Procurement #: 50983>

CITY OF PROVIDENCE, RHODE ISLAND

Department: Providence Water

RFP Title: Accelerated Lead Service Line Replacement Program-Contract 3.1

Opening Date: 12/01/2025

Addendum #: 1

Issue Date: 11/23/2025

The purpose of this addendum is:

Modifications, amends and supplemental information.

Providence City Hall
25 Dorrance Street
Providence, RI 02903

PROVIDENCE WATER

ADDENDUM NO. 1

TO:	ALL CONTRACT DOCUMENT HOLDERS OF RECORD ALL PROSPECTIVE BIDDERS
FROM:	PROVIDENCE WATER 125 DUPONT DRIVE PROVIDENCE, RHODE ISLAND 02907 PHONE: (401) 521-6300
DATE ISSUED:	FRIDAY, NOVEMBER 21, 2025
RE:	ACCELERATED LEAD SERVICE LINE REPLACEMENT PROGRAM – CONTRACT 3.1 CONTRACT NO. 20234
BID OPENING DATE:	MONDAY, DECEMBER 1, 2025 AT 2:15 PM
BID OPENING LOCATION:	BOARD OF CONTRACT AND SUPPLY MEETING CITY COUNCIL CHAMBERS PROVIDENCE CITY HALL 25 DORRANCE STREET PROVIDENCE, RHODE ISLAND 02903
LAST WRITTEN QUESTIONS DUE:	FRIDAY, NOVEMBER 21, 2025

This Addendum No. 1, including all referenced attachments, modifies, amends, and supplements designated parts of the Contract Documents to the above-referenced project and shall be part of the Contract Documents as provided in the “Instructions to Bidders” for the above-referenced project.

Acknowledge receipt of this Addendum by inserting its number and date on page 00 41 00 – 1 of the Bid Form. Failure to do so may subject the Bidder to disqualification.

The Contract Documents are hereby modified, amended, and supplemented as follows:

ATTACHMENTS

The following attachments are included with this Addendum:

1. Pre-Bid Conference Meeting Report
2. Section 00 41 00 Bid Form
3. Section 01310 Construction Scheduling
4. Appendix C – Relevant Rules and Regulations for Traffic Permits and Traffic Control
5. Appendix F – List of Approved Materials/Manufacturers for Use in the Providence Water Distribution System

PRE-BID CONFERENCE

1. The meeting report from the pre-bid conference held on Thursday November 13, 2025, at 2:00 PM is attached to and included with this Addendum.

SPECIFICATIONS

1. **TABLE OF CONTENTS:** Under "Appendices", **REPLACE** "C NOT USED" with "C Relevant Rules and Regulations for Traffic Permits and Traffic Control".

2. **SPECIFICATION 00 10 00 – RFP**: **REPLACE** third bullet under Questions with the following:

   "Please direct questions relative to the specifications outlined (beginning on page 14) to the issuing department's subject matter expert:
   A. Name: Eileen Sundberg, PE
   B. Title: Project Engineer
   C. Email Address: sundbergem@cdmsmith.com"

3. **SPECIFICATION 00 41 00 – Bid Form: DELETE** the section in its entirety and replace with Attachment 2 – Section 00 41 00 Bid Form.

4. **SPECIFICATION 00 73 00 – Supplementary Conditions: ADD** the following at the end of Paragraph SC-15.01B.6 on page 25: "Contractor shall submit a submittal status update and progress schedule update with each Application for Payment."

5. **SPECIFICATION 01014 – Construction Sequence and Schedule Requirements: ADD** new Paragraph 1.01.G as follows and renumber the succeeding paragraphs accordingly:

"G. Contractor shall complete all customer scheduling efforts as required per Section 01170 no later than three (3) months before the end of the Contract."

6. **SPECIFICATION 01025 – Measurement and Payment:**

   A. **DELETE** "square yard(s)" from Paragraph 3.01.B.11 and **REPLACE** with "tonnage".

   B. **DELETE** "cubic" from Paragraph 3.08.B.1 and **REPLACE** with "square".

   C. **DELETE** "square yard(s)" from Paragraph 3.11.B.1 and **REPLACE** with "tonnage".

7. **SPECIFICATION 01026 – Application for Payment:**

   A. **ADD** the following as a new Paragraph 1.05.A.5: "5. Completed leadCAST reports".

   B. **ADD** the following as a new Paragraph 1.05.B.9: "9. Submittal status and progress schedule update".

8. **SPECIFICATION 01170 – Special Provisions:**

   A. **ADD** the following paragraph after Paragraph 1.06.A.3.a:

      "b. Contractor shall comply with all relevant state and local laws as well as DigSafe requirements, including but not limited to RIGL §39-1.2."

   B. **ADD** the following new Paragraph 1.09.C and renumber the succeeding paragraphs:

"D. Notify all affected residents and businesses of any emergency water main shutdowns. It is the Contractor's responsibility to provide and distribute written notifications describing the responsibility of the residents and/or businesses, how long the residents and/or businesses will be without service, and the estimated time of completion of the water distribution system construction activities impacting service. The notice should identify the location of the water distribution system construction activities as well as the times of any disruptions to the water system. The water distribution system shall not be taken out of service unless it is an emergency situation approved by the Owner. Notification templates will be provided by the Owner and printed by Contractor for distribution. Contractors shall have notifications printed and available at the construction site at all times."

   C. **ADD** the following sentence after the third sentence in Paragraph 1.18.F.6: "The Contractor is required to print and distribute abutters notices to all affected properties ahead of construction in accordance with the requirements in Appendix C as well as any relevant Federal, State, and local laws. Abutters notices to be approved by the

Owner and Engineer prior to construction. If the property is a school or abuts a school property, replacements and construction must be coordinated with schools and scheduled on school breaks. Weekend work may be allowed if approved in advance by the Owner and Engineer. If the property is a community building (e.g. church, youth center) or abuts a community building, replacements and construction must be coordinated with the community building ahead of construction."

D. **ADD** the following new paragraph 1.18F.12 as follows:

"12. The Contractor shall respond to customer issues or concerns within 48 hours of the documented issue or concern. The Contractor shall coordinate a visit with the Engineer, visit the property, investigate, and provide detail of the situation to the Engineer with possible solutions."

9. **SPECIFICATION 01300 – Submittals: DELETE** "01720 iPad for RPRs*" from the table listed in Paragraph 2.01.A under the "Construction Materials" section.

10. **SPECIFICATION 01310 – Construction Scheduling: DELETE** the section in its entirety and replace with Attachment 3 – Section 01310 Construction Scheduling.

11. **SPECICATION 01500 – Temporary Facilities: ADD** a new Paragraph 1.01.D.1 as follows:

"1. Contractor and their subcontractors shall wear boot covers when inside of a property. Contractor shall also provide boot covers to the Engineer and Owner when onsite."

12. **SPECIFICATION 01576 – Traffic Control: ADD** the following new paragraph 1.01.K as follows:

"K. Refer to Appendix C for additional traffic permit and traffic control details. Contractor and their subcontractors shall comply with all current applicable Federal, State, and local laws and regulations, as well as the specific requirements stated in this Section and elsewhere in the Specifications."

13. **SPECIFICATION 01700 – Contract Closeout: DELETE** Paragraph 1.04.D in its entirety and **REPLACE** with the following: "D. Provide evidence that all customer complaints have been visited, reviewed, and addressed per Section 01170 Paragraph 1.18.F.12."

14. **SPECIFICATION 01720 – Project Record Documents: DELETE** Paragraph 2.01.B in its entirety.

15. **SPECIFICATION 02221 – Trenching, Backfilling, and Compaction:**

A. **DELETE** Paragraph 1.04.B.5 in its entirety and replace as follows:

"5. During the placement of bedding, backfill and fill, the Contractor shall perform in-place soil density testing to confirm that fill material has been compacted in accordance with the requirements of this Section. Such testing will be paid for by the Contractor and included in the bid price for Bid Items 1A.1, 1A.2, and 1B. The Engineer will designate areas to be tested. The approved testing laboratory representative shall be on-site for one (1) day of testing per every 100 replacements during the course of construction on days selected by the Engineer or Owner and be present during compaction of subgrade and placement and compaction of bedding and backfill. The approved testing laboratory representative shall confirm the suitability of the subgrade of the excavated trench prior to placement of any bedding and backfill."

B. **ADD** the following at the end of Paragraph 1.04.B.6: "If any results do not meet the requirements of these Specifications, the testing rate shall be doubled at no Cost to the Owner."

16. **SPECIFICATION 02230 – Granular Fill Materials: ADD** the following as a new Paragraph 2.01.L.3: "3. All materials noted in Paragraph 2.01 shall meet the definition of clean soil as defined in RIDEM Regulations 250-RICR-140-30-1.4 Definition 12 and shall not emanate from a contaminated site as defined further in Definition 14."

17. **SPECIFICATION 02930 – Loaming and Seeding: ADD** the following as a new Paragraph 2.01.A.1: "1. All materials noted in Paragraph 2.01 shall meet the definition of clean soil as defined in RIDEM Regulations 250-RICR-140-30-1.4 Definition 12 and shall not emanate from a contaminated site as defined further in Definition 14."

18. **SPECIFICATION 02576 – Pavement Repair and Resurfacing:**
    A. **ADD** the following to the end of Paragraph 2.01.A.6: "No road shall be left unpaved for more than seven (7) days after milling."

    B. **ADD** the following new Paragraph 3.01.B.7: "7. Refer to Appendix C for additional traffic permit details. Contractor and their subcontractors shall comply with all current applicable Federal, State, and local laws and regulations, as well as the specific requirements stated in this Section and elsewhere in the Specifications."

    C. **ADD** the following new Paragraph 3.01.C.7: "7. Refer to Appendix C for additional traffic control details. Contractor and their subcontractors shall comply with all current applicable Federal, State, and local laws and regulations, as well as the specific requirements stated in this Section and elsewhere in the Specifications."

    D. **ADD** the following to the end of the first sentence of Paragraph 3.05.A: "or a minimum of 8 inches per the Construction Details".

E. **DELETE** Paragraph 3.09.F in its entirety and replace with the following: “F. Refer to the Appendices for when pavement markings shall be applied to roads depending on jurisdiction. Refer to RIDOT website for State maintained roads.”

19. **DELETE** Appendix C in its entirety and **REPLACE** with the updated Appendix C in Attachment 4 of this Addendum.
20. **DELETE** Appendix F in its entirety and **REPLACE** with the updated Appendix F in Attachment 5 of this Addendum.

WRITTEN QUESTIONS AND COMMENTS SUBMITTED

1. **QUESTION:** How will addendum be released?

   ANSWER: City Hall will send out the addendum directly to anyone that has pulled the RFP from the City site/Bid Net. The addendum will also be posted on the site for additional vendors to see and pull.

2. **QUESTION:** Will there be a plan holders list provided?

   ANSWER: If this is regarding a list of all who have pulled the RFP, it can be found on Bid Net, under Document Request List.

3. **QUESTION:** Can you confirm when the City of Providence waiver request form needs to be submitted? I have submitted this to the MBE/WBE contact however have not received a response. It states on the form this needs to be submitted prior to the bid date and approved to be submitted with the bid.

   ANSWER: The City of Providence waiver request form must be submitted for review to the City prior to bid submission. If the City approves the request, the waiver request form must be submitted with the bid. If you have not heard from the City of Providence MBE/WBE Outreach office, we recommend following up on the status.

4. **QUESTION:** Can an item be added for Concrete sidewalks by the SY? As of right now, the lead service replacement items are a ‘catch all’ for everything, including any restoration of concrete sidewalks. Therefore, PW is paying for a concrete sidewalk in these prices whether it is there or not. If you add an item for Concrete sidewalks by the SY, PW will only be paying for concrete sidewalk restoration when it is actually performed.

   ANSWER: No, the concrete sidewalks will remain under the replacement bid items.

5. **QUESTION:** Can you change the mill/overlay item to two separate items – one for milling and one for paving? The milling to be bid by the SY, and the paving to be bid by the ton? Explanation: This could eliminate the discussion over leveling due to Providence roads that are very little asphalt and a thick layer of trap rock. If the contractor is paid by the ton for the overlay, you can include language in the item that states that leveling is included in this payment. Therefore the paving contractor gets paid for the asphalt that they put down. If you are unable to change the mill/overlay items as noted above, can you add an item for leveling by the ton?

   ANSWER: See the revised bid form in Attachment 2.

6. **QUESTION:** Usually concrete road base is bid based on SY, but the bid form notes CY as the unit of measure. Can this be changed to SY?

   ANSWER: See the revised bid form in Attachment 2.

7. **QUESTION:** On bid form, there is 1I which is 27,000 square yards of final pavement but then there's also S5, which also is 27,000 square yards of additional final pavement restoration. Can you clarify what the second one is?

   ANSWER: Yes, there are two items for final pavement restoration. The intent is to use the base bid paving item in full before using the supplemental item only if additional paving is required. Also, see revised bid form in Attachment 2

8. **QUESTION:** The State requirement for MWBE is 15% with no waiver and for Providence Water it's 10% DBE for the project no waiver, and 20% for MBE/WBE for the City of Providence with the opportunity for a waiver. Is this correct?

   ANSWER: Please refer to Specification Section 00 10 00 and Section 3.c, d, and e above for D/M/WBE requirements for more details. The State M/WBE requirement is 15%. For questions regarding state M/WBE requirements, waiver processes, and good faith efforts, please contact the DEDI Office at mbe.compliance@doa.ri.gov or 401-574-8606.

-END OF ADDENDUM NO. 1-

ATTACHMENT 1

PROVIDENCE WATER

Meeting Agenda

Project:	Accelerated Lead Service Line Replacement Program Contract 3.1	**Project No.:**	20234
Meeting Date:	November 13, 2025 at 2:00 PM		
Subject:	Pre-Bid Conference Meeting		
Location:	Virtual Meeting via Microsoft Teams		

Meeting is being recorded. Hold all questions until the end. Please mute yourself if not speaking to limit background noise.

It is expressly understood by all attendees that if there are any inadvertent conflicts in this Pre-Bid Conference with the Contract Documents (Specifications and/or Drawings), that the Contract Documents and any issued Addenda shall govern.

1. **Introductions & Meeting Attendance**
   a. Owner – Providence Water (PW)
      i. *Gianna Coppola*
      ii. *Gina Palano*

   b. Engineer – CDM Smith
      i. *Lisa Gove*
      ii. *Eileen Sundberg*
      iii. *Mark Filomeno*
      iv. *Mark Roberts*

   c. Attendees – All attendees must provide name and agency/company name; please email Eileen Sundberg, CDM Smith Project Engineer, at sundbergem@cdmsmith.com to confirm your meeting attendance and provide contact information.
      i. *Stephen Spadoni (Dewcon, Inc)*
      ii. *Pete Fogarty (Boyle and Fogarty)*
      iii. *Greg Plate and Brandon Marsocci (Ferreira)*
      iv. *Ashden Middlebrooks (Inliner Solutions)*
      v. *Carmel D'Artista (Ricci Drain Laying)*
      vi. *Stephen Biszko (Biszko)*

   d. *RIDOH*
      i. *Jack Sahlin*

ii. *Elizabeth Bunker*

2. Summary of Project and Work

a. The Work of this Project generally includes replacing lead service lines within the retail water service area of PW in the City of Providence, Rhode Island.

b. Work of this Project will include, but is not limited to, furnishing all materials, labor, equipment, tools, services, appurtenances, and incidentals required to replace lead service lines (both public and private) and to perform all required and associated surface restoration.

c. Refer to Section 01010 – Summary of Work for a detailed description and summary of all Work of this Project.

d. Bidders are requested to review and become familiar with the conditions existing within the project area, the type of equipment required to perform the work, the character, quality and quantity of the subsurface materials to be encountered insofar as this information is reasonably ascertainable from inspection of the sites per Section 01170 Paragraph 1.02 and 1.18.B.

e. Bidders are requested to provide unit rate bid prices for items such as replacing public side only lead service lines (water main to curb stop), public side portion of a full lead service line (water main to curb stop), private side only lead service line (curb stop to meter) and private side portion of a full lead service line (curb stop to meter), along with their qualifications to perform the Work of replacing water service lines. Minimum qualification requirements for water service line replacements and installations are specified in Section 00 21 13 – Instructions to Bidders, Article 2, Paragraph 2.2.

    i. Note, the supplemental bid item S-5 for paving will be used only when Bid Item 1I is fully used.

f. The intent of this Project is that the Owner desires to make an award to the lowest qualified and responsible Bidder on the basis of the Base Bid plus all Supplementary Bid Items.

g. No work shall be performed by any Contractor without first obtaining and securing proper permits from the respective jurisdiction(s) and issuing authorities. Permit costs are to be included as part of the lead service line replacement unit cost.

h. No scheduling of replacements shall be performed by any Contractor without approvals of the noted submittals in the Preliminary Shop Drawing List in Section 01300 Paragraph 2.01.A.

i. Uniformed Traffic Control shall be arranged and coordinated directly by the Contractor and invoices for any and all traffic control (including locations and names of police details and flaggers) shall be submitted for direct reimbursement with no markup by Contractor under the allowance item as included Bid Item No. 1J. Determination of using Uniformed Traffic Control (Bid Item 1J) vs. Flaggers (Bid Item 1K) will be at the discretion of the Contractor unless uniformed police are required in an area by the City or State.

j. Refer to Section 01025 – Measurement and Payment for a detailed description of the various items of the work. Lead service line replacements shall be the same price and payment for each and every lead service line replacement of that replacement item type.

k. All Work shall be constructed in accordance with the Specifications and Construction Details in the appendices. If there are any conflicts between these technical specifications and construction details, specifically in the General Requirements of these appended documents, the Division 0 and Division 1 of these Specifications shall govern.

l. Note, scale shown in Appendix A figures is for topographical information only, such as streets and buildings. Dots representing properties with lead service lines are not to scale and are for identifying the correct properties only. The lines represent which building and which street the service line runs between and does not show the service line alignment.

3. General

a. City of Providence, Rhode Island; State of Rhode Island; and Federal Government Rules, Regulations, Ordinances and Provisions apply to this Contract. Refer to Section 007300 Supplementary Conditions.

b. Questions related to the City of Providence bidding process, MBE/WBE program and requirements, and technical questions should be submitted to the respective contacts as listed in the Request For Proposals included at the beginning of the Specifications.

c. There is a City of Providence goal of 10% Women's Business Enterprise (WBE) and 10% Minority Business Enterprise (MBE), with an overall goal of 20% of the total bid value. A City of Providence MBE/WBE Waiver Request Form may be submitted for consideration by the City of Providence as specified in the Contract Documents. The City of Providence MBE/WBE Waiver Request Form does not apply to the State of Rhode Island MBE/WBE Program or the EPA DBE Program.

d. There is a State or Rhode Island requirement of 15% MBE/WBE participation of the total bid value. There is no waiver available. Prior to award, the contractor must submit

the MBE Utilization Plan to the Department of Administration DEDI for review and approval. Approval of the Plan is required prior to execution of the construction contract.

e. The work of this Contract is in part funded by the Rhode Island Drinking Water State Revolving Fund (DWSRF) as administered by the Environmental Protection Agency (EPA). Bidders shall comply with all requirements of the Rhode Island DWSRF, including but not limited to American Iron and Steel (AIS), Build America Buy America (BABA), and EPA's Disadvantaged Business Enterprise (DBE) Program of which Providence Water and EPA has established a requirement of 10% DBE participation (no waiver request is available).

f. The contractor is required to post the DWSRF project sign somewhere visible for public viewing. Contractor is required to post a set of labor law posters that employees see on a regular basis along with prevailing wage rates. It is the contractor's responsibility to replace the prevailing wage rates when and if they are updated during the duration of the contract.

g. Bidders must be affiliated with a state or federal registered apprenticeship program as specified in Appendix O of the Contract Documents. A minimum of 15% of total labor hours performed by the contractor shall be completed by apprentices registered in the state or federal registered apprenticeship program.

h. Bidders must meet the qualification requirements specified in the Instructions to Bidders, Article 2, Paragraph 2.2 for water service line replacements and installations. The minimum requirement is 1,000 lead service line replacements involving the private side of the line in the past 10 years. Bidders must submit qualifications information to demonstrate compliance using the forms provided in Section 00 45 13 – Bidder's Qualifications.

i. Bids should be submitted in accordance with the City of Providence Request For Proposals included at the beginning of the Specifications and Section 00 21 13 – Instructions to Bidders.

j. Bidders will be required to provide specified insurance certificates and performance and payment bonds for execution of the construction contract.

k. All Applications for Payment shall be prepared and submitted by Contractors as specified in Section 01026 and shall be submitted monthly.

l. Adequate workforce including subcontractors shall be provided to complete the work within the Contract schedule while maintaining minimum monthly quota of 80 completed service replacements per month during winter months (December through

March) and 100 completed service replacements during summer months (April through November) starting no later than 60 days after the issued date of the Notice to Proceed.

m. Refer to Section 01014 Construction Sequence and Schedule Requirements. No City of Providence Department of Public Works controlled roads can be opened after November 15th or before April 15th without an approved road opening permit by the City's Department of Public Works. Private-only replacements that do not require cutting into the roadway may continue throughout the year with approval from the local municipality. If a test pit is performed during the winter shutdown period at a private side location and the utility side is found to be lead, the Contractor shall apply for a DPW road opening permit and, if approved, complete the replacement if hot patch is available for temporary pavement restoration. Replacements can only be performed IF hot patch is available and is to be scheduled by the Contractor with open plants. Hot patch is to be used for temporary sidewalk restoration with final concrete restoration to be completed in the spring.

n. Replacement work shall be up to the existing water meter. Contractors can raise the meter if needed to make the final connection to the existing interior plumbing. Cost of raising the meter shall be included in the private side replacement cost and no additional payment for modifying interior plumbing will be provided.

o. Item 2D Short Segment Private Side Only Lead Service Line Replacements covers replacements where there is only a short segment of lead pipe (up to 30 inches in length) on the private side between the curb stop and foundation of the building.

p. Partial replacements will be permitted after contractor outreach is complete, a written or verbal refusal is on file, and only once approved by Providence Water in writing. Providence Water must approve the partial replacement in writing before the replacement begins. If homeowner changes their mind during the public side replacement, contractor must perform the private side replacement at the same time.

q. Work cannot be started on a property that requires a private-side replacement without obtaining a Right of Entry and Release form for Lead Service Line Replacement. Contractor shall collect the ROE forms and load them to leadCAST per Section 01014. Construction Sequence and Schedule Requirements are as follows:

    i. Contractor shall complete all outreach efforts as required per Section 01170 no later than four (4) months before the end of the Contract.

    ii. Owner outreach can continue up to two (2) months before the end of the Contract per Section 01170.

iii. Contractor shall complete all replacements no later than two (2) months before the end of the Contract to allow time for final restoration in accordance with the minimum required settlement durations in Section 01170.

iv. Of the total replacements noted in Section 00 11 16, a total of 15 replacements of Item 1B, 10 replacements of Item 2A, and 15 replacements of Item 2B (for a potential maximum of 25 separate locations) will be locations directed by the Owner to be completed within 48 hours regardless of weekends and holidays. These are considered "emergency replacements" and will be within the Providence Water Distribution System. These locations may or may not be listed in Appendix A of the Contract Documents.

r. In accordance with Section 01170, Paragraph 1.18 Contractors shall make four (4) documented attempts to obtain a signed ROE from homeowners and log attempts in leadCAST. The four (4) attempts shall be on different dates and times and using different media. A minimum of three (3) of the attempts must be door-to-door. A maximum of one (1) of the attempts can be a phone call or email. The Contractor shall leave notification each time with a phone number for the Customer to contact them. If after four attempts, the ROE is not completed, the Contractor shall inform the Owner and Engineer in writing of the address, Customer name and the documented four (4) failed attempts including date, time and media.

s. In accordance with Section 01170, Paragraph 1.18, Contractors shall make and document four (4) attempts to schedule the work. The four (4) attempts shall be on different dates and times. The Contractor shall leave notification each time with a phone number for the Customer to contact them. If after four attempts the customer does not respond, the Contractor shall inform the Owner and Engineer in writing of the address, Customer name and information on the four (4) failed attempts including date, time, and summary of attempts made.

t. All RFIs and submittals will be tracked electronically, and the Contractor will be required to submit them through Kahua. All submittals are detailed in Section 01300. The Contractor shall provide an initial submittal schedule at the pre-construction meeting for review by Owner and Engineer per Section 01300 Paragraph 3.01.

u. All data will be tracked electronically, and the Contractor will be required to record information on a daily basis in leadCAST. The fields required to be recorded are listed in Section 01720 Paragraph 1.03.

v. Two licenses will be provided for Kahua to the Contractor per Section 01300. Any additional licenses can be purchased by the Contractor.

w. Pre-construction photos shall be provided for each property to document existing conditions per Section 01322. Post-construction photos shall be provided for each property and are required per Section 01322 to provide final visual evidence and a final record of final restoration. Photos must include date, time, location, device information, and source in the metadata tag.

x. Contractors shall provide pitcher filter installation instructions, filter use and flushing instructions, health effects flyers, and sample offer flyers per Section 02663.

y. Contractor to obtain all necessary permits for proper execution of the project per Section 01170 Paragraph 1.07. The required permits per service are as follows:

    i. Traffic Engineering Permit

    ii. Road Opening (municipal and state) Permit

    iii. Sidewalk Opening Permit

    iv. Street Closure Permit

    v. Plumbing Permit

z. Record documents shall consist of pre- and post-construction photos and electronic data per Section 01720. Payment can be withheld for a replacement if the required photos and documentation are not provided.

aa. Prior to performing a replacement involving the private side (curb to meter), the Contractor shall have a quality inspection performed by a competent person properly trained to check if the existing water pipe is being used for grounding and test for current per Section 02663. Install a temporary bonding jumper in parallel to the existing service line, firmly attached with approved grounding clamps on either side of the service line. Temporary grounding will be removed once the replacement is complete.

bb. Pitcher filters (with replacement cartridges, as needed) suitable for a minimum 6-month duration, along with instructions for use shall be furnished and delivered by the Contractor at the quantity needed to supply one pitcher filter to each unit in a property following replacement. Contractor as specified shall store pitcher filters in a suitable location and furnish at the time of replacement property. Contractor *shall* record delivery of pitcher filters (with replacement cartridges, as needed).

