffic in each direction; and
- The flagger is accurately able to read the AFADs' indicators.

(5) Pilot Cars. A pilot car may be used to assist and lead traffic between flaggers or flagger-manned AFADs. Maintain pilot car operations continuously, causing no delay to traffic for reasons such as refueling and breaks. The maximum time for a pilot car round trip is 15 minutes. Coordinate the work accordingly. Do not use the pilot car for other purposes.

Equip the pilot car with signs reading "Pilot Car Follow Me," complying with Contract Documents as they pertain to sign sheeting and lettering requirements. Mount signs a minimum of 1 foot above the top of the vehicle and clearly visible from the front and rear. Display the Contractor's company logo and contact information on pilot car vehicles.

Maintain one-way traffic and use the pilot car to restrict speeds to a maximum of 40 miles per hour in the work zone and restrict speeds in the vicinity of workers to 20 miles per hour until the last car in the pilot queue exits the vicinity of the workers.

k. Height Differential Treatment. On projects that carry traffic through construction, the following criteria shall be considered a minimum for treatment of height differentials adjacent to traffic lanes. A height

800-20

800-20

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- The flagger is accurately able to read the signals' indicators.

(4) Automated Flagger Assistance Device (AFAD). AFADs may be used in the same manner as temporary traffic signals, except that they cannot be left unattended. Manually operate the AFAD directly or by remote, by a Flagger trained in the operation of the AFAD. AFADs may be used at night when the AFAD station is illuminated with temporary lighting and all other nighttime flagger requirements are met. A single flagger may simultaneously operate multiple AFADs when:

- The flagger has an unobstructed view of the AFADs;
- The flagger has an unobstructed view of approaching traffic in each direction; and
- The flagger is accurately able to read the AFADs' indicators.

(5) Pilot Cars. A pilot car may be used to assist and lead traffic between flaggers or flagger-manned AFADs. Maintain pilot car operations continuously, causing no delay to traffic for reasons such as refueling and breaks. The maximum time for a pilot car round trip is 15 minutes. Coordinate the work accordingly. Do not use the pilot car for other purposes.

Equip the pilot car with signs reading "Pilot Car Follow Me," complying with Contract Documents as they pertain to sign sheeting and lettering requirements. Mount signs a minimum of 1 foot above the top of the vehicle and clearly visible from the front and rear. Display the Contractor's company logo and contact information on pilot car vehicles.

Maintain one-way traffic and use the pilot car to restrict speeds to a maximum of 40 miles per hour in the work zone and restrict speeds in the vicinity of workers to 20 miles per hour until the last car in the pilot queue exits the vicinity of the workers.

k. Height Differential Treatment. On projects that carry traffic through construction, the following criteria shall be considered a minimum for treatment of height differentials adjacent to traffic lanes. A height

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Part 805 – Height Differentials, Measurement and Payment

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differential is defined as the vertical distance between the top of the surface being constructed (or the riding surface) to the top of the adjacent pavement. Use TABLE 805-4 to determine what treatment is required for the given situations.

When TABLE 805-4 indicates the use of signs as part of the Traffic Control Plan, place the signs at the beginning of the condition and at each intersecting crossroad or approximately half mile intervals and remove or cover the signs when not applicable.

When the table indicates the use of a wedge, use hot mix asphalt or other material that will remain intact under anticipated traffic as approved by the Engineer.

TABLE 805-4: HEIGHT DIFFERENTIAL TREATMENT		
Condition	Height Differential ("D")	Treatment
Nominal height differential between driving lanes open to traffic	1 inch < D ≤ 2 inches	Use the Uneven Lanes signs (W8-11) as part of the Traffic Control Plan.
	2 inches < D ≤ 4 inches	Use the Uneven Lanes signs (W8-11) as part of the Traffic Control Plan. Construct a 3:1 or flatter slope wedge against the pavement edge.
	D > 4 inches	This condition is not permitted unless otherwise indicated by the contract documents.
Nominal height	D ≤ 2 inches	Use the Shoulder Drop-Off sign (W8-17 and W8-17P) as part of the Traffic Control Plan.
	2 inches < D ≤ 4 inches	Use Shoulder Drop-Off signs (W8-17 and W8-17P) signs as part of the Traffic Control Plan. Construct a 1:1 or flatter slope wedge against the pavement edge. Channelizing devices may be used instead of a wedge if approved by the Engineer and when placed so the maximum device spacing, measured in feet, is equal to the posted speed limit prior to construction.

800-21

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defined as the vertical distance between the top of the surface being constructed (or the riding surface) and the adjacent pavement. Use **TABLE 805-4** to determine what treatment is required for the given

TABLE 805-4 indicates the use of signs as part of the Traffic Control Plan, place the signs at the given condition and at each intersecting crossroad or approximately half mile intervals and remove or when not applicable.

If the table indicates the use of a wedge, use hot mix asphalt or other material that will remain intact under traffic as approved by the Engineer.

TABLE 805-4: HEIGHT DIFFERENTIAL TREATMENT

Height Differential ("D")	Treatment
1 inch < D ≤ 2 inches	Use the Uneven Lanes signs (W8-11) as part of the Traffic Control Plan.
2 inches < D ≤ 4 inches	Use the Uneven Lanes signs (W8-11) as part of the Traffic Control Plan. Construct a 3:1 or flatter slope wedge against the pavement edge.
D > 4 inches	This condition is not permitted unless otherwise indicated by the contract documents.
D ≤ 2 inches	Use the Shoulder Drop-Off sign (W8-17 and W8-17P) as part of the Traffic Control Plan.
2 inches < D ≤ 4 inches	Use Shoulder Drop-Off signs (W8-17 and W8-17P) signs as part of the Traffic Control Plan. Construct a 1:1 or flatter slope wedge against the pavement edge. Channelizing devices may be used instead of a wedge if approved by the Engineer and when placed so the maximum device spacing, measured in feet, is equal to the posted speed limit prior to construction.

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SHOULDER DROP-OFF Nominal height differential between driving lane and shoulder or adjacent pavement that is closed to traffic	open to traffic		
		$D > 4$ inches	This condition is not permitted unless otherwise indicated by the contract documents.
		$D \leq 2$ inches	Use the Shoulder Drop-Off sign (W8-17 and W8-17P) as part of the Traffic Control Plan.
		$2 \text{ inches} < D \leq 4 \text{ inches}$	Use Shoulder Drop-Off signs (W8-17 and W8-17P) signs as part of the Traffic Control Plan. Construct a 1:1 or flatter slope wedge against the pavement edge. Channelizing devices may be used instead of a wedge if approved by the Engineer and when placed so the maximum device spacing, measured in feet, is equal to the posted speed limit prior to construction. height differential is expected to last longer than 2 weeks, the use of a 3:1 or flatter slope wedge against the pavement edge is required and the use of channelizing devices instead of a wedge is not permitted unless otherwise indicated in the Contract Documents.
		$D > 4$ inches	To the extent feasible, provide an obstruction free recovery area between the channelizing devices and height differential. Use Shoulder Drop-Off signs (W8-17 and W8-17P) as part of the Traffic Control Plan. Construct a 3:1 or flatter slope wedge against the pavement edge. Channelizing devices may be used instead of a wedge as approved by the Engineer when the channelizers are placed so the maximum device spacing, measured in feet, is equal to the posted speed limit prior to construction and no height differentials greater than 4 inches are left overnight without a wedge, unless otherwise indicated in the Contract Documents.

Height diff 2.

1. Weather and Increased Traffic Volume Conditions. During periods of inclement weather, or during periods of unusually heavy traffic, from any cause, the Engineer may require construction operations to cease in order to adequately handle traffic. The Engineer reserves the right to require the suspension or delay of certain

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	open to traffic	D > 4 inches	This condition is not permitted unless otherwise indicated by the contract documents.
	Nominal height differential between driving lane and shoulder or adjacent pavement that is closed to traffic	D ≤ 2 inches	Use the Shoulder Drop-Off sign (W8-17 and W8-17P) as part of the Traffic Control Plan.
		2 inches < D ≤ 4 inches	Use Shoulder Drop-Off signs (W8-17 and W8-17P) signs as part of the Traffic Control Plan. Construct a 1:1 or flatter slope wedge against the pavement edge. Channelizing devices may be used instead of a wedge if approved by the Engineer and when placed so the maximum device spacing, measured in feet, is equal to the posted speed limit prior to construction. height differential is expected to last longer than 2 weeks, the use of a 3:1 or flatter slope wedge against the pavement edge is required and the use of channelizing devices instead of a wedge is not permitted unless otherwise indicated in the Contract Documents.
		D > 4 inches	To the extent feasible, provide an obstruction free recovery area between the channelizing devices and height differential. Use Shoulder Drop-Off signs (W8-17 and W8-17P) as part of the Traffic Control Plan. Construct a 3:1 or flatter slope wedge against the pavement edge. Channelizing devices may be used instead of a wedge as approved by the Engineer when the channelizers are placed so the maximum device spacing, measured in feet, is equal to the posted speed limit prior to construction and no height differentials greater than 4 inches are left overnight without a wedge, unless otherwise indicated in the Contract Documents.

1. Weather and Increased Traffic Volume Conditions. During periods of inclement weather, or during periods of unusually heavy traffic, from any cause, the Engineer may require construction operations to cease in order to adequately handle traffic. The Engineer reserves the right to require the suspension or delay of certain

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805.4 MEASUREMENT AND PAYMENT																			
a. General. No Adjustments in the contract unit price will be made regardless of the amount of underruns or overruns.																			
b. Traffic Control (Lump Sum). When traffic control is shown in the Contract Documents as a lump sum it will be measured as such. The Engineer will not measure Uneven Lane signs (W8-11), Shoulder Drop Off signs (W8-17 and W8-17P), or wedge material for separate payment.																			
<table border="1"> <tr> <th colspan="3">TABLE 805-5: TRAFFIC CONTROL (LUMP SUM) PARTIAL PAYMENTS</th></tr> <tr> <th rowspan="2">Percent of Original Contract Amount Completed*</th><th colspan="2">Pay Lesser of the Two</th></tr> <tr> <th>% of Traffic Control</th><th>% of Original Contract Amount</th></tr> <tr> <td>10</td><td>50</td><td>5</td></tr> <tr> <td>80</td><td>100</td><td>10</td></tr> <tr> <td>100</td><td>100</td><td>NA</td></tr> </table>			TABLE 805-5: TRAFFIC CONTROL (LUMP SUM) PARTIAL PAYMENTS			Percent of Original Contract Amount Completed*	Pay Lesser of the Two		% of Traffic Control	% of Original Contract Amount	10	50	5	80	100	10	100	100	NA
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Percent of Original Contract Amount Completed*	Pay Lesser of the Two																		
	% of Traffic Control	% of Original Contract Amount																	
10	50	5																	
80	100	10																	
100	100	NA																	
*The Percent of Original Contract Amount Completed = the amount earned by the Contractor** divided by the total dollar value of the original contract (all bid items). **Do not include monies earned for "Mobilization", "Traffic Control (Lump Sum)", "Contractor Construction Staking" and "Stored Materials".																			
c. Individual Devices and Pavement Marking. (1) General. When bid items are shown in the Contract Documents for individual traffic control devices, the Engineer will measure each item by the designated unit when the device is required and in acceptable condition and position. Once the Contractor has been notified, payment will not be made for any traffic control devices that remain in an unacceptable condition beyond the time specified in the notification. Measurement for payment of traffic control devices will begin on the day they are installed for traffic control and direction. When traffic control devices are not needed, they shall be removed or covered and will not be measured. During non-working periods such as Sundays and holidays, the list of devices in satisfactory condition																			

800-22

142

c. Individual Devices and Pavement Marking.

(1) General. When bid items are shown in the Contract Documents for individual traffic control devices, the Engineer will measure each item by the designated unit **when the device is required and in acceptable condition and position**. Once the Contractor has been notified, payment will not be made for any traffic control devices that remain in an unacceptable condition beyond the time specified in the notification.

Measurement for payment of traffic control devices will begin on the day they are installed for traffic control and direction. When traffic control devices are not needed, they shall be removed or covered and will not be measured. During non-working periods such as Sundays and holidays, the list of devices in satisfactory condition and location will be measured for payment on the day following, to determine the measurement for pay. During suspended periods, measurement of the devices used will be based on periodic checks conducted by the Engineer. These periodic checks do not relieve the Contractor of responsibility for traffic control. Units used for only a portion of a day will be paid for as one full day's use, regardless of the length of time they are used during the day and number of times the unit is moved and re-erected.

The following items are subsidiary to other items when specified by the Traffic Control Plan, shown in the Contract Documents, or used in an approved alternate Traffic Control Plan: barrier delineators, traffic cones, pilot cars, flaggers, temporary traffic signals used in addition to flaggers, AFADs, and wedges at the pavement edge, or channelizing devices used in lieu of wedges. Traffic cones and all traffic control devices used to delineate vehicles, equipment, tools, debris and materials stored within the right-of-way or 30 feet from the edge of the travelled way, whichever is less, are subsidiary to other items. The temporary removal, storage, and final placement of existing signs that conflict with construction work, but are intended to remain in place after the project is complete, is subsidiary to other items and signs damaged while in the Contractor's possession will be replaced at the Contractor's expense.

(2) Work Zone Signs (Size). The Engineer will measure each Work Zone Signs (Size) per each calendar day the device is required in acceptable condition and position.

(3) Work Zone Sign (Special)(Size). The Engineer will measure each Work Zone Signs (Special) when the sign is first installed and in place for traffic control and direction. No additional measurement will be made for relocating, repairing or maintaining the special signs. On the first estimate following the initial installation of a Work Zone Sign (Special), the price bid per sign will be paid for each sign installed.

800-22
(1)

143

Contractor is allowed to use temporary traffic signals in lieu of flaggers, temporary signals will not be paid for separately, but will be considered subsidiary to other items of the contract. If the Contractor elects to use AFADs in addition to flaggers, AFADs will not be paid for separately, but will be considered subsidiary to other items of the contract. If the Engineer determines that additional flaggers are required, each additional flagger will be measured for each hour they are required.

(10) Traffic Signal Installation (Temporary). The Engineer will measure temporary traffic signals by the Lump Sum, when shown in the Contract Documents as part of the Traffic Control Plan. The Engineer will make payments as follows:

Pay 75% of the contract unit price after the traffic signals are initially installed and operational.

Pay 100% after the traffic signals are no longer needed for the movement of traffic and have been removed or stockpiled, as specified.

(11) Traffic Control (Initial Set Up). If the amount bid for this item is less than 25% of the sum of amounts bid for all traffic control items, 100% of the amount bid for this item will be paid on the first estimate following the beginning of any traffic control set up done on the project. If the bid amount for this item is 25%, or greater, than the sum of the amounts bid for all traffic control items, the amount equal to 25% of the sum of the amounts bid for all traffic control items will be paid on the first estimate following any traffic control set up done on the project. Upon completion of all work on the project, 100% of the amount bid for this item will be paid.

(12) Uneven Lane and Shoulder Drop Off Signs. When individual traffic control bid items are shown in the Contract Documents, the Engineer will measure the Uneven Lane signs (W8-11) and the Shoulder Drop Off signs (W8-17 and W8-17P) each per day. See **subsection 805.4b**, when traffic control is bid lump sum.

(13) Liquidated Damages. Once the Contractor is being assessed liquidated damages according to **SECTION 108**, no traffic control devices will be measured for payment. This does not relieve the Contractor from the responsibility for providing and maintaining all necessary traffic control on the project until it has been completed and accepted. Such traffic control will be at the Contractor's expense.

On calendar completion date projects with interim completion dates, no traffic control devices will be measured other than those required between the interim completion date and the next beginning work period. This does not relieve the Contractor from the responsibility for maintaining all necessary traffic control on the project until it has been completed and accepted.

Contract Deducts may be assessed while the contract is in liquidated damages.

144



145

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146

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147

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Pay 100% after the traffic signals are no longer needed for the movement of traffic and have been removed or stockpiled, as specified.

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Contract Deducts may be assessed while the contract is in liquidated damages.

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Part 805 – Temporary Pavement Marking, One Way Traffic (flaggers), Pilot Cars.



Temporary Traffic Control Traffic Engineering Standards



1

Temporary Traffic Control TE 700

1) Design Speed: These items delineated to temporary traffic control should be designed and installed using the posted speed of the roadway prior to work starting.

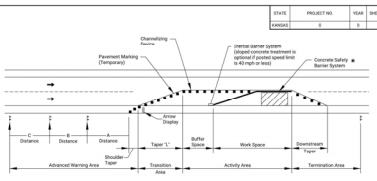
2) Minimum Lane Width: Lane widths shall be a minimum of 11' (measured between centerlines of pavement markings) or as shown on the plans, or as directed by the engineer. A lane width less than 11' may require restricted roadway width signing.

3) Consideration should be made to separate pedestrian and, if needed, bicycle movements from both work site activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross in the appropriate location. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections rather than midblock locations so that pedestrians are not confronted with midblock work sites that will induce them to attempt crossing the work site or making a midblock crossing.

4) When existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall be delineated and include accessibility features consistent with the features present in the existing pedestrian facility.

5) When the driving surface open to traffic is milled or is a temporary surface made of loose material, or when directed by the engineer a W11-1 (Downward Payment) or W8-7 (Lower Grade) sign shall be used on mainline approaches. This sign should be placed a 75' distance after the W20-1 (Road Work Ahead) sign. A W8-16 (Intersection Ahead) shall be used to supplement the W8-7 or W8-7 signs. All signs shall be displayed as long as the condition is present.

6) Alternative temporary variable sign options may be available. Please contact the Temporary Traffic Control Unit for more information at 785-296-1178 or 785-296-1183.



TYPICAL WORK ZONE COMPONENTS

When a portable channelizing device is used, portable channelizing devices are not needed along the tapered barrier section.

Minimum advance warning sign spacing (in feet)

ADDITIONAL SIGNING	A	B	C
URBAN (45 MPH OR LOWER)	100	100	100
URBAN (45 MPH OR HIGHER)	350	350	350
RURAL (55 MPH OR LOWER)	500	500	500
RURAL (55 MPH OR HIGHER)	750	750	750
EXPRESSWAY/INTERSTATE	1000	1000	2640

Posted speed prior to work starting

The minimum spacing between signs shall be no less than 100' unless directed by the engineer. The spacing between any signs may be increased beyond the minimum values in the table above as approved by the engineer in order to maximize visibility.

Buffer Space

SPEED (MPH)	20	25	30	35	40	45	50	55	60	65	70	75
LENGTH (ft)	115	155	205	255	305	355	405	455	505	555	605	655

Channelizer Placement:

(1) The spacing between devices in transition area (taper) should not exceed a distance in feet equal to 1/2 the posted speed limit in mph prior to work starting.

(2) The spacing between devices in the advanced warning area and the activity area should not exceed a distance in feet equal to two times the posted speed limit in mph prior to work starting.

(3) Channelizing devices shall be placed for optimum visibility, normally at right angles to the traffic flow.

(4) Head directional indicator lamps shall be used to direct traffic onto the new path. The arrow sign should not be visible to opposing traffic.

(5) Alternating diagonal orange and white striping must slope downward in the direction traffic is expected to pass.

Taper Formula:

$L = \text{set for speeds of 45 MPH or more}$

$L = 400 \text{ feet for speeds of 45 MPH or less}$

Where: L = Minimum length of taper in feet

S = Numerical value of posted speed prior to work starting in MPH

W = Width in offset feet

Shoulder Taper 1/2 L

Shoulder Taper 1/2 L

Channelizer Placement:

(1) The spacing between devices in transition area (taper) should not exceed a distance in feet equal to 1/2 the posted speed limit in mph prior to work starting.

