



## PUBLIC ANNOUNCEMENT AND GENERAL INFORMATION

### **WILLIAMSON COUNTY PURCHASING DEPARTMENT SOLICIATION 1702-140**

Road Signs, Delineators and Object Markers and Traffic control  
devices

**BIDS MUST BE RECEIVED ON OR BEFORE:  
Mar 13, 2017 10:00:00 AM CDT**

**BIDS WILL BE PUBLICLY OPENED:  
Mar 13, 2017 10:00:00 AM CDT**

Notice is hereby given that sealed Bids for the above-mentioned goods and/or services will be accepted by the Williamson County Purchasing Department. Williamson County uses BidSync to distribute and receive bids. Specifications for this IFB may be obtained by registering at [www.bidsync.com](http://www.bidsync.com).

**Williamson County prefers and requests electronic submittal of this Bid.**

**All electronic bids must be submitted via:** [www.bidsync.com](http://www.bidsync.com)

Electronic bids are requested, however paper bids will currently still be received, until further notice and may be mailed or delivered to the address listed below.

**Bidders are strongly encouraged to carefully read this entire IFB.**

All interested Bidders are invited to submit a Bid in accordance with the Instructions and General Requirements, Bid Format, Bid Specifications, and Definitions, Terms and Conditions stated in this IFB.

**Please note that a complete package must be submitted choosing one of the above two methods. Split packages submitted will be considered "unresponsive" and will not be accepted or evaluated.**

**Williamson County will not accept any Bids received after the submittal deadline, and shall return such Bids unopened to the Bidder.**

General Information:

- If mailed or delivered in person, Bids and Bid addenda are to be delivered in sealed envelope on or before the submittal deadline, as noted in the Public Announcement and General Information listed above for this IFB, to:

Williamson County Purchasing Department  
Attn: **BID NAME AND NUMBER**  
901 South Austin Avenue  
Georgetown, Texas 78626

- Bidders should list the Bid Number, Bid Name, Name and Address of Bidder, and the Date of the Bid opening on the outside of the box or envelope and note "Sealed Bid Enclosed."
  - Bidder should submit one (1) original.
  - Williamson County will NOT be responsible for unmarked or improperly marked envelopes.
  - Williamson County will not accept any responsibility for Bids being delivered by third party carriers.
  - Facsimile transmittals will NOT be accepted.
- Bids will be opened publicly in a manner; however, to avoid public disclosure of contents only the names and of Bidders and prices will be read aloud.
  - All submitted questions with their answers will be posted and updated on [www.bidsync.com](http://www.bidsync.com).
  - It is the Bidder's responsibility to review all documents in BidSync, including any Addenda that may have been added after the document packet was originally released and posted.
    - Any Addenda and/or other information relevant to the IFB will be posted on [www.bidsync.com](http://www.bidsync.com).
    - The Williamson County Purchasing Department takes no responsibility to ensure any interested Bidder has obtained any outstanding addenda or additional information.

**Bid 1702-140****Road Signs, Delineators and Object Markers and Traffic control devises**

Bid Number 1702-140  
 Bid Title Road Signs, Delineators and Object Markers and Traffic control devises

Bid Start Date In Held  
 Bid End Date Mar 13, 2017 10:00:00 AM CDT  
 Question & Answer End Date Mar 8, 2017 12:00:00 PM CST

Bid Contact Teri Jeffries  
 Senior Purchasing Specialist  
 512-943-1553  
 Teri.jeffries@wilco.org

Contract Duration 1 year  
 Contract Renewal Not Applicable  
 Prices Good for 180 days  
 Pre-Bid Conference Feb 23, 2017 10:00:00 AM CST  
 Attendance is optional  
 Location: 3151 S.E. Inner Loop, Georgetown, TX 78262

Bid Comments **Williamson County is seeking qualified companies to provide for the purchase and delivery of road signage materials, delineators, object markers and traffic control devices, per applicable Texas Department of Transportation, Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges 2014, Texas Department of Transportation Departmental Materials Specifications, Texas Manual on Uniform Traffic Control Devices (TMUTCD) 2011, Compliant Work Zone Traffic Control Device List (CWZTCDL), and Standard Sheets included in this IFB. All items must be bid to include delivery. Installation is not to be included.**  
**Vendor is presumed to have fully read and will respond per all applicable included guidelines, specifications, terms and conditions, and requirements of this IFB 1702-140..**  
**An Excel spreadsheet has been attached and can be download to insert your costs, and then uploaded as completed for your convenience.**

**Item Response Form**

Item 1702-140--01-01 - Add all documents to this line item.  
 Quantity 1 each  
 Unit Price   
 Delivery Location **Williamson County, Texas**  
Road and Bridge  
 3151 S. E. Inner Loop  
 Suite B  
 Georgetown TX 78626  
 Qty 1

**Description**

Please add all items to this line item.

## **GENERAL NOTES AND TECHNICAL SPECIFICATIONS**

### **General Information**

Williamson County is seeking qualified companies to provide for the purchase and delivery of road sign materials, delineators, object markers and traffic control devices per applicable Texas Department of Transportation, Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges 2014, Texas Department of Transportation Departmental Materials Specifications, Texas Manual on Uniform Traffic Control Devices (TMUTCD) 2011, Compliant Work Zone Traffic Control Device List (CWZTCDL), and Standard Sheets included in this IFB. County is seeking to purchase materials. All items must be bid per item delivered. Installation is not included.

Williamson County reserves the right to award the bid in whole to one vendor or to award a contract on each separate item or combination of items as may be most advantageous to the County. A primary, secondary, tertiary, and/or subsequent award may be made for this bid by the County.

The County is not obligated to purchase any minimum amount and the County may purchase any reasonable amount for the same unit price. Items will be ordered on an "As Needed" basis.

It is expressly understood and agreed that in case Williamson County should need any item(s) not available within the time frame needed from the successful vendor(s) during the term of this contract, the County reserves the right to purchase the item(s) from vendors other than the successful vendor(s) and shall not be in violation of any terms or conditions of said contract.

Provide three (3) references where like services have been performed by your firm. Include name of firm, address, telephone number and name of representative.

### **Definition of Terms**

County: Williamson County Road and Bridge Division

Vendor: Successful bidder of the attached invitation to bid

Engineer: Director of Road and Bridge Division

Inspector: Employee of Williamson County supplied full time to the vendor's crew for the selection, prosecution, and quality control of the materials.

Specifications: Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014.

CST/M&P: The Texas Department of Transportation Construction Division, Materials and Pavement Section

DMS – 4400: The Texas Department of Transportation Departmental Materials Specification for Flexible Delineator and Object Marker Posts (Embedded and Surface-Mount Types)

DMS – 7110: The Texas Department of Transportation Departmental Materials Specification for Aluminum Sign Blanks.

DMS – 7120: The Texas Department of Transportation Departmental Materials Specification for Sign Hardware

DMS – 8242: The Texas Department of Transportation Departmental Materials Specification for Temporary Flexible, Reflective Roadway Marker Tabs

DMS - 8300: The Texas Department of Transportation Departmental Materials Specification for Sign Face Materials

DMS - 8310: The Texas Department of Transportation Departmental Materials Specification for Flexible Roll-up Reflective Signs

DMS - 8315: The Texas Department of Transportation Departmental Materials Specification for Sign Identification Decals

DMS - 8600: The Texas Department of Transportation Departmental Materials Specification for Delineators and Object Markers.

DMS - 8620: The Texas Department of Transportation Departmental Materials Specification for Flagger Stop/Slow Paddles

Department: Road and Bridge Division of Williamson County

TMUTCD: Texas Manual on Uniform Traffic Control Devices

CWZTCDL: Compliant Work Zone Traffic Control Device List

### **Control of Materials**

**Source Control.** Use only materials that meet Contract requirements. Unless otherwise specified or approved, use new materials for the items. Secure the Engineer's approval of the proposed source of materials to be used before their delivery. Materials can be approved at a supply source or staging area but may be re-inspected.

**Material Quality.** Correct or remove materials that fail to meet the contract requirements, for cost incurred if additional sampling and testing is required by a change of source.

Materials not meeting Contract requirements will be rejected, unless the Engineer approves corrective actions. Upon rejection, immediately remove and replace rejected materials. If the Vendor does not comply with this Article, the County may remove and replace defective material. The cost of testing, removal, and replacement will be deducted from invoice.

**Manufacturer Warranties.** Transfer to the County warranties and guarantees required by the Vendor or received as part of normal trade practice.

### **General Notes**

All materials furnished under the provision of the Contract shall comply with the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD), Compliant Work Zone Traffic Control Device List (CWZTCDL), and requirements which pertain to the various items included herein as *Standard Specifications for Construction of Highways, Streets and Bridges* of the Texas Department of Transportation, adopted November, 2014, and as amended and/or updated, which is incorporated herein by reference for all purposes. In the event that any specification set out herein conflicts with the said TxDOT specifications, the specification set out herein shall control and govern.

Unless otherwise noted, successful bidder shall bid sign items as complete with full legends; however, the Department may request blank or incomplete legends on signs.

Successful bidder shall comply with insurance requirements dictated within this contract.

### **Road Sign Materials**

**Regulatory Signs**

All Regulatory Signs shall be:

- High Intensity Prismatic Sheeting (H.I.P.) unless otherwise specified
- 0.080 aluminum for all material unless otherwise specified

**Warning Signs**

All Warning Signs shall be:

- High Intensity Prismatic Sheeting (H.I.P.) unless otherwise specified
- 0.080 aluminum for all material unless otherwise specified

**School Signs**

All School Signs shall be:

- Diamond Grade (D.G.) unless otherwise specified
- 0.080 aluminum for all material unless otherwise specified
- Florescent Yellow/Green

**Street Signs**

All Street Signs shall be:

- Double-sided
- High Intensity Prismatic Sheeting (H.I.P.) unless otherwise specified
- 0.080 aluminum for all material unless otherwise specified

**Unusual Signs**

All Unusual Signs shall be:

- High Intensity Prismatic Sheeting (H.I.P.) unless otherwise specified
- 0.080 aluminum for all material unless otherwise specified

Refer to DMS-7110, DMS-7120, DMS-8300, DMS-8310, DMS-8315, and TxDOT Specifications Items 636, 643, and 644 for contract requirements.

Materials provided must also meet with the requirements and intended use as shown on attached standard sheets: BC (1)-14, BC (4)-14, BC (5)-14, SMD (GEN)-08, SMD (TWT)-08, SMD (SLIP-1)-08, SMD (SLIP-2)-08 and SMD (SLIP-3)-08.

**Delineators and Object Markers**

Refer to DMS-4400, DMS 8242, DMS-8600 and TxDOT Specifications Items 658 for contract requirements.

Materials provided must also meet with the requirements and intended use as shown on attached standard sheets: BC (9)-14 and D&OM (1)-15.

**Traffic Control Devices**

Refer to DMS-8620 for contract requirements.

Materials provided must also meet with the requirements and intended use as shown on attached standard sheets: BC (8)-14, BC (10)-14 and BC (11)-14.

**DMS - 4400****FLEXIBLE DELINEATOR AND OBJECT MARKER POSTS (EMBEDDED  
AND SURFACE-MOUNT TYPES)****EFFECTIVE DATE: AUGUST 2014**

**4400.1. Description.** This Specification governs for the material, composition, quality, sampling, and testing of flexible delineator and object marker posts, both embedded and surface-mount types, and describes the qualification procedures and the Material Producer List (MPL).

**4400.2. Units of Measurements.** The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

**4400.3. Material Producer List.** The Materials and Pavements Section of the Construction Division (CST/M&P) maintains the Material Producer List (MPL) of all materials conforming to the requirements of this Specification. Materials appearing on the MPL, entitled "[Flexible Delineator and Object Marker Posts](#)," require no further testing unless deemed necessary by the Project Engineer or CST/M&P. Before any material is considered for use on Department projects, it must be of manufacture and product code or designation shown on the MPL.

**4400.4. Pre-Qualification Procedure.**

**A. Pre-Qualification Request.** Prospective producers interested in submitting their product for evaluation must submit a written request to the Texas Department of Transportation, Construction Division, Materials and Pavements Section (CP51), 125 East 11<sup>th</sup> Street, Austin, Texas 78701-2483.

The manufacturer, supplier, or their representative must conduct impact tests. Submit a test report that includes a certification by a licensed, professional engineer that the posts have been impact tested, with the following requirements:

- Test a minimum of eight posts.
- The posts must survive ten hits (hit from the same direction each time) by a passenger car, at a speed between 50 and 55 mph. ("Survive" is defined as remaining in place and not having a list in any direction from vertical of more than 20°.) For this test, install and orient the posts as recommended by the manufacturer for typical roadway applications.
- In addition, after five hits, the delineator or object marker must be certified to meet minimum reflectivity requirements specified in accordance with DMS-8600.
- Submit photographs showing both the posts impacted and the impact vehicle after five and ten hits.
- National Transportation Product Evaluation Program test results will also be accepted.



*DEPARTMENTAL MATERIALS SPECIFICATION**FLEXIBLE DELINEATOR AND OBJECT MARKER POSTS  
(EMBEDDED AND SURFACE-MOUNT TYPES)*

Before materials are placed on the MPL, producers or suppliers must submit certifications and photographs to CST/M&P for approval.

A demonstration of the manual installation of a post 6-1/2 ft. in length, using the recommended manual driver, may be required. The supplier or their designated representative will perform the demonstration at a location specified by the Department. Any problems noted during installation must be addressed before qualified status is granted.

**B. Pre-Qualification Sample.** Submit a minimum of ten flexible posts, including anchors and special mounting hardware for ground or surface mount, for testing.

Identify the post as being one of the following categories and types:

- Embedded—the post is designed to be either driven into the ground or affixed to a foundation set in concrete.
- Surface Mount—the post is designed to be attached to a base that is mounted to the roadway surface.

Submit all materials for pre-qualification tests at no cost to the Department.

The Department reserves the right to perform any or all tests specified as a check on the tests reported by the manufacturer. In the case of any variance, Department tests will govern.

**C. Sampling and Testing.** Sampling will be in accordance with Tex-737-I.

Testing will be in accordance with Article 4400.5.

**D. Evaluation.** CST/M&P will notify prospective bidders and suppliers after completion of material evaluation.

**1. Qualification.** If approved for use by the Department, the material will be added to the MPL. If material is listed on the MPL, no additional submittals are required for that product.

Report changes in the composition or in the manufacturing process of any material to CST/M&P. Significant changes reported by the manufacturer, as determined by the Director of CST/M&P, may require a re-evaluation of performance.

When in the opinion of the Director of CST/M&P changes have been made in the composition, manufacturing process, or design of a pre-qualified product, a re-evaluation may be required. The Department may conduct additional tests to identify changes in the material. Detected changes in the composition or in the manufacturing process not reported by the manufacturer may be cause for removal of that material from the MPL.

**2. Failure.** Producers not qualified under this Specification may not furnish materials for Department projects and must show evidence of correction of all deficiencies before reconsideration for qualification.

## DEPARTMENTAL MATERIALS SPECIFICATION

FLEXIBLE DELINEATOR AND OBJECT MARKER POSTS  
(EMBEDDED AND SURFACE-MOUNT TYPES)

The Department normally bears the costs of sampling and testing; however, the Contractor or supplier will bear the costs for sampling and testing of failing materials. The Director of MST/M&P will assess this cost at the time of testing.

Amounts due the Department will be deducted from monthly or final estimates on contracts or from partial or final payments on direct purchases by the Department. Products will not be retested until costs for previously failed tests have been paid.

- E. Periodic Evaluation.** The Department reserves the right to conduct random sampling of pre-qualified, certified materials for testing and to perform random audits of test reports.

The Department may select random samples for periodic evaluation of performance from materials submitted to the Department on contracts or direct State purchase orders.

Department representatives may sample material from the manufacturing plant, the project site, and the warehouse. CST/M&P reserves the right to test samples to verify compliance with this Specification.

Failure of materials to comply with the requirements specified may be cause for removal of those materials from the MPL.

- F. Disqualification.** Disqualification and removal from the MPL may occur if one of the following infractions occurs:

- material fails to meet the requirements stated in this Specification,
- the producer fails to report to CST/M&P changes in the composition or in the manufacturing process of any material, or
- the producer has unpaid charges for failing samples.

- G. Requalification.** A manufacturer or supplier may submit material for re-evaluation after documenting the problem and its resolution. Submit documentation identifying the cause and corrective action taken.

#### 4400.5. Material Requirements.

- A. General Requirements.** All posts must meet all requirements specified except where specific requirements are shown for a specific type.

Manufacture posts from any flexible material of a high-impact resistance quality and resistant to ultraviolet light, ozone, and hydrocarbons.

- B. Design and Test Requirements.** The top of hollow or tubular posts must be permanently capped to prevent excessive amounts of rain or debris from entering. CST/M&P may allow small holes in the cap when justified by the manufacturer.

The surface texture to which the delineator is to be attached must be clean, smooth, and suitable for the adhesion of reflective sheeting without preparation.

The length of the post must be as specified on the plans or on the purchase order.

The infrared and x-ray spectra of material from posts furnished must match the spectra for the pre-qualified posts in accordance with Tex-888-B and Tex-896-B.

*DEPARTMENTAL MATERIALS SPECIFICATION**FLEXIBLE DELINEATOR AND OBJECT MARKER POSTS  
(EMBEDDED AND SURFACE-MOUNT TYPES)*

The specific gravity of material from posts furnished must not vary more than 0.12 from the specific gravity of the pre-qualified posts. The specific gravity of post material will be measured in a gas pycnometer using helium as the pressure gas. The pycnometer will be operated according to the pycnometer manufacturer's recommended procedures.

The posts must show no significant change in color, flexibility, or integrity after 1,000-hr. exposure in accordance with ASTM G 155 using Exposure Cycle 1 with a quartz inner filter glass and Type "S" Borosilicate outer filter glass.

Unless otherwise specified, the color of the posts must be opaque white meeting all Federal Highway Administration color requirements.

The posts must show no significant change in color, flexibility, or integrity after coating with herbicides, currently used by the Department, for 48 hr. then rinsed.

**C. Surface-Mount Post Base Requirements.** In addition to the above requirements, the base of surface-mount posts must meet the following requirements:

Manufacture the base from a rigid, high-impact, resistant material and be resistant to ultraviolet light, ozone, and hydrocarbons.

CST/M&P must review and approve the dimensions of the base.

Use adhesives or the attachment method recommended by the manufacturer to adhere the base to asphalt and concrete flat surfaces.

Allow for replacement of the post in 4 min. or less.

**4400.6. Payment.**

**A. Procurement by the State.** Payment for all materials will be in accordance with the conditions prescribed in the contract awarded by the State.

**B. Contracts.** Payment for all materials will be in accordance with the Department's Standard Specification Item 658.

**4400.7. Archived Versions.** Archived versions are available.

**DMS - 7110**  
**ALUMINUM SIGN BLANKS**

**EFFECTIVE DATE: MARCH 2005**

**7110.1. Description.** This Specification governs the furnishing of aluminum substrates for signs, including aluminum sheet or coil and extruded sign panels.

**7110.2. Sampling and Testing.** Aluminum sheet or coil, and extrusions will conform to this Specification unless otherwise specified by the plans. Sample the material in accordance with Tex-721-I.

**7110.3. Periodic Evaluation.** The Department reserves the right to conduct sampling of materials for testing. Department representatives may sample material from the sign fabricator's plant.

**7110.4. Material Requirements.**

**A. Aluminum Sheet or Coil.**

- Aluminum sheet or coil will conform to the requirements of ASTM B 209, Alloys 6061-T-6, or 5052-H38.
- Sign blanks made from sheet or coil will be free of buckles, warps, dents, cockles, burrs, and other defects and must be a plane surface.
- Treat all sign blanks fabricated from sheet and coil with a chromate chemical process resulting in a coating meeting the requirements of ASTM B 449, Class 2. The coating will be light-colored, tight, and free from powdery residues.

**B. Aluminum Extrusions.**

- Aluminum signs (Types G and O) will conform to ASTM B 221, Alloys 6061 or 6063, T4 or T6 temper.
- Railroad crossbuck sign panels will conform to ASTM B 221, Alloys 6061 or 6063, T6 temper.

**C. Documentation.** Furnish mill test reports, obtained from the manufacturer, for aluminum sheet or coil and for extrusions that reflect the chemical and physical properties of the aluminum.

**7110.5. Archived Versions.** Archived versions are available.

## **DMS - 7120**

### **SIGN HARDWARE**

**EFFECTIVE DATE: AUGUST 2004**

**7120.1. Description.** This Specification governs the furnishing of hardware for signs, including frames, wind beams, stiffeners, exit number panel supports, splice bars, pipe and post clamp castings, and fasteners.

**7120.2. Material Requirements.**

**A. General Requirements.** Unless otherwise shown on the plans, all frames, wind beams, stiffeners, exit number panel supports, splice bars, pipe and post clamp castings, and fasteners will be stainless steel, galvanized steel, or aluminum. Dissimilar metals will be selected or insulated to prevent corrosion. The following specifications will apply.

**B. Frames and Wind Beams (Tees, Zees).**

- Aluminum—ASTM B 221, Alloy 6061-T6

**C. Stiffeners (S-Shapes).**

- Steel—ASTM A 36, Galvanized to ASTM A 123

**D. Exit Number Panel Supports (Angles, Tees).**

- Aluminum—ASTM B 221, Alloys 6061-T6
- Steel—ASTM A 36, Galvanized to ASTM A 123

**E. Splice Bars.**

- Aluminum—ASTM B 209, Alloys 6061-T6, or 5052-H38

**F. Aluminum Castings.**

- Pipe Clamps:
  - ASTM B 26, Alloy 356.0-F
  - ASTM B 85, Alloy 360.0 or A360.0 or
  - ASTM B 108, Alloy 356.0-F or A444.0-T-4
- Post Clamps:
  - ASTM B 26, Alloy 356.0-T6, or
  - ASTM B 108, Alloy 356.0-T6

**G. Screws, Bolts, Nuts, and Washers.**

- Aluminum—Alloy 2024-T4
- Stainless Steel—ASTM A 320, Grade B8F Annealed
- Galvanized Steel:
  - ASTM A 307
  - galvanized to ASTM A 153, Class C or D, or
  - galvanized to ASTM B 695, Class 50

**H. High-Strength Bolts, Nuts, and Washers.**

- ASTM A 325, or
- ASTM A 449
- galvanized to ASTM A 153, Class C or D, or
- galvanized to ASTM B 695, Class 50

**I. Dichromate Sealed Finish for Aluminum Hardware.**

- Mil-A-8625A Type II

**J. Documentation.** Provide Mill Test Reports from the producing mill for all structural components—frames, wind beams, stiffeners, exit number panel supports, splice bars, and high strength fasteners. Mill test reports must reflect the chemical analysis of the base metal and the physical test results (i.e., yield and tensile strength and elongation) obtained on the finished product.

Provide a manufacturer's certification for pipe and post clamp castings, and miscellaneous fasteners (screws, bolts, nuts, and washers) stating that the material meets all applicable requirements.

**7120.3. Archived Versions.** Archived versions are available.

**DMS - 8242****TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS****EFFECTIVE DATE: AUGUST 2004**

**8242.1. Description.** This Specification governs for the materials, composition, quality, sampling, and testing of temporary, flexible-reflective roadway marker tabs.

**8242.2. Units of Measurements.** The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

**8242.3. Material Producer List.** The Materials and Pavements Section of the Construction Division (CST/M&P) maintains the Material Producer List (MPL) of all materials conforming to the requirements of this Specification. Materials appearing on the MPL, entitled "[Temporary Flexible, Reflective Roadway Marker Tabs](#)," require no further testing, unless deemed necessary by the Project Engineer or CST/M&P.

**8242.4. Bidders' and Suppliers' Requirements.** Before any material is considered, it must be of manufacture and product code or designation shown on the MPL.

**8242.5. Pre-Qualification Procedure.**

**A. Pre-Qualification Request.** Submit a written request for evaluation to the Texas Department of Transportation, Construction Division, Materials and Pavements Section (CP51), 125 East 11th Street, Austin, Texas, 78701-2483.

Include the following information with the request:

- Company name,
- Physical and mailing addresses,
- Type of material, and
- Contact person and telephone number.

**B. Pre-Qualification Samples.** Submit 50 samples of each color and type for laboratory testing and evaluation to the Department at no cost.

The Department reserves the right to perform any or all of the tests specified to confirm the tests reported by the manufacturer. In the case of any variance, the Department's tests will govern.

Some of the required tests extend over a prolonged period. Therefore, testing for acceptance of materials supplied on any Contract or State purchase order will only be considered on those materials that are determined by the Director of CST/M&P as having an established performance history of compliance with the criteria established by this Specification.

**C. Evaluation.** CST/M&P will contact the manufacturer after material evaluation is complete.

- 1. Qualification.** If approved for use by the Department, the material will be added to the MPL.

Report changes in the composition or in the manufacturing process of any material to CST/M&P. Significant changes reported by the manufacturer, as determined by the Director of CST/M&P, may require a re-evaluation of performance.

- 2. Failure.** Producers not qualified under this Specification may not furnish materials for Department projects and must show evidence of correction of all deficiencies before reconsideration for qualification.

Costs of sampling and testing are normally borne by the Department; however, the costs to sample and test materials failing to conform to the requirements of this Specification are borne by the Contractor or supplier. The Director of CST/M&P will assess this cost at the time of testing.

Amounts due the Department will be deducted from monthly or final estimates on Contracts or from partial or final payments on direct purchases by the State.

**D. Periodic Evaluation.** The Department reserves the right to periodically evaluate the performance of materials, to randomly select samples from materials submitted on State purchase orders, and to perform random audits of test reports. Department representatives may sample material from the manufacturing plant, the project site, and the warehouse. CST/M&P reserves the right to test samples to verify compliance with this Specification. Failure of materials to comply with the requirements of this Specification as a result of periodic evaluation may be cause for removal of those materials from the MPL.

The Department will sample in accordance with Tex-729-I and will test in accordance with the methods listed in Article 8240.9.

**E. Disqualification.** The Department reserves the right to conduct whatever tests are considered necessary to identify a pre-approved material and to determine if a change has been made in composition, manufacturing process, or quality, which may affect its durability or performance.

Changes detected in the composition or in the manufacturing process, not reported by the manufacturer, may be cause for removal of that material from the MPL.

Failure of materials to comply with the requirements of this Specification as a result of periodic evaluation may be cause for removal of those materials from the MPL.



**8242.6. Material Requirements.** This Specification covers the general and specific requirements for three types of temporary, flexible-reflective tabs:

- Type Y—yellow marker with amber reflective area on one side
- Type Y-2—yellow marker with amber reflective area on both side
- Type W—white marker with white or silver reflective area on one side

**A. Body Requirements.** The body of the marker must consist of a base and vertical wall made of polyurethane, polyester elastomer, or other approved material.

The base should be  $100 \pm 3$  mm ( $4 \pm 1/8$  in.) in length and from 25 to 64 mm (1 to 2-1/2 in.) in width.

- A butyl rubber or other approved adhesive pad with an easily removed protective covering must be affixed to the bottom of the base.
- The adhesive pad must be approximately 3 mm (1/8 in.) thick, 19 mm (3/4 in.) wide, and 100 mm (4 in.) long.

The vertical wall must be  $100 \pm 3$  mm ( $4 \pm 1/8$  in.) long with a minimum height of 51 mm (2 in.) and a maximum height of 76 mm (3 in.)

