

**CONTRACT DOCUMENTS
&
TECHNICAL SPECIFICATIONS
FOR**

**BID -17-17
2017 SANTA GERTRUDIS AVENUE STREET IMPROVEMENTS
FOR
CITY OF KINGSVILLE, TEXAS**

City Manager

Jesus A Garza

Mayor

Sam Fugate

Commissioner(s)

Alfonso R Garcia

Noel Pena

Arturo Pecos

Edna Lopez

JULY 2017

Prepared by:



Engineering Department
400 W. King Avenue
Kingsville, Texas 78363
(361) 595-8007

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CONTRACT DOCUMENTS

ADVERTISEMENT AND INVITATION FOR BIDS

The City of Kingsville, Texas will receive sealed bids for **BID 17-17 “2017 Santa Gertrudis Avenue Street Improvements”** until **2:00 p.m. on Tuesday, August 8, 2017**. Sealed proposals will be addressed to, Charley Sosa, Purchasing Manager, City of Kingsville, 400 W. King Ave., Kingsville, TX 78363. The bids will be publicly opened and read aloud immediately thereafter. A Pre-Bid Conference will be held on **Wednesday, July 26, 2017 at 9:00 a.m.** at the Kingsville City Hall Community Room, 400 W. King Ave., Kingsville, TX 78363 with an on-site visit being a portion of the proceedings.

Major items of work include the following:

This project consists of street improvements that include road reconstruction, lime treated subgrade, flexible base material, seal coat, and hot mix asphalt pavement in accordance with the contract documents, technical specifications, and plans.

Bid/Contract Documents, including Drawings and Technical Specifications can be found on the City of Kingsville website at the following web address.

<http://www.cityofkingsville.com/departments/purchasing/rfpbid-openings-fy-2017/>

A bid bond by an acceptable surety, in the amount of 5% of the bid amount shall be submitted with each bid.

Attention is called to the fact that not less than, the federally determined prevailing (Davis-Bacon and Related Acts) wage rate, as issued by the Texas Department of Agriculture Office of Rural Affairs and contained in the contract documents, must be paid on this project. In addition, the successful bidder must ensure that employees and applicants for employment are not discriminated against because of race, color, religion, sex, sexual identity, gender identity, or national origin.

The City of Kingsville is an Affirmative Action/Equal Opportunity Employer that reserves the right to reject any and all bids and/ or waive any formalities in the bidding.

Bids may be held by the City for a period not to exceed 30 days from the date of the bid opening for the purpose of reviewing the bids and investigating the bidder's qualifications prior to the contract award.

City of Kingsville, Texas
Jesus A Garza, City Manager

INSTRUCTION TO BIDDERS

Use of Separate Bid Forms:

These contract documents include a complete set of bid and contract forms which are for the convenience of the bidders and are not to be detached from the contract document, completed or executed. **Separate bid forms are provided and are to be used for preparation of the bid.**

Interpretations or Addenda:

No oral interpretations will be made to any bidder. Each request for an interpretation shall be made in writing to the City of Kingsville Engineering Department no less than four (4) days prior to the bid opening. Each interpretation made will be in the form of an Addendum to the contract documents and will be distributed to all parties holding contract documents no less than three (3) days prior to the bid opening. It is, however, the bidder's responsibility to make inquiry as to any addenda issued. All such addenda shall become part of the contract documents and all bidders shall be bound by such addenda, whether or not received by the bidders.

Inspection of Site:

Each bidder should visit the site of the proposed work and should become acquainted with the existing conditions and facilities, the difficulties and restrictions pertaining to the performance of the contract. **A Pre-Bid conference will be held on Wednesday, July 26, 2017, at 9:00 a.m. at the City Hall Community Room, 400 W. King Ave., Kingsville, Texas 78363 with an on-site visit being a portion of the proceedings.** The bidder should thoroughly examine and become familiar with the drawings, technical specifications and all other contract documents. The contractor by the execution of the contract shall in no way be relieved of any obligation under it due to failure to receive or examine any form or legal document or to visit the site or the conditions existing at the site. The City will be justified in rejecting any claim based on lack of inspection of the site prior to the bid.

Alternate Bid Items:

Alternate bids or bid items will be considered as shown in the Bid Proposal:

1. Deductive Alternative No. 1
 - a. Deductive Alternative to have the Contractor install a Geo Grid base reinforcement in lieu of lime treated subgrade.
2. Deductive Alternative No. 2
 - a. Deductive Alternative to have the City of Kingsville pay for base bid materials directly from the supplier. The contractor will still provide labor and installation.

Bids:

- A. All bids must be submitted on the forms provided and are subject to all requirements of the Contract Documents, including the Drawings.
- B. All bids must be regular in every respect and no interlineation, excisions or special conditions may be made or included by the bidder.
- C. Bid documents, including the bid, the bid bond, and the statement of bidder's qualifications shall be sealed in an envelope and clearly labeled with the words "Bid Documents", the project number, name of bidder and the date and time of bid opening.
- D. The City may consider as irregular any bid on which there is an alteration of or departure from the bid form and, at its option, may reject any irregular bid.

- E. If a contract is awarded, it will be awarded to a responsible bidder on the basis of the lowest/best bid and the selected alternate bid items, if any. The contract will require the completion of the work in accordance with the contract documents.
- F. **Contractor must bid the following, Base Bid, Deductive Alternative No. 1, and Deductive Alternative No. 2 in order for the bid proposal to be considered a Responsive Bid.**

Bid Modification Prior to Bid Opening:

- A. Any bidder may modify his bid by telegraphic communication at any time prior to the scheduled closing time for receipt of bids, provided such telegraphic communication is received by the City prior to the closing time, and provided further, the City is satisfied that a written confirmation of the telegraphic modification over the signature of the bidder was mailed prior to the closing time. The telegraphic communication should not reveal the bid price but should provide the addition, subtractions or other modifications so that the final prices or terms will not be known by the Owner until the sealed bid is open. If written confirmation is not received within two (2) days from the closing time, no consideration will be given to the telegraphic communication.
- B. Likewise, any bidder may modify a bid by submitting a supplemental bid in person prior to the scheduled closing time for receipt of bids. Such supplemental bid should mention only additions or subtractions to the original bid so as to not reveal the final prices or terms to the City until the sealed bid is open.

Bid Bond:

- A. A bid bond in the amount of 5% of the bid issued by an acceptable surety shall be submitted with each bid
- B. The bid bond, or its comparable, will be returned to the bidder as soon as practical after the opening of the bids.

Statement of Bidder's Qualifications:

Each bidder shall submit on the form furnished for that purpose a statement of the bidder's qualifications. The City shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform his obligations under the contract, and the bidder shall furnish the City all such information and data for this purpose as it may request. The right is reserved to reject any bid where an investigation of the available data does not satisfy the City that the bidder is qualified to carry out properly the terms of the contract.

Unit Price:

The unit price for each of the several items in the bid shall include its pro rata share of overhead so that the sum of the products obtained by multiplying the quantity for each item by the unit price bid represents the total bid. Any bid not conforming to this requirement may be rejected as informal. Special attention is drawn to this condition, as the unit prices will be used to determine the amount of any change orders resulting from an increase or decrease in quantities.

Corrections:

Erasures or other corrections in the bid must be noted over the signature of the bidder.

Time for Receiving Bids:

Bids received prior to the advertised hour of opening shall be kept securely sealed. The officer appointed to open the bids shall decide when the specified time has arrived and no bid received thereafter will be considered; except that when a bid arrives by mail after the time fixed for opening, but before the reading of all other bids is completed, and it is shown to the satisfaction of the City that the late arrival of the bid was solely due to delay in the mail for which the bidder was not responsible, such bid will be received and considered.

Opening of Bids:

The City shall, at the time and place fixed for the opening of bids, open each bid and publicly read it aloud, irrespective of any irregularities therein. Bidders and other interested individuals may be present.

Withdrawal of Bids:

Bidder may withdraw the bid before the time fixed for the opening of bids, by communicating his purpose in writing to the locality. Upon receipt of such notice, the unopened bid will be returned to the bidder. The bid guaranty of any bidder withdrawing his bid will be returned promptly.

Award of Contract/Rejection of Bids:

- A. The contract will be awarded to the responsive, responsible Bidder submitting a bid that provides goods or services at the best value for the City. The bidder selected will be notified at the earliest possible date. The City reserves the right to reject any or all bids and to waive any informality in bids received where such rejection or waiver is in its interest.
- B. The City reserves the right to consider as unqualified to do the work any bidder who does not habitually perform with his own forces the major portions of the work involved in construction of the improvements embraced in this contract.

Execution of Agreement/Performance and Payment Bonds:

- A. Performance and Payment Bonds are required of all Prime Contractors which enter into a formal contract in excess of \$50,000 with the State, any department, board, agency, municipality, county, school district, or any division or subdivision thereof, to obtain a Payment Bond in the amount of the contract before commencing with work and a performance bond for public works contracts in excess of \$100,000.
- B. The failure of the successful bidder to execute the agreement and supply the required bonds within then (10) days after the prescribed forms are presented for signature, or within such extended period as the City may grant, shall constitute a default and the City may, at its option either award the contract to the next bidder to who provides goods or services at the best value for the City, or re-advertise for bids. In either case, the City may charge against the bidder the difference between the amount of the bid, and the amount for which a contract is subsequently executed irrespective of whether this difference exceeds the amount of the bid bond. If a more favorable bid is received through re-advertisement, the defaulting bidder shall have no claim against the City for a refund.

Equal Employment Opportunity:

Attention is called to the requirements for ensuring that employees and applicants for employment are not discriminated against because of their race, color, creed, sex, or national origin.

BID PROPOSAL

Proposal of _____

a * _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of Texas to City of Kingsville, Texas (hereinafter called "OWNER.")

BIDDER hereby proposes to perform all WORK for the construction of the "2017 Santa Gertrudis Avenue Street Improvements" in accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to its own organization, 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.

BIDDER hereby 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 within 180 consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of \$ 200.00 for each consecutive calendar day thereafter as provided in the General Conditions.

BIDDER acknowledges receipt of the following ADDENDUM:

*Insert "a corporation", "a partnership", or "an Individual" as applicable.

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following amount:

BID SCHEDULE

ITEM	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
BASE BID – SANTA GERTRUDIS AVENUE (6TH ST TO 14TH ST)					
A-1)	14,600	SY	LIME TREAT SUBGRADE (3% LIME, 6") per plans and specifications, complete in place per square yard.	_____	_____
A-2)	6,350	TON	8" LIMESTONE FLEXIBLE BASE (TYPE A, GRADE 1) per plans and specifications, complete in place per square yard.	_____	_____
A-3)	2,200	GAL	PRIME COAT (MC-30) per plans and specifications, complete in place per square yard.	_____	_____
A-4)	3,700	GAL	SINGLE COURSE SEAL (AC-5) per plans and specifications, complete in place per square yard.	_____	_____
A-5)	170	TON	SINGLE COURSE SEAL (#4 GRADE GRAVEL) per plans and specifications, complete in place per square yard.	_____	_____
A-6)	1,625	TON	2" HMAC PAVEMENT (TYPE D) per plans and specifications, complete in place per ton.	_____	_____
A-7)	6,150	LF	REFLECTORIZED PAVEMENT MARKING (TY 1, W, 4", SLD, 090 MIL) per plans and specifications, complete in place per linear foot.	_____	_____

BID SCHEDULE (CONTINUED)

ITEM	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
A-8)	6,150	LF	REFLECTORIZED PAVEMENT MARKING (TY 1, Y, 4", SLD, 090 MIL) per plans and specifications, complete in place per linear foot.	_____	_____
A-9)	460	LF	PREFABRICATED PAVEMENT MARKING (TY C, W, 12", SLD) per plans and specifications, complete in place per linear foot.	_____	_____
A-10)	100	LF	PREFABRICATED PAVEMENT MARKING (TY C, W, 24", SLD) per plans and specifications, complete in place per linear foot.	_____	_____
A-11)	180	EA	REFLECTORIZED PAVEMENT MARKER (TY II-A-A) per plans and specifications, complete in place per each.	_____	_____
TOTAL BASE BID – (ITEMS A-1 – A-11)				\$	_____

BID SCHEDULE (CONTINUED)

ITEM	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
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ADDITIVE/DEDUCTIVE ALTERNATIVES

(Note: Only difference in price between Bid Items shall be entered below. If the difference in price is lower than the Bid Items price, a negative value should be entered for that item.)

DEDUCTIVE ALTERNATIVE No. 1

DEDUCTIVE ALTERNATIVE – SANTA GERTRUDIS AVENUE (6TH ST TO 14TH ST)

B-1)	14,600	SY	GEO-GRID BASE REINFORCEMENT (IN LIEU OF LIME TREAT SUBGRADE) per plans and specifications, complete in place per square yard.	_____	_____
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TOTAL DEDUCTIVE ALTERNATIVE No. 1 (ITEMS B-1) \$ _____

DEDUCTIVE ALTERNATIVE No. 2

DEDUCTIVE ALTERNATIVE – SANTA GERTRUDIS AVENUE (6TH ST TO 14TH ST)

C-1)	6,350	TON	8” LIMESTONE FLEXIBLE BASE (LABOR ONLY) (TYPE A, GRADE 1) per plans and specifications, complete in place per square yard.	_____	_____
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C-2)	2,200	GAL	PRIME COAT (LABOR ONLY) (MC-30) per plans and specifications, complete in place per square yard.	_____	_____
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C-3)	3,700	GAL	SINGLE COURSE SEAL (LABOR ONLY) (AC5) per plans and specifications, complete in place per square yard.	_____	_____
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BID SCHEDULE (CONTINUED)

ITEM	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
C-4)	170	TON	SINGLE COURSE SEAL (LABOR ONLY) (#4 ROCK) per plans and specifications, complete in place per square yard.	_____	_____
C-5)	1,625	TON	2” HMAC PAVEMENT (LABOR ONLY) (TYPE D) per plans and specifications, complete in place per ton.	_____	_____

TOTAL DEDUCTIVE ALTERNATIVE No. 2 (ITEMS C-1 – C5) \$ _____

TOTAL BASE BID \$ _____

TOTAL DEDUCTIVE ALTERNATIVE No. 1 \$ _____

TOTAL DEDUCTIVE ALTERNATIVE No. 2 \$ _____

Respectfully submitted:

Signature

Address

Title

Date

License number (if applicable)

Date

NONCOLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____)

County of _____)

_____, being first duly sworn, deposes and says that:

(1) He is _____ of _____, the Bidder that has submitted the attached Bid;

(2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

(3) Such Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with another Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix an overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the _____ (Local Public Agency) or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

Title

Subscribed and sworn to me this _____ day of _____.

By: _____
Notary Public

My commission expires _____

CONTRACTOR CERTIFICATIONS

U.S. Department of Housing and Urban Development

CERTIFICATION OF BIDDER REGARDING CIVIL RIGHTS LAWS AND REGULATIONS

INSTRUCTIONS

CERTIFICATION OF BIDDER REGARDING Executive Order 11246 and Federal Laws Requiring Federal Contractor to adopt and abide by equal employment opportunity and affirmative action in their hiring, firing, and promotion practices. This includes practices related to race, color, gender, religion, national origin, disability, and veterans' rights.

NAME AND ADDRESS OF BIDDER (include ZIP Code)

CERTIFICATION BY BIDDER

Bidder has participated in a previous contract or subcontract subject to Civil Rights Laws and Regulations.

Yes

No

The undersigned hereby certifies that:

- The Provision of Local Training, Employment, and Business Opportunities clause (Section 3 provision) is included in the Contract. A written Section 3 plan (Local Opportunity Plan) was prepared and submitted as part of the bid proceedings (if bid equals or exceeds \$100,000).
- The Equal Opportunity clause is included in the Contract (if bid equals or exceeds \$10,000).

Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended?

Yes

No

NAME AND TITLE OF SIGNER (Please type)

SIGNATURE

DATE

**STANDARD FORM OF AGREEMENT
BETWEEN CITY AND CONTRACTOR
ON THE BASIS OF A STIPULATED PRICE**

THIS AGREEMENT is dated s of the _____ day of _____ in the year _____ by and between the City of Kingsville, 400 W. King Avenue, Kingsville, Texas 78363 (hereinafter called CITY) and _____ (hereinafter called CONTRACTOR).

CITY and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

Article 1. WORK:

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

“City of Kingsville – BID 17-17 2017 SANTA GERTRUDIS AVENUE STREET IMPROVEMENTS”

Article 2. ENGINEER:

The Project has been designed by:



City of Kingsville - Engineering Department
400 W. King Avenue
Kingsville, Texas 78363
(361) 595-8007

Who is hereinafter called ENGINEER and who is to act as CITY’S representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

Article 3. CONTRACT TIME

- 3.1 The Work will be completed and ready for final payment in accordance with the General Conditions within **180** calendar days from the date when the Contract Time commences to run.
- 3.2 Liquidated Damages. CITY and CONTRACTOR recognize that time is of the essence of this Agreement and that CITY will suffer financial loss if the Work is not completed within the time specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with the General Conditions.

They also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by CITY if the Work is not completed on time. Accordingly, instead of requiring any such proof, CITY and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay CITY two hundred & 00/100 dollars (\$200.00) for each calendar day that expires after the time specified in Article 3.1 of this Agreement for Substantial Completion until the Work is substantially complete. After Substantial Completion if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by CITY, CONTRACTOR shall pay CITY two hundred dollars (\$200.00) for each calendar day that expires after the time specified in Article 3.1 of this Agreement for completion and readiness for final payment.

Article 4. CONTRACT PRICE:

- 4.1 CITY shall pay CONTRACTOR for completion of Work in accordance with the Contract Documents in current funds as follows: Per Contractors Proposal dated _____ in the total base bid amount of _____, as attached and a part of this contract document.

Article 5. PAYMENT PROCEDURES:

CONTRACTOR shall submit Applications for Payment in accordance with the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

Article 6. INTEREST:

All moneys not paid when due as provided in the General Conditions shall bear interest at the maximum rate allowed by law at the place of the Project.

Article 7. CONTRACTORS REPRESENTATIONS:

In order to induce CITY to enter into this Agreement CONTRACTOR makes the following representations:

- 7.1 CONTRACTOR has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
- 7.2 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance of furnishing of the Work at the Contract Price, within the Contract Time and in accordance with other terms and conditions of the Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigation, explorations, tests reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.
- 7.3 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said Underground Facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the Contract Price, within the Contract Time, and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of the General and Special Conditions.
- 7.4 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- 7.5 CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

Article 8. CONTRACT DOCUMENTS:

The Contract Documents which comprise the entire agreement between CITY and CONTRACTOR concerning the Work consists of the following:

8.1 A bound set of executed documents and specifications titled:

**CONTRACT DOCUMENTS
&
TECHNICAL SPECIFICATIONS
FOR
BID -17-17
2017 SANTA GERTRUDIS AVENUE STREET IMPROVEMENTS
FOR
CITY OF KINGSVILLE, TEXAS**

City Manager

Jesus A Garza

Mayor

Sam Fugate

Commissioner(s)

Alfonso R Garcia

Noel Pena

Arturo Pecos

Edna Lopez

JULY 2017

Prepared by:



Engineering Department
400 W. King Avenue
Kingsville, Texas 78363
(361) 595-8007

together with all of the items or sections listed in the Table of Contents thereof.

8.2 A Notice of Award consisting of one page.

8.3 A Notice to Proceed with Construction consisting of one page which shall be executed at a later date.

8.4 A set of drawings consisting of FOURTY FOUR (44) sheets titled:

Description

1. COVER SHEET
2. EXISTING TYPICAL SECTIONS
3. PROPOSED TYPICAL SECTIONS – BASE BID
4. PROPOSED TYPICAL SECTIONS – ALTERNATE BID
- 5-9. GENERAL NOTES & SPECIFICATIONS
10. QUANTITY SHEET
11. SUMMARY OF MANHOLE & VALVE ADJUSTMENTS
12. SUMMARY OF PAVEMENT MARKINGS
- 13-15. TRAFFIC CONTROL PLAN
16. PLAN & PROFILE – STA 0+00 TO STA 6+00
17. PLAN & PROFILE – STA 6+00 TO STA 12+00
18. PLAN & PROFILE – STA 12+00 TO STA 18+00
19. PLAN & PROFILE – STA 18+00 TO STA 24+00
20. PLAN & PROFILE – STA 24+00 TO STA 30+00
21. PLAN & PROFILE – STA 30+00 TO STA 36+93.88
- 22-24. EC(9)-16
25. PM(1)-12
26. PM(2)-12
- 27-32. TCP(1-1)-12 TO TCP(1-6_-12
- 33-44. BC(1)-14 TO BC(12)-14

There are no Contract Documents other than those listed above in this Article 8. The Contract Documents may only be amended, modified or supplemented as provided in the General Conditions.

Article 9. MISCELLANEOUS

- 9.1 Terms used in this Agreement which are defined in the General Conditions will have the meanings indicated in the General Conditions.
- 9.2 No assignment by a party hereto of any rights or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 9.3 CITY and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

Article 10. OTHER PROVISIONS

- 10.1 The successful bidder who is awarded this bid will be required to complete and return a Conflict of Interest Disclosure Form and a Form 1295 – Certificate of Interested Parties
- 10.2 This contract gives no rights or benefits to anyone other than the CITY and CONTRACTOR.
- 10.3 CONTRACTOR agrees to abide by all local, state, and federal nondiscrimination and fair wages, and all other laws applicable to this contract.

IN WITNESS WHEREOF, CITY and CONTRACTOR have signed this Agreement in five counterparts. Two counterparts each have been delivered to CITY and CONTRACTOR and one counterpart to ENGINEER. All portions of the Contract Documents have been signed or identified by CITY and CONTRACTOR or by ENGINEER on their behalf.

This Agreement will be effective on _____, 20_____

CITY:
City of Kingsville, Texas

CONTRACTOR:

By: _____
Jesus, A. Garza, City Manager

By: _____

Attest: _____

Attest: _____

Address for giving notices:

**City of Kingsville
400 W. King Avenue
Kingsville, Texas, 78363**

Address for giving notices:

EQUAL OPPORTUNITY CLAUSE

(b) *Federally assisted construction contracts. Except as otherwise provided, each administering agency shall require the inclusion of the following language as a condition of any grant, contract, loan, insurance, or guarantee involving federally assisted construction which is not exempt from the requirements of the equal opportunity clause:*

The applicant hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 CFR chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to a grant, contract, loan, insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, the following equal opportunity clause:

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) The contractor will not discourage or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- (4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

- (7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction the Executive order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.
- (c) Subcontracts. Each nonexempt prime contractor or subcontractor shall include the equal opportunity clause in each of its nonexempt subcontracts.
- (d) Incorporation by reference. The equal opportunity clause may be incorporated by reference in all Government contracts and subcontracts, including Government bills of lading, transportation requests, contracts for deposit of Government funds, and contracts for issuing and paying U.S. savings bonds and notes, and such other contracts and subcontracts as the Deputy Assistant Secretary may designate.
- (e) Incorporation by operation of the order. By operation of the order, the equal opportunity clause shall be considered to be a part of every contract and subcontract required by the order and the regulations in this part to include such a clause whether or not it is physically incorporated in such contracts and whether or not the contract between the agency and the contractor is written.
- (f) Adaptation of language. Such necessary changes in language may be made in the equal opportunity clause as shall be appropriate to identify properly the parties and their undertakings.

[43 FR 49240, Oct. 20, 1978, as amended at 62 FR 66971, Dec. 22, 1997; 79 FR 72993, Dec. 9, 2014; 80 FR 54934, September 11, 2015]

Equal Opportunity Guidelines for Construction Contractors

Note: To be included in bid packet and distributed at the preconstruction conference (optional)

1. What are the responsibilities of the offeror or bidder to ensure equal employment opportunity?

For contracts over \$ 10,000, the offeror or bidder must comply with the "Equal Opportunity Clause" and the "Standard Federal Equal Opportunity Construction Contract Specifications."

2. Are construction contractors required to ensure a legal working environment for all employees?

Yes, it is the construction contractor's responsibility to provide an environment free of harassment, intimidation, and coercion to all employees and to notify all foremen and supervisors to carry out this obligation, with specific attention to minority or female individuals.

3. To alleviate developing separate facilities for men and women on all sites, can a construction contractor place all women employees on one site?

No, two or more women should be assigned to each site when possible.

4. Are construction contractors required to make special outreach efforts to Section 3 or minority and female recruitment sources?

Yes, construction contractors must establish a current list of Section 3, minority and female recruitment sources. Notification of employment opportunities, including the availability of on-the-job training and apprenticeship programs, should be given to these sources. The efforts of the construction contractors should be kept in file.

5. Should records be maintained on the number of Section 3 residents, minority and females applying for positions with construction contractors?

Yes, records must be maintained to include a current list of names, addresses and telephone numbers of all Section 3, minority and female applicants. The documentation should also include the results of the applications submitted.

6. What happens if a woman or minority is sent to the union by the Contractor and is not referred back to the Contractor for employment?

If the unions impede the construction contractor's responsibility to provide equal employment opportunity, a written notice should be submitted to TDA.

7. What efforts are made by construction contractors to create entry-level positions for Section 3 residents, women and minorities?

Construction contractors are required to develop on-the-job training programs, or participate in training programs, especially those funded by the Department of Labor, to create positions for Section 3 residents, women and minorities and to meet employment needs.

8. Are any efforts made by the Contractor to publicize their Equal Employment Opportunity (EEO) policy?

Yes, the construction contractor is responsible for notifying unions and sources of training programs of their equal employment opportunity policy. Unions should be requested to cooperate in the effort of equal opportunity. The policy should be included in any appropriate manuals, or collective bargaining agreements. The construction contractor is encouraged to publicize the equal employment opportunity policy in the company newspaper and annual report. The Contractor is also responsible to include the EEO policy in all media advertisement.

9. **Are any in-service training programs provided for staff to update the EEO policy?**
At least annually a review of the EEO policy and the affirmative action obligations are required of all personnel employees of a decision-making status. A record of the meeting including date, time, location, persons present, subject matter discussed, and disposition of the subject matter should be maintained.
10. **What recruitment efforts are made for Section 3 residents, minorities and women?**
The construction contractor must notify both orally and in writing, Section 3, minority and female recruitment sources one month prior to the date of acceptance for apprenticeship or other training programs.
11. **Are any measures taken to encourage promotions for minorities and women?**
Yes, an annual evaluation should be conducted for all minority and female personnel to encourage these employees to seek higher positions.
12. **What efforts are taken to ensure that personnel policies are in accordance with the EEO policy?**
Personnel policies in regard to job practices, work assignments, etc. should be continually monitored to ensure that the EEO policy is carried out.
13. **Can women be excluded from utilizing any facilities available to men?**
No, all facilities and company activities are non-segregated except for bathrooms or changing facilities to ensure privacy.
14. **What efforts should be utilized to include minority and female contractors and suppliers?**
Take affirmative steps to ensure that small, minority, and women owned businesses are included on all lists for contractors/service providers. Solicit these businesses when issuing RFPs and RFQs and soliciting construction bids. Divide project activities into small tasks to allow participation. Keep records of all offers to minority and female construction contractors.
15. **If a construction contractor participates in a business related association that does not comply with equal opportunity affirmative action standards, does that show his/her failure to comply?**
No, the construction contractor is responsible for its own compliance.
16. **Can a construction contractor hire a subcontractor who has been debarred from government contracts pursuant to EEO?**
No. The construction contractor must suspend, terminate or cancel its contract with any Subcontractor who is in violation of the EEO policy.
17. **What effort has been taken by the construction contractor to monitor all employment to insure the company EEO policy is being carried out?**
The construction contractor must designate a responsible individual to keep accurate records of all employees that includes specific information required by the government.