(2) The spacing between devices in the advanced warning area and the activity area should not exceed a distance in feet equal to two times the posted speed limit in mph prior to work starting.

(3) Channelizing devices shall be placed for optimum visibility, normally at right angles to the traffic flow.

(4) Head directional indicator lamps shall be used to direct traffic onto the new path. The arrow sign should not be visible to opposing traffic.

(5) Alternating diagonal orange and white striping must slope downward in the direction traffic is expected to pass.

Print on 11"x17" paper

Printed by: Robert D. Smith, Jr. 10/10/2022 14:46
File: TE 700



2

92

Temporary Traffic Control TE 700 (2)

1) Design Speed: Those items delegated to temporary traffic control should be designed and installed using the posted/legal speed of the roadway prior to work starting.

2) Minimum Lane Width: Lane widths shall be a minimum of 11' (measured between centerlines of pavement markings) or as shown on the plans, or as directed by the engineer. A lane width less than 11' may require restricted roadway width signing.

3) Consideration should be made to separate pedestrian and, if needed, bicycle movements from both work site activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt

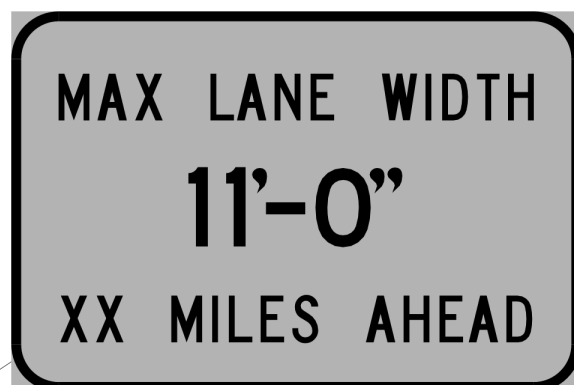
3

Temporary Traffic Control TE 700 (3)

2) Minimum Lane Width: Lane widths shall be a minimum of 11' (measured between centerlines of pavement markings) or as shown on the plans, or as directed by the engineer. A lane width less than 11' may require restricted roadway width signing.

3) Consideration should be made to separate pedestrian movements from both work site activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt skirting the work site or making a midblock crossing.

4) When existing pedestrian facilities are disrupted, temporary facilities shall be detectable and include



4

Temporary Traffic Control TE 700 (4)

3) Consideration should be made to separate pedestrian and, if needed, bicycle movements from both work site activity and vehicular traffic. Unless a reasonable safe route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt skirting the work site or making a midblock crossing.

4) When existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

5) When the driving surface open to traffic is milled or is a temporary surface made of loose material, or when directed by the engineer a W8-15 (Grooved Pavement) or W8-7 (Loose Gravel) sign shall be used on mainline approaches.

5

Temporary Traffic Control TE 700 (5)

placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt skirting the work site or making a midblock crossing.

4) When existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

5) When the driving surface open to traffic is milled or is a temporary surface made of loose material, or when directed by the engineer a W8-15 (Grooved Pavement) or W8-7 (Loose Gravel) sign shall be used on mainline approaches. This sign should be placed a "C" distance after the W20-1 (Road Work Ahead) sign. A W8-15p motorcycle plaque shall be used to supplement the W8-15 or W8-7 signs. All signs shall be displayed as long as the condition is present.

6) Alternative temporary rumble strip options may be available. Please contact the Temporary Traffic Control Unit for more information at 785-296-1179 or 785-296-1183.

6

Temporary Traffic Control

placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock work sites that will induce them to attempt skirting the work site or making a midblock crossing.

4) When existing pedestrian facilities are disrupted, closed, or relocated, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.

5) When the driving surface open to traffic is milled or is a temporary surface made of loose material, or when directed by the engineer a W8-15 (Grooved Pavement) or W8-7 (Loose Gravel) sign shall be used on mainline approaches. This sign should be placed a "C" distance after the W20-1 (Road Work Ahead) sign. A W8-15p motorcycle plaque shall be used to supplement the W8-15 or W8-7 signs. All signs shall be displayed as long as the condition is present.

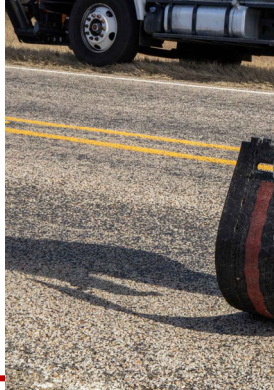
6) Alternative temporary rumble strip options may be available. Please contact the Temporary Traffic Control Unit for more information at 785-296-1179 or 785-296-1183.



Kansas
Department of Transportation

7

skirting the work site or making a midblock crossing.

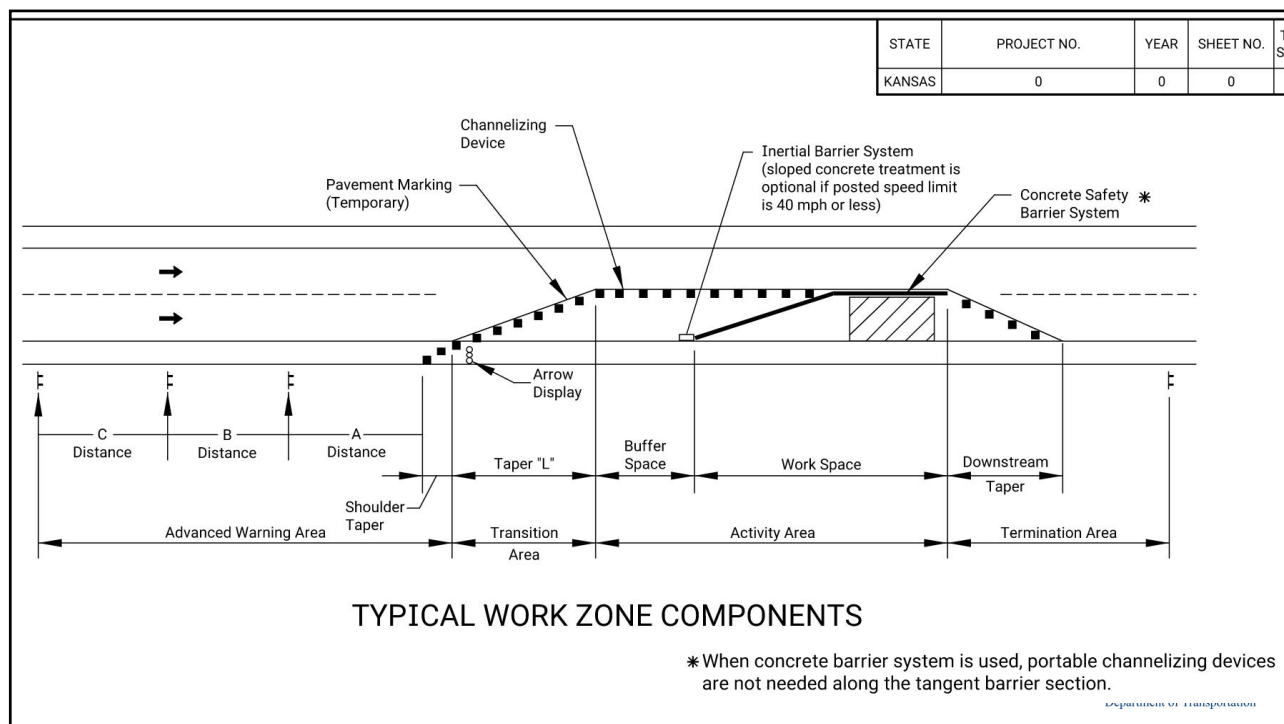


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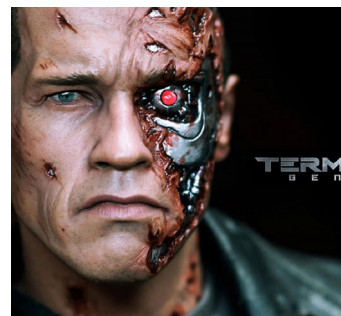
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9

Workzone Areas

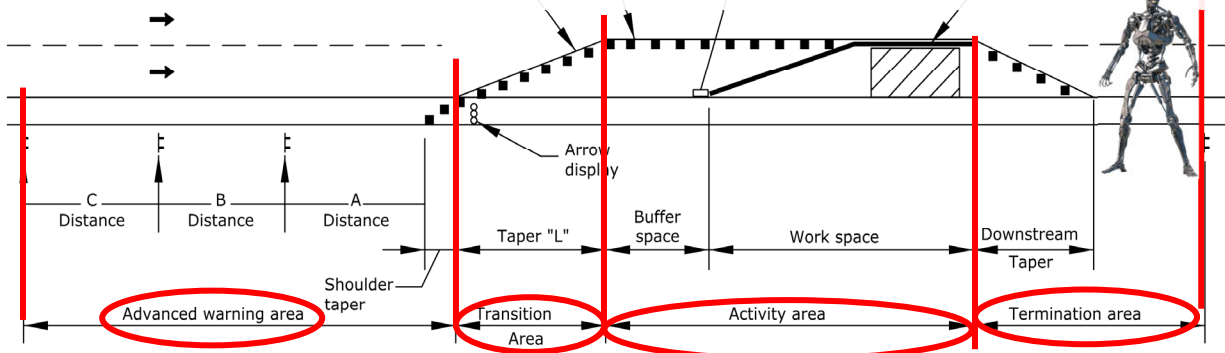
- **ADVANCE WARNING AREA** - TELLS TRAFFIC WHAT TO EXPECT AHEAD!!! INCLUDES THE SHOULDER TAPER.
- **TRANSITION AREA** - MOVES TRAFFIC OUT OF ITS NORMAL PATH.
- **ACTIVITY AREA** - IS WHERE THE WORK TAKES PLACE AND INCLUDES, THE BUFFER SPACE WHICH PROVIDES PROTECTION FOR TRAFFIC AND WORKERS AND THE WORK SPACE WHICH IS SET ASIDE FOR WORKERS, EQUIPMENT, AND MATERIAL STORAGE.
- **TERMINATION AREA** - LETS TRAFFIC RESUME NORMAL OPERATIONS. INCLUDES A BUFFER SPACE AND A DOWNSTREAM TAPER.



10

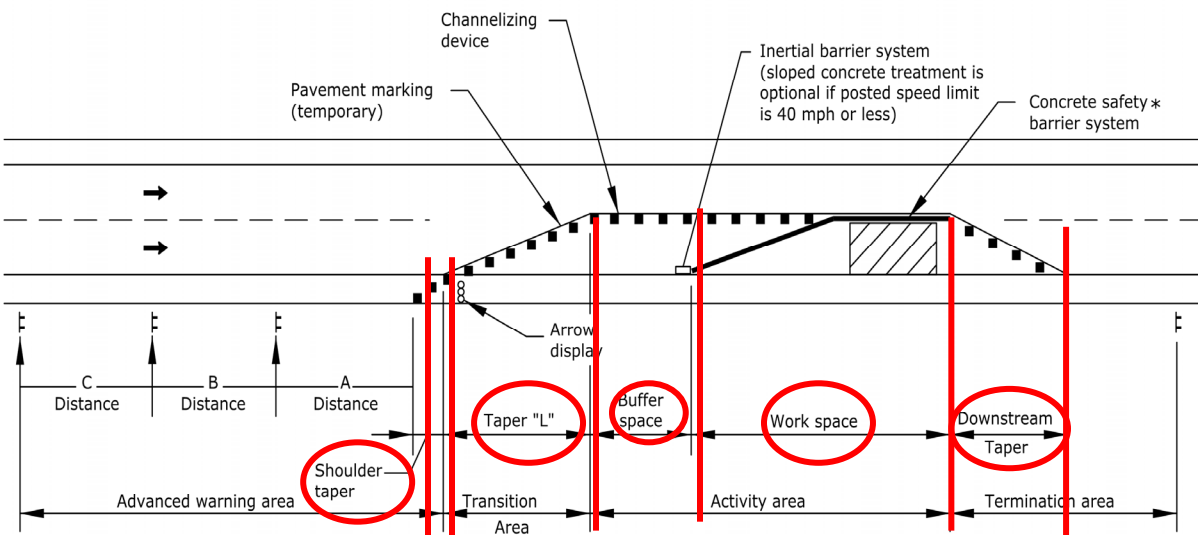
Work Areas

- **ADVANCE WARNING AREA** - TELLS TRAFFIC WHAT TO EXPECT AHEAD !!! INCLUDES SHOULDER TAPER.
- **TRANSITION AREA** - MOVES TRAFFIC OUT OF ITS NORMAL PATH.
- **ACTIVITY AREA** - IS WHERE THE WORK TAKES PLACE AND INCLUDES, THE BUFFER SPACE WHICH PROVIDES PROTECTION FOR TRAFFIC AND WORKERS AND THE WORK SPACE WHICH IS SET ASIDE FOR WORKERS, EQUIPMENT, AND MATERIAL STORAGE.
- **TERMINATION AREA** - LETS TRAFFIC RESUME NORMAL OPERATIONS. INCLUDES A BUFFER SPACE AND A DOWNSTREAM TAPER.



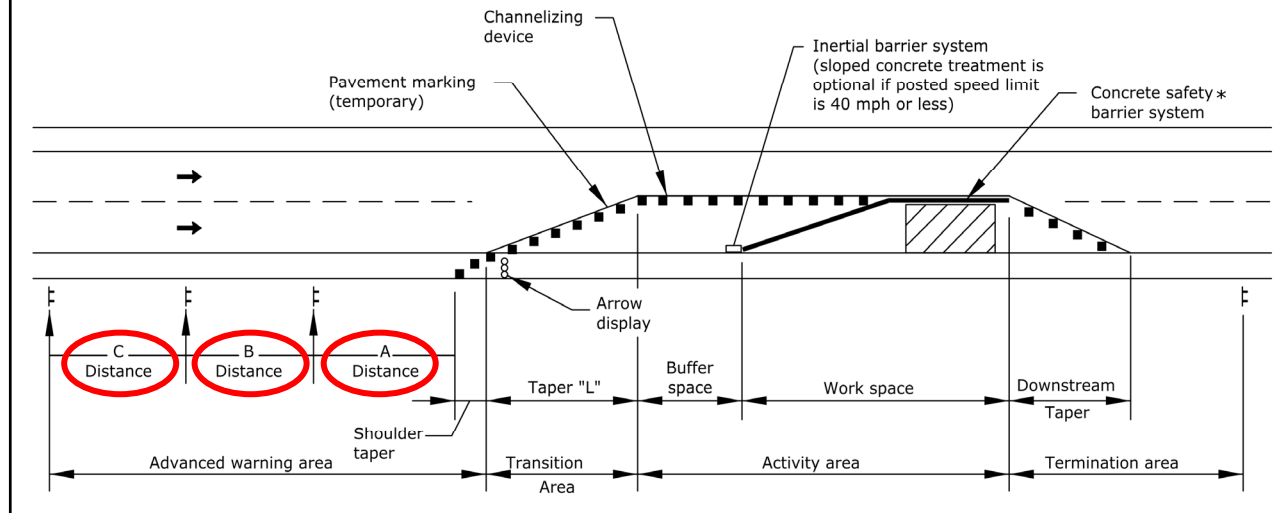
11

Work Spaces



12

Sign Distances



13

Minimum advance warning sign spacing (in feet):

SPEED (MPH) *	A	B	C
URBAN (40 MPH OR LOWER)	100	100	100
URBAN (45 MPH OR HIGHER)	350	350	350
RURAL (55 MPH OR LOWER)	500	500	500
RURAL (60 MPH OR HIGHER)	750	750	750
EXPRESSWAY/FREEWAY	1000	1500	2640

* Posted speed prior to work starting
The minimum spacing between signs shall be no less than 100', unless directed by the engineer. The spacing between any signs may be increased beyond the minimum values in the table above as approved by the engineer in order to maximize visibility.

Taper Formulas:

$L = WS$ for speeds of 45 MPH or more

$L = WS^2/60$ for speeds of 40 MPH or less

Where: L = Minimum length of taper in feet
S = Numerical value of posted speed prior to work starting in MPH
W = Width in offset feet

Shifting Taper=1/2 L
Shoulder Taper=1/3 L

Channelizer Placement:

- (1) The spacing between devices in transition area (taper) should not exceed a distance in feet equal to 1/2 the posted speed limit in mph prior to work starting.
- (2) The spacing between devices in the advanced warning area and the activity area should not exceed a distance in feet equal to two times the posted speed limit in mph prior to work starting.
- (3) Channelizing devices shall be placed for optimum visibility, normally at right angles to the traffic flow.
- (4) Place directional indicator barricades in series to direct traffic onto the new path. The arrow sign should not be visible to opposing traffic.
- (5) Alternating diagonal orange and white striping must slope downward in the direction traffic is expected to pass.

Buffer Space

SPEED (MPH) *	20	25	30	35	40	45	50	55	60	65	70	75
LENGTH (ft)	115	155	200	250	305	360	425	495	570	645	730	820

* Posted speed prior to work starting
Neither work activity nor storage of equipment, vehicles, or material should occur in the buffer space. When a protection vehicle is placed in advance of the work space, only the space upstream of the vehicle constitutes the buffer space.

If temporary concrete safety barrier system is used to separate approaching traffic from the work space, the barrier system shall be considered part of the activity area. A full lane width should be available throughout the length of the buffer space. See typical work zone components above.

NO.	DATE	REVISIONS	BY	APP'D
02	03-13-18	W8-150 usage changed to Shall	R.W.B.	E.K.G.
01	08-18-15	Channelizer spacing info	R.W.B.	K.E.