- A reflective material must be affixed to the upper portion of the vertical wall
- The reflective material must not exceed 25 mm (1 in.) in width and be the approximate length of the vertical wall.
- The reflective material must be protected with an easily removable cover of heat resistant material capable of withstanding and protecting the reflective material from the application of 204°C (400°F) asphalt.
- Stapling or clipping devices used to retain the protective cover must not protrude through the reflective material.

**B. Color Requirements.** The color of the body of the temporary, flexible-reflective tabs and the reflected light must be either white or yellow as specified.

**C. Flexibility and Deformation Resistance.** The vertical wall of the tabs must be sufficiently flexible to bend under normal traffic and sufficiently resistant to permanent deformation to pass the following road test, to be conducted when air temperature is above 10°C (50°F).

1. Affix five tabs at 610 mm (2 ft.) intervals on an asphaltic pavement in a straight line.
2. Using a medium size sedan, run over the tabs with front and rear wheels at a speed of 56 to 64 km per hour (kmph) (35 to 40 miles per hour [mph]), four times in each direction.
3. Remove the reflective surface protective cover and run over the tabs again at 56 to 64 kmph (35 to 40 mph) four times in each direction.

The tabs will be considered sufficiently flexible and resistant to deformation if after the road test all tabs are intact, the reflective material is still adhered to the vertical wall and

## DEPARTMENTAL MATERIALS SPECIFICATION

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY  
MARKER TABS

exhibits no apparent visual damage, and the top of the vertical wall is within 30° of the vertical line through the base of the vertical wall.

- D. Adhesion.** The tabs must adhere to the pavement such that no tab dislodges in the road test detailed in Sub Article 8242.9.D. Affix the tab to the pavement before the road test by positioning by hand, stepping on it with one foot, and placing all the body weight on the one foot. The individual placing the marker will weigh a minimum of 61 kg (135 lb.)
- E. Reflectivity.** When tested in accordance with Tex-842-B, at an angle of incidence of 4° and an observation angle of 0.2° the specific intensity of each tab expressed in the units of (lumens [lux] square meters) per unit must equal or exceed the values shown for each color in Table 1 before and after the road test.

**Table 1**  
**Specific Intensity Minimums for Tabs Before and After Road Test**

Color	Before	After
White	3.0	2.0
Yellow	2.0	1.5

When tested for reflectivity before the road test, place the tab in the holder such that the vertical wall will freely stand. When tested for reflectivity after the road test, place the tab in the holder and support such that a line through the center of the top of the vertical wall and the bottom of the vertical wall is within 10° of the vertical line through the base of the vertical wall.

- F. Packaging.** Package tabs such that the vertical wall will not take a permanent set in excess of 15° from true vertical with respect to the base plane.

**8242.7. Archived Versions.** Archived versions are available.

## DMS - 8300

### SIGN FACE MATERIALS

**EFFECTIVE DATE: NOVEMBER 2013**

**8300.1. Description.** This Specification governs the quality monitoring program (QMP) for sign face materials and describes the Material Producer List (MPL), pre-qualification procedures, quality monitoring (QM) requirements, warranty, and material and testing requirements for the following sign face materials:

- reflective sheeting,
- conformable reflective sheeting,
- screen inks, and
- colored transparent and black non-reflective electronically cuttable (EC) films.

**8300.2. Units of Measurements.** The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

**8300.3. Definitions.** The following definitions apply to this Specification.

- Rotational Sensitive Sheeting—reflective sheeting not meeting the 20% maximum rotational sensitivity requirement when measured as outlined in AASHTO M 268.

**8300.4. Material Producer List.** The Materials and Pavements Section of the Construction Division (CST/M&P) maintains the Material Producer List (MPL) of all materials that have been approved under this Specification. Materials appearing on the MPL, entitled “[Sign Face Materials](#),” do not require sampling and testing before use, but the Department may periodically sample materials to ensure conformance with this Specification and may also sample if material quality is suspect.

**8300.5. National Transportation Product Evaluation Program (NTPEP) Requirement.** Some of these sign face materials are evaluated by the American Association of State Highway and Transportation Officials (AASHTO) NTPEP program. For these sign face materials, the NTPEP evaluation is required prior to submittal for pre-qualification. If NTPEP has designated a re-evaluation schedule, the sign face materials must be resubmitted to NTPEP for evaluation when designated by that schedule.

**8300.6. Bidders’ and Suppliers’ Requirements.** The Department will only purchase or allow on projects those products listed by producer and product code or designation shown on the MPL. To obtain a place on the MPL, the producer must be accepted into the Quality Monitoring Program (QMP).

Use of pre-qualified materials does not relieve the Contractor of the responsibility to provide materials that meet the specifications.

**8300.7. Pre-Qualification Procedure.**

- A. Pre-Qualification Request.** Submit a written request for pre-qualification evaluation to the Texas Department of Transportation, Construction Division, Materials and Pavements Section (CP-51), 125 East 11th Street, Austin, Texas 78701-2483.

Include the following information in the request:

- company name;
- physical and mailing addresses;
- type of material,
- company material designation (product name, code number, etc.);
- contact person, telephone number, and email address;
- NTPEP test data, if applicable;
- AASTHO M 268 sheeting type and a test report with actual test data showing the material complies with the requirements of AASTHO M 268, as modified by this Specification, if applicable;
- fabrication guidelines outlining optimum rotation for rotational sensitive white reflective sheeting; and
- warranty statement required by this Specification.

- B. Pre-Qualification Sample.** For all proposed products, provide pre-qualification sample quantities in accordance with Tex-720-I at no cost to the Department.

The Department reserves the right to perform any or all tests in this Specification as a check on the tests reported by the producer. In the case of any variance, the Department's tests will govern.

The Department will charge suppliers for the cost of sampling and testing of materials that do not meet the requirements of this Specification.

**C. Evaluation.**

- 1. Qualification.** The Department will accept materials meeting the requirements of this Specification to the QMP and will list them on the MPL.

The Department may grant provisional pre-qualification approval for materials that have undergone a full evaluation by NTPEP and whose test results meet the minimum durability values required by this Specification.

The Department will grant full pre-qualification approval after successful completion of the accelerated weathering requirements. Failure to complete all exterior exposure requirements successfully is grounds for cancellation of pre-qualification.

Report changes in the composition or in the manufacturing process of any material to CST/M&P at the address used for pre-qualification. The Department will review significant changes reported, and the material may require a re-evaluation. The Department reserves the right to conduct whatever tests deemed necessary to identify

a pre-qualified material and determine if there is a change in the composition, manufacturing process, or quality that may affect its durability or performance.

- 2. Failure.** Producers not qualified under this Specification may not furnish materials for Department projects and must show evidence of correction of all deficiencies before reconsideration for qualification.

Costs of sampling and testing are normally borne by the Department; however, the producer will bear the costs of sampling and testing materials failing to conform to the requirements of this Specification. The Director of CST/M&P will assess this cost at the time of testing.

#### **8300.8. QM Requirements.**

- A. QM Sample.** To maintain QMP approval status, provide an annual QM sample in accordance with Tex-720-I for each product listed on the MPL. The annual QM cycle begins upon initial acceptance and approval and ends on the anniversary of that date. Submit samples at least 1 month before approval status expires to allow sufficient time for testing. Not submitting material on time may cause a delay in posting on the MPL. Provide QM sample quantities at no cost to the Department.

QM samples must meet all the minimum requirements of this Specification; however, the coefficient of retroreflection will be based on the process average of all samples tested within a minimum 1-year timeframe. Maintain the running process average of all samples for the coefficient of retroreflection above the minimums specified for each sheeting type.

- B. Periodic Evaluation.** The Department reserves the right to randomly sample and evaluate pre-qualified materials for conformance with this Specification and to perform random audits of documentation. Department representatives may sample material from the manufacturing plant, the sign fabrication plant, the project site, and the warehouse.

Periodic samples must meet all the minimum requirements of this Specification; however, the Department will determine conformance for coefficient of retroreflection based on the process average of all samples tested within a minimum 1-year timeframe. Maintain the process average above the minimums specified for each sheeting type.

- C. Disqualification.** The Department may disqualify and remove material from the QMP and MPL if any of the following infractions occurs:

- the material fails to meet or maintain the requirements stated in this Specification,
- the producer fails to report changes in the formulation or production process of the material to CST/M&P,
- the producer fails to properly submit annual QM samples to CST/M&P,
- the producer has unpaid charges for failing samples, or
- the producer has unresolved warranty issues.

Disqualified producers will not be allowed to supply the material to the Department for 1 year, or as determined by the Director of CST/M&P. After this period has expired, the

producer must re-qualify to regain QMP status. Disqualification will only apply to the material type corresponding to the infraction.

- D. Re-Qualification.** Producers may submit material for re-evaluation after 1 year has elapsed from the date of removal from the MPL or after documenting the problem and its resolution to the satisfaction of the Department. Submit documentation identifying the cause and corrective action taken.

**8300.9. Comprehensive Producer's Warranty Requirements.** Sign face material producers must comply with all requirements of the following warranty. Failure to comply with the requirements of this warranty is cause for removal from the QMP and MPL.

Submit a statement to the address used for pre-qualification indicating understanding and compliance with the provisions of the warranty and willingness to abide by the provisions. Include the name, address, telephone number, and email address of the person to contact regarding potential claims under the warranty provisions.

For producers of sign face materials, the warranty must include the use of one producer's sign face material directly applied to a different producer's sign face material. Screen inks must be recommended and warranted by the producer of the base sheeting. If a failure occurs, assignment of warranty responsibility is to the producer of the sign face material that fails. (For example, if the base sheeting, defined as the sheeting attached to the substrate, separates from the sign substrate, the producer of the base sheeting will be responsible. If the sheeting used for legend detaches from the base sheeting, the producer of the legend material will be responsible for the failure.)

- A. Certification.** Submit a certification with each lot or shipment that states that the material supplied meets the requirements listed. Show individual lot numbers on the certification.
- B. Field Performance.** Sign face materials processed, applied, stored, and handled according to the producer's recommendations (or as required in this Specification when there is an exception to the producer's recommendations) must perform satisfactorily for the number of years specified for that sign face material. The performance period begins at the time a sign is fabricated, as indicated by the "Fabrication Date" on the sign identification decal. The warranty requirements go into effect upon final acceptance by the Department. The Department will adjust the performance period to deduct the time between the sign fabrication date and Department acceptance.

The sign face material is unsatisfactory if:

- it deteriorates due to natural causes to the extent that the sign is ineffective for its intended purpose (e.g., being viewed from a moving vehicle under normal day and night driving conditions), or
- shows any of the following defects:
  - cracks discernible with the unaided eye from the driver's position while in an outside lane at a distance of 50 ft. (15 m) or greater from the sign;
  - peeling in excess of 1/4 in. (6.4 mm);
  - shrinkage in excess of 1/8 in. (3.2 mm) total per 48 in. (1.2 m) of sheeting width; or

- fading, loss of color, or loss of reflectivity to the extent that color or reflectivity fails to meet the requirements of AASHTO M 268, as modified by this Specification.

Provide the applicators with manuals, training videos, or both describing the proper application method. Submit, to the address used for pre-qualification, a copy of the current training materials provided with any updates as they occur. Include recommended procedures for the storage and handling of materials after application to the sign face until final installation.

The sign face material producer's warranty does not relieve the Contractor for unacceptable work or improper handling, storage, or installation. The Contractor is fully responsible for all materials and work until final acceptance by the Department.

- C. Minimum Performance Period.** All signs made with the type of sheeting indicated below and any other sign face materials used on each type of sheeting, except construction and maintenance work signs and barricades, must meet the minimum performance periods and replacement actions in Table 1.

**Table 1**  
**Warranty Period (yr.)**

Sheeting Type	Period for Complete Sign Replacement and Installation	Additional Period for Sheeting Material Replacement Only
A, B, C	7	3
D	8	4
B <sub>FL</sub> , C <sub>FL</sub> , D <sub>FL</sub> <sup>1</sup>	5	2

1. B<sub>FL</sub>, C<sub>FL</sub>, and D<sub>FL</sub> indicate fluorescent sheeting products in the Type B, C, and D categories.

- D. Producer's Replacement Obligation.** Where and when shown that retroreflective traffic signs processed in conformance with the sign face material producer's recommendations (or as required in this Specification when there is an exception to the producer's recommendations) have not met the field performance requirements above, a producer's replacement obligation exists. The producer must cover the costs of replacement of the sign on the roadway or of restoring the sign surface to its original effectiveness as determined by and at no cost to the Department for materials or labor.

Replacement sign face materials must:

- be the same type originally specified unless otherwise approved or directed,
- meet all the requirements of this Specification, and
- be listed on the MPL.

Schedule with designated Department personnel, within 30 days of notification of potential replacement obligation, an on-site investigation to determine if the sign face material producer's obligation exists.

Fulfill all obligations within 120 days after determination of obligations. The Department may replace signs where uncompleted obligations occur and may bill the producer for all Department costs in performing the producer's replacement obligation.

When in the judgment of the Department deteriorated signs present a traffic hazard, the Department reserves the right to remove the signs from the roadway and place them in storage for the producer's inspection. Reimburse the Department for all costs, including labor for removal and replacement, when inspection reveals that a material producer's obligation exists.

The material producer may use an independent Contractor to fulfill obligations to replace or refurbish signs on the roadway.

Terms of the Contract must be in conformance with the provisions of Contracts used by the Department for this type work, be approved by the Department, and save harmless the Department from any liability that may arise out of the Contractor's operations.

The Department can provide a sample Contract to the producer upon the producer's request.

The Department reserves the right to place a representative on the job to ensure that the signs are replaced or refurbished in conformance with Department standards. The Department will test all sign face materials used to fulfill the producer's obligations to ensure compliance with this Specification.

Replacement material assumes the remaining warranty period of the material it replaces.

**E. Sign Processors' Obligations.** Submit the following with each shipment of signs or sign faces:

- Department Contract or purchase order number and
- a copy of the certification, as required in Section 8300.9.A, showing the lot number of all sign face materials from which the completed signs or sign faces were processed.

**8300.10. Material Requirements for Reflective Sheeting.** This Specification covers the general and specific requirements for the four types of reflective sheeting materials listed in AASHTO M 268—Types A, B, C, and D. The sheeting producer must furnish identification codes to the Department. Construction work zone grade sheeting used for temporary construction work zone applications must meet all requirements for the type specified except for the weathering requirements, for which it must meet a minimum of 60% of the minimum specified initial retroreflectivity values specified for that type after accelerated weathering of 500 hours and after 12 months of exterior exposure.

The Department conducts outdoor weathering at the Department's test site in Austin, Texas or at other locations as deemed necessary by the Director of CST/M&P.

Meet all requirements of AASHTO M 268, as modified by the following.

- A. Coefficient of Retroreflection.** For rotational sensitive white sheeting, the coefficient of retroreflection will be measured at the orientation identified by the producer as the optimum rotation.
- B. Chemical Resistance.** The surface of the sheeting or the face of a completed sign must be chemically resistant to the extent that there will be no surface change when wiped with a soft, clean cloth dampened with mild detergents or cleaners supplied by or recommended by the sheeting producer.



- C. Adhesive.** Pre-coat the backside of the reflective sheeting with either a heat-activated or a pressure-sensitive adhesive. No additional coats of adhesive must be required to affix the reflective sheeting to the sign blank. The adhesive and liner, when used, must meet the requirements of **AASHTO M 268**.

Suppliers of reflective sheeting using a porous, textured-backing paper to protect the adhesive layer that is not suitable for use as a slip-sheet for packaging of completed signs, sign panels, or both must supply rolls of slip-sheet paper in the various widths of reflective sheeting supplied. The area of slip-sheet paper, supplied in the various widths, must be the same as the area of reflective sheeting supplied in the various widths.

Supplied slip-sheet paper is subsidiary to the reflective sheeting and any costs, direct or indirect, must be included in the bid price for reflective sheeting on State purchases.

The adhesive must have no staining effect on the reflective sheeting.

- D. Color.** Meet all the color requirements of AASTHO M 268 except the Delta E requirements. Additionally, the reflected night color must be
- identifiable as the same color as the day color when observed at 50 ft. (15 m) and
  - uniform and free of streaks, mars, and other imperfections.
- E. Material Identification.** Mark each container, carton, or box containing reflective sheeting with the information listed in **AASHTO M 268**. The identification numbers must also appear on the inside of the sheeting roll core. The identification number on the outside of the box and on the inside of the core must match. The mismatch of these numbers may be cause for rejection.
- F. Sign Fabrication.** Follow the sign fabrication requirements of AASHTO M 268, as modified by this Specification. When using white sheeting identified as rotational sensitive on the MPL, fabricate signs as specified by AASHTO M 268 and follow the sheeting producer's guidelines. Use screen inks as recommended and warranted by the base sheeting producer. Signs fabricated using any other sign face material may be fabricated using products from different producers.

#### **8300.11. Material Requirements for Conformable Reflective Sheeting.**

- A. General Requirements.** Conformable reflective sheeting is intended for use on both flat surfaces and round plastic or metal posts. Conformable reflective sheeting must meet all requirements of **AASHTO M 268, as modified by this Specification**, and the requirements of Tex-843-B.

#### **8300.12. Material Requirements for Screen Inks.**

- A. General Requirements.** Meet the requirements of AASHTO M 268, as modified by this Specification.
- B. Color.** Screen inks, when screened onto any pre-qualified white reflective sheeting, must produce a color meeting the color requirements specified for the various colors of reflective sheeting in **AASHTO M 268**.

Use the type of screen recommended by the producer.

Use screen inks as supplied or thinned according to the producer's recommendations. Color will be determined using ink from sealed, unopened containers as received from the producer and according to producer's recommendations for thinning.

- C. Durability.** Screen inks recommended by the ink producer for use on any of the types of reflective sheeting must exhibit the same durability as specified for that type of reflective sheeting.

When tested in accordance with Federal Test Method 6301, "Adhesion (Wet) Tape Test," the results must show no process inks removed after processing a minimum of 96 hr. or after exposure of the sheeting types to the durability and weathering tests specified.

- D. Screened Sheeting Optical Performance.** Before exterior exposure or weatherometer (WOM) exposure, sheeting reverse screened with transparent ink must have the minimum coefficient of retroreflectivity values specified in AASHTO M 268 for the same color of sheeting as the ink.

Retroreflectivity will be determined in accordance with Tex-842-B.

### **8300.13. Material Requirements for Colored Transparent Films and Non-Reflective Black Films.**

- A. General.** Meet all the requirements of AASHTO M 268, as modified by this Specification. Colored, transparent films and non-reflective black films must consist of durable, EC films coated with a transparent, pressure-sensitive adhesive protected by a removable liner.

The films must be:

- available in standard traffic colors;
- dimensionally stable; and
- designed to cut, weed, lift, and transfer.

The films must not release any volatile organic compounds.

- B. Color.** Non-reflective black film must be acrylic and have a reflectance (Y) no greater than 4.0 as determined by Tex-839-B.
- C. Coefficient of Retroreflection.** Retroreflectivity will be determined in accordance with Tex-842-B.
- D. Durability.** All films, when applied to the various types of reflective sheeting, must meet the same durability requirements as specified for that type of reflective sheeting.

**8300.14. Contrast Ratio of Sign Faces and Completed Signs.** For all sign faces and completed signs using transparent screen inks or transparent films, the "Contrast Ratio" is the quotient obtained when the coefficient of retroreflection of the white is divided by the coefficient of retroreflection of the other color.

The contrast ratio will be determined at an observation angle of 0.2° and an entrance angle of -4°.

For all red and white signs, the contrast ratio must not be less than 4.0 or greater than 15.0. For all other signs, sign panels, sign faces, and traffic control devices, the contrast ratio must not be less than 4.0.

**8300.15. Packaging.** Package the materials in containers that will permit normal shipping and storage without the material sustaining damage or becoming difficult to apply.

Roll material must contain no more than three splices per 50 yd. (46 m). The length of the roll core must not be less than the width of the material.

- A. Pressure-Sensitive Material.** The ends of the material must be cut square with either a butt-splice or an overlap splice of  $3/8 \pm 1/8$  in. in width ( $9.5 \pm 3.2$  mm). Edges of the overlap splice are to be straight and square.
- B. Heat-Activated Material.** Cut the ends of the material square, but jointed closely together and held securely in place with a removable tape.

**8300.16. Archived Versions.** Archived versions are available.

## DMS - 8310

### FLEXIBLE ROLL-UP REFLECTIVE SIGNS

**EFFECTIVE DATE: SEPTEMBER 2007**

**8310.1. Description.** This Specification governs for the materials, composition, quality, services, sampling, and testing of flexible roll-up reflective signs.

**8310.2. Units of Measurements.** The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

**8310.3. Pre-Qualified Product List.** The Support Services Division maintains the pre-qualified product list (QPL) of all materials conforming to the requirements of this Specification. Materials appearing on the QPL, entitled "[Flexible Roll-Up Reflective Signs](#)," require no further testing, unless deemed necessary by the Project Engineer or CST/M&P.

**8310.4. Bidders' and Suppliers' Requirements.** Before any bid is considered, the materials must be shown on the MPL.

**8310.5. Pre-Qualification Procedure.**

**A. Pre-Qualification Request.** Submit a written request for evaluation to the Texas Department of Transportation, Support Services Division (SSD), 125 East 11th Street, Austin, Texas 78701-2483.

**B. Pre-Qualification Sample.** Submit the following materials with the request:

- two 610 × 610-mm (24 × 24-in.) samples of the reflective material, white and orange, to be used as the reflective face of completed signs;
- two 610 × 610-mm (24 × 24-in.) samples of the backing material, white and orange, to be used as the backing of the completed signs; and
- one each, white and orange, completed 1.22 × 1.22-m (48 × 48-in.) "Construction Ahead" signs conforming to the details of the *Texas Manual on Uniform Traffic Control Devices*.

Signs must be complete, with cross braces ready to attach to a fold-up, spring-loaded type sign support

Some of the tests required by this Specification extend over a prolonged period, and some tests cannot be made after the backing material is applied. Therefore, testing for acceptance of materials supplied on any contract or State purchase order will only be considered on those materials that, in the opinion of the Director of the Construction Division's Materials and Pavements Section (CST/M&P), have an established performance history of compliance with this Specification.

**C. Evaluation.** CST/M&P will notify prospective bidders and suppliers after completion of material evaluation.

**1. Qualification.** If approved for Department use, the material will be added to the QPL.

Report changes in the composition or in the manufacturing process of any material to CST/M&P. Significant changes reported by the manufacturer, as determined by the Director of CST/M&P, may require a re-evaluation of performance.

**2. Failure.** Producers not qualified under this Specification may not furnish materials for Department projects and must show evidence of correction of all deficiencies before reconsideration for qualification.

The Department normally bears the costs of sampling and testing; however, the producer will bear the costs associated with materials failing to conform to the requirements of this Specification. The Director of CST/M&P will assess this cost at the time of testing, and amounts due will be billed to the producer.

**D. Periodic Evaluation.** The Department reserves the right to periodically evaluate the performance of materials, to randomly select samples from materials submitted on State purchase orders, and to perform random audits of test reports. Department representatives may sample material from the manufacturing plant, the project site, and the warehouse. Failure of materials to comply with the requirements of this Specification as a result of periodic evaluation may be cause for removal of those materials from the QPL.

Sampling and testing will be in accordance with Tex-720-I. Unless otherwise noted, the Department will sample at the district warehouse or regional service centers.

**E. Disqualification.** The Department reserves the right to conduct any tests considered necessary to identify a pre-qualified material and to determine if a change has been made in composition, manufacturing process, or quality, which may affect its durability or performance.

Changes detected in the composition or in the manufacturing process, not reported by the manufacturer, may be cause for removal of that material from the QPL.

#### **8310.6. Material Requirements.**

**A. General Requirements.** Flexible roll-up reflective signs should consist of a vinyl micropism retroreflective sheeting heat sealed in a pattern not to exceed  $32 \times 32$  mm ( $1\text{-}1/4 \times 1\text{-}1/4$  in.) to a vinyl-coated fabric backing or other approved sheeting and backing materials.

The reflective face and backing must both be UV light stabilized and of the same color.

**B. Sign Face Characteristics.** The reflective sheeting and other materials used to produce the face of flexible roll-up reflective signs must meet the following requirements.

**1. Flexibility.** There must be no signs of cracking or crazing when flexed repeatedly over a 1.6-mm (1/16-in.) mandrel to  $180^\circ$  at  $25^\circ\text{C}$  ( $77^\circ\text{F}$ ).

2. **Chemical Resistance.** The surface of the sheeting or the face of a completed sign must be chemical resistant to the extent that there will be no surface change when wiped with a soft, clean cloth dampened with VM&P naphtha, mineral spirits, turpentine, mild soaps, or mild detergents.
3. **Gloss.** The sheeting's face and screened areas must have an 85° gloss meter rating of not less than 35 when tested in accordance with ASTM D 523.
4. **Diffuse Day Color.** The CIE chromaticity coordinates of reflective sheeting must fall within the areas having the corner points and reflectance requirements for the various colors shown in Table 1 before and after weatherometer exposure as described in Section 8310.6.B.6.

**Table 1**  
**Chromaticity Coordinates**

Color	Chromaticity		Reflectance
	X	y	Y
White	0.310	0.300	
	0.290	0.320	
	0.360	0.360	40 Minimum
	0.340	0.380	
Orange	0.530	0.360	
	0.530	0.400	
	0.590	0.410	12–30
	0.640	0.360	

Color will be determined in accordance with Tex-839-B.

5. **Reflected Night Color.** The reflected night color must appear to be essentially the same as the day color when observed at 15.2 m (50 ft.)
6. **Durability.** Sheeting or sign faces must show no cracking, crazing, blistering, chalking, or dimensional change after 250 hr. of exposure in an Atlas Weather-Ometer utilizing an 18-102 cam, in accordance with ASTM G 155 using exposure Cycle 1 with a quartz inner filter glass and Type "S" Borosilicate outer filter glass.
7. **Mildew Resistance.** The sheeting must evidence no fungus growth when tested by Federal Test Method 6271.1 under the conditions listed in Table 2.

**Table 2**  
**Mildew Resistance Test Requirements**

Conditions
Test specimens will be leached with water before inoculation.
The test organism will be pullularia pullulans.
The length of the incubation period will be 21 days.

- 8. Specific Intensity.** Reflective sheeting must have the minimum brightness values, before exposure shown in Table 3.

Brightness values will be determined at the divergence and entrance angles shown and will be expressed in units of lumens per lux per square meter (candlepower per foot-candle per square foot).

**Table 3**  
**Specific Intensity (SI) Minimum Brightness Values**

Brightness Values							
Color-	Divergence Angle	Angle of Incidence – SI - lm/lx/m <sup>2</sup> (cp/ftc/ft <sup>2</sup> )					
		2°		10°		20°	
White	0.2°	942	(75)	628	(50)	314	(25)
-	0.33°	753	(60)	439	(35)	151	(12)
Orange	0.2°	226	(18)	176	(14)	75	(6)
-	0.33°	151	(12)	100	(8)	75	(4)

SI will be determined in accordance with Tex-842-B.

The reflective sheeting must retain a minimum of 50% of the above shown SI values after weatherometer exposure as described in Section 8310.6.B.6.

No process ink used to produce messages on the sign face must be removed when tested in accordance with Federal Test Method 6301, after a minimum of 96 hours after processing, or after weatherometer exposure as described in Section 8310.6.B.6.

- C. Sign Face Backing Fabric.** The backing fabric used to produce flexible roll-up reflective signs must be coated on both sides with polyvinyl chloride or other approved material of the same color as the sign face.

