BJK Engineering

May 28, 2024,

Email Delivered

RE: Invitation to bid Glasscock County RFB 202401, Asphalt Surfacing, Including Addendum #1

Dear Contractor,

Glasscock County & BJK Engineering thanks you for your interest in our RFB 202401, Asphalt Surfacing Project. We will be taking bids now through June 17, 2024, 10:00 A.M. Your Bid Packet, and specifications are attached. **Be sure to include "Acknowledgement of Addendum".** If you have any questions, please feel free to contact me at (432) 517-0384 or <u>brianklinksiekpe@gmail.com</u>

Each Bid must be submitted in a sealed envelope addressed to Glasscock County and must be marked on the outside with the name of the Bidder and the name of the project: RFB 202401, Asphalt Surfacing. Physical address: Office of the Glasscock County Judge, Glasscock County Courthouse, 117 E. Currie Street, Garden City, TX 79739. If submitted by mail or delivery service, the sealed envelope containing the bid should be enclosed in another envelope addressed to the Glasscock County Judge, P.O. Box 67, Garden City, Texas 79739.

Sincerely,

Buin g Klaksich

Brian J. Klinksiek, P.E.

- Bids are to be submitted on this form. Be sure to include pages 1-3. Each bid shall be placed in an envelope, sealed, and properly identified with the bid title and delivered to Glasscock County Judge, Glasscock County Courthouse, 117 E. Currie Street, Garden City, TX 79739 before 10:00 A.M., Monday, June 17, 2024, at which time the bids will be publicly opened, read aloud and tabulated. These bids will subsequently be considered for award by the Glasscock County Commissioners Court. Late bids will not be considered under any circumstances. Mark Bids "RFB 202401, Asphalt Surfacing".
- 2. This is a bid to provide materials, labor, and equipment to provide a completed project to Glasscock County. Contact Brian Klinksiek, P.E. at (432)-517-0384 for any questions concerning this project. All items must meet 2014 TxDOT Standard Specification.
- 3. Each bid must be accompanied by Bid Bond, certified check, or cashier's check, in the amount of five percent (5 %) of the total amount of the bid submitted and shall be made out and made payable to Glasscock County, as a guarantee that the bidder will enter into a valid contract (including executed bonds) within 10 days after notice of award of contract.
- 4. The successful bidder must furnish a Retainage Bond, a Performance Bond and a Payment Bond for the total amount of each contract and Certificates of Insurance, as called for in these Documents, no later than ten (10) days after being awarded the contract, or the bid bond or check may be retained by the County as liquidated damages.
- 5. The Engineer will return the bonds (or checks) of all except the three lowest responsible bidders. When the Contract is executed, the bonds (or checks) of the two remaining unsuccessful bidders will be returned. The Bid Bond of the successful bidder will be retained until the Contract, Retainage Bond, Payment Bond and Performance Bond have been executed and approved, after which the Bid Bond will be returned.
- 6. Bidders are also expected to understand and comply with legislation concerning payment of the prevailing wage rates. Insurance coverage limits shall conform to the attached Exhibit A.
- 7. All work shown must be completed on or before September 30, 2022. Unless authorized in writing by BJK Engineering, the open season for the application of asphalt is May 1 to September 30. Sunday work will only be allowed with written permission from the engineer.
- 8. Traffic control is of the utmost importance for the safety of the traveling public. The Traffic Control Plan as shown in Project Plans is to be followed or work may be halted by the Engineer. This work is considered subsidiary to the various bid items and will not be paid for directly.
- 9. The quantities in the proposal are approximate. The quantities of work and materials may be increased or decreased as considered necessary to complete the work as planned and contemplated. The bidder agrees that the quantities under this proposal and agreement may be increased to cover additional streets, roads and areas in Glasscock County at the unit prices bid. Work may also be decreased to stay within the County's budget constraints. Change orders (increase or decrease) will not exceed 25% of the original amount bid.

- **10.** The County is exempt from Federal Excise Tax, State Tax and Local Tax. Do not include tax in bid. If it is determined that tax was included in the bid, it will not be included in the tabulation or any awards and will be deleted from subsequent invoices.
- 11. Bids cannot be altered or amended after opening time. Any alterations made before opening time must be signed by the bidder or his agent. No bid can be withdrawn after the opening time without approval of the Commissioners' Court based on reasonable acceptable reason.
- 12. The County will evaluate the bids and make awards for supplies, materials, services, and equipment on the basis of the lowest and best bid, which meet the specifications. The awarded bid will be paid for out of current county funds.
- **13.** The County reserves the right to accept or reject all or any part of any bid and award the bid to best serve the interest of the County.
- 14. By signing and executing this bid, the bidder certifies and represents to the County that bidder has not offered, conferred, or agreed to confer any pecuniary benefit or other thing of value for the receipt of special treatment, advantage, information, recipient's decision, opinion, recommendation, vote or any other exercise of discretion concerning this bid.
- **15.** Bidder further certifies and represents that bidder has not violated any State, Federal, Local Law regulations or ordinance relating to bribery, improper influence, collusion, discrimination or other similar crimes and all items or services provided or delivered under and awarded shall conform hereto.
- **16.** Bid unit price on quantity specified, extend, and show total. In case of errors in extension, unit price shall govern.
- 17. Unless otherwise noted, bid prices must be firm for acceptance 60 days from the opening date of bid.
- **18.** Engineer's estimate for this project is \$ 1,271,273.00