4. Anticipated Schedule

a. November 25, 2025 – Last addendum issued.

b. December 1, 2025 – Bid opening at 2:15 PM at Board of Contract and Supply Meeting, City Council Chambers, 3rd Floor, Providence City Hall, 25 Dorrance Street, Providence, Rhode Island.

c. By March 1, 2026 (within 90 days of bid opening) – Anticipated award and execution of contract(s).

d. Contract time/duration is 312 calendar days from Executed Date of Agreement OR Notice to Proceed, whichever is earlier.

5. General Discussion and Questions

Reminder: Only questions answered by formal written Addenda are binding in accordance with the Section 00 21 13 – Instructions to Bidders of the Specifications. Oral and other clarifications or interpretations (including questions and verbal answers at this pre-bid conference meeting) are without legal effect. Questions received at this pre-bid conference meeting will be answered in a meeting report issued by formal written Addenda. In accordance with Section 00 21 13 – Instructions to Bidders, Article 5, all questions shall be submitted in writing at least ten days before the date set for the bid opening to: Eileen Sundberg, CDM Smith Project Engineer, sundbergem@cdmsmith.com. Bidders are encouraged to submit any questions asked at the pre-bid conference meeting in writing to confirm that they are received. Bidders are solely responsible for verifying that their questions are received.

a. *General Discussion*

i. *A reminder to bidders to read the specifications carefully as the specifications have changed from previous contracts.*

ii. *RIDOH reminded bidders that pitcher filters need to be NSF 53 certified to remove lead.*

iii. *RIDOH stated there is a way to get a state MBE/WBE waiver but there are documents required to demonstrate good faith efforts the contractor made to try to meet the requirements DEDI is the authority and bidders can contact the DEDI office with questions.*

b. *Questions*

1. *Question: On bid form, there is 1I which is 27,000 square yards of final pavement but then there's also S5, which also is 27,000 square yards of additional final pavement restoration. Can you clarify what the second one is?*

Answer: Yes, there are two items for final pavement restoration. The intent is to use the base bid paving item in full before using the supplemental item only if additional paving is required. Also, see revised bid form in Attachment 2 of Addendum No. 1.

2. *Question: The State requirement for MWBE is 15% with no waiver and for Providence Water it's 10% DBE for the project no waiver, and 20% for MBE/WBE for the City of Providence with the opportunity for a waiver. Is this correct?*

   Answer: Please refer to Specification Section 00 10 00 and Section 3.c, d, and e above for D/M/WBE requirements for more details. The State M/WBE requirement is 15%. For questions regarding state M/WBE requirements, waiver processes, and good faith efforts, please contact the DEDI Office at mbe.compliance@doa.ri.gov or 401-574-8606.

3. *Question: With an award date in possibly March and 312 calendar days to complete, that puts the contract completion date in the winter of 2027. Is that correct?*

   Answer: Award date is pending BOCS approval. We would hope to award as early as possible and start construction before March. Timeline depends on exact date of BOCS approval.

ATTACHMENT 2

BID FORM
TO
PROVIDENCE WATER
ACCELERATED LEAD SERVICE LINE REPLACEMENT PROGRAM – CONTRACT 3.1
PROJECT NO. 20234

This Bid is submitted to the City of Providence, Board of Contract and Supply, Department of the City Clerk, Room 311, Providence City Hall, 25 Dorrance Street, Providence, Rhode Island 02903.

The undersigned declares that the only persons or parties interested in this Bid as principals are as stated; that the Bid is made without any collusion with other persons, firms, or corporations; that all the Contract Documents dated October 2025 have been carefully examined; that the undersigned is fully informed in regard to all conditions pertaining to the Work and the places where it is to be done, and from them the undersigned makes this Bid. These prices shall cover all expenses incurred in performing the Work required under the Contract Documents, of which this Bid Form is a part.

If a Notice of Award accompanied by unsigned copies of the Agreement and all other applicable Contract Documents is delivered to the undersigned after the actual date of the opening of the Bids, the undersigned, in accordance with the Standard General Conditions of the Construction Contract as amended and/or modified by the Supplementary Conditions, will execute and return all copies of the Agreement and all other applicable Contract Documents to Owner. The premiums for all Bonds and Insurance required shall be paid by Contractor and shall be included in the Contract Prices. The undersigned Bidder further agrees that the Bid Security accompanying this Bid shall become the property of Owner if the Bidder fails to execute the Agreement as stated above.

The undersigned hereby agrees to fully complete the Work within the times specified in the Contract Documents and in the Agreement.

The undersigned acknowledges receipt of addenda numbered:

_____

In accordance with the above understanding, the undersigned proposes to perform the Work, furnish all materials and complete the Work in its entirety in the manner and under the conditions required at the prices listed as follows:

PROVIDENCE WATER
ACCELERATED LEAD SERVICE LINE REPLACEMENT PROGRAM - CONTRACT 3.1
PROJECT NO. 20234

BID FORM

ITEM NO.	ESTIMATED QUANTITY	BRIEF DESCRIPTION OF ITEMS WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
1A.1	5 each	Lead Service Line Replacement - Public Side Only (Water Main to Curb Stop) _____ each	$ _____	$ _____
1A.2	45 each	Lead Service Line Replacement - Public Side Partial (Water Main to Curb Stop) _____ each	$ _____	$ _____
1B	400 each	Lead Service Line Replacement - Public Side Portion of a Full Replacement (Water Main to Curb Stop) _____ each	$ _____	$ _____
1C	80 each	Test Pit at Curb Stop _____ each	$ _____	$ _____
1D.1	200 each	New Curb Box _____ each	$ _____	$ _____
1D.2	15 each	New Curb Stop Valve _____ each	$ _____	$ _____
1E	200 each	Long Side Replacement _____ each	$ _____	$ _____
1F	200 CY	Lead Service Line Excavation Greater Than Five (5) Feet _____ per cubic yard	$ _____	$ _____

PROVIDENCE WATER
ACCELERATED LEAD SERVICE LINE REPLACEMENT PROGRAM - CONTRACT 3.1
PROJECT NO. 20234

BID FORM

ITEM NO.	ESTIMATED QUANTITY	BRIEF DESCRIPTION OF ITEMS WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
1G	20 SY	Final Trench Pavement Restoration (Infra-red) per square yard	$	$
1H	180 SY	Final Trench Pavement Restoration per square yard	$	$
1I	4,000 TONS	Final Pavement Restoration per ton	$	$
1J	$ 580,000.00 ALLOWANCE	Uniformed Police Traffic Control Five hundred and eighty thousand dollars and zero cents allowance	$ 580,000.00	$ 580,000.00
1K	$ 580,000.00 ALLOWANCE	Flaggers for Traffic Control Five hundred and eighty thousand dollars and zero cents allowance	$ 580,000.00	$ 580,000.00
1L	$ 15,000.00 ALLOWANCE	Utility Provisions Fifteen thousand dollars and zero cents allowance	$ 15,000.00	$ 15,000.00
2A	310 each	Lead Service Line Replacement - Private Side Only (Curb Stop to Meter) each	$	$
2B	400 each	Lead Service Line Replacement - Private Side Portion of a Full Replacement (Curb Stop to Meter) each	$	$

PROVIDENCE WATER
ACCELERATED LEAD SERVICE LINE REPLACEMENT PROGRAM - CONTRACT 3.1
PROJECT NO. 20234

BID FORM

ITEM NO.	ESTIMATED QUANTITY	BRIEF DESCRIPTION OF ITEMS WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
2C	70 each	Access Not Provided _____ each	$ _____	$ _____
2D	20 each	Lead Service Line Replacement - Short Segment Private Side Only (Up to 30-inches in length) _____ each	$ _____	$ _____
3	2,330 each	Pitcher Filters and Replacement Cartridges _____ each	$ _____	$ _____

TOTAL BASE BID PRICE IN WORDS (Items 1A.1-3) _____

TOTAL BASE BID PRICE IN FIGURES (Items 1A.1-3) _____

*Transfer Total Base Bid plus Supplemental in words and figures to Section 001000 Bid Form 1 Bidders Blank (Page 7 of 30) under "Total Amount in Writing and Total Amount in Figures."

PROVIDENCE WATER
ACCELERATED LEAD SERVICE LINE REPLACEMENT PROGRAM - CONTRACT 3.1
PROJECT NO. 20234

BID FORM

ITEM NO.	ESTIMATED QUANTITY	BRIEF DESCRIPTION OF ITEMS WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
S-1A	400 CY	Imported Common Fill per cubic yard	$	$
S-1B	50 CY	Crushed Stone per cubic yard	$	$
S-1C	50 CY	Flowable Fill per cubic yard	$	$
S-2	50 SY	Initial Pavement Restoration With Concrete Subbase per square yard	$	$
S-3	50 CY	Miscellaneous Concrete per cubic yard	$	$
S-4A	$ 50,000.00 ALLOWANCE	Miscellaneous Work at Direction of the Owner (Public Side) Fifty thousand dollars and zero cents allowance	$ 50,000.00	$ 50,000.00
S-4B	$ 50,000.00 ALLOWANCE	Miscellaneous Work at Direction of the Owner (Private Side) Fifty thousand dollars and zero cents allowance	$ 50,000.00	$ 50,000.00
S-5	4,000 TONS	Additional Final Pavement Restoration per ton	$	$

PROVIDENCE WATER
ACCELERATED LEAD SERVICE LINE REPLACEMENT PROGRAM - CONTRACT 3.1
PROJECT NO. 20234

BID FORM

ITEM NO.	ESTIMATED QUANTITY	BRIEF DESCRIPTION OF ITEMS WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES

TOTAL SUPPLEMENTAL PRICE IN WORDS (S-1A through S-5) _____

TOTAL SUPPLEMENTAL PRICE IN FIGURES (S-1A through S-5) _____

TOTAL BASE BID PRICE PLUS SUPPLEMENTAL PRICE IN WORDS _____

TOTAL BASE BID PRICE PLUS SUPPLEMENTAL PRICE IN FIGURES _____

*Transfer Total Base Bid plus Supplemental in words and figures to Section 001000 Bid Form 1 Bidders Blank (Page 6 of 30) under "Total Amount in Writing and Total Amount in Figures."

The undersigned agrees that extra work, if any, will be performed in accordance with Article 11 of the Conditions of the Contract and will be paid for in accordance with Article 12 of the Conditions of the Contract.

The undersigned agrees to furnish Performance and Payment Bonds as specified with a surety company acceptable to the Owner.

Amounts shall be shown in both words and figures, where indicated. In case of discrepancy, the amount shown in words will govern.

The above prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance and incidentals required to complete the Work.

The undersigned acknowledges that (1) they have examined the Contract Documents thoroughly, including all the requirements specified in the Request For Proposals, Invitation to Bid and Instructions to Bidders; (2) they have had the opportunity to visit the site(s) to become familiar with local conditions that may in any manner affect cost, progress or performance of the Work; (3) they are familiar with all Federal, State and local laws, ordinances, rules and regulations that may in any manner affect cost, progress or performance of the Work; and (4) they have studied and carefully correlated Bidder's observations with the requirements of the Contract Documents.

The undersigned acknowledges that they have had the opportunity to make additional investigations and tests as they may deem necessary to determine their Bid for performance of the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

The undersigned acknowledges they are familiar with all laws and regulations that may affect cost, progress, and performance of the work, including BABAA requirements.

The undersigned agrees that the submission of this Bid is an incontrovertible representation that the Bidder has complied with every requirement of this Article and these Contract Documents; that no additional examinations, investigations, explorations, studies, or tests are needed; that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work; and that the Bidder provided written notice of any conflict, error, ambiguity, and/or discrepancy in the Contract Documents and that Owner’s written resolution by formal written Addenda is acceptable to the Bidder.

The undersigned acknowledges that they have submitted the following with this Bid and with their Bid Forms of this Section and further that it is their sole responsibility to confirm that they have submitted all required forms and/or information with their Bid whether or not it is listed herein (failure to submit all required information may result in rejection of a Bid):

1. Bid Form 1: Bidder's Blank as the cover/first page.
2. Bid Form 2: Certification of Bidder as the second page.
3. Bid Form 3: Certificate Regarding Public Records as the third page.
4. Bid Form 4: Affidavit of City Vendor as the fourth and fifth page.
5. Bid Form 5: Bidder Certification, Performance of the Work as the sixth page.
6. Forms from the Minority and Women Business Enterprise Program.
7. Completed Bid Forms from this Section with Bid prices for each item stated in words and figures; acknowledgement of receipt of all Addenda; signed and executed City of Providence, Rhode Island Board of Contract and Supply signature page; and with included evidence of Bidder's authority to do business in the State of Rhode Island and Bidder's Rhode Island contractor license number(s).
8. Bid Security in a separate envelope from the Bid and then attached to the envelope containing the Bid.
9. Completed forms from Section 00 43 36 – Proposed Subcontractors & Suppliers, with supporting documentation as required.
10. Completed forms from Section 00 45 13 – Bidder's Qualifications, with supporting documentation as required.

Bids will remain subject to acceptance for 90 days after the Bid opening, or for such longer time period that Bidder may agree to in writing upon request of the Owner.

The names and residences of all persons and parties interested in the foregoing Bid as principals are as follows:

(Give first and last names in full. See Bid Form Article in the Instructions to Bidders.)

_____

_____

_____

The undersigned hereby certifies that they are able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

The undersigned hereby certifies under the penalties of perjury that this Bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this section, the word "person" shall mean any natural person, joint venture, partnership, corporation, or other business or legal entity.

BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

BID FROM:

Company Name: _____ (SEAL)

If incorporated, State of Incorporation: _____

Date of Incorporation: _____

Type of Business (from incorporation papers): _____

By: _____
(Signature - attach evidence of authority to sign if not an individual submitting Bid)

Name (typed or printed): _____

Title: _____

Date: _____

Business Address: _____

_____

Phone No. _____ Fax No. _____

Bidder State of Rhode Island License Information:

License No.	Type of License/Trade Licensed
_____	_____
_____	_____
_____	_____

ATTACHMENT 3

SECTION 01310
CONSTRUCTION SCHEDULING

PART 1 GENERAL

1.01 PROGRAM DESCRIPTION

A. Within ten days after the effective date of Agreement, provide and submit to the Engineer for approval, the Baseline Schedule the Contractor plans to maintain in order to construct the work with the time allotted successfully. This Schedule shall be a time-scaled Bar Chart in order of early start and shall account for all the work of the Contractor. In addition to all reasonably important construction activities, the Schedule shall provide for the proper sequence of construction considering the various crafts, purchasing time, submittal approval, material delivery, equipment fabrication, and similar time-consuming factors. Failure to supply the construction schedule on time will be cause for withholding progress payments.

B. Following receipt by the Engineer of the Baseline Schedule, a pre-construction conference will then be held between the Owner, Engineer and Contractor to review and, if necessary, revise the Schedule to afford ample time to perform the work in the proper sequence and construction operations. The Engineer shall approve the schedule in accordance with paragraph 2.05 of the Conditions of the Contract.

C. The Contractor bears full responsibility for scheduling all phases and stages of the work to ensure its successful execution and completion with the time specified in accordance with all provisions of these Specifications.

D. Update the Baseline Schedule monthly (Progress Schedule) as referenced in Section 00 72 00 and shall submit it to the Engineer in duplicate. The monthly Schedule update shall include the following items:

1. Activities that are completed or in the process are to be identified.
2. Restraints imposed by material deliveries, precedent activity durations or schedule
3. Actual start and completion dates are to be shown.
4. Shop Drawing Status

1.02 SUBMITTALS

A. Submit schedules, and revisions including graphics, as specified herein.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 BASELINE SCHEDULE

A. Baseline Schedule – A schedule. Prepared and maintained by the Contractor, describing the sequence and duration of the activities comprising Contractor’s plan to accomplish the Work within the Contract Times. This schedule does not need to be address specific but shall address the prescribed scope of work and capture the minimum monthly requirements.

B. Submit the Baseline Schedule before starting any work, in accordance with Article 2.05 of the General Conditions.

C. The Baseline Schedule must account for the following:
1. Time for review and approval of submittals.
2. Schedule of Values preparation and approval
3. Public outreach efforts to obtain Right of Entry and Release Forms.
4. Completion of outreach (4 months prior to contract end date) per Section 01170
5. Completion of scheduling efforts no later than three (3) months before end of the Contract per Section 01170
6. Start of replacements no later than third month (60 days from contract award) of the contract meeting the monthly replacement quotas as stated in Section 01010
7. Minimum crews as stated in Section 01010 showing anticipated replacements by week and by month.
8. Estimated construction duration for each crew in each area
9. Completion of replacements no later than two (2) months before the end of the Contract per Section 01170
10. Traffic management/detour plan preparation and approval
11. Permit timeline (traffic, road opening, dig safe, plumbing, etc.)
12. Final sidewalk restoration schedule
13. Final pavement restoration schedule (milling and paving)
14. Final landscape restoration schedule
15. Moratorium of November 15th to April 15th
16. Special dates – e.g. small business Saturday after Thanksgiving, school breaks, etc
17. Anticipated no work days

3.02 PROGRESS SCHEDULE

A. Progress Schedule is a monthly update to the Baseline schedule. Review the progress schedule with the Engineer periodically. Such review shall be made on a monthly basis or more frequently as required by the Engineer. If the Contractor fails to adhere to any part of the progress schedule, the progress schedule shall be updated by the Contractor to reflect the accurate progress of work.

B. At least 10 days before submission of the second Application for Payment (allowing for a month of replacements), a conference, attended by the Contractor, Engineer, and others as appropriate, will be held to review the Progress Schedule submitted in accordance with this Section and Section 00 72 00. No progress payment will be made to the Contractor until acceptable schedules are submitted to the Engineer.

1. The Progress Schedule will be acceptable to the Engineer if it provides an orderly progression of the Work to completion within the Contract duration.

2. The Progress shall be inclusive, but not limited to the following:
a. Submittal schedule update
b. Number of outreach activities completed
c. Status of leadCAST updates
d. Number and type (full, public side only, private side only, public side partial, or test pit) of planned replacement activities per Baseline Schedule
e. Number of actual replacements completed
f. Crew Size – planned vs actual

g. Customer complaints received and status
h. DigSafe permits and status
i. Traffic permit numbers and status
j. Safety updates

3. Payment to be withheld if Progress Schedules are not provided.

3.03 2-WEEK LOOK AHEAD

A. 2-Week Look Ahead Schedule shall be provided weekly (but no later than 5:00 PM on Thursday of each week). Adhere to the Look Ahead Schedule and provide written updates whenever the schedule changes due to weather or any other reason.

1. At a minimum the 2-week Look Ahead shall have the following items listed in a tabular form:

a. Project Name, and project number, Contractors Name
b. Detailed day-to-day schedule of the task identified in the overall work schedule
c. Identify crew and address for each task
d. Identify any outages, closures and control activities
e. Start and end dates of the week shall be clearly displayed by days of the week
f. Anticipated addresses for lead service line replacements
g. Anticipated work areas for traffic control and if required, encouraging new registrants
h. Dig safe utility mark-out number
i. Hour of day that work will be performed (within a 4 hour window)
j. Type of replacement (full, public side only, public side partial, or private side only) or test pit
k. Assumed water main size and material type (i.e., 6-inch cast iron) if available
l. Name of licensed plumber to be utilized
m. Proposed method of traffic control
n. Traffic engineering permit number
   1) Notation if a detour plan is required
   2) Notification if a school is affected by the work area or traffic plan
o. Whether or not road is under a paving moratorium or anticipated to be under an upcoming paving moratorium

2. Payment to be withheld if weekly updates to the 2-week look ahead are not being provided.

3.04 SCHEDULE UPDATES AND STATUS REPORTS

A. Provide Monthly Schedule Updates with each application for payment. Unless approved otherwise by the Owner and Engineer, the Date for the Monthly Status Reports shall be the end of the respective payment period.

B. Prior to generating each month's status report, meet with the Engineer to agree to the percent complete of each network activity.

3.05 DELIVERABLES

A. Unless approved otherwise by the Engineer, all schedule submittals shall be in electronic format (PDF or Excel as noted) and in color on pages no larger than 11-in by 17-in and may be divided into as many separate sheets as required.

B. Baseline Schedule: Submit one electronic copy (PDF) to the Owner and Engineer.

C. 2-Week Look Ahead: Submit one electronic copy (PDF) to the Owner and Engineer.

D. Monthly Progress Schedule Updates: Submit one electronic copy (Excel spreadsheet) to the Owner and Engineer.

3.06 PROGRESS REPORTING

A. The Monthly Schedule Update will be discussed at each progress meeting with submission in accordance with Paragraoph 3.02 of this Section.

B. The two-week look ahead shall be provided via e-mail every Thursday by 5:00 P.M. The Engineer shall provide the Contractor with a distribution list of who this two-week look ahead schedule should be sent to.

3.07 RESPONSIBILITY FOR SCHEDULE COMPLIANCE

A. Whenever it becomes apparent from the current schedule that delays occurred and the contract completion date will not be met, or when so directed by Owner, submit to the Owner for approval, a written statement of the steps intended to take to remove or arrest the delay in the accepted schedule at no additional cost to the Owner, including:

1. Increase construction manpower in such quantities and crafts,
2. Increase the number of working hours per shift, shifts per day, working days per week,
3. Increase the amount of construction equipment, and/or
4. Reschedule activities to maximize the concurrence of activities and comply with the revised schedule.

B. If when so requested by the Owner, failure to submit a written statement of the steps intended to take or should fail to take such steps as approved by the Engineer, the Engineer may direct the Contractor to increase the level of effort in manpower (trades), equipment and work schedule (overtime, weekend and holiday work, etc.) to be employed by the Contractor in order to remove or arrest the delay to the accepted schedule and the Contractor shall promptly provide such level of effort at no additional cost to the Owner.

3.08 ADJUSTMENT OF CONTRACT SCHEDULE AND COMPLETION TIME

A. If the Contractor wants or needs to make changes in their execution of the construction schedule that would affect schedule, the Contractor shall notify the Engineer in writing stating what changes are proposed and the reasons for the changes. If the Engineer approves such changes, the Contractor shall revise and submit a revised schedule for acceptance - without additional cost to the Owner. The schedule shall be adjusted by the Contractor only after prior acceptance of their proposed changes. Adjustments may consist of changing portions of the activity

sequence, activity durations, division of accepted activities, or other adjustments as may be accepted by the Engineer; however, the addition of extraneous, non-working activities and activities that add unacceptable restraints to the schedule will not be allowed.

B. Shop drawings that are not approved on the first submittal will require the addition of network activities for the re-submittals.

C. Equipment that does not pass the specified tests will require the addition of network activities for the retesting.

D. The contract completion time will be adjusted only for causes specified in this Contract. In the event the Contractor requests an extension of any contract completion date, the Contractor shall furnish such justification and supporting evidence as the Owner may deem necessary to determine whether the Contractor is entitled to an extension of time under the provisions of this Contract. After receipt of such justification and supporting evidence, the Owner shall perform an assessment or evaluation of the appropriate change in contract time based upon the currently accepted schedule and on all data relevant to the extension. Inexcusable delays (attributable to the Contractor) and non-critical delays (delays to activities which, according to the schedule, do not affect any contract completion date) shall not be the basis for a change in contract time. The Owner will provide a written recommendation based on its assessment, with a copy to the Contractor. The Contractor shall not change any fixed contract milestones or required completion dates without the approval of the Owner, evidenced by the execution of a contract change order. However, the Contractor should make a note of such requests for changes in contract time in the narrative of monthly schedule status reports.

E. Each request for a change in any contract completion date shall be submitted by the Contractor to the Owner in accordance with the notification requirements stipulated in the Contract Documents. No time extension will be granted for requests that are not submitted in accordance with the Contract requirements.

F. Total float in the accepted schedule belongs to the project; i.e., either the Owner or Contractor may take advantage of available total float on a first-come, first-served basis. Therefore, without obligation to extend either the overall completion date or any intermediate completion dates set out in the schedule, the Owner may initiate changes to the work or delay work that absorb available total float existing at the time of the change or delay. Owner-initiated changes or delays that affect the schedule shall be the sole grounds for extending (or contracting) contract completion dates or fixed milestones.

END OF SECTION

ATTACHMENT 4

Appendix C

Relevant Rules and Regulations for Traffic Permits and Traffic Control

(City of Providence, MUTCD, RIDOT)

Revised per Addendum No. 1

Traffic Permit

GENERAL INFORMATION

The closing or occupying of a public street or sidewalk and the posting of temporary "Emergency No Parking Tow Zone" signs in the City of Providence requires the submission and approval of a Traffic Permit issued by the Department of Public Works (Traffic Engineering Division).

A permit for each street is required if multiple streets are involved for a single activity.

Applications will not be accepted less than 2 business days prior to the requested permit start date.

The Posting of Emergency No Parking Tow Zone Signs shall be performed by Providence Traffic Engineering only.

Applicants for Street/Sidewalk Closings and permission to Obstruct/Occupy Right-of-Way/Sidewalk are required to show proof of Liability Insurance in the amount of $1,000,000 naming the City of Providence and it employees and/or agents, as additional insured on a primary and non-contributory basis.

SPECIAL EVENT PERMIT: Street closing or occupying of the public street or sidewalk and the posting of temporary emergency no parking tow zone signs for events on City streets/sidewalks or City property are permitted separately through the Department of Arts Culture and Tourism through a Special Events Permit.

ABUTTER NOTIFICATION: Applicants for Street/Sidewalk Closings and permission to Obstruct/Occupy Right-of-Way/Sidewalk are responsible for notifying the property owners abutting the partial or full closure of the sidewalk or street at least 2 business days in advance. The notification shall include a description of the dates and time period of the partial or full closure, a contact person from the applicant including their cell phone #. A copy of this notification and the Attestation of Notification of Abutters shall be attached to the permit.