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

- (1)** The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2)** The classification is utilized in the area by the construction industry; and
- (3)** The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where

appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part

of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section I(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section I(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i). This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, DC 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be maintained under 29 CFR 5.5 (a)(3)(i) and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll

period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the

journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 of this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1010, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration . . . makes, utters or publishes any statement knowing the same to be false . . . shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable only where the amount of the prime contract exceeds \$100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subpara-

graph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in sub paragraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable only where the amount of the prime contract exceeds \$100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, 40 USC 3701 et seq.

(3) The Contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The Contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

Title 29 — LABOR

Subtitle A — Office of the Secretary of Labor

PART 3 — CONTRACTORS AND SUBCONTRACTORS ON PUBLIC BUILDING OR PUBLIC WORK FINANCED IN WHOLE OR IN PART BY LOANS OR GRANTS FROM THE UNITED STATES

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| Sec. | | June 13, 1934, as amended (40 U.S.C. 276c), popularly known as the Copeland Act. This part applies to any contract which is subject to Federal wage standards and which is for the construction, prosecution, completion, or repair of public buildings, public works or buildings or works financed in whole or in part by loans or grants from the United States. The part is intended to aid in the enforcement of the minimum wage provisions of the Davis-Bacon Act and the various statutes dealing with Federally-assisted construction that contain similar minimum wage provisions, including those provisions which are not subject to Reorganization Plan No. 14 (e.g., the College Housing Act of 1950, the Federal Water Pollution Control Act, and the Housing Act of 1959), and in the enforcement of the overtime provisions of the Contract Work Hours Standards Act whenever they are applicable to construction work. The part details the obligation of contractors and subcontractors relative to the weekly submission of statements regarding the wages paid on work covered thereby; sets forth the circumstances and procedures governing the making of payroll deductions from the wages of those employed on such work; and delineates the methods of payment permissible on such work. |
| 3.1 | Purpose and scope | |
| 3.2 | Definitions | |
| 3.3 | Weekly statement with respect to payment of wages | |
| 3.4 | Submission of weekly statements and the preservation and inspection of weekly payroll records. | |
| 3.5 | Payroll deductions permissible without application to or approval of the Secretary of Labor. | |
| 3.6 | Payroll deductions permissible with the approval of the Secretary of Labor. | |
| 3.7 | Applications for the approval of the Secretary of Labor | |
| 3.8 | Action by the Secretary of Labor upon applications. | |
| 3.9 | Prohibited payroll deductions. | |
| 3.10 | Methods of payment of wages. | |
| 3.11 | Regulations part of contract. | |

AUTHORITY: The provisions of this Part 3 issued under R.S. 161, sec. 2, 48 Stat. §48; Reorg. Plan No. 14 of 1950, 64 Stat. 1267, 5 U.S.C. Appendix; 5 U.S.C. 301; 40 U.S.C. 276c.

SOURCE: The provisions of this Part 3 appear at 29 F.R. 97, Jan. 4, 1964, unless otherwise noted.

Section 3.1 Purpose and Scope.

This part prescribes “anti-kickback” regulations under section 2 of the Act of

Section 3.2 Definitions.

As used in the regulations in this part:

(a) The terms “building” or “work” generally include construction activity as distinguished from manufacturing, furnishing of materials, or servicing and maintenance work. The terms include, without limitation, buildings, structures, and improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, powerlines, pumping stations, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals; dredging, shoring, scaffolding, drilling, blasting, excavating, clearing, and landscaping. Unless conducted in connection with and at the site of such a building or work as is described in the foregoing sentence, the manufacture or furnishing of materials, articles, supplies, or equipment (whether or not a Federal or State agency acquires title to such materials, articles, supplies, or equipment during the course of the manufacture or furnishing, or owns the materials from which they are manufactured or furnished) is not a “building” or “work” within the meaning of the regulations in this part.

(b) The terms “construction,” “prosecution,” “completion,” or “repair” mean all types of work done on a particular building or work at the site thereof, including, without limitation, altering, remodeling, painting and decorating, the transporting of materials and supplies to or from the building or work by the employees of the construction contractor or construction subcontractor, and the manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the building or work, by persons employed at the site by the contractor or subcontractor.

(c) The terms “public building” or “public work” include building or work for whose construction, prosecution, completion, or repair, as defined above, a Federal agency is a contracting party, regardless of whether title thereof is in a Federal agency.

(d) The term “building or work financed in whole or in part by loans or grants from the United States” includes building or work for whose construction, prosecution, completion, or repair, as defined above, payment or part payment is made directly or indirectly from funds provided by loans or grants by a Federal agency. The term includes building or work for which the Federal assistance granted is in the form of loan guarantees or insurance.

(e) Every person paid by a contractor or subcontractor in any manner for his labor in the construction, prosecution, completion, or repair of a public building or public work or building or work financed in whole or in part by loans or grants from the United States is “employed” and receiving “wages,” regardless of any contractual relationship alleged to exist between him and the real employer.

(f) The term “any affiliated person” includes a spouse, child, parent, or other close relative of the contractor or subcontractor; a partner or officer of the contractor or subcontractor; a corporation closely connected with the contractor or subcontractor as parent, subsidiary or otherwise, and an officer or agent of such corporation.

(g) The term “Federal agency” means the United States, the District of Columbia, and all executive departments, independent establishments, administrative agencies, and instrumentality’s of the United States and of the District of Columbia, including corporations, all or substantially all of the stock of which is beneficially owned by the United States, by the District of Columbia, or any of the foregoing departments, establishments, agencies, and instrumentality’s.

{29 FR 97, Jan. 4, 1964, as amended at 33 FR 32575, Nov. 27, 1973}

Section 3.3 Weekly statement with respect to payment of wages.

(a) As used in this section, the term “employee” shall not apply to persons in classifications higher than that of laborer or mechanic and those who are the immediate supervisors of such employees.

(b) Each contractor or subcontractor engaged in the construction, prosecution, completion, or repair of any public building or public work, or building or work financed in whole or in part by loans or grants from the United States, shall furnish each week a statement with respect to the wages paid each of its employees engaged on work covered by 29 CFR Parts 3 and 5 during the preceding weekly payroll period. This statement shall be executed by the contractor or subcontractor or by an authorized officer of employee of the contractor or subcontractor who supervises the payment of wages, and shall be on form WH 348, “Statement of Compliance,” or on an identical form on the back of WH 347, “Payroll (For Contractors Optional Use)” or on any form with identical wording. Sample copies of WH 347 and WH 348 may be obtained from the Government contracting or sponsoring agency, and copies of these forms may be purchased at the Government Printing Office.

(c) The requirements of this section shall not apply to any contract of \$2,000 or less.

(d) Upon a written finding by the head of a Federal agency, the Secretary of Labor may provide reasonable limitations, variations, tolerances, and exemptions from the requirements of this section subject to such

conditions as the Secretary of Labor may specify.

{29 F.R. 95, Jan. 4, 1964, as amended at 33 F.R. 10186, July 17, 1968}

Section 3.4 Submission of weekly statements and the preservation and inspection of weekly payroll records.

(a) Each weekly statement required under §3.3 shall be delivered by the contractor or subcontractor, within seven days after the regular payment date of the payroll period, to a representative of a Federal or State agency in charge at the site of the building or work, or if there is no representative of a Federal or State agency at the site of the building or work, the statement shall be mailed by the contractor or subcontractor, within such time, to a Federal or State agency contracting for or financing the building or work. After such examination and check as may be made, such statement, or a copy thereof, shall be kept available, or shall be transmitted together with a report of any violation, in accordance with applicable procedures prescribed by the United States Department of Labor.

(b) Each contractor or subcontractor shall preserve his weekly payroll records for a period of three years from date of completion of the contract. The payroll records shall set out accurately and completely the name and address of each laborer and mechanic, his correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid. Such payroll records shall be made available at all times for inspection by the contracting officer or his authorized representative, and by authorized representatives of the Department of Labor.

Section 3.5 Payroll deductions permissible without application to or approval of the Secretary of Labor.

Deductions made under the circumstances or in the situations described in the paragraphs of this section may be made without application to and approval of the Secretary of Labor:

(a) Any deduction made in compliance with the requirements of Federal, State, or local law, such as Federal or State withholding income taxes and Federal social security taxes.

(b) Any deduction of sums previously paid to the employee as a bona fide prepayment of wages when such prepayment is made without discount or interest. A “bona fide prepayment of wages” is considered to have been made only when cash or its equivalent has been advanced to the person employed in such manner as to give him complete freedom of disposition of the advanced funds.

(c) Any deduction of amounts required by court process to be paid to another, unless, the deduction is in favor of the contractor, subcontractor or any affiliated person, or when collusion or collaboration exists.

(d) Any deduction constituting a contribution on behalf of the person employed to funds established by the employer or representatives of employees, or both, for the purpose of providing either from principal or income, or both, medical or hospital care, pensions, or annuities on retirement, death benefits, compensation for injuries, illness, accidents, sickness, or disability, or for insurance to provide any of the foregoing, or unemployment benefits, vacation pay, savings accounts, or similar payments for the benefit of employees, their

families and dependents: Provided, however, That the following standards are met: (1) The deduction is not otherwise prohibited by law; (2) it is either: (i) Voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of or for the continuation of employment, or (ii) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees; (3) no profit or other benefit is otherwise obtained, directly or indirectly, by the contractor or subcontractor or any affiliated person in the form of commission, dividend, or otherwise; and (4) the deductions shall serve the convenience and interest of the employee.

(e) Any deduction contributing toward the purchase of United States Defense Stamps and Bonds when voluntarily authorized by the employee.

(f) Any deduction requested by the employee to enable him to repay loans to or to purchase shares in credit unions organized and operated in accordance with Federal and State credit union statutes.

(g) Any deduction voluntarily authorized by the employee for the making of contributions to governmental or quasi-governmental agencies, such as the American Red Cross.

(h) Any deduction voluntarily authorized by the employee for the making of contributions to Community Chests, United Givers Funds, and similar charitable organizations.

(i) Any deductions to pay regular union initiation fees and membership dues, not including fines or special assessments:

Provided, however, that a collective bargaining agreement between the contractor or subcontractor and representatives of its employees provides for such deductions and the deductions are not otherwise prohibited by law.

(j) Any deduction not more than for the "reasonable cost" of board, lodging, or other facilities meeting the requirements of section 3(m) of the Fair Labor Standards Act of 1938, as amended, and Part 531 of this title. When such a deduction is made the additional records required under §516.27(a) of this title shall be kept.

(k) Any deduction for the cost of safety equipment of nominal value purchased by the employee as his own property for his personal protection in his work, such as safety shoes, safety glasses, safety gloves, and hard hats, if such equipment is not required by law to be furnished by the employer, if such deduction is not violative of the Fair Labor Standards Act or prohibited by other law, if the cost on which the deduction is based does not exceed the actual cost to the employer where the equipment is purchased from him and does not include any direct or indirect monetary return to the employer where the equipment is purchased from a third person, and if the deduction is either (1) voluntarily consented to be the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of employment or its continuance; or (2) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees. {36 F.R. 9770, May 28, 1971.}

Section 3.6 Payroll deductions permissible with the approval of the Secretary of Labor.

Any contractor or subcontractor may apply to the Secretary of Labor for permission to make any deduction not permitted under §3.5. The Secretary may grant permission whenever he finds that:

(a) The contractor, subcontractor, or any affiliated person does not make a profit or benefit directly or indirectly from the deduction either in the form of a commission, dividend, or otherwise;

(b) The deduction is not otherwise prohibited by law;

(c) The deduction is either (1) voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of employment or its continuance, or (2) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees; and
(d) The deduction serves the convenience and interest of the employee.

Section 3.7 Applications for the approval of the Secretary of Labor.

Any application for the making of payroll deductions under §3.6 shall comply with the requirements prescribed in the following paragraphs of this section:

(a) The application shall be in writing and shall be addressed to the Secretary of Labor.

(b) The application need not identify the contract or contracts under which the work in question is to be performed. Permission will be given for deductions on all current and future contracts of the applicant for a period of 1 year. A renewal of permission to make such payroll deduction will be granted

upon the submission of an application which makes reference to the original application, recites the date of the Secretary of Labor's approval of such deductions, states affirmatively that there is continued compliance with the standards set forth in the provisions of §3.6, and specifies any conditions which have changed in regard to the payroll deductions.

{36 F.R. 9770, May 28, 1971.}

(c) The application shall state affirmatively that there is compliance with the standards set forth in the provisions of §3.6. The affirmation shall be accompanied by a full statement of the facts indicating such compliance.

(d) The application shall include a description of the proposed deduction, the purpose to be served thereby, and the classes of laborers or mechanics from whose wages the proposed deduction would be made.

(e) The application shall state the name and business of any third person to whom any funds obtained from the proposed deductions are to be transmitted and the affiliation of such person, if any, with the applicant.

Section 3.8 Action by the Secretary of Labor upon applications.

The Secretary of Labor shall decide whether or not the requested deduction is permissible under provisions of §3.6; and

shall notify the applicant in writing of his decision.

Section 3.9 Prohibited payroll deductions.

Deductions not elsewhere provided for by this part and which are not found to be permissible under §3.6 are prohibited.

Section 3.10 Methods of payment of wages.

The payment of wages shall be by cash, negotiable instruments payable on demand, or the additional forms of compensation for which deductions are permissible under this part. No other methods of payment shall be recognized on work subject to the Copeland Act.

Section 3.11 Regulations part of contract.

All contracts made with respect to the construction, prosecution, completion, or repair of any public building or public work or building or work financed in whole or in part by loans or grants from the United States covered by the regulations in this part shall expressly bind the contractor or subcontractor to comply with such of the regulations in this part as may be applicable. In this regard, see §5.5(a) of this subtitle.

SECTION 504 CERTIFICATION

POLICY OF NONDISCRIMINATION ON THE BASIS OF DISABILITY

The _____ does not discriminate on the basis of disability in the admission or access to, or treatment or employment in, its federally assisted programs or activities.

(Name) _____

(Address) _____

City State Zip

Telephone Number () _____ - _____ Voice

() _____ - _____ TDD

has been designated to coordinate compliance with the nondiscrimination requirements contained in the Department of Housing and Urban Development's (HUD) regulations implementing Section 504 (24 CFR Part 8. dated June 2, 1988).

(d) The names and addresses of all other persons having a substantial interest in the undersigned, and the nature of the interest are:

NAME	ADDRESS	NATURE OF INTEREST

(e) The names, addresses and trade classifications of all other building construction contractors in which the undersigned has a substantial interest are:

NAME	ADDRESS	TRADE CLASSIFICATION

Date _____

(Contractor)

By _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, _____
as PRINCIPAL, and _____, as SURETY are held and
firmly bound unto _____ hereinafter called the "Owner", in
the penal sum of _____ Dollars, (\$_____),
lawful money of the United States, for the payment of which sum well and truly to be made, we
bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and
severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted
the Accompanying Bid, dated _____, for _____

NOW, THEREFOR, if the Principal shall not withdraw said Bid within the period specified therein
after the opening of the same, or, if no period be specified, within thirty (30) days after the said
opening, and shall within the period specified therefore, or if no period be specified, within ten
(10) days after the prescribed forms are presented to him for signature, enter into a written
contract with the Owner in accordance with the Bid as accepted, and give bond with good and
sufficient surety or sureties, as may be required, for the faithful performance and proper
fulfillment of such contract; or in the event of the withdrawal of said Bid within the period
specified, or the failure to enter into such Contract and give such bond within the time specified,
if the Principal shall pay the Owner the difference between the amount specified in said Bid and
the amount for which the local Public Agency may procure the required work or supplies or both,
if the latter be in excess of the former, then the above obligation shall be void and of no effect,
otherwise to remain in full force and virtue.

IN WITNESS THEREOF, the above-bounded parties have executed this instrument under their
several seals this _____ day of _____, the name and corporate
seal of each corporate party being hereto affixed and these present signed by its undersigned
representative, pursuant to authority of its governing body.

(SEAL)

Attest:

By: _____

(SEAL)

Affix
Corporate
Seal

Attest:

By: _____

Affix
Corporate
Seal

Attest:

By: _____

Countersigned

By _____

* Attorney-in-Fact, State of _____

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____, Secretary of the Corporation named as Principal in the within bond; that _____, who signed the said bond on behalf of the Principal was then _____ of said corporation; that I know his signature, and his signature thereto is genuine; and that said bond was duly signed, sealed, and attested to, for and in behalf of said corporation by authority of this governing body.

Corporate
Seal

Title: _____

* Power-of-attorney for person signing for surety company must be attached to bond.

INSERT CERTIFICATE OF LIABILITY INSURANCE

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that:

(Name of Contractor or Company)

(Address)

a _____, hereinafter called Principal,
(Corporation / Partnership)

and _____
(Name of Surety Company)

(Address)

hereinafter called Surety, are held and firmly bound unto

(Name of Recipient)

(Recipient's Address)

hereinafter called OWNER, in the penal sum of \$ _____

Dollars, \$ _____ in lawful money of the United States, for this payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONFIDENTIALITY OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the ____ day of _____, a copy of which is hereto attached and made a part hereof for the construction of:

(Project Name)

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUB-CONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUB-CONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed

thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counter-parts, each on of (Number) which shall be deemed an original, this the _____ day of _____.

ATTEST: _____
(Principal)

_____ By _____ (s)
(Principal Secretary)

(SEAL)

(Witness as to Principal) (Address)

(Address)

ATTEST: _____
(Surety)

_____ By _____
(Witness as to Surety) (Attorney in Fact)

(Address) (Address)

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that:

_____ (Name of Contractor or Company)

_____ (Address)

a _____ hereinafter called Principal, and

_____ (Name of Surety Company)

_____ (Address)

hereinafter called Surety, are held and firmly bound unto

_____ (Name of Grant Recipient)

_____ (Grant Recipient's Address)

hereinafter called OWNER, in the penal sum of \$ _____

Dollars (\$ _____) in lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, successors, and assigns, jointly and severally, firmly in these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER dated the _____ day of _____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties in all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the

Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____
counterparts, each one of which shall be deemed an original, this the _____
day of _____.

ATTEST: _____
(Principal)

By _____ (s)
(Principal Secretary)

(SEAL)

(Witness as to Principal) (Address)

(Address)

ATTEST: _____
(Surety)

By _____
(Witness as to Surety) (Attorney in Fact)

(Address) (Address)

NOTE: Date of BOND must not be prior to date of Contract. If PRINCIPAL/CONTRACTOR is Partnership, all partners should execute BOND.

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, _____
_____ as PRINCIPAL, and _____, as SURETY
are held and firmly bound unto (City of Kingsville, Texas) hereinafter called the "Local Public
Agency", in the penal sum of _____ Dollars, (\$_____),
lawful money of the United States, for the payment of which sum well and truly to be made, we
bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and
severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted
the Accompanying Bid, dated _____, for _____

NOW, THEREFORE, the Principal shall not withdraw said Bid within the period specified
therein after the opening of the same, or, if no period be specified, within thirty (30) days after
the said opening, and shall within the period specified therefor, or if no period be specified,
within ten (10) days after the prescribed forms are presented to him for signature, enter into a
written contract with the Local Public Agency in accordance with the Bid as accepted, and give
bond with good and sufficient surety or sureties, as may be required, for the faithful performance
and proper fulfillment of such contract; or in the event of the withdrawal of said Bid within the
period specified, or the failure to enter into such Contract and give such bond within the time
specified, if the Principal shall pay the Local Public Agency the difference between the amount
specified in said Bid and the amount for which the local Public Agency may procure the required
work or supplies or both, if the latter be in excess of the former, then the above obligation shall
be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS THEREOF, the above parties have executed this instrument this _____ day of
_____, the name and corporate seal of each corporate party being hereto
affixed and these present signed by its undersigned representative, pursuant to authority of its
governing body.

(SEAL)

(SEAL)

Attest:

By: _____

Affix
Corporate
Seal

Attest: By: _____

Affix
Corporate
Seal

Attest: By: _____

Countersigned

By _____

* Attorney-in-Fact, State of Texas

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the Corporation named as Principal in the bid bond; that _____, who signed the said bond on behalf of the Principal was then _____ of said corporation; that I know his/her signature, and his/her signature thereto is genuine; and that said bond was duly signed, sealed, and attested to, on behalf of said corporation by authority of its governing body.

Corporate
Seal

Title: _____

* Power-of-attorney for person signing for Surety Company must be attached to bond.

GENERAL CONDITIONS

GENERAL CONDITIONS FOR CONSTRUCTION

1. Contract and Contract Documents

- (a) The Plans, Specifications and Addenda shall form part of this contract and the provisions thereof shall be binding upon the parties as if they were herein fully set forth.

2. Definitions

Whenever used in any of the Contract Documents, the following meanings shall be given to the terms here in defined:

- (a) The term "Contract" means the Contract executed between the City of Kingsville, hereinafter called the "City" or "Owner" and (Name of Construction Co.), hereinafter called "Contractor", of which these GENERAL CONDITIONS, form a part.
- (b) The term "Project Area" means the area within the specified Contract limits of the Improvements contemplated to be constructed in whole or in part under this contract.
- (c) The term "Engineer" means the City of Kingsville Engineer, Engineer in charge, serving the City with architectural or engineering services, his successor, or any other person or persons, employed by the City for the purpose of directing or having in charge the work embraced in this Contract.
- (d) The term "Contract Documents" means and shall include the following: Executed Contract, Addenda (if any), Invitation for Bids, Instructions to Bidders, Signed Copy of Bid, General Conditions, Special Conditions, Technical Specifications, and Drawings (as listed in the Schedule of Drawings).

3. Supervision by Contractor

- (a) Except where the Contractor is an individual and personally supervises the work, the Contractor shall provide a competent superintendent, satisfactory to the Engineer, on the work at all times during working hours with full authority to act as Contractor's agent. The Contractor shall also provide adequate staff for the proper coordination and expediting of his work.
- (b) The Contractor shall be responsible for all work executed under the Contract. Contractor shall verify all figures and elevations before proceeding with the work and will be held responsible for any error resulting from his failure to do so.

4. Subcontracts

- (a) No proposed subcontractor shall be disapproved by the City except for cause.
- (b) The Contractor shall be as fully responsible to the City for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them.
- (c) Nothing contained in the Contract shall create any contractual relation between any subcontractor and the City.

5. Fitting and Coordination of Work

The Contractor shall be responsible for the proper fitting of all work and for the coordination of the operations of all trades, subcontractors, or material suppliers engaged upon this Contract.

6. Payments to Contractor

(a) Partial Payments

- 1) The Contractor shall prepare the requisition for partial payment as of the last day of the month and submit it, with the required number of copies, to the Engineer for approval. The amount of the payment due the Contractor shall be determined by adding to the total value of work completed to date, the value of materials properly stored on the site and deducting (1) ten percent (10%) of the total amount, to be retained until final payment, and (2) the amount of all previous payments. The total value of work completed to date shall be based on the estimated quantities of work completed and on the unit prices contained in the agreement. The value of materials properly stored on the site shall be based upon the estimated quantities of such materials and the invoice prices. Copies of all invoices shall be available for inspection of the Engineer.
- 2) Monthly or partial payments made by the City to the Contractor are advanced for the purpose of assisting the contractor to expedite the work of construction. The Contractor shall be responsible for the care and protection of all materials and work upon which payments have been made until final acceptance of such work and materials by the City. Such payments shall not constitute a waiver of the right of the City to require the fulfillment of all terms of the Contract and the delivery of all improvements embraced in this Contract complete and satisfactory to the City in all details.

(b) Final Payment

- 1) After final inspection and the acceptance by the City of all work under the Contract, the Contractor shall prepare the requisition for final payment which shall be based upon the careful inspection of each item of work at the applicable unit prices stipulated in the Contract. The total amount of the final payment due the Contractor under this Contract shall be the amount computed as described above less all previous payments.
- 2) Before paying the final estimate, City shall require the Contractor to furnish releases or receipts from all subcontractors having performed any work and all persons having supplied materials, equipment (installed on the Project) and services to the Contractor. The City may make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts and any payments made shall in no way impair the obligations of any surety or sureties furnished under this Contract.
- 3) Any amount due the City under Liquidated Damages shall be deducted from the final payment due the contractor.

(c) Payments Subject to Submission of Certificates

Each payment to the Contractor by the City shall be made subject to submission by the Contractor of all written certifications required of it and its subcontractors.

(d) Withholding Payments

The City may withhold any payment due the Contractor as deemed necessary to protect the City, and if so elects, may also withhold any amounts due from the Contractor to any subcontractors or material dealers, for work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the City and will not require the City to determine or adjust any claims or disputes between the Contractor and its subcontractors or material dealers, or to withhold any moneys for their protection unless the City elects to do so. The failure or refusal of the City to withhold any moneys from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this Contract.

7. Changes in the Work

- (a) The City may make changes in the scope of work required to be performed by the Contractor under the Contract without relieving or releasing the Contractor from any obligations under the Contract or any guarantee given pursuant to the Contract provisions, and without affecting the validity of the guaranty bonds, and without relieving or releasing the surety or sureties of said bonds. All such work shall be executed under the terms of the original Contract unless it is expressly provided otherwise.
- (b) Except for the purpose of affording protection against any emergency endangering health, life, limb or property, the Contractor shall make no change in the materials used or in the specified manner of constructing and/or installing the improvements or supply additional labor, services or materials beyond that actually required for the execution of the Contract, unless in pursuance of a written order from the City authorizing the Contractor to proceed with the change. No claim for an adjustment of the Contract Price will be valid unless so ordered.
- (c) If applicable unit prices are contained in the Contract, the City may order the Contractor to proceed with desired unit prices specified in the Contract; provided that in case of a unit price contract the net value of all changes does not increase the original total amount of the agreement by more than twenty-five percent (25%) or decrease the original the total amount by eighteen percent (18%).
- (d) Each change order shall include in its final form:
 - 1) A detailed description of the change in the work.
 - 2) The Contractor's proposal (if any) or a confirmed copy thereof.
 - 3) A definite statement as to the resulting change in the contract price and/or time.
 - 4) The statement that all work involved in the change shall be performed in accordance with contract requirements except as modified by the change order.
 - 5) The procedures as outlined in this Section for a unit price contract also apply in any lump sum contract.

8. Claims for Extra Cost

- (a) If the Contractor claims that any instructions by Drawings or otherwise involve extra cost or extension of time, he shall, within ten days after the receipt of such instructions, and in any event before proceeding to execute the work, submit his protest thereto in writing to the City, stating clearly and in detail the basis of his objections. No such claim will be considered unless so made.

- (b) Claims for additional compensation for extra work, due to alleged errors in ground elevations, contour lines, or bench marks, will not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material, or performing more work, than would be reasonably estimated from the Drawings and maps issued.
- (c) Any discrepancies which may be discovered between actual conditions and those represented by the Drawings and maps shall be reported at once to the City and work shall not proceed except at the Contractor's risk, until written instructions have been received from the City.
- (d) If, on the basis of the available evidence, the City determines that an adjustment of the Contract Price and/or time is justifiable, a change order shall be executed.

9. Termination, Delays, and Liquidated Damages

(a) Right of the City to Terminate Contract for Convenience

City may at any time and for any reasons terminate Contractor's services and work at City's convenience upon providing written notice to the Contractor specifying the extent of termination and the effective date. Upon receipt of such notice, Contractor shall, unless the notice directs otherwise, immediately discontinue the work and placing of orders for materials, facilities and supplies in connection with the performance of this Agreement.