BID SUBMITTED BY:	
NAME & TITLE:	PHONE NO:
SIGNATURE:	

The signed Bidder hereby agrees to do all the work and furnish all the necessary materials, machinery, equipment, superintendence and labor to complete all work on which he bids, having examined the plans and specification with all related documents and the sites of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials and labor, in accordance with the Bid/Contract documents, within the time set forth therein, and at the prices stated below. The below unit prices shall include all materials, machinery, equipment, superintendence, labor, overhead, profit, insurance, etc., to cover the finished and complete job. Unit prices shall be written in ink.

The Bidder hereby certifies that this bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this bid with any other bidder or with any competitor.

The Bidder agrees to commence work under this contract on or before a date to be specified in the Notice to Proceed and to fully complete the project by September 30, 2024, unless an extension is approved in writing by the Engineer. Bidder further agrees to pay liquidated damages in the sum of \$250 for each consecutive calendar day thereafter as provided in the General Conditions.

BID PRICE:

ble Asphalt)

32,034 SY @ _____\$/SY

_____\$/SY _____\$____

Item 316-0002 SEALCOAT COUNTY ROADS (PB Grade 3 Flexible Asphalt)

111,116 SY @ \$/SY

\$_____

Item 316-9999 SEALCOAT HEAVY TRAFFIC CR (PBHT Gr 3 Flex Asphalt)

76,172 SY @ \$/SY

Total of Base Bid Items

Alternate Items:

Item 315-9001 FOG SEAL (CSS-1H)

76,172 SY @_____\$/LS

5_____

\$

\$

Notice To Bidders RFB 202401, Asphalt Surfacing Page 3

Acknowledgement of Addendum

We have received Addendum #1 that corrects bid receiving date and location, engineer's estimate, and bid \$/SY on Item 316-9999 SEALCOAT HEAVY TRAFFIC CR (PBHT Gr 3 Flex Asphalt), replaces Notice to Bidder Sheets 1-3 and adds this page. Item 316-9999 SEALCOAT HEAVY TRAFFIC CR (PBHT Gr 3 Flex Asphalt). Revises Plan Sheets 2 to reflect changes.

SIGNATURE:

EXHIBIT A

- A Contractor shall, at all times during the term hereof, maintain such insurance coverage as may be required by County. All such insurance, including renewals, shall be subject to the approval of County for adequacy of protection and evidence of such coverage shall be furnished to County on Certificates of Insurance indicating such insurance to be in force and effect and providing that it will not be canceled during the performance of Work under this Agreement without thirty (30) calendar days prior written notice to County. Completed Certificates of Insurance shall be filed with County prior to the performance of services hereunder, provided however, that Contractor shall at any time upon request, file duplicate copies of the policies of such insurance with County.
- B If in the judgment of County, prevailing conditions warrant the provision by Contractor of additional liability insurance coverage or coverage which is different in kind, County reserves the right to require the provision by Contractor of an amount of coverage different from the amounts orkind previously required and shall afford written notice of such change in requirements thirty (30) days prior to the date on which the requirements shall take effect. Should the Contractor fail or refuse to satisfy the requirement of changed coverage within thirty (30) days following County's written notice, this Agreement shall be considered terminated on the date that the required change in policy coverage would otherwise take effect.

General Conditions

The following condition shall apply to all insurance policies obtained by Contractor for the purpose of complying with this Agreement:

- 1)<u>Named Insureds:</u> All insurance policies required herein shall be drawn in the name of Contractor, with County, its council members, board and commission members, officials, agents, guests, invitees, consultants and employees named as additional insureds, except on Workers' Compensation coverage.
- 2) <u>Waiver of Subrogation:</u> Contractor shall require its insurance carrier(s), with respect to all insurance policies, to waive all rights of subrogation against County, its council members, board and commission members, officials, agents, guests, invitees, consultants and employees.
- 3) Certificates of Insurance: At or before the time of execution of this Agreement,

Contractor shall furnish County's Risk Manager with certificates of insurance as evidence that all of the policies required herein are in full force and effect and provide the required coverage and limits of insurance. All certificates of insurance shall clearly state that all applicable requirements have been satisfied. The certificates shall provide that any company issuing an insurance policy shall provide to County not less than thirty (30) days advance notice inwriting of cancellation, non-renewal, or material change in the policy of insurance. In addition, Contractor and insurance company shall immediately provide written notice to County's Risk Manager upon receipt of notice of cancellation of any insurance policy, or of a decision to terminate or alter any insurance policy. Certificates of insurance and notices of cancellations, terminations, or alterations shall be furnished to: County Engineer at 3604 Old Colorado CityRd, Big Spring Texas 79720.