POLICE DETAILS: If a Police Detail is required, it is the Applicants responsibility to call the Detail Office at (401) 243-6405 to request the detail. Please note that police details are an additional fee above and beyond the fees in the Traffic Engineering Division permit.

FEE(S)

There is a $25 or $185 permit fee to process an Application requesting Street/Sidewalk Closings or Obstruct/Occupy Right-of-Way/Sidewalk. If the applicant is furnishing and installing the traffic control devices the fee is $25 and if Providence Traffic Engineering is furnishing and installing the traffic control devices the fee is $185. It is desirable that the permit be submitted ten (10) days before the requested permit start date. Applications that are received within the ten (10) day period will require the applicant to pay an additional $50.00 late fee which brings the permit fee up to $75 /$235. Applications to Obstruct/Occupy Right-of-Way/Sidewalk have an additional fee of $0.06/square feet of right of way occupied/week ($80/week minimum fee).

The City of Providence shall seek reimbursement for restricting access to metered parking spaces and for expenses to post temporary no parking signs. The costs are broken down as follows:

- Posting Emergency No parking Tow Zone Signs (up to 500 ft. street length) = $80.00 per posting
- If access to metered Parking is being restricted a fee of $12.50 per metered parking spaces per day not including Sundays or Holidays will be applied in addition to other permit fees.

NOTE: All Traffic Permit fees must be paid online by either credit card or bank transfer. DPW does not accept cash or checks for Traffic Permits.

FULL CLOSING OF STREETS

To insure the safe, efficient use of the public ways in the City of Providence, a Detour Plan shall be submitted for review and approval by the office of Traffic Engineering for all functionally classified roadways, including: Principal Arterials, Major Collectors, and Minor Collectors.

A list of functionally classified roadways in the City of Providence is available on the State of Rhode island Statewide Planning website https://planning.ri.gov/planning-areas/transportation/highway-functional-classification

The Detour Plan shall be prepared in accordance with the guidelines of the Federal Highway Administration Manual of Uniform Traffic Control Devices.

The Applicant shall be responsible to place and remove signs indicating the detour route in a timely manner. If, during the course of the work, it is found that the detour signs are not in place, Traffic Engineering reserves the right to revoke the permit and cause the Applicant to vacate the roadway immediately.

So as to minimize the disturbance to traffic flow, Traffic Engineering may issue a permit with limits as to the time of day or days of the week when the work can be performed. Failure to comply with any time restrictions, or any other stipulation of a permit, may be cause for revocation of the permit and restrictions on future permits.

PARTIAL STREET CLOSURES

Should the activity require the closing of a portion of the public way, including sidewalks, shoulders or single travel lanes, a plan for temporary traffic controls shall be submitted to Traffic Engineering for review and approval. The plan shall be prepared in accordance with the guidelines of the Federal Highway Administration Manual on Uniform Traffic Control Devices.

The Applicant shall be responsible to place and remove all signs in a timely manner. Posting of roads for Emergency No Parking is strictly the responsibility of the office of Traffic Engineering and the Applicant shall be financially responsible for this service.

Personnel needed to control the flow of traffic through a construction area shall be uniformed police detail officers. The Applicant is responsible for coordinating police details. Should the use of flaggers be permitted, they shall be properly attired in safety apparel and adequately trained in the use of hand-signaling devices.

INTERFERENCE WITH BICYCLE ROUTES OR PEDESTRIAN MOVEMENTS

When a designated bicycle route in the City is impacted by either a full street closing or partial closing, temporary signs designating an alternative route for bicyclists shall be placed by the Applicant, in accordance with a plan approved by the office of Traffic Engineering.

When it is necessary to close a sidewalk, sidewalk closed cross here signs shall be erected in each direction at the nearest crosswalk. If the sidewalk is closed for an extended period of time in areas of heavy pedestrian traffic pedestrian paths parallel to the work zone may be required where feasible.

Apply Online

PART 6
TEMPORARY TRAFFIC CONTROL

CHAPTER 6A. GENERAL

Section 6A.01 General

Support:

01 Whenever the acronym "TTC" is used in Part 6, it refers to "temporary traffic control."

Standard:

02 **The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, or on a site roadway open to public travel (see definition in Section 1C.02), including persons with disabilities) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.**

Support:

03 When the normal function of the roadway, or a site roadway open to public travel, is suspended, TTC planning provides for continuity of the movement of motor vehicle, bicycle, and pedestrian traffic (including accessible passage); transit operations; and access (and accessibility) to property and utilities.

04 The primary function of TTC is to facilitate movement of road users through or around TTC zones while protecting road users, workers, responders to traffic incidents, and equipment.

05 Of equal importance to the public traveling through the TTC zone is the safety of workers performing the many varied tasks within the work space. TTC zones present constantly changing conditions that are unexpected by the road user. This creates an even higher degree of vulnerability for the workers and incident management responders on or near the roadway (see Section 6C.04). At the same time, the TTC zone provides for the efficient completion of whatever activity interrupted the normal use of the roadway.

06 Consideration for road user safety, worker and responder safety, and the efficiency of road user flow is an integral element of every TTC zone, from planning through completion. A concurrent objective of the TTC is the efficient construction and maintenance of the highway and the efficient resolution of traffic incidents.

07 No one set of TTC devices can satisfy all conditions for a given project or incident. At the same time, defining details that would be adequate to cover all applications is impractical. Instead, Part 6 displays typical applications that depict common applications of TTC devices. The TTC selected for each situation depends on the type of highway, road user conditions, the duration of operation, physical constraints, and the nearness of the work space or incident management activity to road users.

08 The TTC needs on low-volume and special purpose roads will sometimes be minimal, especially for shorter-term durations and for lower-speed roads. The use of maintenance vehicle warning flashers, a limited number of signs, or a single flagger could be adequate for these situations.

09 Improved road user performance might be realized through a well-prepared public relations effort that covers the nature of the work, the time and duration of its execution, the anticipated effects upon road users, and possible alternate routes and modes of travel. Such programs have been found to result in a significant reduction in the number of road users traveling through the TTC zone, which reduces the possible number of conflicts.

10 Operational improvements might be realized by using intelligent transportation systems (ITS) in work zones. The use in work zones of ITS technology, such as portable camera systems, highway advisory radio, variable speed limits, ramp metering, traveler information, merge guidance, warning systems for vehicles exiting the work space, and queue detection information, is aimed at increasing safety for both workers and road users and helping to ensure a more efficient traffic flow. The use in work zones of ITS technologies has been found to be effective in providing traffic monitoring and management, data collection, and traveler information.

Standard:

11 **TTC plans and devices shall be the responsibility of the public body or official or the owners of site roadways open to public travel having jurisdiction for guiding road users.**

Guidance:

12 *There should be adequate statutory authority for the implementation and enforcement of needed road user regulations, parking controls, speed zoning, and the management of traffic incidents. Such statutes should provide sufficient flexibility in the application of TTC to meet the needs of changing conditions in the TTC zone.*

Support:

13 The provisions of Part 6 apply to both rural and urban areas. A rural highway is normally characterized by lower volumes, higher speeds, fewer turning conflicts, and less conflict with pedestrians or other vulnerable road users. An urban street is typically characterized by relatively low speeds, wide ranges of road user volumes, narrower roadway lanes, frequent intersections and driveways, significant vulnerable road user activity, and more businesses and houses.

14 The determination as to whether a particular facility at a particular time of day can be considered to be a high-volume roadway or can be considered to be a low-volume roadway is made by the public agency or official having jurisdiction.

15 Special plans preparation and coordination with transit, other highway agencies, law enforcement and other emergency units, utilities, schools, trucking associations, and railroad companies might be needed to reduce unexpected and unusual road user operation situations.

Section 6A.02 Fundamental Principles of Temporary Traffic Control

Guidance:

01 *Road user and worker safety and accessibility in TTC zones should be an integral and high-priority element of every project from planning through design and construction. Similarly, maintenance and utility work should be planned and conducted with the safety and accessibility of all motorists, bicyclists, pedestrians (including those with disabilities), and workers being considered at all times. If the TTC zone includes a grade crossing, early coordination with the railroad company or light rail transit agency should take place.*

02 *The following are the seven fundamental principles of TTC:*

A. General plans or guidelines should be developed to provide safety for motorists, bicyclists, pedestrians, workers, enforcement/emergency officials, and equipment, with the following factors being considered:

1. The basic safety principles governing the design of permanent roadways and roadsides should also govern the design of TTC zones. The goal should be to route road users through such zones using roadway geometrics, roadside features, and TTC devices as nearly as possible comparable to those for normal highway situations.

2. A TTC plan, in detail appropriate to the complexity of the work project or incident, should be prepared and understood by all responsible parties before the site is occupied. Any changes in the TTC plan should be approved by an official who is knowledgeable (for example, trained and/or certified) in proper TTC practices.

B. Road user movement should be inhibited as little as practical, based on the following considerations:

1. TTC at work and incident sites should be designed on the assumption that drivers will only reduce their speeds if they clearly perceive a need to do so (see Section 6B.01).

2. Frequent and abrupt changes in geometrics such as lane narrowing, dropped lanes, or main roadway transitions that require rapid maneuvers, should be avoided.

3. Work should be scheduled in a manner that minimizes the need for lane closures or alternate routes, while still getting the work completed quickly and the lanes or roadway open to traffic as soon as possible.

4. Attempts should be made to reduce the volume of traffic using the roadway or freeway to match the restricted capacity conditions. Road users should be encouraged to use alternative routes. When the roadway capacity is reduced because of lane closures, the demand could exceed the available capacity, which might result in either a lengthy stopped or slow moving queue of vehicles that might extend past the normal location of the signs shown in the typical advance warning area. An assessment of the expected queue length, which should be a part of the TTC plan design process, might result in adjustments to the sign spacing and number of signs as well as the use of more conspicuous devices to increase the distance and conspicuity of the advance warning area. For high-volume roadways and freeways, the closure of selected entrance ramps or other access points and the use of signed diversion routes should be evaluated.

5. Bicyclists and pedestrians, including those with disabilities, should be provided with access and passage through the TTC zone.

6. If work operations permit, lane closures on high-volume streets and highways should be scheduled during off-peak hours. Night work should be considered if the work can be accomplished with a series of short-term operations.

7. Early coordination with officials having jurisdiction over the affected cross streets and providing emergency services should occur if significant impacts to roadway operations are anticipated.

C. *Motorists, bicyclists, and pedestrians should be guided in a clear and positive manner while approaching and traversing TTC zones and incident sites. The following principles should be applied:*
   1. *Adequate warning, delineation, and channelization should be provided to assist in guiding road users in advance of and through the TTC zone or incident site by using proper pavement marking, signing, or other devices that are effective under varying conditions. Information should be provided in usable formats for pedestrians with vision disabilities.*
   2. *TTC devices inconsistent with intended travel paths through TTC zones should be removed or covered. However, in intermediate-term stationary, short-term, and mobile operations, where visible permanent devices are inconsistent with intended travel paths, devices that highlight or emphasize the appropriate path should be used. Traffic control devices should provide information in usable formats for pedestrians with vision disabilities.*
   3. *Flagging procedures, when used, should provide positive guidance to road users traversing the TTC zone.*

D. *To provide acceptable levels of operations, routine day and night inspections of TTC elements should be performed as follows:*
   1. *Individuals who are knowledgeable (for example, trained and/or certified) in the principles of proper TTC should be assigned responsibility for safety in TTC zones. The most important duty of these individuals is to check that TTC devices on the project are consistent with the TTC plan and are effective for motorists, bicyclists, pedestrians, and workers.*
   2. *As the work progresses, temporary traffic controls and/or working conditions should be modified, as needed, to facilitate road user movement and provide worker safety. The individual responsible for TTC should have the authority to halt work until applicable or remedial safety measures are taken.*
   3. *TTC zones should be carefully monitored under varying conditions of road user volumes, light, and weather to check that applicable TTC devices are effective, clearly visible, clean, and in compliance with the TTC plan.*
   4. *When warranted, an engineering study should be made (in cooperation with law enforcement officials) of reported crashes occurring within the TTC zone. Crash records in TTC zones should be monitored to identify the need for changes in the TTC zone.*

E. *Attention should be given to the maintenance of roadside safety during the life of the TTC zone by applying the following principles:*
   1. *To accommodate run-off-the-road incidents, disabled vehicles, or emergency situations, unencumbered roadside recovery areas or clear zones should be provided where practical.*
   2. *Channelization of road users should be accomplished by the use of pavement markings, signing, and crashworthy, detectable channelizing devices.*
   3. *Work equipment, workers' private vehicles, materials, and debris should be stored in such a manner to reduce the probability of being impacted by run-off-the-road vehicles.*

F. *Each person whose actions affect TTC zone safety, from the upper-level management through the field workers, should receive training appropriate to the job decisions each individual is required to make. Only those individuals who are trained in proper TTC practices and have a basic understanding of the principles (established by applicable standards and guidelines, including those of this Manual) should supervise the selection, placement, and maintenance of TTC devices used for TTC zones and for incident management.*

G. *Good public relations should be maintained by applying the following principles:*
   1. *The needs of all road users should be assessed such that appropriate advance notice is given and clearly defined alternative paths are provided.*
   2. *The cooperation of the various news media should be sought in publicizing the existence of and reasons for TTC zones because news releases can assist in keeping the road users well informed.*
   3. *The needs of abutting property owners, residents, and businesses should be assessed and appropriate accommodations made.*
   4. *The needs of emergency service providers (law enforcement, fire, and medical) should be assessed and appropriate coordination and accommodations made.*
   5. *The needs of railroads and transit should be assessed and appropriate coordination and accommodations made.*
   6. *The needs of operators of commercial vehicles such as buses and large trucks should be assessed and appropriate accommodations made.*
   7. *Early coordination should occur with school officials to discuss potential impacts on picking up and dropping off schoolchildren, on school bus routing, and on safe routes to school patterns.*

Section 6A.03 TTC Devices

Guidance:

01 *The design and application of TTC devices used in TTC zones should consider the needs of all road users (motorists, bicyclists, and pedestrians), including those with disabilities.*

Standard:

02 **Traffic control devices shall be defined as all signs, signals, markings, channelizing devices, or other devices that use colors, shapes, symbols, words, sounds, or tactile information for the primary purpose of communicating a regulatory, warning, or guidance message to road users on a street, highway, pedestrian facility, bikeway, pathway, or site roadway open to public travel.**

03 **All traffic control devices used for construction, maintenance, utility, or incident management operations on a street, highway, pedestrian facility, bikeway, pathway, or site roadway open to public travel shall comply with the applicable provisions of this Manual.**

04 **All TTC devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, TTC devices that are no longer appropriate shall be removed or covered.**

Section 6A.04 Crashworthiness of TTC Devices

Support:

01 Various Sections of the MUTCD require certain traffic control devices, their supports, and/or related appurtenances to be crashworthy (see definition in Section 1C.02). Such MUTCD crashworthiness provisions apply to all streets, highways, and site roadways open to public travel.

Section 6A.05 Night Work

Support:

01 Conducting highway construction and maintenance activities during night hours could provide an advantage when traditional daytime traffic control strategies cannot achieve an acceptable balance between worker and public safety, traffic and community impact, and constructability. The two basic advantages of working at night are reduced traffic congestion and less involvement with business activities. However, the two basic conditions that must normally be met for night work to offer any advantage are reduced traffic volumes and easy set up and removal of the traffic control patterns on a nightly basis.

02 Shifting work activities to night hours, when traffic volumes are lower and normal business is less active, might offer an advantage in some cases, as long as the necessary work can be completed and the worksite restored to essentially normal operating conditions to carry the higher traffic volume during non-construction hours.

03 Although working at night might offer advantages, it also includes safety issues. Reduced visibility inherent in night work impacts the performance of both drivers and workers. Because traffic volumes are lower and congestion is minimized, speeds are often higher at night necessitating greater visibility at a time when visibility is reduced. Finally, the incidence of impaired (alcohol or drugs), fatigued, or drowsy drivers might be higher at night.

04 Working at night also involves other factors, including construction productivity and quality, social impacts, economics, and environmental issues. A decision to perform construction or maintenance activities at night normally involves some consideration of the advantages to be gained compared to the safety and other issues that might be impacted.

05 Section 6N.18 contains specific provisions on TTC for work during nighttime hours.

CHAPTER 6B. TEMPORARY TRAFFIC CONTROL ELEMENTS

Section 6B.01 Temporary Traffic Control Plans

Support:

01 Each TTC zone is different. Many variables, such as location of work, highway type, geometrics, vertical and horizontal alignment, intersections, interchanges, road user volumes, road user mix (motorists, bicyclists, and pedestrians), road vehicle mix (buses, trucks, and cars), and road user speeds affect the needs of each zone. The goal of TTC in work zones is safety with minimum disruption to road users. The key factor in promoting TTC zone safety is proper judgment.

02 A TTC plan describes TTC measures to be used for facilitating road users through a work zone or an incident area. TTC plans play a vital role in facilitating road user flow when a work zone, incident, or other event temporarily disrupts normal road user flow. Important auxiliary provisions that cannot conveniently be specified on project plans can easily be incorporated into Special Provisions within the TTC plan.

03 TTC plans range in scope from being very detailed to simply referencing typical drawings contained in this Manual, standard approved highway agency drawings and manuals, or specific drawings contained in the contract documents. The degree of detail in the TTC plan depends entirely on the nature and complexity of the situation.

04 During TTC activities, commercial vehicles might need to follow a different route from passenger vehicles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous materials might need to follow a different route from other vehicles. The Hazardous Materials and National Network signs are included in Sections 2B.67 and 2B.68, respectively.

Guidance:

05 *A TTC plan should be developed for planned activities that will affect road users. A TTC plan should be developed for unplanned and emergency situations where practicable.*

06 *The TTC plan should start in the planning phase and continue through the design, construction, and restoration phases. The TTC plans and devices should follow the principles set forth in Part 6. The management of traffic incidents should follow the principles set forth in Chapter 6O.*

07 *TTC plans should be prepared by persons knowledgeable (for example, trained and/or certified) about the fundamental principles of TTC and work activities to be performed. The design, selection, and placement of TTC devices for a TTC plan should be based on engineering judgment.*

08 *Coordination should be made between adjacent or overlapping projects to check that duplicate signing is not used and to check compatibility of traffic control between adjacent or overlapping projects.*

09 *Traffic control planning should be completed for all highway construction, utility work, maintenance operations, and incident management including minor maintenance and utility projects prior to occupying the TTC zone. Planning for all road users should be included in the process.*

10 *For any planned special event that will have an impact on the traffic on any street or highway, a TTC plan should be developed in conjunction with and be approved by the agency or agencies that have jurisdiction over the affected roadways.*

11 *Provisions for effective continuity of accessible circulation paths for pedestrians should be incorporated into the TTC plan.*

Option:

12 Provisions may be incorporated into the project bid documents that enable contractors to develop an alternate TTC plan.

13 Modifications of TTC plans may be necessary because of changed conditions or a determination of better methods of safely and efficiently handling road users.

Guidance:

14 *This alternate or modified plan should have the approval of the responsible highway agency or owner of site roadways open to public travel prior to implementation.*

15 *Provisions for effective continuity of transit service should be incorporated into the TTC planning process because often public transit buses cannot efficiently be detoured in the same manner as other vehicles (particularly for short-term maintenance projects). Where applicable, the TTC plan should provide for features such as accessible temporary bus stops, pull-outs, and satisfactory waiting areas for transit patrons, including persons with disabilities (see Section 8A.13 for additional light rail transit issues to consider for TTC).*

16 *Provisions for effective continuity of railroad service and acceptable access to abutting property owners and businesses should also be incorporated into the TTC planning process.*

17 *Reduced speed zoning (lowering the regulatory speed limit) should be avoided as much as practical because drivers will reduce their speeds only if they clearly perceive a need to do so.*

18 *If reduced speed limits are used, they should be used only in the specific portion of the TTC zone where conditions or restrictive features are present. However, frequent changes in the speed limit should be avoided. A TTC plan should be designed so that vehicles can travel through the TTC zone with a speed limit reduction of no more than 10 mph.*

19 *A reduction of more than 10 mph in the speed limit should be used only when required by restrictive features in the TTC zone. Where restrictive features justify a speed reduction of more than 10 mph, additional driver notification should be provided. The speed limit should be stepped down in advance of the location requiring the lowest speed, and additional TTC warning devices should be used.*

Support:

20 Research has demonstrated that large reductions in the speed limit, such as a 30-mph reduction, increase speed variance and the potential for crashes. Smaller reductions in the speed limit of up to 10 mph cause smaller changes in speed variance and lessen the potential for increased crashes. A reduction in the regulatory speed limit of only up to 10 mph from the normal speed limit has been shown to be more effective.

21 Chapter 6P contains typical applications (TAs) of TTC zones that are organized according to duration, location, type of work, and highway type. Table 6P-1 is an index of these typical applications. These typical applications include the use of various TTC methods, but do not include a layout for every conceivable work situation.

22 Decisions regarding the selection of the most appropriate typical application to use as a guide for a specific TTC zone require an understanding of each situation. Although there are many ways of categorizing TTC zone applications, the typical applications illustrated in Chapter 6P are characterized by work duration, work location, work type, and highway type.

Guidance:

23 *Typical applications should be altered, when necessary, to fit the conditions of a particular TTC zone.*

Option:

24 Other devices may be added to supplement the devices shown in the typical applications. The sign spacings and taper lengths may be increased to provide additional time or space for driver response.

25 Devices labeled as optional in the typical applications may be deleted.

Support:

26 Formulating specific plans for TTC at traffic incidents is difficult because of the variety of situations that can arise.

27 Well-designed TTC plans for planned special events will likely be developed from a combination of treatments from several of the typical applications.

Section 6B.02 Temporary Traffic Control Zones

Support:

01 A TTC zone is an area of a highway where road user conditions are changed because of a work zone, an incident zone, or a planned special event through the use of TTC devices, uniformed law enforcement officers, or other authorized personnel.

02 A work zone is an area of a highway with construction, maintenance, or utility work activities. A work zone is typically marked by signs, channelizing devices, barriers, pavement markings, and/or work vehicles. It extends from the first warning sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to the END ROAD WORK sign or the last TTC device.

03 An incident zone is an area of a highway where temporary traffic controls are imposed by authorized officials in response to a traffic incident (see Section 6O.01). It extends from the first warning device (such as a sign, light, or cone) to the last TTC device or to a point where road users return to the original lane alignment and are clear of the incident.

04 A planned special event often creates the need to establish altered traffic patterns to handle the increased traffic volumes generated by the event. The size of the TTC zone associated with a planned special event can be small, such as closing a street for a festival, or can extend throughout a municipality for larger events. The duration of the TTC zone is determined by the duration of the planned special event.

Section 6B.03 Components of Temporary Traffic Control Zones

Support:

01 A TTC zone is often divided into four areas as needed, based on engineering judgment: the advance warning area, the transition area, the activity area, and the termination area. Figure 6B-1 illustrates the four areas typically included in a TTC zone. These four areas are described in Sections 6B.04 through 6B.07.

Section 6B.04 Advance Warning Area

Support:

01 The advance warning area is the section of highway where road users are informed about the upcoming transition and activity areas or incident area.

Option:

02 The advance warning area may vary from a single sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to a series of signs in advance of the TTC zone activity area.

Guidance:

03 *Typical distances for placement of advance warning signs on freeways and expressways should be longer because drivers are conditioned to uninterrupted flow. Therefore, the advance warning sign placement should extend on these facilities as far as ½ mile or more.*

04 *On urban streets, the effective placement of the nearest warning sign to the TTC zone, in feet, should range from 4 to 8 times the speed limit in mph, with the high end of the range being used when speeds are relatively high. When two or more advance warning signs are used on higher-speed streets, such as major arterials, the advance warning area should extend a greater distance (see Table 6B-1).*

Option:

05 When a single advance warning sign is used (in cases such as low-speed residential streets), the advance warning area may be as short as 100 feet.

Guidance:

06 *Since rural highways are normally characterized by higher speeds, the effective placement of the first warning sign in feet should be substantially longer—from 8 to 12 times the speed limit in mph. Since two or more advance warning signs are normally used for these conditions, the advance warning area should extend 1,500 feet or more for open highway conditions (see Table 6B-1).*

07 *The distances contained in Table 6B-1 are approximate, are intended for guidance purposes only, and should be applied with engineering judgment. These distances should be adjusted for field conditions, if necessary, by increasing or decreasing the recommended distances.*

Support:

08 The need to provide additional reaction time for a condition is one example of justification for increasing the sign spacing. Conversely, decreasing the sign spacing might be justified in order to place a sign immediately downstream of an intersection or major driveway such that traffic turning onto the roadway in the direction of the TTC zone will be warned of the upcoming condition.

Option:

09 Advance warning may be eliminated when the activity area is sufficiently removed from the road users' path so that it does not interfere with the normal flow.

Section 6B.05 Transition Area

Support:

01 The transition area is that section of highway where road users are redirected out of their normal path. Transition areas usually involve strategic use of tapers, which because of their importance are discussed separately in detail.

Standard:

02 **Except for mobile operations, when redirection of the road users' normal path is required, road users shall be directed from the normal path to a new path with appropriate channelizing devices, traffic control devices, and/or TTC methods.**

Option:

03 Because it is impracticable in mobile operations to redirect the road users' normal path with stationary channelization, more dominant vehicle-mounted traffic control devices, such as arrow boards, portable changeable message signs, and high-intensity rotating, flashing, oscillating, or strobe lights, may be used instead of channelizing devices to establish a transition area.