KANSAS DEPARTMENT OF TRANSPORTATION

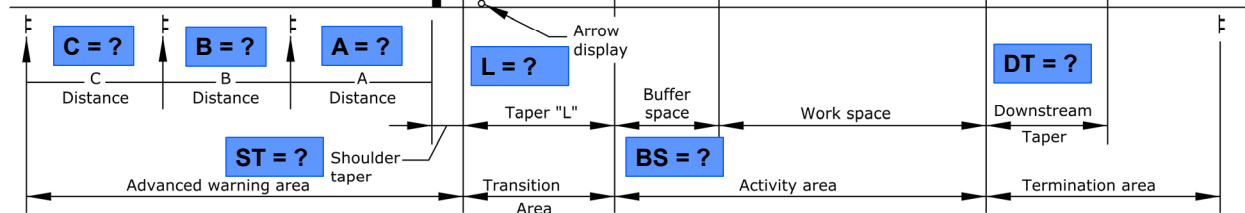
TRAFFIC CONTROL GENERAL NOTES

TE700

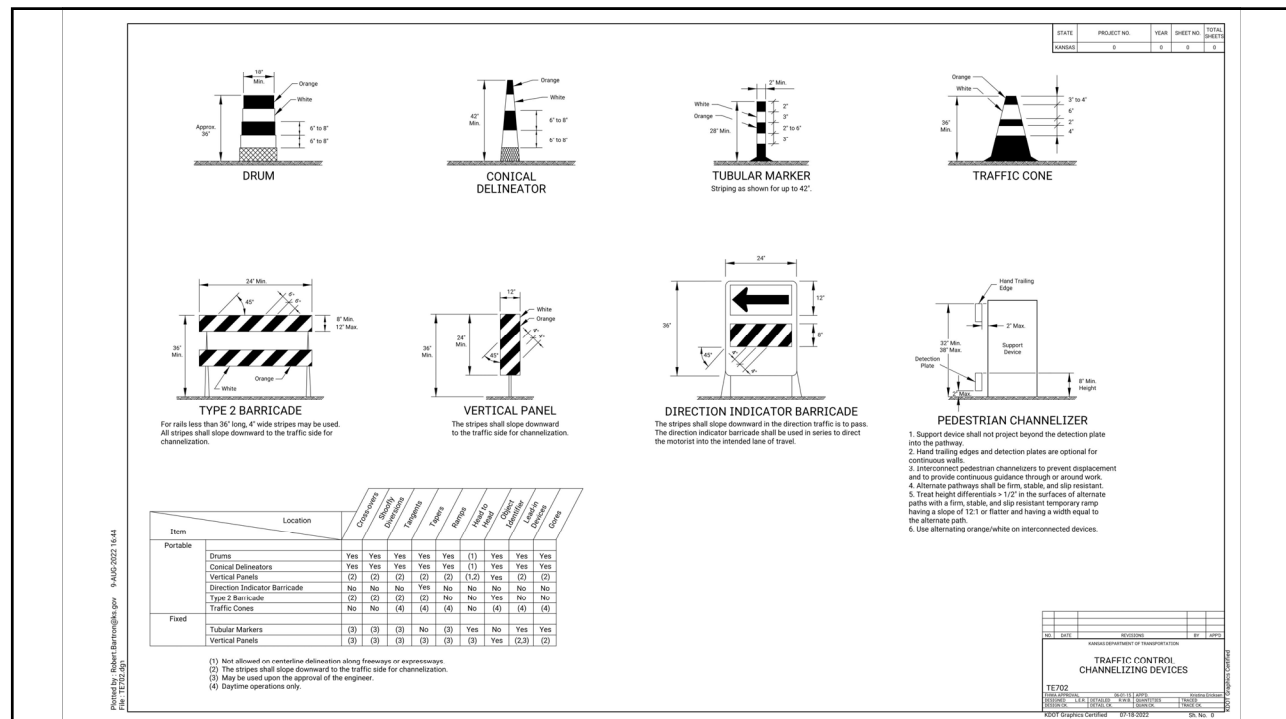
DESIGNED BY: B.A.H. | DETAILED BY: R.W.B. | QUANTITIES BY: T.R.C. | TRACED BY: T.R.C. | CHECKED BY: T.R.C. | DATE: 03-13-18 | APP'D: Eric Koster

KDOT Graphics Certified 03/13/2022 Sh. No. 0

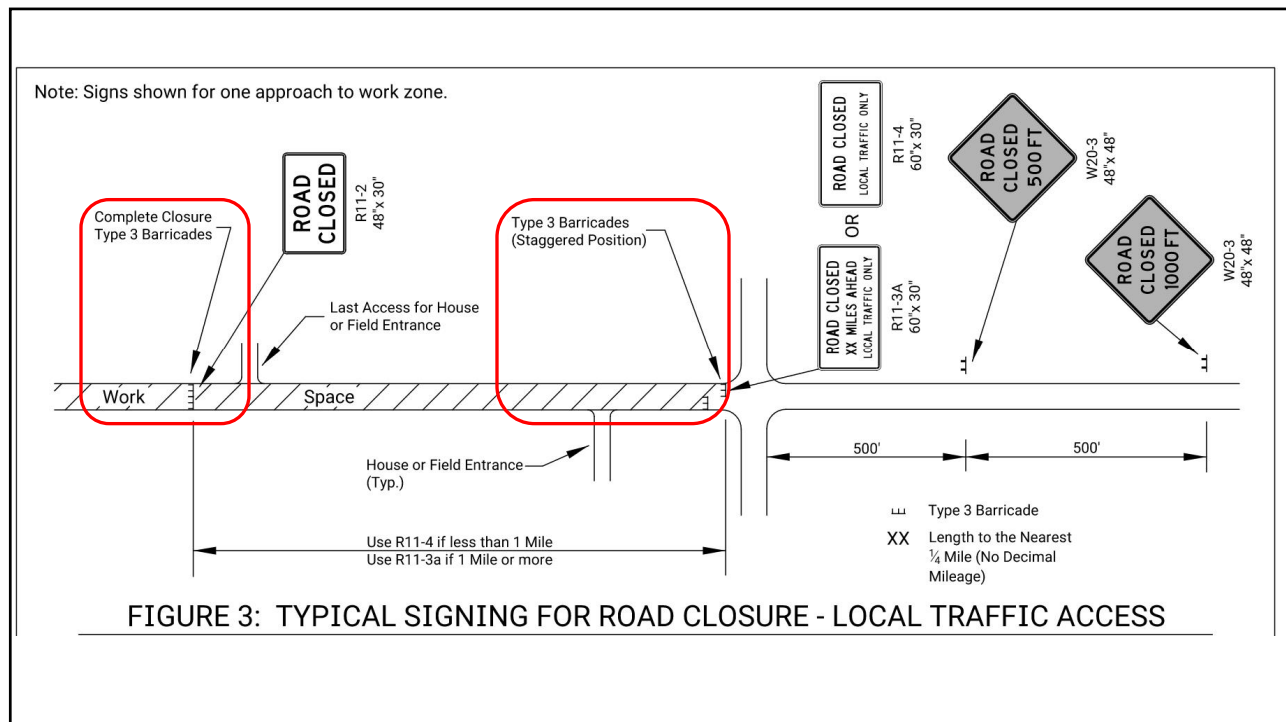
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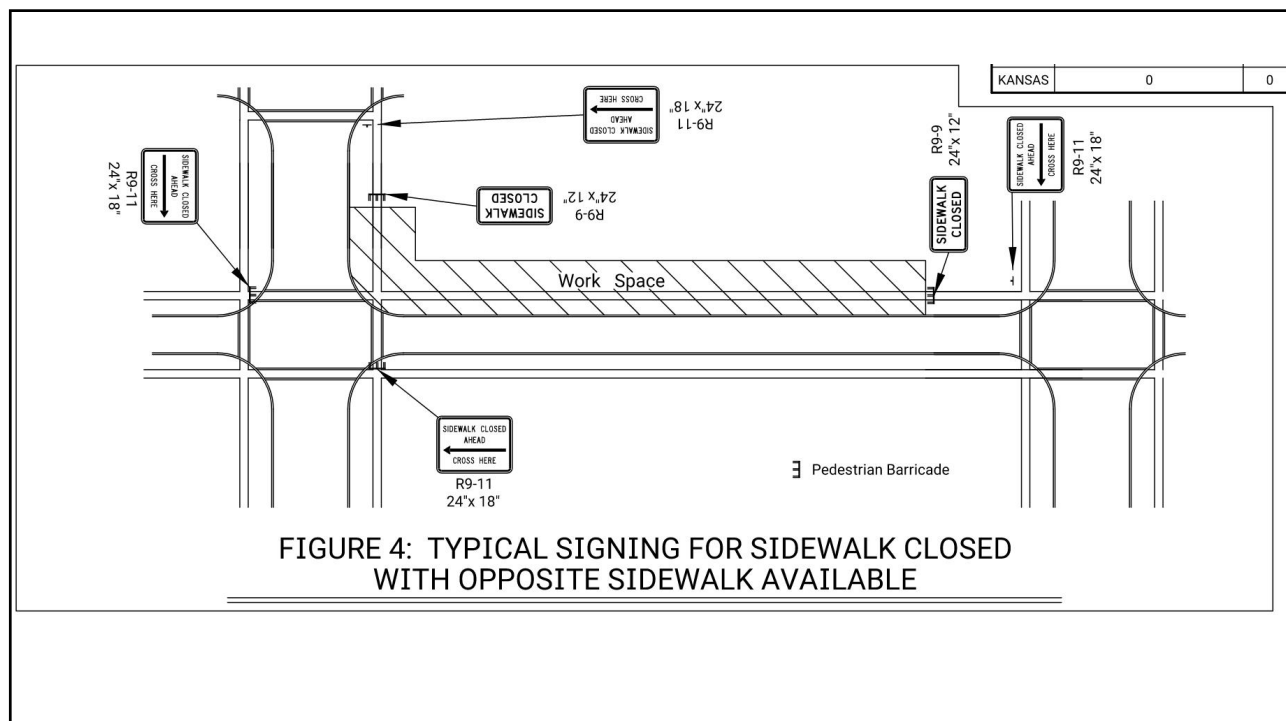
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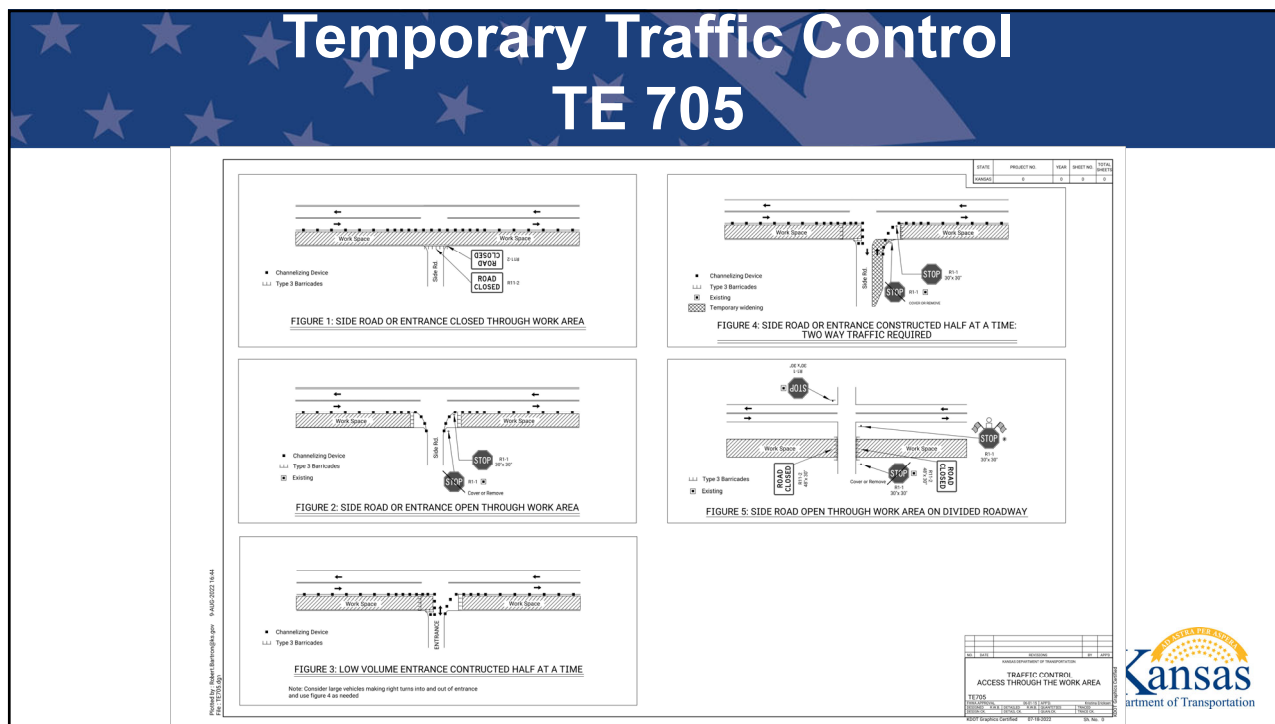
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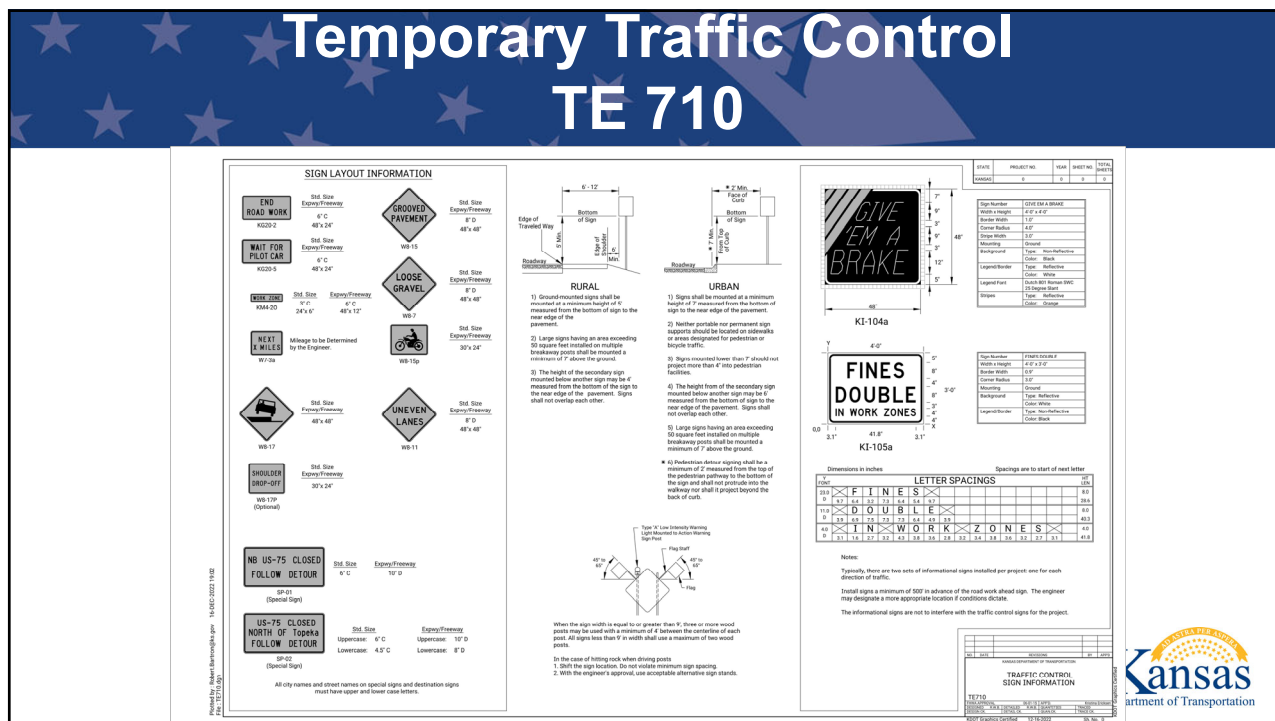
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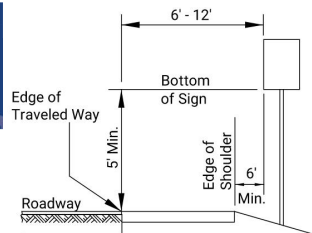
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Temporary Traffic Control TE 710

SIGN LAYOUT INFORMATION

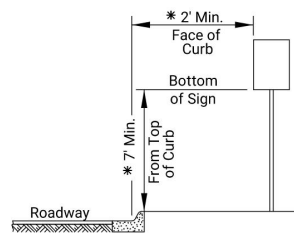
	<table><tr><td>Std. Size</td><td>Expy/Freeway</td></tr><tr><td>6' C</td><td>48"x 24"</td></tr></table>	Std. Size	Expy/Freeway	6' C	48"x 24"		<table><tr><td>Std. Size</td><td>Expy/Freeway</td></tr><tr><td>8' D</td><td>48"x 48"</td></tr></table>	Std. Size	Expy/Freeway	8' D	48"x 48"
Std. Size	Expy/Freeway										
6' C	48"x 24"										
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	<table><tr><td>Std. Size</td><td>Expy/Freeway</td></tr><tr><td>3' C</td><td>6' C</td></tr><tr><td>24"x 6"</td><td>48"x 12"</td></tr></table>	Std. Size	Expy/Freeway	3' C	6' C	24"x 6"	48"x 12"				
Std. Size	Expy/Freeway										
3' C	6' C										
24"x 6"	48"x 12"										
	Mileage to be Determined by the Engineer.		<table><tr><td>Std. Size</td><td>Expy/Freeway</td></tr><tr><td>30"x 24"</td><td></td></tr></table>	Std. Size	Expy/Freeway	30"x 24"					
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23



RURAL

- 1) Ground-mounted signs shall be mounted at a minimum height of 5' measured from the bottom of sign to the near edge of the pavement.
- 2) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.
- 3) The height of the secondary sign mounted below another sign may be 4' measured from the bottom of the sign to the near edge of the pavement. Signs shall not overlap each other.



URBAN

- 1) Signs shall be mounted at a minimum height of 7' measured from the bottom of sign to the near edge of the pavement.
- 2) Neither portable nor permanent sign supports should be located on sidewalks or areas designated for pedestrian or bicycle traffic.
- 3) Signs mounted lower than 7' should not project more than 4" into pedestrian facilities.
- 4) The height from of the secondary sign mounted below another sign may be 6' measured from the bottom of sign to the near edge of the pavement. Signs shall not overlap each other.
- 5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

24



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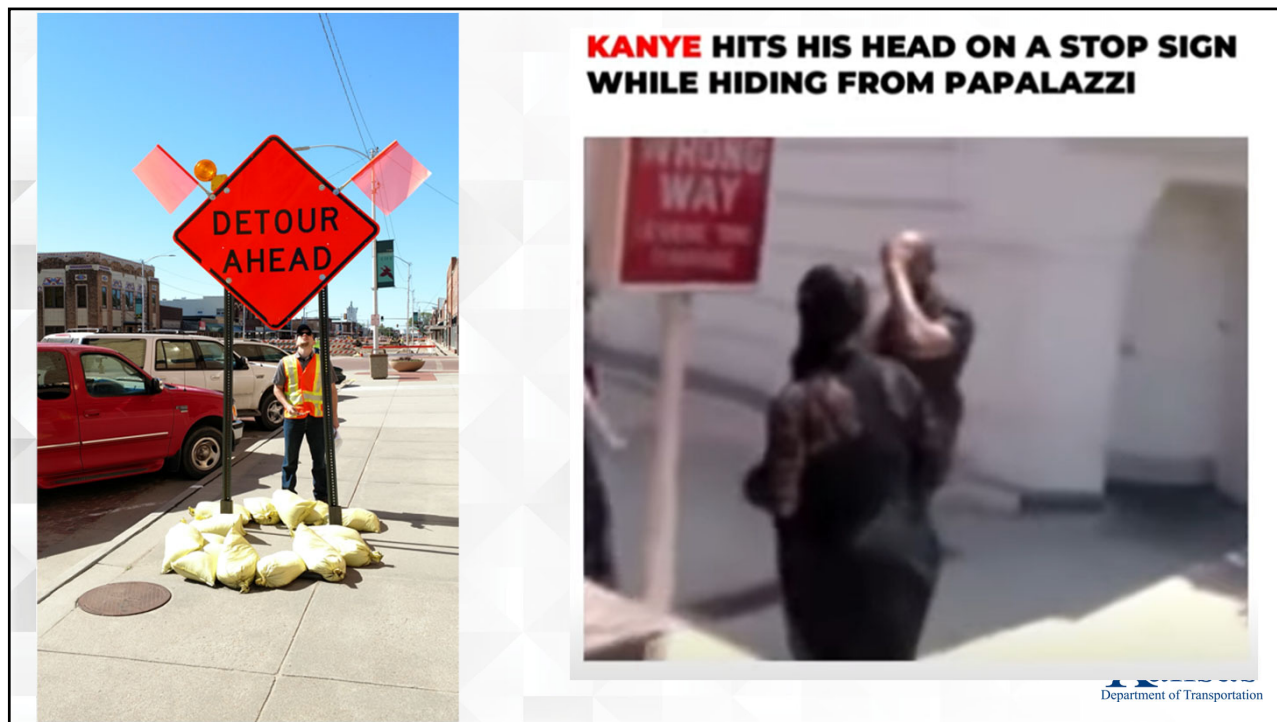
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- 5) Large signs having an area exceeding 50 square feet installed on multiple breakaway posts shall be mounted a minimum of 7' above the ground.