Upon such termination, Contractor shall be entitled to payment only as follows: (1) the actual cost of the work completed in conformity with this Agreement; plus, (2) such other costs actually incurred by Contractor as are permitted by the prime contract and approved by City; (3) plus ten percent (10%) of the cost of the work referred to in subparagraph (1) above for overhead and profit. There shall be deducted from such sums as provided in this subparagraph the amount of any payments made to Contractor prior to the date of the termination of this Agreement. Contractor shall not be entitled to any claim or claim of lien against City for any additional compensation or damages in the event of such termination and payment.

(b) Right of the City to Terminate Contract for Cause

In the event that any of the provisions of this contract are violated by the Contractor, or by any subcontractors, the City may serve written notice upon the Contractor and the Surety of its intention to terminate the contract. The notices shall contain the reasons for such intention to terminate the contract, and unless such violation or delay shall cease and satisfactory arrangement of correction be made within ten days, the contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination, the City shall immediately serve notice thereof upon the Surety and the Contractor. The Surety shall have the right to take over and perform the contract. Provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the City may take over the work and complete the project by bid/contract or by force account at the expense of the Contractor and his Surety shall be liable to the City for any excess cost incurred. In such event the City may take possession of and utilize in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefore.

(c) Liquidated Damages for Delays.

If the work is not completed within the time stipulated in the applicable bid for Lump Sum or Unit Price Contract provided, the Contractor shall pay to the City as fixed, agreed, and liquidated damages (it being impossible to determine the actual damages occasioned by the delay) the amount of **\$200.00** for each calendar day of delay, until the work is completed. The Contractor and Contractor's sureties shall be liable to the City for the amount thereof.

(d) Excusable Delays.

- 1) The right of the Contractor to proceed shall not be terminated nor shall the Contractor be charged with liquidated damages for any delays in the completion of the work due to:
- 2) Any acts of the Government, including controls or restrictions upon or requisitioning of materials, equipment, tools, or labor by reason of war, national defense, or any other national emergency;
- 3) Any acts of the City;
- 4) Causes not reasonably foreseeable by the parties to this Contract at the time of execution which are beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, terrorism, war, acts of another Contractor in the performance of some other contract with the City, fires, floods, epidemics, quarantine, restrictions, strikes, freight embargoes, and weather of unusual severity such as hurricanes, tornadoes, cyclones and other extreme weather conditions.
- 5) Provided, however, that the Contractor promptly notifies the City within ten (10) days in writing of the cause of the delay. Upon receipt of such notification, the City shall ascertain the facts and the cause and extent of delay. If, upon the basis of the facts and the terms of this contract, the delay is properly excusable, the City shall extend the time for completing the work for a period of time commensurate with the period of excusable delay.

10. Assignment or Novation

The Contractor shall not assign nor transfer, whether by assignment or novation, any of its rights, duties, benefits, obligations, liabilities, or responsibilities under this Contract without the written consent of the City. No assignment or novation of this Contract shall be valid unless the assignment or novation expressly provides that the assignment of any of the Contractor's rights or benefits under the Contract is subject to a prior lien for labor performed, services rendered, and materials, tools, and equipment supplied for the performance of the work under this Contract in favor of all persons, Contractors, or corporations rendering such labor or services or supplying such materials, tools, or equipment.

11. Technical Specifications and Drawings

Anything mentioned in the Technical Specifications and not shown on the Drawings or vice versa shall be of like effect as if shown on or mentioned in both. In case of difference between Drawings and Technical Specifications, the Technical Specifications shall govern. In case of any discrepancy in Drawings, or Technical Specifications, the matter shall be immediately submitted to the City for review. Contractor shall be liable for any issues or expenses in the event the discrepancy is not submitted to the City.

12. Shop Drawings

- (a) All required shop drawings, machinery details, layout drawings, etc. shall be submitted to the Engineer in hard copies for approval sufficiently in advance of requirements to afford ample time for

checking, including time for correcting, resubmitting and rechecking if necessary. The Contractor may proceed, only at Contractor's own risk, with manufacture or installation of any equipment or work covered by said shop drawings, etc. until they are approved and no claim, by the Contractor, for extension of the contract time shall be granted by reason of his failure in this respect.

- (b) Any drawings submitted without the Contractor's stamp of approval will not be considered and will be returned to him for proper resubmission. If any drawings show variations from the requirements of the Contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment of contract price and/or time, otherwise the Contractor will not be relieved of the responsibility for executing the work in accordance with the Contract even though the drawings have been approved.
- (c) If a shop drawing is in accordance with the contract or involves only minor adjustment in the interest of the City not involving a change in contract price or time, the engineer may approve the drawing. The approval shall not relieve the Contractor from responsibility to adhere to the contract or for any error in the drawing.

13. Requests for Supplementary Information

It shall be the responsibility of the Contractor to make timely requests of the City for any additional information which should be furnished by the City under the terms of this Contract, and which is required in the planning and execution of the work. Such requests may be submitted from time to time as the need approaches, but each shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay. Each request shall be in writing, and list the various items and the latest date by which each will be required by the Contractor. The first list shall be submitted within two weeks after Contract award and shall be as complete as possible at that time. The Contractor shall, if requested, furnish promptly any assistance and information the Engineer may require in responding to these requests of the Contractor. The Contractor shall be fully responsible for any delay in his work or to others arising from his failure to comply fully with the provision of this section.

14. Materials and Workmanship

- (a) Unless otherwise specifically provided for in the technical specifications, all workmanship, equipment, materials and articles incorporated in the work shall be new and the best grade of the respective kinds for the purpose. Where equipment, materials, articles or workmanship are referred to in the technical specifications as "equal to" any particular standard, the Engineer shall decide the question of equality.
- (b) The Contractor shall furnish to the City for approval the manufacturer's detailed specifications for all machinery, mechanical and other special equipment, which he contemplates installing together with full information as to type, performance characteristics, and all other pertinent information as required, and shall likewise submit for approval full information concerning all other materials or articles which he proposes to incorporate.
- (c) Machinery, mechanical and other equipment, materials or articles installed or used without such prior approval shall be at the risk of subsequent rejection.
- (d) Materials specified by reference to the number or symbol of a specific standard, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the

date of the Invitation for Bids, except as limited to type, class or grade, or modified in the technical specifications shall have full force and effect as though printed therein.

- (e) The City may require the Contractor to dismiss from the work such employee or employees as the City or the Engineer may deem unqualified.

15. Samples, Certificates and Tests

- (a) The Contractor shall submit all material or equipment samples, certificates, affidavits, etc., as called for in the contract documents or required by the Engineer, promptly after award of the contract and acceptance of the Contractor's bond. No such material or equipment shall be manufactured or delivered to the site, except at the Contractor's own risk, until the required samples or certificates have been approved in writing by the Engineer. Any delay in the work caused by late or improper submission of samples or certificates for approval shall not be considered just cause for an extension of the contract time.
- (b) Each sample submitted by the Contractor shall carry a label giving the name of the Contractor, the project for which it is intended, and the name of the producer. The accompanying certificate or letter from the Contractor shall state that the sample complies with contract requirements, shall give the name and brand of the product, its place of origin, the name and address of the producer and all specifications or other detailed information which will assist the Engineer in making a prompt decision regarding the acceptability of the sample. It shall also include the statement that all materials or equipment furnished for use in the project will comply with the samples and/or certified statements.
- (c) Approval of any materials shall be general only and shall not constitute a waiver of the City's right to demand full compliance with Contract requirements. After actual deliveries, the Engineer will have such check tests made as he deems necessary in each instance and may reject materials and equipment and accessories for cause, even though such materials and articles have been given general approval. If materials, equipment or accessories which fail to meet check tests have been incorporated in the work, the Engineer will have the right to cause their removal and replacement by proper materials or to demand and secure such reparation by the Contractor as is equitable.
- (d) Except as otherwise specifically stated in the Contract, the costs of sampling and testing will be divided as follows:
 - 1) The Contractor shall furnish without extra cost, including packing and delivery charges, all samples required for testing purposes, except those samples taken on the project by the Engineer;
 - 2) The Contractor shall assume all costs of re-testing materials which fail to meet contract requirements;
 - 3) The Contractor shall assume all costs of testing materials offered in substitution for those found deficient;
 - 4) The City will pay all other expenses.

16. Permits and Codes

- (a) The Contractor shall give all notices required by and comply with all applicable federal and state laws, ordinances, and codes of the Local Government. All construction work and/or utility

installations shall comply with all applicable ordinances, and codes including all written waivers. Before installing any work, the Contractor shall examine the drawings and technical specifications for compliance with applicable ordinances and codes and shall immediately report any discrepancy to the City. Where the requirements of the drawings and technical specifications fail to comply with such applicable ordinances or codes, the City will adjust the Contract by Change Order to conform to such ordinances or codes (unless waivers in writing covering the difference have been granted by the governing body or department) and make appropriate adjustment in the Contract Price or stipulated unit prices.

- (b) Should the Contractor fail to observe the foregoing provisions and proceed with the construction and/or install any utility at variance with any applicable ordinance or code, including any written waivers (notwithstanding the fact that such installation is in compliance with the drawings and technical specifications), the Contractor shall remove such work without cost to the City.
- (c) The Contractor shall at his own expense, secure and pay for all permits for street pavement, sidewalks, shed, removal of abandoned water taps, sealing of house connection drains, pavement cuts, buildings, electrical, plumbing, water, gas and sewer permits required by the local regulatory body or any of its agencies.
- (d) The Contractor shall comply with applicable local laws and ordinances governing the disposal of surplus excavation, materials, debris and rubbish on or off the Project Area and commit no trespass on any public or private property in any operation due to or connected with the Improvements contained in this Contract.
- (e) The Contractor will be required to make arrangements for and pay the water, electrical power, or any other utilities required during construction.
- (f) During construction of this project, the Contractor shall use every means possible to control the amount of dust created by construction. Prior to the close of a day's work, the Contractor, if directed by the City, shall moisten the surrounding area to prevent a dusty condition.

17. Care of Work

- (a) The Contractor shall be responsible for all damages to person or property that occur as a result of its fault or negligence in connection with the prosecution of the work and shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance.
- (b) In an emergency affecting the safety of life, limb or property, including adjoining property, the Contractor, without special instructions or authorization from the City is authorized to act to prevent such threatened loss or injury. Contractor shall follow all instructions of City.
- (c) The Contractor shall avoid damage as a result of his operations to existing sidewalks, streets, curbs, pavements, utilities (except those which are to be replaced or removed), adjoining property, etc., and shall be responsible for completely repairing any damage thereto caused by the operations.
- (d) The Contractor shall shore up, brace, underpin, secure, and protect as maybe necessary, all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be in any way affected by the excavations or other operations connected with the construction of the improvements included in this Contract. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owner or other party

before the commencement of any work. The Contractor shall indemnify and save harmless the City from any damages on account of settlements or the loss of lateral support of adjoining property and from all loss or expense and all damages for which the City may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

18. Accident Prevention

- (a) No laborer or mechanic employed in the performance of this Contract shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety as determined under construction safety and health standards promulgated by the Department of Labor.
- (b) The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of his prosecution of the work.
- (c) The Contractor shall maintain an accurate record of all cases of death, occupational disease, or injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the Contract. The Contractor shall promptly furnish the City with reports concerning these matters.
- (d) The Contractor shall indemnify and hold harmless the City from any claims for damages resulting from property damage, personal injury and/or death suffered or alleged to have been suffered by any person as a result of any work conducted under this contract.
- (e) The Contractor shall provide trench safety for all excavations more than five feet deep prior to excavation. All OSHA Standards for trench safety must be adhered to by the Contractor.
- (f) The contractor shall at all time conduct work in such a manner as to ensure the least possible inconvenience to vehicular and pedestrian traffic. At the close of the work each day, all streets where possible in the opinion of the City, shall be opened to the public in order that persons living in the area may have access to their homes or businesses by the use of the streets. Barricades, warning signs, and necessary lighting shall be provided to the satisfaction of the City at the expense of the Contractor.

19. Sanitary Facilities

The Contractor shall furnish, install and maintain ample sanitary facilities for laborers. As the needs arise, a sufficient number of enclosed temporary toilets shall be conveniently placed as required. Drinking water shall be provided from an approved source, so piped or transported as to keep it safe and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing and governing health regulations.

20. Use of Premises

- (a) The Contractor shall confine equipment, storage of materials, and construction operations to the contract limits as shown on the drawings and as prescribed by ordinances or permits, or as may be desired by the City, and shall not unreasonably encumber the site or public rights of way with materials and construction equipment.

- (b) The Contractor shall comply with all reasonable instructions of the City and all existing federal, state and local regulations regarding signs, advertising, traffic, fires, explosives, danger signals, and barricades.

21. Removal of Debris, Cleaning, Etc.

The Contractor shall, periodically or as directed during the progress of the work, remove and legally dispose of all surplus excavated material and debris, and keep the Project Area and public rights of way reasonably clear. Upon completion of the work, he shall remove all temporary construction facilities, debris and unused materials provided for work, and put the whole site of the work and public rights of way in a neat and clean condition.

22. Inspection

- (a) All materials and workmanship shall be subject to inspection, examination, or test by the City and Engineer at any and all times during manufacture or construction and at any and all places where such manufacture or construction occurs. The City shall have the right to reject defective material and workmanship or require its correction. Unacceptable workmanship shall be satisfactorily corrected. Rejected material shall be promptly segregated and removed from the Project Area and replaced with material of specified quality without charge. If the Contractor fails to proceed at once with the correction of rejected workmanship or defective material, the City may by contract or otherwise have the defects remedied or rejected materials removed from the Project Area and charge the cost of the same against any Monies which may be due the Contractor, without prejudice to any other rights or remedies of the City.
- (b) The Contractor shall furnish promptly all materials reasonably necessary for any tests which may be required. All tests by the City will be performed in such manner as not to delay the work unnecessarily and will be made in accordance with the provisions of the technical specifications.
- (c) The Contractor shall notify the City sufficiently in advance of back filling or concealing any facilities to permit proper inspection. If any facilities are concealed without approval or consent of the City, the Contractor shall uncover for inspection and recover such facilities at Contractor's expense, when so requested by the City.
- (d) Should it be considered necessary or advisable by the City at any time before final acceptance of the entire work to make an examination of work already completed, the Contractor shall on request promptly furnish all necessary facilities, labor, and material. If such work is found to be defective in any important or essential respect, due to fault of the Contractor or subcontractors, the Contractor shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the actual cost of labor and material necessarily involved in the examination and replacement, shall be reimbursable and if completion of the work of the entire Contract has been delayed, a suitable extension of time will be approved.
- (e) Inspection of materials and appurtenances to be incorporated in the improvements included in this Contract may be made at the place of production, manufacture or shipment, whenever the quantity justifies it, and such inspection and acceptance, unless otherwise stated in the technical specifications, shall be final, except as regards to: (1) latent defects, (2) departures from specific requirements of the Contract, (3) damage or loss in transit, or (4) fraud or such gross mistakes as amount to fraud. Subject to the requirements contained in the preceding sentence, the inspection of materials as a whole or in part will be made at the Project Site.

- (f) Neither inspection, testing, approval nor acceptance of the work in whole or in part, by the City or its agents shall relieve the Contractor or its sureties of full responsibility for materials furnished or work performed not in strict accordance with the Contract.

23. Review by City

The City and its authorized representatives and agents shall have access to and be permitted to observe and review all work, materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this Contract, provided, however that all instructions and approval with respect to the work will be given to the Contractor only by the City through its authorized representatives or agents.

24. Final Inspection

When the Improvements included in this Contract are substantially completed, the Contractor shall notify the City in writing that the work will be ready for final inspection on a definite date which shall be stated in the notice. The City will make the arrangements necessary to have final inspection commenced on the date stated in the notice, or as soon thereafter as is practicable.

25. Deduction for Uncorrected Work

If the City deems it not expedient to require the Contractor to correct work not done in accordance with the Contract Documents, an equitable deduction from the Contract Price will be made by agreement between the Contractor and the City and subject to settlement, in case of dispute, as herein provided.

26. Insurance

The Contractor shall not commence work under this contract until all required insurance under this paragraph has been secured and approved by the City.

- (a) Worker's Compensation Insurance: The Contractor shall procure and shall maintain during the life of this contract Worker's Compensation Insurance as required by the State of Texas for all of his employees to be engaged in work at the site of the project under this contract and, in case of any such work sublet, the Contractor shall require the subcontractor similarly to provide Worker's Compensation Insurance for all of the employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Worker's Compensation Insurance.
- (b) Contractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: Please see the following Exhibit for the City of Kingsville's Insurance Requirements:

EXHIBIT

INSURANCE REQUIREMENTS

I. CONTRACTOR'S LIABILITY INSURANCE

- A. Contractor must not commence work under this contract until all insurance required has been obtained and such insurance has been approved by the City. Contractor must not allow any

subcontractor to commence work until all similar insurance required of any subcontractor has been obtained.

- B. Contractor must furnish to the City’s Risk Manager and Public Works Director, 1 copy of Certificates of Insurance (COI) with applicable policy endorsements showing the following minimum coverage by an insurance company(s) acceptable to the City’s Risk Manager. The City of Kingsville must be listed as an additional insured on the General Liability and Auto Liability policies **by endorsement**, and a waiver of subrogation is required on all applicable policies including Workers’ Compensation. **Endorsements** must be provided with COI. Project name and or number must be listed in Description Box of COI.

TYPE OF INSURANCE	MINIMUM INSURANCE COVERAGE
30-written day notice of cancellation, required on all certificates or by applicable policy endorsements	Bodily Injury and Property Damage Per occurrence - aggregate
Commercial General Liability including: 1. Commercial Broad Form 2. Premises – Operations 3. Products/ Completed Operations 4. Contractual Liability 5. Independent Contractors	\$1,000,000 Per Occurrence \$2,000,000 Aggregate
AUTO LIABILITY (including) 1. Owned 2. Hired and Non-Owned 3. Rented/Leased	\$1,000,000 Combined Single Limit
WORKERS’ COMPENSATION	Statutory
EMPLOYER’S LIABILITY	\$500,000 /\$500,000 /\$500,000

- C. In the event of accidents of any kind related to this agreement, Contractor must furnish the Risk Manager with copies of all reports of any accidents within 10 days of the accident.

II. ADDITIONAL REQUIREMENTS

- A. Applicable for paid employees, Contractor must obtain workers’ compensation coverage through a licensed insurance company. The coverage must be written on a policy and endorsements approved by the Texas Department of Insurance. The workers’ compensation coverage provided must be in an amount sufficient to assure that all workers’ compensation obligations incurred by the Contractor will be promptly met.
- B. Contractor shall obtain and maintain in full force and effect for the duration of this Contract, and any extension hereof, at Contractor's sole expense, insurance coverage written on an occurrence basis, by companies authorized and admitted to do business in the State of Texas and with an A.M. Best's rating of no less than A- VII.
- C. Contractor shall be required to submit a copy of the replacement certificate of insurance to City at

the address provided below within 10 days of the requested change. Contractor shall pay any costs incurred resulting from said changes. All notices required by this exhibit shall be given to City at the following address:

City of Kingsville
Attn: Risk Manager
P.O. Box 1458
Kingsville, TX 78364

D. Contractor agrees that with respect to the above required insurance, all insurance policies are to contain or be endorsed to contain the following required provisions:

- List the City of Kingsville and its officers, officials, employees, volunteers, and elected representatives as additional insured by endorsement, as respects operations, completed operation and activities of, or on behalf of, the named insured performed under contract with the City, with the exception of the workers' compensation policy;
- Provide for an endorsement that the "other insurance" clause shall not apply to the City of Kingsville where the City is an additional insured shown on the policy;
- Workers' compensation and employers' liability policies will provide a waiver of subrogation in favor of the City. An All States Endorsement will be required for companies not domiciled in Texas; and
- Provide thirty (30) calendar days advance written notice directly to City of any suspension, cancellation, non-renewal or material change in coverage, and not less than ten (10) calendar days advance written notice for nonpayment of premium.

E. Within five (5) calendar days of a suspension, cancellation, or non-renewal of coverage, Contractor shall provide a replacement Certificate of Insurance and applicable endorsements to City. City shall have the option to suspend Contractor's work should there be a lapse in coverage at any time during this contract. Failure to provide and to maintain the required insurance shall constitute a material breach of this contract.

F. In addition to any other remedies the City may have upon Contractor's failure to provide and maintain any insurance or policy endorsements to the extent and within the time herein required, the City shall have the right to order Contractor to stop work hereunder, and/or withhold any payment(s) if any, which become due to Contractor hereunder until Contractor demonstrates compliance with the requirements hereof.

G. Nothing herein contained shall be construed as limiting in any way the extent to which Contractor may be held responsible for payments of damages to persons or property resulting from Contractor's or its subcontractor's performance of the work covered under this contract.

H. It is agreed that Contractor's insurance shall be deemed primary and non-contributory with respect to any insurance or self-insurance carried by the City of Kingsville for liability arising out of operations under this contract.

I. It is understood and agreed that the insurance required is in addition to and separate from any other obligation contained in this contract.

- (c) Proof of Insurance: The Contractor shall furnish the City with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by the City."

27. Warranty of Title

No material, supplies, or equipment to be installed or furnished under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease-purchase or other agreement by which an interest is retained by the seller or supplier. The Contractor shall warrant good title to all materials, supplies, and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same, together with all improvements and appurtenances constructed or placed by Contractor, to the City free from any claims, liens, or charges. Neither the Contractor nor any person, firm, or corporation furnishing any material or labor for any work covered by this Contract shall have any right to a lien upon any improvement or appurtenance. Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any law permitting such persons to look to funds due the Contractor. The provisions of this paragraph shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

28. Warranty of Workmanship and Materials

Neither the final certificate of payment nor any provision in the Contract nor partial or entire use of the improvements included in this Contract by the City or the public shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of 3 months from the date of final acceptance of the work.

29. Job Offices

- (a) The Contractor and its subcontractors may maintain such office and storage facilities on the site as are necessary for the proper conduct of the work. These shall be located so as to cause no interference to any work to be performed on the site. The City shall be consulted with regard to locations.
- (b) Upon completion of the improvements, or as directed by the City, the Contractor shall remove all such temporary structures and facilities from the site, and leave the site of the work in the condition required by the Contract.

30. Partial Use of Site Improvements

The City may give notice to the Contractor and place in use those sections of the improvements which have been completed, inspected and can be accepted as complying with the technical specifications and if in its opinion, each such section is reasonably safe, fit, and convenient for the use and accommodation for which it was intended, provided:

- (a) The use of such sections of the Improvements shall in no way impede the completion of the remainder of the work by the Contractor.

- (b) The Contractor shall not be responsible for any damages or maintenance costs due directly to the use of such sections.

31. Local Program Liaison

For purposes of this Agreement, the City's Capital Improvement's Manager or equivalent authorized person will serve as the Local Program Liaison and primary point of contact for the Contractor. All required progress reports and communication regarding the project shall be directed to this liaison and other local personnel as appropriate.

32. Records Retention

- (a) The Contractor shall retain all required records for three years after the City makes its final payment and all pending matters are closed.

- (b) Contractor shall include the substance of this clause in all subcontracts it awards.

33. Conflicts of interest.

- (a) Governing Body. No member of the governing body of the City and no other officer, employee, or agent of the City, who exercises any functions or responsibilities in connection with administration, construction, engineering, or implementation of this award, shall have any personal financial interest, direct or indirect, in the Contractor or this Contract; and the Firm shall take appropriate steps to assure compliance.

- (b) Other Local Public Officials. No other public official, who exercises any functions or responsibilities in connection with the planning and carrying out of administration, construction, engineering or implementation of this award, shall have any personal financial interest, direct or indirect, in the Contractor or this Contract; and the Contractor shall take appropriate steps to assure compliance.

34. Debarment and Suspension (Executive Orders 12549 and 12689)

The Contractor certifies, by entering into this Contract, that neither it nor its principals are presently debarred, suspended, or otherwise excluded from or ineligible for participation in federally-assisted programs under Executive Orders 12549 (1986) and 12689 (1989). The term "principal" for purposes of this Contract is defined as an officer, director, owner, partner, key employee, or other person with primary management or supervisory responsibilities, or a person who has a critical influence on or substantive control over the operations of the Contractor. The Contractor understands that it must not make any award or permit any award (or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs under Executive Order 12549, "Debarment and Suspension."

35. Procurement of Recovered Materials

The Contractor shall comply with section 6002 of the Solid Waste Act, as amended by the Resource Conservation and Recovery Act, procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the

item exceeds \$10,000 or the value of the quantity acquired by the preceding fiscal year exceeded \$10,000 as long as such procurement is economically feasible.

36. [For Contracts > \$100K] Overtime Requirements

No Contractor or subcontractor contracting for any part of the Contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any laborer or mechanic in any workweek in which he is employed on such work to work in excess of 40 hours in such work week unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of 40 hours in such work week, as the case may be.

37. [For Contracts > \$150K] Clean Air Act and the Federal Water Pollution Control Act

The Contractor or subcontractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401–7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251–1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

38. Contract Documents and Drawings

The City will furnish the Contractor without charge 5 copies of the Contract Documents, including Technical Specifications and Drawings. Additional copies requested by the Contractor will be furnished at cost.

39. Contract Period

The work to be performed under this contract shall commence within the time stipulated by the City in the Notice to Proceed, and shall be fully completed within 180 calendar days thereafter.

40. Liquidated Damages

Since the actual damages for any delay in completion of the work under this contract are impossible to determine, the Contractor and his Sureties shall be liable for and shall pay to the City the sum of Two-Hundred Dollars (\$200) as fixed, agreed and liquidated damages for each calendar day of delay from the above stipulated time for completion.

SPECIAL CONDITIONS

SPECIAL CONDITIONS

DESCRIPTION OF WORK:

“2017 SANTA GERTRUDIS AVENUE STREET IMPROVEMENTS”

The Contractor shall furnish all labor, materials, equipment, tools, services and supervision necessary to perform all the work as described in the Proposal and shall deliver the work complete in all respects and in full accordance with the Contract Documents. All incidental services and materials which may be reasonably inferred as necessary to accomplish the intended end result shall be provided by the Contractor whether or not specifically shown on the Drawings or itemized in the Specifications.

CONSTRUCTION SEQUENCE:

Within ten (10) days after receiving a written “Notice to Proceed” the Contractor will be expected to pursue continuous progress of the overall Project from beginning of the work to completion. The Contractor will, in general, be left to schedule his work as he sees fit in so far as the Owner remains satisfied that an orderly progress is being made on the project to the extent of finishing within the stated contract time.

The Contractor will, however, be required to coordinate the sequencing of this work with the Owner and various utility companies, and any other individual or entity which may suffer inconvenience or damage as a result of a lack of cooperation in the construction of the project.

TIME OF COMPLETION:

Construction time is to start ten (10) days after receipt of a written “Notice to Proceed”. All items of work contemplated in these Specifications and the accompanying drawings are to be fully complete in the number of days specified in the bid proposal. After the notification of final completion and a final inspection, Contractor shall have thirty (30) days to remedy any incomplete or defective work.

PROJECT MEETINGS:

Prior to starting work, the Contractor shall attend a pre-construction conference to review the Contractor’s schedules, to establish procedures for processing applications for payment, and to establish a working understanding between Owner, Engineer and Contractor. Representatives of all parties shall be in attendance. Other meetings will be scheduled during the construction as need dictates.