Figure 6B-1. Component Parts of a Temporary Traffic Control Zone

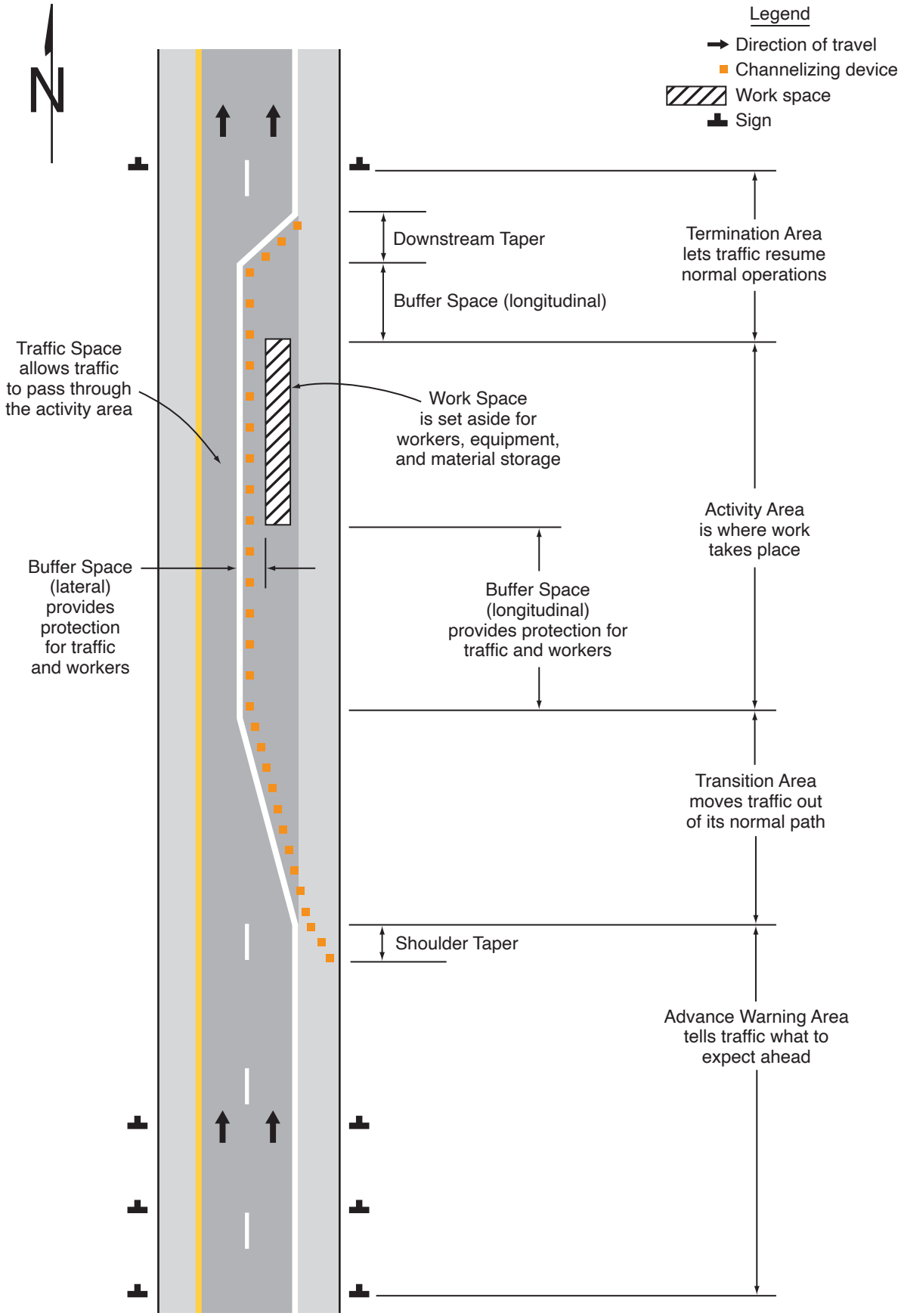


Table 6B-1. Recommended Advance Warning Sign Minimum Spacing

Road Type	Distance between Signs**		
	A	B	C
Urban (low speed)*	100 feet	100 feet	100 feet
Urban (high speed)*	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet

* Speed category to be determined by the highway agency or owner of site roadways open to public travel.

** The column headings A, B, and C are the dimensions shown in Figures 6P-1 through 6P-54 The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The "first sign" is the sign in a three-sign series that is closest to the TTC zone. The "third sign" is the sign that is furthest upstream from the TTC zone.)

Section 6B.06 Activity Area

Support:

01 The activity area is the section of the highway where the work activity takes place. It is comprised of the work space, the traffic space, and the buffer space.

02 The work space is that portion of the highway closed to road users and set aside for workers, equipment, and material, and a shadow vehicle if one is used upstream. Work spaces are usually delineated for road users by channelizing devices or, to exclude vehicles and pedestrians, by temporary barriers.

Option:

03 The work space may be stationary or may move as work progresses.

Guidance:

04 *Since there might be several work spaces (some even separated by several miles) within the project limits, each work space should be adequately signed to inform road users and reduce confusion.*

Support:

05 The traffic space is the portion of the highway in which road users are routed through the activity area.

06 The buffer space is a lateral and/or longitudinal area that separates road user flow from the work space or an unsafe area, and might provide some recovery space for an errant vehicle.

Guidance:

07 *Neither work activity nor storage of equipment, vehicles, or material should occur within a buffer space.*

Option:

08 Buffer spaces may be positioned either longitudinally or laterally with respect to the direction of road user flow. The activity area may contain one or more lateral or longitudinal buffer spaces.

09 A longitudinal buffer space may be placed in advance of a work space.

10 The longitudinal buffer space may also be used to separate opposing road user flows that use portions of the same traffic lane, as shown in Figure 6B-2.

11 If a longitudinal buffer space is used, the values shown in Table 6B-2 may be used to determine the length of the longitudinal buffer space.

Support:

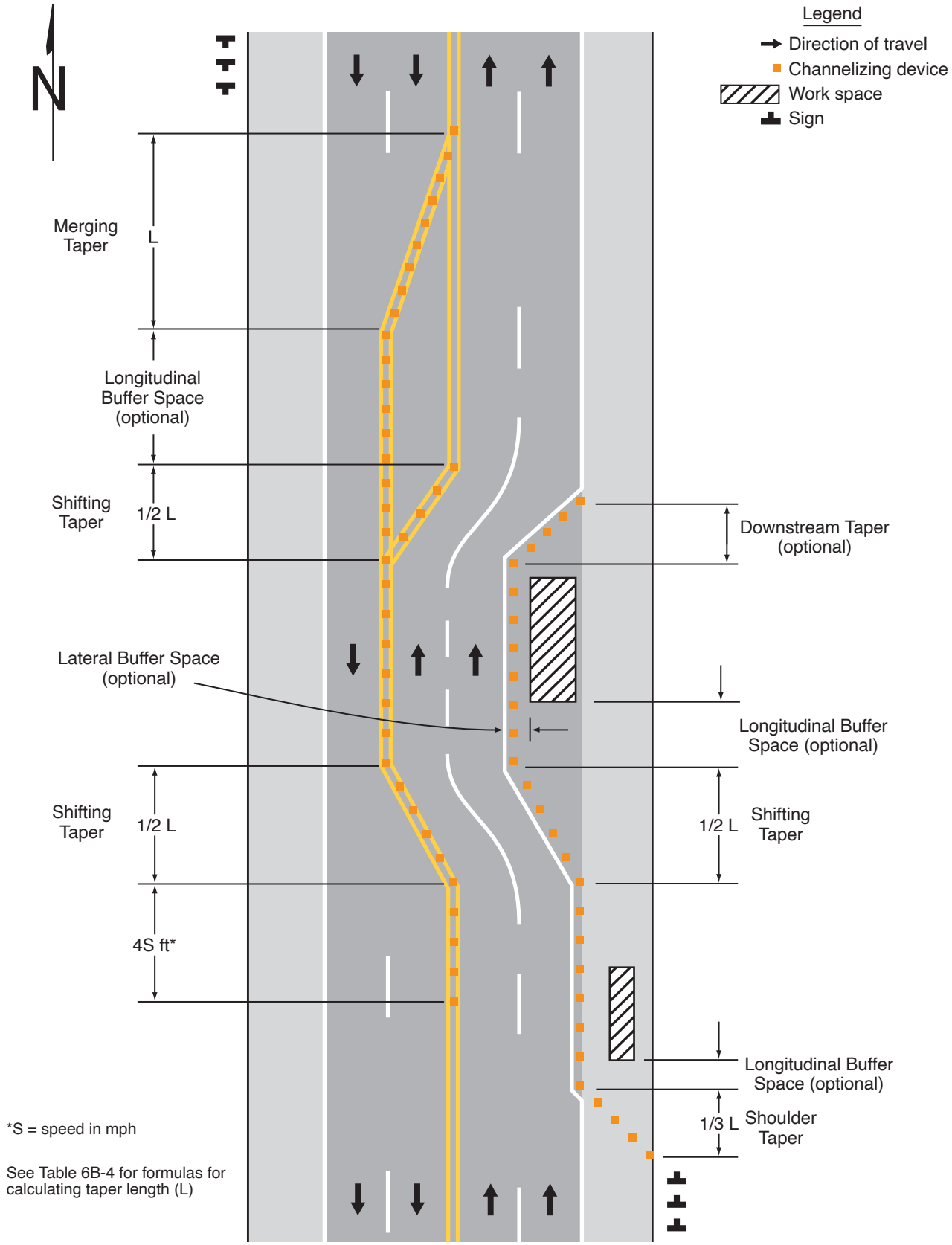
12 Typically, the buffer space is formed as a traffic island and defined by channelizing devices.

13 When a shadow vehicle, arrow board, or changeable message sign is placed in a closed lane in advance of a work space, only the area upstream of the vehicle, arrow board, or changeable message sign constitutes the buffer space.

Option:

14 The lateral buffer space may be used to separate the traffic space from the work space, as shown in Figures 6B-1 and 6B-2, or such areas as excavations or pavement-edge drop-offs. A lateral buffer space also may be used between two travel lanes, especially those carrying opposing flows.

Figure 6B-2. Types of Tapers and Buffer Spaces



Guidance:

15 *The width of a lateral buffer space should be determined by engineering judgment.*

Option:

16 When work occurs on a high-volume, highly-congested facility, a vehicle storage or staging space may be provided for incident response and emergency vehicles (for example, tow trucks and fire apparatus) so that these vehicles can respond quickly to road user incidents.

Table 6B-2. Stopping Sight Distance as a Function of Speed

Speed*	Distance
20 mph	115 feet
25 mph	155 feet
30 mph	200 feet
35 mph	250 feet
40 mph	305 feet
45 mph	360 feet
50 mph	425 feet
55 mph	495 feet
60 mph	570 feet
65 mph	645 feet
70 mph	730 feet
75 mph	820 feet

* Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed

Section 6B.07 Termination Area

Support:

01 The termination area is the section of the highway where road users are returned to their normal driving path. The termination area extends from the downstream end of the work area to the last TTC device such as END ROAD WORK signs, if posted.

Option:

02 An END ROAD WORK sign, a Speed Limit sign, or other signs may be used to inform road users that they can resume normal operations.

03 A longitudinal buffer space may be used between the work space and the beginning of the downstream taper.

Section 6B.08 Tapers

Option:

01 Tapers may be used in both the transition and termination areas. Whenever tapers are to be used in close proximity to an interchange ramp, crossroads, curves, or other influencing factors, the length of the tapers may be adjusted.

Support:

02 Tapers are created by using a series of channelizing devices and/or pavement markings to move traffic out of or into the normal path. Types of tapers are shown in Figure 6B-2.

03 Longer tapers are not necessarily better than shorter tapers (particularly in urban areas with characteristics such as short block lengths or driveways) because extended tapers tend to encourage sluggish operation and to encourage drivers to delay lane changes unnecessarily. The test concerning adequate lengths of tapers involves observation of driver performance after TTC plans are put into effect.

Table 6B-3. Taper Length Criteria for Temporary Traffic Control Zones

Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	50 feet minimum, 100 feet maximum

Note: Use Table 6B-4 to calculate L

Guidance:

04 *The appropriate taper length (L) should be determined using the criteria shown in Tables 6B-3 and 6B-4.*

Table 6B-4. Formulas for Determining Taper Length

Speed (S)	Taper Length (L) in feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	L = WS

Where: L = taper length in feet
W = width of offset in feet
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

Support:

05 A merging taper requires the longest distance because drivers are required to merge into common road space.

Guidance:

06 *A merging taper should be long enough to enable merging drivers to have adequate advance warning and sufficient length to adjust their speeds and merge into an adjacent lane before the downstream end of the transition.*

Support:

07 A shifting taper is used when a lateral shift is needed. When more space is available, a longer than minimum taper distance can be beneficial. Changes in alignment can also be accomplished by using horizontal curves designed for normal highway speeds.

Guidance:

08 *A shifting taper should have a length of approximately ½ L (see Tables 6B-3 and 6B-4).*

Support:

09 A shoulder taper might be beneficial on a high-speed roadway where shoulders are part of the activity area and are closed, or when improved shoulders might be mistaken as a driving lane. In these instances, the same type, but abbreviated, closure procedures used on a normal portion of the roadway can be used.

Guidance:

10 *If used, shoulder tapers should have a length of approximately ⅓ L (see Tables 6B-3 and 6B-4). If a shoulder is used as a travel lane, either through practice or during a TTC activity, a normal merging or shifting taper should be used.*

Support:

11 A downstream taper might be useful in termination areas to provide a visual cue to the driver that access is available back into the original lane or path that was closed.

Guidance:

12 *If used, a downstream taper should have a minimum length of 50 feet and a maximum length of 100 feet with devices placed at a spacing of approximately 20 feet.*

Support:

13 The one-lane, two-way taper is used in advance of an activity area that occupies part of a two-way roadway in such a manner that a portion of the road is used alternately by traffic in each direction.

Guidance:

14 *A taper having a minimum length of 50 feet and a maximum length of 100 feet with channelizing devices at approximately 20-foot spacing should be used to guide traffic into the one-lane section, and a downstream taper should be used to guide traffic back into their original lane.*

Support:

15 An example of a one-lane, two-way traffic taper is shown in Figure 6B-3.

Section 6B.09 Detours and Diversions

Support:

01 A detour is a temporary rerouting of road users onto an existing highway in order to avoid a TTC zone.

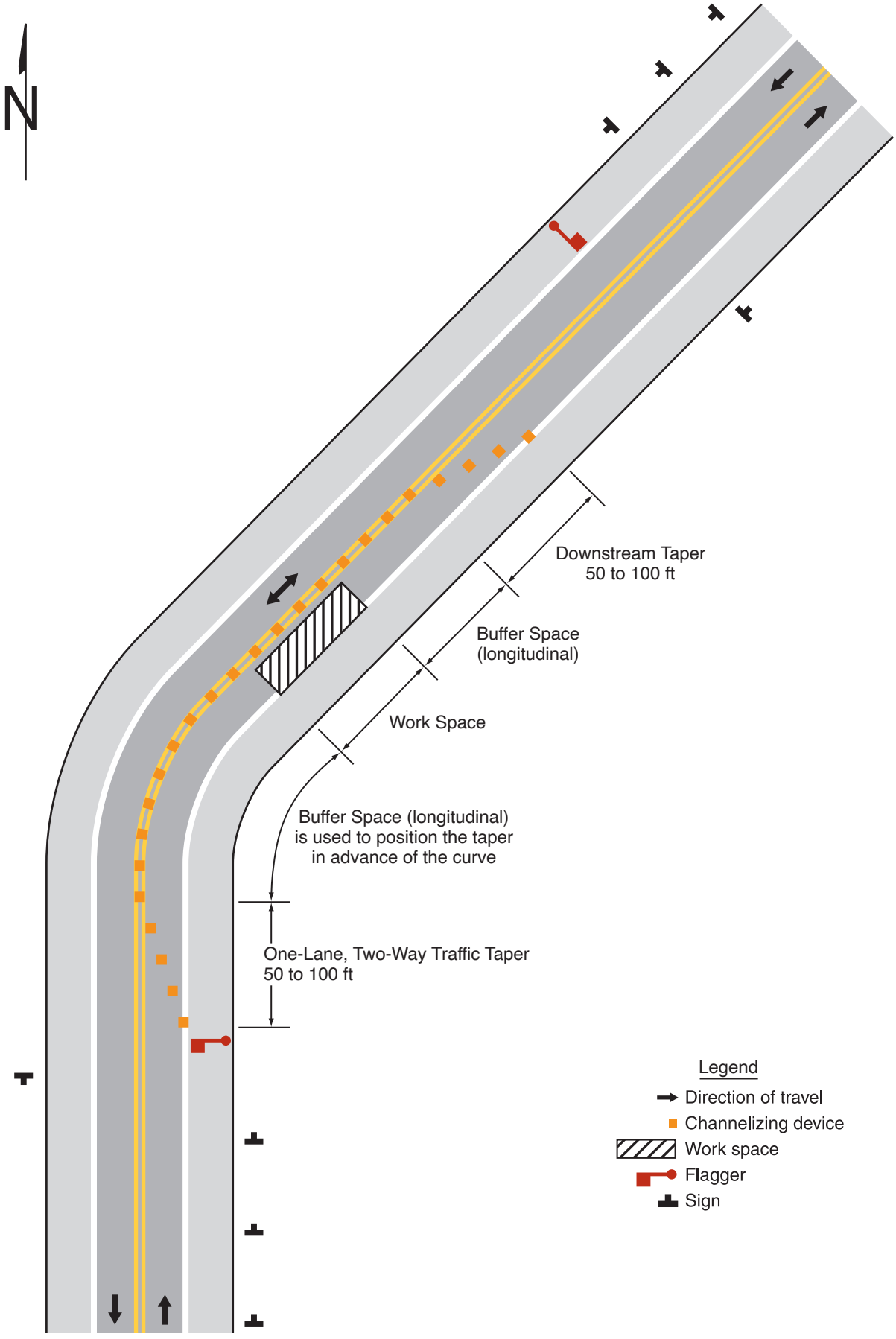
Guidance:

02 *Detours should be clearly signed over their entire length so that road users can easily use existing highways to return to the original highway.*

Support:

03 A diversion is a temporary rerouting of road users onto a temporary highway or alignment placed around the work area.

Figure 6B-3. Example of a One-Lane, Two-Way Traffic Taper



CHAPTER 6C. PEDESTRIAN AND WORKER SAFETY

Section 6C.01 Pedestrian and Worker Safety – General

Standard:

01 **The various TTC provisions for pedestrian and worker safety set forth in Part 6 shall be applied by knowledgeable (for example, trained and/or certified) persons after appropriate evaluation and engineering judgment.**

Section 6C.02 Pedestrian Considerations

Support:

01 A wide range of pedestrians might be affected by TTC zones, including the young, elderly, and people with disabilities such as hearing, vision, or mobility. Pedestrians need a clearly delineated and usable travel path. Considerations for pedestrians with disabilities are addressed in Section 6C.03.

Guidance:

02 *Prior to closing a sidewalk or other pedestrian facility, the maintaining agency should advise users of the future closure.*

Standard:

03 **If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkways shall be provided.**

Option:

04 If establishing or maintaining an alternate pedestrian route is not feasible during the project, an alternate means of providing for pedestrians may be used, such as adding free bus service around the project or assigning someone the responsibility to assist pedestrians with disabilities through the project limits.

05 If an existing pedestrian route is impacted by a short-duration or a short-term stationary work zone that is attended with project personnel, establishing an alternate pedestrian route may not be necessary if the work can be stopped and pedestrians can navigate the work zone. Pedestrians may be delayed for a short period of time for project personnel to move equipment and material to facilitate passage. Work zone personnel may also provide assistance to pedestrians as necessary.

Support:

06 Pedestrians are reluctant to retrace their steps to a prior intersection for a crossing or to add distance or out-of-the-way travel to a destination.

Guidance:

07 *The following three items should be considered when planning for pedestrians in TTC zones:*

A. Pedestrians should not be led into conflicts with vehicles, equipment, and operations.
B. Pedestrians should not be led into conflicts with vehicles moving through or around the worksite.
C. Pedestrians should be provided with a convenient and accessible path that replicates as nearly as practical the most desirable characteristics of the existing sidewalk(s) or footpath(s).

08 *A pedestrian route should not be severed and/or moved for non-construction activities such as parking for vehicles and equipment.*

09 *TTC zones should be designed to minimize conflicts between vehicular and pedestrian movements. Consideration should be made to separate pedestrian movements from both worksite activity and vehicular traffic. Unless an acceptable 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 worksites that will induce them to attempt skirting the worksite or making a midblock crossing.*

Support:

10 Figures 6P-28 and 6P-29 show typical TTC device usage and techniques for pedestrian movement through work zones.

Guidance:

11 *To accommodate the needs of pedestrians, including those with disabilities, the following considerations should be addressed when temporary pedestrian pathways in TTC zones are designed or modified:*

A. Provisions for continuity of accessible paths for pedestrians should be incorporated into the TTC plan.
B. Access to transit stops should be maintained.

C. *A smooth, continuous hard surface should be provided throughout the entire length of the temporary pedestrian facility. There should be no curbs or abrupt changes in grade or terrain that could cause tripping or be a barrier to pedestrians with disabilities. The geometry and alignment of the facility should meet the applicable requirements of the "U.S. Department of Justice 2010 ADA Standards for Accessible Design, September 15, 2010, 28 CFR 35 and 36, Americans with Disabilities Act of 1990."*

D. *The width of the existing pedestrian facility should be provided for the temporary facility if practical. Traffic control devices and other construction materials and features should not intrude into the usable width of the sidewalk, temporary pathway, or other pedestrian facility. When it is not possible to maintain a minimum width of 60 inches throughout the entire length of the pedestrian pathway, a 60 x 60-inch passing space should be provided at least every 200 feet to allow individuals in wheelchairs to pass.*

E. *Blocked routes, alternate crossings, and sign and signal information should be communicated to pedestrians with vision disabilities by providing devices such as audible information devices or barriers and channelizing devices that are detectable to the pedestrians traveling with the aid of a long cane or who have vision disabilities.*

F. *When channelization is used to delineate a pedestrian pathway, a continuous detectable edging should be provided throughout the length of the facility such that pedestrians using a long cane can follow it. These detectable edgings should comply with the provisions of Section 6M.04.*

G. *Signs and other devices mounted lower than 7 feet above the temporary pedestrian pathway should not project more than 4 inches into accessible pedestrian facilities.*

Support:

12 Where pedestrians in TTC zones are routed on temporary pedestrian pathways, providing information in non-visual formats (such as accessible pedestrian signals with audible tones and/or speech messages, and vibrotactile surfaces) aids pedestrians with vision disabilities so they can navigate the temporary pathway. Section 6C.03 contains additional information on accessibility considerations in TTC zones. Section 4K.01 contains information on accessible pedestrian signals.

Option:

13 Whenever it is feasible, the worksite may be closed off from pedestrian intrusion if doing so is determined to be preferable to channelizing pedestrians along the site with TTC devices.

Guidance:

14 *Fencing should not create sight distance restrictions for road users. Fences should not be constructed of materials that would be hazardous if impacted by vehicles. Wooden railing, fencing, and similar systems placed immediately adjacent to motor vehicle traffic should not be used as substitutes for crashworthy temporary traffic barriers.*

15 *Ballast for TTC devices should be kept to the minimum amount needed and should be mounted low to prevent penetration of the vehicle windshield.*

16 *Movement by work vehicles and equipment across designated pedestrian paths should be minimized and, when necessary, should be controlled by flaggers or other TTC. Staging or stopping of work vehicles or equipment along the side of pedestrian paths should be avoided, since it encourages movement of workers, equipment, and materials across the pedestrian path.*

17 *Access to the work space by workers and equipment across pedestrian walkways should be minimized because the access often creates unacceptable changes in grade, and rough or muddy terrain, and pedestrians will tend to avoid these areas by attempting non-intersection crossings where no curb ramps are available.*

Option:

18 A canopied walkway may be used to protect pedestrians from falling debris, and to provide a covered passage for pedestrians.

Guidance:

19 *Covered walkways should be sturdily constructed and adequately lighted for nighttime use.*

20 *When pedestrian and vehicle paths are rerouted to a closer proximity to each other, consideration should be given to separating them by a temporary traffic barrier.*

21 *If a temporary traffic barrier is used to shield pedestrians, it should be designed to accommodate site conditions.*

Support:

22 Depending on the possible vehicular speed and angle of impact, temporary traffic barriers might deflect upon impact by an errant vehicle. Guidance for locating and designing temporary traffic barriers can be found in Chapter 9 of the "Roadside Design Guide," 4th Edition, 2011, AASHTO.

Standard:

23 **Normal vertical curbing shall not be used as a substitute for temporary traffic barriers when temporary traffic barriers are needed.**

Option:

24 Temporary traffic barriers or longitudinal channelizing devices may be used to discourage pedestrians from unauthorized movements into the work space. They may also be used to inhibit conflicts with vehicular traffic by minimizing the possibility of midblock crossings.

Support:

25 A major concern for pedestrians is building construction encroaching onto the contiguous sidewalks, which forces pedestrians off the curb into direct conflict with moving vehicles.

Guidance:

26 *If a significant potential exists for vehicle incursions into the pedestrian path, pedestrians should be rerouted or temporary traffic barriers should be installed.*

Support:

27 TTC devices, temporary traffic barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.

Guidance:

28 *Tape, rope, or plastic chain strung between devices should not be used as a control for pedestrian movements because they are not detectable and are therefore not accessible to and usable by individuals with disabilities.*

29 *In general, pedestrian routes should be preserved in urban and commercial suburban areas. Alternative routing should be discouraged.*

30 *The highway agency in charge of the TTC zone should regularly inspect the activity area so that effective pedestrian TTC is maintained.*

Section 6C.03 Accessibility Considerations

Support:

01 Additional information on the design and construction of accessible temporary facilities is found in the "Guidelines for Accessible Pedestrian Signals (NCHRP Web-Only Document 117B)," 2008 Edition (TRB) and the U.S. Department of Justice 2010 ADA Standards for Accessible Design, September 15, 2010, 28 CFR 35 and 36, Americans with Disabilities Act of 1990.

02 Where pedestrians are detoured to a temporary traffic control signal, an accessible pedestrian signal (see Chapter 4K) provides information in non-visual formats (such as audible tones and/or speech messages, and vibrating surfaces) so that a pedestrian with vision disabilities can know when to cross the street along the alternate route.