26



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Temporary Traffic Control

TF 710

48"

48"

KI-104a

KANSAS: XX-XX XX-XXXX-XX XXXX XXX X	
SIGN NUMBER	GIVE EM A BRAKE
WIDTH x HEIGHT	4'-0" x 4'-0"
BORDER WIDTH	1.0"
CORNER RADIUS	4.0"
STRIPE WIDTH	3.0"
MOUNTING	GROUND
BACKGROUND	TYPE: NON-REFLECTIVE COLOR: BLACK
LEGEND/BORDER	TYPE: REFLECTIVE COLOR: WHITE
LEGEND FONT	DUTCH 801 ROMAN SWC 25 DEGREE SLANT
STRIPES	TYPE: REFLECTIVE COLOR: ORANGE

41.8"

3'-0"

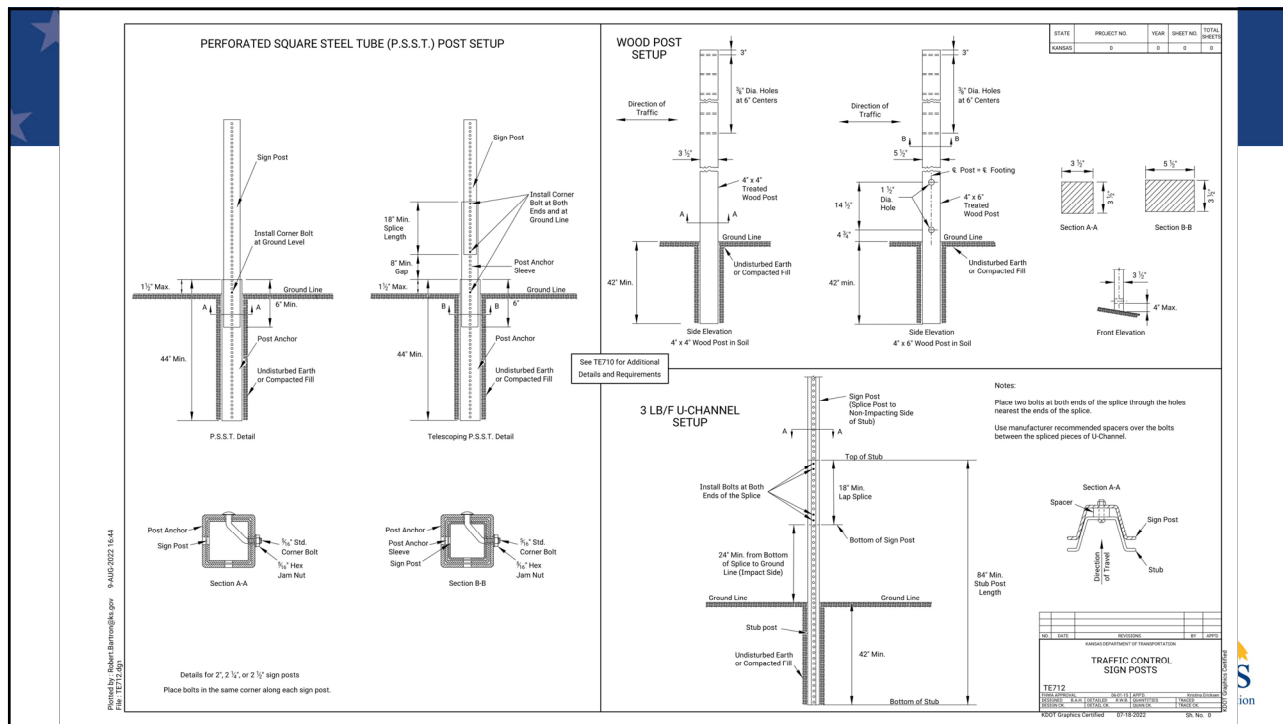
KI-105a

SIGN NUMBER	FINES DOUBLE
WIDTH x HEIGHT	4'-0" x 3'-0"
BORDER WIDTH	0.5"
CORNER RADIUS	3.0"
MOUNTING	GROUND
BACKGROUND	TYPE: REFLECTIVE COLOR: WHITE
LEGEND/BORDER	TYPE: NON-REFLECTIVE COLOR: BLACK

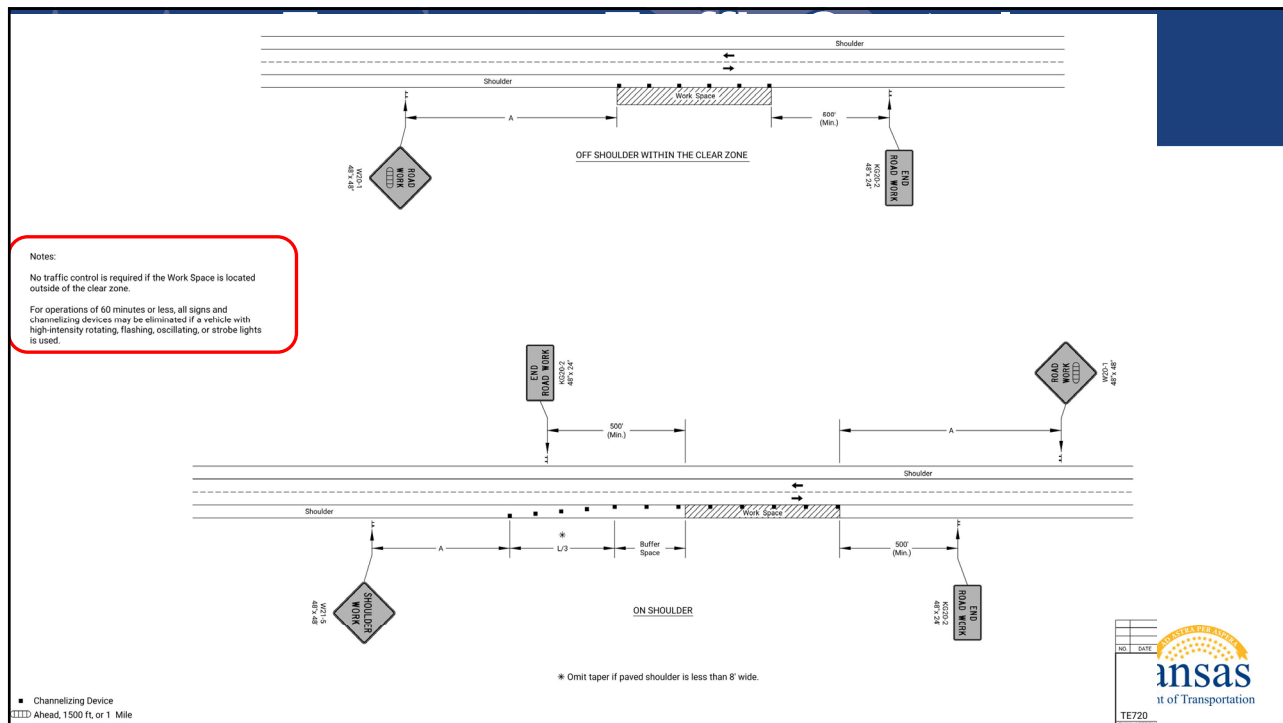
DIMENSIONS IN INCHES SPACINGS ARE TO START OF NEXT LETTER

Y		LETTER SPACINGS																HT	
FONT																		LEN	
23.0	D	9.7	6.4	3.2	7.3	6.4	5.4	9.7											8.0
																			28.6
11.0	D	3.9	6.9	7.5	7.3	7.3	6.4	4.9	3.9										8.0
																			40.3
4.0	D	3.1	1.6	2.7	3.2	4.3	3.8	3.6	2.8	3.2	3.4	3.8	3.6	3.2	2.7	3.1			4.0
																			41.8

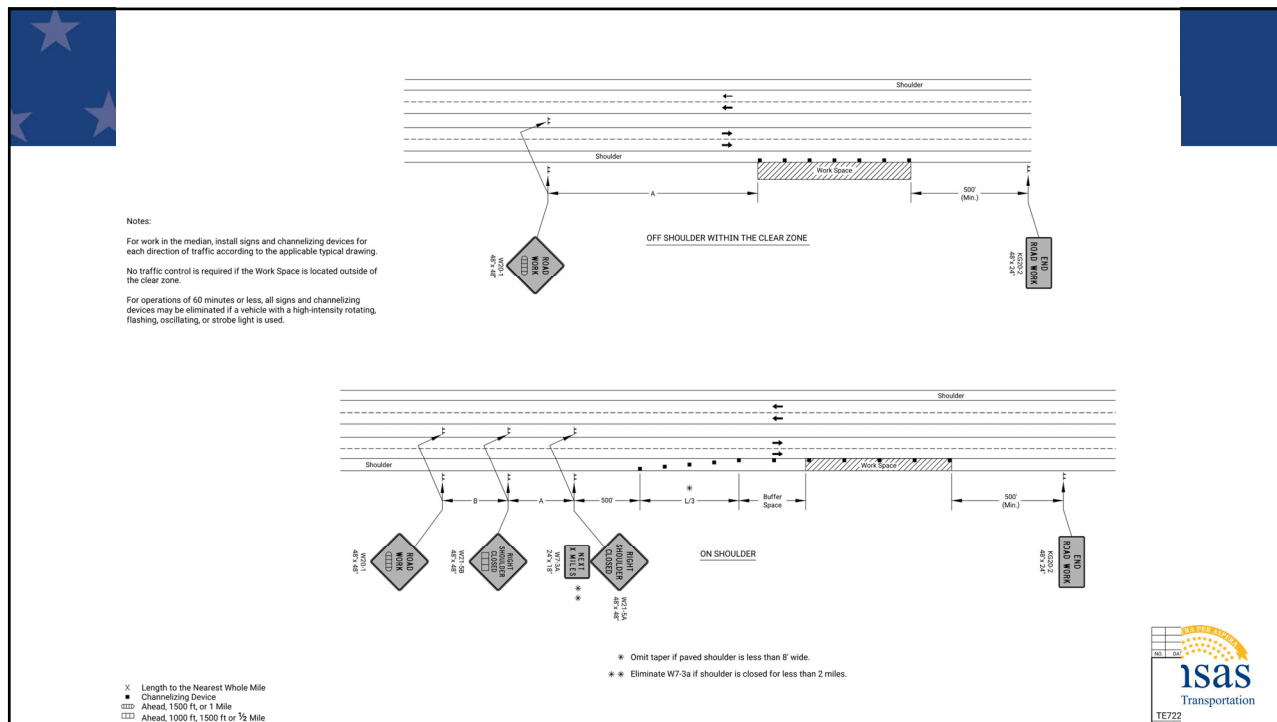
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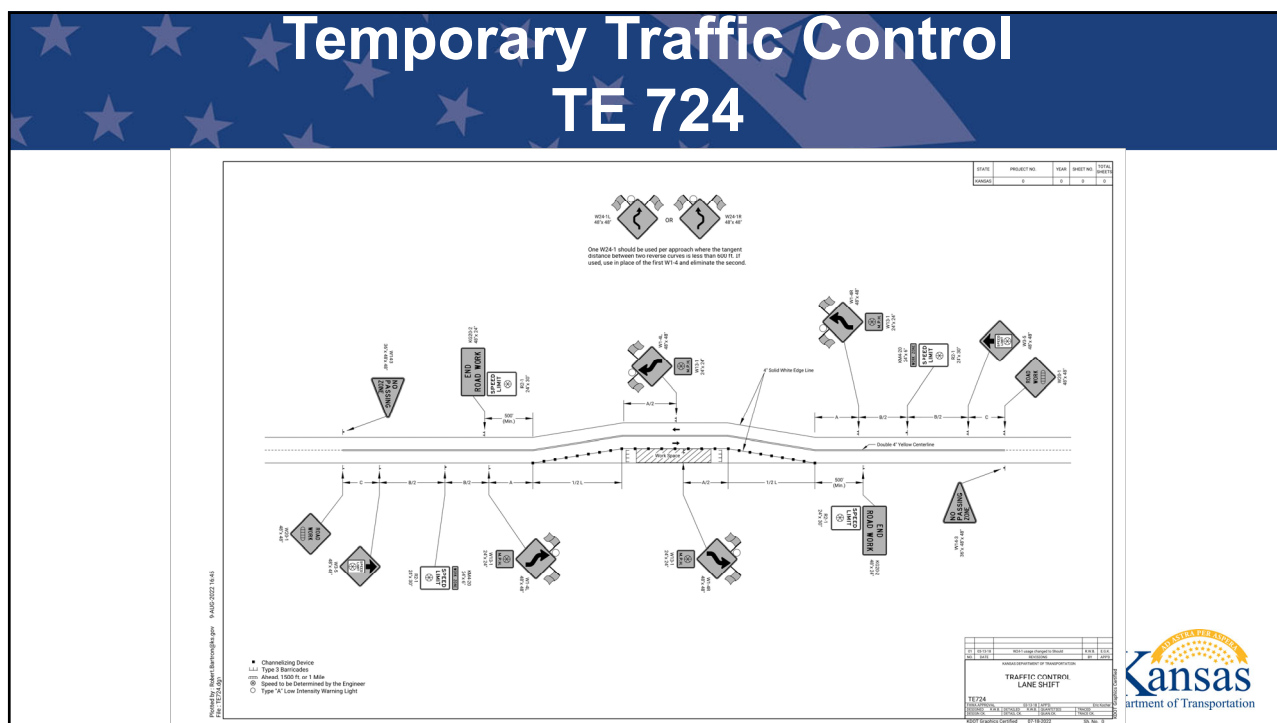
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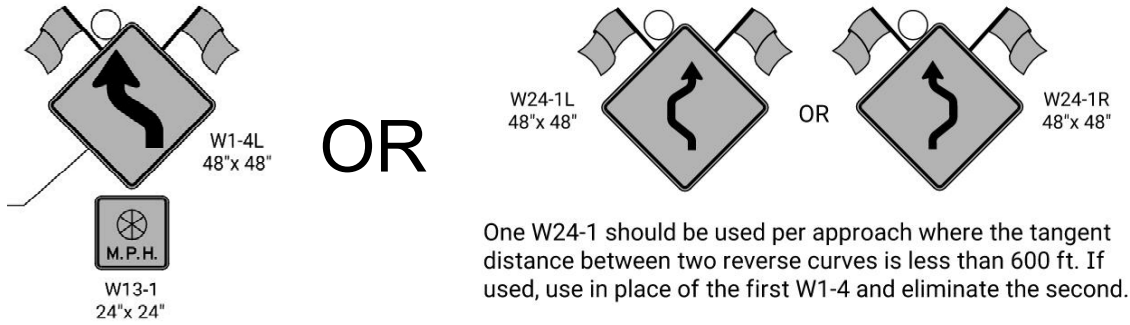


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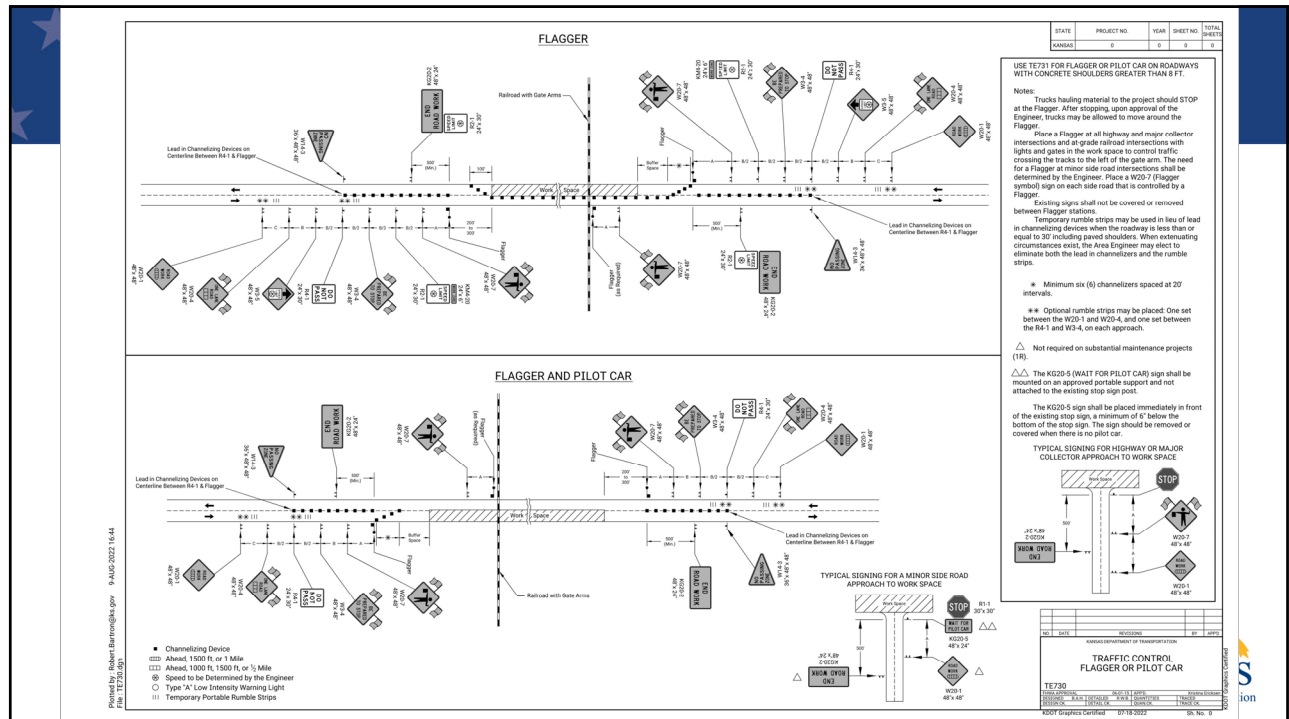


32

Temporary Traffic Control TE 724



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[illegible]

36

Temporary Traffic Control TE 730 (3)

109

Temporary Traffic Control
TE 730

USE TE731 FOR FLAGGER OR PILOT CAR ON ROADWAYS WITH CONCRETE SHOULDERS GREATER THAN 8 FT.

Notes:

Trucks hauling material to the project should STOP at the Flagger. After stopping, upon approval of the Engineer, trucks may be allowed to move around the Flagger.

Place a Flagger at all highway and major collector intersections and at-grade railroad intersections with lights and gates in the work space to control traffic crossing the tracks to the left of the gate arm. The need for a Flagger at minor side road intersections shall be determined by the Engineer. Place a W20-7 (Flagger symbol) sign on each side road that is controlled by a Flagger.



37

Temporary Traffic Control TE 730 (4)

at the Flagger. After stopping, upon approval of the Engineer, trucks may be allowed to move around the Flagger.

Place a Flagger at all highway and major collector intersections and at-grade railroad intersections with lights and gates in the work space to control traffic crossing the tracks to the left of the gate arm. The need for a Flagger at minor side road intersections shall be determined by the Engineer. Place a W20-7 (Flagger symbol) sign on each side road that is controlled by a Flagger.

Existing signs shall not be covered or removed between Flagger stations.

Temporary rumble strips may be used in lieu of lead in channelizing devices when the roadway is less than or equal to 30' including paved shoulders. When extenuating circumstances exist, the Area Engineer may elect to



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Temporary Traffic Control

TE 730 (5)

between the W20-1 and W20-4, and one set between the R4-1 and W3-4, on each approach.

△ Not required on substantial maintenance projects (1R).