- 4) <u>Contractor's Liability:</u> The procurement of such policy of insurance shall not be construed to be a limitation upon Contractor's liability or as a full performance on its part of the indemnification provisions of this Agreement. Contractor's obligations are, notwithstanding any policy of insurance, for the full and total amount 6f any damage, injury, or loss caused by or attributable to its activities conducted at or upon the premises. Failure of Contractor to maintain adequate coverage shall not relieve Contractor of any contractual responsibility or obligation.
- 5) <u>Subcontractors' Insurance:</u> Contractor shall cause each Subcontractor and Sub-Sub-Contractor of Contractor to purchase and maintain insurance of the types and in the amounts specified below. Contractor shall require Subcontractors and Sub- Subcontractors to furnish copies of certificates of insurance to the County Engineer evidencing coverage for each Subcontractor and Sub-Subcontractor.

Types And Amounts Of Insurance Required

Contractor shall obtain and continuously maintain in effect at all times during the term hereof, at Contractor's sole expense, insurance coverage as follows with limits not less than those set forth below:

 <u>Commercial General Liability</u>: This policy shall be occurrence-type policy and shall protect Contractor and additional insureds against all claims arising from bodily injury, sickness, disease or death of any person (other than Contractor's employees) and damage to property of County or others arising out of the act or omission of Contractor or its agents and employees. This policy shall include completed operations, products liability, contractual coverage, broad form property coverage, explosion, collapse, underground, premises/operations, and independent contractors (to remain in force for two years after final payment). Coverage limits shall not be less than:

\$1,000,000.00 General Aggregate
\$1,000,000.00 Products Completed Operations
\$1,000,000.00 Personal & Advertising Injury
\$1,000,000.00 Each Occurrence
\$ 100,000.00 Fire Damage (Any one Fire)

2) <u>Business Automobile Liability:</u> This policy shall protect Contractor and the additional insureds against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles and shall cover operation on and off the premises of all motor vehicles licensed for highway use, whether they are owned, non-owned or hired. Coverage limits shall not be less than:

\$1,000,000.00 Combined Single Limit

3) Workers' Compensation and Employer's Liability: If Contractor hires any employees, Contractor shall maintain Workers' Compensation and Employer's Liability insurance, which shall protect Contractor against all claims under applicable state workers' compensation laws and employer's liability. The insured shall also be protected against claim for injury, disease or death of employees which for any reason, may not fall within the provisions of a workers' compensation law. Coverage shall not be less than:

Statutory Amount	Workers' Compensation
\$ 500,000.00	Employer's Liability, Each Accident Employer's
\$ 500,000.00	Liability, Disease - Each Employee Employer's
\$ 500,000.00	Liability, Disease - Policy Limit

DISCLOSURE OF CERTAIN RELATIONSHIPS

Effective January 1, 2006, Chapter 176 of the Texas Local Government Code requires that any vendor or person considering doing business with a local government entity disclose in the Questionnaire Form CIQ, the vendor or person's affiliation or business relationship that might cause a conflict of interest with a local government entity. By law, this questionnaire must be filed with the County Clerk of Glasscock County no 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. 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.

A copy of the law is available at: https://statutes.capitol.texas.gov/Docs/LG/htm/LG.176.htm

Frequently ask questions are available at: https://www.county.org/TAC/media/TACMedia/Legal%20Publications%20Documents/2019-Disclosure-of-Certain-Business-Relationships.pdf

The forms for reporting are available at: https://www.ethics.state.tx.us/data/forms/conflict/CIQ.pdf

By submitting a response to this request, the vendor represents that it is in compliance with the requirements of Chapter 176 of the Texas Local Government Code.