LIQUIDATED DAMAGES FOR DELAY:

The Contractor agrees that a delay in substantial completion of the project beyond the total number of days anticipated for substantial completion plus such extensions to the allotted time as may be provided for in the General Conditions shall cause a damage to the Owner and that the Owner may withhold, permanently, from the Contractor’s total compensation a sum of two hundred dollars (\$200.00) per calendar day as the stipulated damages for such delay.

GUARANTEES:

The Contractor shall provide a warranty which shall guarantee work against defective materials and workmanship for a period of one (1) year from the date of issue of certificate of acceptance. Neither final acceptance nor final payment or any provision in the contract documents will relieve Contractor of above guarantee. Failure to repair or replace defect upon notice entitles Owner to repair or replace same and recover reasonable cost thereof from the Contractor and/or his surety.

PERMITS AND RIGHT-OF-WAY:

The Owner will provide right-of-way for the purpose of construction without cost to the Contractor by securing permits in areas of public dedication or by obtaining easements across privately owned property. It shall be the responsibility of the Contractor prior to the initiation of construction on easements through private property, or upon areas of public dedication, to familiarize himself with the requirements of the pertinent easement or permit and to abide by all of the stated terms of such easements or permits. The Contractor shall give notice of intent to begin construction on privately owned property or permitted areas as required by the relevant easement or permit but in no case less than 48 hours before commencing work.

MATERIALS AND EQUIPMENT:

Incorporate into work only new materials and equipment of domestic manufacture unless otherwise designated. Store these materials and equipment in manner to protect them from damage.

REPAIR OF DAMAGE:

Driveways, curbs, culverts, yards or items of private or public ownership, if damaged during the course of construction of this project, shall be, to the greatest extent practicable, repaired or replaced to the condition of such items before their being damaged, at no cost.

SITE MAINTENANCE AND CLEAN-UP:

Maintain work site during construction neat and free of trash, rubbish or other debris. In cleanup operations, remove from site temporary structures, rubbish and waste materials, and leave site in a neat and presentable condition throughout. Dispose of excavated material beyond that which is needed to bring site to required final elevations.

MEASUREMENT AND PAYMENT:

Estimated quantities shown in the Contract Documents are provided solely for the purpose of allowing a uniform comparison of submitted bids. Payment will be made on either the basis of actual measured quantities or a lump sum as may be relevant to the particular item. For those items for which payment is based on actual measured quantities, the Contractor shall verify all measurements at the site and shall be responsible for the correctness of same. Unit prices shall then be used to calculate payment. Methods of measurement shall be given in the Technical Specifications for each measured item.

RETAINAGE:

The Owner will retain from the Contractor's monthly estimate and request for payment an amount equal to 10% of the invoice amount. This 10% shall be retained by the Owner until final acceptance of the total project and then paid to the Contractor.

PAYMENT FOR MATERIALS ON SITE:

Contractor shall present to the Owner with his monthly estimate of production and request for payment a list of all material delivered to the project site, but not installed, with the total invoice cost of that material and the Owner shall pay to the Contractor the invoice cost of such material as has been verified by the Engineer to be "on site", less a 10% retainage. "On site" shall mean on or immediately adjacent to the work area or point of material installation, or a central storage yard or office area which has been set up for the project in the immediate project area. This does not include material in transit to the job site, material stored in yards or areas located in other towns, or materials stored in a manufacturer's warehouse, even though Contractor may have been invoiced for such material. Materials considered as consumables, i.e. chlorine for disinfection, testing pipe and equipment, etc., shall not be considered as material on-site, and only principle material items shall be considered for payment for material on-site.

STATE SALES TAX:

The improvements proposed for construction under the terms of these Contract Documents shall become a part of the utility system of the Owner. The Owner qualifies as an exempt organization under the Limited Sales Excise Tax Rules and Regulations of the State of Texas. Since the Owner and the Contractor shall be exempt from the state sales tax, the state sales tax shall not be included in the Bid.

Prior to the execution of the Contract, the Contractor shall obtain a Limited Sales Tax Permit and shall show evidence of this permit when signing the Contract. The Contractor shall then issue Resale Certificates in lieu of payment of the sales tax, on material purchased for incorporation into the project. These instructions are in strict compliance with the State Sales Tax Code, Section 151.311. The Contractor is assumed to be fully aware of the sales tax regulations and agrees to cooperate fully with the Owner claiming its lawful exemption from the state sales tax.

TRAFFIC CONTROL:

It will be the Contractor's responsibility to adequately provide for the safety of the public during the course of the construction of the project to include flagmen. No separate compensation will be paid to the Contractor for traffic control.

MATERIALS TESTING:

The Owner will provide for the initial testing of materials to be incorporated into the project to such extent as may be desired including the testing of concrete samples taken at the time of concrete placement. The Contractor shall be responsible for supplying samples of materials as may be required for testing. Any re-testing required shall be at the Contractor's expense as stated in the General Conditions.

WATER FOR CONSTRUCTION:

Water used for the mixing of concrete, jetting or flooding trenches, or testing, or any other purposes incidental to this project, will be furnished by the Contractor. If water is obtained from the Owner's water supply, the Contractor shall make the necessary arrangements for securing and transporting such water and shall take such water in a manner and at such times that will not produce a harmful drain or decrease pressure in the Owner's water system. There will be no charge to Contractor for water used in the construction of this project.

LINES AND GRADES:

Detailed construction staking shall be the full responsibility of the Contractor.

LOCATION OF AND DAMAGE TO EXISTING UTILITIES:

The Contractor shall be solely responsible for all above ground utilities, structures, and appurtenances in regard to protection and replacement or repair of same. The Contractor shall also be solely responsible for visible below ground utilities, structures and appurtenances that may be accurately located by removing manhole covers, valve box covers, and other access point coverings, with a reasonable effort on the part of two workmen, using hand tools for such removal and inspection. The cost of protecting, replacing, or repairing the utilities, structures, and appurtenances covered by this paragraph shall be borne solely by the Contractor and shall be included in the prices bid for the various affected items in the Contract.

The Contractor shall notify all private and public utilities 48 hours prior to performing any work in the vicinity of said utilities. Such 48-hour notice shall not include Saturdays, Sundays and holidays.

In those instances where faults, caverns or subsidence zones are encountered during construction, the design engineer will make the necessary adjustments and/or modifications to ensure proper installation. This subject is further defined in the detailed specification list which governs this project.

CONTRACTOR'S FIELD ADMINISTRATION STAFF:

The Contractor shall employ for this project, as its field administration staff, superintendents and foremen who are careful and competent and acceptable to the Owner. The criteria upon which the Owner shall make this determination shall include the following:

- A. The superintendent shall have at least five (5) years experience in the day-to-day field management and oversight of projects of a similar size and complexity to the project which is the subject of this Contract. This experience shall include, but is not limited to, scheduling of manpower and materials, safety, coordination of subcontractors, and familiarity with the submittal process, federal and state wage rate requirements, and contract close-out procedures.
- B. The foreman shall have at least five (5) years experience in oversight and management of the work of various subcontractors and crafts. Should the scope of the project be such that a foreman is not required, the Contractor's superintendent shall assume the responsibilities of a foreman.

Documentation concerning these matters shall be reviewed by the Owner. The Contractor's field administration staff, and any subsequent substitutions or replacements thereto, shall be approved by the Owner in writing prior to such superintendent or foreman assuming responsibilities on the project.

Such written approval of field administration staff is a prerequisite to the Owner's obligation to execute a contract for this project. If such approval is not obtained, the award may be rescinded. Further, such written approval is also necessary prior to a change in field administration staff during the term of this Contract. If the Contractor fails to obtain prior written approval of the Owner concerning any substitutions or replacements in its field administration staff for this project, the award may be rescinded. Further, such written approval is also necessary prior to a change in field administration staff during the term of this Contract. If the Contractor fails to obtain prior written approval of the Owner concerning any substitutions or replacements in its field administration staff for this project during the term of the Contract, such a failure will constitute a basis to annul the Contract.

CHARACTER OF WORKMEN AND CONDITION OF EQUIPMENT:

The Contractor shall employ such superintendents, foremen, and workmen as are careful and competent and the Engineer may demand the dismissal of any person or persons employed by the Contractor, in, about or on the work who shall misconduct himself or be incompetent or negligent in the proper performance of his or their duties or neglect or refuse to comply with the directions of the Engineer, and such person or persons shall not be employed thereon again without the written consent of the Engineer. All workmen shall have sufficient skill and experience to perform properly the work assigned them.

The Contractor shall furnish such equipment as is considered necessary for the prosecution of the work in an acceptable manner and at a satisfactory rate of progress. All equipment, tools and machinery used for handling materials and executing any part of the work shall be subject to the approval of the Engineer and shall be maintained in a satisfactory working condition. Equipment on any portion of the work shall be such that no injury to the work or adjacent property will result from its use.

AS-BUILT DRAWINGS:

Contractor shall maintain daily a set of "As-Built" drawings detailing the location and depths of new and existing utilities. The completed set of "As-Built" shall be submitted to the ENGINEER at the completion of the project.

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. **This statement must be notarized.** If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information it desires.

Date: _____

Bidder (Legal Name of Firm): _____

Date Organized: _____

Address : _____
: _____

Date Incorporated _____

Federal ID Number: _____

Number of Years in contracting business under present name _____

List all other names under which your business has operated in the last 10 years:

Work Presently Under Contract:

Contract	Amount \$	Completion Date
_____	_____	_____
_____	_____	_____
_____	_____	_____

Type of work performed by your company: _____

Total Staff employed by Firm (Break down by Managers and Trades on separate sheet):

Have you ever failed to complete any work awarded to you? Yes No
(If yes, please attach summary of details on a separate sheet. Include brief explanation of cause and resolution)

Have you ever defaulted on a contract? Yes No
(If yes, please attach summary of details on a separate sheet.)

Has your organization had any disbarments or suspensions that have been imposed in the past five years or that was still in effect during the five-year period or is still in effect? Yes No

(If yes, list and explain; such list must include disbarments and suspensions of officers, principals, partners, members, and employees of your organization.)

List the projects most recently completed by your firm (include project of similar importance):

Project	Amount \$	Mo/Yr. Completed
---------	-----------	------------------

Major equipment available for this contract: _____

Are you in compliance with all applicable EEO requirements? Yes No
(If no, please attach summary of details on a separate sheet.)

Bank References

Address: _____ Contact Name:

City & State: _____ Zip: _____ Phone Number:

Credit available: \$ _____

Has the firm or predecessor firm been involved in a bankruptcy or reorganization? Yes No
(If yes, please attach summary of details on a separate sheet.)

List on a sheet attached hereto all judgements, claims, arbitration proceedings, or suits pending or outstanding against bidder over the last five (5) years with amount of claim and brief description.

List on a sheet attached hereto all lawsuits or requested arbitration with regard to construction contracts which bidder has initiated within the last five (5) years and brief explanation of claim and outcome.

Attach resume(s) for the principal member(s) of your organization, including the officers as well as the proposed superintendent for the project.

Signed this _____ day of _____, 20_____.

Signature

Printed Name and Title

Company Name

Notary Statement:

_____, being duly sworn, says that he/she is the _____ Position/Title _____ of _____ (Firm Name), and hereby swears that the answers to the foregoing questions and all statements therein contained are true and correct. He/she hereby authorizes and requests any person, firm, or corporation to furnish any information requested City of _____ in verification of the recitals comprising this Statement of Bidder's Qualifications.

Subscribed and sworn before me this _____ day of _____, 20_____.

Notary Public

Signature

Printed Name

My Commission Expires: _____,

The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.

ATTORNEY'S REVIEW CERTIFICATION

I, the undersigned, _____, the duly authorized and acting legal representative of the _____, do hereby certify as follows:

I have examined the attached contract(s) and surety bonds and am of the opinion that each of the agreements may be duly executed by the proper parties, acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties; and that the agreements shall constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

Attorney's signature: _____ Date: _____

Print Attorney's Name: _____

Texas State Bar Number: _____

TECHNICAL SPECIFICATIONS

SECTION 021080
REMOVING OLD STRUCTURES (S-55)

1. DESCRIPTION

This specification shall provide for the removal and disposal of old structures or portions of old structures, as noted on the plans, and shall include all excavation and backfilling necessary to complete the removal. The work shall be done in accordance with the provisions of these specifications.

2. METHOD OF REMOVAL

Culverts or Sewers. Pipe shall be removed by careful excavation of all dirt on top and the sides in such manner that the pipe will not be damaged. Removal of sewer appurtenances shall be included for removal with the pipe. Those pipes which are deemed unsatisfactory for reuse by the Engineer may be removed in any manner the Contractor may select.

Concrete Structures. Concrete structures or concrete portions of structures shall be removed by blasting and/or sledging the concrete into sizes not larger than one cubic foot.

Portions of the old structure shall be removed to the lines and dimensions shown on the plans, and these materials shall be disposed of as shown on the plans or as directed by the Engineer. Any portion of the existing structure, outside of the limits designated for removal, damaged during the operations of the Contractor shall be restored to its original condition at his entire expense. Explosives shall not be used in the removal of portions of the existing structure unless approved by the Engineer, in writing.

Concrete portions of structures below the permanent ground line, which will not interfere in any manner with the proposed construction, may be left in place, but removal shall be carried at least 2 feet below the permanent ground line and neatly squared off. Reinforcement shall be cut off close to the concrete.

Steel Structures. Steel structures or steel portions of structures shall be dismantled in sections as determined by the Engineer. The sections shall be stored. Rivets and bolts connecting steel railing members, steel beams of beam spans and steel stringers of truss spans shall be removed by butting the heads with a "cold cut" and punching or drilling from the hole, or by such other method as will not injure the members for re-use and will meet the approval of the Engineer. The removal of rivets and bolts from connections of truss members, bracing members, and other similar members in the structure will not be required unless specifically called for on the plans or special provisions and the Contractor shall have the option of dismantling these members by flame-cutting the members immediately adjacent to the connections. Flame-Cutting will not be permitted, however, when plans or special provisions call for the structure unit to be salvaged in such manner as to permit re-erection. In such case, all members shall be carefully matchmarked with paint in accordance with diagram furnished by the Engineer prior to

dismantling, and all rivets and bolts shall be removed from the connections in the manner specified in the first portion of this paragraph.

Timber Structures Timber structures or timber portions of structures shall be removed in such manner as to damage the timber for further use as little as possible. All bolts and nails shall be removed from such lumber as deemed salvable by the Engineer.

Unless otherwise specified on the plans, timber piles shall be either pulled or cut off at the point not less than 2 feet below ground line, with the choice between these two methods resting with the Contractor, unless otherwise specified.

Brick or Stone Structures. Brick or stone structures or stone portions of structures shall be removed by blasting and/or sledging the masonry into sizes not larger than one cubic foot.

Portions of such structures below the permanent ground line, which will not in any manner interfere with the proposed construction, may be left in place, but removal shall be carried at least 2 feet below the permanent ground line and neatly squared off.

Salvage. All material such as pipe, timbers, railings, etc., which the Engineer deems as salvable for reuse, and all structural steel shall be in the property of City unless otherwise specified and delivered to a designated storage area.

The I-beams, stringers, etc., which are specified to be dismantled without damage for reuse, and all steel members when matchmarked and dismantled for reuse, shall be blocked off the ground in an upright position to protect the members against further damage.

Materials, other than structural steel, which are not deemed salvable by the Engineer, shall become the property of the Contractor and shall be removed to suitable disposal sites off of the right-of-way arranged for by the Contractor, or otherwise disposed of in a manner satisfactory to the Engineer.

Where temporary structures are necessary for a detour adjacent to the present structure, the Contractor will be permitted to use the material in the old structure for the detour structure, but he shall dismantle and stack or dispose of the material as required above as soon as the new structure is opened for traffic.

The bidder's attention is called to the section, "Use of Explosive" in the "General Provisions and Requirements", regarding the use of explosives.

Backfill. All excavation made in connection with this specification and all openings below the natural ground line caused by the removal of old structures or portions thereof shall be backfilled to the level of the original ground line, unless otherwise provided on the plans.

That portion of the backfill which will support any portion of the roadbed or embankment shall be placed in layers of the same depth as those required for placing embankment.

Material in each layer shall be wetted uniformly, if required, and shall be compacted to the density required in the adjoining embankment. In places inaccessible to blading and rolling equipment, mechanical or hand tamps or rammers shall be used to obtain the required compaction.

That portion of the backfill which will not support any portion of the roadbed or embankment shall be placed as directed by the Engineer in such manner and to such state of compaction as will preclude objectionable amount of settlement.

3. MEASUREMENT AND PAYMENT

Measurement and payment for removal of structures shall be considered subsidiary to appropriate bid item for which the work is a component of.

END OF SECTION

**SECTION 022010
TRAFFIC CONTROL**

1. DESCRIPTION

Traffic control by the CONTRACTOR shall follow the guidelines as set forth in the Texas Manual of Uniform Traffic Control Devices. CONTRACTOR shall furnish traffic control plan to ENGINEER and the Texas Department of Transportation, and obtain approval of plan from both prior to start of operation.

2. LIMITS OF INTERSECTION CLOSING

No intersections may be closed without specific authorization of the ENGINEER/CITY and the Texas Department of Transportation.

3. ACCESS TO PROPERTY

The CONTRACTOR shall provide and maintain at all times an all weather driving surface and unencumbered ingress and egress to businesses and residences.

4. MODIFICATIONS OF TRAFFIC CONTROL PLAN

Modifications of the traffic control plan described herein shall be approved by the ENGINEER and the Texas Department of Transportation.

5. MEASUREMENT AND PAYMENT

Measurement and payment for Traffic Control shall be considered subsidiary to the appropriate bid items.

END OF SECTION

SECTION 022020
EXCAVATION AND BACKFILL FOR UTILITIES AND SEWERS (S-9)

1. DESCRIPTION

This specification shall govern all excavation for storm or sanitary sewers, sewers structures appurtenances and connections, utility pipe or conduits, and for backfilling to the level of the original ground, all in conformity with the locations, lines, and grades shown on the plans or as established by the Engineer. This specification also governs for the necessary pumping or bailing and drainage, and all sheathing and bracing of trench walls, the furnishing and placing of cement stabilized backfill, and hauling and disposition of surplus materials, and the bridging of trenches and other provisions for traffic or access as provided herein.

2. CONSTRUCTION

- (1) Unless otherwise specified on the plans or permitted by the Engineer, all sewers, pipe, and conduit shall be constructed in open cut trenches with vertical sides. Trenches shall be sheathed and braced as necessary throughout the construction period. Sheathing and bracing shall be the responsibility of the Contractor (Section 312317).

Trenches shall have a maximum width of one foot beyond the horizontal projection of the outside surfaces of the pipe and parallel thereto on each side unless otherwise specified.

The Contractor shall not have more the 200 feet of open trench left behind the trenching operation and no more than 500 feet of ditch behind the ditching machine that is not compacted as required by the plans and specification. No trench or excavation shall remain open after working hours.

For all utility conduit and sewer pipe to be constructed in fill above natural ground, the embankment shall first be constructed to an elevation not less than one foot above the top of the pipe or conduit after which excavation for the pipe or conduit shall be made.

If quicksand, muck, or similar unstable material, is encountered at the bottom of the excavation, the following procedure shall be used unless other methods are called for on the plans. If the unstable condition is a result of ground water, it shall be controlled by the Contractor, prior to additional excavation. After stable conditions have been achieved, unstable soil shall be removed or stabilized to a

depth of 2 feet below the bottom of pipe for pipes 2 feet or more in height; and to a depth equal to the height of pipe, 6 inch minimum, for pipe less than 2 feet in height. Such excavation shall be carried at least 1 foot beyond the horizontal limits of the structure on all sides. All unstable soil so removed shall be replaced with suitable stable material, placed in uniform layers of suitable depth as

directed by the Engineer, and each layer shall be wetted, if necessary, and compacted by mechanical tamping as required to provide a stable foundation for the structure. Soil which is considered to be of sufficient stability to sustain properly the adjacent sections of the roadway embankment will be considered a suitable foundation material for the culvert or sewer. For unstable trench conditions requiring outside forms, seals, sheathing, and bracing, or where ground water is encountered, and additional excavation and backfill required shall be done at the contractor's expense.

- (2) Shaping of Trench Bottom. The trench bottom shall be undercut a minimum depth sufficient to accommodate the class of bedding indicated in the plans and specification.
- (3) Dewatering Trench. Pipe or conduit shall not be constructed or laid in a trench in the presence of water. All water shall be removed from the trench sufficiently prior to the pipe or conduit planing operation insure a relatively dry (no standing water), firm bed. The trench shall be maintained in such dewatered condition until the trench has been backfilled to a height at least one foot above the top of pipe. Removal of water may be accomplished by bailing, pumping, or by a well-points installation as conditions warrant. Removal of well-points shall be at rate of 1/3 per 24 hours (every third well-point).
- (4) Excavation in Streets. Excavation in streets, together with the maintenance of traffic where specified, and the restoration of the pavement riding surface shall be in accordance with plan detail or as required by other applicable specification.
- (5) Removing Old Structures. When old masonry structures or foundations are encountered in the excavation, such obstructions shall be removed for the full width of the trench and to a depth of 1-foot below the bottom of the trench. When old inlets or manholes are encountered and no plan provision is made for adjustment or connection to the new sewer, such manholes and inlets shall be removed completely to a depth 1-foot below the bottom of the trench. In each instance, the bottom to the trench shall be restored to grade by backfilling and compacting by the methods provided hereinafter for backfill. Where the trench cuts through storm or sanitary sewers which are known to be abandoned, these sewers shall be cut flush with sides of the trench and blocked with a concrete plug in a manner satisfactory to the Engineer.
- (6) Protection of Utilities. The Contractor shall conduct his work such that a reasonable minimum of disturbance to existing utilities will result. Particular care shall be exercised to avoid the cutting or breakage of water and gas line. Such lines, if broken, shall be restored promptly by the Contractor. When active sanitary sewer lines are cut in the trenching operations, temporary flumes shall be provided across the trench, while open, and the lines shall be restored when the backfilling has progressed to the original bedding lines of the sewer so cut.

The Contractor shall inform utility owners sufficiently in advance of the Contractor's operations to enable such utility owners to reroute, provide temporary detours, or to make other adjustments to utility lines in order that the Contractor may proceed with his work with a minimum of delay and concerned in effecting any utility adjustments necessary and shall not hold the City liable for any expense due to delay or additional work because of conflicts.

(7) Excess Excavated Material. All materials from excavation not required for backfilling the trench shall be removed, by the Contractor, from the job site promptly following the completion of work involved.

(8) Backfill

A. Backfill Procedure Around Pipe

All trenches and excavation shall be backfilled as soon as is practical after the pipes or conduits are properly laid. In addition to the specified pipe bedding material, the backfill around the pipe as applicable, shall be Bank Sand as described by specification "Bank Sand Backfill". Compacted material shall be in place between the external wall of the pipe and the undisturbed sides of the trench and to a level twelve (12) inches above the top of the pipe.

B. Backfill Over One Foot Above Pipe

The backfill for that portion of trench over (1) foot above the pipe or conduit shall be selected excavated material free of hard lumps, rock fragments, or other debris, placed in layers not more than 6 inches in depth (loose measurement), wetted if required and thoroughly compacted by use of mechanical tampers to the natural bank density and not less than 95% Standard Proctor. Flooding of backfill is not allowed. Jetting of backfill will be allowed in sandy soils and in soils otherwise approved by the Engineer. Regardless of backfill method, no lift shall exceed one foot and density shall not be less than 95% Standard Proctor. The last four feet of backfill shall be placed in layers of not more than 6 inches and compacted by use of mechanical tampers to the natural back density and not less than 95% Standard Proctor.

A period of not less than twenty-four (24) hours shall lapse between the time of jetting and the placing of the top four (4) feet of backfill.

When indicated on the plans or at utility line crossings that are under pavements, trenches shall be backfilled to the road base with "Hasty Backfill" cement stabilized sand containing a minimum of 2 sacks of standard Type I Portland cement per cubic yard of sand.

3. MEASUREMENT AND PAYMENT

Excavation and backfill for utilities and sewers shall not be measured and paid for separately. It shall be considered subsidiary to the items for which the excavation is required.

END OF SECTION

SECTION 022022
TRENCH SAFETY FOR EXCAVATIONS

1. DESCRIPTION

This specification shall govern all work for providing for worker safety in excavations and trenching operations required to complete the project.

2. REQUIREMENTS

Worker Safety in excavations and trenches shall be provided by the Contractor in accordance with Occupational Safety and Health Administration (OSHA) Standards, 29 CFR Park 1926 Subpart P - Excavations.

It is the sole responsibility of the Contractor, and not the City or Engineer, to determine and monitor the specific applicability of a safety system to the field conditions to be encountered on the job site during the project.

The Contractor shall indemnify and hold harmless the City and Engineer from all damages and cost that may result from failure of methods or equipment used by the Contractor to provide for worker safety.

Trenches as used herein, shall apply to any excavation into which structures, utilities, or sewers are placed regardless of depth.

Trench Safety Plan as used herein, shall apply to all methods and materials used to provide for worker safety in excavation and trenching operations required during the project.

3. MEASUREMENT AND PAYMENT

Measurement of Trench Safety Plan shall be by the linear foot of trench or excavation, regardless of depth. Measurement shall be taken along the center line for trenches and along the longest horizontal distance across the bottom for other shape of excavations.

Payment for Trench Safety Plan shall be at the unit price bid and shall fully compensate the Contractor for all work, equipment, materials, personnel, and incidentals as required to provide for worker safety in trenches and excavations for the project.

Revision current for Texas H.B. No. 1569, dated 5/23/89.

END OF SECTION

**SECTION 022081
BANK SAND BACKFILL**

1. DESCRIPTION

This specification shall govern the quality and placement of sand backfill adjacent to and above utilities and elsewhere as shown on the plans.

2. MATERIALS

A. Bank Sand Backfill shall meet the following gradation limits:

<u>Sieve Size</u>	<u>% Passing</u>
1/2"	100
3/8"	90-100
#4	80-100
200	< 20%

B. Bank sand backfill shall have a PI from non-plastic to a maximum of 10 and a maximum liquid limit of 30.

3. EXECUTION

Place bank sand backfill at 2 %, plus or minus, from optimum moisture in lifts of 8" or less. Compact with mechanical tamps to a minimum of 95% of Standard Proctor Density.

4. MEASUREMENT & PAYMENT

No separate pay for bank sand backfill. Include cost of same in contract bid price for items of which work is a component.

END OF SECTION

**SECTION 022100
SELECT MATERIAL (S-15)**

1. DESCRIPTION

This specification shall govern the use of select material to be used to treat designated sections of roadways, embankments, trenches, etc. Select material shall be a mixture of sand and clay or other suitable granular material. The material shall be free from vegetation, debris and clay lumps. That portion of the select material passing a 40-mesh sieve shall have a liquid limit of 45 maximum, a plasticity index range from 6 to 13, and a calculated linear shrinkage of 8.5 maximum.

2. CONSTRUCTION METHODS

Select material shall be mixed uniformly and placed in layers not to exceed 6" loose depth. The material shall be brought to approximately optimum moisture content and compacted to 95% Standard Proctor Density. Each layer shall be complete before the succeeding layer is placed.

The finished surface of the select material shall conform to the grade and section shown on the plans.

3. MEASUREMENT & PAYMENT

Select material shall not be measured and paid for separately. It shall be considered subsidiary to the items for which the select material is required.