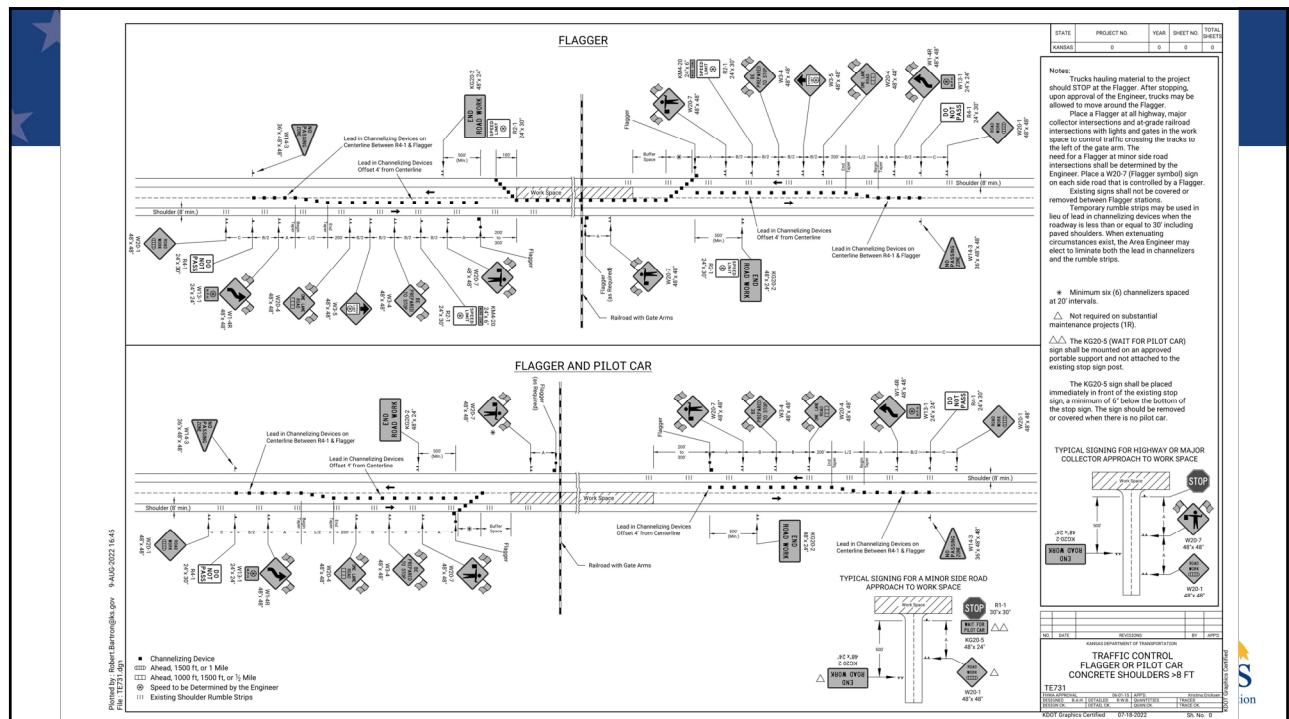
△△ The KG20-5 (WAIT FOR PILOT CAR) sign shall be mounted on an approved portable support and not attached to the existing stop sign post.

The KG20-5 sign shall be placed immediately in front of the existing stop sign, a minimum of 6" below the bottom of the stop sign. The sign should be removed or covered when there is no pilot car.

TYPICAL SIGNING FOR HIGHWAY OR MAJOR COLLECTOR APPROACH TO WORK SPACE



40



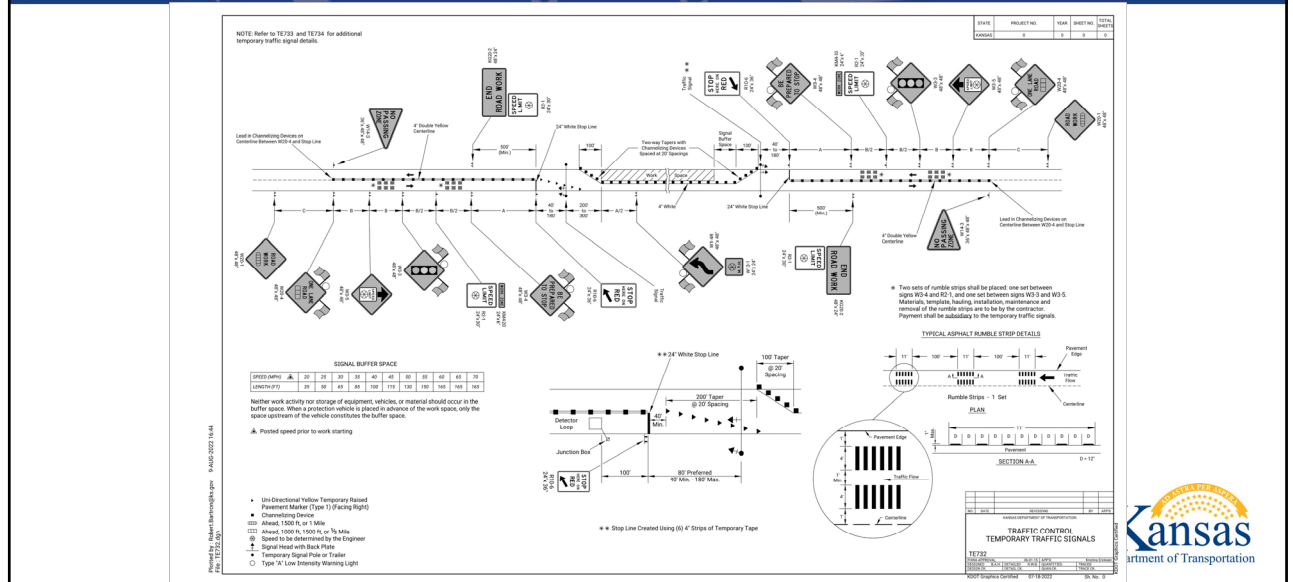
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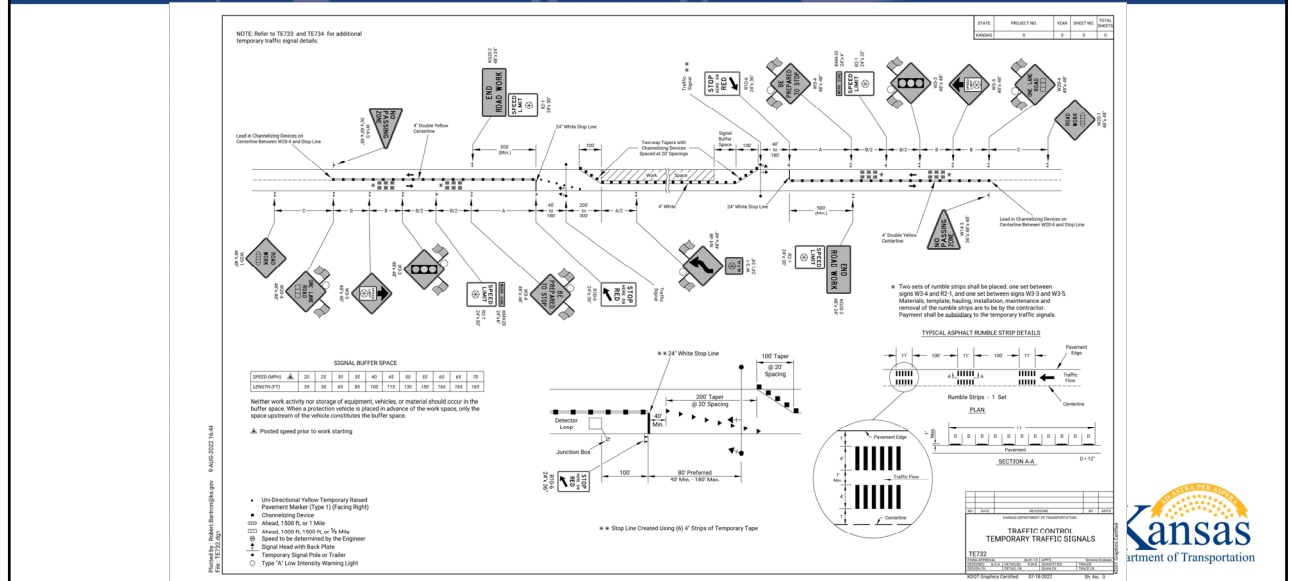
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112

Temporary Traffic Control
TE 732 – Temp traffic signals

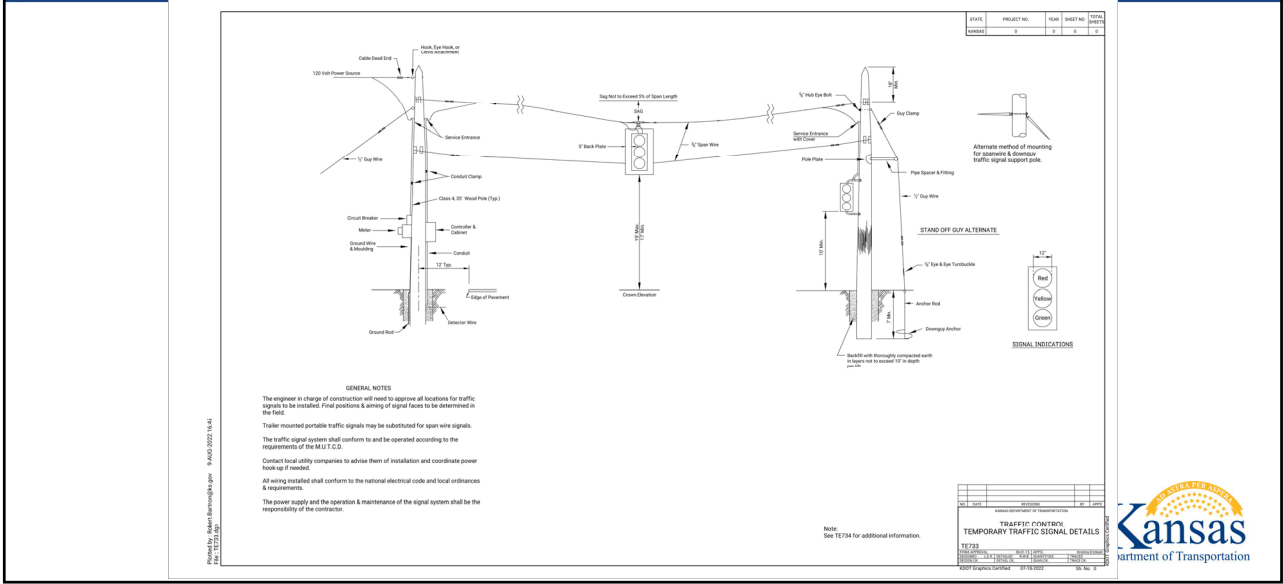


Temporary Traffic Control
TE 732 – Closure w/ temp traffic signals



Temporary Traffic Control

TE 733 – Traffic Control Temp Signal



45



46

r2



47



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TE 734

equipment shall be designed in such a manner that the normal dwell condition shall be an "all red" signal display. Upon receipt of a detector actuation from one approach, the signal facing that approach shall cycle to a green indication for a minimum period (minimum green). Subsequent detector actuations from the same direction shall result in additional green time being allocated to that movement (unit extension). In the event that an actuation exists for the direction of travel not having the right of way, a maximum green time setting shall provide a preset time limit for the direction having the right of way.

The control equipment shall provide for different clearance sequences, one for each required phase.

If the green indication has been displayed to one approach to the zone, no vehicle actuation exists on the opposite approach and another actuation occurs during the yellow display to the approach just serviced, the display shall proceed to an all red display for a period of time (red event) to prevent the display of green - yellow - green indications to the motorist.

If the right of way is to be transferred to another approach, an all red indication shall be provided so that opposing traffic does not meet within the one way zone.

Response to a vehicle actuation from another approach shall be immediate if all timings have expired. In the event that all time settings have not expired at the point at which a vehicle actuation occurs, the system shall continue to display the appropriate clearance interval timings before acting upon an actuation input.

Vehicle actuations received from the detector at approaches other than that which last received a green indication shall have preference over additional actuations received from the end which last had the right of way in the event that any clearance interval timings have not expired when the actuation(s) occurs. If all timings have expired, response shall be on a first come, first served basis.

All time settings shall be user adjustable and shall be accomplished from the equipment front panel by way of a keyboard and menu screen format. All applicable portions of the KDOT standard specifications for vehicle actuation shall apply except that a standard NFEMA conflict monitor shall be acceptable.

Signals shall be capable of actuation. On asphalt roadways, detection loops may be sawed into the road. Commercially made loop mats may also be used. Do not cut loops into concrete pavement. Other types of detection may be used if approved prior to installation by the Engineer. Do not use inductive detection systems in urban areas. Detector shall be set to operate in the locking mode.

If used, detection loops shall be 6' by 6' and have three turns of wire (see detail). Center loops in the lane of traffic and locate 100' behind the stop line. Cut slots in pavement for loops 1/2" wide with 1/4" minimum depth. Fill slots with asphalt or an approved elastic epoxy sealant (concrete pavement) to within 1/8" of pavement surface. Other than a "western union" type splice or approved connector at their junction, feeder cable and loop wire shall be of continuous run with no splices. The loop and the feeder cable connection shall be twisted 2 turns per foot.

SIGNAL PHASING AND TIMING

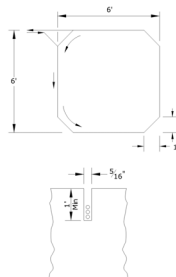


PHASE	MINIMUM GREEN	MAXIMUM GREEN	YELLOW	ALL RED
1	10	60	4	42
2	10	60	4	42

All times in seconds.
Normal dwell shall be "all red".
Unit extension shall be 3.0 seconds.
Red revert shall be 5.0 seconds.

PHASE	STATIONING
NB	STOPLINE 34+40
NB	SIGNAL 35+20
SB	SIGNAL 55+20
SB	STOPLINE 56+20

LOOP DETECTOR DETAIL



STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	128-05 KA-3088-01	2015	66	78

KANSAS DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	
TEMPORARY TRAFFIC SIGNAL DETAILS	
TE734	REVISED
DESIGNED BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
KDOT Graphic Control 09-29-2015	



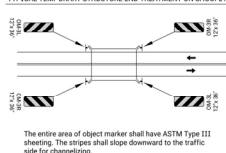
Phasing and Timing

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TE 736

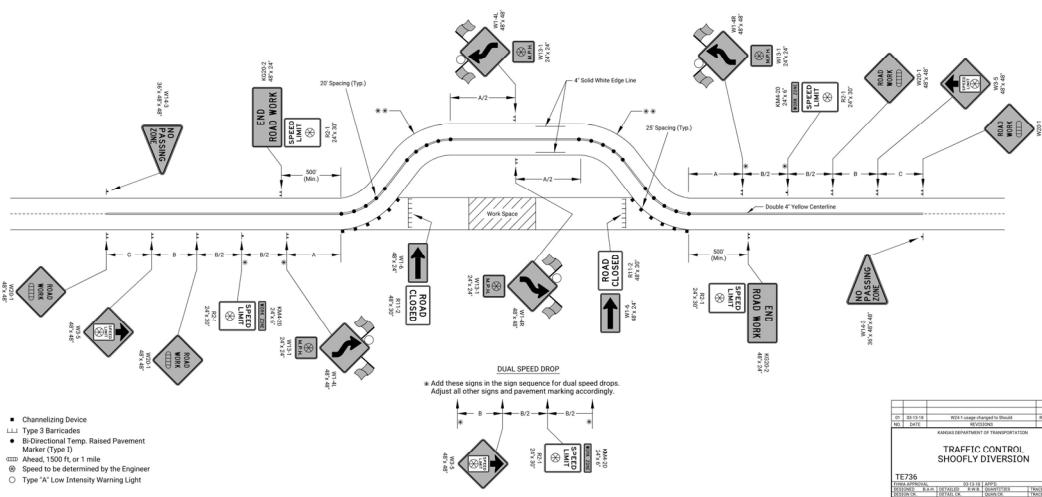
One W24-1 should be used per approach where the tangent distance between two reverse curves is less than 600 ft. If used, use in place of the first W1-4 and eliminate the second.

TYPICAL TEMPORARY STRUCTURE END TREATMENT ON SHOOFLY



** Black on orange 24" x 30" chevron signs (W1-8) shall be mounted back to back on the outside edge of shoofly curves with a radius of 1000' or less at the spacing shown below. A minimum of 3 chevrons should be installed per curve.

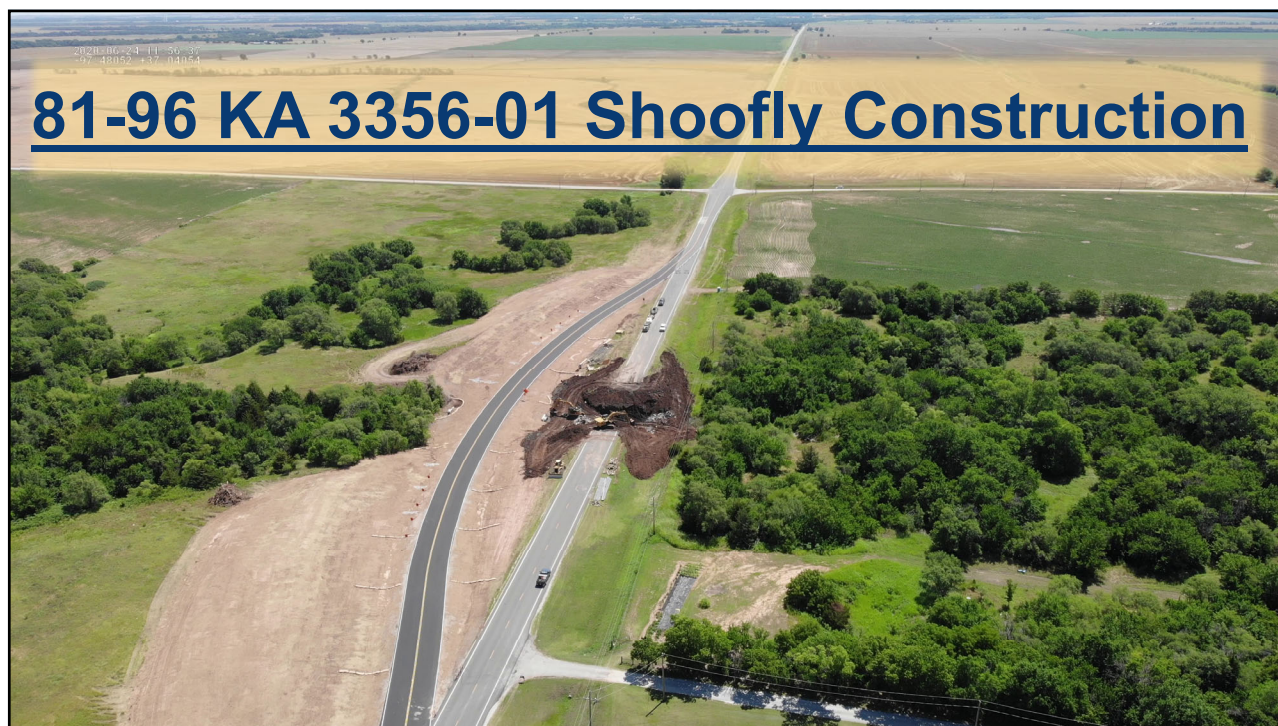
Curve Radius	Max. Spacing
1000' - 800'	100'
800' - 600'	80'
Less than 600'	60'



KANSAS DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	
SHOOFLY DIVERSION	
TE736	REVISED
DESIGNED BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
KDOT Graphic Control 07-18-2015	