1 ----- Title Sheet **General Notes Estimated Quantities** 3 -_____ Precinct #1 Map & Quantities 4 ----_____ Precinct #2 Map & Quantities 5 6 -----Precinct #3 Map & Quantities 7 ----- Precinct #4 Map & Quantities 8-19 -----BC (1)-21 Through BC (12)-21 * 20 ----- TCP (SC-1) - 21 *

5/22/2024

Date

GLASSCOCK COUNTY



PLANS OF PROPOSED **COUNTY ROAD IMPROVEMENT**

Project GC 202401

For the Sealcoating of Various County Roads

CONSISTING OF APPLICATION OF ASPHALT, AGGREGATE, &

TRAFFIC CONTROL

84,087 Feet Project Length: Project Length: 15.93 Miles



The standard sheets specifically identified above with an (*) have been selected by me or under my responsible supervision as being applicable to this project.

9 Khaksich Brian J. Klinksiek



Specifications adopted by the Texas Department of Transportation, November 1, 2014 and specification items listed and dated as follows, shall govern on this project:

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> Pro speci

Final Plans	
te Work Began:	
te Work Was Completed:	
te Work Was Accepted:	
al Contract Cost:	
Final Plan Certification	
ject was built according to the plans and	
cifications. These final plans represent the work	

ons. These final plans represent the work done and the quantities shown thereon and on the final estimate are final quantities



Title Sheet

Project #	Precinct	Sheet #
GC 202401	All	1

General Notes

All pages of the bid package must be initialed or signed as indicated for a bid to be considered complete. This package has 4 pages and include the acknowledgment of addendum #1.

All Items reference the Texas Department of Transportation 2014 English Specification Book

Sealed bids for the construction of Asphalt Surfacing (chip seal of approximately 16 miles of county roads) in Glasscock County will be accepted at the Office of the Glasscock County Judge, Glasscock County Courthouse, 117 E. Currie Street Garden City, TX 79739 until 10:00 A.M. on Monday June 17, 2024, at which time the bids will be publicly opened, read aloud and tabulated. These bids will subsequently be considered for award by the Glasscock County Commissioners Court.

In order to qualify to have a bid read the contractor must prove that they have the knowledge and capability to perform the work described herein. Provide the Howard County Road & Bridge (HC R&B) Engineer with a list of personnel, their experience, and references from recent jobs. Traffic control is of the utmost importance for the safety of the traveling public of Howard County. Documentation on traffic control certifications must also be provided. The Engineer will supply to the Auditor a list of all contractors meeting the qualification process before the bid opening. If a contractor has worked for Howard County Road & Bridge within the last 8 years they may request placement on the list pased solely on their previous work without the need for documentation.

Delineate stockpiles located in the right of way with 42" cones at 75 foot on center or as approved in writing by the Engineer. Failure to meet this requirement will impact payment of Material on Hand. Stockpiles should maintain a 7 oot clear zone from the edge of pavement. Stockpile placed on TxDOT right of way must conform to the San Angelo district stockpile procedure to qualify for payment of Material on hand.

The Engineer has not secured stockpile locations, but will assist the contractor in locating locations if needed. Glasscock County is not responsible for cleaning off ROW locations.

Payment for Material on Hand (MOH) will be allowed. Contractor must submit the supplier's invoice to BJK Engineering's office. The engineer will verify quantity in place within the County and check for proper traffic control before submitting the invoice to be paid. Materials so submitted and paid become the property of the County. If MOH s not paid the County is interested in any aggregate left at the end of the project and is willing negotiate a mutually acceptable price for left over aggregate.

Unless authorized in writing by the Howard County Road & Bridge Engineer, the open season for the application of asphalt is June 15 to September 30. Sunday work will only be allowed with written permission from the engineer.

Glasscock County has programed funds from the current fiscal year budget for the completion of this project. The quantities in the proposal are approximate. The quantities of work and materials may be increased or decreased as considered necessary to complete the work as planned and contemplated.

The Contractor should be aware that this a best fit bid for Glasscock County. The Contractor should also be aware that the bid contains an alternate item 315-9001 FOG SEAL (CSS 1-H) and the County requests that the contractor bid the alternate

Item 316-0001 SEALCOAT COUNTY ROADS (PB Grade 4 Flexible Asphalt)

Aggregate will conform to TxDOT Item 302 Type PB Grade 4. Suggested application rate will be between 100 to 110 SY/CY. Adjustment may be made in field with the agreement of the Engineer. Asphalt will conform to TxDOT Item 300.2.B: (AC-20-5Tr or AC-15-P) or Item 300.2.I: A-R Binder. Suggested application rate will be between 0.30 to 0.42 Gal/Sy. Adjustment may be made in field with the agreement of the Engineer

Item 316-0002 SEALCOAT COUNTY ROADS (PB Grade 3 Flexible Asphalt)

Aggregate will conform to TxDOT Item 302 Type PB Grade 3. Suggested application rate will be between 90 to 100 SY/CY. Adjustment may be made in field with the agreement of the Engineer. Asphalt will conform to TxDOT Item 300.2.B: (AC-20-5Tr or AC-15-P) or Item 300.2.I: A-R Binder. Suggested application rate will be between 0.40 to 0.50 Gal/Sy. Adjustment may be made in field with the agreement of the Engineer

Item 316-9999 SEALCOAT HEAVY TRAFFIC COUNTY ROADS (PBHT Grade 3 Flexible Asphalt) Roadways so marked will have a severely reduced asphalt rate to correct flushin / bleeding due to heavy truck traffic.