**1. Base Fabric.**

**Table 4**  
**Minimum Requirements for Base Fabric**

Item	Requirement
Fiber	1000 Denier polyester
Weight	100 g/m <sup>2</sup> (3 oz./yd <sup>2</sup> )
Fabric Count	10 warp, 10 fill

**2. Coated Fabric.**

**Table 5**  
**Minimum Requirements for Coated Fabric**

Item	Requirement
Total Weight	490 g/m <sup>2</sup> (14.5 oz./yd <sup>2</sup> )
Distribution	60 face, 40 back

- D. Completed Flexible Roll-Up Reflective Sign.** The completed flexible roll-up reflective sign must exhibit a minimum tensile strength of 3.4 N per 25.4 mm width (15 lb. per in. of width) and a minimum elongation of 90%.

Test tensile strength in accordance with ASTM D 828. Test elongation in accordance with ASTM D 987, (Discontinued 1969). Condition the sign face at room temperature 22–27°C (72–80°F) for a minimum of 24 hr. before testing.

**1. Additions to Sign Blank.**

- Four reinforced vinyl tie straps or hook and loop fasteners must be attached to the backside of the sign. Attachment must be on the sign diagonals and 300–355 mm (12–14 in.) from the sign center.
- Tie straps must be 13 mm (1/2 in.) minimum in width and 355 mm (14 in.) minimum in length. Attachment to the sign must be by sewing with a non-wicking, high tensile strength, and mildew-resistant thread. Attachment must be within 13 mm (1/2 in.) of the center of the tie strap. Attachment must be rectangular approximately 25 × 10 mm (1 in. × 3/8 in.) with diagonal stitching.
- Hook side and loop side of the fastener shall be a minimum of 140 × 25 mm (5-1/2 × 1 in.) each. Attachment shall be approximately 25 × 25 mm (1 × 1 in.) with diagonal stitching using a non-wicking, high tensile strength, mildew-resistant thread. Hook side of fastener must face away from the back of the sign. A tie strap or hook and loop fastener must be attached approximately 20 mm (3/4 in.) from a horizontal corner of the sign to secure sign when in the rolled up position for transporting or storing. The tie strap or hook and loop fastener must meet the requirements and be attached as specified. Corner reinforcement must be attached to the backside of the sign at each corner.
- Reinforcements must be made of three triangular 200 × 200 × 280-mm (8 × 8 × 11-in.) pieces of 510-g (18-oz.) nylon-reinforced vinyl double stitched



with stitching approximately 6 mm (1/4 in.) from edges. A pocket for cross braces should be formed in the corner reinforcing by double stitching 25–28 mm (1–1-1/8 in.) along each side of and parallel to the sign diagonals and cutting a slot 45 mm (1-3/4 in.) long into the two outer layers of reinforcing perpendicular to the diagonals and 6 mm (1/4 in.) from the inner double stitch in the corner reinforcing.

- 2. Sign Support Cross Brace Material.** Cross braces must be constructed of glass reinforced resin or other suitable material to provide enough strength for the sign to withstand 65 kmph (40 mph) winds without causing sign material to distort enough to affect legibility of sign. Cross-brace material must be UV stabilized if necessary.
- 3. Sign Support Cross Brace Fabrication.** Cross-brace ends must be rounded to prevent splintering, sharp edges and damage to sign faces. Cross braces must be fastened at centers with a pop rivet. The pop rivet must have rounded heads on both sides a minimum of 13 mm (1/2 in.) in diameter. An aluminum washer must be placed between the two cross braces.

**E. Overlay Panels.** Overlay panels must be constructed of the same materials as the signs.

Attachment to the face of the sign must be accomplished by means of hook and loop fastener system.

- Hook fastener components must be attached to the signs.
- Loop fastener components must be attached to the back of the overlay panel.

Attachment of fastener components must be by means of sewing. A non-wicking, high-tensile strength, mildew-resistant thread must be used.

When overlay panels are required, they must conform to details of drawings attached to the invitation to bid.

**8310.7. Payment.** Payment for all materials and services under this specification will be in conformance with the conditions prescribed in the Contract awarded by the State.

**8310.8. Archived Versions.** Archived versions are available.

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# DMS-8315

## Sign Identification Decals

*Effective Date: December 2014*



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### 1. DESCRIPTION

This Specification governs the materials, composition, quality, sampling, and testing of sign identification decals.

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### 2. UNITS OF MEASUREMENTS

The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

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### 3. SAMPLING AND TESTING

The Department will sample in accordance with Tex-720-I and will test in accordance with the methods listed in Article 5 of this Specification.

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### 4. PERIODIC EVALUATION

The Department reserves the right to conduct random sampling and testing of pre-qualified materials to verify performance and Specification compliance and to perform random audits of documentation. Department representatives may sample material from the manufacturing plant, the project site, and the warehouse.

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### 5. MATERIAL REQUIREMENTS

#### 5.1. Film Characteristics. Measure the film thickness to a minimum of 0.003 in. and a maximum of 0.0045 in.

The film must:

- be flexible,
- conform to contoured surfaces,
- have a minimum 60° gloss value of 35, when tested in accordance with ASTM D 523, and
- not support fungus growth.

For oven and weathering tests, apply film and completed decals to clean, degreased aluminum test panels. After application of the film or decal, but before testing, age and condition test panels for 48 hr. at 70–90°F.

The material must not exhibit more than 1/64-in. shrinkage in any direction from the edge of the test panel when subjected to 140°F for 48 hr. After 1 week at that temperature, material must retain adhesion to the panel.

#### 5.2. Adhesive. The film contains a pre-coat of a pressure-sensitive adhesive, which allows decal positioning, without bonding, to clean surfaces at temperatures up to 100°F. Bonding is to occur only after pressure is applied.

## Departmental Materials Specification

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The adhesive must:

- form a durable bond to surfaces that are smooth, clean, corrosion-free, and weather-resistant;
- be of uniform thickness;
- be non-corrosive to metal surfaces;
- have no staining effect on the film; and
- adhere securely at temperatures from -30–200°F, such that the decal cannot be removed in one piece.

Cover the adhesive side of the film with a pre-scored, treated paper liner. Score the liner approximately in the center. At application time, the liner must be removable without soaking in water or other solvents.

- 5.3. **Finished Decals.** Completed decals must not discolor, crack, craze, blister, delaminate, peel, chalk, or lose adhesion after 1,200 hr. exposure in accordance with ASTM G 155 using Exposure Cycle 1 with a quartz inner filter glass and Type "S" Borosilicate outer filter glass.

After exposure, the ink must not be faded or discolored.

- 5.4. **Decal Design.** The minimum permissible size is 3 in. wide by 4 in. high. The maximum permissible size is 3.75 in. wide by 5 in. high. Mark the decal to display the face design as shown in Table 1. Face marking must not show any deterioration before the design life of the film material. The decal must be free from ragged edges, streaks, blisters, foreign matter, or other surface imperfections.

Table 1  
Decal Design

Texas Department of Transportation												
C	Fabrication Date											T
J	F	M	A	M	J	J	A	S	O	N	D	
	201		202		203		204		205			
	0	1	2	3	4	5	6	7	8	9		
Sheeting MFR - Substrate												
A	B	C	D	E	F	G	H	J	K	L	M	
Film MFR												
A	B	C	D	E	F	G	H	J	K	L	M	
Sheeting MFR - Legend												
A	B	C	D	E	F	G	H	J	K	L	M	
Installation Date												
				0	1	2	3					
	0	1	2	3	4	5	6	7	8	9		
J	F	M	A	M	J	J	A	S	O	N	D	
	201		202		203		204		205			
	0	1	2	3	4	5	6	7	8	9		

## 6. PAYMENT

- 6.1. **Procurement by the State.** Payment for all materials under this Specification will be in conformance with the conditions prescribed in the Contract awarded by the Department.

## Departmental Materials Specification

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- 6.2. **Contracts.** All materials covered by this Specification utilized in the performance of the specified work are subsidiary to the bid item or are paid for in conformance with the bid item in the Contract.

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**7. ARCHIVED VERSIONS**

- 7.1. Archived versions are available.

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# DMS-8600

## Delineators, Object Markers, and Barrier Reflectors

*Effective Date: July 2016*



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### 1. DESCRIPTION

This Specification governs the materials, sampling, and testing of delineators, object markers, and barrier reflectors used on concrete traffic barrier, railing, metal beam guard fence (MBGF), or other locations as shown on the plans.

[DMS-8300](#), "Sign Face Materials," governs the pre-qualification procedure and material requirements for reflective sheeting used on reflector units.

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### 2. MATERIAL PRODUCER LIST

The Materials and Pavements Section of the Construction Division (CST/M&P) maintains the Material Producer List (MPL) of all materials conforming to the requirements of this Specification. Materials appearing on the MPL, entitled "[Barrier Reflectors](#)," require no further sampling and testing before use unless deemed necessary by the Project Engineer or CST/M&P.

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### 3. BIDDERS' AND SUPPLIERS' REQUIREMENTS

The Department will only purchase or allow on projects those products listed by producer and product code or designation shown on the MPL.

Use of pre-qualified product does not relieve the Contractor of the responsibility to provide product that meets this Specification. The Department may inspect or test material at any time and reject any material that does not meet the specifications.

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### 4. PRE-QUALIFICATION PROCEDURE

- 4.1. **Pre-Qualification Request.** Submit **on company letterhead** a request for evaluation under DMS-8600 to [DMS\\_Pregual@txdot.gov](mailto:DMS_Pregual@txdot.gov).

Include the following information in the request:

- company name;
- physical and mailing addresses;
- complete description of the product(s), to include the producer and type of sheeting used;
- contact person, phone number, and email address; and
- test report from an independent laboratory containing test results and certifying compliance of the material with this Specification.

- 4.2. **Pre-Qualification Sample.** Ship 10 units of each product to the Texas Department of Transportation, CST/M&P (CP51), 9500 North Lake Creek Parkway, Austin, TX 78717.

Submit all materials for pre-qualification at no cost to the Department.

- 4.3. **Evaluation.** CST/M&P will notify prospective bidders and suppliers after completion of material evaluation.

## Departmental Materials Specification

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- 4.3.1. **Qualification.** If approved for Department use, CST/M&P will accept materials meeting the requirements of this Specification to the Quality Monitoring Program (QMP) and will add them to the MPL.

Report changes in the composition or in the manufacturing process of any material to CST/M&P. Significant changes reported by the producer, as determined by the Director of CST/M&P, may require a re-evaluation of performance.

The Department reserves the right to conduct whatever tests it deems necessary to identify a pre-qualified material and determine if there is a change in the composition, manufacturing process, or quality that may affect its durability or performance. In case of variance, the Department's tests will govern

- 4.3.2. **Failure.** Producers not qualified under this Specification may not furnish materials for Department projects and must show evidence of correction of all deficiencies before reconsideration for qualification.

The Department normally bears the costs of sampling and testing; however, the producer will bear the costs associated with materials failing to conform to the requirements of this Specification. The Director of CST/M&P will assess this cost at the time of testing, and amounts due will be billed to the producer.

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## 5. QUALITY MONITORING (QM) REQUIREMENTS

- 5.1. **QM Sample.** To maintain QMP approval status, provide an annual QM sample in accordance with Tex-725-I for each product listed on the MPL. Submit samples at least 1 month before approval status expires to allow sufficient time for testing. Not submitting material on time may cause a delay in posting on the MPL. Provide QM sample quantities at no cost to the Department.

- 5.2. **Periodic Evaluation.** The Department reserves the right to conduct random sampling and testing of pre-qualified materials to verify performance and Specification compliance and to perform random audits of documentation. Department representatives may sample material from the manufacturing plant, the project site, and the warehouse. Sampling will be in accordance with Tex-725-I.

Failure of materials to comply with the requirements of this Specification as a result of periodic evaluation may be cause for removal of those materials from the MPL. In case of variance, the Department's tests will govern.

The Department normally bears the costs of sampling and testing; however, the producer will bear the costs associated with materials failing to conform to the requirements of this Specification. The Director of CST/M&P will assess this cost at the time of testing, and amounts due will be billed to the producer.

- 5.3. **Disqualification.** Causes for disqualification and removal from the QMP may include, but are not limited to:

- falsification of documentation,
- material fails to meet or maintain the requirements stated in this Specification,
- producer fails to report any change in material composition or manufacturing process to CST/M&P,
- producer fails to properly submit annual QM samples to CST/M&P, or
- producer has unpaid charges for failing samples.

Disqualification will only apply to the material type corresponding to the infraction.

CST/M&P will remove disqualified producers from the MPL and will not allow submission of material for re-qualification for 1 year, at the discretion of the Department.

- 5.4. **Re-Qualification.** Once the disqualification period established by CST/M&P has elapsed, producers disqualified and removed from the QMP and MPL may begin the re-qualification process by submitting a request in accordance with Section 4.1, including additional documentation identifying the cause of the

problem and corrective action taken. The re-qualification process will then follow all subsequent Sections of Article 4.

The Department normally bears the costs of sampling and testing; however, the disqualified producer will bear the costs associated with re-qualification. The Director of CST/M&P will assess this cost at the time of re-evaluation, and amounts due will be billed to the producer.

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## 6. MATERIAL REQUIREMENTS

### 6.1. General Requirements.

6.1.1. **Delineators.** Reflector units for delineators must be of the color and size specified in the Delineator and Object Marker (D&OM) [Standard Sheets](#). The reflective sheeting must meet the requirements for Type B or Type C reflective sheeting as specified in DMS-8300 and must be listed on the MPL entitled "Sign Face Materials."

6.1.2. **Object Markers.** Reflector units for object markers must be of the color and type specified in the D&OM [Standard Sheets](#). The reflective sheeting used must meet the requirements for Type B or Type C reflective sheeting as specified in DMS-8300 and must be listed on the MPL entitled "Sign Face Materials."

6.1.3. **Barrier Reflectors.** Reflector units for barrier reflectors must use reflective sheeting meeting the requirements for Type B or Type C reflective sheeting as specified in DMS-8300 and must be listed on the MPL entitled "Sign Face Materials."

### 6.2. Construction Requirements.

6.2.1. **Delineators.** Reflector units for delineators consist of one or more individual reflectorized units of reflective sheeting. Directly apply reflector units either to the delineator post or to an aluminum backplate conforming to the requirements of ASTM B 209, alloy 6061-T-6, with a minimum thickness of 0.08 in.

#### 6.2.2. Object Markers.

6.2.2.1. **Types 1, 3, and 4.** Reflector units for Type 1, 3, and 4 object markers consist of one individual reflectorized unit directly applied to an aluminum backplate conforming to the requirements of ASTM B 209, alloy 6061-T-6, with a minimum thickness of 0.08 in.

6.2.2.2. **Type 2.** Reflector units for Type 2 object markers consist of one or more individual reflectorized panels of reflective sheeting. Directly apply reflector units either to the object marker post or to an aluminum backplate conforming to the requirements of ASTM B 209, alloy 6061-T-6, with a minimum thickness of 0.08 in.

6.2.3. **Barrier Reflectors.** Reflector units for barrier reflectors consist of one or more reflectorized panels of conformable reflective sheeting attached to a bracket or approved post to facilitate the mounting of the reflector on concrete traffic barriers, railings, MBGF, or other locations as shown on the plans. Provide barrier reflectors of the type specified in the D&OM [Standard Sheets](#). Barrier reflectors must also meet the following requirements.

6.2.3.1. **Durability.** Weatherometer exposure will be in accordance with ASTM G 155 using Exposure Cycle 1 with a quartz inner filter glass and Type "S" Borosilicate outer filter glass.

Color must show no appreciable change and specific intensity must be a minimum of 80% of the beginning value after 2,000 hours weatherometer exposure.

The sheeting and bracket must show no cracking, crazing, blistering, chalking, or dimensional change after 2,000 hours weatherometer exposure.

## Departmental Materials Specification

DMS-8600

- 6.2.3.2. **Adhesion.** The adhesive must adhere so that the sheeting cannot be peeled or pulled from the surface in pieces greater than 2 sq. in. when applied to clean aluminum panels at 50°F, aged for 36 hours at 140°F, and allowed to cool to room temperature for 12 hours.
- 6.2.3.3. **Stability.** The barrier reflector must pass thermal cyclic testing in accordance with Tex-882-B.

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**7. ARCHIVED VERSIONS**

Archived versions are available.



## DMS - 8620

### FLAGGER STOP/SLOW PADDLES

**EFFECTIVE DATE: AUGUST 2004**

**8620.1. Description.** This Specification governs the materials, composition, quality, sampling, and testing of flagger stop/slow paddles.

**8620.2. Units of Measurements.** The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

**8620.3. Bidders' and Supplier's Requirements.** Before any material is considered, it must be of design and shape that is approved by the Materials and Pavements Section of the Construction Division (CST/M&P).

**8620.4. Sampling and Testing.** A minimum of one unit per lot may be sampled for testing. Unless otherwise noted, the Department will sample at the district warehouse or regional service centers.

The Department normally bears the costs of sampling and testing; however, the producer will bear the costs associated with materials failing to conform to the requirements of this Specification. The Director of CST/M&P will assess this cost at the time of testing.

Amounts due the Department will be deducted from monthly or final estimates on contracts, from partial or final payments on direct purchases by the State, or directly billed to the producer.

#### **8620.5. Material Requirements.**

- A. General Requirements.** Provide paddles meeting all the requirements listed in the *Texas Manual on Uniform Traffic Control Devices* for stop/slow double-sided signs.
- B. Sign Face Size.** Sign face must be a minimum of 610 × 610 mm (24 × 24 in.)
- C. Sign Face Shape.** Sign face must be Federal Highway Administration (FHWA) standard octagonal shape used for stop signs.
- D. Sign Face Color.**
  - “Stop” sign—red field, white letters and border
  - “Slow” sign—orange field, black letters and border
  - All colors must meet color requirement listed in DMS-8300 for Type C sheeting (high-specific intensity).
- E. Sheeting Type.** Sign sheeting must be Type C (high-specific intensity) in accordance with DMS-8300.

**F. Letters.**

- “Stop” sign—203 mm (8 in.) series C
- “Slow” sign—203 mm (8 in.) series B

**G. Staff.** Staff must:

- be designed to telescope from 1372–2388 mm (54–94 in.)
- must include an easy to use, screw-type compression coupling for staff adjustment
- be designed for the bottom or base of the staff to not slip from the pavement and include a short rubber boot attached to the shaft, and
- be designed for easy re-assembly using simple hand tools.

**H. Weight.** Complete unit weight must not exceed 4.5 kg (10 lb.)**I. Sign Faces.** Sign faces must:

- be fabricated from a light, rigid, durable material,
- not warp due to use or outdoor exposure,
- maintain sufficient rigidity during use to be functional, and
- be provided with a durable storage bag designed to protect sign faces when not in use.

**8620.6. Payment.**

**A. Procurement by the State.** Payment for all materials governed by this Specification will be in conformance with provisions of the purchase order awarded by the State.

**B. Contracts.** All materials governed by this Specification utilized by the Contractors must be paid for in conformance with the applicable Contract item.

**8620.7. Archived Versions.** Archived versions are available.

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

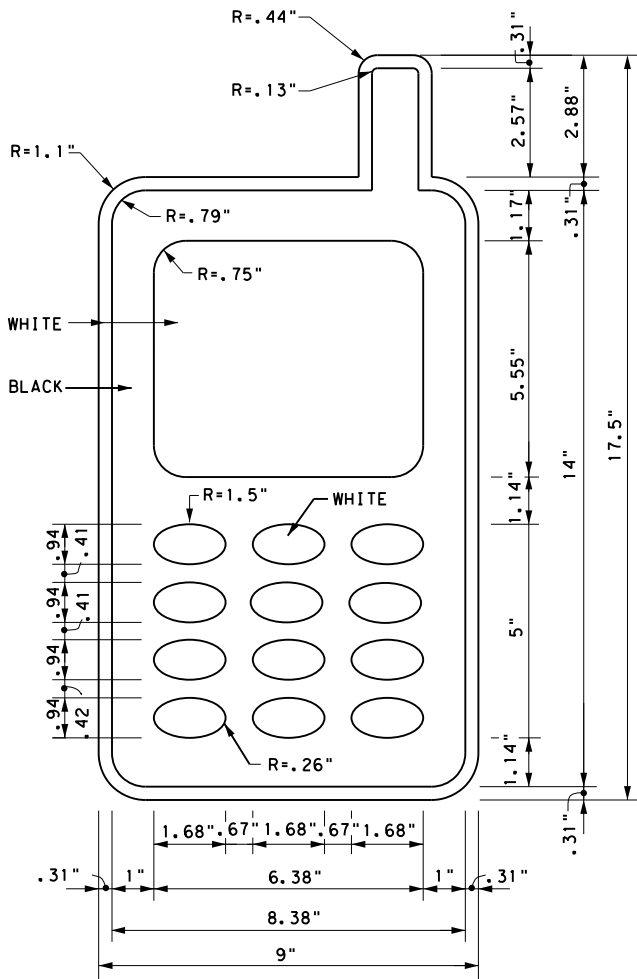
BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

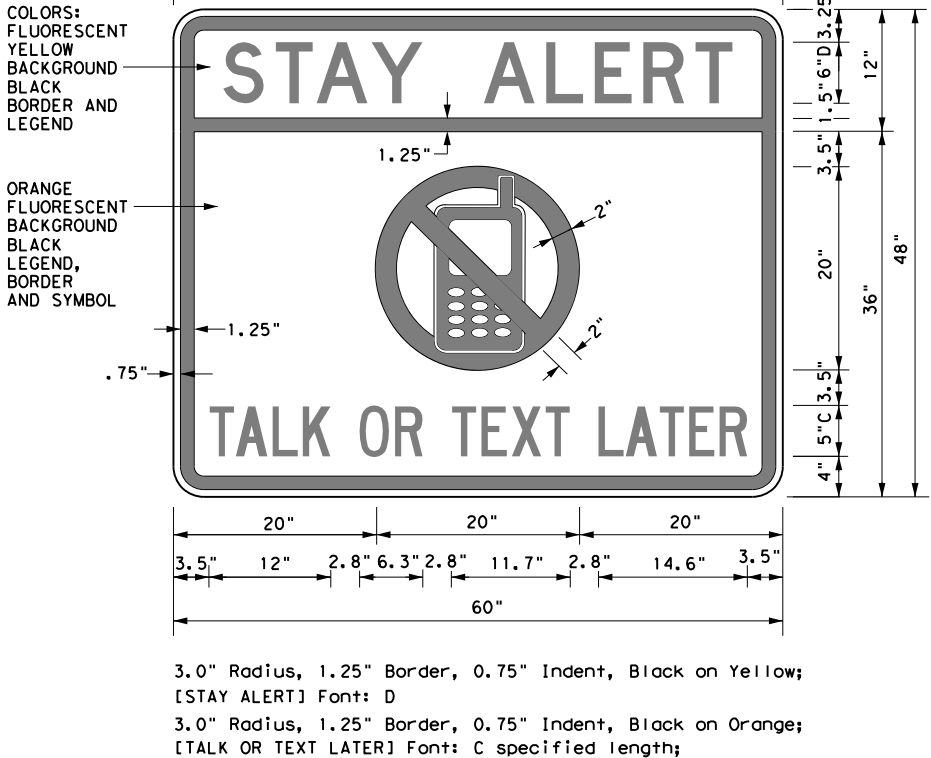
WORKER SAFETY APPAREL NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

Williamson County, Texas



SIGN DETAIL (G20-10T)



Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation  
Traffic Operations Division - TE  
Phone (512) 416-3118

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT  
<http://www.txdot.gov>

COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

SHEET 1 OF 12

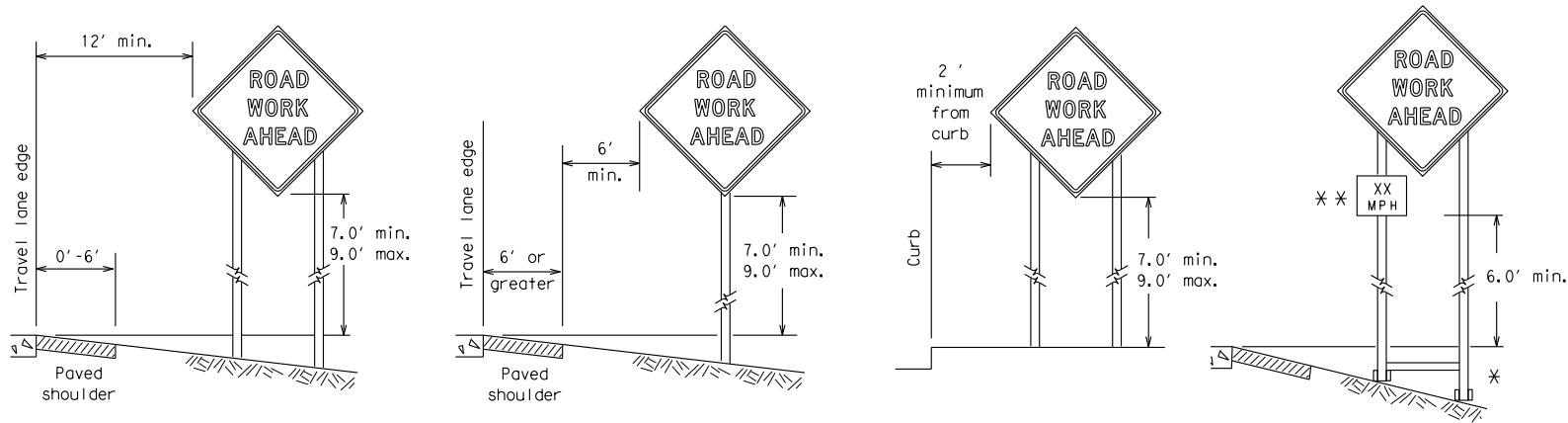


BARRICADE AND CONSTRUCTION  
GENERAL NOTES  
AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
4-03 5-10 8-14				
9-07 7-13				
	DIST	COUNTY		SHEET NO.