END OF SECTION

SECTION 025000
CEMENT SAND BACKFILL

1. DESCRIPTION

The specifications presented in this item provide for the use of cement-sand for backfilling around drainage pipes, manholes, inlets and structures as required; and for backfill in pavement sections.

2. MATERIALS

- A. Sand: Provide sand from an approved source free from clay lumps, organic or other deleterious material and having a Plasticity Index of four (4) or less.
- B. Portland Cement: Furnish Portland cement to conform with ASTM C 150, Type I.
- C. Water: Water shall be reasonably clean and free from injurious amounts of oil, acid, salt, organic matter, or other deleterious material.

3. PROPORTIONING AND MIXING

Add not less than 2 sacks of Portland cement to stabilize 1 cubic yard of sand mixture. Add required amount of water and mix thoroughly in an approved pugmill type mixer. Where pugmill mixing is impractical in the ENGINEER'S opinion, cement sand backfill may be machine mixed on site upon prior approval from ENGINEER. Stamp batch ticket with the time of loading. Material not in place within 1½ hours after loading will be rejected.

4. SUBSTITUTE MATERIAL

Crushed Limestone Bedding and Backfill Material: Crushed Limestone bedding and backfill material may be used as a substitute for cement-sand bedding and backfill if a shortage of cement-sand exists.

5. BEDDING PROCEDURES

- A. Use cement stabilized sand as bedding only where called for on the detail drawings.
- B. Place cement-stabilized sand in trench prepared for pipe to the depth shown on the detail drawings.
- C. After bedding material is in place, set pipe in position to grade.

- D. Add additional cement-sand material around pipe, filling to at least the spring line of the pipe. Place cement-sand material at optimum moisture content and in layers not to exceed 12 inches measured loose.
- E. Compact with mechanical or hand tamps to at least 95 percent of AASHTO Density, Test Method T-99.

6 FOUNDATIONS

Use cement-sand for stabilizing the foundation for manholes, inlets or concrete structures, if required.

7. BACKFILL PROCEDURES

- A. Use cement-stabilized sand as backfill only where specified on the detail drawings.
- B. Place cement-stabilized sand (see detail drawings) as backfill for utility lines through existing or future pavement. Use cement-sand material as backfill material around manholes, inlets and junction boxes if the structure adjoins pavements.
- C. Place cement-sand material at optimum moisture content in layers not to exceed 12 inches, measured loose.
- D. Compact with mechanical or hand tamps to at least 95 percent of prescribed AASHTO Density, Test Method T-99.

8. MEASUREMENT AND PAYMENT

Separate payment shall not be made for cement-stabilized sand bedding or backfill. Cost of this item is to be included in the unit price bid for the work for which this specification is applicable.

END OF SECTION

SECTION 5001
GEOGRID BASE REINFORCEMENT

1. DESCRIPTION

Furnish and place geogrid base reinforcement in accordance with the lines and grades shown on the plans.

2. MATERIAL

Provide geogrid base reinforcement, of the type shown on the plans, meeting the requirements of DMS-6240 "Geogrid for Base/Embankment Reinforcement." Use roll widths and lengths shown on the plans or as approved.

3. CONSTRUCTION METHODS

Prepare the subgrade as indicated on the plans or as directed. Set string lines for alignment if directed. Install geogrid in accordance with the lines and grades as shown on the plans. Place base material in lift thicknesses and compact as shown on the plans or as directed. Do not operate tracked construction equipment on the geogrid until a minimum fill cover of 6 in. is achieved. Rubber tire construction equipment may operate directly on the geogrid at speeds of less than 5 mph if the underlying material will support the loads. Where excessive substructure deformation is apparent, correct grid placement operations as recommended by the manufacturer or as directed

- a. **Geogrid Placement.** Orient the geogrid length as unrolled parallel to the direction of roadway. Overlap geogrid sections as shown on the plans or as directed. Use plastic ties at overlap joints or as directed. Placement of geogrid around corners may require cutting and diagonal lapping. Pin geogrid at the beginning of the backfill section as directed. Keep geogrid taut at the beginning of the backfilling section but not restrained from stretching or flattening.
- b. **Longitudinal Joints.** Overlap longitudinal joints by a minimum of 1 ft. Space longitudinal ties 10 ft. to 20 ft. or as directed.
- c. **Transverse Joints.** Overlap transverse joints by a minimum of 1 ft. Space transverse ties 4 ft. to 5 ft. or as directed.
- d. **Damage Repair.** As directed, remove and replace contractor damaged or excessively deformed areas without additional compensation. Lap repair areas a minimum of 3 ft. in all directions. Tie each side of repair grid in at least 3 locations but do not exceed normal construction spacing; tie spacing for odd shapes will be as directed. Repair excessively deformed materials underlying the grid as directed

4. MEASURNMENT AND PAYMENT

Geogrid base reinforcement will be measured by the square yard of roadway placement as shown in the plans with no allowance for overlapping at transverse and longitudinal joints.

The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" are paid for at the unit bid price "Geogrid Base Reinforcement" of the type specified. This price is full compensation for furnishing, preparing, hauling and placing materials including labor, materials, freight, tools, equipment and incidentals.

END OF SECTION

SECTION 025220
FLEXIBLE BASE - LIMESTONE

1. DESCRIPTION

The specifications presented in this item are intended to present a minimum level of quality in the construction of flexible base which must be equaled or exceeded by the flexible base construction incorporated into work being a part of the proposed paving repairs for which this set of specifications is applicable.

Flexible Base may be used for a foundation for a surface course or for other base courses; shall be composed of crusher run broken stone; and shall be constructed as herein specified, in conformity with sections shown on plans, and to the lines and grades as established by the ENGINEER.

2. MATERIAL

The materials shall be crushed limestone from an approved source and shall consist of durable particles of stone mixed with approved binding material. The material shall conform to TxDOT Specifications (2014) Item 247, "Flexible Base", Type A, Grade 1.

3. CONSTRUCTION METHODS

Flexible base shall be placed by methods conforming to TxDOT Specifications (2014) Item 247.4. Compacted thickness of crushed limestone base shall be as shown on the plans with not less than 95% of maximum dry unit weight obtained by compaction of ASTM D-1557 procedure.

END OF SECTION

**SECTION 025404
ASPHALTS, OILS AND EMULSIONS (S-29)**

1. DESCRIPTION

This specification shall govern all work for asphalt cement, cut-back asphalts, emulsified asphalts, other miscellaneous asphaltic materials and latex additives required to complete the project.

2. MATERIALS

When tested according to Texas Department of Transportation Test Methods, the various materials shall meet the applicable requirements of this specification.

A. ASPHALT CEMENT. The asphalt cement shall be homogeneous, shall be free from water, shall not foam when heated to 347 F and shall meet the requirements in Table 1.

TABLE 1

Viscosity Grade	AC-1.5		AC-3		AC-5		AC-10		AC-20		AC-30	
Property	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, 140 F, poises	100	200	250	350	400	600	800	1200	1600	240	2400	360
275 F, poises	0.7	-	1.1	-	1.4	-	1.9	-	2.5	0	3.0	0
										-		-
Penetration, 77 F 100 g, 5 sec	250	-	210	-	135	-	85	-	55	-	45	-
Flash Point, C.O.C., F	425	-	425	-	425	-	450	-	450	-	450	-
Solubility in Trichloroethylene, %	99.0	-	99.0	-	99.0	-	99.0	-	99.0	-	99.0	-
Spot Test	Negative for all grades											
Tests on Residue from Thin Film Oven Test: Viscosity, 140 F, poises												
Ductility, 77 F, 5 cm per min., cm	-	450	-	900	-	1500	-	3000	-	600	-	900
										0		0
	100	-	100	-	100	-	100	-	70	-	50	-
	*									-		-

*If the ductility at 77 F is less than 100 cm, the material will be acceptable if its ductility at 60 F is more than 100 cm.

CAUTION: Heating of asphaltic materials (except emulsions) constitutes a fire hazard. Proper precautions should be used in all cases, especially with RC cutbacks. The utmost care shall be taken to prevent open flames from coming in contact with the asphaltic material or the gases of same. The Contractor shall be responsible for damage from any fires or accidents which may result from heating the asphaltic materials.

B. LATEX MODIFIED ASPHALT.

- a. Latex Additive. The latex additive shall be an emulsion of styrene-butadiene low-temperature copolymer in water. The emulsion shall have good storage stability and possess the following properties.

Monomer Ratio of Latex,	-	73 ± 5

butadiene to styrene		27 ± 5
Minimum Solids Content,	-	45
percent by weight		
Viscosity of Emulsion at	-	2000
77 ± 1 F, cps, max		
(No. 3 spindle, 20 rpm,		
Brookfield RVT Viscometer)		

The manufacturer shall furnish the actual styrene-butadiene rubber (SBR) content for each batch of latex emulsion. This information shall accompany all shipments to facilitate proper addition rates.

- b. Latex Modified Asphalt Cement. The latex modified asphalt cement shall consist of an AC-5 or AC-10 asphalt cement in accordance with Subarticle 300.2 (1) to which a styrene-butadiene rubber latex has been added. The amount shown is based on latex solids in the finished asphalt cement-latex additive blend. Possible combinations and their intended uses are as follows:

Material	Use
AC-5 + 2% latex solids	Surface treatments
AC-10 + 2% latex solids	Surface treatments or asphaltic concrete
AC-10 + 3% latex solids	Asphaltic concrete
AC-10 + 3% latex solids (High viscosity blend)	Asphaltic concrete where maximum high temperature toughness is needed.

The finished asphalt cement-latex additive blend shall be smooth, homogeneous, and comply with the requirements in Table 2.

TABLE 2

Type - Grade	AC-5 + 2% Latex Solids	AC-10 + 2% Latex Solids	AC-10 + 3% Latex Solids	AC-10 + 3% Latex Solids (High Viscosity Blend)
Property				
Minimum SBR content, percent by wt. solids (IR determination)*	2.0	2.0	3.0	3.0
Penetration, 100g, 5 sec, 77 F, min	120	80	75	75
Viscosity, 140 F, poises, minimum	700	1300	1600	2300
Viscosity, 275 F, poises, maximum	7.0	8.0	12.0	12.0
Ductility, 39.2 F, 1cm/min, cm, minimum				
Ductility, 39.2 F, 5 cm/min, cm, minimum				
Separation of Polymer after 48 hrs. at 325 F	None	None	None	None
Separation of Polymer after 5 hrs. at 325 F **	None	None	None	None

* The asphalt supplier shall furnish the Department samples of the asphalt cement and latex emulsion used in making the finished product.

** Applies in lieu of the 48 hour requirement when the latex modified asphalt is to be used in asphaltic concrete and the latex additive is introduced separately at the mix plant, either by injection into the asphalt line or into the mixer.

- c. Latex Modified Cutback Asphalt. The latex modified cutback asphalt shall be a medium curing cutback produced from an asphalt cement to which has been added a styrene-butadiene rubber latex. The latex modified cutback asphalt shall comply with the requirements in Table 3.

TABLE 3

Type - Grade	MC-2400 Latex	
	Min	Max
Property		
Kinematic Viscosity @ 140 F, cst	2400	4800
Water, percent	-	0.2
Flash Point, T.O.C., F	150	-
Distillation Test:		
Distillate, percentage by volume of total distillate to 680 F		
to 500 F	-	35
to 600 F	35	80
Residue from Distillation, volume %	78	-
Tests on Distillation Residue:		
Minimum SBR Content percent by wt. solids (IR determination)*	2.0	-
Penetration, 100g, 5 sec., 77 F	150	300
Ductility, 5cm/min, 77 F, cm	50	-
Solubility in Trichloroethylene, %	99.0	-

* The asphalt supplier shall furnish the Department samples of the asphalt cement and latex emulsion used in making the finished product.

C. CUTBACK ASPHALT. Cutback asphalt shall meet the requirements indicated in Tables 4 and 5 for the specified type and grade.

TABLE 4
RAPID CURING TYPE CUTBACK ASPHALT

Type - Grade	RC-250		RC-800		RC-3000	
Property	Min	Max	Min	Max	Min	Max
Kinematic Viscosity @ 140 F, cst	250	400	800	1600	3000	6000
Water, percent	-	0.2	-	0.2	-	0.2
Flash Point, T.O.C., F	80	-	80	-	80	-
Distillation Test:						
Distillate, percentage by volume of total distillate to 680 F						
to 437 F	40	75	35	70	20	55
to 500 F	65	90	55	85	45	75
to 600 F	85	-	80	-	70	-
Residue from distillation, volume %	70	-	75	-	82	-
Tests on Distillation Residue:						
Penetration, 100g, 5 sec., 77 F	80	120	80	120	80	120
Ductility, 5cm/min, 77 F, cm	100	-	100	-	100	-
Solubility in Trichloroethylene, %	99.0	-	99.0	-	99.0	-
Spot Test	Negative for all grades					

CAUTION: R.C. CUTBACKS ARE EXTREMELY FLAMMABLE!

TABLE 5
MEDIUM CURING TYPE CUTBACK ASPHALT

Type - Grade	MC-30		MC-70		MC-250		MC-800		MC-3000	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Kinematic Viscosity @ 140 F, cst	30	60	70	140	250	500	800	1600	3000	6000
Water, percent	-	0.2	-	0.2	-	0.2	-	0.2	-	0.2
Flash Point, T.O.C., F	100	-	100	-	150	-	150	-	150	-
Distillation Test:										
Distillate, percentage by volume of total distillate to 680 F										
to 437 F	-	25	-	20	-	10	-	-	-	-
to 500 F	40	70	20	60	15	55	-	35	-	15
to 600 F	75	93	65	90	60	87	45	80	15	75
Residue from Distillation, volume %	50	-	55	-	67	-	75	-	80	-
Tests on Distillation Residue:										
Penetration, 100g, 5 sec., 77 F	120	250	120	250	120	250	120	250	120	250
Ductility, 5cm/min, 77 F, cm	100*	-	100*	-	100*	-	100	-	100*	-
Solubility in Trichloroethylene, %	99.0	-	99.0	-	99.0	-	99.0	-	99.0	-
Spot Test	Negative for all grades									

* If the penetration of residue is more than 200 and the ductility at 77 F is less than 100 cm, the material will be acceptable if its ductility at 60 F is more than 100.

D. EMULSIFIED ASPHALT. Emulsified asphalt shall be homogeneous, shall show no separation of asphalt after thorough mixing and shall meet the requirements for the specified type and grade shown in Tables 6 through 9

TABLE 6
ANIONIC EMULSIONS

Type - Grade	Rapid Setting				Medium Setting		Slow Setting			
	RS-2		RS-2h		MS-2		SS-1		SS-1h	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol at 77 F, sec at at 122 F, sec	-	-	-	-	-	-	20	100	20	100
Sieve Test, %	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10
Miscibility (Standard Test)	-	-	-	-	-	-	Passing		Passing	
Cement Mixing, %	-	-	-	-	-	-	-	2.0	-	2.0
Demulsibility, 35 ml of 0.02 N CaCl ₂ , %	60	-	60	-	-	30	-	-	-	-
Storage Stability, 1 day, %	-	1	-	1	-	1	-	1	-	1
Freezing Test, 3 cycles*	-	-	-	-	Passing		Passing		Passing	
Distillation Test:										
Residue by Distillation, % by weight	65	-	65	-	65	-	60	-	60	-
Oil Distillate, % by volume of emulsion	-	2	-	2	-	2	-	2	-	2
Tests on Residue from Distillation:										
Penetration at 77 F, 100 g, 5 sec	120	160	80	110	120	160	120	160	70	100
Solubility in Trichloroethylene, %	97.5	-	97.5	-	97.5	-	97.5	-	97.5	-
Ductility at 77 F, 5 cm/min, cm	100	-	80	-	100	-	100	-	80	-

* Applies only when the Engineer designates material for winter use.

TABLE 7
HIGH FLOAT ANIONIC EMULSIONS

Type - Grade	Rapid Setting		Medium Setting	
	HFRS - 2		AES - 300	
Property	Min	Max	Min	Max
Viscosity, Saybolt Furol				
at 77 F, sec	-	-	75	400
at 122 F, sec	150	400	-	-
Sieve Test, %	-	0.10	-	0.10
Coating Ability and Water Resistance:				
Coating, dry aggregate	-	-	good	
Coating, after spraying	-	-	fair	
Coating, wet aggregate	-	-	fair	
Coating, after spraying	-	-	fair	
Demulsibility 35 ml of 0.02 N CaCl ₂ , %	50	-	-	-
Storage Stability Test, 1 day, %	-	1	-	1
Distillation Test:				
Residue by Distillation, % by weight	65	-	65	-
Oil Distillate, by volume of emulsion, %	-	2	-	5
Tests on Residue from Distillation:				
Penetration at 77 F, 100 g, 5 sec	100	140	300	-
Solubility in Trichloroethylene, %	97.5	-	97.5	-
Ductility at 77 F, 5 cm/min, cm	100	-	-	-
Float Test at 140 F, sec	1200	-	1200	-

TABLE 8
CATIONIC EMULSIONS

Type - Grade	Rapid Setting				Medium Setting				Slow Setting			
	CRS-2		CRS-2h		CMS-2		CMS-2s		CSS-1		CSS-1h	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol												
at 77 F, sec	-	-	-	-	-	-	-	-	20	100	20	100
at 122 F, sec	150	400	150	400	100	300	100	300	-	-	-	-
Sieve Test, %	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10
Cement Mixing, %	-	-	-	-	-	-	-	-	-	2.0	-	2.0
Demulsibility, 35 ml 0.8 percent sodium dioctyl sulfosuccinate, %	40	-	40	-	-	-	-	-	-	-	-	-
Storage Stability, 1 day, %	-	1	-	1	-	1	-	1	-	1	-	1
Coating Ability and Water Resistance:												
Coating, dry aggregate	-	-	-	-	good		good		-	-	-	-
Coating, after spraying	-	-	-	-	fair		fair		-	-	-	-
Coating, wet aggregate	-	-	-	-	fair		fair		-	-	-	-
Coating, after spraying	-	-	-	-	fair		fair		-	-	-	-
Particle Charge Test	positive		positive		positive		positive		positive		positive	
Distillation Test:												
Residue by Distillation, % by wt	65	-	65	-	65	-	65	-	60	-	60	-
Oil Distillate, % by volume of emulsion	-	2	-	2	-	7	-	5	-	2	-	2
Tests on Residue from Distillation:												
Penetration at 77 F, 100 g, 5 sec	120	160	80	110	120	200	300	-	120	160	80	110
Solubility in Trichloroethylene, %	97.5	-	97.5	-	97.5	-	97.5	-	97.5	-	97.5	-
Ductility at 77 F, 5 cm/min, cm	100	-	80	-	100	-	-	-	100	-	80	-

TABLE 9
POLYMER MODIFIED EMULSIONS

	High Float Anionic Rapid Setting		Cationic Rapid Setting	
Type-Grade	HFRS-2P		CRS-2P	
Property	Min	Max	Min	Max
Polymer Content, percent by weight of the distillation residue *	3.0	-	3.0	-
Viscosity, Saybolt Furol at 122 F, sec	150	400	150	400
Storage Stability Test, 1 day, %	-	1	-	1
Demulsibility, 35 ml of 0.02 N CaCl ₂ , %	40	-	-	-
Demulsibility, 35 ml 0.8 percent sodium dioctyl sulfosuccinate, %	-	-	40	-
Sieve Test, %	-	0.10	-	0.10
Particle Charge Test	-		Positive	
**Distillation Test:				
Oil distillate, by volume of emulsion, %	-	2	-	2
Residue, % by wt	65	-	65	-
Tests on Residue from Distillation:				
Float Value at 140 F, sec	1200	-	-	-
Penetration, 77 F, 100 g, 5 sec	100	140	110	150
Ductility, 39.2 F, 5 cm/min, cm	50	-	50	-
Viscosity at 140 F, poises	1500	-	1300	-
Solubility in Trichloroethylene, %	97	-	97	-

* The emulsion supplier shall furnish the Department samples of the asphalt cement and polymer used in making the finished emulsion.

** The temperature on the lower thermometer shall be brought slowly to 350 F plus or minus 10 F and maintained at this temperature for 20 minutes. The total distillation shall be completed in 60 plus or minus 5 minutes from the first application of heat.

E. FLUXING MATERIAL. Fluxing material shall be free from foreign matter and shall be comprised of flux oil or a blend of flux oil and aromatic oil. The materials, when tested separately, shall meet the following requirements:

a. Flux Oil.

Properties	Minimum	Maximum
Water, weight percent	-	.2
Kinematic Viscosity, 140 F cst	60	200
Flash Point, C.O.C., F	200	-
Loss on Heating, 50 g, 5 hrs @ 325 F	10	Weight percent
Asphalt Content (100-200 Penetration residue by vacuum distillation), weight percent	25	-
Pour Point, F	-	60

b. Aromatic Oil.

Properties	Minimum	Maximum
Water, Weight Percent	-	.2
Kinematic Viscosity, 1400 F, cst	-	150
Flash Point, C.O.C., F	250	-
Loss on Heating, 50 g, 5 hrs @ 325 F, Weight percent	-	12
Pour Point, F	-	60

The aromatic oil, when blended with a maximum of 30 percent by weight of bitumen recovered from limestone rock asphalt by Test Method Tex-211-F, shall produce a material with a minimum penetration at 77 F of 85.

c. SPECIAL PRECOAT MATERIAL. Special precoat material shall meet the following requirements:

Properties	Minimum	Maximum
Water %	-	.2
Flash Point, C.O.C., F	200	-
Kinematic Viscosity at 140 F, cst	300	500
Distillation to 680 F:		
Initial Boiling Point, F	500	-
Residue by weight, %	70	-
Residue Penetration, 77F, 100g, 5 sec..		
200		

d. CRACKED FUEL OIL. Cracked fuel oil shall meet the following requirements:

Properties	Minimum	Maximum
Asphalt Content of 100 Penetration @ 77 F, %	65	80
Flash Point, C.O.C., F	250	-
Kinematic Viscosity at 140 F, cst	-	550
Loss @ 212 F, 20 g, 5 hrs %	-	3.0
Water and Sediment, %	-	2.0

e. CRACK SEALER. This section sets forth the requirements for SS-1P polymer modified emulsion suitable for sealing fine cracks, and a rubber asphalt compound suitable for sealing cracks 1/8 inch or greater width. For cracks on the order of 1/8 inch width, HFRS-2P polymer modified emulsion as described in Section (4), Table 9 of this item may be used. Requirements for SS-1P and rubber-asphalt crack sealing compound are as follows:

f. SS-1P Polymer Modified Emulsion. Specific requirements are as follows:

Properties	Minimum	Maximum
sPolymer Content, percent by		
Weight of the distillate residue	3	-
Viscosity, Saybolt Furol @ 77 F. sec	30	100
Storage Stability Test, one day, %	-	1
Cement Mixing, %	-	2.0
Sieve Test, %	-	.10
Miscibility (Standard Test)	Passing	

** Distillation:

Oil distillate, by volume of emulsion, %	-	2
Residue, %	60	-

Requirements on Residue from Distillation:

Penetration, 77 F, 100 g, 5 sec	100	140
Ductility, 39.2 F, 5cm/min, cm	50	-
Solubility in trichloroethylene, %	97	-
Viscosity @ 140 F, poises	1300	-

* The emulsion supplier shall furnish the Department samples of the asphalt cement and polymer used in making the finished emulsion.

** The temperature on the lower thermometer shall be brought slowly to 350 F plus or minus 10 F and maintained at this temperature for 20 minutes. The total distillation shall be completed in 60 plus or minus 5 minutes from the first application of heat.

g. Rubber-Asphalt Crack Sealing Compound. This may be a proprietary material. The compound shall be capable of being melted and applied at a temperature of 400 F or less by a suitable oil jacketed kettle equipped with a pressure pump, a hose and a nozzle. It shall contain no water or highly-volatile matter. It shall not be tracked by traffic when cooled to road temperature.

The rubber-asphalt crack sealing compound shall meet the following requirements:

Properties	Minimum	Maximum
Rubber Content, percent by wt.	22	26
Flash Point, Modified C.O.C., F *	400	-
Penetration @ 77 F, 150 g, 5 sec ** 30	-	50
Penetration @ 32 F, 200 g, 60 sec** 12		

* The equipment and procedure shall be as specified in ASTM D 92 with the following modification. Prior to passing the test flame over the cup, agitate the sealing compound with a 3/8 inch to 2 inch wide square-end metal spatula in a manner so as to bring the material on the bottom of the cup to the surface, i.e., turn the material over. This shall be done, starting at one side of the thermometer, moving around to the other, then returning to the starting point, using 8 to 10 rapid circular strokes. The agitation shall be accomplished in 3 to 4 seconds. The test flame shall be passed over the cup immediately after the stirring is completed. This procedure shall be repeated at each successive 10 F interval until the flash point is reached.

** The penetration shall be determined by ASTM D 5 except that the cone specified in ASTM D 217 shall be substituted for the penetration needle.

Properties of Rubber Used in Sealer. The rubber shall be one of the following types:

Type I - Ground tire rubber.

Type II - Mixture of ground tire rubber and high natural reclaimed scrap rubber. The natural rubber content, determined by ASTM D 297, shall be a minimum of 25 percent.

The ground rubber shall comply with the following gradation requirements when tested by Test Method Tex-200-F, Part 1.

U.S. Standard Sieve Size	Percent Retained	
	Type I	Type II
No. 8	0	-
No. 10	0-5	0
No. 30	90-100	50-70
No. 50	95-100	70-95
No. 100	-	95-100

The ground rubber shall be free from fabric, wire, cord or other contaminating materials.

Packaging. The rubber-asphalt crack sealing compound shall be packaged in boxes which contain two (2) 30-35 pound blocks that are individually packaged in a liner made of polyethylene, or other packaging approved by the Engineer.

- f. ASPHALT RECYCLING AGENT. The asphalt recycling agent shall be either a petroleum oil, referred to as recycling agent, or a petroleum oil emulsion, referred to as emulsified recycling agent. These agents may be used alone or the emulsified recycling agent may be used in conjunction with emulsified asphalt having the same particle charge, i.e., a cationic emulsified asphalt must be used with a cationic emulsified recycling agent and an anionic emulsified asphalt with an anionic emulsified recycling agent. The supplier must clearly state whether the emulsified recycling agent being furnished is cationic or anionic. Specific requirements are as follows:

Emulsified Recycling Agent.

Properties	Minimum	Maximum
Viscosity, Saybolt Furol @ 77 F, sec	15	100
Sieve Test, %	-	.10
Miscibility *	No Coagulation	
Residue, % by wt. **	60	-
Test on Residue from Evaporation Test:		
Flash Point, C.O.C., F	400	-
Viscosity @ 140 F, cst	75	250
Viscosity @ 275 F, cst	-	10.0

* Performed according to Test Method Tex-521-C except that 0.02 N calcium chloride solution shall be used in place of water.

** Residue shall be determined by the evaporation method set forth in ASTM D 244, except that the sample shall be maintained at 300 F until foaming ceases, then cooled and weighed.

The ability of the residue from the evaporation test to restore the original properties of an aged asphalt cement shall be determined as follows. The residue shall be blended uniformly in the laboratory with a standard 14 to 16 penetration asphalt at a maximum rate of 20 percent by weight of the asphalt. The resulting blend must comply with all the requirements of Subarticle 300.2.(1) for AC-20 asphalt cement.