Aggregate will conform to TxDOT Item 302 Type PB Grade 3. Suggested application rate will be between 90 to 100 SY/CY. Adjustment may be made in field with the agreement of the Engineer. Asphalt will conform to TxDOT Item 300.2.B: (AC-20-5Tr or AC-15-P) or Item 300.2.I: A-R Binder. Suggested application rate will be between 0.30 to 0.40 Gal/Sy. Adjustment may be made in field with the agreement of the Engineer

Item 315-9001 FOG SEAL (CSS 1-H) (50/50 PLANT MIXED)(Alternate)

Fog Seal is intended to maintain aggreagate in the short term for heavy truck traffic roads. Fog seal is to be placed within 2 days of completing the seal. The County expects this to be completed by a subcontractor due to the difference in asphalt.

Asphalt will conform to TxDOT Item 300.2.B: (CSS 1-H)(50/50 PLANT MIX). Suggested application rate will be between 0.12 to 0.15 Gal/Sy. Adjustment may be made in field with the agreement of the Engineer

INTERSECTIONS:

The County maintains an excellent working relationship with the TxDOT Glasscock County Maintenance Section. By agreement with TxDOT, the County will shoot sealcoat up to main lane/shoulder of TxDOT maintained roadways. This is corrective action due to neglect of these areas. It is possible that both agencies will cover the same intersection in the same year. We understand that traffic will have turning motion at those locations, however it is the engineer's intention to shoot the intersections and quantities were included as noted. Therefore a \$500.00 penalty will be assessed along with removal of intersection quantities for each intersection not sealcoated.

Engineer's Estimate:

Howard County Road & Bridge Engineer's estimate is \$ 1,271,273

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General Notes

Project #	Precinct	Sheet #
GC 202401	All	2

	E	Estimated Length C	uantities	E	stimated Cost			
	Alternate	316-0001	316-0002	316-9999				
	315-9001	SEALCOAT COUNTY	SEALCOAT COUNTY	SEALCOAT HEAVY	Longth of Soalcoated	roadways		
Location	FOG SEAL (CSS-1H)	ROADS (PB Grade 4	ROADS (PB Grade 3	TRAFFIC CR (PBHT	PBHT			
		Flexible Asphalt)	Flexible Asphalt)	Gr 3 Flex Asphalt)				
	(SY)	(SY)	(SY)	(SY)	(Feet)	(Miles)		
Precinct #1			77,327		29,074	5.51	\$	386,635
Precinct #2			33,839		12,088	2.29	\$	169,195
Precinct #3		32,034			16,575	3.14	\$	144,153
Precinct #4	76,172			76,172	26,350	4.99	\$	571,290
Total	76,172	32,034	111,166	76,172	84,087	15.93	\$	1,271,273.00



TYPICAL INTERSECTION DETAIL



Map #	Туре	Road	Start	Stop	Length	Width	Widen SY
P1-1	PB GR-3	Seidenberger Rd	SH 137	FM 3093	21,122	25	50
P1-2	PB GR-3	CR175	Seidenberger Rd	End of Pavement	7,952	21	50
Precinct #	1 Total				29,074		



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	77,327			
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		Precinct #	#1 Ma	ap &
		Quan	lulles	
		Project #	Precinct	Sheet #
_		GC 202401	All	4

Map #	Туре	Road	Start	Stop	Length	Width	Widen S
P2-1	PB GR-3	CR 290	RM 33	East 1000 Ft	1,000	26	7
P2-2	PB GR-3	CR 280	RM 33	East 11088 FT	11,088	25	7
Precinct #	1 Total				12,088		



v	Oty (SV)	No	ites	
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		Proiect #	Precinct	Sheet #
		GC 202401	All	5
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Map #	Tuno	Pood	Start	Ston	Longth	\\/idth	Widon SV	Oty (SV) Notos
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P3-1	PB GR-4	Reed Rd	Elowers Bd	End of Pavement	2,400	10	12	6 552 Padii @ Elowers
P3-3	PB GR-4	Flowers Rd		End of Pavement	1150	10	50	2 478 Badii @ US 87 (See Typ TyDOT Detail)
P3-4	PB GR-4	Tonn Rd	Allen Rd	End of Pavement	6 695	17	25	12 671 Radii @ Allen & Reed
P3-5	PB GR-4	Sisson Rd	Allen Rd	End of Pavement	2 980	16	25	5 323 Badii @ Allen & Reed
13.5					2,500	10	25	
recinct #	#1 Total	1			16,575			32,034
								Sheet Notes
			P3-1	P3-2 P3-5 P3-3	P3-4			BRIAN J. KLINKSIEK 96664 96664 Sol Consed Sol Consed So
								<u>Buing</u> <u>Alhakich</u> , p. BRAN J. KLINKSIEK
								©2024 BJK Engineering Glasscock County