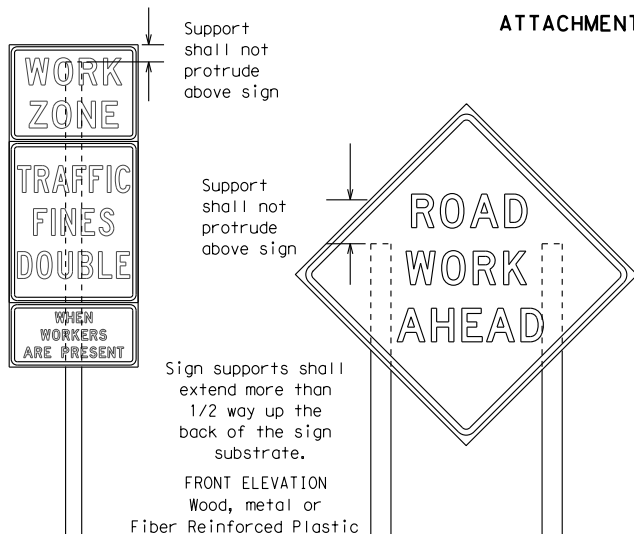
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



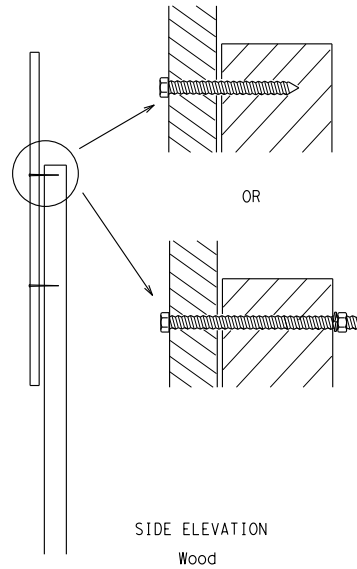
✱ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

✱✱ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

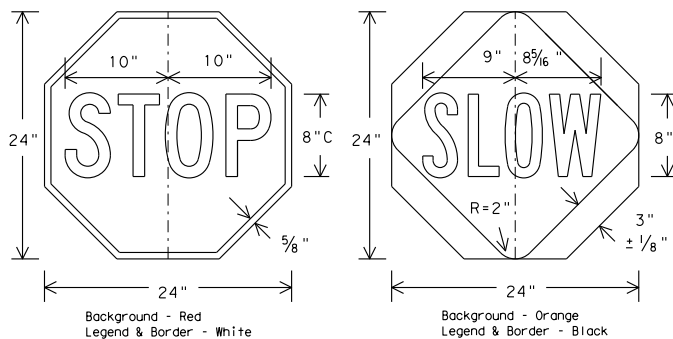


Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the splice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
- When used at night, the STOP/SLOW paddle shall be retroreflectORIZED.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
- The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
- The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
- The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
- The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

- The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
  - Long-term stationary - work that occupies a location more than 3 days.
  - Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
  - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
  - Short, duration - work that occupies a location up to 1 hour.
  - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
- The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
- Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

- The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

- The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

- All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- Orange sheeting, meeting the requirements of DMS-8300 Type B<sub>FL</sub> or Type C<sub>FL</sub>, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

- All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
- Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
- When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
- Burlap shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
- Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
- Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
- Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

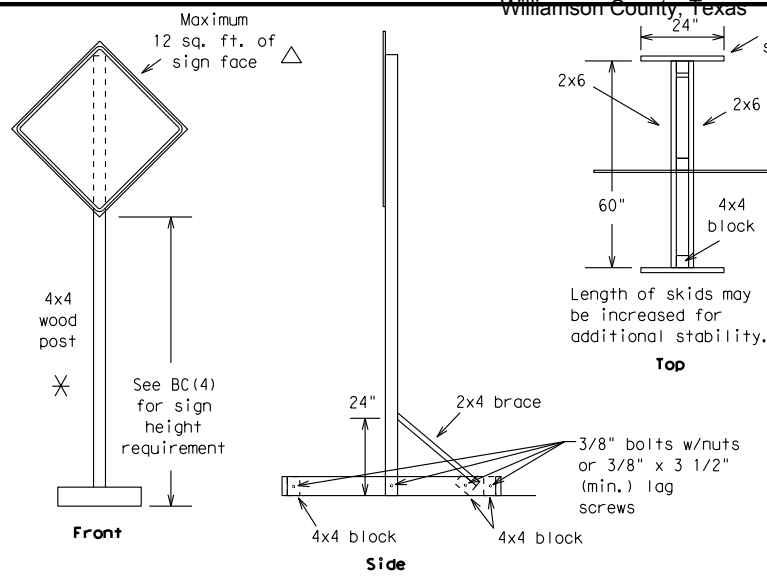
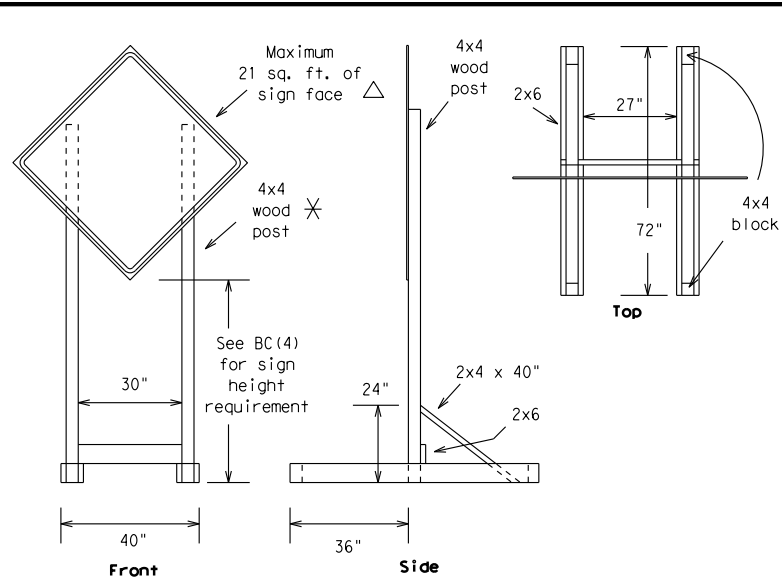
FLAGS ON SIGNS

- Flags may be used to draw attention to warning signs. When used the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

SHEET 4 OF 12

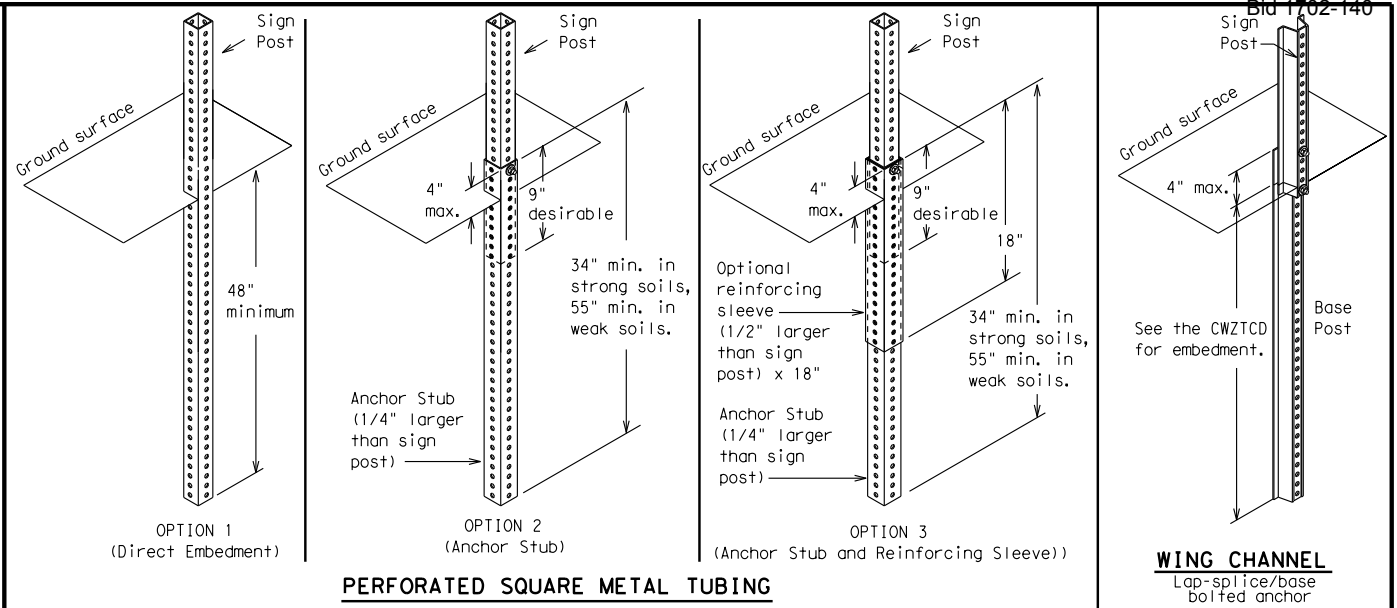
		Traffic Operations Division Standard	
<b>BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES</b>			
<b>BC (4) - 14</b>			
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© TxDOT November 2002	CONT	SECT	JOB
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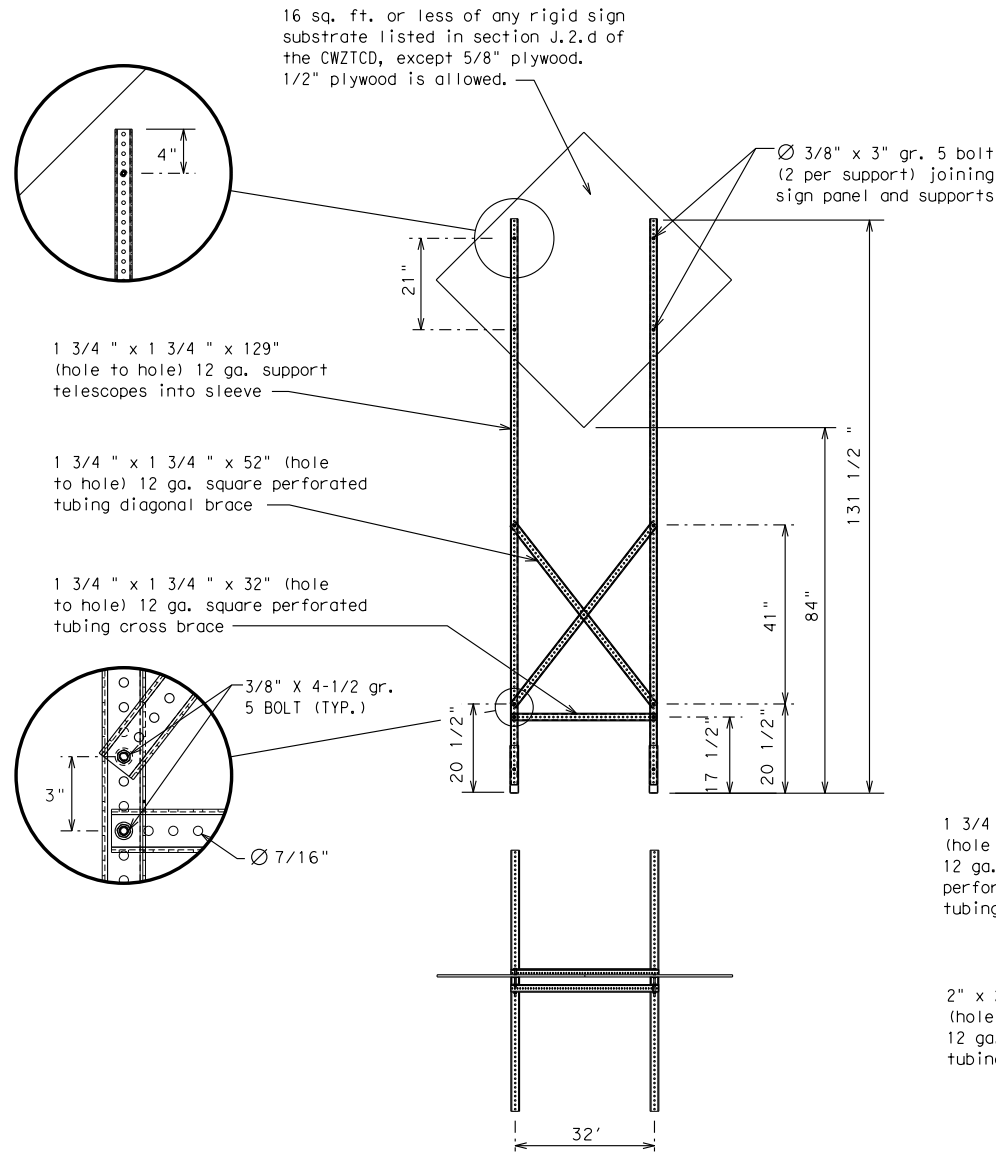
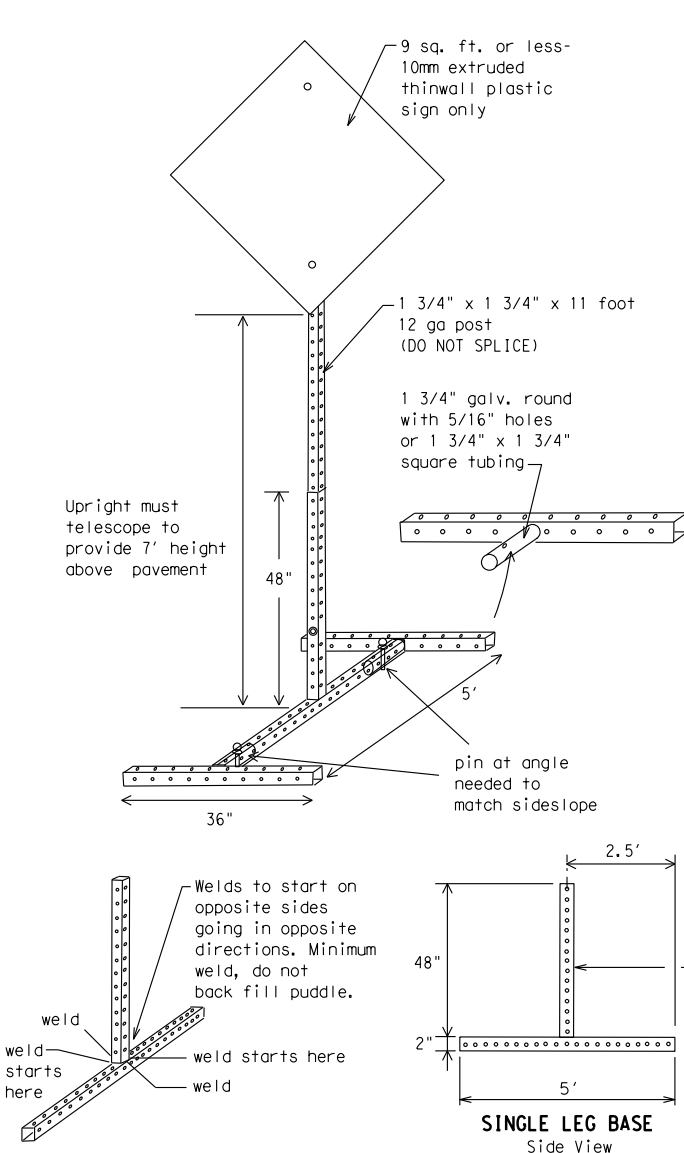
## SKID MOUNTED WOOD SIGN SUPPORTS

LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS  $\square$



## GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support. The maximum sign square footage shall adhere to the manufacturer's recommendation. Two post installations can be used for larger signs.



1 1/2" Dia. (typ)

4"

6"

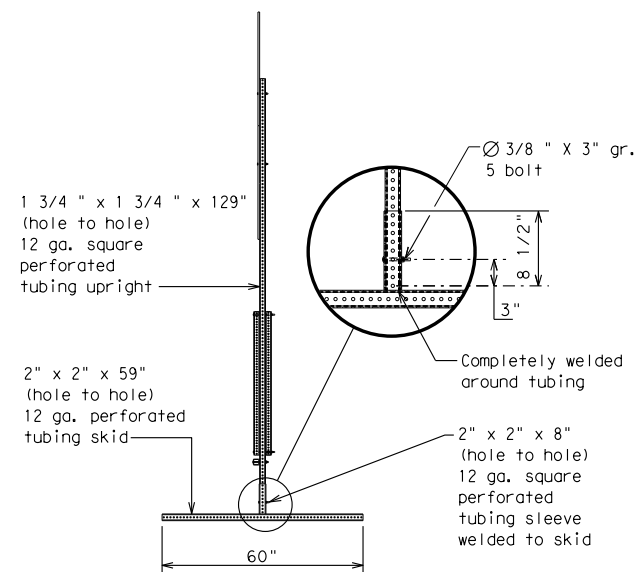
18"

4"

Direction of Traffic

Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

## WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



## WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

## OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

## GENERAL NOTES

- Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
- No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
- When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

- ☐ See BC(4) for definition of "Work Duration."
- $\times$  Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- $\triangle$  See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



## BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 14

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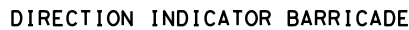
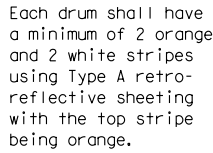
1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

Pre-qualified plastic drums shall meet the following requirements:

1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

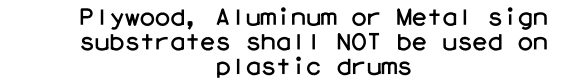
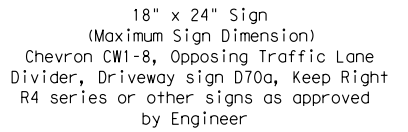
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.



1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B<sub>FL</sub> or Type C<sub>FL</sub> Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



1. 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.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



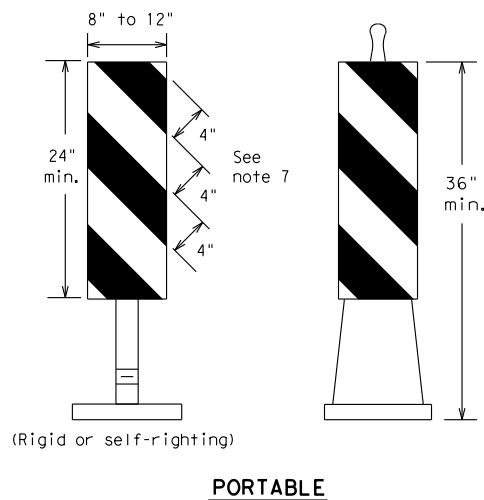
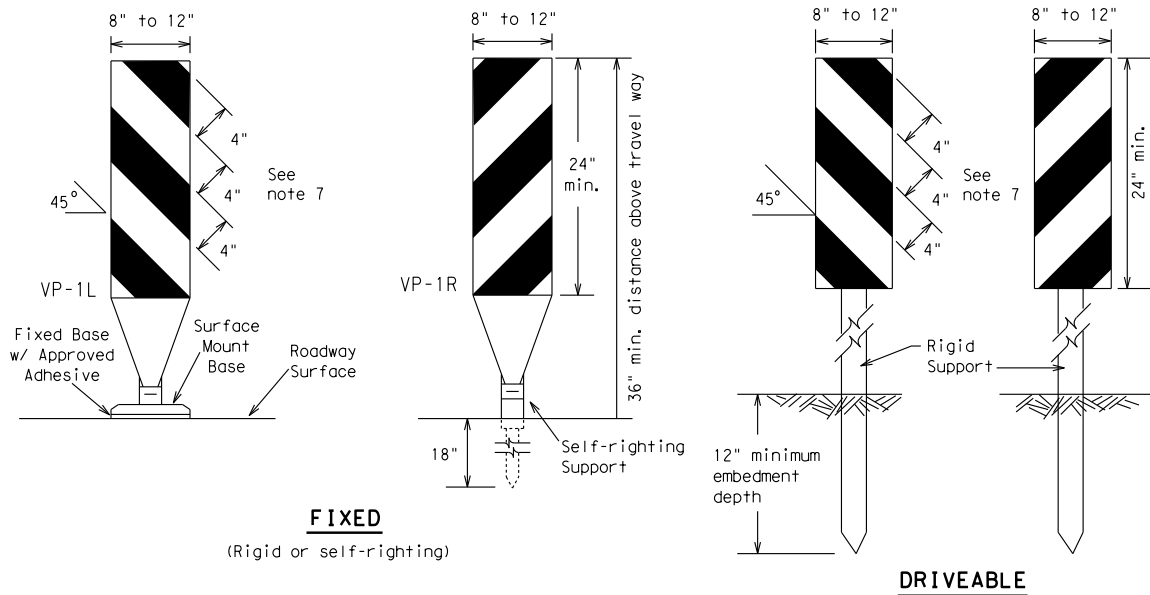
1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B<sub>FL</sub> or Type C<sub>FL</sub> Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

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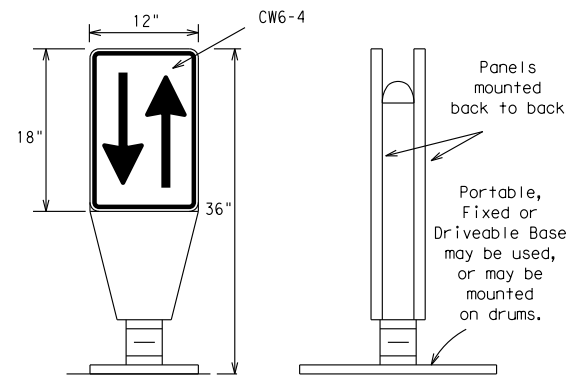


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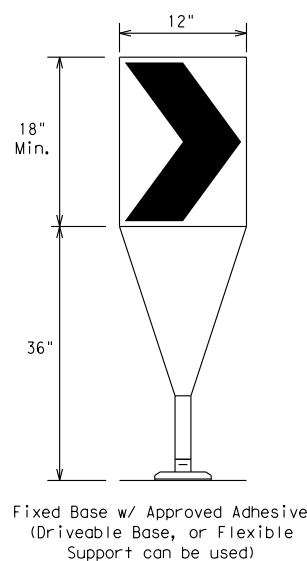
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

## VERTICAL PANELS (VPs)



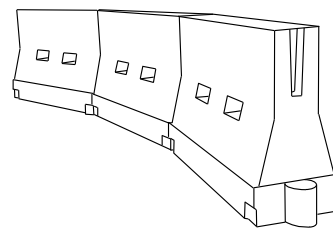
1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPS.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPS placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B<sub>FL</sub> or Type C<sub>FL</sub> conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

## OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B<sub>FL</sub> or Type C<sub>FL</sub> conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

**CHEVRONS**



## LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10) placed near the top of the LCD along the full length of the device.

## WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

### HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

## GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

Posted Speed X	Formula	Minimum Desirable Taper Lengths X X			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

\*\*Taper lengths have been rounded off.  
 L=Length of Taper (FT.) W=Width of Offset (FT.)  
 S=Posted Speed (MPH)

### SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



## BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 14

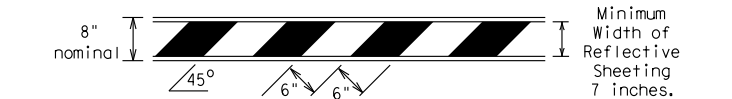
FILE:	bc-14.dgn	DN: TxDOT	Ck: TxDOT	DW: TxDOT	Ck: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS					
9-07		DIST	COUNTY	SHEET NO.	
8-14					
7-13					

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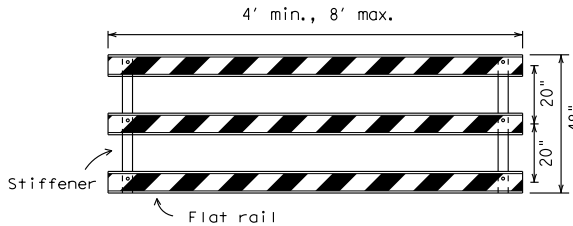
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

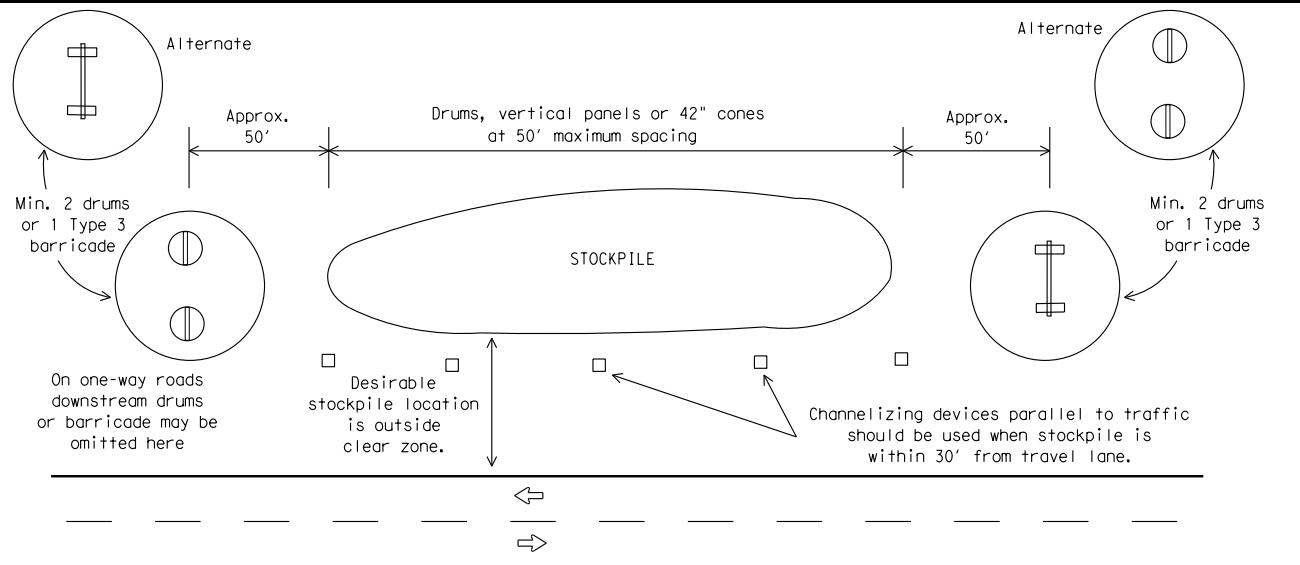


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

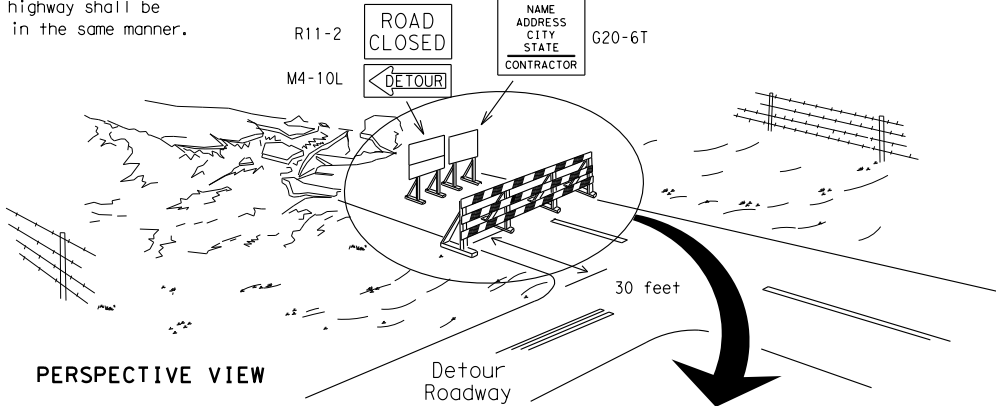
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Williamson County, Texas

Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

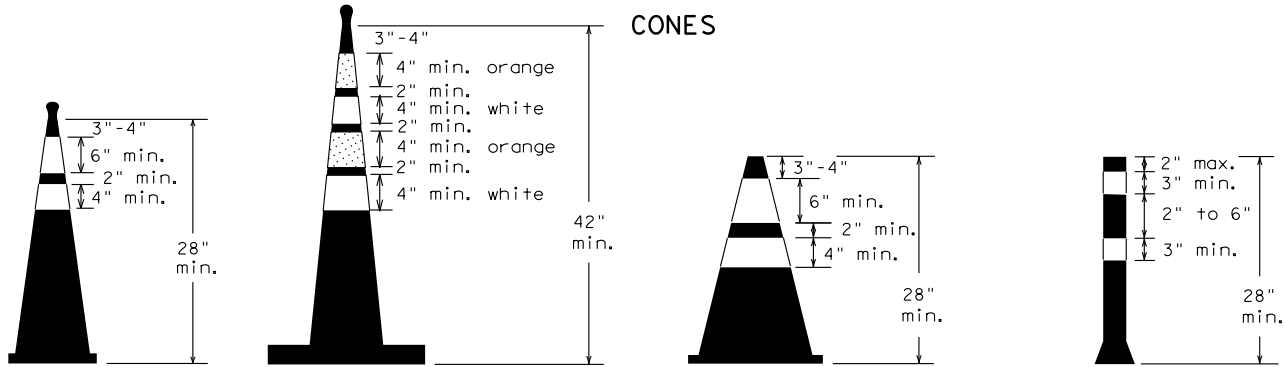
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

Barricade striping should slant downward in the direction of detour.