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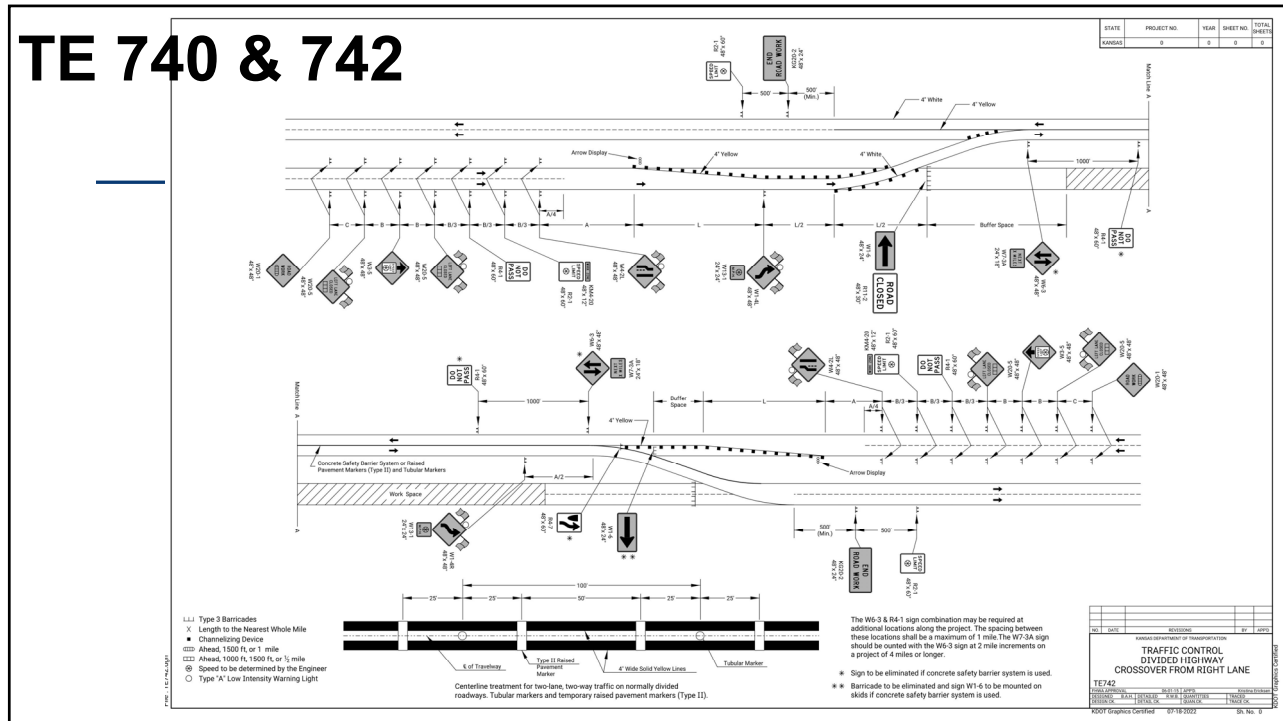


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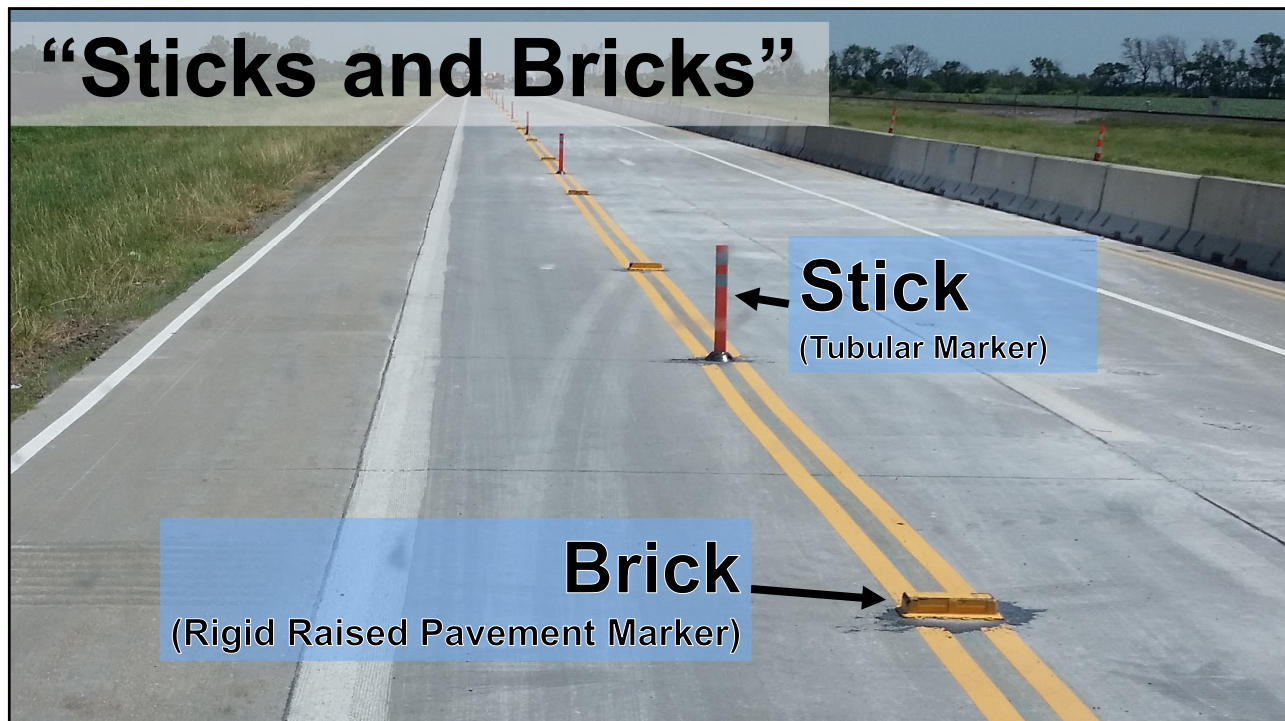


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TE 740 & 742

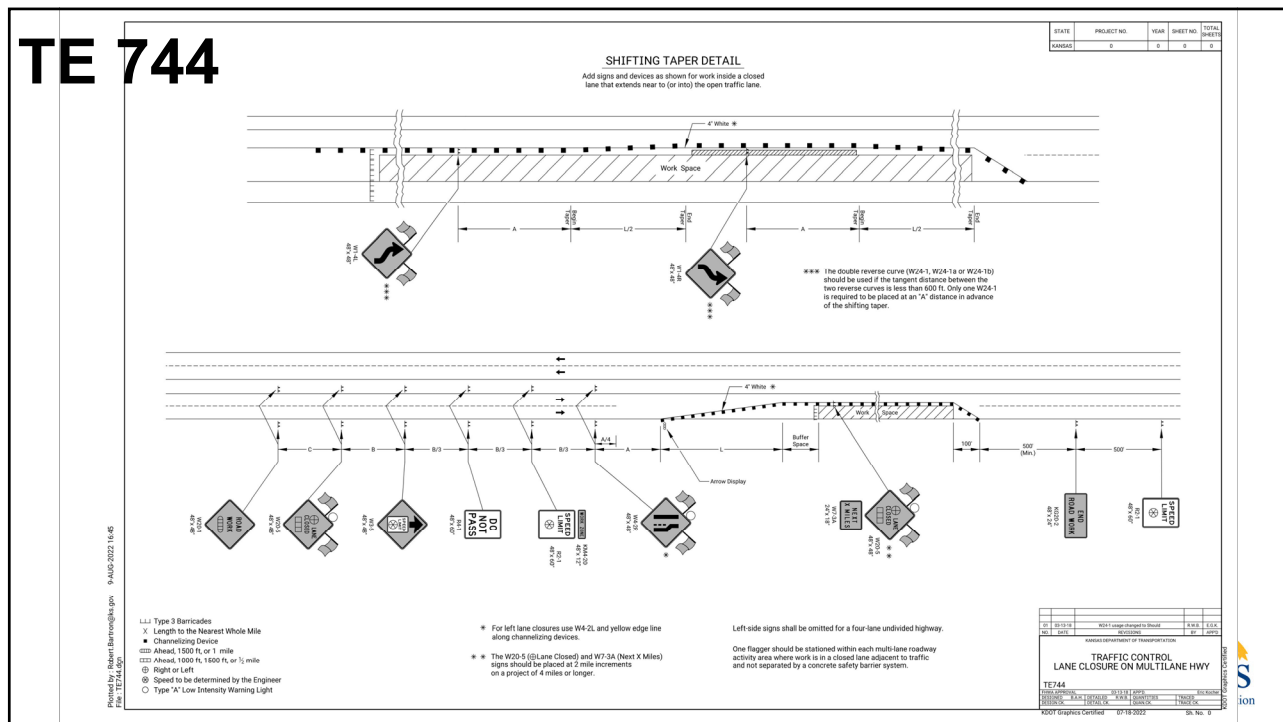


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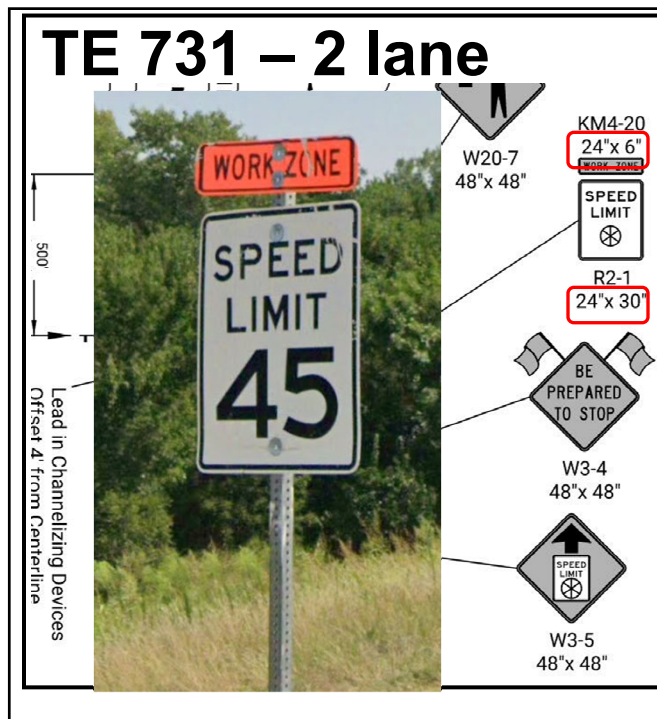
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TE 744

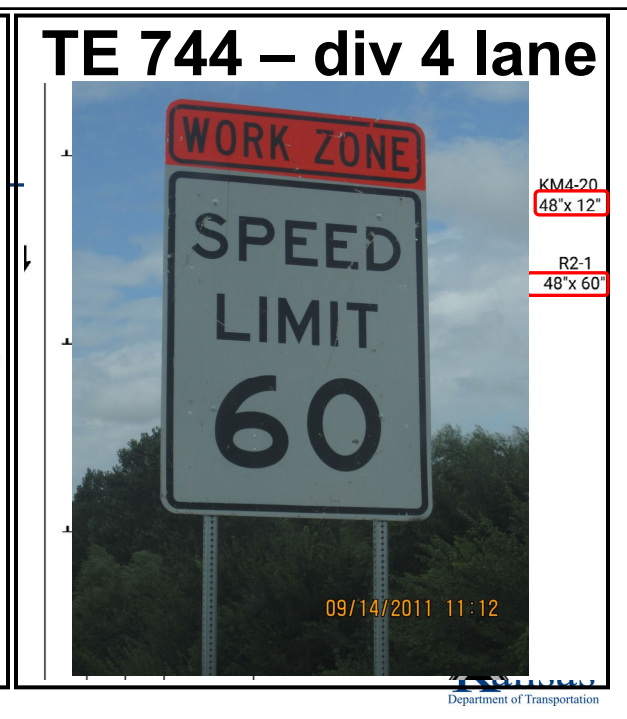


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TE 731 – 2 lane

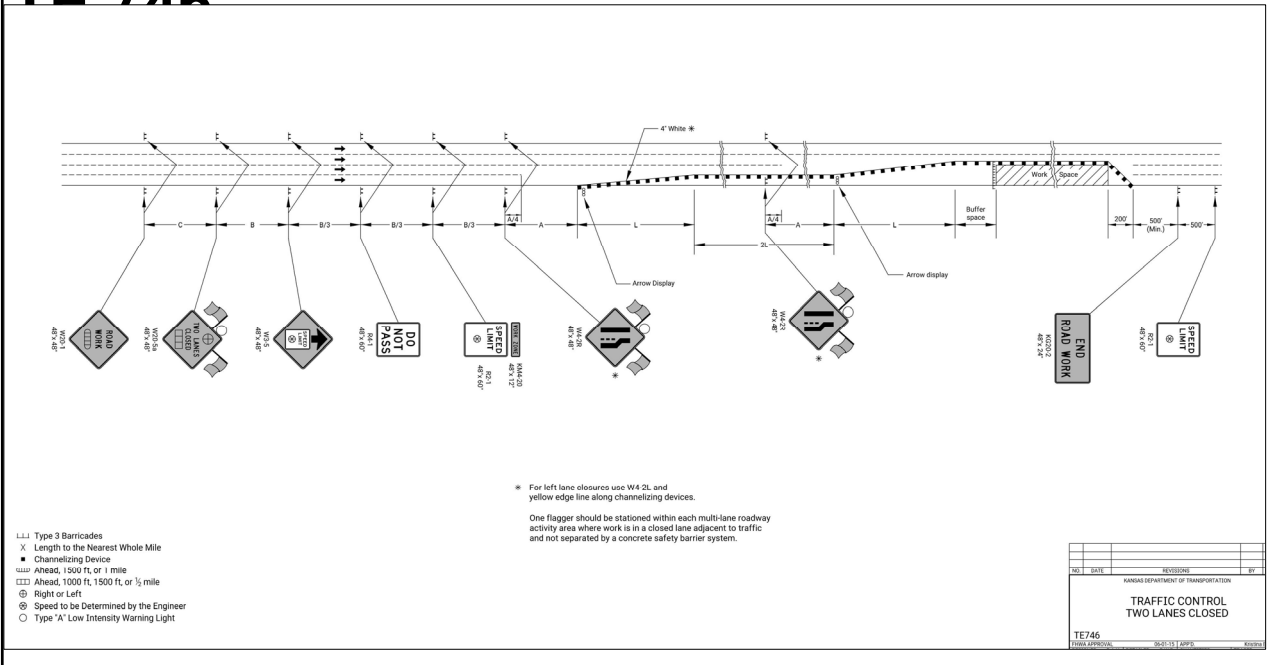


TE 744 – div 4 lane

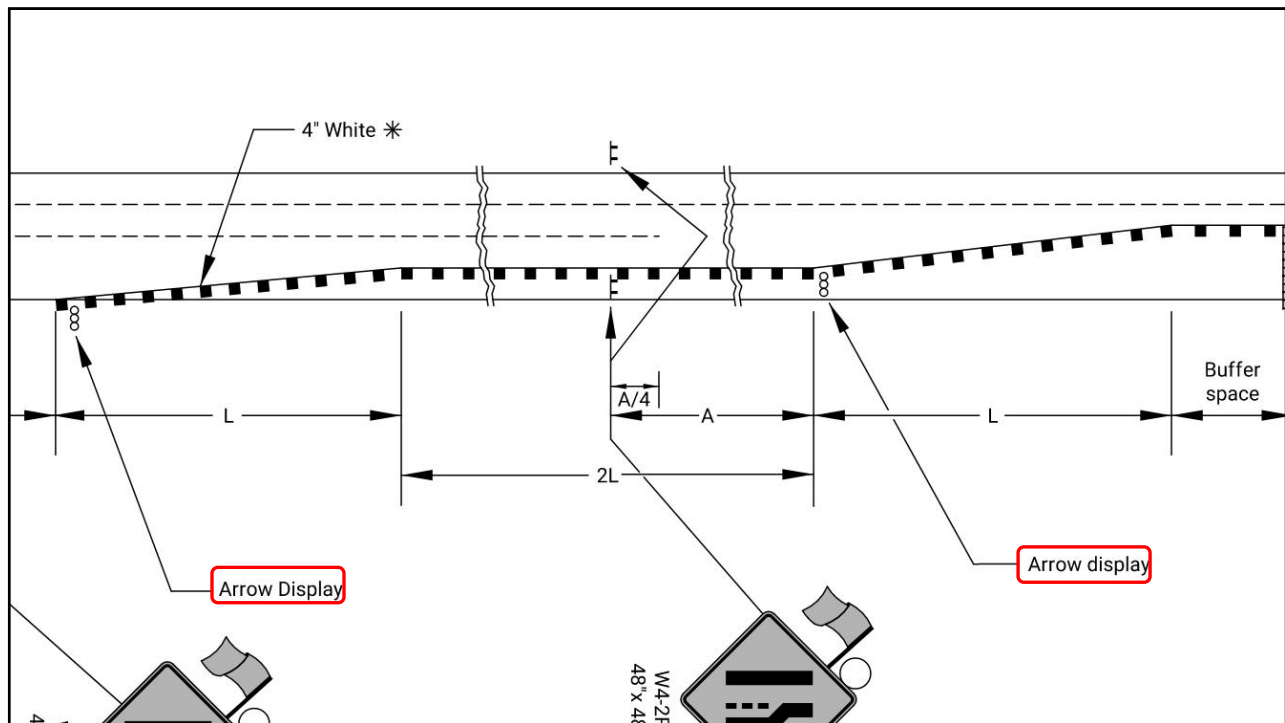


56

TE 746



57



58

[illegible][illegible]

121

TE 795

Number of
Barricades

Barricades *		Channelizing Devices *		
Type 3 (4' To 12')	Pedestrian	Fixed	Portable	Pedestrian
20			100	

Lighted Device Quantities

Lighted Devices *	
Work Zone Warning Light (Type "A" Low Intensity)	10
Work Zone Warning Light (Red Type "B" High Intensity)	2
Arrow Display	
Portable Changeable Message Sign	

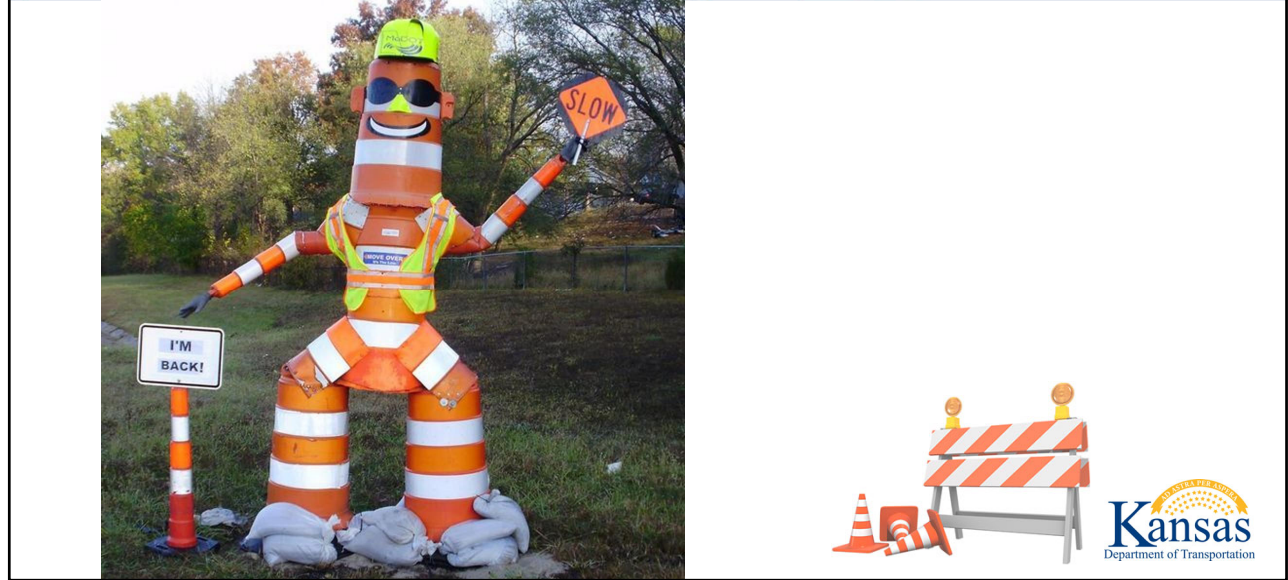
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TE 795 (2)