Precinct #3 Map &

Quantities

Project # GC 202401 Precinct Sheet #

6

All



Map #	Туре	Road	Start	Stop	Length	Width	Widen SY	Qty (SY)	Notes
P4-1	PBHT GR3	CR 490	SH 137	26,350 Feet to Curve	26,350	26	50	76,172	Radii @ SH137 (See Typ TxDOT Detail)
Precinct #	1 Total				26,350			76,172	
									Sheet Notes
	Glass							B	BRIAN J. KLINKSIEK 96664 96664 96664 5-22-2024 Date 5-22-2024 Date Classcock county Precinct #4 Map & Quantities Project # Precinct Sheet # GC 202401 All 7



BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- The Barricade and Construction Standard Sheets (BC sheets) are intended 1. 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).
- The development and design of the Traffic Control Plan (TCP) is the 2. responsibility of the Engineer.
- 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.
- 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.
- 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.
- The temporary traffic control devices shown in the illustrations of the 9. BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
- 10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown ON BC(2). THE OBEY WARNING SIGNS STATE LAW sign. STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES. CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, ČSJ limit signs are not required.
- 11. 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 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.
- 2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

- 1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
- 2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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





TYPICAL	CONSTRUCTION	WARNING	SIGN	SIZE	AND	SPACING 1,5,6

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway			
CW20 ⁴ CW21 CW22 CW23 CW25	48" × 48"	48" × 48"			
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" × 36"	48" × 48"			
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" × 48"	48" × 48"			

SF	PACING
Posted Speed	Sign∆ Spacing "X"
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500 ²
60	600 ²
65	700 ²
70	800 ²
75	900 ²
80	1000 ²
*	* 3

★ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

 Δ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

- 1. Special or larger size signs may be used as necessary.
- 2. Distance between signs should be increased as required to have 1500 feet advance warning.
- 3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
- 5. Only diamond shaped warning sign sizes are indicated.

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6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

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	Π	Type 3 Barr	icade				
	000 Channelizing Devices						
	-	Sign					
]	x	See Typical Warning Sig Spacing cho TMUTCD for spacing rec	Construc In Size ar Irt or the sign Juirements	ction nd e			
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barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered. (See Removing or Covering on BC(4)).

- B. Flagger stationed next to sign.
- C. Portable changeable message sign (PCMS).
- D. Low-power (drone) radar transmitter.
- E. Speed monitor trailers or signs.
- 9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

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BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT BC(3)-21										
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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
- guide the traveling public safely through the work zone.
- the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
- the Engineer can verify the correct procedures are being followed.
- damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- for identification shall be 1 inch.

The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

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

- regard to crashworthiness and duration of work requirements.
- a. Long-term stationary work that occupies a location more than 3 days.
- 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 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.

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

- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave. centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

- 1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway 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.
- 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.
- 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

- 1. 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

1. 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.

to Item 502.

All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and

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 Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZICD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a guestion regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so

The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or

Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used

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

Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting

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

Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

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 CWZICD lists each substrate that can be used on the different types and models of sign supports. 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"

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. 3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of

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

When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the

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st Texas Department of Transportation Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

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PORTABLE CHANGEABLE MESSAGE SIGNS

- 1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- Messages on PCMS should contain no more than 8 words (about four to 2. eight characters per word), not including simple words such as "TO," "FOR, " "AT, " etc.
- 3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
- 4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) 5. along with the number when referring to a roadway.
- When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- The message term "WEEKEND" should be used only if the work is to 7. start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
- The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
- Do not use the word "Danger" in message.
 Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- 13. Do not display messages that scroll horizontally or vertically across the face of the sign.
- 14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together, Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
- 15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
- 16. Each line of text should be centered on the message board rather than left or right justified.
- 17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Cannot	CANT	North	N
Center	CTR	Nor thbound	(route) N
Construction Abead	CONST AHD	Parking	PKING
CROSSING	YINC	Road	RD
Detour Route		Right Lone	
		Saturday	SAI
East		Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency		Slippery	SLIP
Emergency Vehicle		South	5
Entrance Enter		Southbound	(route) S
Erress Lone	EXP IN	Speed	SPD
Expression	EXPWY	Street	21
XXXX Feet	XXXX FT		SUN
Fog Abead		Terephone	PHUNE
Freewoy	FRWY FWY	Tempor or y	THUDC
Freeway Blocked	FWY BLKD	Thursday	
Friday	FRI	Troff:o	
Hazardous Driving	HAZ DRIVING	Indific	IRAF
Hazardous Material	HAZMAT	Trovelers	TRVLRS
High-Occupancy	HOV	Tuesday	TUES
Vehicle		lime Minutes	TIME MIN
Highway	HWY	Upper Level	UPR LEVEL
Hour (s)	HR. HRS	Vehicles (s)	VEH, VEHS
Information	INFO	Warning	WARN
It is	ITS	Wednesday	WED
Junction	JCT	Weight Limit	
Left	I F T	West	W
Left Lone		westbound	(route) W
	IN CLOSED	Wet Povement	WET PVMT
Lower Level		Will Not	WONT
Maintenance	MAINT		