The standard asphalt cement for the above blend shall be obtained by subjecting an AC-20 produced by Fina Oil and Chemical, Big Spring, Texas, meeting all requirements of this Item, to the thin film oven test as specified in Test Method Tex-510-C except that the test period shall be increased so as to obtain the required penetration.

- a) Recycling Agent. When recycling agent (petroleum oil) is specified, it shall meet the same requirements indicated above for the Residue from Evaporation Test on emulsified recycling agent.

3. STORAGE, HEATING AND APPLICATION TEMPERATURES

Asphaltic materials should be applied at the temperature which provides proper and uniform distribution and within practical limits avoiding higher temperatures than necessary. Satisfactory application should usually be obtained within the recommended ranges shown below. No material shall be heated above the maximum temperatures shown in Table 10.

TABLE 10

TYPE - GRADE	Application		Storage Maximum, F
	Recommended Range, F	Maximum Allowable, F	
AC-1.5 and AC-3	220-300	350	350
AC-5, 10, 20, 30	275-350	375	400
AC-5 or AC-10 + 2% SBR	300-375	390*	375
AC-10 + 3% SBR	300-350	350	360
RC-250	125-180	200	200
RC-800	170-230	260	260
RC-3000	215-275	85	285
MC-30	70-150	175	175
MC-70	125-175	200	200
MC-250	125-210	240	240
MC-800	175-260	275	275
MC-3000 & MC-2400 Latex	225-275	290	290
SS-1, SS-1h, SS-1P, CSS-1, CSS-1h, recycling agent, emulsified recycling agent	50-130	140	140
RS-2, RS-2h, MS-2, CRS-2, CRS2h, CRS-2P, CMS-2, CMS-2s, HFRS-2, HFRS-2P, AES-300	110-160	170	170
Special Precoat Material	125-250	275	275
Flux Oil	-	275	275
Aromatic Oil	-	275	275
Cracked Fuel Oil	160-220	260	260
Rubber-Asphalt Crack Sealer	350-375	400	-

* AC-5 + 2% SBR and AC-10 + 2% SBR which is designated for surface treatment work may be heated to a maximum temperature of 390 F by the supplier loading through an in-line heater, or, with the Engineer's permission, these materials may be heated to a maximum of 390 F by the Contractor just prior to application. When any of the SBR-modified asphalt cements are used in asphaltic concrete, the storage temperature at the mix plant should not exceed 350 F.

END OF SECTION

SECTION 025412
PRIME COAT (S-30)
(Asphalt Material Only)

1. DESCRIPTION

This specification shall consist of an application of asphalt material on the completed base course and/or other approved area in accordance with this specification.

Prime Coat shall not be applied when the air temperature is below 60⁰ F and falling, but it may be applied when the air temperature is above 50⁰ F and is rising, the air temperature being taken in the shade and away from artificial heat. Asphalt material shall not be placed when general weather conditions, in the opinion of the Engineer, are not suitable.

2. MATERIALS

The asphalt material used for the prime coat shall be MC-70, unless otherwise specified, and when tested by approved laboratory methods shall meet the requirements of the specification 025404 - Asphalts, Oils and Emulsions.

3. CONSTRUCTION METHODS

When, in the opinion of the Engineer, the area and/or base is satisfactory to receive the prime coat, the surface may be cleaned by sweeping or other approved methods. If found necessary by the Engineer, the surface shall be lightly sprinkled just prior to application of the asphalt material. The asphalt material shall be applied on the clean surface by an approved type of self-propelled pressure distributor so operated as to distribute the material in the quantity specified, evenly and smoothly under a pressure necessary for proper distribution. The Contractor shall provide all necessary facilities for determining the temperature of the asphalt material in all of the heating equipment and in the distributor, for determining the rate at which it is applied, and for securing uniformity at the junction of two distributor loads.

All storage tanks, piping, retorts, booster tanks and distributors used in storing or handling asphalt material shall be kept clean and in good operating condition at all times, and they shall be operated in such manner that there will be no contamination of the asphalt material with foreign material. It shall be the responsibility of the Contractor to provide and maintain in good working order a recording thermometer at the storage-heating unit at all times. The distributor shall have been recently calibrated and the Engineer shall be furnished an accurate and satisfactory record of such calibration. After beginning of the work, should the yield on the asphalt material applied appear to be in error, the distributor shall be calibrated in a manner satisfactory to the Engineer before proceeding with the work.

Prime shall be applied at a temperature within the recommended range per Standard Specification 025404 "Asphalts, Oils, and Emulsions with that range being 70 to 150⁰F for MC-30. Application rate shall be 0.15 GAL/SY, unless otherwise specified.

The Contractor shall be responsible for the maintenance of the surface until the Engineer accepts the work.

No traffic hauling or placement of any subsequent courses shall be permitted over the freshly applied prime coat until authorized by the Engineer.

SECTION 025424
HOT MIX ASPHALTIC CONCRETE PAVEMENT

1. DESCRIPTION

This specification shall govern all work required for furnishing and laying Hot Mix Asphalt Concrete (HMAC) surface, binder and base courses required to complete the project.

2. MATERIALS

2.1. Aggregate: The aggregate shall consist of a blend of course aggregate, fine aggregate and, if required, a mineral filler.

2.1.1. Coarse Aggregate shall consist of that fraction of aggregate retained on a No. 10 sieve and shall consist of crushed furnace slag, crushed stone, or crushed gravel.

Deterious material in coarse aggregate shall not exceed 2% per TEX-217-F. Course aggregate shall be crushed such that a minimum of 85% of the particles have more than one crushed face, unless noted otherwise on plans. Los Angeles abrasion losses for course aggregate shall not exceed 40% by weight for the surface course and 45% for the binder and base courses per TEX-410-A.

Polish Value not less than 30 for aggregate used in the surface course per TEX-438-A.

2.1.2. Fine Aggregate is defined as the fraction passing a No. 10 sieve and shall be of uniform quality.

Fine aggregate shall consist of screenings of material that passes the Los Angeles abrasion requirements per above. Screenings shall be blended with a maximum of 15% un-crushed aggregate or field sand for Type D mixes or a maximum of 10% uncrushed aggregate or field sand for Type A, B, and C mixes.

Grading of fine aggregate shall be as follows:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
No. 10	100
No. 200	0-15

- 2.1.3 Filler shall consist of dry stone dust, Portland cement, hydrated lime, or other approved by the Engineer.

Grading of filler shall be as follows:

<u>Sieve Size</u>	<u>Minimum Percent Passing by Weight</u>
No. 30	95
No. 80	75
No. 200	55

- 2.2 Reclaimed Asphalt Pavement (RAP): Reclaimed asphalt pavement may be incorporated into the hot mix asphalt concrete furnished for the project, provided that the mixture is designed per the TX DOT Methods and meets the applicable provisions of said TX DOT Item 340 and this specification.
- 2.3 Asphalt: Asphalt Material shall be in accordance with Section 025404 "Asphalt, Oils, and Emulsions" and AASHTO.

2.3.1 Paving Mixture:

<u>APPLICATION</u>	<u>ASPHALT GRADE</u>
Residential or low volume	PG 64-22
Collector	
Surface Course	PG 70-22
Binder Course	PG 64-22
Arterial	
Surface Course	PG 76-22
Binder Course	PG 64-22
Base Courses	PG 64-22

- 2.3.2 Tack Coat shall consist of an emulsion, SS-1 diluted with equal volume of water and applied at a rate ranging from 0.05 to 0.15 gallons per square yard.

3. PAVING MIXTURE

- 3.1 Mix Design: The mixture shall be designed in accordance with TX DOT Bulletin C-14 and TEX-204-F to conform to the requirements of this specification. The Contractor shall furnish the mix design for the job-mix to be used for the project, unless shown otherwise on the drawings. The mix design shall be submitted prior to placement of mixture.

The design procedures are actually intended to result at a job-mix with properties in compliance with these specifications and when properly placed the job-mix will be durable and stable. The sieve analysis of the job-mix shall be within the range of the Master Gradation and Tolerances specified herein. The job-mix shall meet the density and stability requirements as specified and shall be included with the mix design as submitted per above.

If the specific gravity of any of the types of aggregates differ by more than 0.3, use volume method.

Plot sieve analysis of job-mix; percent passing versus size on four-cycle semi-log paper or other appropriate type paper. Show tolerance limits and Limits of Master Gradation.

- 3.2 Master Gradation of Aggregate: The aggregate for the type of mix specified shall be within the following tabulated limits per TEX-200-F (Dry Sieve Analysis):

Sieve Size	Type			
	A Coarse Base	B Fine Base	C Course Surface	D Fine Surface
1-1/2"	100			
1-1/4"	95-100			
1"		100		
7/8"	70-90	95-100	100	
5/8"		75-95	95-100	
1/2"	50-70			100
3/8"		60-80	70-85	85-100
1/4"				
No. 4	30-50	40-60	43-63	50-70
No. 10	20-34	27-40	30-40	32-42
No. 40	5-20	10-25	10-25	11-26
No. 80	2-12	3-13	3-13	4-14
No. 200	1-6*	1-6*	1-6*	1-6*
VMA % minimum	11	12	13	14

* 2-8 when Test Method Tex-200-F, Part II (Washed Sieve Analysis) is used.

- 3.3 Tolerances: The mixture delivered to the job site shall not vary from the job-mix by more than the tolerances specified below. The gradation of the produced mix shall not fall outside the Master Grading Limits, with the following exceptions: for Type B material courser than 3/8" and for Type D material courser than #4. Variations from job-mix shall not exceed the following limits, except as noted above:

<u>Item:</u>	<u>Tolerances Percent by Weight or Volume</u>
1" to No. 10	Plus or Minus 5.0
No. 40 to No. 200	Plus or Minus 3.0
Asphalt Weight	Plus or Minus 0.5
Asphalt Volume	Plus or Minus 1.2

- 3.4 Mix Properties: The mixture shall have a minimum Hveem stability of 40 for Type A,B, and C mixes and 35 for Type D mixes per TEX-208-F at an optimum density of 96% (plus or minus 1.5) of theoretical maximum per TEX-227-F and TEX-207-F.
- 3.5 Sampling and Testing of raw materials: The Contractor shall sample materials as necessary to produce a mix in compliance with these specifications.

4. EQUIPMENT

- 4.1 Mixing Plants. Mixing plants shall be either the weight batching type or the drum mix type. Both types shall be equipped with satisfactory conveyors, power units, aggregate handling equipment, aggregate screens and bins (weigh batch only), and pollution control devices as required.
- 4.2 Truck Scales. A set of truck scales, if needed for measurement, shall be placed at a location approved by the Engineer.
- 4.3 Asphalt Material Heating Equipment. Asphalt material heating equipment shall be adequate to heat the required amount of material to the desired temperature. Agitation with steam or air will not be permitted. The heating apparatus shall be equipped with a recording thermometer with a 24-hour continuous chart that will record the temperature of the asphalt at the highest temperature.
- 4.4 Surge-Storage System. A surge-storage system may be used provided that the mixture coming out of the bins is of equal quality to that coming out of the mixer. The system shall be equipped with a gob hopper, rotating chute, or other devices designed to minimize segregation of the asphalt mixture.
- 4.5 Laydown Machine. The laydown machine shall be capable of producing a surface that will meet the requirements of the typical cross section, of adequate power to propel the delivery vehicles, and produce the surface tolerances herein required. It shall be wide enough to lay a 28-foot back-back street in a maximum of two passes.

- 4.6 Rollers. All rollers shall be self propelled and of any type capable of obtaining the required density. Rollers shall be in satisfactory operating condition and free from fuel, hydraulic fluid, or any other fluid leaks.

5. **STORAGE, PROPORTIONING, AND MIXING**

- 5.1 Storage and Heating of Asphalt Materials. Asphalt cement shall not be heated to a temperature in excess of that recommended by the producer. Asphalt storage equipment shall be maintained in a clean condition and operated in such a manner that there will be no contamination with foreign matter.
- 5.2 Feeding and Drying of Aggregates. The feeding of various sizes of aggregate to the dryer shall be done in such a manner that a uniform and constant flow of materials in the required proportions will be maintained. In no case shall the aggregate be introduced into the mixing unit at a temperature in excess of 350 degrees F.
- 5.3 Proportioning. All materials shall be handled and proportioned in a manner that yield an acceptable mixture as herein specified and as defined by the job-mix.
- 5.4 Mixing.
- 5.4.1 Weight Batch Plant. In charging the weigh box and in charging the pugmill from the weigh box, such methods or devices shall be used as necessary to minimize segregation of the mixture.
- 5.4.2 Drum Mix Plant. The amount of aggregate and asphalt cement entering the mixer and the rate of travel through the mixer shall be coordinated so that a uniform mixture of the desired gradation and asphalt content will be produced.
- 5.4.3 The mixture produced from each type of plant shall not vary from the job-mix by more than the tolerances and restrictions herein specified. The mixture when discharged from the plant shall have a moisture content not greater than one percent by weight of total mix when determined by Test Method TEX-212-F.
- 5.4.4 The mixture produced from each type of plant shall be at a temperature between 250 and 325 degrees F. After a target mixing temperature has been established, the mixture when discharged from the mixer shall not vary from this temperature by more than 25 degrees F.

6. CONSTRUCTION METHODS

- 6.1 Construction conditions. For mat thicknesses greater than 1.5 inches, the asphalt material may be placed with a laydown machine when the air temperature is 40 degrees F. and rising but not when the air temperature is 50 degrees and falling. In addition, mat thickness less than and including 1.5 inches shall not be placed when the temperature of the surface on which the mat is placed is below 50 degrees F.
- 6.2 Prime Coat. If a prime coat is required, it shall be applied and paid for as a separate item conforming to the requirements of the specification, "Prime Coat", except the application temperature shall be as provided above. The tack coat or asphaltic concrete shall not be applied on a previously primed flexible base until the primed base has completely cured to the satisfaction of the Engineer.
- 6.3 Tack Coat. Before the asphalt mixture is laid, the surface upon which the tack coat is to be placed shall be thoroughly cleaned to the satisfaction of the Engineer. The surface shall be given a uniform application of tack coat using materials and rates herein specified and/or as shown on the plans. The tack coat shall be rolled with a pneumatic tire roller as necessary.
- 6.4 Transporting Asphalt Concrete. The asphalt mixture shall be hauled to the job site in tight vehicles previously cleaned of all foreign matter. In cool weather or for long hauls, canvas covers and insulated truck beds may be necessary. The inside of the bed may be given a light coating of lime water or other suitable release agent necessary to prevent from adhering. Diesel oil not allowed.
- 6.5 Placing. The asphalt mixture shall be spread on the approved prepared surface with a laydown machine or other approved equipment in such a manner such that when properly compacted, the finished surface will be smooth or uniform density, and meet the requirements of the typical cross sections as shown on the plans.
 - 6.5.1 Flush Structures. Adjacent to flush curbs, gutters, liners and structures, the surface shall be finished uniformly high so that when compacted, it will be slightly above the edge of the curb and flush structure.
 - 6.5.2 Construction joints of successive courses of asphaltic material shall be offset at least six inches. Construction joints on surface courses shall coincide with lane lines, or as directed by the Engineer.
- 6.6 Compacting. The asphalt mixture shall be compacted thoroughly and uniformly with the necessary rollers to obtain the required density and surface tolerances herein described and any requirements as shown on the plans. Regardless of the method of compaction control followed, all rolling shall be completed before the mixture temperature drops below 175 degrees F.

- 6.7 In-Place Density. In-place density control is required for all mixtures except for thin, irregular level-up courses. Material should be compacted to between 96% and 92% of maximum theoretical density or between 4% and 8% air voids. Average density shall be greater than 92% and not individual determination shall be lower than 90%. Testing shall be in accordance with TEX-207-F and TEX-227-F. Pavement specimens, which shall be either cores or sections of the compacted mixture, will be tested as required to determine the percent air voids. Other methods, such as nuclear determination of in-place density, which correlate satisfactorily with actual project specimens may be used when approved by the Engineer.
- 6.8 Thickness. The total compacted average thickness of the combined HMAC courses shall not be less than the amount specified on the drawings. No more than 10% of the measured thicknesses shall be more than 1/4" less than the plan thickness(es). If so, the quantity for pay shall be decreased as deemed appropriate by the Engineer.
- 6.9 Surface smoothness criteria and tests. The pavement surface after compaction, shall be smooth and true to the established lines, grade, and cross-section. The surface shall be tested by the City with the Mays Roughness Meter.
- 6.10 The Mays Roughness Value for each block (intersection to intersection) or 600-foot section, whichever is the lesser, shall not exceed ninety inches per mile per traffic lane.

For each block of 600-foot section not meeting this criteria, the Engineer shall have the option of requiring that block or section to be reworked to meet the criteria, or paying an adjusted unit price for the surface course. The unit price adjustment shall be made on the following basis:

Adjusted Unit Price = (Adjustment Factor) X Surface Course Unit Bid Price

The adjustment factor shall be:

For Residential Streets:

Adjustment Factor = 1.999 - 0.0111 M

For All Other Class Streets (Non Residential)

Adjustment Factor = 1.287 - 0.0143 M

Where M - Mays Roughness Value

In no case shall the Contractor be paid more than the unit bid price. If the surface course is an inverted penetration (surface treatment) the Mays Roughness Value observed will be reduced by ten inches per mile, prior to applying the above criteria.

Localized Defects (obvious settlements, humps, ridges, etc.) shall be tested with a ten-foot straightedge placed parallel to the roadway centerline. The maximum deviation shall not exceed 1/8 inch in ten feet. Areas not meeting this criteria shall be corrected to the satisfaction of the Engineer.

- 6.10 Opening to Traffic. The pavement shall be opened to traffic when directed by the Engineer. The Contractor's attention is directed to the fact that all construction traffic allowed on pavement open to the public will be subject to the State laws governing traffic on highways.

If the surface ravel, it will be the contractor's responsibility to correct this condition at his expense.

SECTION 025613
EXCAVATION, ROAD AND DRIVEWAY REPAIR

1. DESCRIPTION

The specifications presented in this item are intended to present a minimum level of quality in materials of the road and driveway repair being a part of the proposed water and sanitary sewer construction for which this set of specifications is applicable.

2. EXCAVATION

Where required by the alignment of the proposed water and/or sanitary sewer lines as indicated on the Construction Drawings, roads and driveways shall be excavated as true to line and proper depth as possible. Effort shall be expended to maintain as straight and narrow a trench as possible.

Where cutting through a concrete or asphalt paved surface, CONTRACTOR shall maintain a cut line as straight as possible.

Excavated material not suitable for backfill in adjacent trench areas shall be removed and disposed of at the CONTRACTOR's expense.

3. REPAIR OF TRENCHES IN PAVEMENT AREA

Trench area that has to be opened to traffic after backfilling shall be mechanically or hand tamped to a depth of 12 inches above the crown of the pipe, with select Class III material (bank sand), free from rocks and debris or clods which are larger than 2 inches.

The remainder of the trench shall be backfilled with cement sand to the proposed flexible base and compacted to 95% standard proctor. A minimum of eight inches (8") of road base material shall then be placed in the trench and compacted to 95% standard proctor.

Settlement or soft spots that develop as trench line consolidates shall be repaired by addition of road base material as required.

4. REPAIR OF PAVED SURFACES

Asphaltic paved driveways and road surfaces shall be brought to final smooth driving surface with 1-1/2 inches of compacted type "D" cold-mix. A tack of RC-250 shall be utilized for bonding the cold-mix to base material and existing asphalt edges.

5. STATE REQUIREMENTS

Requirements of the Texas Department of Transportation and Public Transportation for repair of paved surfaces within their jurisdiction shall have precedence over this specification.

6. MEASUREMENT AND PAYMENT

Measurement and payment of "Asphalt Driveway Repair", and "Asphalt Pavement Repair", and "Base Repair" shall be made at the unit price bid per square yard.

END OF SECTION

SECTION 026000
BORING FOR ROADWAY & RAILROAD CROSSINGS

1. DESCRIPTION

The specifications presented in this item are intended to present a minimum level of quality in material and procedure which must be equaled or exceeded by the boring for roadway crossings incorporated into work being a part of the proposed construction for which this set of specifications is applicable.

2. CONSTRUCTION METHOD

- A) Pits or trenches shall be excavated at locations shown on the plans or otherwise required, to such a depth and size necessary to accurately place the bore at locations indicated on the drawings. The length of the pit or trench shall be sufficient to make up pipe joints and to insert the pipe into the bore. Brace trench sides sufficiently to prevent caving and so that work may be accomplished safely and efficiently in accordance with OSHA and State regulations.
- B) During construction operations, barricades and lights to protect traffic and pedestrians shall be furnished and maintained until backfill has been completed.
- C) BORING--The boring shall proceed from a pit provided for the boring equipment and workmen. Excavation for pits and installations shall be as outlined herein. The locations of the pit shall meet the approval of the ENGINEER. The holes are to be bored mechanically. The boring shall be done using a pilot hole and back reaming or by dry auger.

The pilot hole and back reaming method shall utilize an approximate two (2) inch pilot hole bored the entire length of the crossing which shall be checked for line and grade on the opposite end of the bore from the work pit. This pilot hole shall serve as the centerline of the larger diameter hole to be back reamed. The use of water or other fluids in connection with the boring operation will not be permitted. Jetting will not be permitted. After back reaming, casing shall be placed in reamed hole.

The dry auger method may be accomplished either integrally with or separate from pushing the casing. Dry augering shall be used separate from casing only when ground characteristics permit.

3. CASING SPECIFICATIONS

Where required on the plans, the casing shall be:

- A) ¼" wall, new pipe, with a bituminous prime coating on the outside of the casing pipe.

- B) 3/8" wall, good quality, used pipe, cleaned, with a bituminous prime coat on the outside of the casing pipe.
- C) Casing shall be three (3) nominal sizes larger than specified pipe to be installed in casing. The CONTRACTOR is hereby advised that any special requirements by the agency issuing permits for such work shall be adhered to.

4. MEASUREMENT AND PAYMENT

Boring pipe shall be measured by the linear foot of casing or bore, complete and in place. Such measurement shall be made between the ends of the bore or casing along the central axis installed.

The item "Bore" shall include only the bore. The item "Bore & Case" shall include the bore and properly sized casing.

The work performed and materials furnished as prescribed by this item, measured as provided in the above paragraph will be paid for at the unit price bid per linear foot for "bore and case" of the type, size and class specified on the plans, which price shall be full compensation for furnishing labor, equipment, materials, supplies, and incidentals.

END OF SECTION

SECTION 026202
HYDROSTATIC TESTING OF PRESSURE SYSTEM

1. DESCRIPTION

The specifications presented in this item are intended to present a minimum level of quality in the hydrostatic pressure and leakage test procedures which must be equaled or exceeded by the water line testing incorporated into work being a part of the proposed potable water system improvements for which this set of specifications is applicable.

2. PROCEDURE

After water line has been laid and backfilled, fill each valved section of pipe slowly with water and apply test pressure of 150 psi measured at point of lowest elevation, by means of a pump connected to pipe. Waterline Pressure Test shall not exceed 1,000 linear feet, and a Water Testing Plan shall be submitted to the Engineer and City for approval. Test pressure shall not be less than 120 psi measured at the point of highest elevation. CONTRACTOR shall furnish pump, pipe connection, plugs, and necessary apparatus including gauges, meters and required accessories for conducting tests. CONTRACTOR shall also furnish labor and incidentals as needed to perform hydrostatic test. Tests shall be performed in the presence of the ENGINEER'S authorized representative. It will be the CONTRACTOR's responsibility to notify the Engineer's Representative on the job no later than the preceding day, of the date and approximate time the test will be made by the CONTRACTOR and a record of such notice made on the daily report for that day. New waterlines shall be pressure tested prior to connection to existing lines.

Note: Contractor may use City water to fill mains at no charge. A backflow prevention device and meter shall be utilized at the connection between the existing and new main during filling.

3. DURATION OF PRESSURE TEST

Duration of the tests shall be four (4) hours where joints are covered, and not less than two (2) hours where joints are exposed. Continue tests for an additional two (2) hours if leakage at end of initial testing period is between 75 and 100 percent of allowable.

4. ALLOWABLE LEAKAGE

Leakage shall not exceed that determined from the following table per 50 couplings.

2"PVC	0.17 GPH (gallons per hour)
4"PVC	0.33 GPH
6"PVC	0.50 GPH
8"PVC	0.66 GPH

Correct work until leakage does not exceed allowable.

5. MEASUREMENT AND PAYMENT

No separate measurement or payment shall be made for work performed under this item. Cost of this work shall be considered subsidiary to those items for which this work is a component.

END OF SECTION

SECTION 026206
DUCTILE IRON PIPE AND FITTINGS

1. DESCRIPTION

This specification shall govern all work necessary for furnishing all ductile iron pipe and fittings required to complete the project.

2. GENERAL

All ductile iron pipe shall conform to AWWA C151. The interior of pipe and fittings shall be lined with enameled cement mortar in accordance with AWWA C104. The exterior of pipe and fittings shall have a coating of coal tar enamel of approximately 1 mil thick or as specified in A.W.W.A. C-105. Ductile iron pipe shall be wrapped in two plies of 8 mil polyethylene in accordance with Section 026402.

3. FITTINGS

All fittings shall be either gray cast iron or ductile iron and in accordance with AWWA C110 or C153. Fittings shall have a pressure rating of 250 p.s.i for sizes through 12" and 150 p.s.i for 14" and larger sizes, unless shown differently on drawings. Mechanical joints with Uni-Flange Series 1500-C Restraining Glands for use with C-900 pipe as manufactured by Ford Meter Box Company, Inc., or approved equal, shall be used on all fittings.

4. JOINTS

Joints for pipe shall be mechanical type; joints for fittings shall be mechanical joints, unless shown otherwise on drawings.

Mechanical joints shall conform to AWWA C111 and/or C153. Mechanical joints shall be furnished complete with joint material, Cor-ten nuts, Cor-ten bolts, glands and gaskets.

Restrained joints for pipe and fittings of 12" diameter and less shall be mechanical joint with Uni-Flange Series 1500-C Restraining Glands by Ford Meter Box Company, Inc., or approved equal with a minimum of 250 psi rated working pressure. Restrained joints for pipe and fittings over 12" in diameter shall be push on type with a retainer ring as LOK-RING by American Ductile Iron Pipe or TR FLEX by U.S. Pipe, or approved equal.

Gaskets shall be of synthetic rubber. An analysis of the material used in each size gasket showing the type of synthetic rubber and that no natural rubber is present shall be supplied

5. PIPE

Pressure class ductile iron pipe requirements:

<u>Diameter</u> (inches)	<u>Pressure</u> (psi)	<u>Class</u> (inches)	<u>Wall</u> <u>Thickness</u> (feet)	<u>Range of Maximum</u> <u>Allowable Depth Cover</u> (feet)
				A - B*
4#	350		0.25	60+
6	350		0.25	30 - 65
8	350		0.25	20 - 50
10#	350		0.26	15 - 45
12	350		0.28	15 - 44
14#	300		0.30	13 - 42
16	300		0.32	13 - 39
18	300		0.34	13 - 36
20	300		0.36	13 - 35
24	250		0.37	11 - 29
24+	x		x	x

* Range of maximum allowable depth of pipe where:

A = Ground water, or unstable bottom, or quick condition.

B = Ideal trench conditions, and sand encasement is at an average density in excess of 90% Standard Proctor.

Pipe sizes not typically specified on City projects, but shown for reference.

x Requires special evaluation.

The face of bells shall be plainly marked by color coding for classes so as to be readily identified in the field.