Recapitulation of Quantities		
Item	Quantity	Unit
Work Zone Signs (0 to 9.25 Sq.Ft.)	46,940	Each Per Day
Work Zone Signs (9.26 to 16.25 Sq.Ft.)	5040	Each Per Day
Work Zone Signs (16.26 Sq.Ft. & Over)		Each Per Day
Work Zone Barricades (Type 3 - 4' to 12')	4410	Each Per Day
Work Zone Barricades (Pedestrian)		Each Per Day
Channelizer (Fixed)		Each Per Day
Channelizer (Portable)	6300	Each Per Day
Channelizer (Pedestrian)		Each Per Day
Work Zone Warning Light (Type "A" Low Intensity)	3780	Each Per Day
Work Zone Warning Light (Red Type "B" High Intensity)		Each Per Day
Arrow Display		Each Per Day
Portable Changeable Message Sign		Each Per Day
Pavement Marking (Temporary)		
4" Solid (Type I)		Sta./Line

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Temporary Traffic Control Traffic Engineering Standards



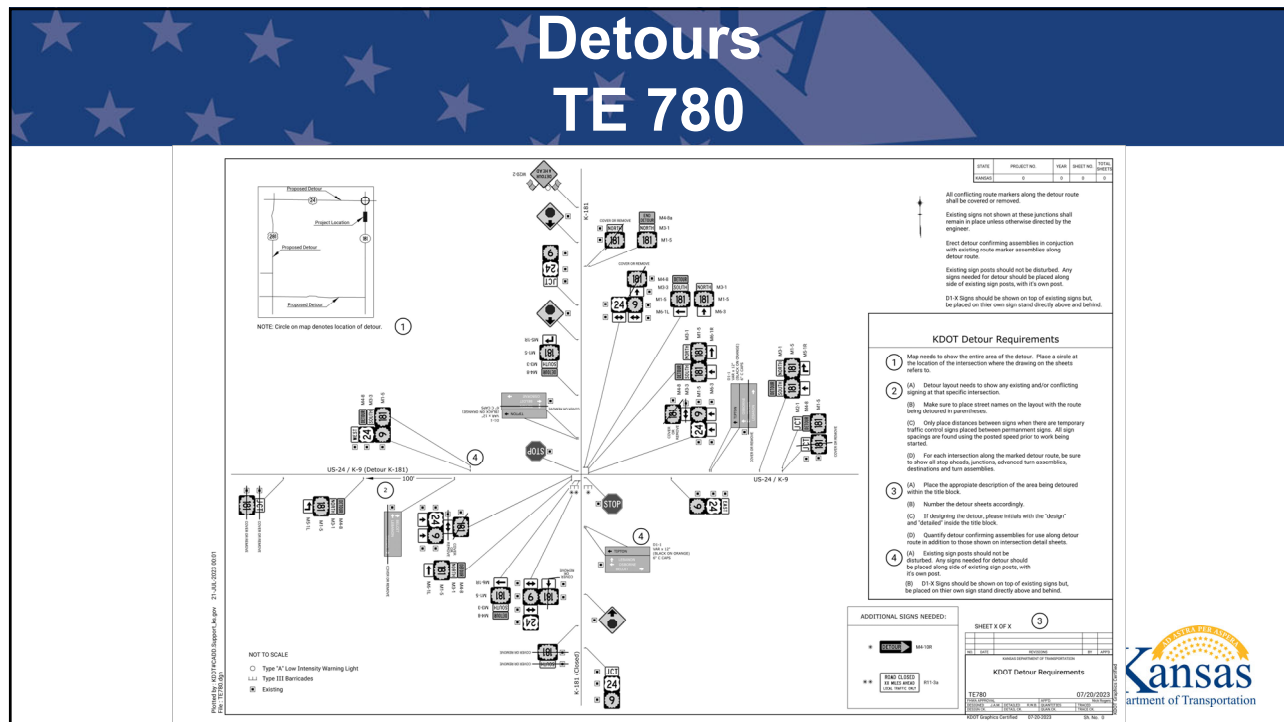
63



1



2



3



4

Detours TE 780

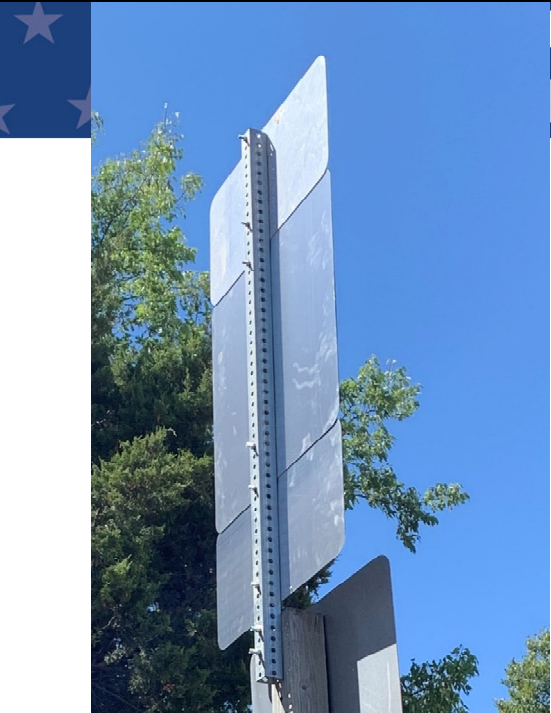


1. Responsibility – who replaces it if/when it gets knocked down?
2. Is it crash compliant?
3. Wind load



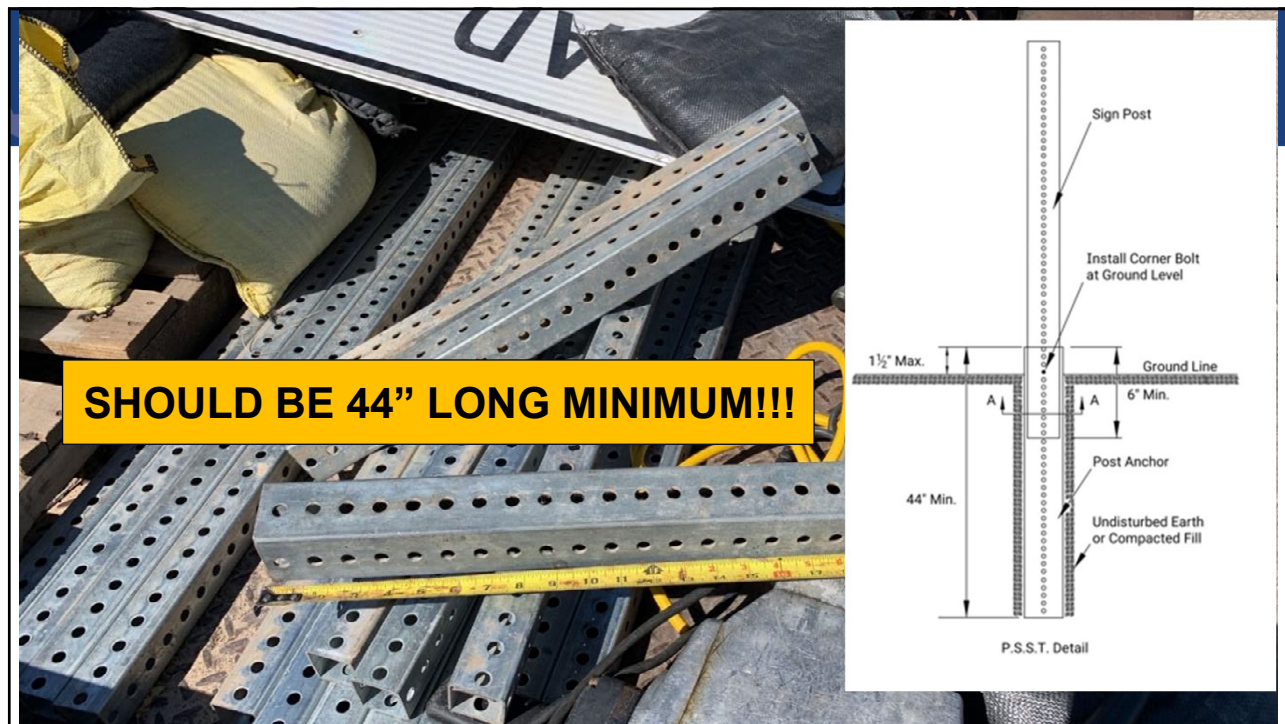
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Detours E 7

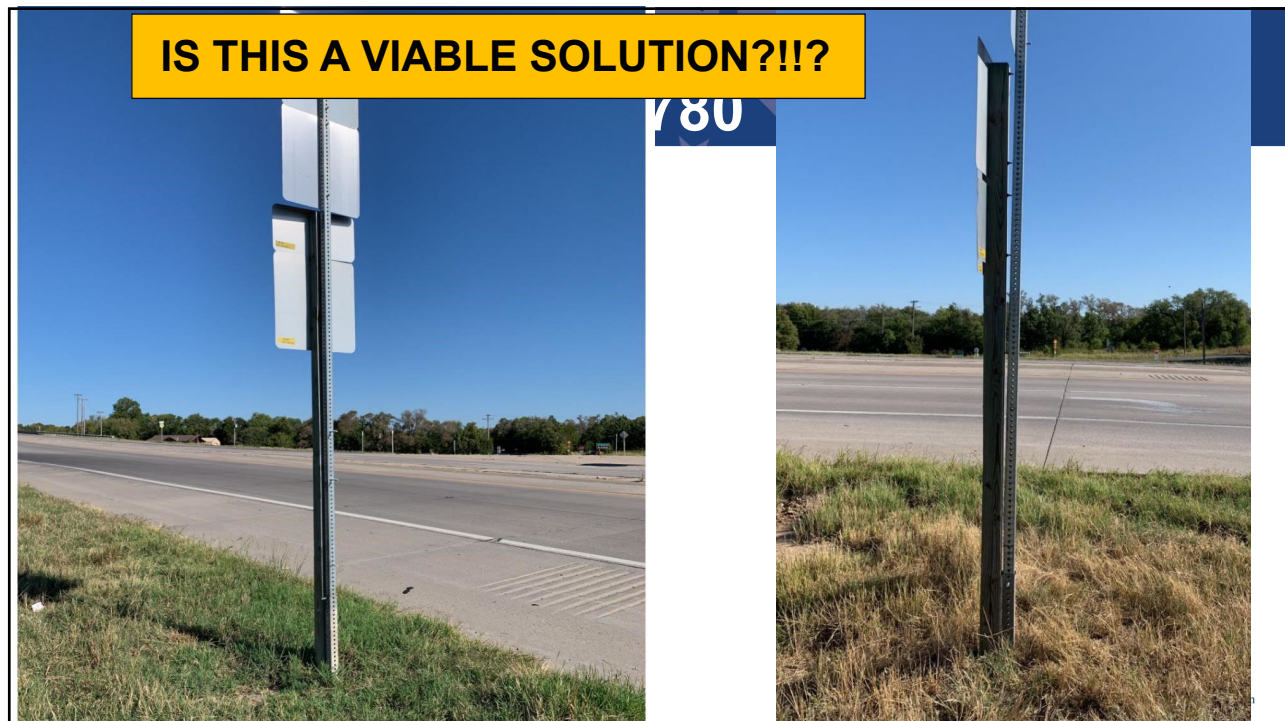




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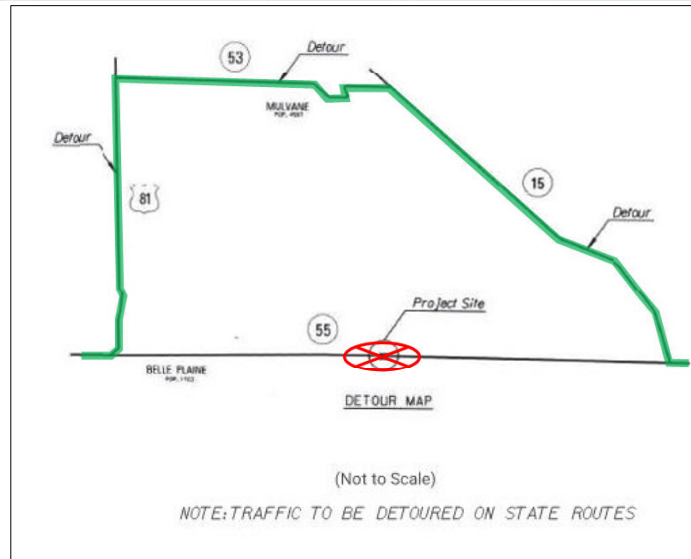


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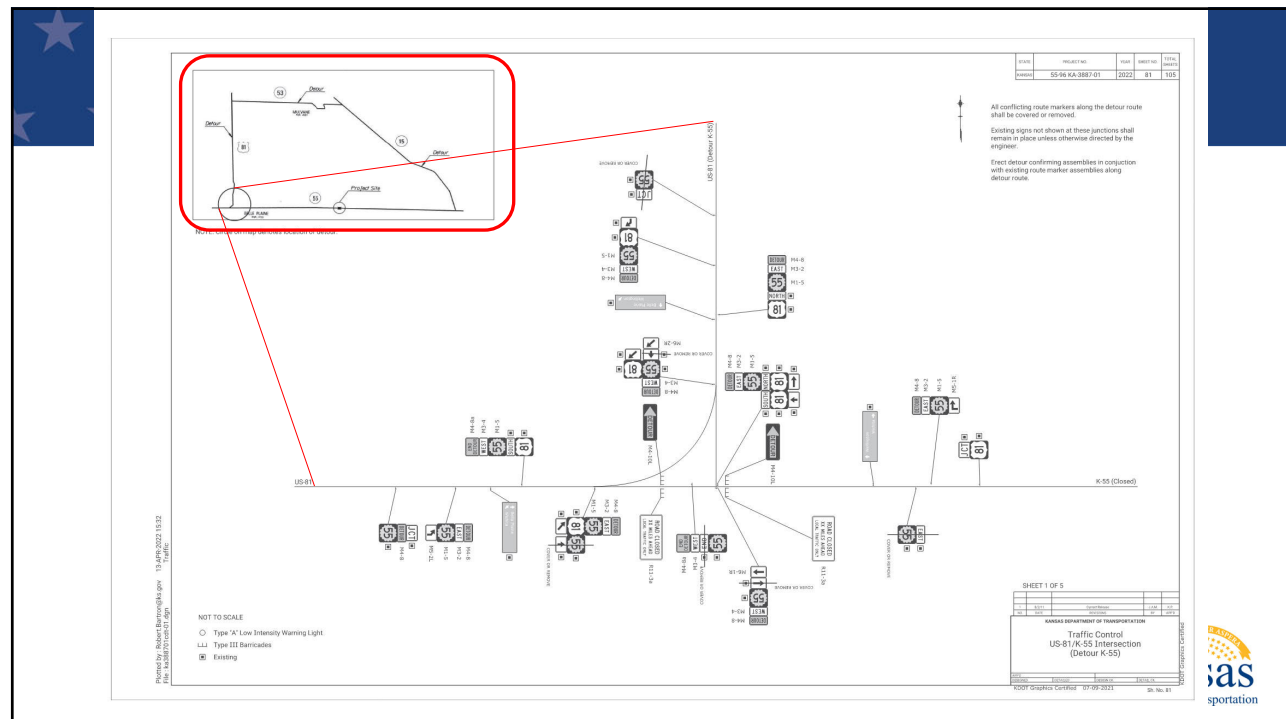
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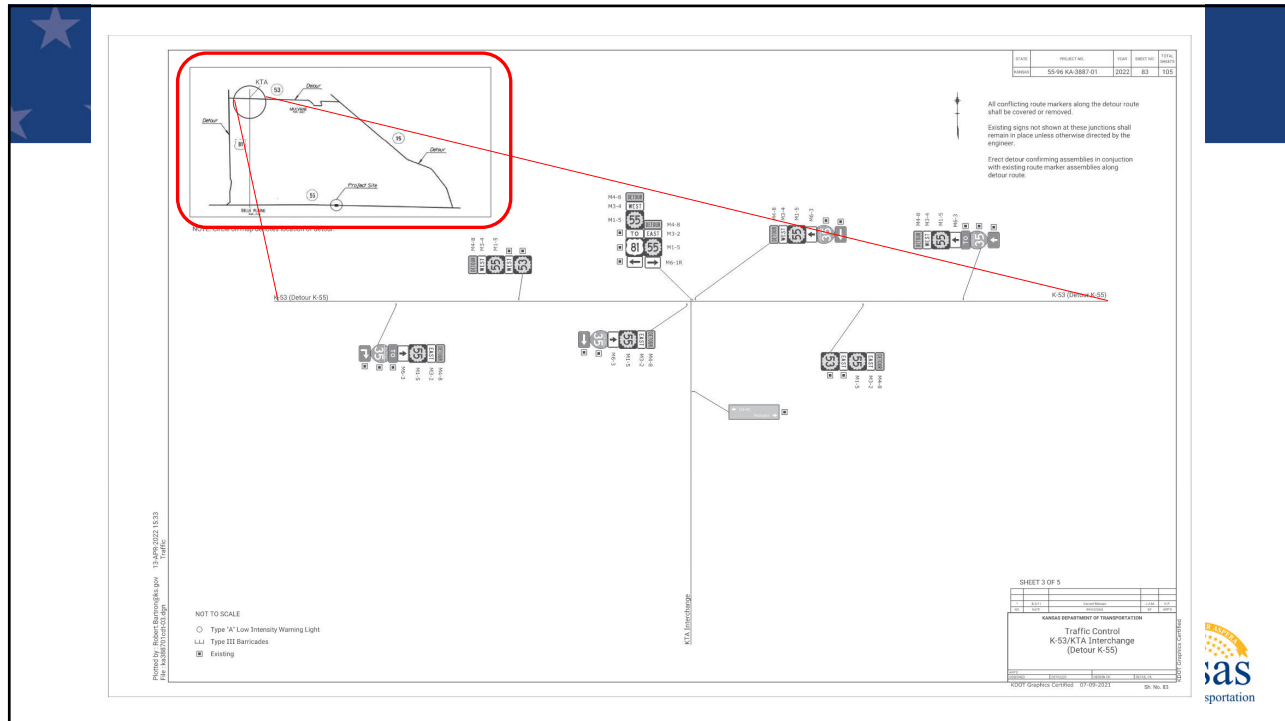
Detours 2