1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



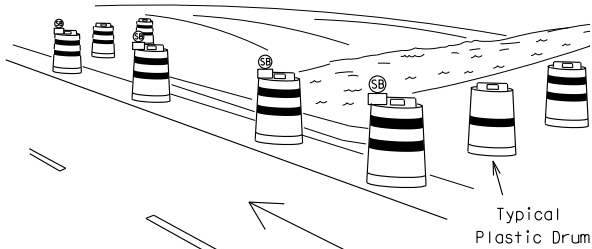
Two-Piece cones

One-Piece cones

Tubular Marker

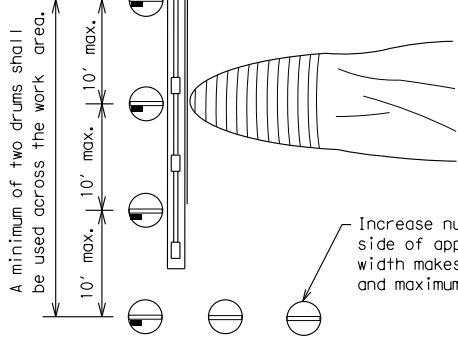
28" Cones shall have a minimum weight of 9 1/2 lbs.  
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



PERSPECTIVE VIEW

These drums are not required on one-way roadway



PLAN VIEW

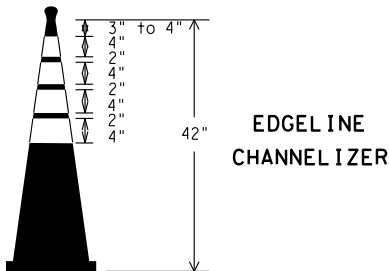
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

1. Where positive redirection capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.

LEGEND

	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
	Steady burn warning light or yellow warning reflector


THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

SHEET 10 OF 12

 <b>Texas Department of Transportation</b>				<b>Traffic Operations Division Standard</b>			
<b>BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES</b>							
<b>BC (10) - 14</b>							
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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

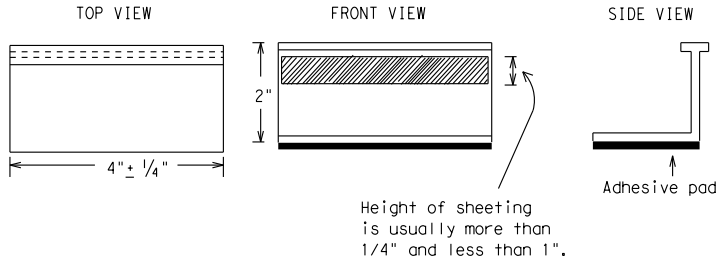
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective  
Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE  
TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER  
TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
  - A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
  - B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS


1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:  
YELLOW - (two amber reflective surfaces with yellow body).  
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

SHEET 11 OF 12



Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC (11) - 14

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11-02 8-14				

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## SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

### Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))  
TWT = Thin-Walled Tubing (see SMD(TWT))  
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))  
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

### Number of Posts (1 or 2)

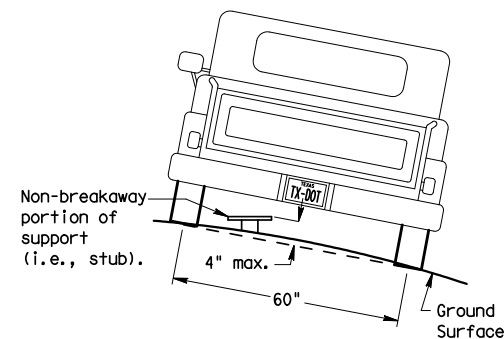
### Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))  
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))  
WS = Wedge Anchor Steel - (see SMD(TWT))  
WP = Wedge Anchor Plastic (see SMD(TWT))  
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))  
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

### Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))  
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))  
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))  
IF REQUIRED  
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))  
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))  
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))  
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

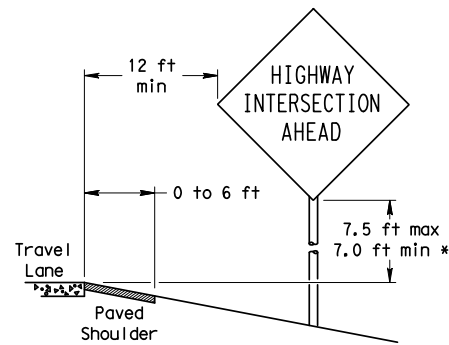
## REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

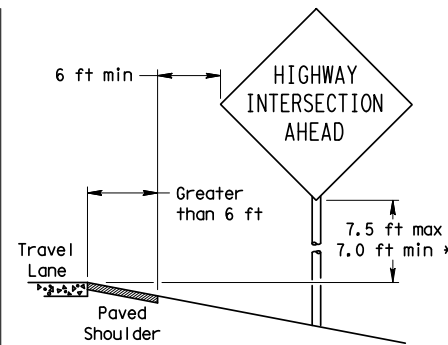
## SIGN LOCATION

### PAVED SHOULDERS



#### LESS THAN 6 FT. WIDE

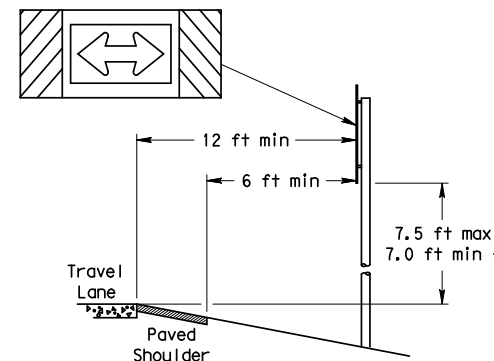
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



#### GREATER THAN 6 FT. WIDE

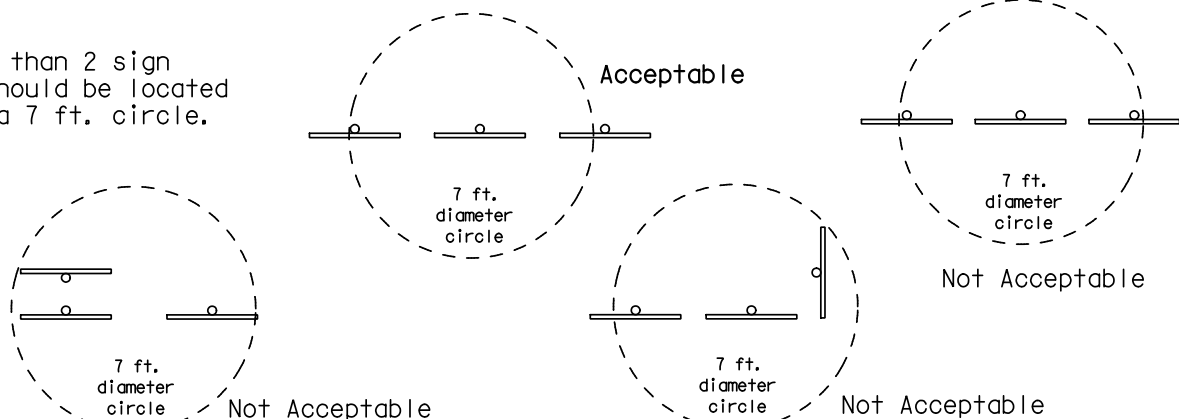
When the shoulder is greater than 6 ft. in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

### T-INTERSECTION

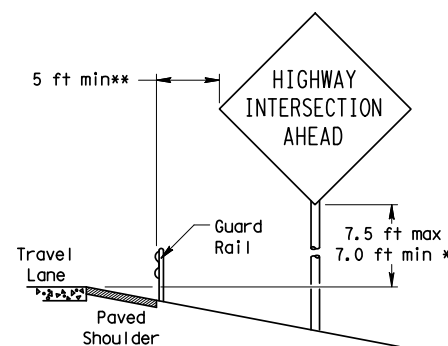


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

No more than 2 sign posts should be located within a 7 ft. circle.

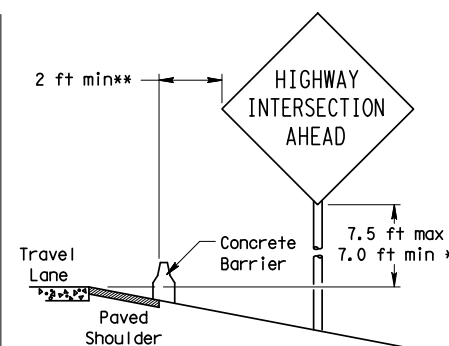


### BEHIND BARRIER



#### BEHIND GUARDRAIL

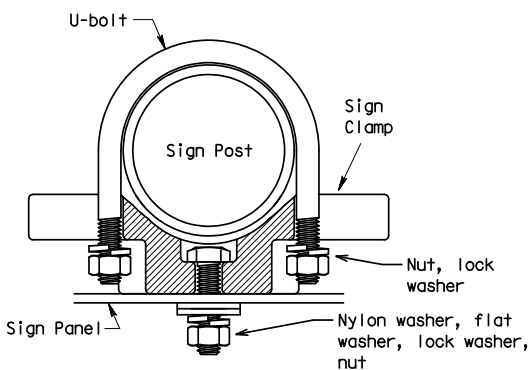
\*\*Sign clearance based on distance required for proper guard rail or concrete barrier performance.



#### BEHIND CONCRETE BARRIER

## TYPICAL SIGN ATTACHMENT DETAIL

### Single Signs

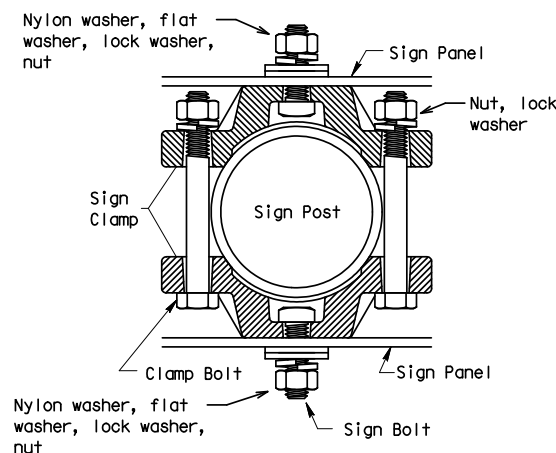


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

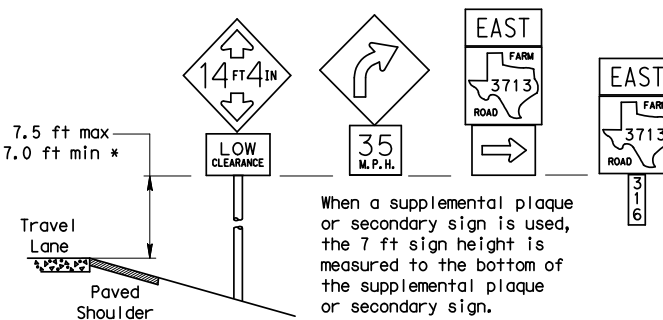
Sign clamps may be either the specific size clamp or the universal clamp.

### Back-to-Back Signs



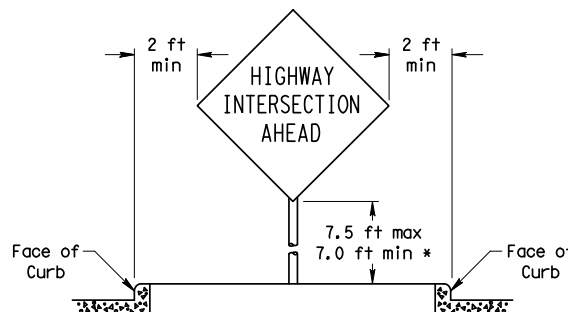
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

## SIGNS WITH PLAQUES

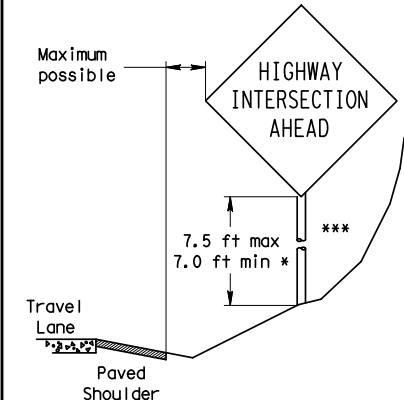


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

### CURB & GUTTER OR RAISED ISLAND



## RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

\*\*\* Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.



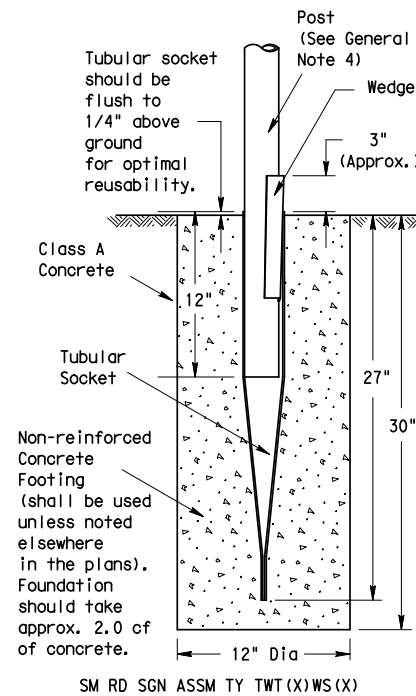
## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD (GEN) -08

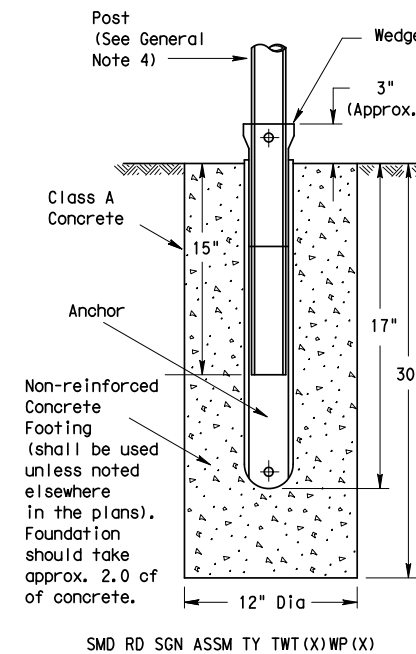
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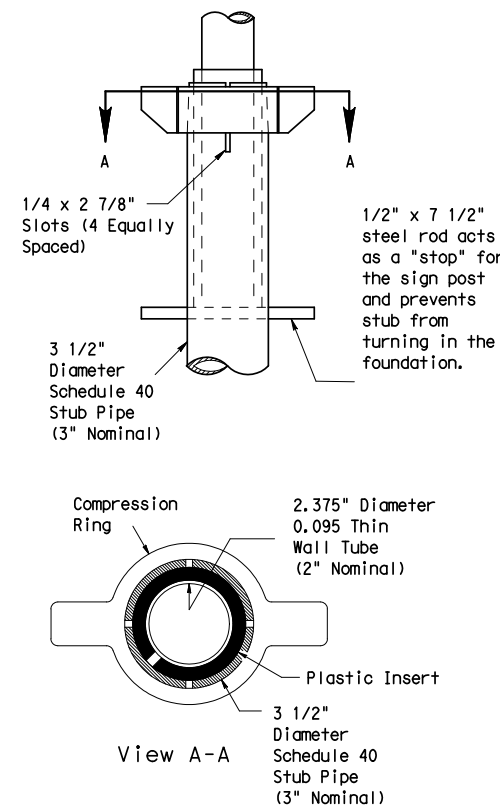
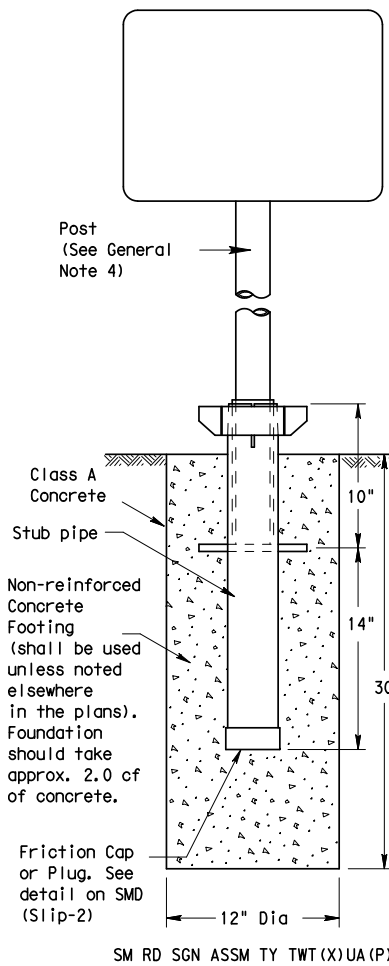
## Wedge Anchor Steel System



## Wedge Anchor High Density Polyethylene (HDPE) System

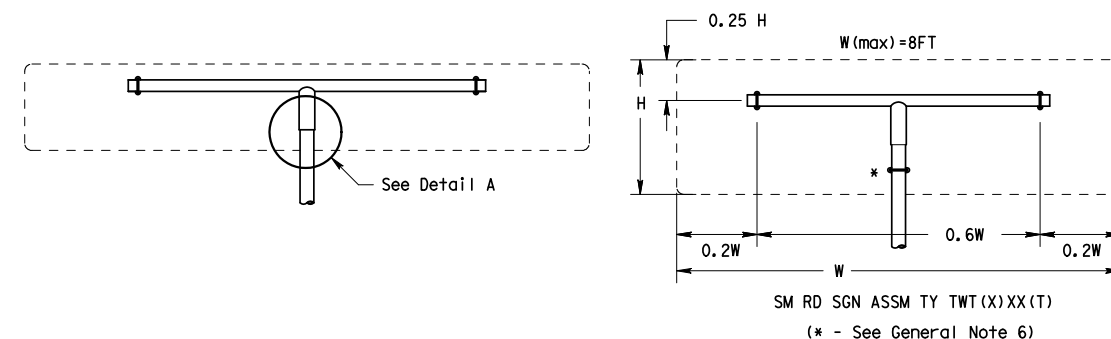


## Universal Anchor System with Thin-Walled Tubing Post



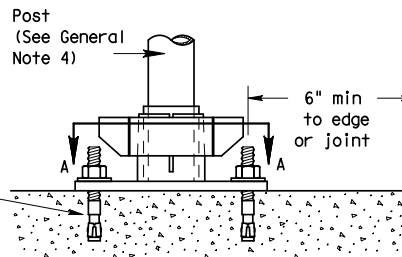
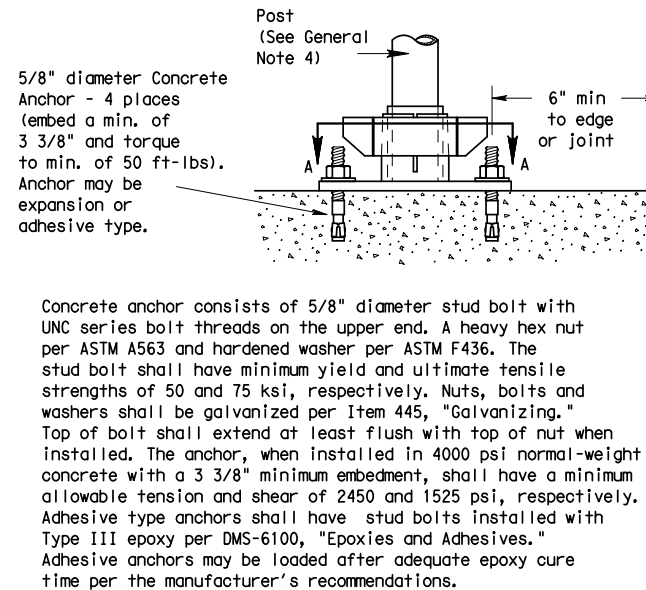
Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

## Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post

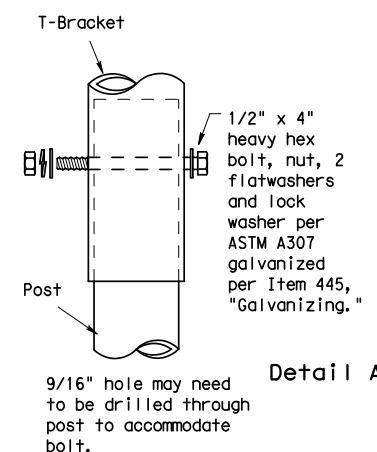
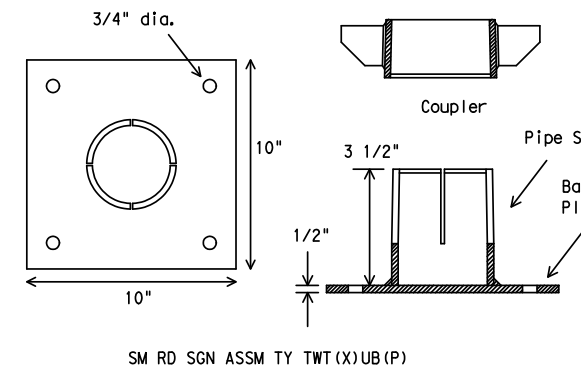


### NOTE

The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxy and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



### Detail A

### GENERAL NOTES:

- The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
- The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
- Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: [http://www.txdot.gov/business/producer\\_list.htm](http://www.txdot.gov/business/producer_list.htm)
- Material used as post with this system shall conform to the following specifications:
  - 13 BWG Tubing (2.375" outside diameter) (TWT)
  - 0.095" nominal wall thickness
  - Seamless or electric-resistance welded steel tubing
  - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
  - Other steels may be used if they meet the following:
    - 55,000 PSI minimum yield strength
    - 70,000 PSI minimum tensile strength
    - 18% minimum elongation in 2"
  - Wall thickness (uncoated) shall be within the range of .083" to .099"
  - Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
  - Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
- Sign blanks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: <http://www.txdot.gov/publications/traffic.htm>

### WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
- Insert tubular socket into concrete until top of socket is approximately 1/4" above the concrete footing.
- Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
- Attach the sign to the sign post.
- Insert the sign post into socket and align sign face with roadway.
- Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

### UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- Insert base post in hole to depths shown and backfill hole with concrete.
- Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
- Attach the sign to the sign post.
- Install plastic insert around bottom of post.
- Insert sign post into base post. Lower until the post comes to rest on steel rod.
- Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
- Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.



## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST SMD(TWT)-08

© TxDOT July 2002		Revised	By	Checked	Approved
9-08	REVISIONS	DATE	BY	CHKD	APPROVED
		07/01/02	JUB		
		07/01/02	JUB		

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. [http://www.txdot.gov/business/producer\\_list.htm](http://www.txdot.gov/business/producer_list.htm) The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer, method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
  - 10 BWG Tubing (2.875" outside diameter)
    - 0.134" nominal wall thickness
    - Seamless or electric-resistance welded steel tubing or pipe
    - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
    - Other steels may be used if they meet the following:
      - 55,000 PSI minimum yield strength
      - 70,000 PSI minimum tensile strength
      - 20% minimum elongation in 2"
    - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
    - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
    - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
  - Schedule 80 Pipe (2.875" outside diameter)
    - 0.276" nominal wall thickness
    - Steel tubing per ASTM A500 Gr C
    - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
      - 46,000 PSI minimum yield strength
      - 62,000 PSI minimum tensile strength
      - 21% minimum elongation in 2"
    - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
    - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
    - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is:  
<http://www.txdot.gov/publications/traffic.htm>
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

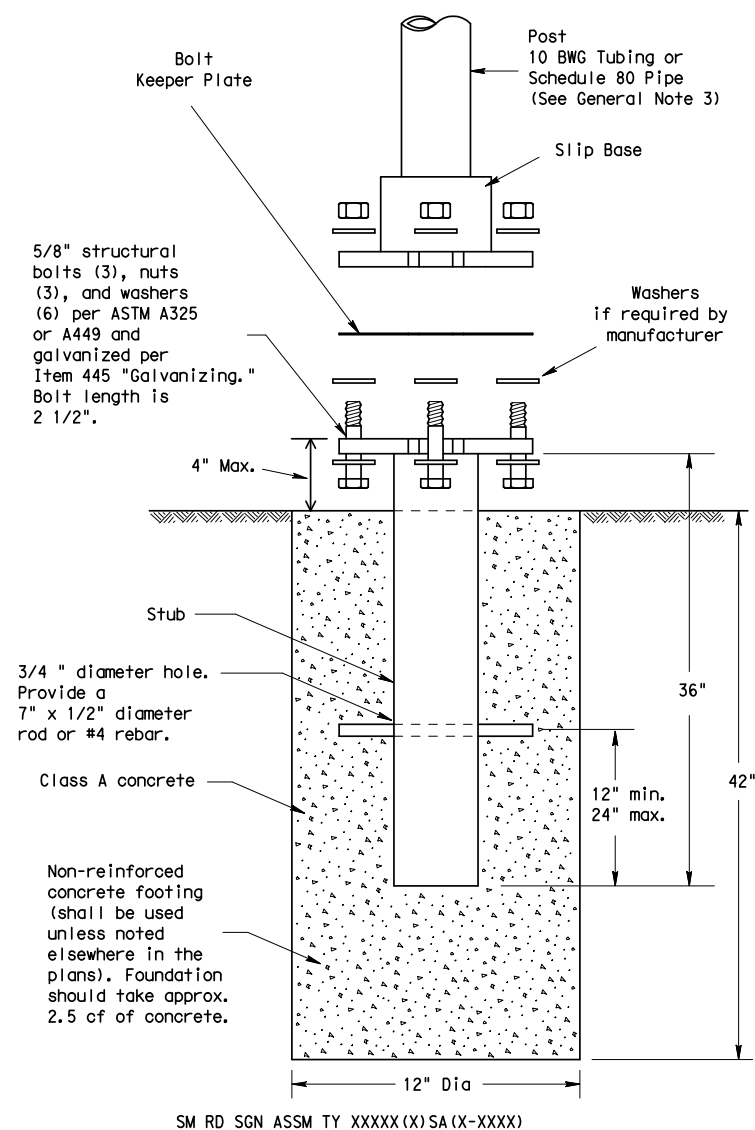
## ASSEMBLY PROCEDURE

## Foundation

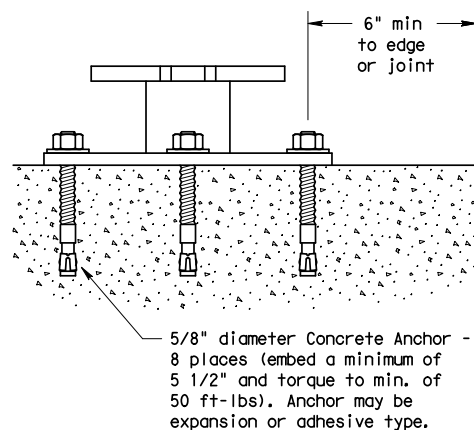
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

## Support

1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD (SLIP-2) for clearances based on sign types.



CONCRETE ANCHOR



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end, Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxyes and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.