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES (The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED	* LANES SHIFT in Phase	1 must be used with	STAY IN LANE in Phas

Other Cond	lition List
ROADWORK XXX FT	ROAD REPAIRS XXXX FT
FLAGGER XXXX FT	LANE NARROWS XXXX FT
RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
DETOUR X MILE	ROUGH ROAD XXXX FT
ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
BUMP XXXX FT	US XXX EXIT X MILES
TRAFFIC SIGNAL XXXX FT	L ANE S SH I F T

Action to Take/Effect on Travel List MERGE FORM RIGHT X LINES RIGHT DETOUR USE XXXXX NEXT RD EXIT X EXITS USE USE EXIT EXIT XXX I-XX NORTH STAY ON USE US XXX I-XX F SOUTH TO I-XX N TRUCKS WATCH USE FOR US XXX N TRUCKS WATCH EXPECT FOR DELAYS TRUCKS PREPARE EXPECT DELAYS то STOP REDUCE END SPEED SHOULDER XXX FT USE WATCH USE OTHER FOR ROUTES WORKERS STAY ĪΝ LANE

APPLICATION GUIDELINES

- 1. Only 1 or 2 phases are to be used on a PCMS. 2. The 1st phase (or both) should be selected from the
- "Road/Lane/Ramp Closure List" and the "Other Condition List".
- 3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- 4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
- 6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

- 1. The words RIGHT, LEFT and ALL can be interchanged as appropriate. 2. Roadway designations IH, US, SH, FM and LP can be interchanged as
- appropriate.
- be interchanged as appropriate.
- 4. Highway names and numbers replaced as appropriate.
- 5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- 6. AHEAD may be used instead of distances if necessary. 7. FT and MI. MILE and MILES interchanged as appropriate.
- 8. AT. BEFORE and PAST interchanged as needed.
- 9. Distances or AHEAD can be eliminated from the message if a
- location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC. THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT FACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

- 1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
- 2. When symbol signs, such as the "Flagger Symbol" (CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above
- When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
- 4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the some size arrow.

Roadway

Phase 2: Possible Component Lists



* * See Application Guidelines Note 6.

XX AM

EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can















GENERAL NOTES

- 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).
- 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.
- 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.

GENERAL DESIGN REQUIREMENTS

- Pre-qualified plastic drums shall meet the following requirements:
- 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.
- 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.
- 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.
- 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.

RETROREFLECTIVE SHEETING

- 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 or Type B 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.

BALLAST

- 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 CWZTCD 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,





DETECTABLE PEDESTRIAN BARRICADES

- 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. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
 Where pedestrians with visual disabilities normally use the
- Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
- 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 (ADAAG)" and should not be used as a control for pedestrian movements.
- Warning lights shall not be attached to detectable pedestrian barricades.
- Detectable pedestrian barricades should use 8" nominal barricade roils 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.

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(Maximum Sign Dimension)

Chevron CW1-8, Opposing Traffic Lane

Divider, Driveway sign D70a, Keep Right

R4 series or other signs as approved

by Engineer



12" x 24" Vertical Panel mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- 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_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
- Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- 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.
- 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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See Ballast

Note 3



- 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 out side 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_{FL} or Type C_{FL} 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). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- 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 Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
- 2. Water ballosted 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. 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. 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

or may be mounted on drums

4. The OTLD shall be orange with a black nonreflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300. unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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.
- 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	Formula	D Tap	Minimur esirab er Len X X	n Ie gths	Suggested Maximum Spacing of Channelizing Devices			
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{CO}$	150'	1651	180'	30′	60′		
35		205'	225′	245'	35′	70′		
40	60	265'	295′	320'	40′	80′		
45		450'	495′	540'	45′	90′		
50		500'	550'	600'	50 <i>'</i>	100′		
55	1 = WS	550'	605′	660 <i>′</i>	55 <i>'</i>	110′		
60	2-43	600 <i>'</i>	660 <i>'</i>	720'	60 <i>'</i>	120′		
65		650′	715′	780′	65 <i>'</i>	130'		
70		700′	770'	840′	70'	140'		
75		750'	8251	900'	75′	150′		
80		8001	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	
Texas Department of Transportation	Traffic Safety Division Standard
BARRICADE AND CONSTR	UCTION