Guidance:

03 *Adequate provisions should be made for pedestrians with disabilities. The extent of needs for such provisions should be determined through engineering judgment or by the individual responsible for each TTC zone situation.*

Standard:

04 **When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. A barrier that is detectable by a person with a vision disability traveling with the aid of a long cane shall be placed across the full width of the closed pedestrian facility.**

Support:

05 Maintaining a detectable, channelized pedestrian route is much more useful to pedestrians with vision disabilities than closing a walkway and providing audible directions to an alternate route involving additional crossings and a return to the original route. Braille is not useful in conveying such information because it is difficult to find. Audible instructions might be provided, but the extra distance and additional street crossings might add complexity to a trip.

Guidance:

06 *Because printed signs and surface delineation are not usable by pedestrians with vision disabilities, blocked routes, alternate crossings, and sign and signal information should be communicated to pedestrians with vision disabilities by providing audible information devices, tactile and/or vibrating surface devices, and barriers and channelizing devices that are detectable to pedestrians traveling with the aid of a long cane or who have vision disabilities.*

Support:

07 The most desirable way to provide information to pedestrians with vision disabilities that is equivalent to visual signing for notification of sidewalk closures is a speech message provided by an audible information device. Devices that provide speech messages in response to passive pedestrian actuation are the most desirable. Other devices that continuously emit a message, or that emit a message in response to use of a pushbutton, are also acceptable. Audible information devices might not be needed if detectable channelizing devices make an alternate route of travel evident to pedestrians with vision disabilities.

Guidance:

08 *If a pushbutton is used to provide equivalent TTC information to pedestrians with vision disabilities, the pushbutton should be equipped with a locator tone to notify pedestrians with vision disabilities that a special accommodation is available, and to help them locate the pushbutton.*

Section 6C.04 Worker Safety Considerations

Support:

01 Equally as important as the safety of road users traveling through the TTC zone is the safety of workers. TTC zones present temporary and constantly changing conditions that are unexpected by road users. This creates an even higher degree of vulnerability for workers on or near the roadway.

02 Maintaining TTC zones with road user flow inhibited as little as possible, and using TTC devices that get the road users' attention and provide positive direction are of particular importance. Likewise, equipment and vehicles moving within the activity area create a risk to workers on foot. When possible, the separation of moving equipment and construction vehicles from workers on foot provides the operators of these vehicles with a greater separation clearance and improved sight lines to minimize exposure to the hazards of moving vehicles and equipment.

Guidance:

03 *The following are the key elements of worker safety and TTC management that should be considered to improve worker safety:*

- *A. Training—all workers should be trained on how to work next to motor vehicle traffic in ways that minimize their vulnerability. Workers having specific TTC responsibilities should be trained in TTC techniques, device usage, and placement.*
- *B. Temporary Traffic Barriers—temporary traffic barriers should be placed along the work space depending on factors such as lateral clearance of workers from adjacent traffic, speed of traffic, duration and type of operations, time of day, and volume of traffic.*
- *C. Speed Management—reducing the speed of vehicular traffic, mainly through regulatory speed zoning, funneling, lane reduction, and/or the use of speed safety cameras, uniformed law enforcement officers, or flaggers should be considered.*
- *D. Activity Area—operations entering and departing the work space, and within the work space, should be planned to minimize backing maneuvers by construction vehicles and equipment to minimize the risk of run-over and back-over crashes.*
- *E. Worker Safety Planning—a trained person designated by the employer should conduct a basic hazard assessment for the worksite and job classifications required in the activity area. This safety professional should determine whether engineering, administrative, or personal protection measures should be implemented. This plan should be in accordance with the Occupational Safety and Health Act of 1970, as amended, "General Duty Clause" Section 5(a)(1) - Public Law 91-596, 84 Stat. 1590, December 29, 1970, as amended, and with the requirement to assess worker risk exposures for each job site and job classification, as per 29 CFR 1926.20 (b)(2) of "Occupational Safety and Health Administration Regulations, General Safety and Health Provisions."*

Option:

04 The following are additional elements of TTC management that may be considered to improve worker safety:

- A. Shadow Vehicle—in the case of mobile and constantly moving operations, such as pothole patching and striping operations, a shadow vehicle, equipped with appropriate lights and warning signs, may be used to protect the workers from impacts by errant vehicles. The shadow vehicle may be equipped with a rear-mounted impact attenuator.
- B. Road Closure—if alternate routes are available to handle road users, the road may be closed temporarily to facilitate project completion and thus further reduce worker vulnerability.
- C. Law Enforcement Use—in highly vulnerable work situations, particularly those of relatively short-duration, law enforcement units may be stationed to heighten the awareness of passing vehicular traffic and to improve safety through the TTC zone.
- D. Lighting—for nighttime work, the TTC zone and approaches may be lighted.

E. Special Devices—these include rumble strips, changeable message signs, hazard identification beacons, flags, and warning lights. Intrusion warning devices may be used to alert workers to the approach of errant vehicles.

Support:

05 Judicious use of the special devices described in Item E in Paragraph 4 of this Section might be helpful for certain difficult TTC situations, but misuse or overuse of special devices or techniques might lessen their effectiveness.

Section 6C.05 High-Visibility Safety Apparel

Standard:

01 **For daytime and nighttime activity, all workers, including emergency responders, within the right-of-way who are within the TTC zone shall wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107–2015 publication entitled "American National Standard for High-Visibility Safety Apparel and Headwear," or equivalent revisions, except as provided in Paragraph 4 of this Section. A person designated by the employer to be responsible for worker safety shall make the selection of the appropriate class of garment.**

02 **The apparel background (outer) material color shall be fluorescent orange-red, fluorescent yellow-green, or a combination of the two as defined in the ANSI standard. The retroreflective material shall be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors.**

03 **When uniformed law enforcement personnel are used to direct traffic, to investigate crashes, or to handle lane closures, obstructed roadways, and disasters, high-visibility safety apparel as described in this Section shall be worn by the law enforcement personnel.**

Option:

04 Emergency and incident responders and law enforcement personnel within the TTC zone may wear high-visibility safety apparel that meets the performance requirements of the ANSI/ISEA 207-2006 publication entitled "American National Standard for High-Visibility Public Safety Vests," or equivalent revisions, and labeled as ANSI 207-2006, in lieu of ANSI/ISEA 107-2015 apparel.

Standard:

05 **Except as provided in Paragraph 6 of this Section, firefighters or other emergency responders working within the right-of-way shall wear high-visibility safety apparel as described in this Section.**

Option:

06 Firefighters or other emergency responders working within the right-of-way and engaged in emergency operations that directly expose them to flame, fire, heat, and/or hazardous materials may wear retroreflective turn-out gear that is specified and regulated by other organizations, such as the National Fire Protection Association.

Guidance:

07 *For flagger wear during nighttime activity, high-visibility safety apparel that meets the Performance Class 3 requirements of the ANSI/ISEA 107–2015 publication entitled "American National Standard for High-Visibility Apparel and Headwear," or equivalent revision, and labeled as meeting the ANSI 107-2015 standard performance for Class 3 risk exposure should be worn.*

CHAPTER 6D. FLAGGER CONTROL

Section 6D.01 Qualifications for Flaggers

Guidance:

01 *Because flaggers are responsible for public safety and make the greatest number of contacts with the public of all highway workers, they should be trained in proper traffic control practices and public contact techniques. Flaggers should be able to satisfactorily demonstrate the following abilities:*

- *A. Ability to receive and communicate specific instructions clearly, firmly, and courteously;*
- *B. Ability to move and maneuver quickly in order to avoid danger from errant vehicles;*
- *C. Ability to control signaling devices (such as paddles and flags) in order to provide clear and positive guidance to drivers approaching a TTC zone in frequently changing situations;*
- *D. Ability to understand and apply proper traffic control practices, sometimes in stressful or emergency situations; and*
- *E. Ability to recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.*

Section 6D.02 STOP/SLOW Paddle for Hand-Signaling

Guidance:

01 *The STOP/SLOW paddle (see Figure 6D-1 and Table 6G-1) should be the primary and preferred hand-signaling device because the STOP/SLOW paddle gives road users more positive guidance than red flags.*

Standard:

02 **The STOP/SLOW paddle (R1-1 and W20-8) shall have an octagonal shape on a rigid handle. When used at night, the STOP/SLOW paddle shall be retroreflectorized.**

Option

03 A STOP/STOP or a SLOW/SLOW paddle may be used in certain situations (see Section 6D.05), provided the device meets the size and shape requirements for the STOP/SLOW paddle.

Guidance:

04 *The STOP/SLOW paddle should be fabricated from light semi-rigid material.*

Support:

05 The optimum method of displaying a STOP or SLOW message is to place the STOP/SLOW paddle on a rigid staff that is tall enough that when the end of the staff is resting on the ground, the message is high enough to be seen by approaching or stopped traffic.

Option:

06 The STOP/SLOW paddle may be modified to improve conspicuity by incorporating either white or red flashing lights on the STOP face, and either white or yellow flashing lights on the SLOW face. The flashing lights may be arranged in any of the following patterns:

- A. Two white or red lights, one centered vertically above and one centered vertically below the STOP legend; and/or two white or yellow lights, one centered vertically above and one centered vertically below the SLOW legend;
- B. Two white or red lights, one centered horizontally on each side of the STOP legend; and/or two white or yellow lights, one centered horizontally on each side of the SLOW legend;
- C. One white or red light centered below the STOP legend; and/or one white or yellow light centered below the SLOW legend;
- D. A series of eight or more small white or red lights no larger than ¼ inch in diameter along the outer edge of the paddle, arranged in an octagonal pattern at the eight corners of the border of the STOP face; and/or a series of eight or more small white or yellow lights no larger than ¼ inch in diameter along the outer edge of the paddle, arranged in a diamond pattern along the border of the SLOW face; or
- E. A series of white lights forming the shapes of the letters in the legend.

Standard:

07 **If flashing lights are used on the STOP face of the paddle, their colors shall be all white or all red. If flashing lights are used on the SLOW face of the paddle, their colors shall be all white or all yellow.**

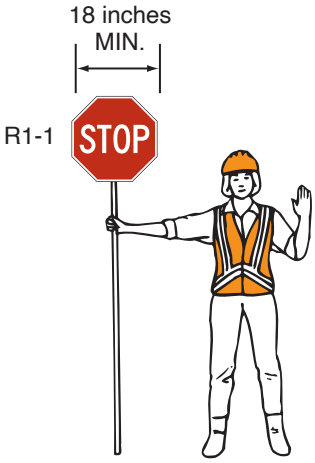
08 **If more than eight flashing lights are used, the lights shall be arranged such that they clearly convey the octagonal shape of the STOP face of the paddle and/or the diamond shape of the SLOW face of the paddle.**

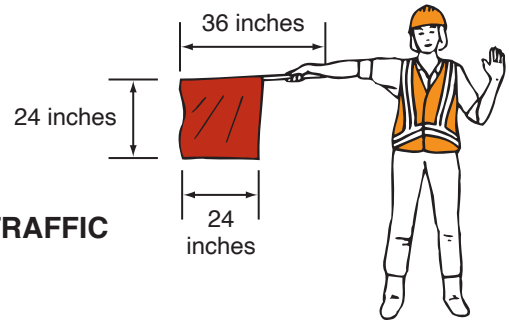
09 **If flashing lights are used on the STOP/SLOW paddle, the flash rate shall be at least 50, but not more than 60, flashes per minute.**

Figure 6D-1. Use of Hand-Signaling Devices by Flaggers

PREFERRED METHOD
STOP/SLOW Paddle

EMERGENCY SITUATIONS ONLY
Red Flag





TO STOP TRAFFIC

TO LET
TRAFFIC PROCEED

TO ALERT AND
SLOW TRAFFIC

Section 6D.03 Flag for Hand-Signaling

Guidance:

01 *Use of flags should be limited to emergency situations.*

Standard:

02 **Flags, when used, shall be red or fluorescent orange-red in color, shall be a minimum of 24 inches square, and shall be securely fastened to a staff that is approximately 36 inches in length.**

Guidance:

03 *The free edge of a flag should be weighted so the flag will hang vertically, even in heavy winds.*

Standard:

04 **When used at nighttime, flags shall be retroreflectorized.**

Section 6D.04 Flashlight for Hand-Signaling

Option:

01 When flagging in an emergency situation at night in a non-illuminated flagger station, a flagger may use a flashlight with a red glow cone to supplement the STOP/SLOW paddle or flag.

Standard:

02 **When a flashlight is used for flagging in an emergency situation at night in a non-illuminated flagger station, the flagger shall hold the flashlight in the left hand, shall hold the paddle or flag in the right hand as shown in Figure 6D-1, and shall use the flashlight in the following manner to control approaching road users:**

- **A. To inform road users to stop, the flagger shall hold the flashlight with the left arm extended and pointed down toward the ground, and then shall slowly wave the flashlight in front of the body in a slow arc from left to right such that the arc reaches no farther than 45 degrees from vertical.**
- **B. To inform road users to proceed, the flagger shall point the flashlight at the vehicle's bumper, slowly aim the flashlight toward the open lane, then hold the flashlight in that position. The flagger shall not wave the flashlight.**
- **C. To alert or slow traffic, the flagger shall point the flashlight toward oncoming traffic and quickly wave the flashlight in a Figure eight motion.**

Section 6D.05 Flagger Procedures

Support:

01 The use of paddles and flags by flaggers is illustrated in Figure 6D-1.

Standard:

02 **Flaggers shall use a STOP/SLOW paddle, a flag, or an Automated Flagger Assistance Device (AFAD) (see Sections 6L.02 through 6L.04) to control road users approaching a TTC zone. The use of hand movements alone without a paddle, flag, or AFAD to control road users shall be prohibited when controlling traffic in a one-lane two-way operation except when the control is provided by emergency responders at incident scenes as described in Section 6O.01 or provided by uniformed law enforcement officers.**

03 **The following methods of signaling with a paddle shall be used:**

- **A. To stop road users, the flagger shall face road users and aim the STOP paddle face toward road users in a stationary position with the arm extended horizontally away from the body. The free arm shall be held with the palm of the hand above shoulder level toward approaching traffic.**
- **B. To direct stopped road users to proceed, the flagger shall face road users with the SLOW paddle face aimed toward road users in a stationary position with the arm extended horizontally away from the body. The flagger shall motion with the free hand for road users to proceed.**
- **C. To alert or slow traffic, the flagger shall face road users with the SLOW paddle face aimed toward road users in a stationary position with the arm extended horizontally away from the body.**

Option:

04 To further alert or slow traffic, the flagger holding the SLOW paddle face toward road users may motion up and down with the free hand, palm down.

Standard:

05 **The following methods of signaling with a flag shall be used:**

- **A. To stop road users, the flagger shall face road users and extend the flag staff horizontally across the road users' lane in a stationary position so that the full area of the flag is visibly hanging below the staff. The free arm shall be held with the palm of the hand above shoulder level toward approaching traffic.**

B. To direct stopped road users to proceed, the flagger shall face road users with the flag and arm lowered from the view of the road users, and shall motion with the free hand for road users to proceed. Flags shall not be used to signal road users to proceed.

C. To alert or slow traffic, the flagger shall face road users and slowly wave the flag in a sweeping motion of the extended arm from shoulder level to straight down without raising the arm above a horizontal position. The flagger shall keep the free hand down.

Guidance:

06 *The flagger should stand either on the shoulder adjacent to the road user being controlled or in the closed lane prior to stopping road users. A flagger should only stand in the lane being used by moving road users after road users have stopped. The flagger should be clearly visible to the first approaching road user at all times. The flagger also should be visible to other road users. The flagger should be stationed sufficiently in advance of the workers to warn them (for example, with audible warning devices such as horns or whistles) of approaching danger by out-of-control vehicles. The flagger should stand alone, away from other workers, work vehicles, or equipment.*

Option:

07 In certain conditions, it may be more appropriate for a flagger to use a STOP/STOP or a SLOW/SLOW paddle to convey the appropriate message to approaching road users and avoid confusing those that are approaching the operation from the opposing direction.

Section 6D.06 Flagger Stations

Standard:

01 **Except as provided in Paragraph 2 of this Section, flagger stations shall be located such that approaching road users will have sufficient distance to stop at an intended stopping point.**

Option:

02 If sufficient stopping sight distance is not achievable, the location of the flagger station may be modified based on engineering judgment.

03 The distances shown in Table 6B-2, which provides information regarding the stopping sight distance as a function of speed, may be used for the location of a flagger station. These distances may be increased for downgrades and other conditions that affect stopping distance.

Guidance:

04 *Flagger stations should be located such that an errant vehicle has additional space to stop without entering the work space. The flagger should identify an escape route that can be used to avoid being struck by an errant vehicle.*

Standard:

05 **Except in emergency situations, flagger stations shall be preceded by an advance warning sign or signs. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.**

CHAPTER 6F. TEMPORARY TRAFFIC CONTROL ZONE SIGNS – GENERAL

Section 6F.01 General Characteristics of TTC Zone Signs

Support:

01 TTC zone signs convey both general and specific messages by means of words, symbols, and/or arrows and have the same three categories as all road user signs: regulatory, warning, and guide.

Option:

02 Where the color orange is required, the fluorescent orange color may also be used.

Support:

03 The fluorescent version of orange provides higher conspicuity than standard orange, especially during twilight.

Option:

04 Standard orange flags, flashing beacons, and/or flashing warning lights may be used in conjunction with signs.

Standard:

05 **When standard orange flags, flashing beacons, and/or flashing warning lights are used in conjunction with a sign, they shall not block the sign face.**

06 **Except as provided in Section 2A.07, the sizes for TTC signs and plaques shall be as shown in Tables 6G-1, 6H-1, and 6I-1. The sizes in the minimum column shall only be used on low-volume rural roads, local streets, or roadways where the operating speed is 30 mph or less.**

Option:

07 The dimensions of signs and plaques shown in Tables 6G-1, 6H-1, and 6I-1 may be increased wherever necessary for greater legibility or emphasis.

Guidance:

08 *Deviations from standard sizes as prescribed in this Manual should be in 6-inch increments.*

Support:

09 Sign design details are contained in the "Standard Highway Signs" publication (see Section 1A.05).

10 Section 2A.04 contains additional information regarding the design of signs, including an Option allowing the development of special word message signs if a standard word message or symbol sign is not available to convey the necessary regulatory, warning, or guidance information.

Standard:

11 **All signs used at night shall be either retroreflective or illuminated to show the same shape and similar color both day and night.**

12 **The requirement for sign illumination shall not be considered to be satisfied by street, highway, or strobe lighting.**

Option:

13 Sign illumination may be either internal or external.

14 Signs may be made of rigid or flexible material.

Section 6F.02 Sign Placement

Guidance:

01 *Signs should be located on the right-hand side of the roadway unless otherwise provided in this Manual.*

Option:

02 Where special emphasis is needed, signs may be placed on both the left-hand and right-hand sides of the roadway. Signs mounted on portable supports may be placed within the roadway itself. Signs may also be mounted on or above barricades.

Support:

03 The provisions of this Section regarding mounting height apply unless otherwise provided for a particular sign elsewhere in this Manual.

Standard:

04 **The minimum height, measured vertically from the bottom of the sign to the elevation of the near edge of the pavement, of signs installed at the side of the road in rural areas shall be 5 feet (see Figure 6F-1).**

05 **The minimum height, measured vertically from the bottom of the sign to the top of the curb, or in the absence of curb, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way, of signs installed at the side of the road in business, commercial, or residential areas where parking or pedestrian movements are likely to occur, or where the view of the sign might be obstructed, shall be 7 feet (see Figure 6F-1).**

06 **The minimum height, measured vertically from the bottom of the sign to the sidewalk, of signs installed above sidewalks shall be 7 feet.**

07 **The bottom of a sign mounted on a barricade, or other portable support, shall be at least 1 foot above the traveled way.**

Option:

08 The height to the bottom of a secondary sign mounted below another sign may be 1 foot less than the height provided in Paragraphs 4 through 6 of this Section.

Guidance:

09 *Neither portable nor permanent sign supports should be located on sidewalks, bicycle facilities, or areas designated for pedestrians or bicyclists.*

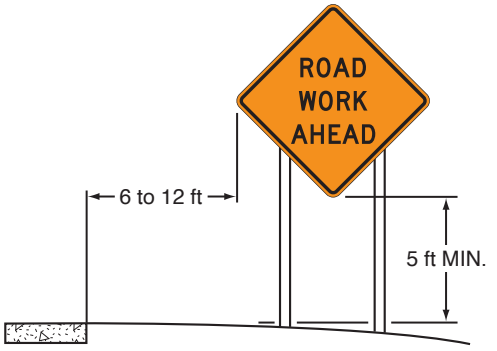
Standard:

10 **Signs shall be mounted and placed in accordance with Section 307 of the U.S. Department of Justice 2010 ADA Standards for Accessible Design, September 15, 2010, 28 CFR 35 and 36, Americans with Disabilities Act of 1990.**

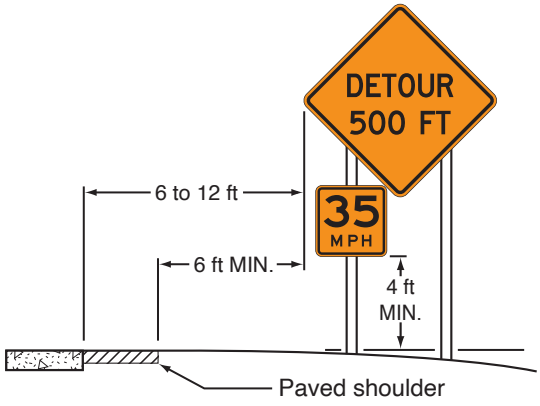
Guidance:

11 *Except as provided in Paragraph 12 of this Section, signs mounted on portable sign supports that do not meet the minimum mounting heights provided in Part 2 should not be used for a duration of more than 3 days.*

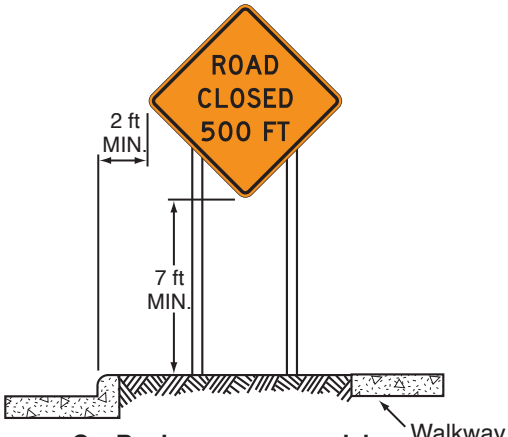
Figure 6F-1. Height and Lateral Location of Signs—Typical Installations



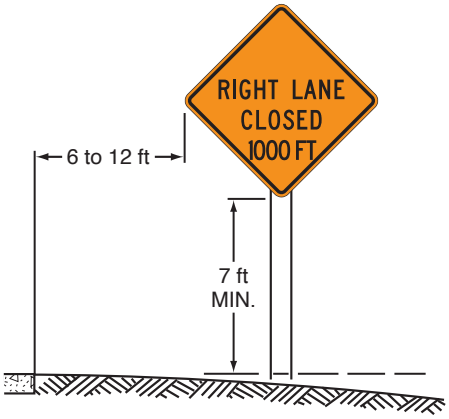
A – Rural area



B – Rural area with advisory speed plaque



C – Business, commercial, or residential area



D – Business, commercial, or residential area (without curb)

Option:

12 The R9-8 through R9-11a series, R11 series, W1-6 through W1-8 series, M4-10, E5-1, or other similar type signs (see Figures 6G-1, 6H-1, and 6I-1) may be used on portable sign supports that do not meet the minimum mounting heights provided in Part 2 for longer than 3 days.

Support:

13 Methods of mounting signs other than on posts are illustrated in Figure 6F-2.

Guidance:

14 *Signs mounted on Type 3 Barricades should not cover more than 50 percent of the top two rails or 33 percent of the total area of the three rails.*

Standard:

15 **Signs and sign supports used together shall be crashworthy (see Section 6A.04). Where large signs having an area exceeding 50 square feet are installed on multiple breakaway posts, the clearance from the ground to the bottom of the sign shall be at least 7 feet.**

Option:

16 For mobile operations, a sign may be mounted on a work vehicle, a shadow vehicle, or a trailer stationed in advance of the TTC zone or moving along with it.