6. CERTIFICATIONS

A certification shall accompany each order of pipe and fittings furnished to job site. Certification shall include the following items: indicate that pipe complies with Part 3 of this specification; indicate that fittings and joints comply with Part 4 of this specification (it should be noted that the supplier shall furnish sufficient technical material for the Engineer to determine whether or not push-on joints can comply with the "or equal" clause); and a copy of a lab analysis of the material used in each size gasket showing the type of synthetic rubber and that no natural rubber is present.

7. MEASUREMENT

Unless specified otherwise in the Special Provision, Ductile Iron Pipe will be subsidiary to the other work (waterline, sanitary force main, etc.). Fittings will be measured as individual units for each size and type installed. Measurement of pipe shall be up to, but not include, the fittings.

8. PAYMENT

Payment for fittings shall include all labor, materials, equipment, and incidentals required to complete work.

END OF SECTION

SECTION 026210
POLYVINYL CHLORIDE PIPE
(AWWA C900 & C905 Pressure Pipe for Municipal Water Mains and Sanitary Force Mains)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing all PVC pipe (AWWA C900 and C905) required to complete the project.

2. MATERIAL

PVC pipe shall be made of Class 12454-A or Class 1245-B virgin compounds, as defined in ASTM D1784 with an established hydrostatic-design-basis of 4000 psi for water at 73.4 F.

3. DIMENSIONS

Pipe shall be manufactured to cast iron pipe equivalent outside diameters.

4. JOINT

Pipe shall have a gasket bell end with a thickened wall section integral with the pipe barrel. The use of solvent weld pipe shall not be allowed.

5. GASKETS

Gaskets for jointing pipe shall be in accordance with ASTM F477. (High Head)

6. PIPE PRESSURE CLASS AND DIMENSION RATION

Unless indicated otherwise on the drawings pipe shall have a dimension ratio (DR) of 18 and in accordance with:

<u>Pipe Size</u>	<u>Designation</u>
4" to 12"	AWWA C900
Over 12"	AWWA C905

7. CAUSE FOR REJECTION

Pipe shall be clearly marked in accordance with AWWA Requirements. Unmarked or scratched pipe shall be rejected.

8. CERTIFICATION

The contractor shall furnish in duplicate to the Engineer a copy of the manufacturer's affidavit of compliance with this specification, to include gaskets. Certification shall accompany each delivery of materials.

9. MEASUREMENT AND PAYMENT

Unless specified otherwise in the plans and specifications, PVC pipe (AWWA C900 or C905) will not be measured for pay but shall be subsidiary to the appropriate bid item. Measurement of pipe shall be up to, but not include, the fittings.

END OF SECTION

SECTION 026402
WATER PIPE

1. DESCRIPTION

This specification shall govern all work necessary for the installation of all waterline facilities required to complete the project.

2. MATERIALS

Concrete: Concrete shall have a minimum compressive strength of 3000 PSI.

Ductile Iron Pipe and Fittings: See Standard Specification Section 026206.

Polyvinyl Chloride Pipe: See Standard Specification Section 026210.

Gate Valves for Waterlines: See Standard Specification Section 026411.

3. CONSTRUCTION METHODS

A. HANDLING MATERIALS

- a. General: The Contractor shall be responsible for the safe storage of all material furnished to, or by him, and accepted by him, until it has been incorporated in the completed project.

All material found during the progress of the work to have cracks, flaws or other defects will be rejected, and the Contractor shall remove such defective material from the site of the work.

- b. Unloading and Distribution of Materials at Work Site: Pipe and other materials shall be unloaded at point of delivery, hauled to and distributed at the job site by the Contractor. Materials shall at all times be handled with care and in accordance with manufacturer's recommendations. Care shall be taken not to scratch PVC pipe. Excessive scratching shall be considered cause for rejection of PVC pipe. Materials may be unloaded opposite or near the place where it is to be installed provided that it is to be incorporated into the work within 10 days. The Contractor shall not distribute material in such a manner as to cause undue inconvenience to the public.
- c. Storing Materials: Materials that are not to be incorporated into the work within 10 days shall be stored on platforms. The interior of pipes and accessories shall be kept free from dirt and foreign matter.

B. ALIGNMENT AND GRADE

- a. General: All pipes shall be laid and maintained to the required lines and grades. Fittings, valves and hydrants shall be at the required locations with joints centered, spigots home and all valve and hydrant stems plumb.

Temporary support and adequate protection of all underground and surface utility structures encountered in the progress of the work shall be furnished by the Contractor.

Where the grade or alignment of the pipe is obstructed by existing utility structures such as conduits, ducts, pipes, connections to sewers or drains, the obstruction shall be permanently supported, relocated, removed, or reconstructed by the Contractor at the Contractor's expense, in cooperation with the owners of such utility structures.

- b. Deviation from Drawings: No deviation from the line and grade shown on plans may be made without the written consent of the Engineer.
- c. Depth of Cover: Depth of cover will be measured from the established street grade or the surface of the permanent improvement, or from finished grade to the top of the pipe barrel. Unless otherwise shown on drawings, the minimum depth of cover shall be 36 inches.

C. TRENCH EXCAVATION AND BACKFILL

See Standard Specification Section 022020, Excavation and Backfill for Utilities.

D. POLYETHYLENE WRAPPING

All ductile or cast iron pipe, valves and fittings, except pipe or valves which are laid in encasement pipe or in concrete valve boxes, shall be wrapped in polyethylene. The polyethylene material shall have a thickness of 8 mils and may be either clear or black. The wrapping shall be lapped in such manner that all surfaces of pipe valves and fittings, including joints, shall have a double thickness of polyethylene. If a single longitudinal lap is made, using a double thickness of polyethylene, it shall be lapped a minimum of 18 inches and the lap shall be placed in the lower quadrant of the pipe and in such a manner that backfill material cannot fall into the lap. The polyethylene shall be secured in place with binder twine at not more than 6-foot intervals. If wrapping is applied before the pipe is placed in the trench, then special care shall be taken in handling the pipe so that the wrapping will not be damaged. Care shall also be exercised in backfilling around the pipe and fittings and in blocking fittings so as not to damage the wrapping. Any wrapping that may be damaged shall be repaired in a manner satisfactory to the Engineer and so as to form the best protection to the pipes.

E. LOWERING PIPE AND ACCESSORIES IN THE TRENCH

- a. General: The trench shall be excavated true and parallel to the pipe center line with a minimum clearance of eight inches below the pipe bottom and with a like clearance from the bottom of the bell to the bottom of the bell hole. The trench will then be refilled to the proper grade with sand as

specified. The placing of the encasing material shall be done in such a manner so as to be free of all natural soil rock or other foreign matter.

After final grading in the trench of the encasing material, bell holes shall be excavated at each joint.

Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and efficient execution of the work. All pipe, fittings, valves, hydrants and accessories shall be carefully lowered into the trench by means of a derrick, ropes, or other suitable equipment, in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.

- b. Inspection of Pipe and Accessories: The pipe and accessories shall be inspected for defects prior to lowering in the trench. Any defective damage or unsound pipe shall be replaced.
- c. Clean Pipe: All foreign matter, or dirt, shall be removed from the interior of the pipe prior to lowering into the trench. Pipe shall be kept clean both in and out of the trench at all times during the laying.

F. JOINTING PIPES

All pipes shall be made up in accordance with manufacturer's recommendation. Pipe deflection shall not exceed 75% of the maximum amount recommended by the manufacturer.

G. CONCRETE THRUST BLOCKS

Thrust backings shall be applied at all bends, tees, incomplete crosses and blow-offs, except at anchored fittings. The size and shape of the thrust blocking shall be as shown on the plans. Materials for the backings shall be minimum 3,000 psi concrete and shall be placed between solid ground and the fittings to be anchored. The sizes of thrust blocking is indicated on the drawings.

The backing shall be placed so that the pipe and fitting joints will be accessible for repair.

Temporary thrust blocks, or other means of carrying thrust loads generated by hydrostatic testing shall be provided at all ends of lines to be tested. Details of the end connections and method of temporary blocking shall be submitted to the Engineer for approval. After satisfactory completion of the hydrostatic test, this temporary blocking shall be removed so that connections may be made with existing lines. This work is subsidiary to waterline installation and no separate payment will be made for it.

H. METAL HARNESS

Metal harness, tie rods and clamps, or swivel fittings shall be used to prevent movement when soil conditions will not withstand thrust blocking. Steel rods and clamps shall be galvanized, or otherwise rust proofed or coated with hot coal tar enamel, then wrapped with two layers of polyethylene wrapping.

I. STERILIZATION

- a. Fittings: Valves, hydrants and fittings shall be stored on timbers and kept clean. Where soil or other substance has come in contact with the water surfaces of the fittings, the interior shall be washed and sterilized with 2% solution of calcium hypochlorite.
- b. Pipe: As each joint of pipe is laid, the Contractor, unless otherwise specified by the Engineer, shall throw powdered calcium hypochlorite (70%) through the length of the joint (One pound for each 1,680 gallons of water to give 50 ppm). When the line is complete, and before testing, same shall be slowly filled with water between valves and allowed to stand for 48 hours. After sterilization period is completed, lines shall be flushed by the Contractor under the direct supervision of a representative of the City Water Department. The Engineer will take same test two hours after refilling. If the sample does not pass State Health Department purification standards, the procedure shall be repeated. The entire procedure shall be coordinated under the supervision of the Water Division Superintendent/Engineer.

During sterilization process, valves shall be operated only under the supervision of the Water Division Superintendent/Engineer.

J. HYDROSTATIC TESTING WATER SYSTEM

See Standard Specification Section 026202, Hydrostatic Testing of Pressure System.

K. WATER SERVICE CONNECTIONS

See Standard Specification Section 26404, Water Service Connections.

L. MEASUREMENT AND PAYMENT

Unless specified otherwise, water pipe will be measured by the linear foot. Measurement shall include, but not be limited to, trenching, dewatering, bedding, pipe (except for fittings), restraints, thrust blocking, and backfill. Payment shall be made at the unit price bid and include all labor, materials, equipment, and incidentals required to complete the work.

END OF SECTION

SECTION 026404
WATER SERVICE LINES

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and installing water service lines required to complete the project. Water Service lines are those lines from the City main to the meter at the property line

2. MATERIALS

A. GENERAL

Service fittings shall have a minimum of 150 psi working pressure rating, unless indicated otherwise.

Fittings and materials shall be in accordance with the applicable provisions of AWWA C-800.

All service connections shall require service clamps.

B. SERVICE CLAMP

Service clamps shall be brass saddle with two silicon bronze straps with I.P. thread and have a minimum working pressure rating of 200 psi. The saddle and nuts shall be of 85-5-5-5 brass alloy per ASTM B-62 and AWWA C800. The Nuts shall have unitized washers. Straps shall be 5/8" high quality silicone bronze flattened and contoured to provide a wider bearing surface against pipe. Clamps shall be comparable to:

Ford 202B, Smith Blair 323, Rockwell 323

C. CORPORATION STOP

Corporation Stop shall be of brass with I.P. thread inlet and Muller 110 Compression connection outlet designed for type K copper pipe and be comparable in design to the following:

Muller H-15028 for 3/4" & 1" sizes
Muller H-15023 for 1½" & 2" sizes

D. ANGLE METER STOP

Angle Meter Stop shall have a Teflon coated bronze ball which rotates within two Buna-N rubber seats. Inlet shall be packed joint for Type K copper and be comparable in design to the following:

For BA43-332 for 3/4" & BA43-444 for 1"
Brass gate valve req. for 1½" and 2" sizes

E. SERVICE LINE

Service line shall be of type K copper tube.

Other products of comparable featured and equal quality may be substituted for the above items with approval of the Engineer.

3. CONSTRUCTION METHODS

See Section 022020, "Excavation and Backfill for Utilities".

Service lines shall be placed by the Contractor as indicated on the drawings and as directed by the Engineer.

Relocation of existing meters and change over to the new system shall be done only under the direct supervision of the City Water Department.

4. MEASUREMENT

Service lines shall be measured with the units indicated in the proposal for each size of service line indicated in the proposal.

5. PAYMENT

Payment for service lines shall include but not be limited to the following: copper tubing, corporation stop, service clamp, angle meter stop, trenching, trench safety, testing, flushing, clean-up, site restoration, all labor, all equipment, and incidentals required for the proper installation.

END OF SECTION

SECTION 026406
PRIVATE WATER SERVICE LINES (S-112)

1. DESCRIPTION

This section governs the furnishing of all labor, equipment, tools and materials necessary for the construction of private water service lines as shown on the plans, as outlined herein and as necessary to complete the project. Private water service lines are defined as those lines from the customer side of the water meter to the structure.

2. MATERIALS

Materials for the construction of private water service lines shall comply with the provisions of the Standard Plumbing Code as published by the Southern Building Code Congress and as adopted, with local amendments, by the County, unless otherwise noted herein or on the plans.

3. PERMITS

Normal plumbing permit application and fee requirements of the Standard Plumbing Code as adopted by County shall apply for this project. A plumbing permit for each lot will be issued to the Contractor by the County. The Contractor shall make application for permits upon award of the contract.

4. GENERAL OBLIGATIONS

- (a) Contractor: The Contractor shall construct private water line services in accordance with the plans and these specifications in a neat and workmanlike manner. The route of the proposed water service shall be determined by the Contractor subject to approval of the Owner and the Engineer. All work on private service lines shall be supervised and inspected by a licensed plumber. Good relationships with the public are essential to the success of this project. The Contractor shall make all the required notifications and notices to the owner/occupants in the area. The work shall be accomplished with minimal inconvenience to the public and owner/occupants. The Contractor shall cooperate with all County employees involved in the execution of this contract. The removal of the existing meter from the old location and placement in the new location shall be done by the Contractor under County supervision. Contractor will be held responsible for restoring the water service level better than or equal to before. Compensation will be addressed on an as needed basis upon approval by the Engineer.
- (b) County: The Engineer will review work proposed by the Contractor and the County Plumbing Inspector shall inspect the installation.

5. SEQUENCE OF WORK AND CONSTRUCTION METHODS

- (a) County will mail out general letter to property owner describing the project for

execution.

- (b) Contractor shall acquire authorization for site inspections, from those owners not responding to general letter. Contractor is encouraged to take photographs of before and after conditions on each lot.
- (c) Contractor shall perform site inspection, fill-out required forms and submit copy of "Private Water Service Inspection Report & Routing Recommendation" and Site Plan Showing Route to Engineer.
- (d) Typically, the proposed service line will be connected at the existing riser serving the main structure, usually at the rear. In special cases, where existing surface improvements preclude trench excavation, the connection of the proposed line to the existing line may be allowed at an alternate location. Any alternate tie in locations must be authorized by the Engineer; and there must be evidence that equivalent water pressure of the standard connection will result using the information gathered during the site inspection.
- (e) Contractor notifies owner/occupant of proposed construction and acquires approval for proposed construction with County assistance.
- (f) Construct private service lines from structure to proposed meters.
 - (1) Materials shall be installed in accordance with manufacturer's requirements and as set forth in the plumbing code.
 - (2) The Contractor shall be responsible for laying the line along the pre-approved Site Plan Route. All lines shall be a minimum depth of 18 inches except at the riser and near water meter. Portions of the lines which are exposed shall be protected from frost action.
 - (3) Separate trenches (one for water and one for sewer) separated by undisturbed or compacted earth shall be excavated. The trenches shall be excavated in such a manner which will minimize damage to surface vegetation. After installation of the line, the excavated material shall be tamped into the trench and the surface restored to a condition acceptable to the Engineer. Lines shall be bored, jacked or jacked under sidewalks, driveways or other such improved surfaces--unless authorized by the Engineer.
 - (4) When authorized, the proposed line may be hung under pier and beam structures. In such cases, new line shall be insulated and supported with hangar straps at intervals not to exceed four (4) feet spacing.
 - (5) Where required by the building code, electrical ground wires shall be installed to assure any appliances grounded to the plumbing system remain grounded.

- (6) Boring and casing shall be required adjacent to foundations (Foundation Protection Exhibit in Appendix).
- (g) Clean, flush, and pressure test new service lines. Make final connection to riser. The service line shall remain under pressure to the angle water check valve.
- (h) Construct the water service lines to the angle meter stop for meter setting. Clean, flush, and put into service.
 - (1) The proposed meter location shall be placed as follows:
 - (a) for separated curb and sidewalk; 1.5 feet from curb edge of sidewalk;
 - (b) for sidewalk tied to curb; 1.5 feet behind sidewalk;
 - (c) where no sidewalk exists; 4.5 feet behind the curb;
 - (2) The County shall furnish the Contractor a water meter housing so that a proper alignment of the angle meter stop and meter coupling is assured.
- (i) Set meter box. Existing meter boxes shall be re-used on this project. Any meter boxes which are cracked, broken, or have missing lids shall be replaced with new meter boxes provided by the County.
- (j) The Contractor shall remove the old meter and set the same meter at the new location. Concurrently, the Contractor shall plug the existing service line and backfill the old meter box pit with clean excavated material.

6. INTERRUPTIONS OF WATER SERVICE

The Contractor shall advise the building occupants a minimum of twenty-four (24) hours in advance of the interruption of water service. After the water service has been interrupted, the Contractor shall expeditiously continue work until service has been restored. In no case shall water service be interrupted for more than four (4) hours.

7. MEASUREMENT AND PAYMENT

Private water service lines shall be measured per each service for the appropriate size of meter setting installed. Payment shall be at the contract unit bid price per meter setting and shall constitute full compensation for furnishing and installing all lines, valves, fittings, hangar straps, meter boxes and incidentals, trenching, trench safety, boring, jetting or jacking, flushing, testing, service restoration and all other work or materials required to provide water service lines from the meter location to the existing riser.

SECTION 026411
GATE VALVES & VALVE BOXES

1. DESCRIPTION

The specifications presented in this item are intended to present a minimum level of quality in material and manufacture which must be equaled or exceeded by the Gate Valves and Valve Boxes incorporated into work for which this set of specifications is applicable.

2. MATERIALS

Gate valves 4" through 12" shall conform to ANSI/AWWA standard C-515, and have a working pressure of not less than 150 psi.

The Resilient-Seated Gate Valve shall consist of an encapsulated disc with elastomer seat which, in the closed position effects a seal upon a cast iron body resulting in a bubble tight seal across the disc at a full differential pressure of 200 psi. This shall be accomplished by means of a corrosion resistant threaded bronze stem, acting through a bronze stem nut, fixed into the disc in such a way as to force the disc seat into the body, effecting a seal when the stem is torqued in the desired direction.

Each valve shall be tested from both directions, by the manufacturer, for bubble tight, 200 psi differential sealing ability. Each valve shall also be tested in the "disc up" position at 400 psi resulting in a full shell test. There shall be no leakage at the valve's joints or connections.

Internal parts shall be accessible without removing the main body from the pressure line.

Cast iron surfaces of the body shall be coated completely with a corrosion resistant coating.

Resilient-Seated Gate Valve shall conform to ANSI/AWWA Standard C-515 latest revision.

The internal diameter of the water passageway shall be at least as large as the connecting pipe inside diameter.

Underground gate valves 4" through 12" shall be mechanical joint, Clow Resilient Wedge Valve ANSI/AWWA C-515 ULFM approved full water way C-R coated or approved equal. Gate valves above ground shall be flanged, Mueller A-2370-6 or approved equal.

Underground gate valves 2 inches in diameter and smaller shall be mechanical joint, cast iron, Clow Resilient Wedge Valve ANSI/AWWA C-515 ULFM approved full water way C-R coated or approved equal .

Gate valves shall open left (counter clockwise). The number of turns required to open gate valves from a fully closed position shall be as set out in Table 3 of ANSI/AWWA standard C-515 or latest revision.

Valve boxes shall be provided over operating nuts of gate valves. Valve boxes shall be cast iron with a bottom configuration to fit the particular valve size on which it is to be used, with a screw type extension adjustment capable of 12 inches of extension to accommodate grade adjustment. Contractor is responsible for determining the appropriate box length to meet grade. Each cast iron valve box shall have a round lid cover.

3. INSTALLATION

Each gate valve shall be completely closed when installed in pipeline. Set gate valves plumb and true at locations shown on plans. Before installing, clean and check valves. Center valve box on operating nut and adjust to proper grade.

Install a concrete pad around the top of each valve box 24" diameter, 8" thick, reinforced with #3 bars at 8" centers, both ways, two layers.

4. MEASUREMENT AND PAYMENT

Separate payment shall not be made for gate valves, valve boxes, and concrete pad. Cost of this item is to be included in the unit price bid for the work for which this specification is applicable.

END OF SECTION

**SECTION 02641
FIRE HYDRANTS**

1. DESCRIPTION

This specification shall govern all work necessary to provide all fire hydrants required to complete this project.

2. MATERIALS

A. Concrete

Concrete shall have a minimum compressive strength of 3000 p.s.i. at 28 days.

B. FIRE HYDRANTS

The fire hydrants shall conform to AWWA C502-64 standard specifications for fire hydrants for ordinary water works service, except for changes, additions and supplementary details specifically outlined herein:

- a) Hydrants shall be of the traffic model type equipped with a safety flange or collar on both the hydrant barrel and stem.
- b) Type of Shutoff - The shutoff shall be of the compression type only.
- c) Inlet Connection - The inlet shall be ASA A-21.11 1964 mechanical joint for six (6") inch, Class 150 ductile iron pipe. A complete set of joint material shall be furnished with each hydrant.
- d) Delivery Classifications - Each hydrant shall have two hose nozzles and one pumper nozzle.
- e) Bury Length - The hydrants shall be furnished in the bury length as indicated on drawings.
- f) Diameter (Nominal Inside) of Hose and Pumper Nozzles - The hose nozzles shall be two and one-half (2½") inches inside diameter and the pumper nozzle shall be four (4") inches inside diameter.
- g) Hose and Pumper Nozzle Threads - The hose nozzles shall have two and one-half (2½") inch National Standard thread (7½" threads per inch). The pumper nozzle shall have size (6) threads per inch with an outside diameter of 4.658 inches, pitch diameter of 4.543 inches, and a root diameter of 4.406 inches.
- h) Harnessing Lugs - None required.

- i) Nozzle Cap Gaskets - Required.
- j) Drain Openings - Required.
- k) Tapping of Drain Opening - Tapping of the drain opening for pipe threads is not required.
- l) Nozzle Chain - Required.
- m) Direction to Open - The hydrants shall open left (counter clockwise).
- n) Color of Finish Above Ground Line - That portion of the hydrant above the ground line shall be painted red.
- o) Shape and Size of Operating and Cap Nuts - The operating and cap nuts shall be tapered pentagon one and one-fourth (1¼") inch point to face at base and one and one-eighth (1-1/8") inch point to face at top of nut.
- p) Nozzle Cap Chains - Hydrants shall be furnished without nozzle cap chains.
- q) Size of Fire Hydrant - The main valve opening shall not be less than five and one-quarter (5¼") inches inside diameter.
- r) Valve Facing - The main valve facing of the hydrant shall be rubber with 90± Durometer hardness. When the main valve lower washer and stem nut are not an integral casting then the bottom stem threads shall be protected with a bronze cap nut and a bronze lock nut.
- s) Barrel Sections - The hydrant shall be made in two or more barrel sections with flanges connecting the barrel to the elbow and to the packing plate.
- t) Breakable Coupling - Hydrants shall be equipped with a breakable coupling on both the barrel section and the stem. The couplings shall be so designed that in case of traffic collision the barrel and stem collar will break before any other part of the hydrant breaks.
- u) Hydrant Adjustment - The hydrant shall be designed as to permit its extension without excavating after the hydrant is completely installed.
- v) Breakable Collars, Barrel and Stem - Weakened steel or weakened cast iron bolts that are used in the breakable barrel couplings will not be acceptable.
- w) Operating Stem - Stems that have operating thread located in the waterway shall be made of manganese bronze, everdure, or other high quality non-corrodible metal. Stems that do not have operating threads located in the waterway must be sealed by a packing gland or "O" ring seal located between the stem threads and

waterway. Iron or steel stems shall be constructed with a bronze sleeve extending through the packing or "O" ring seal area. The sleeve shall be of sufficient length to be in the packing gland "O" ring seal in both open and closed positions of the main valve. The sleeve shall be secured to the steel stem so as to prevent water leakage between the two when subjected to 300 pounds hydrostatic test pressure.

- x) Drain Valve Mechanism - Drain valves operating through springs or gravity are not acceptable.
- y) Operating Stem Nut - The operating stem nut shall be designed to prevent seepage or rain, sleet and the accumulation of dust between the operating nut and the hydrant top.
- z) Packing Gland or "O" Ring Seal - Fire hydrants having the threaded part of the stem at the hydrant top shall be equipped with a packing gland or an "O" ring seal immediately below the threaded section of the stem.

3. CONSTRUCTION METHODS

Fire hydrants shall be installed as shown on drawings. Minimum burial length shall be 3 feet. Breakable couplings shall be located at least 2 inches and less than 6 inches above finish grade.

Hydrants and fittings shall be stored on timber and kept clean. The interior surfaces of hydrants and fittings shall be washed and sterilized with approved sterilized agent, if requested by the Engineer at time of installation.

4. CERTIFICATION

The manufacturer shall furnish to the Engineer two (2) certified sets of prints showing complete details and dimensions of the hydrant.

The manufacturer shall furnish to the Engineer one (1) certified copy of the physical tests of all metals used in the manufacture of the fire hydrant that is normally manufactured and that will meet these specifications.

5. MEASUREMENT & PAYMENT

Unless indicated otherwise in the proposal "Fire Hydrant Assembly with ..." shall be measured as a unit and shall include but not be limited to the complete fire hydrant assembly with valve, 6" line, and fitting on the main.

Payment shall include all labor, materials and incidentals required to complete the work.

END OF SECTION

DRAWINGS

CITY OF KINGSVILLE, TEXAS
ENGINEERING DEPT.

2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

KINGSVILLE, TEXAS
SANTA GERTRUDIS AVE.

LIMITS:

FROM: N. 6TH ST.
TO: N. 14TH ST.

FOR THE RE-CONSTRUCTION OF FLEXIBLE PAVEMENT STRUCTURE
AND RE-STRIPING OF ROADWAY.

NET LENGTH OF PROJECT = 3,693.88 FT. = 0.69 MI.
ROADWAY = 3,581.80 FT. = 0.67 MI.
BRIDGE = 112.08 FT. = .02 MI.