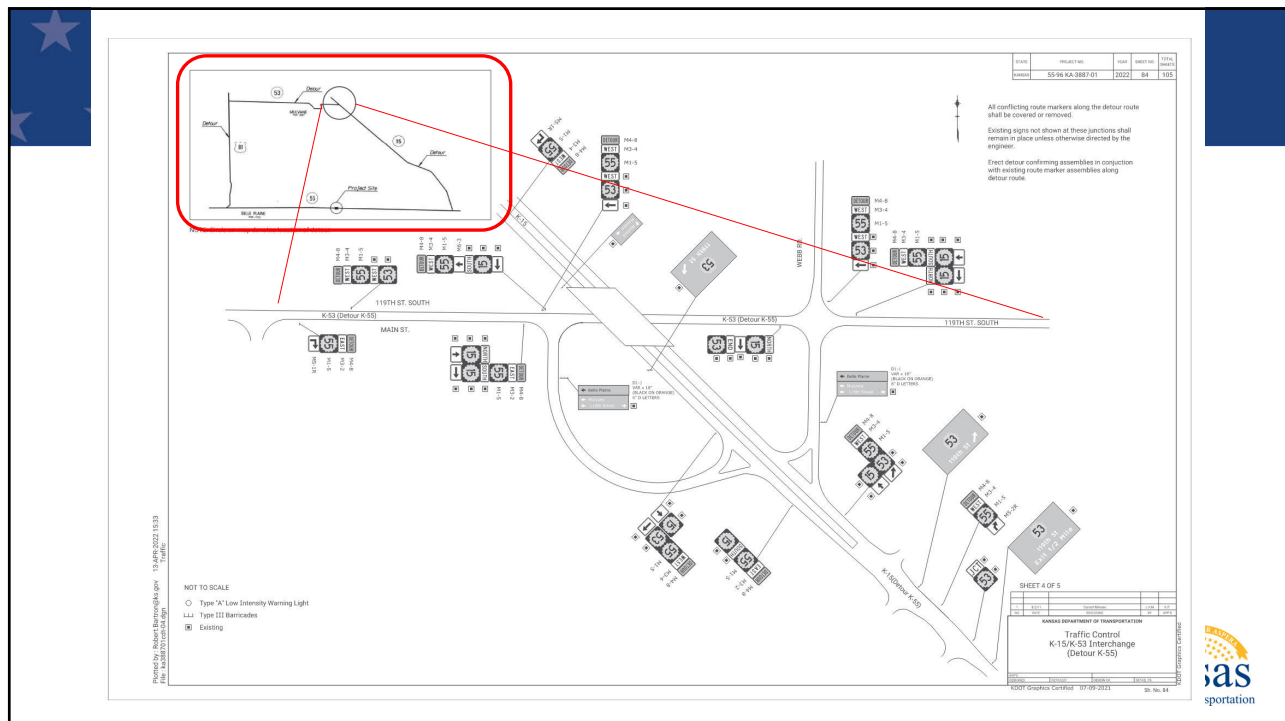
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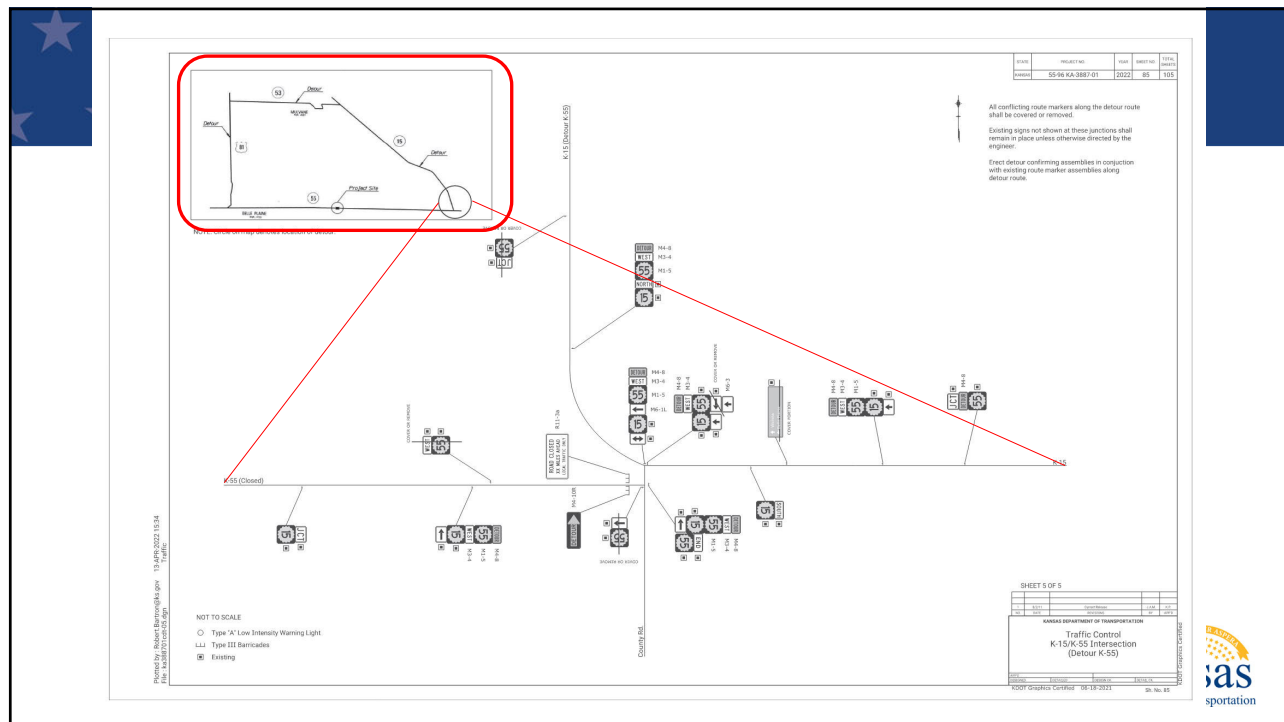
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14



15



16



17



18



19



“...I just don’t feel comfortable with this.”

20



Common Sense



21



Common Sense

The Zipper Merge



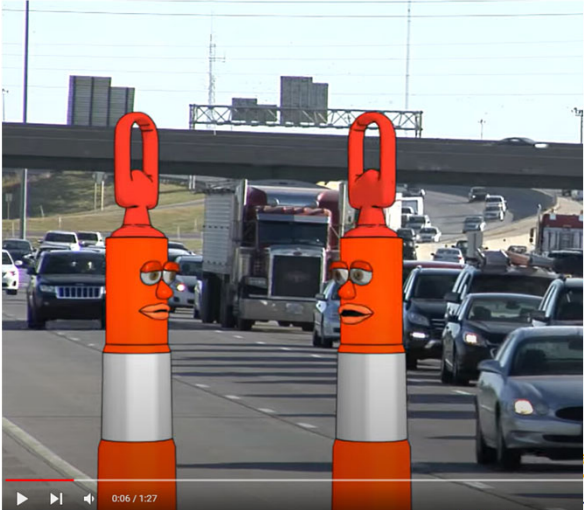
22

Common Sense

The Zipper Merge

Zipper merge

The zipper merge keeps cars in both lanes for as long as possible before they merge, one by one, into the open lane. Traffic moves at a consistent speed, making it safer for drivers and avoiding heavy congestion by up to 40 per cent, according to the Minnesota Department of Transportation.

Department of Transportation

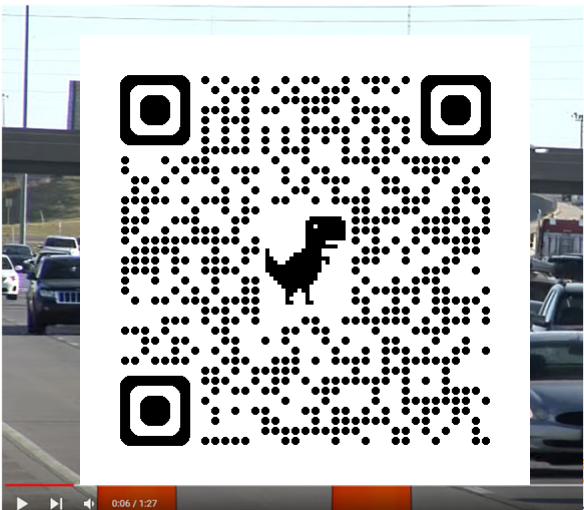
23

Common Sense

The Zipper Merge

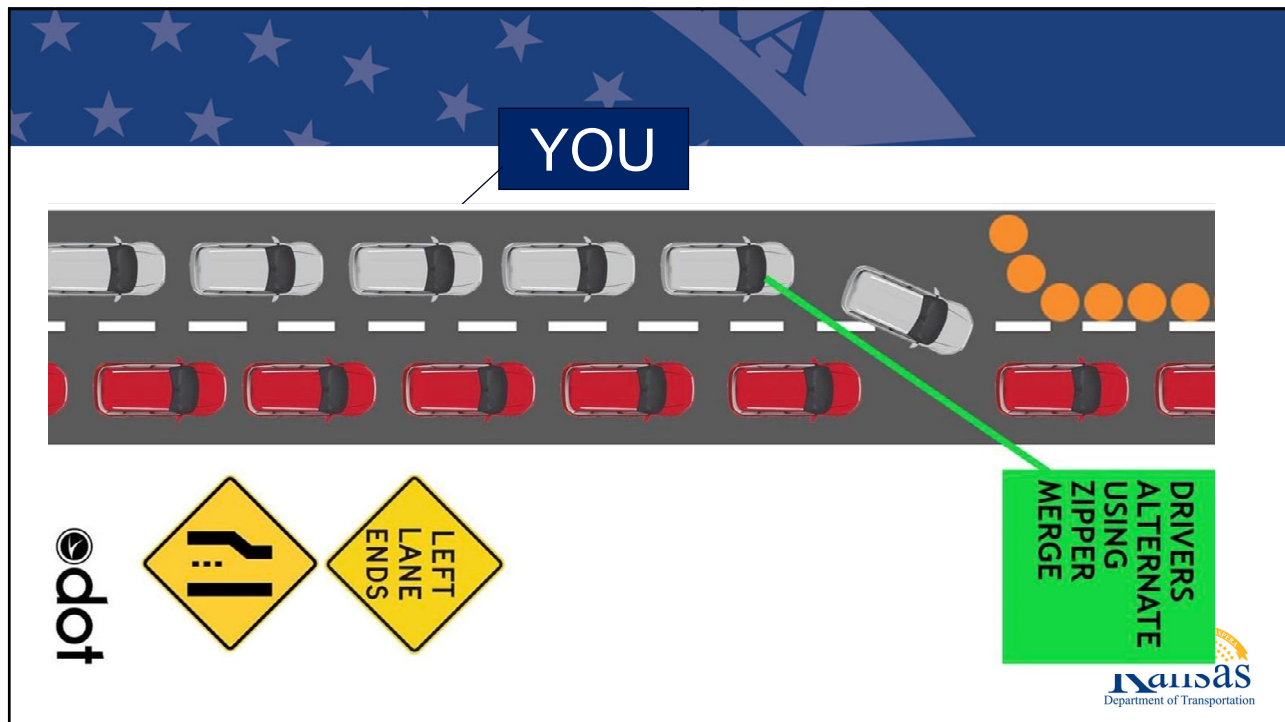
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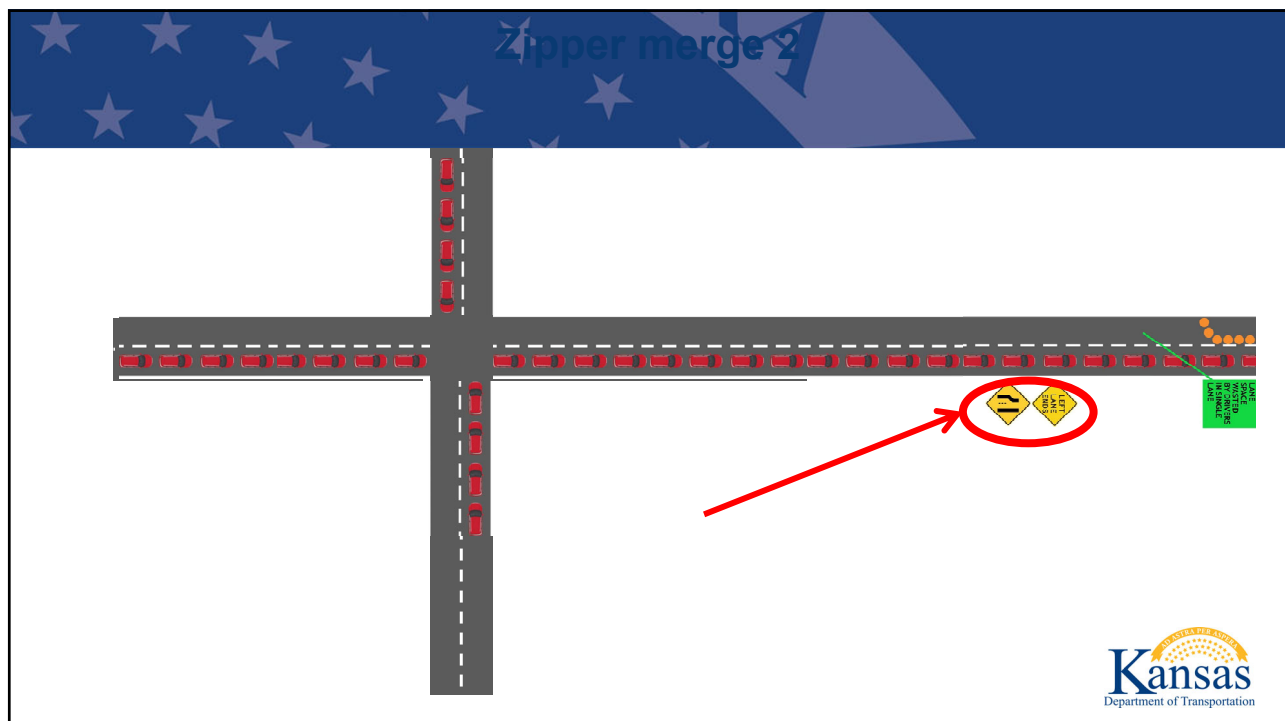



Department of Transportation

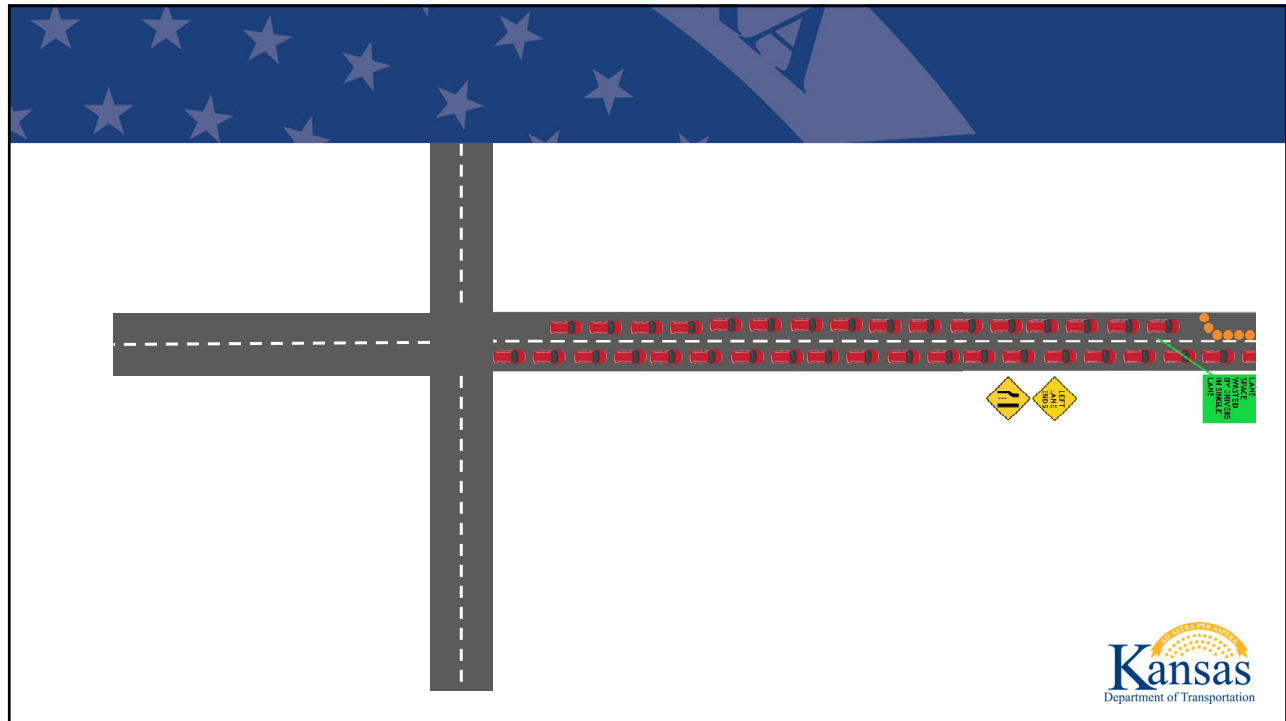
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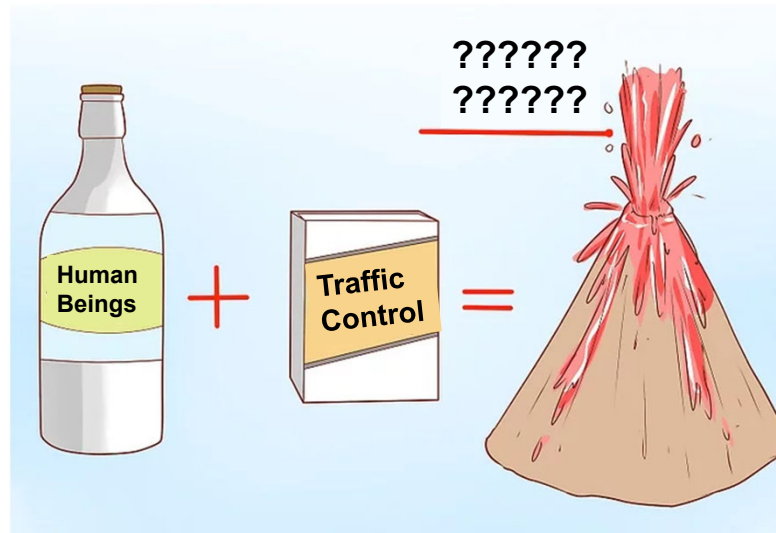


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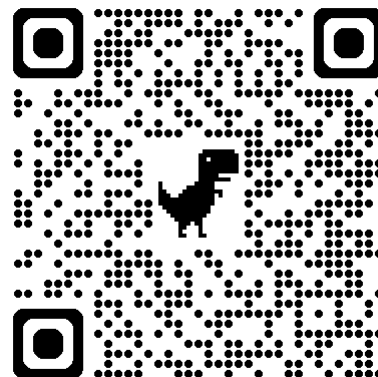
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Common Sense 1



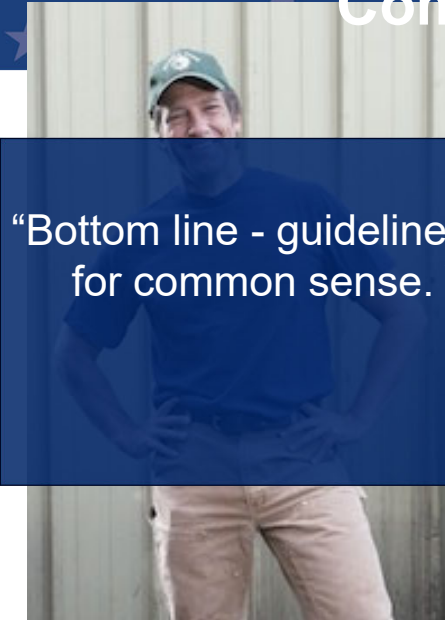
29

Common Sense 2



30

Common Sense 3



“Bottom line - guidelines are great, but they’re no substitute for common sense. Your safety is your responsibility”

-Mike Rowe