Section 6F.03 Sign Maintenance

Guidance:

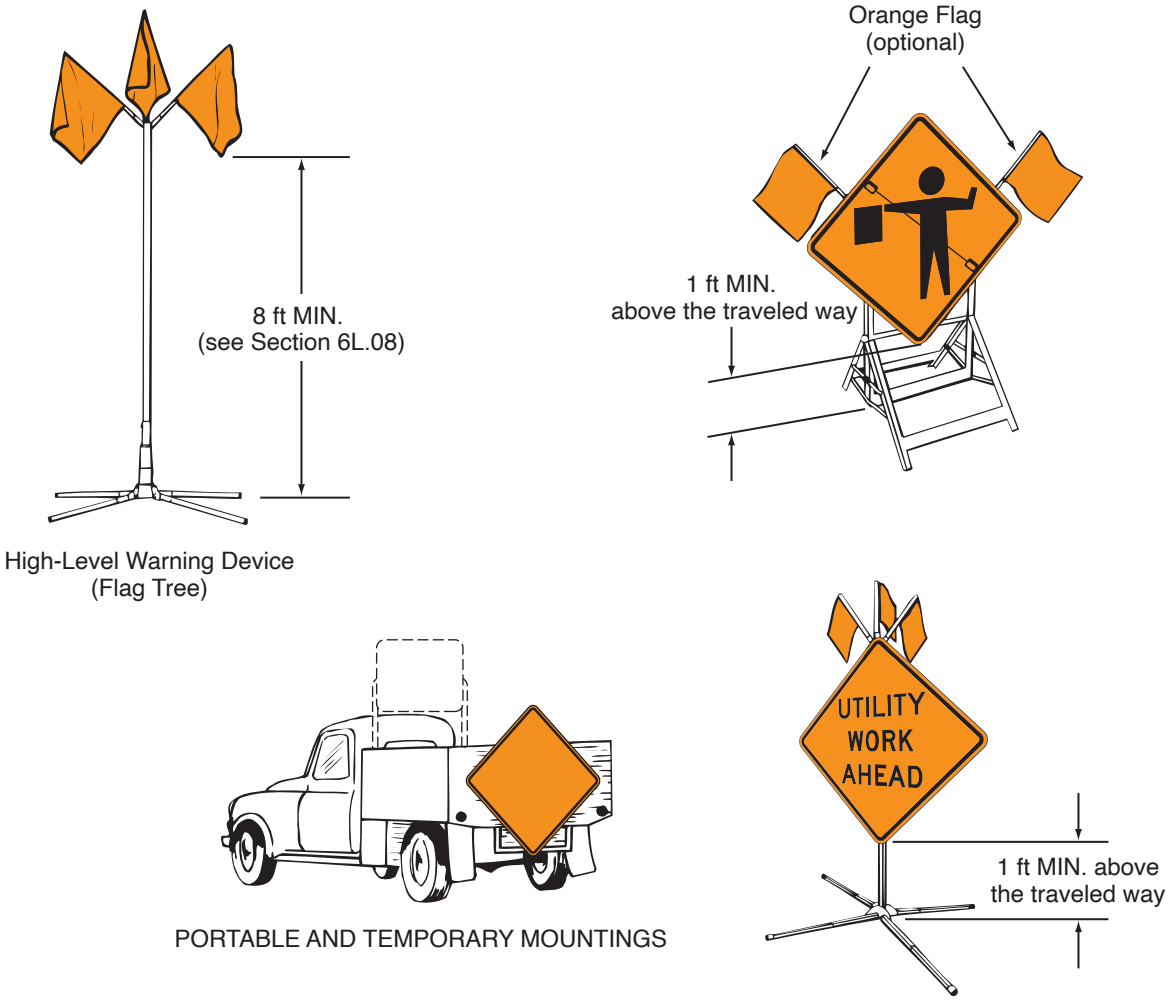
01 *Signs should be properly maintained for cleanliness, visibility, retroreflectivity, and correct positioning.*

02 *Signs that have lost significant legibility should be promptly replaced.*

Support:

03 Section 2A.21 contains information regarding the retroreflectivity of signs, including the signs that are used in TTC zones.

Figure 6F-2. Methods of Mounting Signs Other Than on Posts



CHAPTER 6G. TTC ZONE REGULATORY SIGNS

Section 6G.01 Regulatory Sign Authority

Support:

01 Regulatory signs such as those shown in Figure 6G-1 inform road users of traffic laws or regulations and indicate the applicability of legal requirements that would not otherwise be apparent.

Standard:

02 **Regulatory signs shall be authorized by the public agency or official having jurisdiction and shall conform with Chapter 2B.**

Section 6G.02 Regulatory Sign Design and Size

Standard:

01 **TTC regulatory signs shall comply with the Standards for regulatory signs presented in Part 2 and in the FHWA's "Standard Highway Signs" publication (see Section 1A.05).**

02 **The sizes for TTC regulatory signs shall be as shown in Table 6G-1.**

Section 6G.03 Regulatory Sign Applications

Standard:

01 **If a TTC zone requires regulatory measures different from those existing, the existing permanent regulatory devices shall be removed or covered and superseded by the appropriate temporary regulatory signs. This change shall be made in compliance with applicable ordinances or statutes of the jurisdiction.**

Section 6G.04 Road Closed Signs (R11-2 Series)

Guidance:

01 *The ROAD CLOSED (R11-2) sign (see Figure 6G-1) should be used when the roadway is closed to all road users except contractors' equipment or officially authorized vehicles. The R11-2 sign should be accompanied by appropriate warning and detour signing.*

Option:

02 STREET CLOSED (R11-2a), BRIDGE OUT (R11-2b), or PATH CLOSED (R11-2c) signs may be substituted for Road Closed signs where applicable.

Guidance:

03 *Road Closed signs should be installed at or near the center of the roadway on or above a Type 3 Barricade that closes the roadway (see Section 6K.07).*

Standard:

04 **Road Closed signs shall not be used where road user flow is maintained through the TTC zone with a reduced number of lanes on the existing roadway or where the actual closure is some distance beyond the sign.**

Section 6G.05 Local Traffic Only Signs (R11-3 Series and R11-4)

Guidance:

01 *The Local Traffic Only signs (see Figure 6G-1) should be used where road user flow detours to avoid a closure some distance beyond the sign, but where local road users can use the roadway to the point of closure. These signs should be accompanied by appropriate warning and detour signing.*

02 *In rural applications, the Local Traffic Only sign should have the legend ROAD CLOSED XX MILES AHEAD, LOCAL TRAFFIC ONLY (R11-3).*

Option:

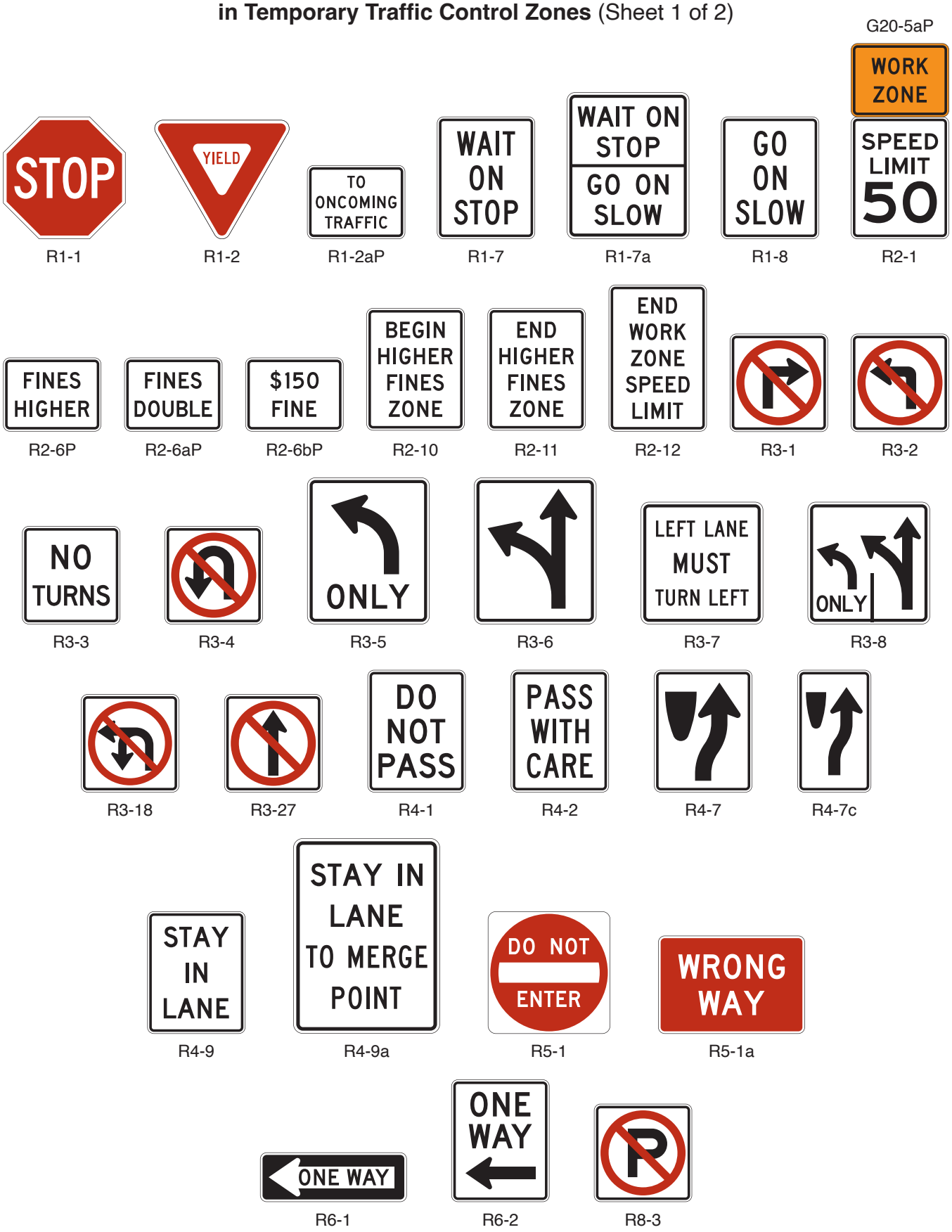
03 In urban areas, a ROAD (STREET) CLOSED TO THRU TRAFFIC (R11-4) sign or the legend ROAD CLOSED, LOCAL TRAFFIC ONLY may be used.

04 In urban areas, a word message that includes the name of an intersecting street name or well-known destination may be substituted for the words XX MILES AHEAD on the R11-3 sign where applicable.

05 A STREET CLOSED (R11-3a) or BRIDGE OUT (R11-3b) sign may be substituted for an R11-3 sign, where applicable.

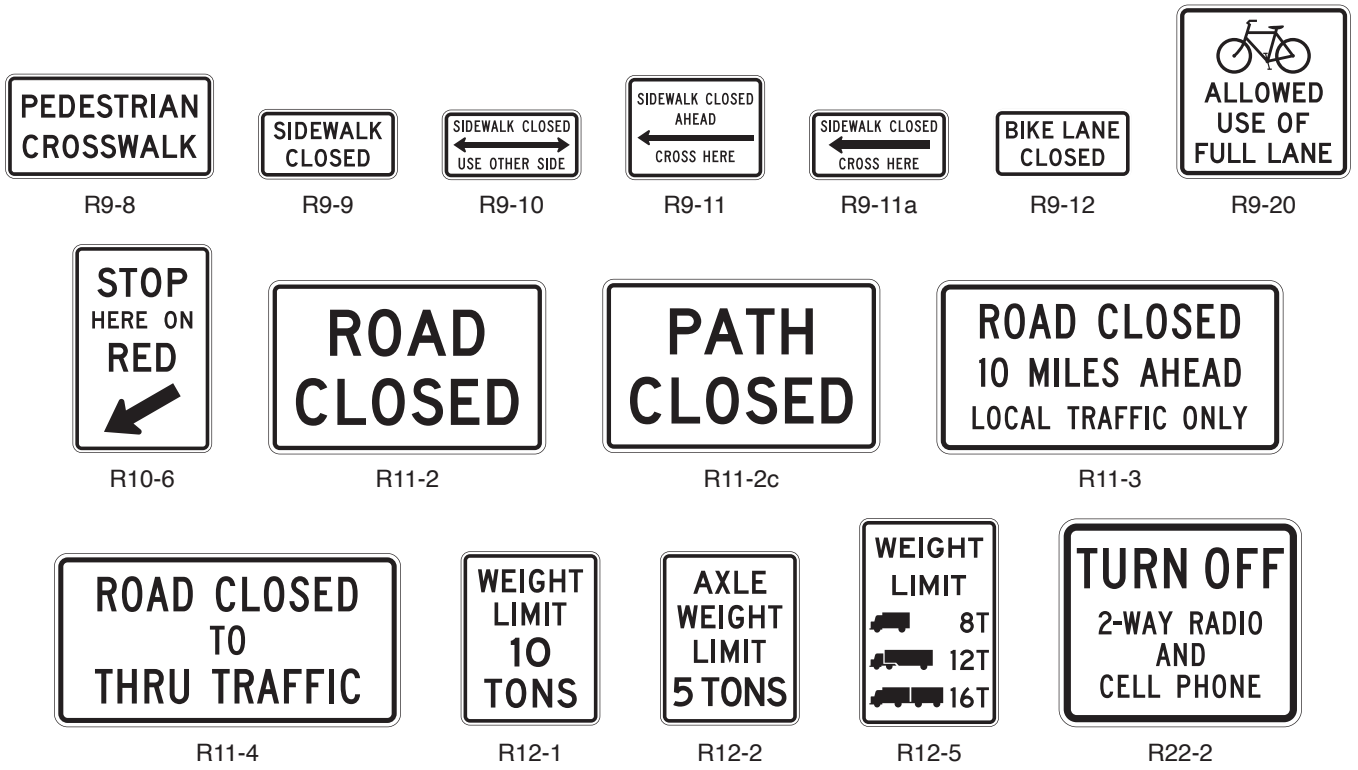
06 The words BRIDGE OUT, BRIDGE CLOSED, or STREET CLOSED may be substituted for the words ROAD CLOSED on the R11-4 sign where applicable.

Figure 6G-1. Regulatory Signs and Plaques in Temporary Traffic Control Zones (Sheet 1 of 2)



Note: See Chapter 2B for information on the application of these signs.

Figure 6G-1. Regulatory Signs and Plaques in Temporary Traffic Control Zones (Sheet 2 of 2)



Note: See Chapter 2B for information on the application of these signs.

Section 6G.06 Weight Limit Signs (R12-1, R12-2, and R12-5)

Standard:

01 **A Weight Limit sign (see Figure 6G-1), which shows the gross weight or axle weight that is permitted on the roadway or bridge, shall be consistent with State or local regulations and shall not be installed without the approval of the authority having jurisdiction over the highway.**

02 **When weight restrictions are imposed because of the activity in a TTC zone, a marked detour shall be provided for vehicles weighing more than the posted limit.**

Section 6G.07 STAY IN LANE Signs (R4-9 and R4-9a)

Option:

01 A STAY IN LANE (R4-9) sign (see Figure 6G-1) may be used where a multi-lane shift has been incorporated as part of the TTC on a highway to direct road users around road work that occupies part of the roadway on a multi-lane highway.

Guidance:

02 *A STAY IN LANE TO MERGE POINT (R4-9a) sign (see Figure 6G-1) should be used during late merge operations (see Section 6N.19) to direct traffic to use all available lanes until the merge point is reached.*

Section 6G.08 Work Zone and Higher Fines Signs and Plaques

Option:

01 A WORK ZONE (G20-5aP) plaque (see Figure 6G-1) may be mounted above a Speed Limit sign to emphasize that a reduced speed limit is in effect within a TTC zone. An END WORK ZONE SPEED LIMIT (R2-12) sign (see Figure 6G-1) may be installed at the downstream end of the reduced speed limit zone.

Guidance:

02 *A BEGIN HIGHER FINES ZONE (R2-10) sign (see Figure 6G-1) should be installed at or near the beginning of a TTC zone where increased fines are imposed for traffic violations, and an END HIGHER FINES ZONE (R2-11) sign (see Figure 6G-1) should be installed at or near the downstream end of the TTC zone.*

Table 6G-1. Temporary Traffic Control Zone Regulatory Sign and Plaque Sizes

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Stop	R1-1	6G.02	30 x 30*	—	—
Stop (on Stop/Slow Paddle)	R1-1	6D.02	18 x 18	—	—
Yield	R1-2	6G.02	36 x 36 x 36*	—	30 x 30 x 30
To Oncoming Traffic (plaque)	R1-2aP	6G.02	36 x 30	48 x 36	24 x 18
Wait on Stop	R1-7	6L.03	24 x 30	24 x 30	—
Wait on Stop - Go on Slow	R1-7a	6G.03	30 x 36	30 x 36	—
Go on Slow	R1-8	6L.03	24 x 30	24 x 30	—
Speed Limit	R2-1	6G.08	24 x 30*	36 x 48	—
Fines Higher (plaque)	R2-6P	6G.08	24 x 18	36 x 24	—
Fines Double (plaque)	R2-6aP	6G.08	24 x 18	36 x 24	—
$XX Fine (plaque)	R2-6bP	6G.08	24 x 18	36 x 24	—
Begin Higher Fines Zone	R2-10	6G.08	24 x 30	36 x 48	—
End Higher Fines Zone	R2-11	6G.08	24 x 30	36 x 48	—
End Work Zone Speed Limit	R2-12	6G.08	24 x 36	36 x 54	—
Movement Prohibition	R3-1,2,3,4	6G.02	24 x 24*	36 x 36	—
Mandatory Movement Lane Control - Turn Only	R3-5	6G.02	30 x 36	—	—
Optional Movement Lane Control - Thru and Turn	R3-6	6G.02	30 x 36	—	—
Right (Left) Lane Must Turn Right (Left)	R3-7	6G.02	30 x 30*	—	—
Advance Intersection Lane Control (2 lanes)	R3-8	6G.02	30 x 30	—	—
Movement Prohibition - No U or Left Turn	R3-18	6G.02	24 x 24*	36 x 36	—
Movement Prohibition - No Straight Through	R3-27	6G.02	24 x 24*	36 x 36	—
Do Not Pass	R4-1	6G.02	24 x 30	36 x 48	—
Pass With Care	R4-2	6G.02	24 x 30	36 x 48	—
Keep Right	R4-7	6G.02	24 x 30	36 x 48	—
Narrow Keep Right	R4-7c	6G.02	18 x 30	—	—
Stay in Lane	R4-9	6G.07	24 x 30	36 x 48	—
Stay In Lane To Merge Point	R4-9a	6G.07	36 x 48	36 x 48	—
Do Not Enter	R5-1	6G.02	30 x 30*	36 x 36	—
Wrong Way	R5-1a	6G.02	36 x 24*	42 x 30	—
One Way	R6-1	6G.02	36 x 12*	48 x 18	—
One Way	R6-2	6G.02	24 x 30*	36 x 48	—
No Parking (symbol)	R8-3	6G.02	24 x 24*	36 x 36	—
Pedestrian Crosswalk	R9-8	6G.09	36 x 18	—	—
Sidewalk Closed	R9-9	6G.10	24 x 12	—	—
Sidewalk Closed, Use Other Side	R9-10	6G.10	24 x 12	—	—
Sidewalk Closed Ahead, Cross Here	R9-11	6G.10	24 x 18	—	—
Sidewalk Closed, Cross Here	R9-11a	6G.10	24 x 12	—	—
Bike Lane Closed	R9-12	6P.01	24 x 12	—	—
Stop Here on Red	R10-6	6L.04	24 x 36	—	—
Road Closed	R11-2, 2a, 2b, 2c	6G.04	48 x 30	—	—
Road Closed - Local Traffic Only	R11-3, 3a, 3b, 4	6G.05	60 x 30	—	—
Weight Limit	R12-1, 2	6G.06	24 x 30	36 x 48	—
Weight Limit	R12-5	6G.06	24 x 36	36 x 48	—
Turn Off 2-Way Radio and Cell Phone	R22-2	6G.11	42 x 36	42 x 36	—
Work Zone (plaque)	G20-5aP	6G.08	24 x 18	30 x 24	—

* See Table 2B-1 for minimum size required for signs facing traffic on multi-lane conventional roads

Notes:

1. Larger signs may be used wherever necessary for greater legibility or emphasis
2. Dimensions are shown in inches and are shown as width x height

Option:

03 Alternate legends such as BEGIN (or END) DOUBLE FINES ZONE may also be used for the R2-10 and R2-11 signs.

04 A FINES HIGHER, FINES DOUBLE, or $XX FINE plaque (see Section 2B.25 and Figure 6G-1) may be mounted below the Speed Limit sign if increased fines are imposed for traffic violations within the TTC zone.

05 Individual signs and plaques for work zone speed limits and higher fines may be combined into a single sign or may be displayed as an assembly of signs and plaques.

Section 6G.09 PEDESTRIAN CROSSWALK Sign (R9-8)

Option:

01 The PEDESTRIAN CROSSWALK (R9-8) sign (see Figure 6G-1) may be used to indicate where a temporary crosswalk has been established.

Standard:

02 **If a temporary crosswalk is established, it shall be accessible to pedestrians with disabilities in accordance with Section 6C.03.**

Section 6G.10 SIDEWALK CLOSED Signs (R9-9, R9-10, R9-11, and R9-11a)

Guidance:

01 *SIDEWALK CLOSED signs (see Figure 6G-1) should be used where pedestrian flow is restricted. Bicyclist/Pedestrian Detour (M4-9a) signs or Pedestrian Detour (M4-9b) signs should be used where pedestrian flow is rerouted (see Section 6I.02).*

02 *The SIDEWALK CLOSED (R9-9) sign should be installed at the beginning of the closed sidewalk, at the intersections preceding the closed sidewalk, and elsewhere along the closed sidewalk as needed.*

03 *The SIDEWALK CLOSED, (ARROW) USE OTHER SIDE (R9-10) sign should be installed at the beginning of the restricted sidewalk when a parallel sidewalk exists on the other side of the roadway.*

04 *The SIDEWALK CLOSED AHEAD, (ARROW) CROSS HERE (R9-11) sign should be used to indicate to pedestrians that sidewalks beyond the sign are closed and to direct them to open crosswalks, sidewalks, or other travel paths.*

05 *The SIDEWALK CLOSED, (ARROW) CROSS HERE (R9-11a) sign should be installed just beyond the point to which pedestrians are being redirected.*

Support:

06 These signs are typically mounted on a detectable barricade to encourage compliance and to communicate with pedestrians that the sidewalk is closed. Printed signs are not useful to many pedestrians with vision disabilities. A barrier or barricade detectable by a person with a vision disability is sufficient to indicate that a sidewalk is closed. If the barrier is continuous with detectable channelizing devices for an alternate route, accessible signing might not be necessary.

Section 6G.11 TURN OFF 2-WAY RADIO AND CELL PHONE Sign (R22-2)

Standard:

01 **The TURN OFF 2-WAY RADIO AND CELL PHONE (R22-2) sign (see Figure 6G-1) shall be used to require road users to turn off mobile radio transmitters and cellular telephones where blasting operations occur.**

Support:

02 Section 6H.25 contains information about the full sequence of signs for blasting zones and the specific requirements for location of this regulatory sign.

Section 6G.12 Other Regulatory Signs

Option:

01 Regulatory word message signs other than those classified and specified in this Manual and the "Standard Highways Signs" publication (see Section 1A.05) may be developed and used based on engineering judgment to aid the enforcement of other laws or regulations in TTC zones.

Guidance:

02 *Special regulatory signs should comply with the general requirements of color, shape, and alphabet size and series. The sign message should be brief, legible, and clear.*

CHAPTER 6H. TTC ZONE WARNING SIGNS

Section 6H.01 Warning Sign Function, Design, and Application

Support:

01 TTC zone warning signs (see Figure 6H-1) notify road users of specific situations or conditions on or adjacent to a roadway that might not otherwise be apparent.

Standard:

02 **TTC warning signs shall comply with the Standards for warning signs presented in Part 2 and in the FHWA's "Standard Highway Signs" publication (see Section 1A.05).**

03 **The sizes for TTC warning signs shall be as shown in Table 6H-1.**

04 **Except as provided in Paragraph 5 of this Section, TTC warning signs shall be diamond-shaped with a black legend and border on an orange background, except for the Grade Crossing Advance Warning (W10-1) sign, which shall have a black legend and border on a yellow background.**

Option:

05 Warning signs that are required or recommended in Parts 2 or 7 to have a fluorescent yellow-green background may have that color background in TTC zones.

06 Existing warning signs with a yellow background that are still applicable may remain in place.

07 Warning signs used for TTC incident management situations may have a black legend and border on a fluorescent pink background.

08 Mounting or space considerations may justify a change from the standard diamond shape to a rectangular shape.

09 In emergencies, available warning signs having yellow backgrounds may be used if signs with orange or fluorescent pink backgrounds are not at hand.

Guidance:

10 *Where roadway or road user conditions require greater emphasis, larger than standard size warning signs should be used, with the symbol or legend enlarged approximately in proportion to the outside dimensions.*

11 *Where any part of the roadway is obstructed or closed by work activities or incidents, advance warning signs should be installed to alert road users well in advance of these obstructions or restrictions.*

12 *Where road users include pedestrians, the provision of supplemental audible information or detectable barriers or barricades should be provided for people with vision disabilities.*

Support:

13 Detectable barriers or barricades communicate very clearly to pedestrians who have vision disabilities that they can no longer proceed in the direction that they are traveling.

Option:

14 Advance warning signs may be used singly or in combination.

15 Where distances are not displayed on warning signs as part of the message, a supplemental plaque with the distance legend may be mounted immediately below the sign on the same support.

Section 6H.02 Position of Advance Warning Signs

Guidance:

01 *Where highway conditions permit, warning signs should be placed in advance of the transition and activity areas at varying distances depending on roadway type, condition, and posted speed. Table 6B-1 contains information regarding the spacing of advance warning signs. Where a series of two or more advance warning signs is used, the closest sign to the transition and activity areas should be placed approximately 100 feet for low-speed urban streets to 1,000 feet or more for freeways and expressways.*

02 *Where multiple advance warning signs are needed on the approach to a transition and activity area, the ROAD WORK AHEAD (W20-1) sign should be the first advance warning sign encountered by road users.*

Support:

03 Various conditions, such as limited sight distance or obstructions that might require a driver to reduce speed or stop, might require additional advance warning signs.