# SIGN MOUNTING DETAILS

## SMALL ROADSIDE SIGNS

### TRIANGULAR SLIPBASE SYSTEM

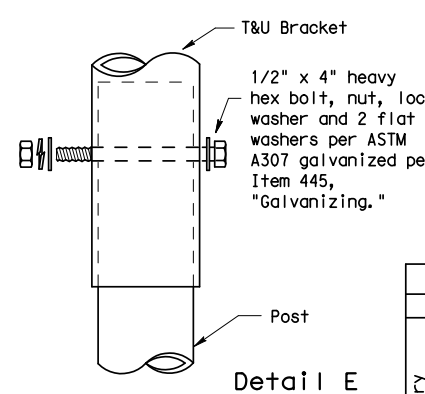
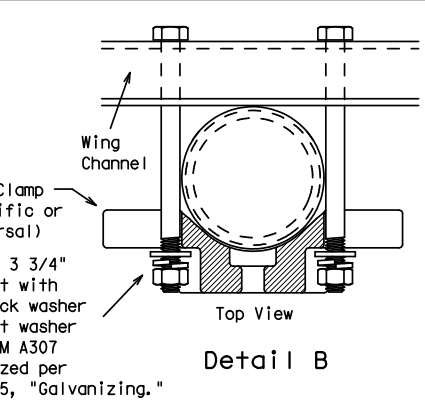
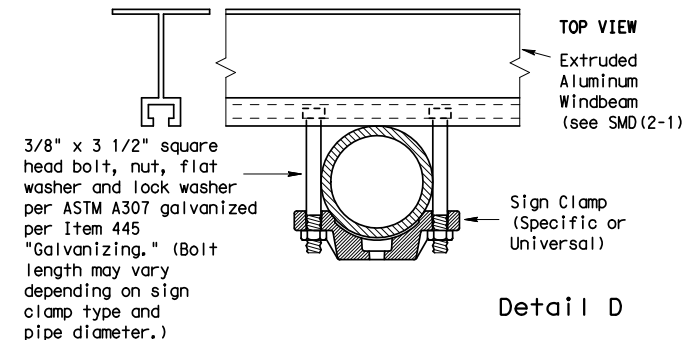
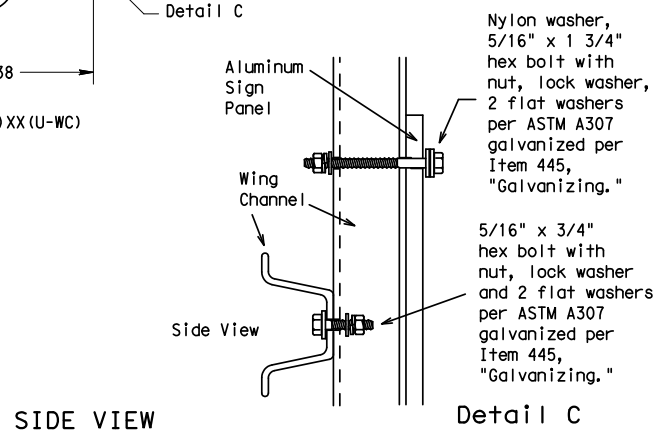
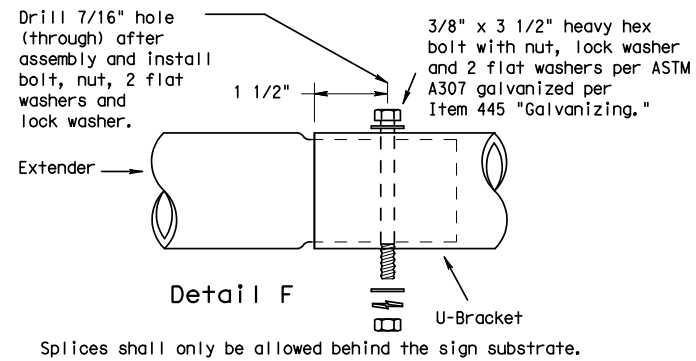
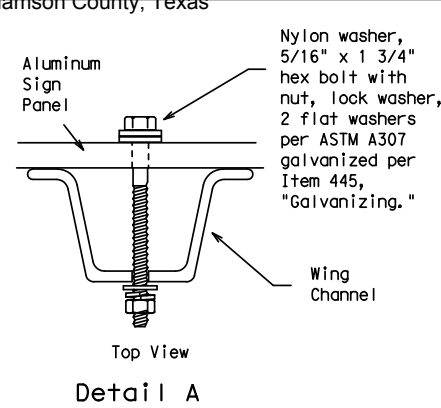
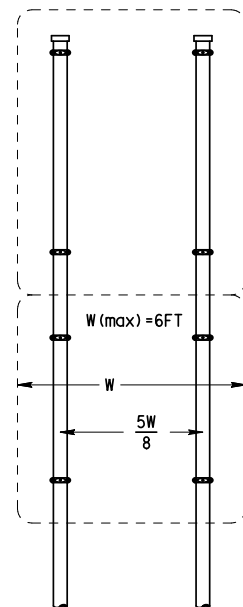
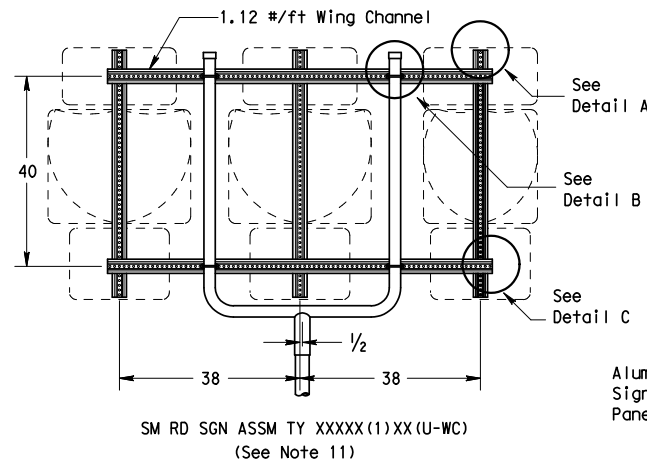
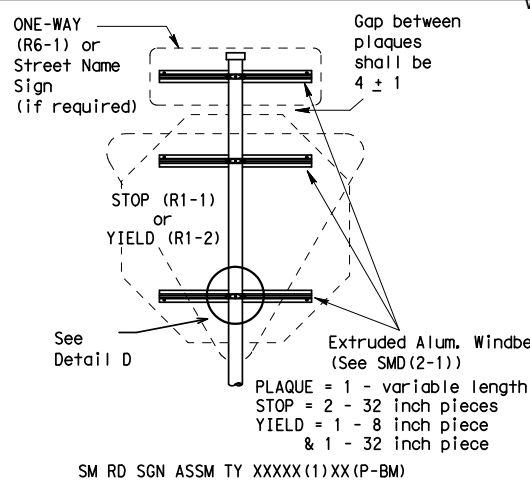
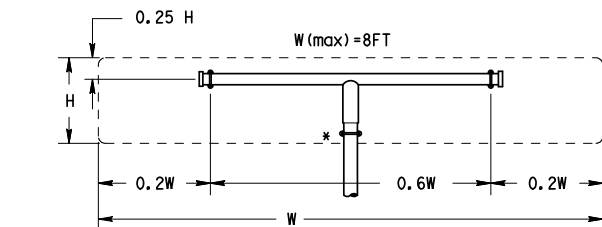
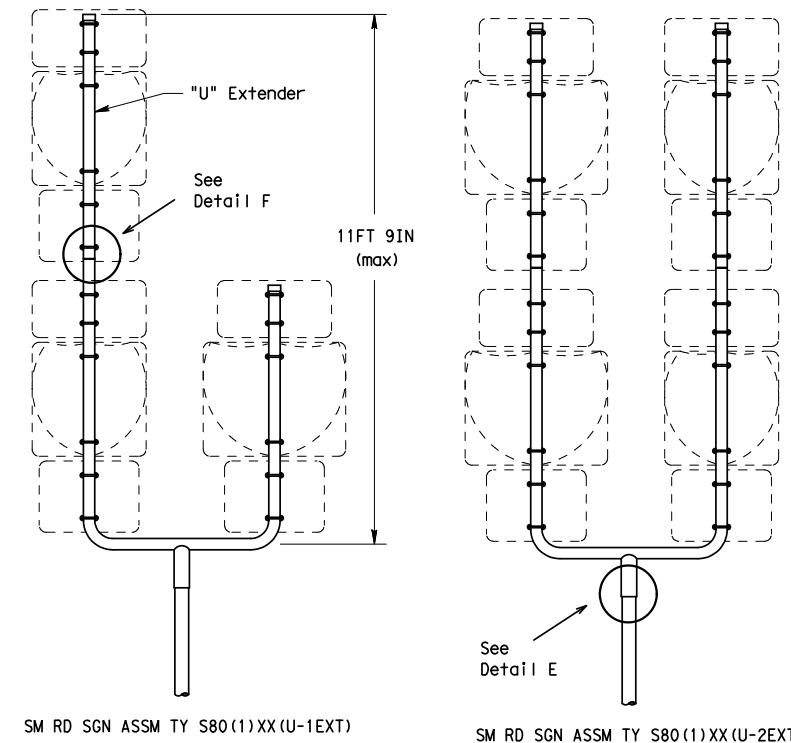
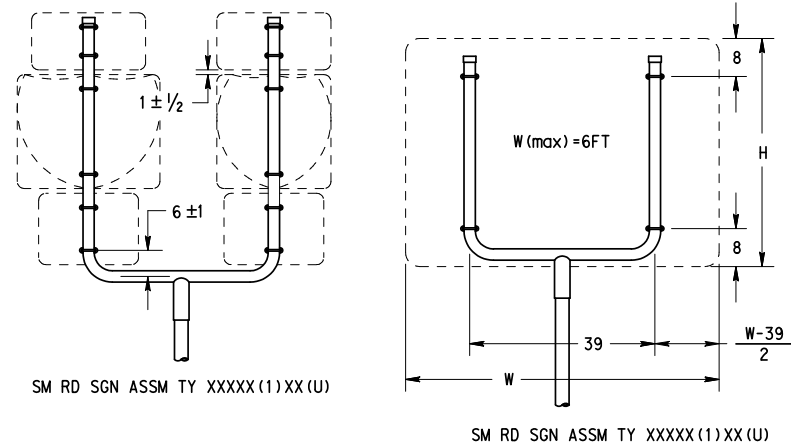
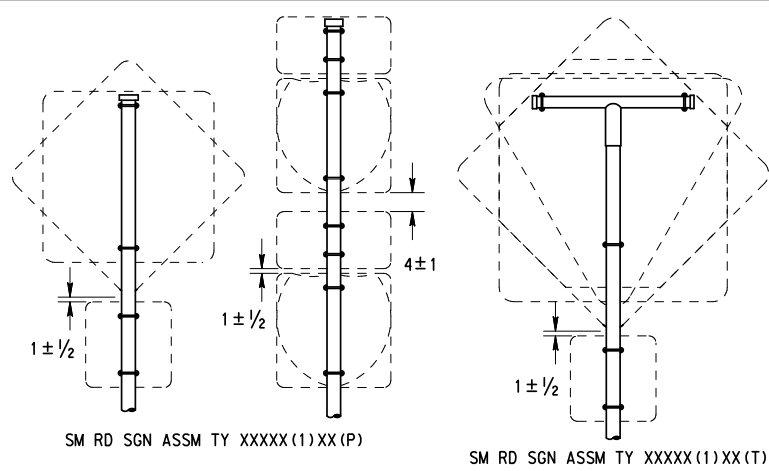
SMD (SLIP-1) -08

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		DATE	DRAWN BY		SHEET NO.
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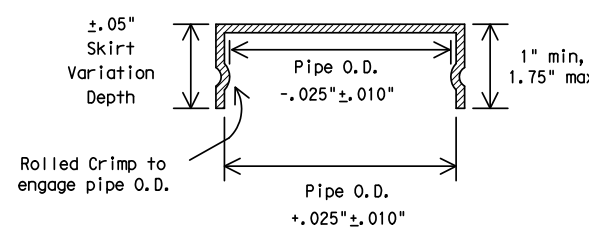
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FRICION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1. SIGN SUPPORT # OF POSTS MAX. SIGN AREA  
10 BWG 1 16 SF  
10 BWG 2 32 SF  
Sch 80 1 32 SF  
Sch 80 2 64 SF
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT		
SIGN DESCRIPTION		SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

SIGN MOUNTING DETAILS  
SMALL ROADSIDE SIGNS  
TRIANGULAR SLIPBASE SYSTEM  
SMD(SLIP-2)-08

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GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

- The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
- When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
- Sign blanks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
- Post open ends shall be fitted with Friction Caps.

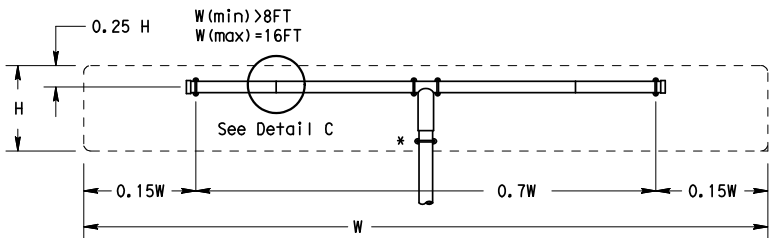
REQUIRED SUPPORT

	SIGN DESCRIPTION		SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)	
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)	
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)	
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)	
	48x60-inch signs	TY S80(1)XX(T)	
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)	
	48x60-inch signs	TY S80(1)XX(T)	
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)	
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)	
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)	

Texas Department of Transportation  
Traffic Operations Division

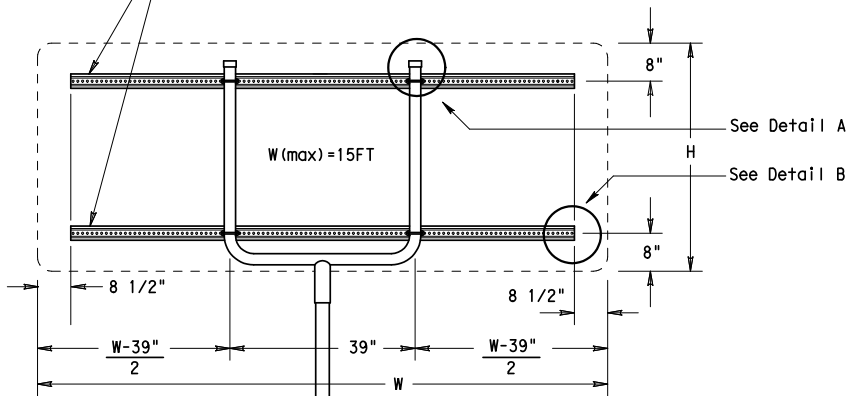
SIGN MOUNTING DETAILS  
SMALL ROADSIDE SIGNS  
TRIANGULAR SLIPBASE SYSTEM  
SMD (SLIP-3) -08

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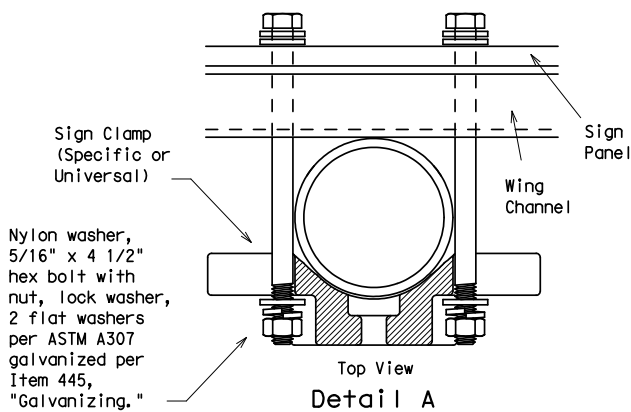


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)  
(\* - See Note 12)

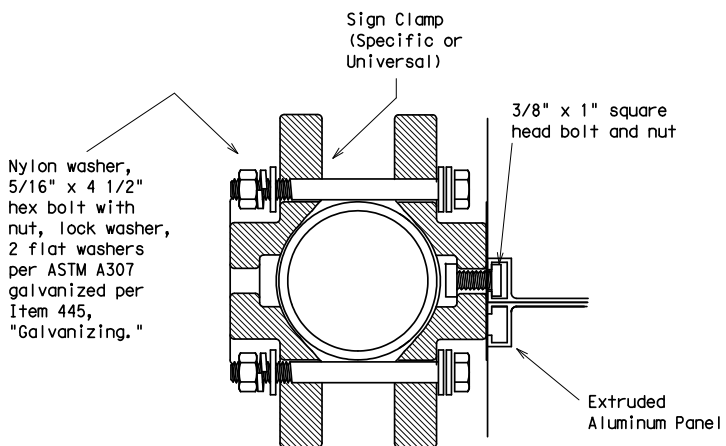
Extruded Alum. Windbeam (See Detail D on SMD (SLIP-2))  
or 1.12 #/ft Wing Channel (See Detail A and Detail B)



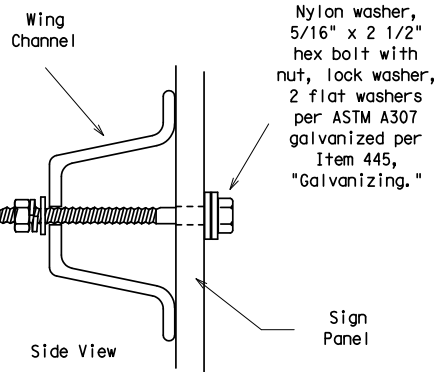
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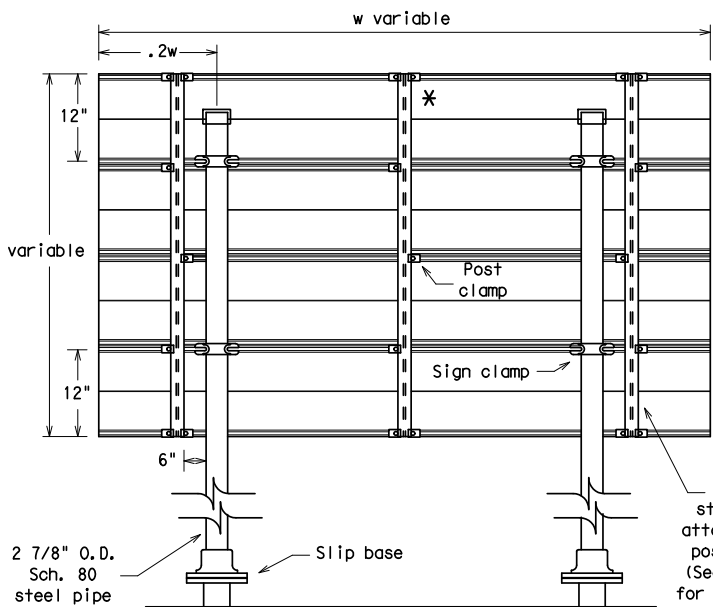
Top View  
Detail A



Detail D  
EXTRUDED ALUMINUM SIGN WITH T BRACKET

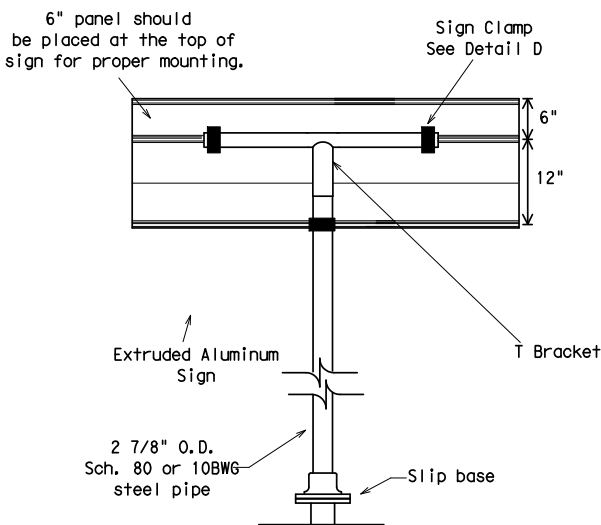


Side View  
Detail B

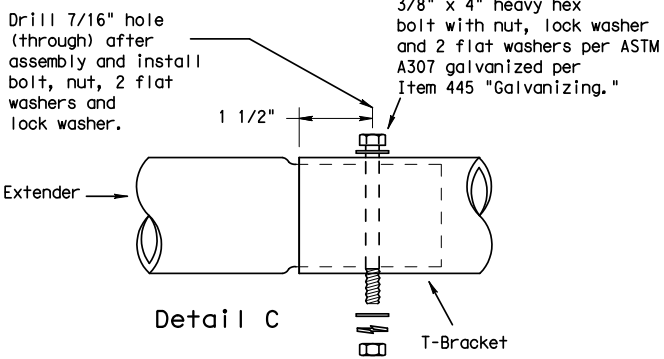


Typical Sign Mount  
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

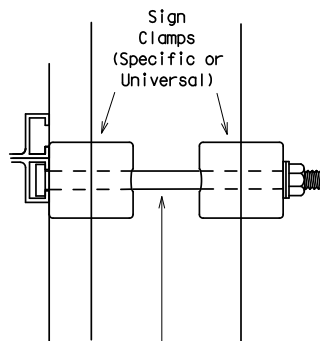
\* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



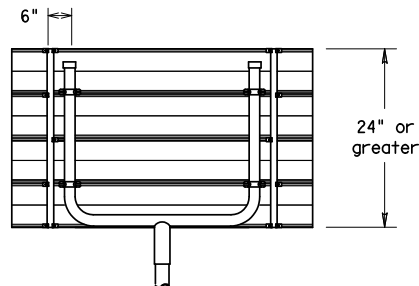
Extruded Aluminum Sign  
With T Bracket



Splices shall only be allowed behind the sign substrate.



Detail E



Use Extruded Alum. Windbeam as stiffeners  
See SMD (2-1) for additional details  
See Detail E for clamp installation

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REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS					DELINEATORS				D & OM DESCRIPTIVE CODES										
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	DEVICE	SINGLE		DOUBLE		INSTL DEL ASSM (D-XX)SZ X (XXX)XXX(XX)									
										<div>NUMBER OF REFLECTORS S = Single D = Double</div> <div>COLOR OF REFLECTORS W = White Y = Yellow R = Red</div> <div>REFLECTOR UNIT SIZE 1 or 2</div> <div>TYPE OF POST OR DELINEATOR WC = Wing Channel Post FLX = Flexible Post BRF = Barrier Reflector</div> <div>TYPE OF MOUNT GND = Embedded (drivable or set in concrete) CTB = Concrete Barrier Mount GF1 or GF2 = Guard Fence Attachment SRF = Surface Mount</div> <div>DIRECTION If Required BI = Bi-Directional BR = Bi-Directional with red on back</div>									
SHEETING Yellow, White or Red Type B or C reflective sheeting					SHEETING	Yellow, White or Red Type B or C Reflective Sheeting				INSTL OM ASSM (OM-XX) (XXX)XXX(XX)									
NOTE 1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.					POST TYPE	WC	FLX	WC	FLX	<div>TYPE OF OBJECT MARKER 1, 2, 3, or 4</div> <div>NUMBER OF REFLECTORS OR DIRECTION X = 3-Size 2 reflector units (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only) L = Left Side (Type 3 Object Marker only) R = Right Side (Type 3 Object Marker only) C = Center (Type 3 Object Marker only)</div> <div>TYPE OF POST WC = Wing Channel Post FLX = Flexible Post TWT = Thin Walled Tubing</div> <div>TYPE OF MOUNT GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic</div> <div>DIRECTION If Required BI = Bi-Directional</div>									
					MOUNT TYPE	GND	GND, SRF	GND	GND, SRF										
OBJECT MARKERS																			
DEVICE	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)											
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4											
								3-Size 2 reflector units			1-Size 3 reflector unit			3-Size 1 reflector units or 1-Size 4 reflector unit					
	Yellow-Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting							Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective yellow - Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting			Red -Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting					
	TWT							WC	WC	FLX	TWT			TWT					
	WAS, WAP							GND	GND	GND, SRF	WAS, WAP			WAS, WAP					
BARRIER REFLECTORS (BRF)				CHEVRONS				ONE DIRECTION LARGE ARROW				NOTE: Delineator and object marker backplates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.							
DEVICE	GF1	GF2	CTB	DEVICE					DEVICE										
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.				W1-8					W1-6									
	SIZE (W x L)				18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)		SIZE (W x L)						48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)		
	MOUNTING HEIGHT				4'-0" or 7'-0"		7'-0" Only			MOUNTING HEIGHT						7'-0"			
SHEETING Yellow, White, Red				NOTE				1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. The Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTIONAL LARGE ARROW (W1-6).											
NOTE																			
										DEPARTMENTAL MATERIAL SPECIFICATIONS									
										FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES) DMS-4400									
										SIGN FACE MATERIALS DMS-8300									
										DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS DMS-8600									
										Traffic Operations Division Standard									
										DEL INEATOR & OBJECT MARKER MATERIAL DESCRIPTION									
										D & OM(1)-15									
										FILE: dom1-15.dgn DN: TxDOT CK: TxDOT DW: TxDOT CK: TxDOT									
										© TxDOT August 2004 CONT SECT JOB HIGHWAY									
										REVISIONS									
										10-09 3-15 DIST COUNTY SHEET NO.									
										4-10									

## Signs and Markers BID SHEET

TMUTCD SIGNS - REGULATORY			
ITEM	DESCRIPTION	UNIT	UNIT PRICE
1.01	24" Stop/Slow Paddles and 6' Wooden Staff	EACH	
1.02	24" Octagon (H.I.P.)	EACH	
1.03	30" Octagon (H.I.P.)	EACH	
1.04	36" Octagon (H.I.P.)	EACH	
1.05	48" Octagon (H.I.P.)	EACH	
1.06	30" Triangle (H.I.P.)	EACH	
1.07	36" Triangle (H.I.P.)	EACH	
1.08	12"x 6" (H.I.P.)	EACH	
1.09	12"x 9" (H.I.P.)	EACH	
1.10	15"x 30" (H.I.P.)	EACH	
1.11	18"x 6" (H.I.P.)	EACH	
1.12	18"x 12" (H.I.P.)	EACH	
1.13	18"x 18" (H.I.P.)	EACH	
1.14	18"x 24" (H.I.P.)	EACH	
1.15	21"x 15" (H.I.P.)	EACH	
1.16	24"x 24" (H.I.P.)	EACH	
1.17	24"x 30" (H.I.P.)	EACH	
1.18	24"x 36" (H.I.P.)	EACH	
1.19	24"x 42" (H.I.P.)	EACH	
1.20	24"x 48" (H.I.P.)	EACH	
1.21	30"x 18" (H.I.P.)	EACH	
1.22	30"x 24" (H.I.P.)	EACH	
1.23	30"x 30" (H.I.P.)	EACH	
1.24	30"x 36" (H.I.P.)	EACH	
1.25	30"x 42" (H.I.P.)	EACH	
1.26	36"x 12" (H.I.P.)	EACH	
1.27	36"x 18" (H.I.P.)	EACH	
1.28	36"x 24" (H.I.P.)	EACH	
1.29	36"x 36" (H.I.P.)	EACH	
1.30	48"x 9" (H.I.P.)	EACH	
1.31	48"x 24" (H.I.P.)	EACH	
1.32	48"x 30" (H.I.P.)	EACH	
1.33	60"x 30" (H.I.P.)	EACH	
TMUTCD SIGNS - WARNING			
ITEM	DESCRIPTION	UNIT	UNIT PRICE
2.01	30" Circle (H.I.P.)	EACH	
2.02	36" Circle (H.I.P.)	EACH	
2.03	12"x 18" (H.I.P.)	EACH	
2.04	18"x 18" (H.I.P.)	EACH	
2.05	18"x 24" (H.I.P.)	EACH	
2.06	24"x 12" (H.I.P.)	EACH	
2.07	24"x 24" (H.I.P.)	EACH	
2.08	24"x 30" (H.I.P.)	EACH	
2.09	30"x 15" (H.I.P.)	EACH	
2.10	30"x 30" (H.I.P.)	EACH	
2.11	30"x 36" (H.I.P.)	EACH	
2.12	36"x 12" (H.I.P.)	EACH	
2.13	36"x 18" (H.I.P.)	EACH	
2.14	36"x 24" (H.I.P.)	EACH	