CHANNELIZING DEVICES

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WORK ZONE PAVEMENT MARKINGS

GENERAL

- 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.
- 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 povement 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.
- 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).
- 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

- Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
- 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.
- 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.
- 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

- 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.
- 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.
- 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.
- 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.
- 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 SECU TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARK TABS TO THE PAVEMENT SURFACE

- Temporary flexible-reflective roadway marker tabs used as guiden shall meet the requirements of DMS-8242.
- Tabs detailed on this sheet are to be inspected and accepted by Engineer or designated representative. Sampling and testing is m normally required, however at the option of the Engineer, either or "B" below may be imposed to assure quality before placement or roadway.
 - A. Select five (5) or more tabs at random from each lot or sh and submit to the Construction Division, Materials and Pav Section to determine specification compliance.
 - B. Select five (5) tabs and perform the following test. Affix (5) tabs at 24 inch intervals on an asphaltic pavement in straight line. Using a medium size passenger vehicle or pir run over the markers with the front and rear tires at a sp of 35 to 40 miles per hour, four (4) times in each direction more than one (1) out of the five (5) reflective surfaces 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. Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARK

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

Guidemarks shall be designated as:

YELLOW - (two amber reflective surfaces with yellow body). WHITE - (one silver reflective surface with white body).

	DAVEMENT MARKERS (REELECTORIZED)	DMS-4200
		DMS-4300
		DMS-6100
IEW		DMS-6130
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	TENDODADY DEMOVADLE DEFEADDLCATED	DM5-8240
	PAVEMENT MARKINGS	DMS-8241
∱ /e_pod	ROADWAY MARKER TABS	DMS-8242
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Trailer Mounted Flashing Arrow Board					ed w Board	M	Portable Message			
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,	т	Minimum Sugge Desirable Sp Taper Lengths Cho X X		Suggested Spacin Channel Dev	d Maximum ng of lizing ices	Minimum Sign Spacing	Suggested Longitudinal Buffer Space	Stopping Sight Distance		
	10 Offs	, set	11' Offset	12' Offset	On a Taper	On a Tangent	"X"	"B"		
2	150	0'	1651	180′	30′	60 <i>'</i>	120'	90'	200′	
-	205	5′	225′	245′	35′	70 <i>'</i>	160'	120′	250'	
	265	5′	295'	320'	40'	80 <i>'</i>	240'	155'	305′	
	450	0,	495′	540′	45′	90′	320'	1951	360′	
	500	٦,	550'	600′	50'	100'	400'	240′	425′	
	550	0,	6051	660'	55'	110′	500′	295′	495′	
	600	٥,	660'	720'	60′	120′	600′	350′	570'	
	650	0'	715'	780′	65′	130'	700′	410'	645′	
	700	о'	770'	840′	70'	140′	800′	475′	730′	
	750	٦,	8251	9001	75'	150′	900′	540′	820'	

* Conventional Roads Only

<u>WS</u> 60

XX Taper lengths have been rounded off.

L = Length of Taper (FT) W = Width of Offset (FT) S = Posted Speed (MPH)

TYPICAL USAGE								
MOBILE	SHORT SHORT TERM INTERMEDIATE LONG TER DURATION STATIONARY TERM STATIONARY STATIONAR							
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1. Flags attached to signs where shown are REQUIRED.

2. All traffic control devices illustrated are REQUIRED, except: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.

3. Sign spacing may be increased or an additional ROAD WORK AHEAD (CW20-1D) sign may be used if advance warning ahead of the flagger sign is less than 1500 feet.

Flaggers should use two-way radios or other methods of communication at all times for traffic control coordination.

5. Flaggers should use 24" STOP (CW20-8) / SLOW (CW20-8aT) paddles to control traffic. Flags should be limited to emergency situations.

6. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).

7. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personnel (flaggers) at the intersection.

8. Temporary rumble strips are not required on seal coat operations.

9. The pilot car is used to guide vehicles through traffic control zone. The pilot car shall have an identification name displayed and PILOT CAR, FOLLOW ME (G20-4) sign or message board mounted in a conspicuous position on rear.

	SHEET 1 OF 8								
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ding traffic, y the Engineer.	TRAF SEAL ON	TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS ONE-LANE TWO-WAY							
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