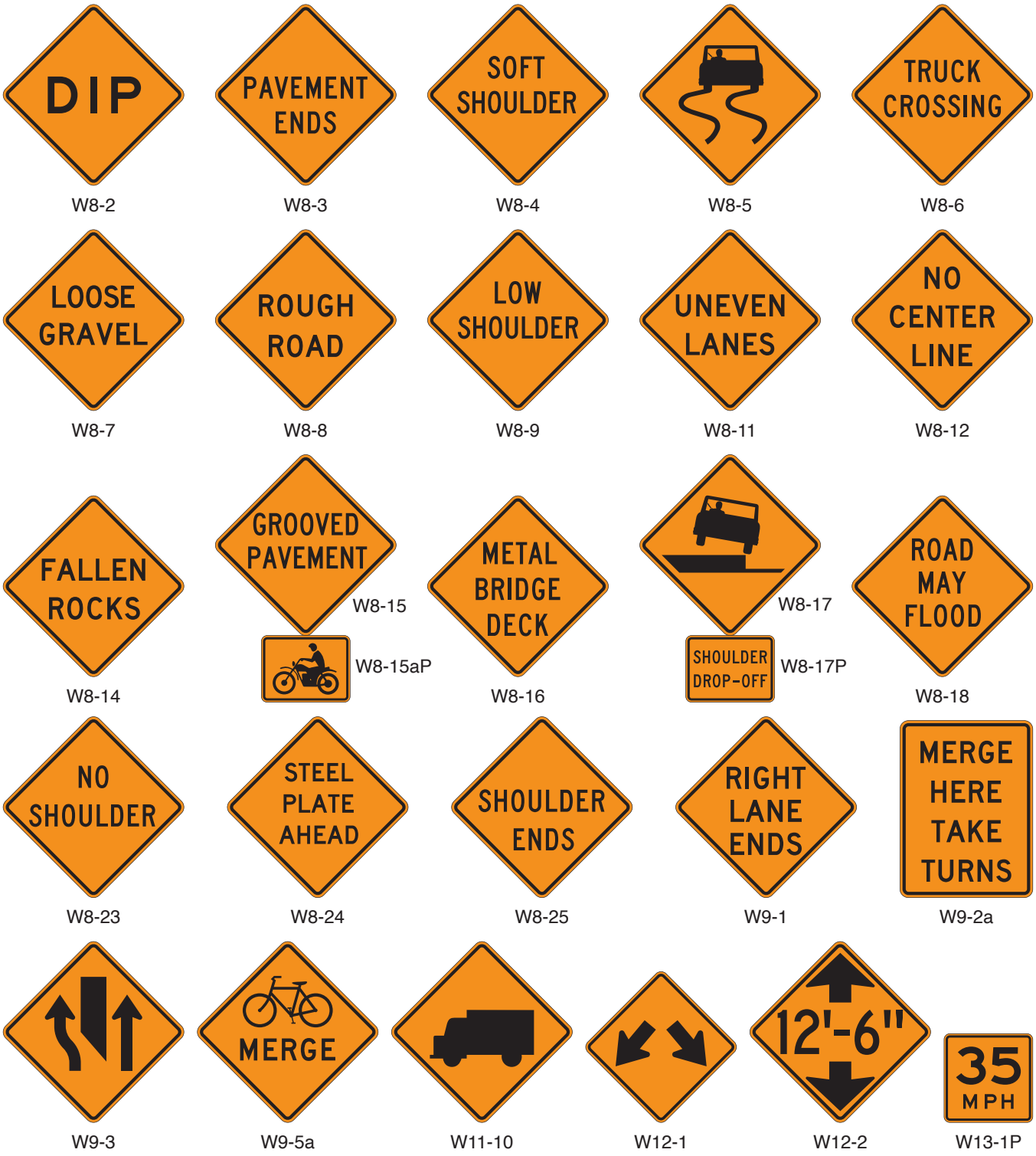
Option:

04 As an alternative to a specific distance on advance warning signs, the word AHEAD may be used.

Figure 6H-1. Warning Signs and Plaques in Temporary Traffic Control Zones (Sheet 1 of 4)

Note: See Chapter 2C for information on the application of these signs.

Figure 6H-1. Warning Signs and Plaques in Temporary Traffic Control Zones (Sheet 2 of 4)



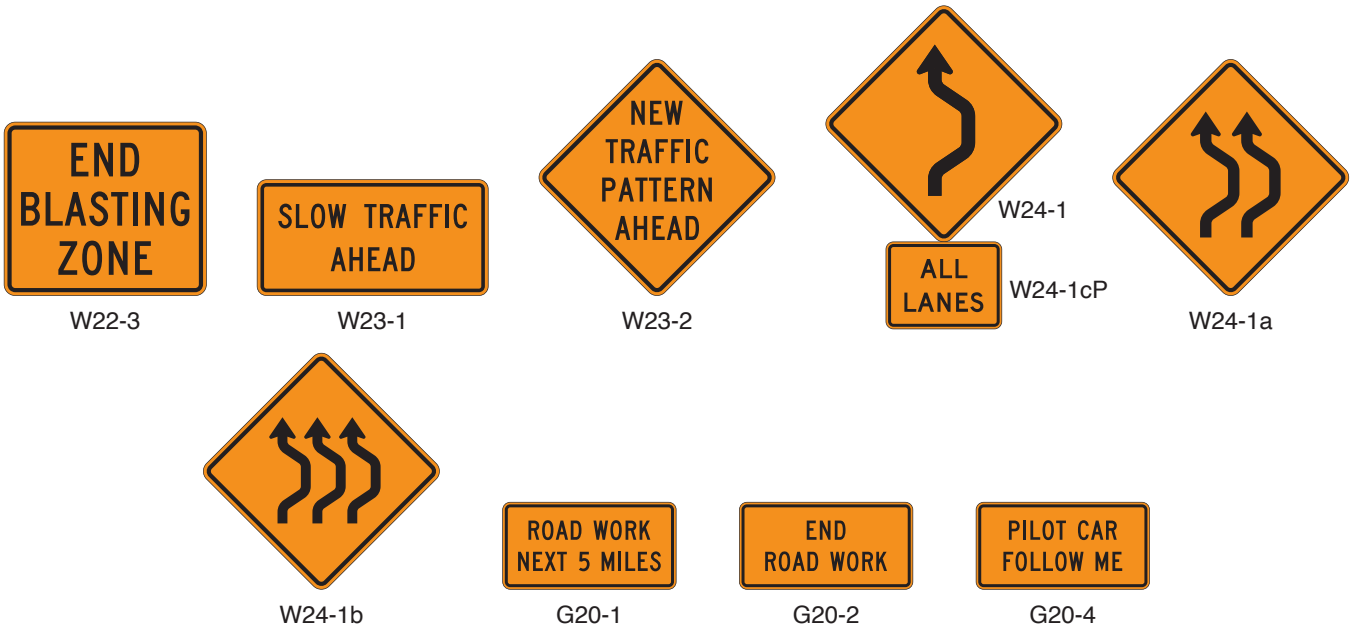
Note: See Chapter 2C for information on the application of these signs.

Figure 6H-1. Warning Signs and Plaques in Temporary Traffic Control Zones (Sheet 3 of 4)

Note: See Chapter 2C for information on the application of these signs.

* An optional STREET WORK word message sign is shown in the “Standard Highway Signs” publication.
** An optional STREET CLOSED word message sign is shown in the “Standard Highway Signs” publication.
*** An optional FLAGGER (W20-7a) word message sign is shown in the “Standard Highway Signs” publication.
**** An optional FRESH TAR word message sign is shown in the “Standard Highway Signs” publication.

Figure 6H-1. Warning Signs and Plaques in Temporary Traffic Control Zones (Sheet 4 of 4)



Note: See Chapter 2C for information on the application of these signs.

Support:

05 At TTC zones on lightly-traveled roads, all of the advance warning signs prescribed for major construction might not be needed.

Option:

06 Utility work, maintenance, or minor construction can occur within the TTC zone limits of a major construction project, and additional warning signs may be needed.

Guidance:

07 *Utility, maintenance, and minor construction signing and TTC should be coordinated with appropriate authorities so that road users are not confused or misled by the additional TTC devices.*

Section 6H.03 ROAD (STREET) WORK Sign (W20-1)

Guidance:

01 *The ROAD (STREET) WORK (W20-1) sign (see Figure 6H-1), which serves as a general warning of obstructions or restrictions, should be located in advance of the work space or any detour, on the road where the work is taking place.*

02 *Where traffic can enter a TTC zone from a crossroad or a major (high-volume) driveway, an advance warning sign should be used on the crossroad or major driveway.*

Option:

03 The legend STREET may be substituted for ROAD and the distance legend may be either XX FEET, XX MILES, or AHEAD.

Section 6H.04 DETOUR Sign (W20-2)

Guidance:

01 *The DETOUR (W20-2) sign (see Figure 6H-1) should be used in advance of a road user detour over a different roadway or route.*

Option:

02 The distance legend may be either XX FEET, XX MILES, or AHEAD.

Table 6H-1. Temporary Traffic Control Zone Warning Sign and Plaque Sizes (Sheet 1 of 2)

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Turn and Curve Signs	W1-1,2,3,4	6H.01	36 x 36	48 x 48	30 x 30
Reverse Curve (2 or more lanes)	W1-4b,4c	6H.30	36 x 36	48 x 48	30 x 30
Large Arrow (1-direction)	W1-6	6H.01	48 x 24	60 x 30	—
Chevron Alignment	W1-8	6H.01	18 x 24	30 x 36	—
Stop Ahead	W3-1	6H.01	36 x 36	48 x 48	30 x 30
Yield Ahead	W3-2	6H.01	36 x 36	48 x 48	30 x 30
Signal Ahead	W3-3	6H.01	36 x 36	48 x 48	30 x 30
Be Prepared to Stop	W3-4	6H.01	36 x 36	48 x 48	30 x 30
Reduced Speed Limit Ahead	W3-5	6H.01	36 x 36	48 x 48	30 x 30
XX MPH Speed Zone Ahead	W3-5a	6H.01	36 x 36	48 x 48	30 x 30
Merging Traffic	W4-1,5	6H.01	36 x 36	48 x 48	36 x 36
Lane Ends	W4-2	6H.08	36 x 36	48 x 48	30 x 30
Added Lane	W4-3,6	6H.01	36 x 36	48 x 48	30 x 30
No Merge Area (plaque)	W4-5aP	6H.01	18 x 24	24 x 30	—
Road Narrows	W5-1	6H.01	36 x 36	48 x 48	30 x 30
Narrow Bridge	W5-2	6H.01	36 x 36	48 x 48	30 x 30
One Lane Bridge	W5-3	6H.01	36 x 36	48 x 48	30 x 30
Ramp Narrows	W5-4	6H.10	36 x 36	48 x 48	30 x 30
Divided Highway	W6-1	6H.01	36 x 36	48 x 48	30 x 30
Divided Highway Ends	W6-2	6H.01	36 x 36	48 x 48	30 x 30
Two-Way Traffic	W6-3	6H.16	36 x 36	48 x 48	30 x 30
Narrow Two-Way Traffic	W6-4	6H.17	12 x 18	12 x 18	—
Hill	W7-1	6H.01	36 x 36	48 x 48	30 x 30
Next XX Miles (plaque)	W7-3aP	6H.33	24 x 18	36 x 30	—
Bump	W8-1	6H.01	36 x 36	48 x 48	24 x 24
Dip	W8-2	6H.01	36 x 36	48 x 48	24 x 24
Pavement Ends	W8-3	6H.01	36 x 36	48 x 48	30 x 30
Soft Shoulder	W8-4	6H.26	36 x 36	48 x 48	30 x 30
Slippery When Wet	W8-5	6H.01	36 x 36	48 x 48	30 x 30
Truck Crossing	W8-6	6H.21	36 x 36	48 x 48	30 x 30
Loose Gravel	W8-7	6H.01	36 x 36	48 x 48	30 x 30
Rough Road	W8-8	6H.01	36 x 36	48 x 48	24 x 24
Low Shoulder	W8-9	6H.26	36 x 36	48 x 48	24 x 24
Uneven Lanes	W8-11	6H.27	36 x 36	48 x 48	30 x 30
No Center Line	W8-12	6H.29	36 x 36	48 x 48	30 x 30
Fallen Rocks	W8-14	6H.01	36 x 36	48 x 48	30 x 30
Grooved Pavement	W8-15	6H.01	36 x 36	48 x 48	30 x 30
Motorcycle (plaque)	W8-15aP	6H.34	24 x 18	30 x 24	—
Metal Bridge Deck	W8-16	6H.34	36 x 36	48 x 48	30 x 30
Shoulder Drop Off (symbol)	W8-17	6H.26	36 x 36	48 x 48	30 x 30
Shoulder Drop-Off (plaque)	W8-17P	6H.26	24 x 18	30 x 24	—
Road May Flood	W8-18	6H.01	36 x 36	48 x 48	24 x 24
No Shoulder	W8-23	6H.01	36 x 36	48 x 48	30 x 30
Steel Plate Ahead	W8-24	6H.28	36 x 36	48 x 48	30 x 30
Shoulder Ends	W8-25	6H.01	36 x 36	48 x 48	30 x 30
Lane Ends	W9-1,2	6H.01	36 x 36	48 x 48	30 x 30
Merge Here Take Turns	W9-2a	6N.19	36 x 48	36 x 48	—
Interior Lane Shift Ahead	W9-3	6H.07	36 x 36	48 x 48	30 x 30

Table 6H-1. Temporary Traffic Control Zone Warning Sign and Plaque Sizes (Sheet 2 of 2)

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Bicycles Merging	W9-5a	6P.01	30 x 30	—	18 x 18
Grade Crossing Advance Warning	W10-1	6H.01	36 dia.	48 Dia.	—
Truck	W11-10	6H.21	36 x 36	48 x 48	24 x 24
Double Arrow	W12-1	6H.01	30 x 30	36 x 36	—
Low Clearance	W12-2	6H.01	36 x 36	48 x 48	30 x 30
Advisory Speed (plaque)	W13-1P	6H.32	18 x 18	24 x 24	18 x 18
On Ramp (plaque)	W13-4P	6H.09	36 x 36	36 x 36	—
No Passing Zone (pennant)	W14-3	6H.01	48 x 48 x 36	64 x 64 x 48	40 x 40 x 30
XX Feet (2-line plaque)	W16-2P	6H.01	24 x 18	30 x 24	—
Road Work (with distance)	W20-1	6H.03	36 x 36	48 x 48	30 x 30
Path Work (with distance)	W20-1b	6P.01	36 x 36	—	30 x 30
Detour (with distance)	W20-2	6H.04	36 x 36	48 x 48	30 x 30
Bike Detour (with distance)	W20-2a	6P.01	36 x 36	—	30 x 30
Bike Diversion (with distance)	W20-2b	6P.01	36 x 36	—	30 x 30
Road Closed (with distance)	W20-3	6H.05	36 x 36	48 x 48	30 x 30
Path Closed (with distance)	W20-3a	6P.01	36 x 36	—	30 x 30
One Lane Road (with distance)	W20-4	6H.06	36 x 36	48 x 48	30 x 30
Lane(s) Closed (with distance)	W20-5,5a	6H.07	36 x 36	48 x 48	30 x 30
Bike Lane Closed (with distance)	W20-5b	6P.01	36 x 36	—	30 x 30
Flagger (symbol)	W20-7	6H.15	36 x 36	48 x 48	30 x 30
Flagger	W20-7a	6H.15	36 x 36	48 x 48	30 x 30
Slow (on Stop/Slow Paddle)	W20-8	6D.02	18 x 18	—	—
Workers	W21-1,1a	6H.18	36 x 36	48 x 48	30 x 30
Fresh Oil	W21-2	6H.19	36 x 36	48 x 48	30 x 30
Road Machinery Ahead	W21-3	6H.20	36 x 36	48 x 48	30 x 30
Slow Moving Vehicle	W21-4	6N.05	36 x 18	—	—
Shoulder Work	W21-5	6H.22	36 x 36	48 x 48	30 x 30
Shoulder Closed	W21-5a	6H.22	36 x 36	48 x 48	30 x 30
Shoulder Closed (with distance)	W21-5b	6H.22	36 x 36	48 x 48	30 x 30
Survey Crew	W21-6	6H.23	36 x 36	48 x 48	30 x 30
Utility Work (with distance)	W21-7	6H.24	36 x 36	48 x 48	30 x 30
Mowing Ahead	W21-8	6N.05	36 x 36	48 x 48	30 x 30
Blasting Zone Ahead	W22-1	6H.25	36 x 36	48 x 48	30 x 30
End Blasting Zone	W22-3	6H.25	42 x 36	42 x 36	36 x 30
Slow Traffic Ahead	W23-1	6H.11	48 x 24	48 x 24	—
New Traffic Pattern Ahead	W23-2	6H.14	36 x 36	48 x 48	30 x 30
Double Reverse Curve (1 lane)	W24-1	6H.31	36 x 36	48 x 48	30 x 30
Double Reverse Curve (2 lanes)	W24-1a	6H.31	36 x 36	48 x 48	30 x 30
Double Reverse Curve (3 lanes)	W24-1b	6H.31	36 x 36	48 x 48	30 x 30
All Lanes (plaque)	W24-1cP	6H.31	24 x 18	30 x 24	—
Road Work Next XX Miles	G20-1	6H.35	36 x 18	48 x 24	—
End Road Work	G20-2	6H.36	36 x 18	48 x 24	—
Pilot Car Follow Me	G20-4	6H.37	36 x 18	—	—

* See Table 2C-1 for minimum size required for signs facing traffic on multi-lane conventional roads

Notes:

1. Larger signs may be used wherever necessary for greater legibility or emphasis
2. Dimensions are shown in inches and are shown as width x height

Section 6H.05 ROAD (STREET) CLOSED Sign (W20-3)

Guidance:

01 *The ROAD (STREET) CLOSED (W20-3) sign (see Figure 6H-1) should be used in advance of the point where a highway is closed to all road users, or to all but local road users.*

Option:

02 The legend STREET may be substituted for ROAD and the distance legend may be either XX FEET, XX MILES, or AHEAD.

Section 6H.06 ONE LANE ROAD Sign (W20-4)

Standard:

01 **The ONE LANE ROAD (W20-4) sign (see Figure 6H-1) shall be used only in advance of that point where motor vehicle traffic in both directions must use a common single lane (see Section 6E.01).**

Option:

02 The distance legend may be either XX FEET, XX MILES, or AHEAD.

Section 6H.07 Lane(s) Closed Signs (W20-5, W20-5a, and W9-3)

Standard:

01 **The Lane(s) Closed sign (see Figure 6H-1) shall be used in advance of that point where one or more through lanes of a multi-lane roadway are closed.**

02 **For a single lane closure, the Lane Closed (W20-5) sign (see Figure 6H-1) shall use the legend RIGHT (LEFT) LANE CLOSED. Where two or more adjacent lanes are closed, the W20-5a sign (see Figure 6H-1) shall use the legend XX RIGHT (LEFT) LANES CLOSED.**

Option:

03 The distance legend may be either XX FEET, XX MILES, or AHEAD.

Guidance:

04 *The Interior Lane Shift (W9-3) sign (see Figure 6H-1) should be used in advance of that point where work occupies an interior lane(s) and approaching motor vehicle traffic is directed to the right or left of the work zone in the lane(s) by using a shifting taper to route traffic around the closed interior lane(s).*

Section 6H.08 Lane Ends Signs (W4-2 and W9-2a)

Option:

01 The Lane Ends (W4-2) sign (see Figure 6H-1) may be used to warn drivers of the reduction in the number of lanes for moving motor vehicle traffic in the direction of travel on a multi-lane roadway.

Guidance:

02 *The MERGE HERE TAKE TURNS (W9-2a) sign (see Figure 6H-1) should be used to identify the merge point at which vehicles from alternate lanes take turns merging during Late Merge applications (see Section 6N.19).*

Section 6H.09 ON RAMP Plaque (W13-4P)

Guidance:

01 *When work is being done on a ramp, but the ramp remains open, the ON RAMP (W13-4P) plaque (see Figure 6H-1) should be used to supplement the advance ROAD WORK sign.*

Section 6H.10 RAMP NARROWS Sign (W5-4)

Guidance:

01 *The RAMP NARROWS (W5-4) sign (see Figure 6H-1) should be used in advance of the point where work on a ramp reduces the normal width of the ramp along a part or all of the ramp.*

Section 6H.11 SLOW TRAFFIC AHEAD Sign (W23-1)

Option:

01 The SLOW TRAFFIC AHEAD (W23-1) sign (see Figure 6H-1) may be used on a shadow vehicle, usually mounted on the rear of the most upstream shadow vehicle, along with other appropriate signs for mobile operations to warn of slow moving work vehicles. A ROAD WORK (W20-1) sign may also be used with the SLOW TRAFFIC AHEAD sign.

Section 6H.12 EXIT OPEN and EXIT CLOSED Signs (E5-2 and E5-2a)

Option:

01 An EXIT OPEN (E5-2) or EXIT CLOSED (E5-2a) sign (see Figure 6H-1) may be used to supplement other warning signs where work is being conducted in the vicinity of an exit ramp and where the exit maneuver for vehicular traffic using the ramp is different from the normal condition.

Section 6H.13 EXIT ONLY Sign (E5-3)

Option:

01 An EXIT ONLY (E5-3) sign (see Figure 6H-1) may be used to supplement other warning signs where work is being conducted in the vicinity of an exit ramp and where the exit maneuver for vehicular traffic using the ramp is different from the normal condition.

Section 6H.14 NEW TRAFFIC PATTERN AHEAD Sign (W23-2)

Option:

01 A NEW TRAFFIC PATTERN AHEAD (W23-2) sign (see Figure 6H-1) may be used on the approach to an intersection or along a section of roadway to provide advance warning of a change in traffic patterns, such as revised lane usage, roadway geometry, or signal phasing.

Guidance:

02 *To retain its effectiveness, the W23-2 sign should be displayed for up to 2 weeks, and then it should be covered or removed until it is needed again.*

Section 6H.15 Flagger Signs (W20-7 and W20-7a)

Guidance:

01 *The Flagger (W20-7) sign (see Figure 6H-1) should be used in advance of any point where a flagger is stationed to control road users.*

Option:

02 A distance legend may be displayed on a supplemental plaque below the Flagger sign. The sign may be used with appropriate legends or in conjunction with other warning signs, such as the BE PREPARED TO STOP (W3-4) sign (see Figure 6H-1).

03 The FLAGGER (W20-7a) word message sign with a distance legend may be substituted for the Flagger (W20-7) sign.

Section 6H.16 Two-Way Traffic Sign (W6-3)

Guidance:

01 *When one roadway of a normally-divided highway is closed, with two-way vehicular traffic maintained on the other roadway, the Two-Way Traffic (W6-3) sign (see Figure 6H-1) should be used at the beginning of the two-way vehicular traffic section and at intervals to remind road users of opposing vehicular traffic.*

Section 6H.17 Narrow Two-Way Traffic Sign (W6-4)

Standard:

01 **The Narrow Two-Way Traffic (W6-4) sign (see Figure 6H-1) shall be an upright, retroreflective orange-colored sign placed on a flexible support and sized at least 12 inches wide by 18 inches high.**

Support:

02 The Narrow Two-Way Traffic (W6-4) sign is intended for mounting only on a flexible support in a series along the center line to separate opposing vehicular traffic on a two-lane, two-way operation.

Standard:

03 **Narrow Two-Way Traffic signs shall not be placed within pedestrian crossings.**

Section 6H.18 Workers Signs (W21-1 and W21-1a)

Option:

01 A Workers (W21-1) sign (see Figure 6H-1) may be used to alert road users of workers in or near the roadway.

Guidance:

02 *In the absence of other warning devices, a Workers sign should be used when workers are in the roadway.*

Option:

03 The WORKERS (W21-1a) word message sign may be used as an alternate to the Workers (W21-1) symbol sign.

Section 6H.19 FRESH OIL (TAR) Sign (W21-2)

Guidance:

01 *The FRESH OIL (TAR) (W21-2) sign (see Figure 6H-1) should be used to warn road users of the surface treatment.*

Section 6H.20 ROAD MACHINERY AHEAD Sign (W21-3)

Option:

01 The ROAD MACHINERY AHEAD (W21-3) sign (see Figure 6H-1) may be used to warn of machinery operating in or adjacent to the roadway.

Section 6H.21 Motorized Traffic Signs (W8-6 and W11-10)

Option:

01 Motorized Traffic (W8-6 and W11-10) signs may be used to alert road users to locations where unexpected travel on the roadway or entries into or departures from the roadway by construction vehicles might occur. The TRUCK CROSSING (W8-6) word message sign may be used as an alternate to the Truck (W11-10) symbol sign (see Figure 6H-1) where there is an established construction vehicle crossing of the roadway.

Support:

02 These locations might be relatively confined or might occur randomly over a segment of roadway.

Section 6H.22 Shoulder Work Signs (W21-5, W21-5a, and W21-5b)

Support:

01 Shoulder Work signs (see Figure 6H-1) warn of maintenance, reconstruction, or utility operations on the highway shoulder where the roadway is unobstructed.

Standard:

02 **The Shoulder Work sign shall have the legend SHOULDER WORK (W21-5), RIGHT (LEFT) SHOULDER CLOSED (W21-5a), or RIGHT (LEFT) SHOULDER CLOSED XX FT or AHEAD (W21-5b).**

Option:

03 The Shoulder Work sign may be used in advance of the point on a non-limited access highway where there is shoulder work. It may be used singly or in combination with a ROAD WORK NEXT XX MILES or ROAD WORK AHEAD sign.

Guidance:

04 *On freeways and expressways, the RIGHT (LEFT) SHOULDER CLOSED XX FT or AHEAD (W21-5b) sign followed by RIGHT (LEFT) SHOULDER CLOSED (W21-5a) sign should be used in advance of the point where the shoulder work occurs and should be preceded by a ROAD WORK AHEAD sign.*

Section 6H.23 SURVEY CREW Sign (W21-6)

Guidance:

01 *The SURVEY CREW (W21-6) sign (see Figure 6H-1) should be used to warn of surveying crews working in or adjacent to the roadway.*

Section 6H.24 UTILITY WORK Sign (W21-7)

Option:

01 The UTILITY WORK (W21-7) sign (see Figure 6H-1) may be used as an alternate to the ROAD (STREET) WORK (W20-1) sign for utility operations on or adjacent to a highway.

Support:

02 Typical examples of where the UTILITY WORK sign is used appear in Figures 6P-4, 6P-6, 6P-10, 6P-15, 6P-18, 6P-21, 6P-22, 6P-26, and 6P-33.