2.15	36"x 36" (H.I.P.)	EACH	
2.16	36"x 48" (H.I.P.)	EACH	
2.17	48"x 24" (H.I.P.)	EACH	
2.18	48"x 48" (H.I.P.)	EACH	
2.19	48"x 60" (H.I.P.)	EACH	
2.20	60"x 30" (H.I.P.)	EACH	
2.21	66"x 12" (H.I.P.)	EACH	
2.22	84"x 24" (H.I.P.)	EACH	

<b>TMUTCD SIGNS - SCHOOL</b>			
ITEM	DESCRIPTION	UNIT	UNIT PRICE
3.01	30" Pentagon (D.G. - Florescent Yellow/Green)	EACH	
3.02	36" Pentagon (D.G. - Florescent Yellow/Green)	EACH	
3.03	24"x 8" (D.G. - Florescent Yellow/Green)	EACH	
3.04	24"x 10" (H.I.P. - White)	EACH	
3.05	24"x 12" (D.G. - Florescent Yellow/Green)	EACH	
3.06	24"x 48" (D.G. - Florescent Yellow/Green and H.I.P. - White)*	EACH	
3.07	30"x 30" (D.G. - Florescent Yellow/Green)	EACH	
3.08	36"x 12" (D.G. - Florescent Yellow/Green)	EACH	
3.09	36"x 36" (D.G. - Florescent Yellow/Green)	EACH	
	*per TMUTCD S5-1		
<b>BRACKET/POST AND HARDWARE</b>			
ITEM	DESCRIPTION	UNIT	UNIT PRICE
4.01	2 3/8" Post Bracket	EACH	
4.02	3" Post Bracket	EACH	
4.03	2 3/8" Back to Back Post Brackets	EACH	
4.04	Wedge Steel System Anchor (socket and wedge)	EACH	
4.05	Triangular Slipbase System (complete assembly with tri-base ground stub)	EACH	
4.06	Triangular Slipbase System (anchor, collar, fasteners – excluding ground stub anchor)	EACH	
<b>STREET SIGNS BLANKS AND HARDWARE</b>			
ITEM	DESCRIPTION	UNIT	UNIT PRICE
5.01	6"x 18" Flat (H.I.P. - White)	EACH	
5.02	6"x 24" Flat (H.I.P. - White)	EACH	
5.03	6"x 30" Flat (H.I.P. - White)	EACH	
5.04	6"x 36" Flat (H.I.P. - White)	EACH	
5.05	9"x 24" Flat (H.I.P. - White)	EACH	
5.06	9"x 30" Flat (H.I.P. - White)	EACH	
5.07	9"x 36" Flat (H.I.P. - White)	EACH	
5.08	Cap Round - 2 3/8" x 5 1/2" Flat Blade Holder	EACH	
5.09	Cap Round - 2 3/8" x 12" Flat Blade Holder	EACH	
5.10	Cap Round - 3" x 5 1/2" Flat Blade Holder	EACH	
5.11	Cap Round - 3" x 12" Flat Blade Holder	EACH	
5.12	90° Tee - 5 1/2" Flat Blade	EACH	
5.13	90° Tee - 12" Flat Blade Holder	EACH	
<b>POSTS</b>			
ITEM	DESCRIPTION	UNIT	UNIT PRICE
6.01	10' x 2 3/8" O.D. Round Post	EACH	
6.02	12' x 2 3/8" O.D. Round Post	EACH	
6.03	6' Green U-Channel Post	EACH	
6.04	6' Galvanized U-Channel Post	EACH	
6.05	12' Green U-Channel Post	EACH	
6.06	12' x 2-7/8" O.D. 10 BWG Post complete assembly with Pins	EACH	

6.07	11' x 1-3/4" Perforated Square Metal Tubing	EACH	
6.08	10' Steel T-leg Assembly* – Single complete assembly with 36" x 36" FL DG Coroplast sign, 5' x 2" square leg base, and two 3' base ends (feet) 1 3/4" square with 5/16" holes.	EACH	
6.09	4' x 1 3/4" square T-leg with 5' x 2" square base*		
6.10	3' x 1 3/4" Perforated Square Metal Tubing - Base End (Foot)* with pins	EACH	
6.11	5' x 2" Perforated Square Metal Tubing - Single Leg Base* with stub out and pins	EACH	
	*see assembly for single leg base (skid mounted) on lower left corner of sheet BC (5)-14		
<b>ROLL GOODS</b>			
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>UNIT PRICE</b>
7.01	7"x 50 Yards - Barricade Tape (H.I.P.) Red	EACH	
7.02	7"x 50 Yards - Barricade Tape (H.I.P.) Orange	EACH	
7.03	30" x 50 Yards - Reflective Sheeting (E.G.)	EACH	
7.04	30" x 50 Yards - Reflective Sheeting (H.I.P.)	EACH	
7.05	30" x 50 Yards - Reflective Sheeting (D.G.)	EACH	
7.06	30" x 50 Yards - Non Reflective Sheeting (Black Vinyl)	EACH	
7.07	30" x 50 Yards - Non Reflective Sheeting (Orange Vinyl)	EACH	
7.08	30" x 50 Yards - E.C. Film	EACH	
7.09	48" x 50 Yards - Reflective Sheeting (E.G.)	EACH	
7.10	48" x 50 Yards - Reflective Sheeting (H.I.P.)	EACH	
7.11	48" x 50 Yards - Non Reflective Sheeting (Black Vinyl)	EACH	
7.12	48" x 50 Yards - Non Reflective Sheeting (Orange Vinyl)	EACH	
7.13	48" x 50 Yards - E.C. Film	EACH	
<b>BARRICADE MATERIAL</b>			
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>UNIT PRICE</b>
8.01	1"x 8"x 8' Barricade Rail (plank)	EACH	
8.02	Type I 24" Barricade with Sheeting	EACH	
8.03	Type II 24" Barricade with Sheeting	EACH	
8.04	Type III 4' Barricade with Sheeting	EACH	
8.05	Type III 8' Barricade with Sheeting	EACH	
8.06	Barricade base/skid (5'- 2" square steel tubing with 6" stub out)	EACH	
8.07	1 3/4" x 1 3/4" x 5' X-tube barricade stiffener with standard holes	EACH	
<b>FLEXIBLE ROLL UP SIGNS</b>			
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>UNIT PRICE</b>
9.01	36" Non Reflective Sign	EACH	
9.02	36" Reflective Sign	EACH	
9.03	48" Non Reflective Sign	EACH	
9.04	48" Reflective Sign	EACH	
9.05	Rubber Sign Stand (min. 38 lbs)	EACH	
<b>DELINEATOR AND OBJECT MARKERS</b>			
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>UNIT PRICE</b>

10.01	62" Flexible Posts w/stub w/ 3"x 12" Yellow H.I.P. Sheeting	EACH	
10.02	28" Cones w/ Reflective Bands - 9.5 lbs. min (two-piece cone with separate weighted base)	EACH	
10.03	36"- 42" Drums w/ Reflective Bands with Tire Ring Base	EACH	
10.04	Barrier reflector - GF-1	EACH	
10.05	Barrier reflector - GF-2	EACH	
10.06	Barrier reflector - CTB	EACH	
10.07	Temporary Flexible-Reflective Roadway Marker Tabs	EACH	
10.08	Reflector 6" x 12" (Size 3)	EACH	
10.09	12" x 36" Object Marker - OM -3L (H.I.P.)	EACH	
10.10	12" x 36" Object Marker - OM -3R (H.I.P.)	EACH	
10.11	12" x 36" Object Marker - OM -3C (H.I.P.)	EACH	
10.12	18" x 18" Object Marker - OM -4 (H.I.P.)	EACH	
<b>CWZTCDL SUBSTRATES FOR SIGNS BLANKS FOR SHORT-TERM/SHORT DURATION</b>			
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>UNIT PRICE</b>
11.01	24" x 30" 10 MM Coroplast	EACH	
11.02	36" x 36" 10 MM Coroplast	EACH	
11.03	48" x 96" 10 MM Coroplast	EACH	
11.04	60" x 30" 10 MM Coroplast	EACH	

## **1.0 BID FORMAT AND SUBMISSION**

### **1.1 Organization of Bid Contents for Submittal**

Each Bid should be organized and items submitted in the order described in of this IFB.

### **1.2 Conflict of Interest**

No public official shall have interest in a contract, in accordance with Vernon's Texas Codes Annotated, Local Government Code Title 5, Subtitle C, Chapter 171, as amended.

As of January 1, 2006, Bidders are responsible for complying with Local Government Code Title 5, Subtitle C, Chapter 176. Additional information may be obtained from the Williamson County website at the following link:

<http://www.wilco.org/CountyDepartments/Purchasing/ConflictOfInterestDisclosure/tabid/689/language/en-US/Default.aspx>

Each Bidder must disclose any existing or potential conflict of interest relative to the performance of the requirements of this IFB. Examples of potential conflicts may include an existing business or personal relationship between the Bidder, its principal, or any affiliate or subcontractor, with Williamson County or any other entity or person involved in any way in the project that is the subject of this IFB. Similarly, any personal or business relationship between the Bidder, the principals, or any affiliate or subcontractor, with any employee or official of Williamson County or its suppliers must be disclosed. Any such relationship that might be perceived or represented as a conflict must be disclosed. Failure to disclose any such relationship or reveal personal relationships with Williamson County employees or officials may be cause for termination. Williamson County will decide if an actual or perceived conflict should result in Bid disqualification.

By submitting a Bid in response to this IFB, all Bidders affirm that they have not given, nor intend to give, at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a Williamson County public servant or any employee, official or representative of same, in connection with this procurement.

**Each Bidder must provide a Conflict of Interest Statement in accordance with this IFB.**

### **1.3 Certificate of Interested Parties**

As of January 1, 2016, Bidders are responsible for complying with the Texas Government Code Section 2252.908. The law states that Williamson County may not enter into certain contracts with a Bidder unless the Bidder submits a disclosure of interested parties to Williamson County at the time the Bidder submits the signed contract to Williamson County. The law applies only to a contract of Williamson County that either (1) requires an action or vote by the Commissioners Court before the contract may be signed or (2) has a value of at least \$1 million. The disclosure requirement applies to a contract entered into on or after January 1, 2016.

By January 1, 2016, the Texas Ethics Commission will make available on its website a new filing application that must be used to file Form 1295. A Bidder must use the application to enter the required information on Form 1295 and print a copy of the form and a separate certification of filing that will contain a unique certification number. An authorized agent of the Bidder must sign the printed copy of the form and have the form notarized. The completed Form 1295 and certification of filing must be filed with Williamson County.

Williamson County must notify the commission, using the commission's filing application, of the receipt of the filed Form 1295 and certification of filing not later than the 30th day after the date the contract binds all parties to the contract. The commission will post the completed Form 1295 to its website within seven business days after receiving notice from Williamson County.

Information regarding how to use the filing application will be available on the Texas Ethics Commission website by January 1, 2016.

## 1.4 Ethics

The Bidder shall not accept or offer gifts or anything of value nor enter into any business arrangement with any employee, official or agent of Williamson County.

## 1.5 Bid Submittal Deadline

The Bid is due no later than the submittal date and time set forth in the 'Public Announcement and General Information' listed above for this IFB. Contents of each Bid shall be submitted in accordance with this IFB.

## 1.6 Delivery of Bids

Williamson County uses BidSync to distribute and receive bids and proposals Bids can be submitted electronically through BidSync or by hard copy. Refer to [www.bidsync.com](http://www.bidsync.com) for further information.

**If mailed or delivered in person**, Bids and Bid addenda are to be delivered in sealed envelope on or before the submittal deadline, as noted in the 'Public Announcement and General Information' listed above for this IFB, to:

Williamson County Purchasing Department

Attn: **BID NAME AND NUMBER**

901 South Austin Avenue Georgetown, Texas 78626

Williamson County will not accept any Bids received after the submittal deadline, and shall return such Bids unopened to the Bidder. Williamson County will not accept any responsibility for Bids being delivered by third party carriers. Bidder should submit one (1) original, and one (1) copy of their Bid on CD (or other portable storage device). Bids will be opened publicly and read aloud. In the case of an RFP (Request for Proposal) submissions may be recognized in a manner to avoid public disclosure of contents; however, names of Bidders will then be read aloud.

Bidders should list the Bid Number, Bid Name, Name and Address of Bidder, and the Date of the Bid opening on the outside of the box or envelope and note "Sealed Bid Enclosed."

## 2.1 INSTRUCTIONS AND GENERAL REQUIREMENTS RELATED TO THIS BID

Read this document carefully. Follow all instructions and requirements. You are responsible for fulfilling all requirements and specifications. Be sure you have a clear understanding of this IFB.

General requirements apply to all advertised IFBs; however, these may be superseded, in whole or in part, by the Bid Specifications, Addenda issued as a part of this IFB and Modifications issued as a part of this IFB. Be sure your Bid package is complete.

## 2.2 Ambiguity, Conflict, or other Errors in the IFB

If Bidder discovers any ambiguity, conflict, discrepancy, omission or other error in this IFB, Bidder shall immediately notify Williamson County Purchasing Department of such error in writing and request modification or clarification of the document.

Modifications will be made by issuing Addenda. If the Bidder fails to notify Williamson County prior to the date and time fixed for submission of Bids of an error or ambiguity in the IFB known to Bidder, or an error or ambiguity that reasonably should have been known to Bidder, then Bidder shall be deemed to have waived the error or ambiguity or its later resolution.

Williamson County may also modify the IFB, no later than 48 hours prior to the date and time fixed for submission of Bids, by issuance of an Addendum. All addenda will be numbered consecutively, beginning with 1.

## 2.3 Notification of Most Current Address

Bidders in receipt of this IFB shall notify the Williamson County Purchasing Department of any address changes, contact person changes, and/or telephone number changes no later than 48 hours prior to the date and time fixed for submission of Bids.

## 2.4 Bid Preparation Cost

Cost of developing Bids is entirely the responsibility of Bidders and shall not be charged to Williamson County.

## **2.5 Signature of Bidder**

If the Bidder is a Corporation or Limited Liability Company, the legal name of the Corporation or Limited Liability Company shall be provided together with the signature of the officer or officers authorized to sign on behalf of such entity.

If the Bidder is a General Partnership, the true name of the firm shall be provided with the signature of each partner authorized to sign.

If the Bidder is a Limited Partnership, the name of the Limited Partner's General Partner shall be provided with the signature of the officer authorized to sign on behalf of the General Partner.

If the Bidder is a Sole Proprietor(s) (individual), each Sole Proprietor(s) shall sign.

If signature is by an agent, other than the Sole Proprietor(s) or an officer of a Corporation, Limited Liability Company, General Partner or a member of a General Partnership, a power of attorney or equivalent document must be submitted to the Williamson County Purchasing Department.

## **2.6 Assumed Business Name**

If the Bidder operates business under an Assumed Business Name, the Bidder must have on file with the Williamson County Clerk a current Assumed Name Certificate and provide a file marked copy of same.

## **2.7 Bid Obligation**

The contents of the IFB, Bid, and any clarification thereof submitted by the Successful Bidder shall become part of the contractual obligation and incorporated by reference into the Contract and any ensuing Agreement.

## **2.8 Compliance with IFB Specifications**

It is intended that this IFB describe the requirements and the Bid format in sufficient detail to secure comparable Bids. Failure to comply with all provisions of the IFB may, at the sole discretion of Williamson County, result in disqualification.

## **2.9 Withdrawal of Bid**

The Bidder may withdraw its Bid by submitting a written request over the signature of an authorized individual, as described herein above, to the Williamson County Purchasing Department any time prior to the submission deadline. The Bidder may thereafter submit a new Bid prior to the deadline. Modification of the Bid in any manner will not be considered if submitted after the deadline. Withdrawal of a Bid after the deadline will be subject to written approval of the Williamson County Purchasing Agent.

## **2.10 Evaluation/Award**

Williamson County reserves the right to use all pertinent information (also learned from sources other than disclosed in the BID process) that might affect Williamson County's judgment as to the appropriateness of an award to the lowest and best evaluated Bid. This information may be appended to the Bid evaluation process results. Information on a Bidder from reliable sources, and not within the Bidder's Bid, may also be noted and made part of the evaluation file. Williamson County shall have sole discretion for determining the reliability of the source.

To ensure the proper and fair evaluation of a solicitation, Williamson County prohibits unsolicited communication initiated by the Bidder to the County Official or Employee evaluating or considering the Bids prior to the time an award has been made. Unsolicited communication may be ground for disqualifying the offending Bidder from consideration or award of the solicitation then in evaluation, or any future solicitation.

Communication between Bidder and the County will be initiated by the appropriate County Official or Employee in order to obtain information or clarification needed to develop a proper and accurate evaluation of the solicitation.

To award the lowest responsible bidder in accordance with Texas Government Code and Local Government Code, the County may consider, to the extent allowed by law, the following:

- Price
- Bidder's experience and reputation
- Quality of the Bidder's goods and/or services
- Bidder's safety record
- Bidder's proposed personnel
- Bidder's financial capabilities
- Any other relevant factors specifically listed in the IFB

## **Consideration of Location of Principal Office**

Pursuant to Texas Local Government Code Section 271.905, in purchasing under this title any real property or personal property that is not affixed to real property, if Williamson County receives one or more Bids from a Bidder whose principal place of business is in Williamson County and whose Bid is within three percent (3%) of the lowest bid price received by Williamson County from a Bidder who is not a resident of Williamson County, Williamson County may enter into a contract with: the lowest Bidder; or the Bidder whose principal place of business is in Williamson County if the Williamson County Commissioners Court determines, in writing, that the local Bidder offers Williamson County the best combination of contract price and additional economic development opportunities for Williamson County created by the contract award, including the employment of residents of Williamson County and increased tax revenues to Williamson County.

This consideration does not prohibit Williamson County from rejecting all Bids. It is understood that the Commissioners Court of Williamson County, Texas, reserves the right to accept or reject any and/or all Bids for any or all goods and/or services covered in this IFB, and to waive informalities or defects in the Bid or to accept such Bid it shall deem to be in the best interest of Williamson County.

Awards should be made approximately sixty (60) business days after the Bid opening date. Results may be obtained by viewing the Williamson County vendor portal at the following link:

<http://www.wilco.org/CountyDepartments/Purchasing/SearchforaPastBid/tabid/5213/language/en-US/Default.aspx>

## **2.11 Responsibility**

It is expected that a prospective Bidder will be able to affirmatively demonstrate Bidder's responsibility. A prospective Bidder should be able to meet the following requirements:

- a) have adequate financial resources, or the ability to obtain such resources as required;
- b) be able to comply with the required or proposed delivery schedule;
- c) have a satisfactory record of performance that can be determined thru references provided
- d) have a satisfactory record of performance with Williamson County; and e) be otherwise qualified and eligible to receive an award.

Williamson County may request representation and other information sufficient to determine Bidder's ability to meet these minimum standards listed above.

## **2.12 Firm Pricing**

For unit price items, all of the items listed are to be on a "per unit" basis, stating a firm price per unit or unit quantity of each item. Bidder must submit a firm price that must be good from the date of Bid opening for the fixed period of time set out in this IFB. Unless the IFB expressly states otherwise, this period shall be until the end of the Initial Contract Period. Bids which do not state a fixed price, or which are subject to change without notice, will not be considered. The Court may award a contract for the period implied or expressly stated in the lowest and best Bid.

## **2.13 Purchase Orders**

If required by the Williamson County Purchasing Department, a purchase order(s) may be generated to the Successful Bidder for goods and/or services. If a purchase order is issued, the purchase order number must appear on all itemized invoices and/or requests for payment.

## **2.14 Silence of Specifications**

The apparent silence of these specifications as to any detail or to the apparent omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best practices are to prevail. All interpretations of these specifications shall be made on the basis of this statement.

## **2.15 References**

Williamson County may require Bidder to supply a list of at least three (3) references where like services and/or goods have been supplied by their firm within the past five (5) years. References should be provided in accordance with this IFB.



## **3.1 DEFINITIONS, TERMS AND CONDITIONS**

### **3.2 Definitions**

- a) "Addenda" – Means any written or graphic instruments issued by Williamson County prior to the consideration of Bids which modify or interpret the Bid Documents by additions, deletions, clarifications, or corrections.
- b) "Agreement" – The Successful Bidder may be required by Williamson County to sign an additional Agreement containing terms necessary to ensure compliance with the IFB and Bidder's Bid. Such ensuing Agreement(s) shall contain the Bid Specifications, Terms and Conditions that are derived from the IFB.
- c) "Contract" – This IFB and the Bid of the Successful Bidder shall become a contract between the Successful Bidder and Williamson County once the Successful Bidder's Bid is properly accepted by the Williamson County Commissioners Court.
- d) "Bid Documents" – The Legal Notice, IFB including attachments, and any Addenda issued by Williamson County prior to the consideration of any Bids.
- e) "Bid" – The completed and signed bid form referred to as the Price Sheet and ALL required forms and documentation listed in the bid package which have been submitted in accordance with the terms and conditions described in the IFB package. A Bid submitted in accordance with this IFB is irrevocable during the specified period for evaluation and acceptance of Bids unless a waiver is obtained from the Williamson County Purchasing Agent.
- f) "Bidder" – A person or entity who submits a Bid in response to this IFB.
- g) "IFB" – Refers to this document, together with the attachments thereto and any future addenda issued by Williamson County.
- h) "Successful Bidder" – The liable Bidder to whom Williamson County intends to award the Contract.

#### **3.2.1 Venue and Governing Law**

Bidder hereby agrees and acknowledges that venue and jurisdiction of any suit, right, or cause of action arising out of or in connection with this IFB, the Contract and any ensuing Agreement shall lie exclusively in either Williamson County, Texas or in the Austin Division of the Western Federal District of Texas, and the parties hereto expressly consent and submit to such jurisdiction. Furthermore, except to the extent that this IFB, the Contract and any ensuing Agreement is governed by the laws of the United States, this IFB, the Contract and any ensuing Agreement shall be governed by and construed in accordance with the laws of the State of Texas, excluding, however, its choice of law rules.

#### **3.2.2 Incorporation by Reference and Precedence**

The Contract shall be derived from (1) the IFB and its Schedules; and (2) the Bidder's Bid. In the event of a dispute under the Contract, applicable documents will be referred to for the purpose of clarification or for additional detail in the following order of precedence: (1) the IFB and its Schedules; and (2) the Bidder's Bid.

In the event Williamson County requires that an ensuing Agreement be executed following award and a dispute arises between the terms and conditions of the ensuing Agreement, (2) the IFB, and its Schedules; and (3) the Bidder's Bid, applicable documents will be referred to for the purpose of clarification or for additional detail in the following order of precedence: (1) terms and conditions of the ensuing Agreement, (2) the IFB; and (3) the Bidder's Bid.

#### **3.2.3 Ownership of Bid**

Each Bid shall become the property of Williamson County upon submittal and will not be returned to Bidders unless received after the submittal deadline.

#### **3.2.4 Disqualification of Bidder**

Upon signing and submittal of the Bid, a Bidder offering to sell supplies, materials, services, or equipment to Williamson County certifies that the Bidder has not violated the antitrust laws of this state codified in Section 15.01, et seq, Business & Commerce Code, or the Federal Antitrust Laws, and has not communicated directly or indirectly the offer made to any competitor or any other person engaged in such line of business. Any or all Bids may be rejected if Williamson County believes that collusion exists among the Bidders.

#### **3.2.5 Funding**

Williamson County intends to budget and make sufficient funds available and authorize funds for expenditure to finance the costs of the Contract. Bidders understand and agree that the County's payment of amounts under the Contract shall be contingent on Williamson County receiving appropriations or other expenditure authority sufficient to allow the County, in the exercise of reasonable administrative discretion, to make payments under this Contract.

### 3.2.6 Assignment, Successors and Assigns

The Successful Bidder may not assign, sell, or otherwise transfer the Contract or any other rights or interests obtained under the Contract without written permission of the Williamson County Commissioners Court. The Contract and any ensuing Agreement shall be binding upon and inure to the benefit of the contracting parties hereto and their respective successors and permitted assigns.

### 3.2.7 Implied Requirements

Products or services not specifically described or required in the IFB, but are necessary to provide the functional capabilities described by the Bidder, shall be implied and deemed to be included in the Bid.

### 3.2.8 Termination

- a) **Termination for Cause:** Williamson County reserves the right to terminate the Contract and/or any ensuing Agreement for default if the Successful Bidder breaches any of the IFB Specifications, Terms and Conditions, including warranties of Bidder, if any, or if the Successful Bidder becomes insolvent or commits acts of bankruptcy. Such right of termination is in addition to and not in lieu of any other remedies Williamson County may have at law or in equity or as may otherwise be provided hereunder. Default may be construed as, but not limited to, failure to deliver the proper goods and/or services within the proper amount of time, and/or to properly perform any and all other requirements to Williamson County's satisfaction, and/or to meet all other obligations and requirements.
- b) **Termination for Convenience:** Williamson County may terminate the Contract and/or any ensuing Agreement for convenience and without cause or further liability, upon no less than thirty (30) calendar day's written notice to Successful Bidder. Williamson County reserves the right to extend this period if it is in the best interest of the County. In the event Williamson County exercises its right to terminate without cause, it is understood and agreed that only the amounts due to the Successful Bidder for goods, commodities and/or services provided and expenses incurred to and including the date of termination, will be due and payable. No penalty will be assessed for Williamson County's termination for convenience.

### 3.2.9 Non-Performance

It is the objective of Williamson County to obtain complete and satisfactory performance of the requirements set forth herein. In addition to any other remedies available at law, in equity or that may be set out herein, failure to perform may result in a deduction of payment equal to the amount of the goods and/or services that were not provided and/or performed to Williamson County's satisfaction. In the event of such non-performance, Williamson County shall have the right, but shall not be obligated, to complete the services itself or by others and/or purchase the goods from other sources. If Williamson County elects to acquire the goods or perform the services itself or by others, pursuant to the foregoing, the Successful Bidder shall reimburse Williamson County, within ten (10) calendar days of demand, for all costs incurred by Williamson County (including, without limitation, applicable, general, and administrative expenses, and field overhead, and the cost of necessary equipment, materials, and field labor) in correcting the nonperformance which the Successful Bidder fails to meet pursuant to the requirements set out herein. In the event the Successful Bidder refuses to reimburse Williamson County as set out in this provision, Williamson County shall have the right to deduct such reimbursement amounts from any amounts that may be then owing or that may become owing in the future to the Successful Bidder.

### 3.2.10 Proprietary Information and Texas Public Information Act

All material submitted to Williamson County shall become public property and subject to the Texas Public Information Act upon receipt. If a Bidder does not desire proprietary information in the Bid to be disclosed, each page must be clearly identified and marked proprietary at time of submittal or, more preferably, all proprietary information may be placed in a folder or appendix and be clearly identified and marked as being proprietary. Williamson County will, to the extent allowed by law, endeavor to protect from public disclosure the information that has been identified and marked as proprietary. The final decision as to what information must be disclosed, however, lies with the Texas Attorney General. Failure to clearly identify and mark information as being proprietary as set forth under this provision will result in all unmarked information being deemed non-proprietary and available to the public. For all information that has not been clearly identified and marked as proprietary by the Bidder, Williamson County may choose to place such information on the County's website and/or a similar public database without obtaining any type of prior consent from the Bidder.

To the extent, if any, that any provision in this IFB or in the Bidder's Bid is in conflict with Tex. Gov't Code 552.001 et seq., as amended (the "Public Information Act"), the same shall be of no force or effect. Furthermore, it is expressly understood and agreed that Williamson County, its officers and employees may request advice, decisions and opinions of the Attorney General of the State of Texas in regard to the application of the Public Information Act to any items or data furnished to Williamson County as to whether or not the same are available to the public. It is further understood that Williamson County's officers and employees shall have the right to rely on the advice, decisions and opinions of the Attorney General, and that Williamson County, its officers and employees shall have no liability or obligation to any party hereto for the disclosure to the public, or to any person or persons, of any items or data furnished to Williamson County by a party hereto, in reliance of any advice, decision or opinion of the Attorney General of the State of Texas.

### 3.2.11 Right to Audit

Successful Bidder agrees that Williamson County or its duly authorized representatives shall, until the expiration of three (3) years after termination or expiration of the services to be performed, have access to and the right to examine and photocopy any and all books, documents, papers and records of Successful Bidder, which are directly pertinent to the services to be performed or goods to be delivered for the purposes of making audits, examinations, excerpts and transcriptions. Successful Bidder agrees that Williamson County shall have access during normal working hours to all necessary facilities and shall be provided adequate and appropriate work space in order to conduct audits in compliance with the provisions of this section. Williamson County shall give Successful Bidder reasonable advance notice of intended audits.

### 3.2.12 Testing and Inspections

Williamson County reserves the right to inspect and test equipment, supplies, materials and goods for quality and compliance with this IFB, and ability to meet the needs of the user. Demonstration units must be available for review. Should the goods or services fail to meet requirements and/or be unavailable for evaluation, Williamson County can deem the Bidder to be in breach and terminate the Contract and/or any ensuing Agreement(s).

### 3.2.13 Bid Preparation Cost

Cost of developing Bids is the sole responsibility of Bidders and shall not be charged to Williamson County. There is no expressed or implied obligation for Williamson County to reimburse Bidders for any expense incurred in preparing a Bid in response to this IFB and Williamson County will not reimburse Bidders for such expenses.

### 3.2.14 INDEMNIFICATION

**SUCCESSFUL BIDDER SHALL INDEMNIFY, DEFEND AND SAVE HARMLESS WILLIAMSON COUNTY, ITS OFFICIALS, EMPLOYEES, AGENTS AND AGENTS' EMPLOYEES FROM AND AGAINST ALL CLAIMS, LIABILITY, AND EXPENSES, INCLUDING REASONABLE ATTORNEYS' FEES, ARISING FROM ACTIVITIES OF BIDDER, ITS AGENTS, SERVANTS OR EMPLOYEES, PERFORMED HEREUNDER THAT RESULT FROM THE NEGLIGENT ACT, ERROR, OR OMISSION OF BIDDER OR ANY OF BIDDER'S AGENTS, SERVANTS OR EMPLOYEES, AS WELL AS ALL CLAIMS OF LOSS OR DAMAGE TO THE BIDDER'S AND WILLIAMSON COUNTY'S PROPERTY, EQUIPMENT, AND/OR SUPPLIES.**

**FURTHERMORE, WILLIAMSON COUNTY, ITS OFFICIALS, EMPLOYEES, AGENTS AND AGENTS' EMPLOYEES SHALL NOT BE LIABLE FOR DAMAGES TO THE SUCCESSFUL BIDDER ARISING FROM ANY ACT OF ANY THIRD PARTY, INCLUDING, BUT NOT BEING LIMITED TO THEFT. SUCCESSFUL BIDDER FURTHER AGREES TO INDEMNIFY, DEFEND AND SAVE HARMLESS WILLIAMSON COUNTY FROM, ITS OFFICIALS, EMPLOYEES, AGENTS AND AGENTS' EMPLOYEES AGAINST ALL CLAIMS OF WHATEVER NATURE ARISING FROM ANY ACCIDENT, INJURY, OR DAMAGE WHATSOEVER CAUSED TO ANY PERSON OR TO THE PROPERTY OF ANY PERSON OCCURRING IN RELATION TO SUCCESSFUL BIDDER'S PERFORMANCE OF ANY SERVICES REQUESTED HEREUNDER DURING THE TERM OF THE CONTRACT AND/OR ANY ENSUING AGREEMENT(S).**

**SUCCESSFUL BIDDER SHALL TIMELY REPORT ALL CLAIMS, DEMANDS, SUITS, ACTIONS, PROCEEDINGS, LIENS OR JUDGMENTS TO WILLIAMSON COUNTY AND SHALL, UPON THE RECEIPT OF ANY CLAIM, DEMAND, SUIT, ACTION, PROCEEDING, LIEN OR JUDGMENT, NOT LATER THAN THE FIFTEENTH (15<sup>TH</sup>) DAY OF EACH MONTH; PROVIDE WILLIAMSON COUNTY WITH A WRITTEN REPORT ON EACH SUCH MATTER, SETTING FORTH THE STATUS OF EACH MATTER, THE SCHEDULE OR PLANNED PROCEEDINGS WITH RESPECT TO EACH MATTER AND THE COOPERATION OR ASSISTANCE, IF ANY, OF WILLIAMSON COUNTY REQUIRED BY SUCCESSFUL BIDDER IN THE DEFENSE OF EACH MATTER. SUCCESSFUL BIDDER'S DUTY TO DEFEND, INDEMNIFY AND HOLD WILLIAMSON COUNTY HARMLESS SHALL BE ABSOLUTE. IT SHALL NOT ABATE OR END BY REASON OF THE EXPIRATION OR TERMINATION OF THE CONTRACT AND/OR ANY ENSUING AGREEMENT(S) UNLESS OTHERWISE AGREED BY WILLIAMSON COUNTY IN WRITING. THE PROVISIONS OF THIS SECTION SHALL SURVIVE THE TERMINATION OF THE CONTRACT AND SHALL REMAIN IN FULL FORCE AND EFFECT WITH RESPECT TO ALL SUCH MATTERS NO MATTER WHEN THEY ARISE.**

**IN THE EVENT OF ANY DISPUTE BETWEEN THE PARTIES AS TO WHETHER A CLAIM, DEMAND, SUIT, ACTION, PROCEEDING, LIEN OR JUDGMENT APPEARS TO HAVE BEEN CAUSED BY OR APPEARS TO HAVE ARISEN OUT OF OR IN CONNECTION WITH ACTS OR OMISSIONS OF WILLIAMSON COUNTY, BIDDER SHALL NEVER-THE- LESS FULLY DEFEND SUCH CLAIM, DEMAND, SUIT, ACTION, PROCEEDING, LIEN OR JUDGMENT UNTIL AND UNLESS THERE IS A DETERMINATION BY A COURT OF COMPETENT JURISDICTION THAT THE ACTS AND OMISSIONS OF BIDDER ARE NOT AT ISSUE IN THE MATTER.**

**SUCCESSFUL BIDDER'S INDEMNIFICATION SHALL COVER, AND SUCCESSFUL BIDDER AGREES TO INDEMNIFY WILLIAMSON COUNTY, IN THE EVENT WILLIAMSON COUNTY IS FOUND TO HAVE BEEN NEGLIGENT FOR HAVING**

**SELECTED SUCCESSFUL BIDDER TO PER THE WORK DESCRIBED IN THIS REQUEST. THE PROVISION BY SUCCESSFUL BIDDER OF INSURANCE SHALL NOT LIMIT THE LIABILITY OF SUCCESSFUL BIDDER UNDER THE CONTRACT AND/OR ANY ENSUING AGREEMENT.**

### 3.2.15 Waiver of Subrogation

Successful Bidder and Successful Bidder's insurance carrier waive any and all rights whatsoever with regard to subrogation against Williamson County as an indirect party to any suit arising out of personal or property damages resulting from the Bidder's performance under this Contract and any ensuing Agreement.

### 3.2.16 Relationship of the Parties

The Successful Bidder shall be an independent contractor and shall assume all of the rights, obligations, liabilities, applicable to it as such independent contractor hereunder and any provisions herein which may appear to give Williamson County the right to direct the Successful Bidder as to details of doing work herein covered or to exercise a measure of control over the work shall be deemed to mean that the Successful Bidder shall follow the desires of Williamson County in the results of the work only. Williamson County shall not retain or have the right to control the Successful Bidder's means, methods or details pertaining to the Successful Bidder's performance of the work. Williamson County and the Successful Bidder hereby agree and declare that the Successful Bidder is an independent contractor and as such meets the qualifications of an "Independent Contractor" under Texas Workers Compensation Act, Texas Labor Code, Section 406.141, that the Successful Bidder is not an employee of Williamson County, and that the Successful Bidder and its employees, agents and sub- contractors shall not be entitled to workers compensation coverage or any other type of insurance coverage held by Williamson County.

### 3.2.17 Sole Provider

The Successful Bidder agrees and acknowledges that it shall not be considered a sole provider of the goods and/or services described herein and that Williamson County may contract with other providers of such goods and/or services if Williamson County deems, at its sole discretion, that multiple providers of the same goods and/or services will serve the best interest of Williamson County.

### 3.2.18 Force Majeure

If the party obligated to perform is prevented from performance by an act of war, order of legal authority, act of God, or other unavoidable cause not attributable to the fault or negligence of said party, the other party shall grant such party relief from the performance. The burden of proof for the need of such relief shall rest upon the party obligated to perform. To obtain release based on force majeure, the party obligated to perform shall file a written request with the other party.

### 3.2.19 Severability

If any provision of this IFB, the Contract or any ensuing Agreement shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision thereof, but rather the entire IFB, Contract or any ensuing Agreement will be construed as if not containing the particular invalid or unenforceable provision or provisions, and the rights and obligation of the parties shall be construed and enforced in accordance therewith. The parties acknowledge that if any provision of this IFB, the Contract or any ensuing Agreement is determined to be invalid or unenforceable, it is the desire and intention of each that such provision be reformed and construed in such a manner that it will, to the maximum extent practicable, give effect to the intent of this IFB, the Contract or any ensuing Agreement and be deemed to be validated and enforceable.

### 3.2.20 Equal Opportunity

Neither party shall discriminate against any employee or applicant for employment because of race, color, sex, religion or national origin.

### 3.2.21 Notice

Any notice to be given shall be in writing and may be affected by personal delivery, or by registered or certified mail, return receipt requested, addressed to the proper party, at the following address:

Williamson County Purchasing Department Purchasing Agent 901 South Austin Avenue Georgetown, Texas 78626

Bidder: Address set out in IFB referred to as the Bid Affidavit.

Notices given in accordance with this provision shall be effective upon (i) receipt by the party to which notice is given, or (ii) on the third

### **3.2.22 Sales and Use Tax Exemption**

Williamson County is a body corporate and politic under the laws of the State of Texas and claims exemption from sales and use taxes under Texas Tax Code Ann. § 151.309, as amended, and the services and/or goods subject hereof are being secured for use by Williamson County.

### **3.2.23 Compliance with Laws**

Williamson County and Successful Bidder shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance of the Contract and any ensuing Agreement, including, without limitation, Workers' Compensation laws, salary and wage statutes and regulations, licensing laws and regulations. When required, the Successful Bidder shall furnish Williamson County with certification of compliance with said laws, statutes, ordinances, rules, regulations, orders, and decrees above specified.

### **3.2.24 Incorporation of Schedules, Exhibits, Appendices & Attachments**

All of the Schedules, Exhibits, Appendices and Attachments referred to herein are incorporated by reference as if set forth verbatim herein. All of the Schedules, Exhibits, Appendices and Attachments referred to herein are incorporated by reference as if set forth verbatim herein. Any conflicting terms in the contract documents will be resolved at the sole discretion of the Williamson County Commissioners Court.

### **3.2.25 No Waiver of Immunities**

Nothing herein shall be deemed to waive, modify or amend any legal defense available at law or in equity to Williamson County, its past or present officers, employees, or agents, nor to create any legal rights or claim on behalf of any third party. Williamson County does not waive, modify, or alter to any extent whatsoever the availability of the defense of governmental immunity under the laws of the State of Texas and of the United States.

### **3.2.26 No Waiver**

The failure or delay of any party to enforce at any time or any period of time any of the provisions of this IFB, the Contract or any ensuing Agreement shall not constitute a present or future waiver of such provisions nor the right of either party to enforce each and every provision. Furthermore, no term or provision hereof shall be deemed waived and no breach excused unless such waiver or consent shall be in writing and signed by the party claimed to have waived or consented. Any consent by any party to, or waiver of, a breach by the other, whether expressed or implied, shall not constitute a consent to, waiver of or excuse for any other, different or subsequent breach.

### **3.2.27 Current Revenues**

The obligations of the parties under the Contract and any ensuing Agreement do not constitute a general obligation or indebtedness of Williamson County for which Williamson County is obligated to levy, pledge, or collect any of taxation. It is understood and agreed that Williamson County shall have the right to terminate the Contract and any ensuing Agreement at the end of any Williamson County fiscal year if the governing body of Williamson County does not appropriate sufficient funds as determined by Williamson County's budget for the fiscal year in question. Williamson County may effect such termination by giving written notice of termination to the Successful Bidder at the end of its then-current fiscal year.

### **3.2.28 FOB – Destination**

To the extent applicable to this IFB, all of the items listed are to be Free On Board to final destination (FOB Destination) with all transportation charges if applicable to be included in the Bid, unless otherwise specified in the Invitation for Bids. The title and risk of loss of the goods shall not pass to Williamson County until receipt and acceptance takes place at the FOB Destination point.

### **3.2.29 Binding Effect**

This Contract and any ensuing Agreement shall be binding upon and inure to the benefit of the parties and their respective permitted assigns and successors.

### **3.2.30 Assignment**

The Successful Bidder's interest and duties hereunder may not be assigned or delegated to a third party without the express written consent of Williamson County.

### **3.2.31 Safety**

Successful Bidder is responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with any services to be provided hereunder. The safety program shall comply with all applicable requirements of the current federal Occupational Safety and Health Act and all other applicable federal, state and local laws and regulations.

### **3.2.32 General Obligations and Reliance**

Successful Bidder shall perform all services and/or provide all goods, as well as those reasonably inferable and necessary for completion and provision of services and/or goods required hereunder. The Successful Bidder shall keep Williamson County informed of the progress and quality of the services. Successful Bidder agrees and acknowledges that Williamson County is relying on Successful Bidder's represented expertise and ability to provide the goods and/or services described herein. Successful Bidder agrees to use its best efforts, skill, judgment, and abilities to perform its obligations in accordance with the highest standards used in the profession and to further the interests of Williamson County in accordance with Williamson County's requirements and procedures. Successful Bidder's duties as set forth herein shall at no time be in any way diminished by reason of any approval by the Williamson County nor shall the Successful Bidder be released from any liability by reason of such approval by Williamson County, it being understood that Williamson County at all times is ultimately relying upon the Successful Bidder's skill and knowledge in performing the services and providing any goods required hereunder.

### **3.2.33 Estimated Quantities**

To the extent applicable to this IFB, the estimated quantity of each item listed in this IFB is only an estimate -- the actual quantity to be purchased may be more or less. Williamson County is not obligated to purchase any minimum amount, and Williamson County may purchase any reasonable amount greater than the estimate for the same unit price. Any limit on quantities available must be stated expressly in the Bid.

### **3.2.34 Contractual Development**

The contents of the IFB and the selected Bid will become an integral part of the Contract, but may be modified, at Williamson County's sole discretion, by provisions of an ensuing Agreement. Therefore, the Bidder must agree to inclusion in an ensuing Agreement of the Bid Specifications, Terms and Conditions of this IFB. If an ensuing Agreement is required under this IFB, information relative to the Agreement will be located in the Special Provisions Section of this IFB.

### **3.2.35 Survivability**

All applicable agreements that were entered into between Successful Bidder and Williamson County under the terms and conditions of the Contract and/or any ensuing Agreement shall survive the expiration or termination thereof for ninety (90) days unless a new contract has been awarded.

### **3.2.36 Air Quality**

In determining the overall best Bid, Williamson County may, to the extent applicable, exercise the following option granted to local governments under the Texas Local Government Code.

Option – TLGC § 271.907. This option allows Williamson County to evaluate Bids and give preference to goods and/or services of a Bidder that demonstrates that the Bidder meets or exceeds any and all state or federal environmental standards, including voluntary standards, relating to air quality. If the Bid being submitted will have an effect on air quality for Williamson County (as it relates to any state, federal, or voluntary air quality standard), then the Bidder is encouraged to provide information in narrative indicating the anticipated air quality impact. Bidders are expected to meet all mandated state and federal air quality standards.

### **3.2.37 Entire Agreement**

The Contract and any ensuing Agreement shall supersede all prior Agreements, written or oral between the Successful Bidder and Williamson County and shall constitute the entire Agreement and understanding between the parties with respect to the services and/or

### 3.2.38 Payment

Williamson County's payment for goods and services shall be governed by Chapter 2251 of the Texas Government Code. An invoice shall be deemed overdue the 31st day after the later of (1) the date Williamson County receives the goods under the Contract; (2) the date the performance of the service under the Contract is completed; or (3) the date the Williamson County Auditor receives an invoice for the goods or services. Interest charges for any overdue payments shall be paid by Williamson County in accordance with Texas Government Code Section 2251.025. More specifically, the rate of interest that shall accrue on a late payment is the rate in effect on September 1 of Williamson County's fiscal year in which the payment becomes due. The said rate in effect on September 1 shall be equal to the sum of one percent (1%); and (2) the prime rate published in the Wall Street Journal on the first day of July of the preceding fiscal year that does not fall on a Saturday or Sunday.

In the event that an error appears in an invoice submitted by Successful Bidder, Williamson County shall notify Successful Bidder of the error not later than the twenty first (21st) day after the date Williamson County receives the invoice. If the error is resolved in favor of Successful Bidder, Successful Bidder shall be entitled to receive interest on the unpaid balance of the invoice submitted by Successful Bidder beginning on the date that the payment for the invoice became overdue. If the error is resolved in favor of Williamson County, Successful Bidder shall submit a corrected invoice that must be paid in accordance within the time set forth above. The unpaid balance accrues interest as provided by Chapter 2251 of the Texas Government Code if the corrected invoice is not paid by the appropriate date.

As a minimum, invoices shall include:

- a) Name, address, and telephone number of Successful Bidder and similar information in the event the payment is to be made to a different address
- b) Williamson County contract, Purchase Order, and/or delivery order number
- c) Identification of items or service as outlined in the Contract
- d) Quantity or quantities, applicable unit prices, total prices, and total amount
- e) Any additional payment information which may be called for by the Contract

Payment inquiries should be directed to the Williamson County Auditor's Office,  
Accounts Payable Department: [accountspayable@wilco.org](mailto:accountspayable@wilco.org) , 512-943-1500.

### 3.2.39 Contractual Formation and Ensuing Agreement

The IFB and the Bidder's Bid, when properly accepted by the Williamson County Commissioners Court, shall constitute a contract equally binding between the Successful Bidder and Williamson County.

**If an ensuing Agreement is required by this IFB, that information will be provided in Special Provisions section of this IFB.** The Successful Bidder shall be required to execute the Agreement at the Williamson County Purchasing Department approximately ten (10) calendar days after the Successful Bidder is notified of award. The ensuing Agreement shall be in the same form as the Agreement which is attached to the end of this IFB. The only anticipated changes in the ensuing Agreement will be to include additional exhibits, to fill in blanks to identify the Successful Bidder, and terms relating to the compensation, or to revise the Agreement to accommodate corrections, changes in the scope of services, or changes pursuant to Addenda issued. **Bidders should raise any questions regarding the terms of the Agreement in the of written questions or submittals as described in the Public Announcement and General Information portion of this IFB.** Because the signed ensuing Agreement will be substantively and substantially derived from the attached Agreement, each Bidder is urged to seek independent legal counsel as to any questions about the terms, conditions or provisions contained in the Agreement **before** submitting a Bid. Again, the attached Agreement contains important legal provisions and is considered part and parcel of this IFB. Failure or refusal to sign aforesaid Agreement shall be grounds for Williamson County to revoke any award which has been issued, forfeit Bid security, if applicable, and select another Bidder.

### 3.2.40 Cooperative Purchasing Program

During the term of the Contract resulting from this IFB, Williamson County would like to afford the same prices, terms and conditions to other political subdivisions or public entities. Another entity's participation in the Contract resulting from this Invitation to Bid is subject to a properly authorized Purchasing Cooperative Inter-local Agreement with Williamson County. Any liability created by Purchase Orders issued against the Contract shall be the sole responsibility of the governmental agency placing the order.

### 3.2.41 Insurance Requirements

To the extent applicable Insurance information will appear in the Special Provisions section of this IFB.

### **3.2.42 Bidders Bond, Warranty Bond, Performance and Payment Bonds**

To the extent applicable Bond information will appear in the Special Provisions section of this IFB.

### **3.2.43 Legal Liability Information**

The Successful Bidder shall disclose all legal liability information by listing any pending litigation or anticipated litigation that your firm is involved in, including but not limited to, potential or actual legal matters with private parties and any local, State, Federal or international governmental entities. Williamson County reserves the right to consider legal liability information in the recommendation of any proposed contract to the Williamson County Commissioners Court.

### **3.2.44 Inclement Weather**

In case of inclement weather or any other unforeseen event causing the County to close for business on the date of a bid/proposal submission deadline, the bid closing will automatically be postponed until the next business day the County is open. If inclement weather conditions or any other unforeseen event causes delays in carrier service operations, the County may issue an addendum to all known vendors interested in the project to extend the deadline. It will be the responsibility of the vendor to notify the County of their interest in the project if these conditions are impacting their ability to turn in a submission within the stated deadline. The County reserves the right to make the final judgment call to extend any deadline.



## Proposal References

List the last three (3) companies or governmental agencies, where the same or similar goods and/or services as contained in this RFP package, were recently provided by Respondent.

### **Reference 1**

Client Name:

Location:

Contact Name:

Title:

Phone:

E-mail

Contract Date To:

Contract Date From:

Contract Value: \$

Scope of Work:

### **Reference 2**

Client Name:

Location:

Contact Name:

Title:

Phone:

E-mail

Contract Date To:

Contract Date From:

Contract Value: \$

Scope of Work:

### **Reference 3**

Client Name:

Location:

Contact Name:

Title:

Phone:

E-mail

Contract Date To:

Contract Date From:

Contract Value: \$

Scope of Work:

5

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<b>CONFLICT OF INTEREST QUESTIONNAIRE</b> <b>For vendor or other person doing business with local governmental entity</b>		<b>Form</b> <b>CIQ</b>
<p>This questionnaire is being filed in accordance with chapter 176 of the Local Government Code by a person doing business with the governmental entity.</p> <p>By law this questionnaire must be filed with the records administrator of the local government not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. See Section 176.006, Local Government Code.</p> <p>A person commits an offense if the person violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.</p>		<b>OFFICE USE ONLY</b>  Date Received <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
1	<b>Name of person doing business with local governmental entity.</b> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	
2	<p style="text-align: center;"><b>Check this box if you are filing an update to a previously filed questionnaire.</b></p> <p><input type="checkbox"/></p> <p>(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than September 1 of the year for which an activity described in Section 176.006(a), Local Government Code, is pending and not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)</p>	
3	<p><b>Describe each affiliation or business relationship with an employee or contractor of the local governmental entity who makes recommendations to a local government officer of the local governmental entity with respect to expenditure of money.</b></p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div> <div style="text-align: right; position: absolute; top: 0; right: 0;">5</div> <div style="text-align: right; position: absolute; bottom: 0; right: 0;">6</div>	
4	<p><b>Describe each affiliation or business relationship with a person who is a local government officer and who appoints or employs a local government officer of the local governmental entity that is the subject of this questionnaire.</b></p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div> <div style="text-align: right; position: absolute; top: 0; right: 0;">5</div> <div style="text-align: right; position: absolute; bottom: 0; right: 0;">6</div>	

<b>CONFLICT OF INTEREST QUESTIONNAIRE</b> <b>For vendor or other person doing business with local governmental entity</b>		<b>Form</b> <b>CIQ</b> <b>Page 2</b>
5	<p><b>Name of local government officer with whom filer has affiliation or business relationship.</b>  <b>(Complete this section only if the answer to A, B, or C is YES.)</b></p> <p>This section, item 5 including subparts A, B, C &amp; D, must be completed for each officer with whom the filer has affiliation or other relationship. Attach additional pages to this Form CIQ as necessary.</p> <p>A. Is the local government officer named in this section receiving or likely to receive taxable income from the filer of the questionnaire?  <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>B. Is the filer of the questionnaire receiving or likely to receive taxable income from or at the direction of the local government officer named in this section AND the taxable income is not from the local governmental entity?  <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>C. Is the filer of this questionnaire affiliated with a corporation or other business entity that the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?  <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>D. Describe each affiliation or business relationship.</p> <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div>	
	<p><b>6. Describe any other affiliation or business relationship that might cause conflict of interest:</b></p> <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div>	
7	<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 60%; border-bottom: 1px solid black; margin-bottom: 5px;"></div> <div style="width: 35%; border-bottom: 1px solid black; margin-bottom: 5px;"></div> </div> <div style="display: flex; justify-content: space-between;"> <span>Signature of person doing business with the governmental entity</span> <span>Date</span> </div>	
	<b>Signature not required if completing in BIDSYNC electronically.</b>	

## BID AFFIDAVIT

**This form must be completed, signed, notarized and returned with Bid package**

The undersigned certifies that the IFB and the Bidder's Bid have been carefully reviewed and are submitted as correct and final. Bidder further certifies and agrees to furnish any and/or all goods and/or services upon which prices are extended at the price Bid, and upon the conditions contained in the IFB.

I hereby certify that the foregoing Bid has not been prepared in collusion with any other Bidder or other person or persons engaged in the same line of business prior to the official opening of this Bid. Further, I certify that the Bidder is not now, nor has been for the past six (6) months, directly or indirectly concerned in any pool or agreement or combination, to control the price of services/commodities Bid on, or to influence any person or persons to submit a Bid or not to submit a Bid thereon."

<b>Name of Bidder:</b>	<input style="width: 90%;" type="text"/>
<b>Address of Bidder:</b>	<input style="width: 90%;" type="text"/>
<b>Email:</b>	<input style="width: 90%;" type="text"/>
<b>Telephone:</b>	<input style="width: 90%;" type="text"/>
<b>Printed Name of Person Submitting Affidavit:</b>	<input style="width: 90%;" type="text"/>
<b>Signature of Person Submitting Affidavit:</b>	<input style="width: 90%;" type="text"/>

### Cooperative Purchasing Program

**Check one of the following options below.** A non-affirmative Bid will in no way have a negative impact on the County's evaluation of the Bid.

<input type="checkbox"/>	I will offer the quoted prices to all authorized entities during the term of the County's Contract.
<input type="checkbox"/>	I will not offer the quoted prices to all authorized entities.

**\*If no box is checked, the Bidder agrees to make best efforts in good faith to offer the quoted prices to all authorized entities.\***

BEFORE ME, the undersigned authority, a Notary Public, personally appeared   
*(Name of Signer)*, who after being by me duly sworn, did depose and say: "I, ,  
*(Name of Signer)* am a duly authorized officer of/agent for  *(Name of Bidder)* and  
have been duly authorized to execute the foregoing on behalf of the said  *(Name of Bidder)*.

SUBSCRIBED AND SWORN to before me by the above-named   
on this the  day of , 20.

Notary Public in and for  
The State of   
The County of

SIGNATURE AND NOTARY NOT REQUIRED IF COMPLETING IN BIDSYNCH ELECTRONICALLY.

## Question and Answers for Bid #1702-140 - Road Signs, Delineators and Object Markers and Traffic control devises

### Overall Bid Questions

There are no questions associated with this bid.