Option:

03 The distance legend may be either XX FEET, XX MILES, or AHEAD.

Section 6H.25 Signs for Blasting Areas

Support:

01 Radio-Frequency (RF) energy can cause the premature firing of electric detonators (blasting caps) used in TTC zones.

Standard:

02 **Road users shall be warned where blasting operations occur. A sequence of signs shall be prominently displayed to warn all road users of blasting operations and to direct operators of mobile radio equipment, including cellular telephones, to turn off transmitters in a blasting area. These signs shall be covered or removed when there are no explosives in the area or the area is otherwise secured.**

03 **The BLASTING ZONE AHEAD (W22-1) sign (see Figure 6H-1) shall be used in advance of any TTC zone where explosives are being used. The TURN OFF 2-WAY RADIO AND CELL PHONE (R22-2) and END BLASTING ZONE (W22-3) signs shall be used in sequence with this sign.**

04 **The TURN OFF 2-WAY RADIO AND CELL PHONE (R22-2) sign (see Section 6G.11 and Figure 6G-1) shall follow the BLASTING ZONE AHEAD (W22-1) sign and shall be placed at least 1,000 feet before the beginning of the blasting zone.**

05 **The END BLASTING ZONE (W22-3) sign (see Figure 6H-1) shall be placed a minimum of 1,000 feet past the blasting zone.**

Option:

06 The END BLASTING ZONE sign may be placed either with or preceding the END ROAD WORK sign.

Section 6H.26 Shoulder Signs and Plaque (W8-4, W8-9, W8-17, and W8-17P)

Option:

01 The SOFT SHOULDER (W8-4) sign (see Figure 6H-1) may be used to warn of a soft shoulder condition.

02 The LOW SHOULDER (W8-9) sign (see Figure 6H-1) may be used to warn of a shoulder condition where there is an elevation difference of 3 inches or less between the shoulder and the travel lane.

Guidance:

03 *The Shoulder Drop Off (W8-17) sign (see Figure 6H-1) should be used when an unprotected shoulder drop-off, adjacent to the travel lane, exceeds 3 inches in depth for a continuous length along the roadway, based on engineering judgment.*

Option:

04 A SHOULDER DROP-OFF (W8-17P) supplemental plaque (see Figure 6H-1) may be mounted below the W8-17 sign.

Section 6H.27 UNEVEN LANES Sign (W8-11)

Guidance:

01 *The UNEVEN LANES (W8-11) sign (see Figure 6H-1) should be used during operations that create a difference in elevation between adjacent lanes that are open to travel.*

Section 6H.28 STEEL PLATE AHEAD Sign (W8-24)

Option:

01 A STEEL PLATE AHEAD (W8-24) sign (see Figure 6H-1) may be used to warn road users that the presence of a temporary steel plate(s) might make the road surface uneven and might create slippery conditions during wet weather.

Section 6H.29 NO CENTER LINE Sign (W8-12)

Guidance:

01 *The NO CENTER LINE (W8-12) sign (see Figure 6H-1) should be used when the work obliterates the center line pavement markings. This sign should be placed at the beginning of the TTC zone and repeated at 2-mile intervals in long TTC zones.*

Support:

02 Section 6J.02 contains information regarding temporary markings.

Section 6H.30 Reverse Curve Signs (W1-4 Series)

Guidance:

01 *In order to give road users advance notice of a lane shift, a Reverse Curve (W1-4, W1-4b, or W1-4c) sign (see Figure 6H-1) should be used when a lane (or lanes) is being shifted to the left or right. If the design speed of the curves is 30 mph or less, a Reverse Turn (W1-3) sign should be used.*

Standard:

02 **If a Reverse Curve (or Turn) sign is used, the direction of the reverse curve (or turn) shall be appropriately illustrated. Except as provided in Paragraph 3 of this Section, the number of lanes illustrated on the sign shall be the same as the number of through lanes available to road users.**

Option:

03 Where two or more lanes are being shifted, a W1-4 (or W1-3) sign with an ALL LANES (W24-1cP) plaque (see Figure 6H-1) may be used instead of a sign that illustrates the number of lanes.

04 Where more than three lanes are being shifted, the Reverse Curve (or Turn) sign may be rectangular.

Section 6H.31 Double Reverse Curve Signs (W24-1 Series)

Option:

01 The Double Reverse Curve (W24-1, W24-1a, or W24-1b) sign (see Figure 6H-1) may be used where the tangent distance between two reverse curves is less than 600 feet, thus making it difficult for a second Reverse Curve (W1-4 series) sign to be placed between the curves. If the design speed of the curves is 30 mph or less, Double Reverse Turn signs may be used.

Standard:

02 **If a Double Reverse Curve (or Turn) sign is used, the direction of the double reverse curve (or turn) shall be appropriately illustrated. Except as provided in Paragraph 3 of this Section, the number of lanes illustrated on the sign shall be the same as the number of through lanes available to road users.**

Option:

03 Where two or more lanes are being shifted, a W24-1 (or Double Reverse Turn sign showing one lane) sign with an ALL LANES (W24-1cP) plaque (see Figure 6H-1) may be used instead of a sign that illustrates the number of lanes.

04 Where more than three lanes are being shifted, the Double Reverse Curve (or Turn) sign may be rectangular.

Section 6H.32 Advisory Speed Plaque (W13-1P)

Option:

01 In combination with a warning sign, an Advisory Speed (W13-1P) plaque (see Figure 6H-1) may be used to indicate a recommended speed through the TTC zone.

Standard:

02 **The Advisory Speed plaque shall not be used in conjunction with any sign other than a warning sign, nor shall it be used alone. When used with orange TTC zone signs, this plaque shall have a black legend and border on an orange background. The plaque shall be at least 24 x 24 inches in size when used with a sign that is 36 x 36 inches or larger. Except in emergencies, an Advisory Speed plaque shall not be mounted until the recommended speed is determined by the highway agency.**

Support:

03 Warning signs with advisory speed plaques (see Section 2C.59) inform drivers of the recommended operating speed based on temporary conditions within a TTC zone. Examples include narrow lanes, temporary diversion (reverse curves), lane shifts, sight distance restrictions, rough road surface, bumps, low/no shoulder, workers on foot, work vehicles or equipment close to the open travel lane, or other conditions that indicate the need for reduced speed.

04 AASHTO and ITE design documents contain established engineering practices for the determination of the recommended advisory speeds for horizontal curves or locations with limited sight distance.

Section 6H.33 Supplementary Distance Plaque (W7-3aP)

Option:

01 In combination with a warning sign, a Supplementary Distance (W7-3aP) plaque (see Figure 6H-1) with the legend NEXT XX MILES may be used to indicate the length of highway over which a work activity is being conducted, or over which a condition exists in the TTC zone.

02 In long TTC zones, Supplementary Distance plaques with the legend NEXT XX MILES may be placed in combination with warning signs at regular intervals within the zone to indicate the remaining length of highway over which the TTC work activity or condition exists.

Standard:

03 **The Supplementary Distance plaque with the legend NEXT XX MILES shall not be used in conjunction with any sign other than a warning sign, nor shall it be used alone. When used with orange TTC zone signs, this plaque shall have a black legend and border on an orange background. The plaque shall be at least 30 x 24 inches in size when used with a sign that is 36 x 36 inches or larger.**

Guidance:

04 *When used in TTC zones, the Supplementary Distance plaque with the legend NEXT XX MILES should be placed below the initial warning sign designating that, within the approaching zone, a temporary work activity or condition exists.*

Section 6H.34 Motorcycle Plaque (W8-15P)

Option:

01 A Motorcycle (W8-15P) plaque (see Figure 6H-1) may be mounted below a LOOSE GRAVEL (W8-7) sign, a GROOVED PAVEMENT (W8-15) sign, a METAL BRIDGE DECK (W8-16) sign, or a STEEL PLATE AHEAD (W8-24) sign if the warning is intended to be directed primarily to motorcyclists.

Section 6H.35 ROAD WORK NEXT XX MILES Sign (G20-1)

Guidance:

01 *The ROAD WORK NEXT XX MILES (G20-1) sign (see Figure 6H-1) should be installed in advance of TTC zones that are more than 2 miles in length.*

Option:

02 The ROAD WORK NEXT XX MILES sign may be mounted on a Type 3 Barricade. The sign may also be used for TTC zones of shorter length.

Standard:

03 **The distance displayed on the ROAD WORK NEXT XX MILES sign shall be stated to the nearest whole mile.**

Section 6H.36 END ROAD WORK Sign (G20-2)

Guidance:

01 *When used, the END ROAD WORK (G20-2) sign (see Figure 6H-1) should be placed near the downstream end of the termination area, as determined by engineering judgment.*

Option:

02 The END ROAD WORK sign may be installed on the back of a warning sign facing the opposite direction of road users or on the back of a Type 3 Barricade.

Section 6H.37 PILOT CAR FOLLOW ME Sign (G20-4)

Standard:

01 **The PILOT CAR FOLLOW ME (G20-4) sign (see Figure 6H-1) shall be mounted in a conspicuous position on the top or on the rear of a vehicle used for guiding one-way vehicular traffic through or around a TTC zone (see Section 6E.04).**

Section 6H.38 Other Warning Signs

Option:

01 Advance warning signs may be used by themselves or with other advance warning signs.

02 Besides the warning signs specifically related to TTC zones, several other warning signs in Part 2 may apply in TTC zones.

03 Word message warning signs other than those classified and specified in this Manual and the "Standard Highway Signs" publication (see Section 1A.05) may be developed and used based on engineering judgment to warn of special conditions in TTC zones.

Standard:

04 **Except as provided in Sections 6F.01 and 6H.01, other warning signs that are used in TTC zones shall have black legends and borders on an orange background.**

Guidance:

05 *Other warning signs should comply with the general requirements of color, shape, and alphabet size and series. The sign message should be brief, legible, and clear.*

CHAPTER 6I. TTC ZONE GUIDE SIGNS

Section 6I.01 Guide Signs – General

Support:

01 Guide signs along highways provide road users with information to help them along their way through the TTC zone. The design of guide signs is presented in Part 2.

Guidance:

02 *The following guide signs should be used in TTC zones as needed:*

A. Standard route markings where temporary route changes are necessary,
B. Directional signs and street name signs, and
C. Special guide signs relating to the condition or work being done.

Standard:

03 **If additional temporary guide signs are used in TTC zones, they shall have a black legend and border on an orange background.**

Option:

04 Guide signs used in TTC incident management situations may have a black legend and border on a fluorescent pink background.

05 When temporary directional signs and temporary street name signs are used in conjunction with detour routing, these signs may have a black legend and border on an orange background.

06 When permanent directional signs or permanent street name signs are used in conjunction with detour signing, they may have a white legend on a green background (see Sections 2D.35 and 2D.45).

07 The sizes for TTC guide signs shall be as shown in Table 6I-1.

Section 6I.02 Detour Signs and Plaques (M4-8P, M4-8a, M4-8bP, M4-9, M4-9a, M4-9b, M4-9c, and M4-10)

Standard:

01 **Each detour shall be adequately marked with standard temporary route signs and destination signs.**

Option:

02 Detour signs in TTC incident management situations may have a black legend and border on a fluorescent pink background.

03 The Detour Arrow (M4-10) sign (see Figure 6I-1) may be used where a detour route has been established.

04 The DETOUR (M4-8P) plaque (see Figure 6I-1) may be mounted at the top of a route sign assembly to mark a temporary route that detours from a highway, bypasses a section closed by a TTC zone, and rejoins the highway beyond the TTC zone.

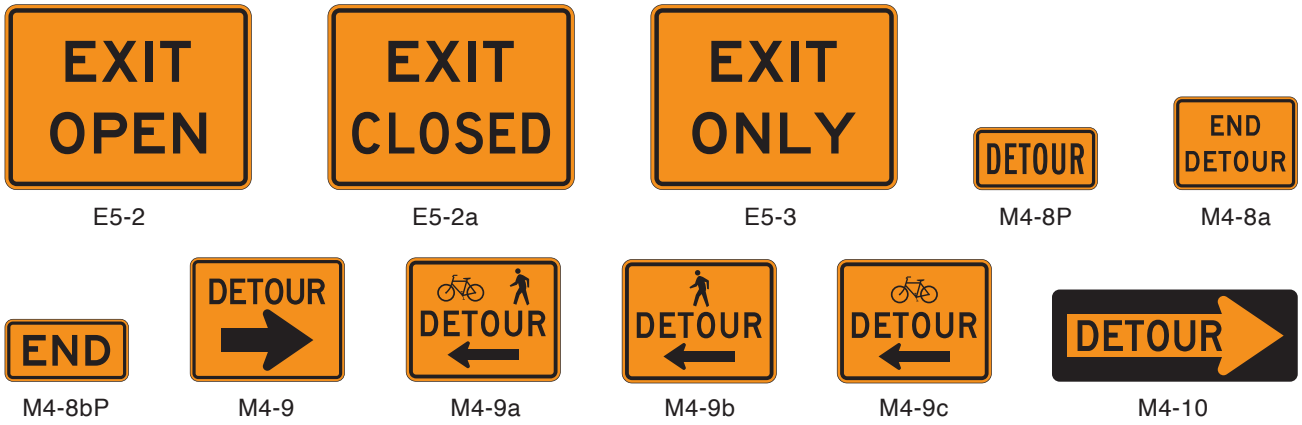
Table 6I-1. Temporary Traffic Control Zone Guide Sign and Plaque Sizes

Sign or Plaque	Sign Designation	Section	Conventional Road	Freeway or Expressway	Minimum
Exit Open	E5-2	6H.12	48 x 36	48 x 36	—
Exit Closed	E5-2a	6H.12	48 x 36	48 x 36	—
Exit Only	E5-3	6H.13	48 x 36	48 x 36	—
Detour	M4-8P	6I.02	24 x 12	30 x 15	—
End Detour	M4-8a	6I.02	24 x 18	24 x 18	—
End (plaque)	M4-8bP	6I.02	24 x 12	24 x 12	—
Detour	M4-9	6I.02	30 x 24	48 x 36	—
Bike/Pedestrian Detour	M4-9a	6I.02	30 x 24	—	—
Pedestrian Detour	M4-9b	6I.02	30 x 24	—	—
Bike Detour (with arrow)	M4-9c	6I.02	30 x 24	—	—
Detour	M4-10	6I.02	48 x 18	—	—

Notes:

1. Larger signs may be used wherever necessary for greater legibility or emphasis
2. Dimensions are shown in inches and are shown as width x height

Figure 6I-1. Exit Open and Closed and Detour Signs and Plaques



Guidance:

05 *The Detour Arrow (M4-10) sign should normally be mounted just below the ROAD CLOSED (R11-2, R11-3a, or R11-4) sign. The Detour Arrow sign should include a horizontal arrow pointed to the right or left as required.*

06 *The DETOUR (M4-9) sign (see Figure 6I-1) should be used for unnumbered highways, for emergency situations, for periods of short durations, or where, over relatively short distances, road users are guided along the detour and back to the desired highway without route signs.*

07 *A Street Name sign should be placed above, or the street name should be incorporated into, a DETOUR (M4-9) sign to indicate the name of the street being detoured.*

Option:

08 The END DETOUR (M4-8a) sign or the END (M4-8bP) plaque (see Figure 6I-1) may be used to indicate that the detour has ended.

Guidance:

09 *When the END DETOUR sign is used on a numbered highway, the sign should be mounted above a route sign after the downstream end of the detour.*

10 *The Pedestrian/Bicyclist Detour (M4-9a) sign (see Figure 6I-1) should be used where a pedestrian/bicyclist detour route has been established because of the closing of a pedestrian/bicycle facility to through traffic.*

Standard:

11 **If used, the Pedestrian/Bicyclist Detour sign shall have an arrow pointing in the appropriate direction.**

Option:

12 The arrow on a Pedestrian/Bicyclist Detour sign may be on the sign face or on a supplemental plaque.

13 The Pedestrian Detour (M4-9b) sign or Bicyclist Detour (M4-9c) sign (see Figure 6I-1) may be used where a pedestrian or a bicyclist detour route (not both) has been established because of the closing of the pedestrian or bicycle facility to through traffic.

Section 6I.03 EXIT CLOSED Panel

Guidance:

01 *When an exit ramp is closed, an EXIT CLOSED sign panel with a black legend and border on an orange background should be placed diagonally across the interchange/intersection guide signs.*

SECTION 913 — LAW ENFORCEMENT OFFICERS

913.01 DESCRIPTION.

This work includes providing law enforcement officers as deemed necessary by the Engineer for the direction and control of both vehicular traffic and pedestrians within the limits of the Project.

913.02 QUALIFICATIONS.

Use law enforcement officers that wear regulation uniforms who should be regular, reserve, or special officers of the communities in which they serve. Ensure that the officers use high visibility safety apparel that conforms to **Subsection 107.08**.

913.03 CONSTRUCTION METHODS.

The primary function of uniformed law enforcement officers, with or without marked cruisers, is to supplement (not replace) the traffic control devices used to move road users safely and expeditiously through and/or around work areas while protecting on-site workers and equipment. Ensure that the number of law enforcement officers used at any location is no greater than the number necessary to adequately alert, slow, and/or control road users through or around the work zone.

The following presents guidance on the appropriate use of law enforcement officers in a work zone:

- Frequent worker presence adjacent to high-speed traffic without positive protection devices
- Traffic control setup or removal that presents significant risks to workers and road users
- Complex or very short-term changes in traffic patterns with significant potential for road user confusion or worker risk from traffic exposure
- Night work operations that create substantial traffic safety risks for workers and road users
- Existing traffic conditions and/or crash histories that indicate a potential for substantial safety and congestion impacts related to the work zone activity, and that may be mitigated by improved driver alertness and/or behavior through the work zone
- Work zone operations that require brief stoppage of all traffic in one or both directions
- High-speed highways where unexpected or sudden traffic queuing is anticipated, especially if the queue forms a considerable distance in advance of the work zone or immediately adjacent to the work space

The following Table provides guidelines for the use of law enforcement officers and flagpersons (**SECTION 914**).

Quick Reference Guidelines[1] Use of Traffic Control Personnel in Work Zones (if needed[2])							
Facility Type	**Speed Limit[3]**	**No. of Travel Lanes Per Direction**	**Traffic Restriction in Work Zone**	**Typically, Most Appropriate Traffic Control Personnel**	**Marked Cruiser[4]**	**Example Uses**	
						Personnel Location	**Personnel Function**
Highway Ramps	Any	2 or more	Lane Closure/Shoulder Closure/Land Shift	Law Enforcement Officers	Yes	In Advance of Work Area Work Vehicle Access/Egress Point	Presence and/or Speed Enforcement Control Traffic to Allow Access/Egress
		1	Lane Closure/Shoulder Closure/Land Shift	Flagpersons	No	Work Vehicle Access/Egress Point	Control Traffic to Allow Access/Egress
Highway Mainline Segments	Greater than 35	Any	Lane Closure	Law Enforcement Officers	Yes	In Advance of Work Area	Presence and/or Speed Enforcement
		2 or more	Lane Shift/ Shoulder Closure	Law Enforcement Officers	Yes	Work Vehicle Access/Egress Point	Control Traffic to Allow Access/Egress
		1	Land Shift/ Shoulder Closure/Lane Shift	Flagpersons	No	Work Vehicle Access/Egress Point	Control Traffic to Allow Access/Egress
	35 or Less[5]	Any	Lane Closure/Shoulder Closure/Lane Shift	Flagpersons	No	In Advance of Work Area	Control Alternating One-Way Traffic
						Work Vehicle Access/Egress Point	Control Traffic to Allow Access/Egress
Signalized Intersections	Greater than 35	Any	Lane Closure/Shoulder Closure/Lane Shift	Law Enforcement Officers	Yes	Intersection	Direct and/or Control Traffic
	35 or Less[6]	Any	Lane Closure/Shoulder Closure/Lane Shift	Law Enforcement Officers	No	Intersection	Direct and/or Control Traffic
Unsignalized Intersections	Any	Any	Lane Closure/Shoulder Closure/Lane Shift	Flagpersons	No	Intersection	Direct and/or Control Traffic

1 See Policy language for detailed guidelines.

2 In most cases, Law Enforcement Officers/Flagpersons should be used only if the Engineer deems that they are needed to direct, control, and/or alert road users.

3 Posted or statutory speed limit on one or more approaches to the facility type.

4 With emergency lights activated.

5 On all approaches to the facility type.

913.04 METHOD OF MEASUREMENT.

Services of law enforcement officers will be measured for payment by the number of hours for each person rendering services according to directions of the Engineer. This only includes, however, law enforcement officers that are employed within either the limits of the construction right-of-way for the Project, upon detours stipulated in the Contract, or upon detours ordered by the Engineer. Law enforcement officers furnished by the Contractor for continued use of a detour, bypass, or temporary traffic control beyond the period for which the Engineer deems that law enforcement officers are necessary to the proper completion of the Project, or at locations where traffic is unnecessarily restricted by the Contractor's method of operation, will not be measured for payment.

913.05 BASIS OF PAYMENT.

Although services of uniformed law enforcement officers (with/without cruisers) will be measured for payment by the number of hours for each person rendering services, there is no bid item for this work.

Uniformed law enforcement officers (with/without cruisers) will be paid based on actual cost as submitted by a bill of lading from the local community or communities involved or from the State for State Troopers and approved by the Engineer. The payment for this work will be made directly by the Department through a separate Purchase Order submitted by the local community or communities or the State agency. Payment for the law enforcement officers (with/without cruisers) required by the Contractor's operations beyond the period for which the Engineer deems necessary shall be the Contractor's responsibility.

SECTION 914 — FLAGPERSONS

914.01 DESCRIPTION.

This work includes providing flagpersons as required in the Contract or as directed by the Engineer to assist in controlling traffic through the construction site.

914.02 QUALIFICATIONS.

Provide flagpersons who are trained in safe traffic control practices and public contact techniques who are knowledgeable with the most recent publication of the "Flagging Handbook," published by the Federal Highway Administration, and who possess a certificate of satisfactory completion from a training course approved by the Department.

Flagpersons who are unqualified or unable to meet the above requirements or who are unable to provide proper and effective traffic control may be removed at the discretion of the Engineer. In this case, provide qualified replacement flagpersons, and maintain the required traffic control measures for the work site at all times.

914.03 CONSTRUCTION METHODS.

See the Table in **Subsection 913.03** for guidance on the use of flagpersons in work zones.

914.04 METHOD OF MEASUREMENT.

Services of flagpersons will be measured for payment by the number of hours for each person rendering services according to directions from the Engineer. This only includes, however, flagpersons that are employed within either the limits of the construction right-of-way for the Project, upon detours stipulated in the Contract, or upon detours ordered by the Engineer. Flagpersons furnished by the Contractor for its convenience will not be measured for payment. Examples include:

- Providing flaggers for the continued use of a detour, bypass, or temporary traffic control beyond the period for which the Engineer deems that flagpersons are necessary for the proper completion of the Project
- At locations where traffic is unnecessarily restricted by the Contractor's method of operation (e.g., laydown areas, site access/security)

914.05 BASIS OF PAYMENT.

The Department will pay for the completed and accepted quantities as follows:

Pay Item	Pay Unit
Flagpersons	HR

The current minimum acceptable bid for regular and overtime hours are provided on Page P-1 of the Proposal.

The unit bid price per manhour will constitute compensation for the flagpersons' services, including fringe benefits, and for associated protective clothing, hand signaling devices, communications equipment, and other applicable equipment and incidentals deemed necessary by the Engineer. Overtime will be compensated for separately and according to the union contract.

Payment for temporary work is included under **SECTION 937**.

ATTACHMENT 5

Appendix F

List of Approved Materials/Manufacturers for Use in the Providence Water Distribution System

Revised per Addendum No. 1

LIST OF APPROVED MATERIALS / MANUFACTURERS FOR USE IN THE PROVIDENCE WATER DISTRIBUTION SYSTEM

(As of June 20, 2024)

PROVIDENCE WATER

DUCTILE IRON PIPE
(Must Be Zinc Coated – US Made Only)

American DI Pipe Co.
Atlantic States Cast Iron Pipe Co.
U.S. Pipe & Foundry Co.
McWane Ductile

DUCTILE IRON FITTINGS
(Must Be Zinc Coated – US Made Only)

Star Pipe Products
Tyler/Union Foundry Co.
U.S. Pipe & Foundry Co.

VALVES

American Valve
American AVK Co.
Clow Valve Co. Kennedy Valve M&H Valve Co. Mueller Co.
U.S. Pipe & Foundry Co.
Red-White Valve Corp.
Apollo Valves

BUTTERFLY VALVES (16" and larger)

Henry Pratt Co.
Mueller Co.

VALVE AND SERVICE BOXES

Bingham & Taylor
East Jordan Iron Works
General Foundries
Mueller Co.
Tyler Union / Biby
The Ford Meter Box Co.
A.Y. McDonald Manufacturing Co.
EJ USA

PIPE COUPLINGS

ROMAC Industries, Inc.
Smith-Blair, Inc.
Total Piping Solutions, Inc. (Hymax)
The Ford Meter Box Co.
Dresser Inc.
Baker Coupling, LLC

SERVICE ADAPTER COUPLINGS, PLASTIC

The Harrington Corp (HARCO)

FIRE HYDRANTS

Kennedy Guardian Hydrant - K81D,
by Kennedy Valve (Must be "Hydra-Shield - Custodian" ready for installation in Providence only)

5-1/4" American-Darlin B-62-B-5,
by American Flow Control (Must be "Hydra-Shield - Custodian" ready for installation in Providence only)

Clow Medallion,
by American Flow Control (Must be "Hydra-Shield - Custodian" ready for installation in Providence only)

JOINT RESTRAINT FOR DUCTILE IRON PIPE - MECHANICAL

EBAA Iron Sales, Inc. MEGALUG MJ Retainer Gland
  Series 1100 – MJ Gland
  Series 1100SDB – Mid Span Restraint
Star National Products
  "Star Tie-Anchor III Joint Restrainer"
Tyler Union
  Series 1000 TUFGRIP MJ Retainer Gland
The Ford Meter Box Co.
  Uni-Flange Series 1400

JOINT RESTRAINT FOR DUCTILE IRON PIPE-GASKETED

American – Fast-Grip Gasket
McWane Sure Stop 350 Gasket
U.S. Pipe & Foundry Co. - "Field Lok 350" Gasket

SERVICE BRASS / COPPER
(Must meet "Lead Free Standard")

A.Y. McDonald Manufacturing Co.
Cambridge Lee Industries, LLC
Mueller Co.
Red Hed Manufacturing
The Ford Meter Box Co

A Providence Water guidance document. This list is subject to change without notice. Customers or contractors are responsible for contacting Providence Water to verify their selection of materials prior to starting any construction.
Note, all materials must meet the Specifications listed in the Contract Documents, even if the material is on this list.
If a Contractor would like to use a material that is not currently on this list but meets the requirements of the Contract specifications, they may submit a request to the Owner/Engineer for approval.