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	EXISTING TYPICAL SECTIONS
3	PROPOSED TYPICAL SECTIONS - BASE BID
4	PROPOSED TYPICAL SECTIONS - ALTERNATE BID
5-9	GENERAL NOTES & SPECIFICATIONS
10	QUANTITY SHEET
11	SUMMARY OF MANHOLE & VALVE ADJUSTMENTS
12	SUMMARY OF PAVEMENT MARKINGS
13-15	TRAFFIC CONTROL PLAN
16	PLAN & PROFILE - STA 0+00 TO STA 6+00
17	PLAN & PROFILE - STA 6+00 TO STA 12+00
18	PLAN & PROFILE - STA 12+00 TO STA 18+00
19	PLAN & PROFILE - STA 18+00 TO STA 24+00
20	PLAN & PROFILE - STA 24+00 TO STA 30+00
21	PLAN & PROFILE - STA 30+00 TO STA 36+93.88
22-24	EC(9)-16
25	PM(1)-12
26	PM(2)-12
27-32	TCP(1-1)-12 TO TCP(1-6)-12
33-44	BC(1)-14 TO BC(12)-14

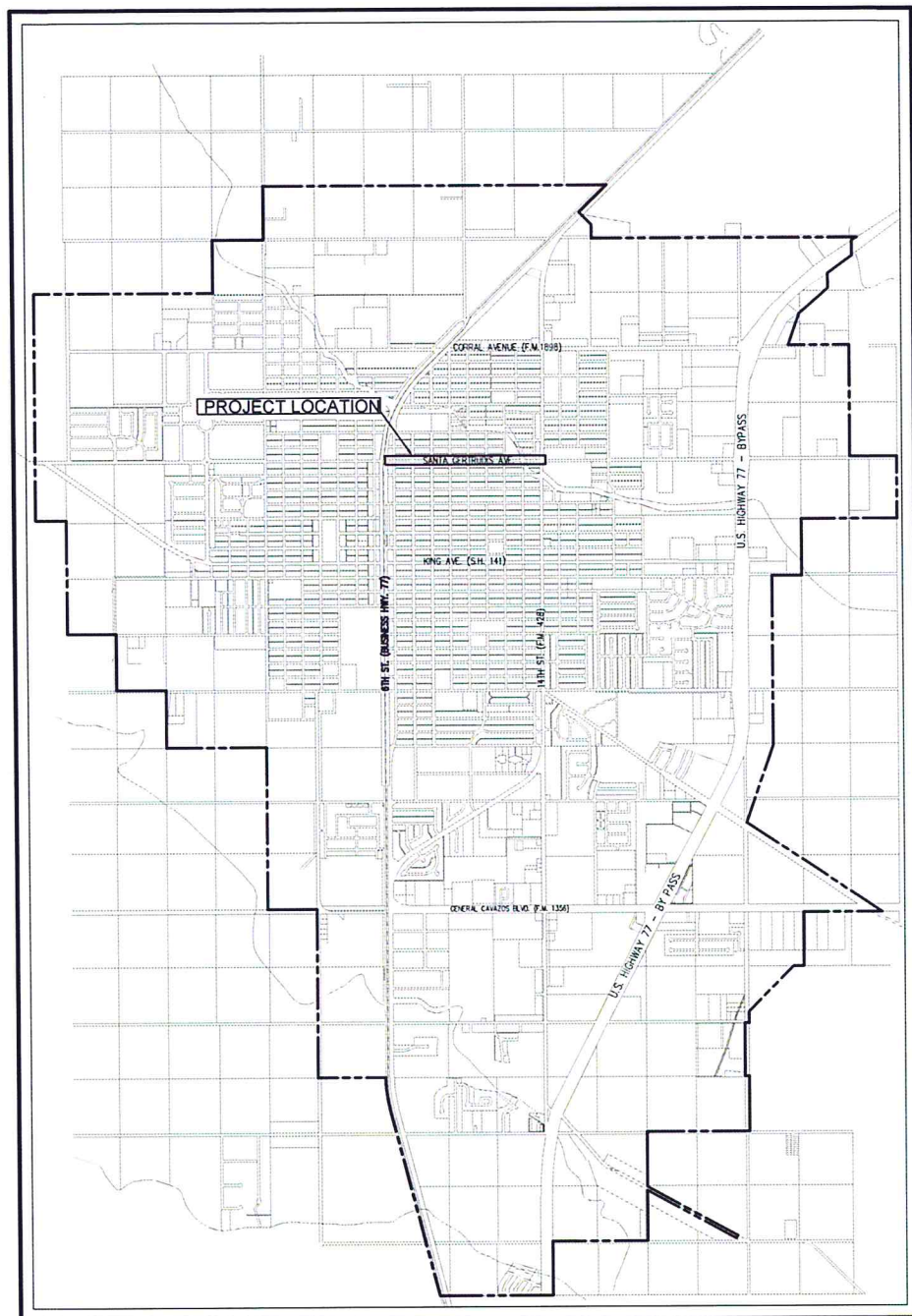
EQUATIONS: NONE
EXCEPTIONS:
(1) BRIDGE: STA. 31+96.90 TO STA. 33+09.98 = 112.08'
NO RAILROAD CROSSING

MAYOR
SAM FUGATE

CITY MANAGER
JESUS A. GARZA

CITY ENGINEER/DIRECTOR OF PUBLIC WORKS
JUAN CARLOS CARDENAS, P.E.

CITY COMMISSIONERS
ALFONSO R. GARCIA
NOEL PENA
ARTURO PECOS
EDNA LOPEZ



KINGSVILLE, TEXAS
SCALE: NOT TO SCALE



COVER SHEET

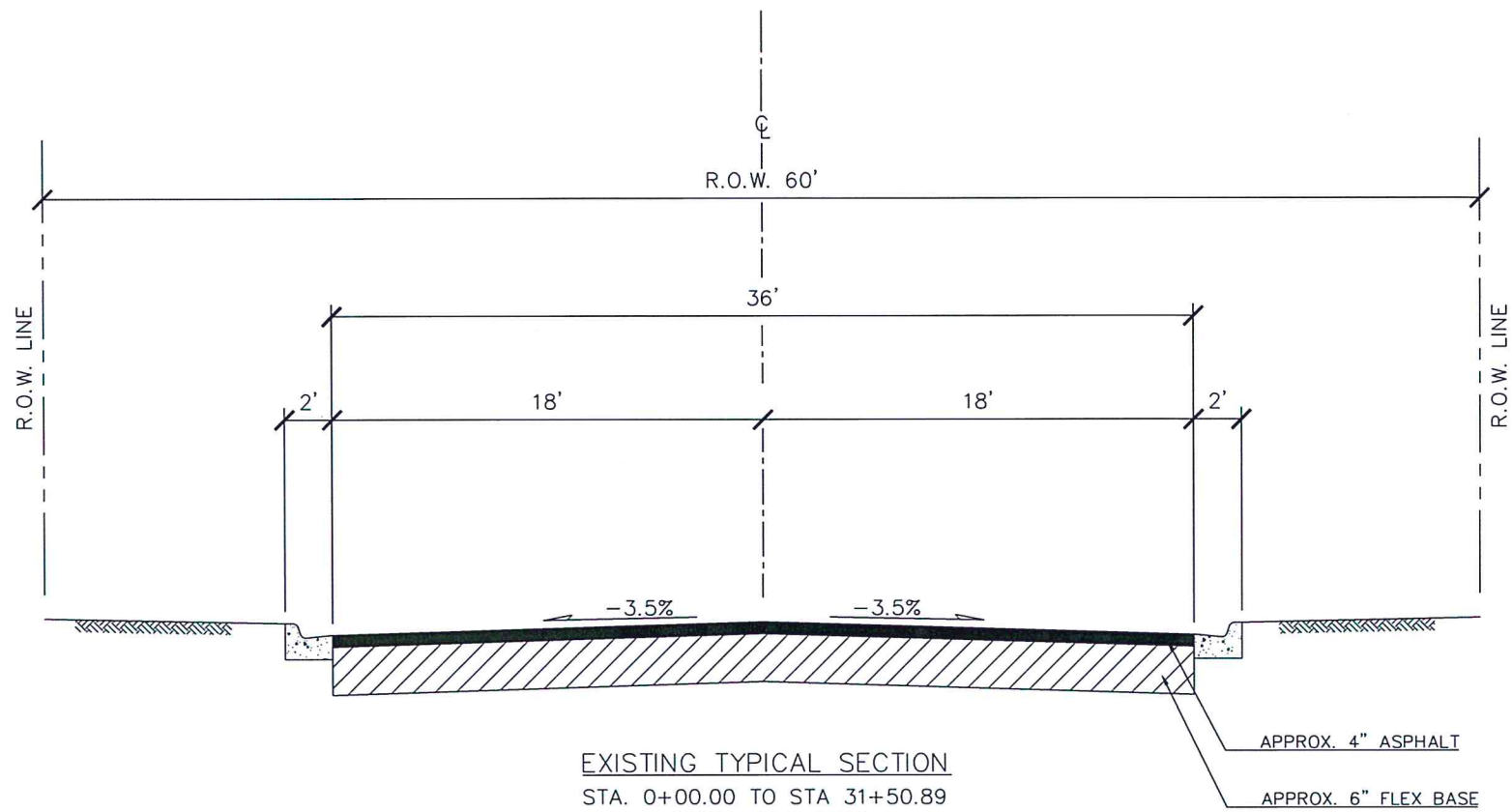
2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

No.	DATE	REVISION
10		
9		
8		
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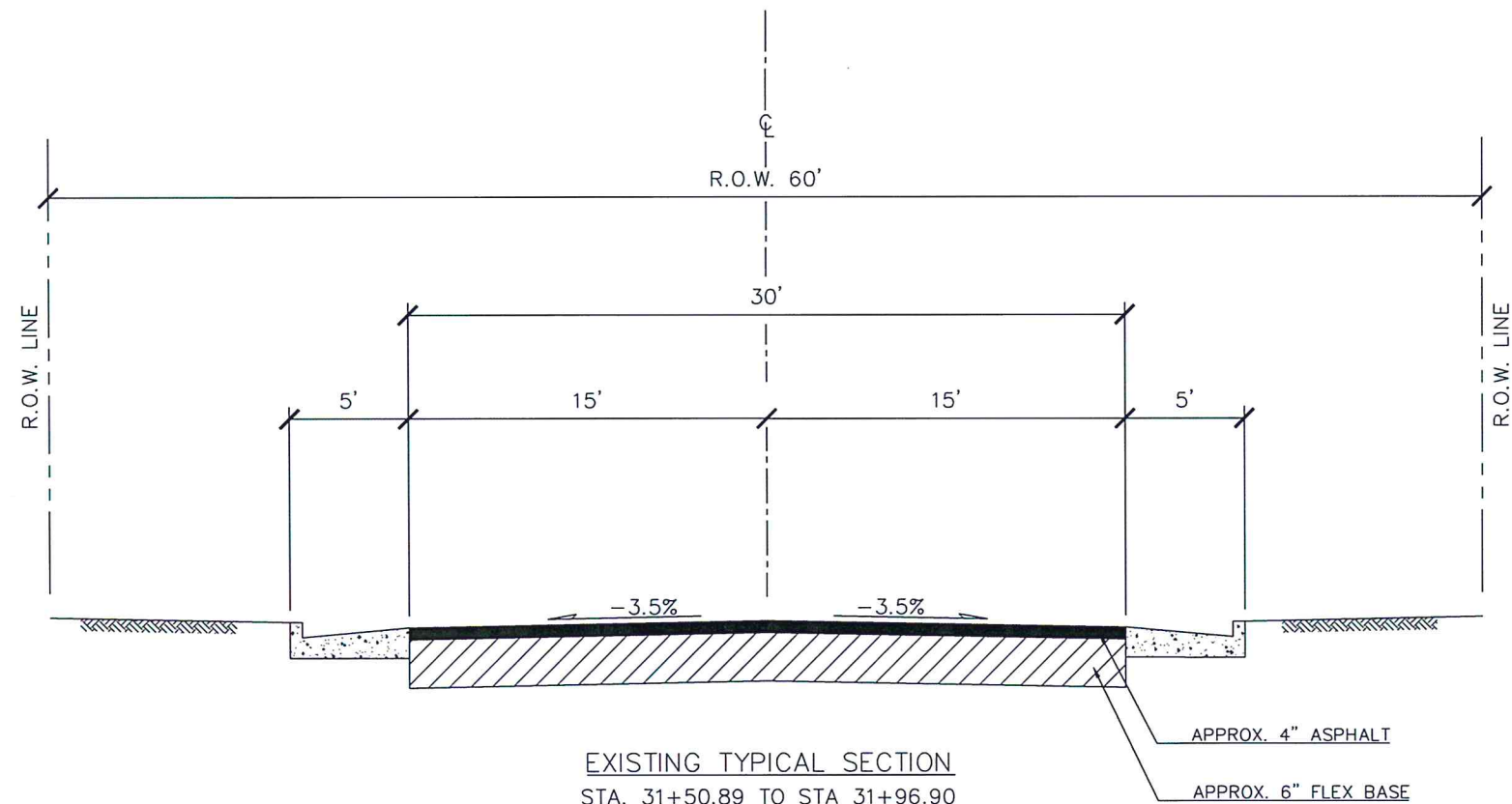


DATE:	02/14/2017	SCALE:	NTS
DRAWN:	S.SANTILLAN	CHECKED BY:	
PROJECT #	17-17		
SHEET NO:	1		

6/28/17



EXISTING TYPICAL SECTION
 STA. 0+00.00 TO STA 31+50.89
 APPROX 31.5 STAS.
 STA. 33+08.98 TO STA 36+93.88
 APPROX 3.85 STAS.
 (EXCEPTION STA. 31+96.90 TO STA. 33+08.98)



EXISTING TYPICAL SECTION
 STA. 31+50.89 TO STA 31+96.90
 APPROX 0.5 STAS.

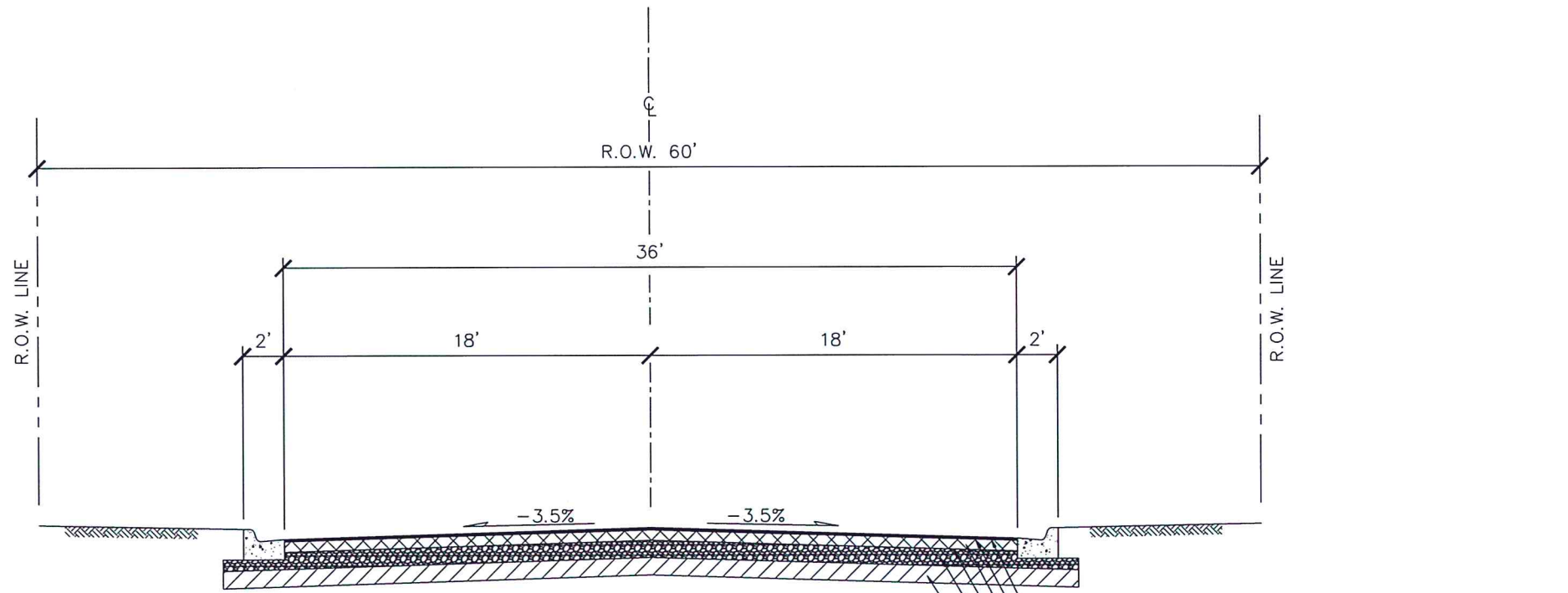
EXISTING TYPICAL SECTIONS

2017 SANTA GERTRUDIS AVENUE
 STREET IMPROVEMENTS

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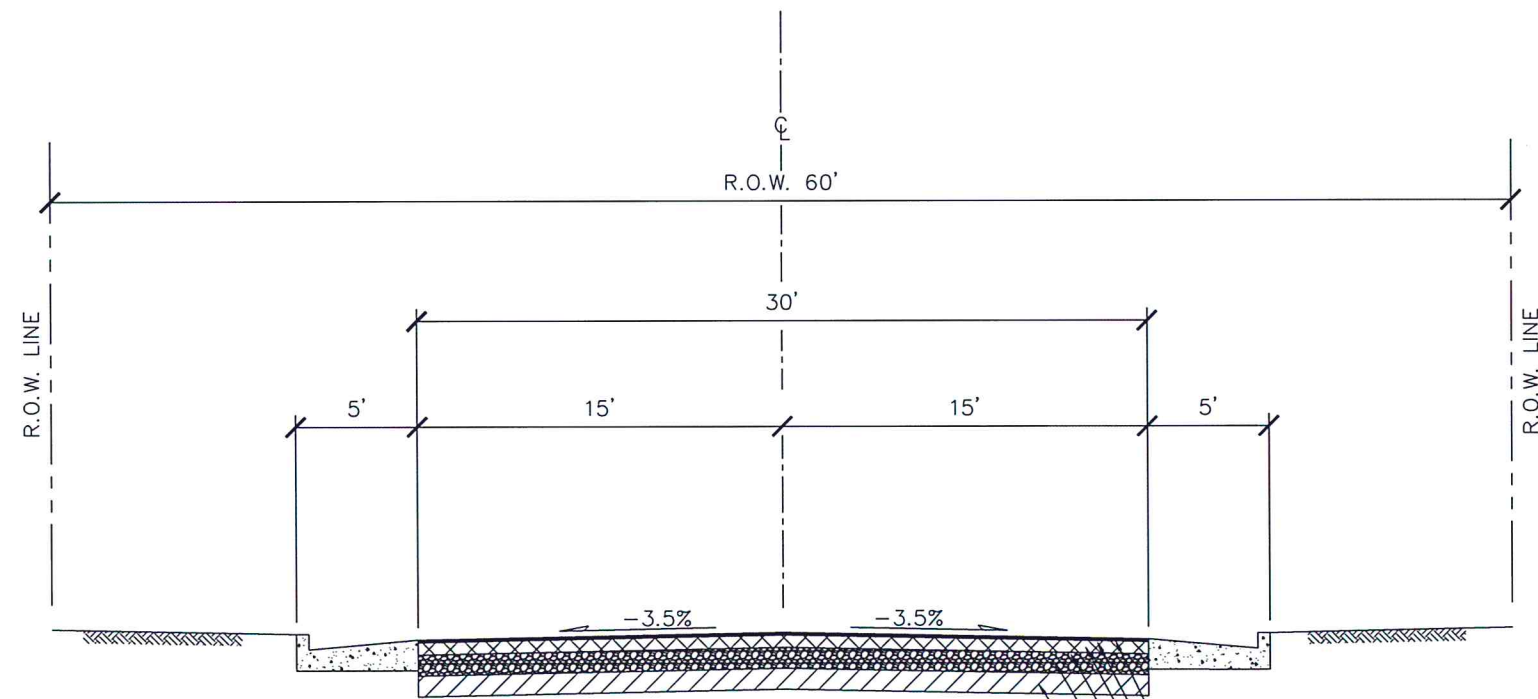


DATE: 02/14/2017	SCALE: NTS
DRAWN: S.SANTILLAN	CHECKED BY:
PROJECT: 17-17	
SHEET NO: 2	



**PROPOSED TYPICAL SECTION
BASE BID**
 STA. 0+00.00 TO STA 31+50.89
 APPROX 31.5 STAS.
 STA. 33+08.98 TO STA 36+93.88
 APPROX 3.85 STAS.
 (EXCEPTION STA. 31+96.90 TO STA. 33+08.98)

- 2" 110#/S.Y./IN. H.M.A.C. (TY. "D")
- #4 GRADE GRAVEL
- EMULSIFIED ASPHALT TREATMENT AC-5 (0.25 GAL/SY)
- EMULSIFIED ASPHALT TREATMENT MC-30 (0.15 GAL/SY)
- 8" TY. 'A' GR. 1 LIMESTONE (NEW) (EST @ 90 CY/STA.)
- 6" STAB. SUBGR. EST @ 400 S.Y./STA. W/3% LIME BY WEIGHT



**PROPOSED TYPICAL SECTION
BASE BID**
 STA. 31+50.89 TO STA 31+96.90
 APPROX 0.5 STAS.

- 2" 110#/S.Y./IN. H.M.A.C. (TY. "D")
- #4 GRADE GRAVEL
- EMULSIFIED ASPHALT TREATMENT AC-5 (0.25 GAL/SY)
- EMULSIFIED ASPHALT TREATMENT MC-30 (0.15 GAL/SY)
- 8" TY. "A" GR. 1 LIMESTONE (NEW) (EST @ 75 CY/STA.)
- 6" STAB. SUBGR. EST @ 334 S.Y./STA. W/3% LIME BY WEIGHT

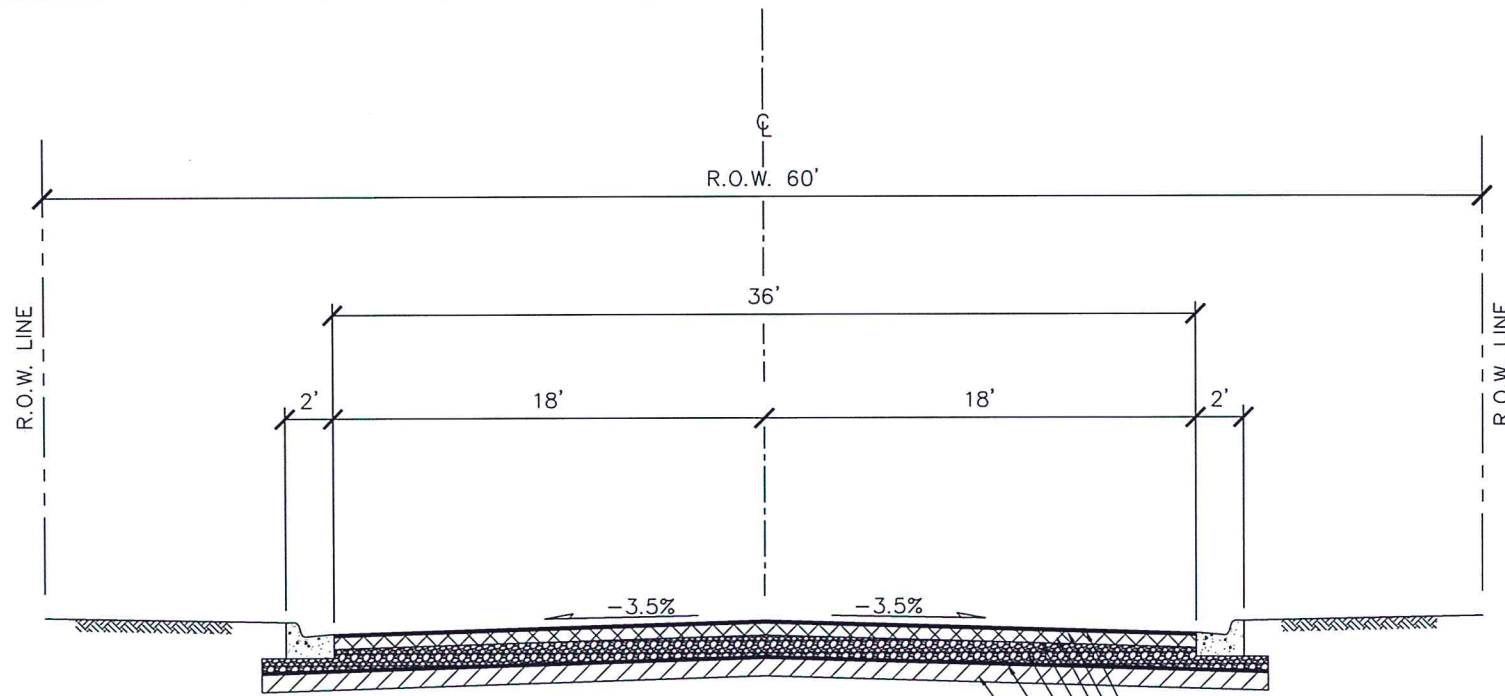
PROPOSED TYPICAL SECTIONS

2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

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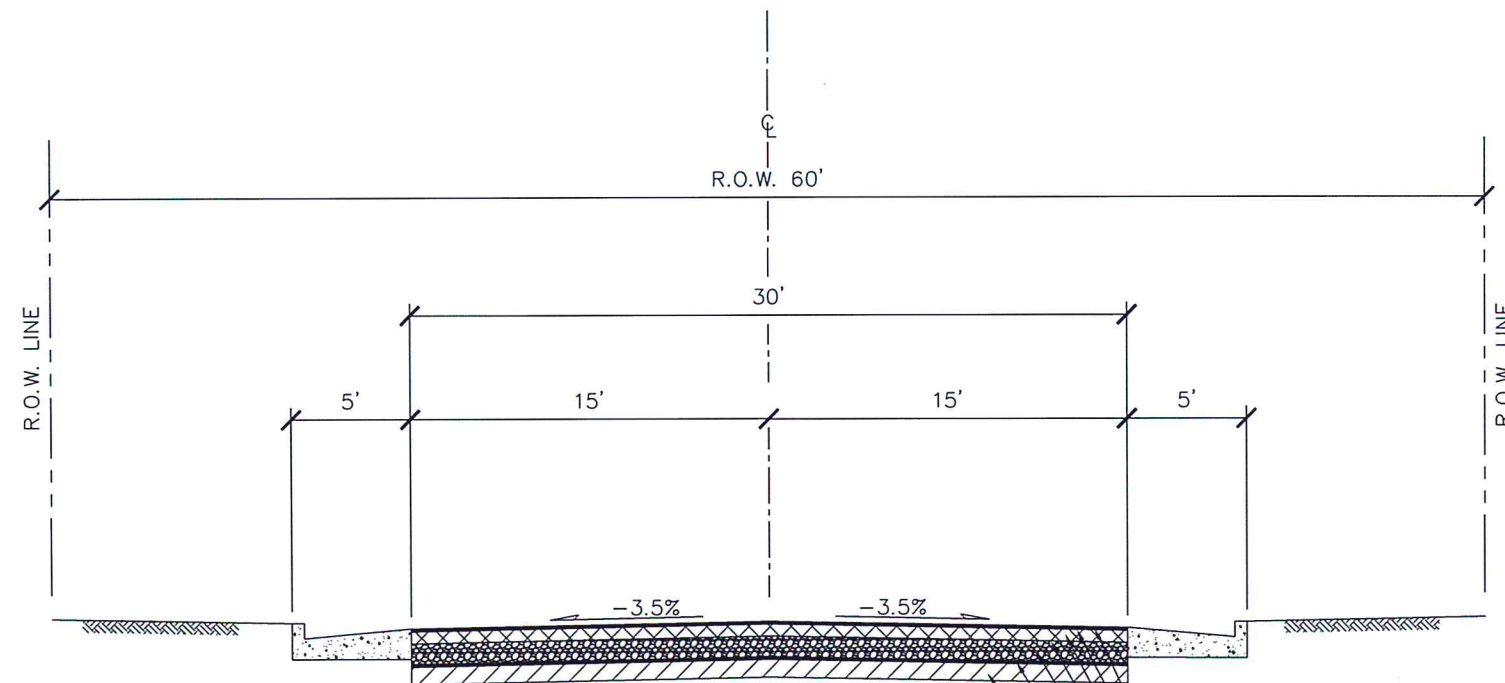


DATE: 02/14/2017	SCALE: NTS
DRAWN: S.SANTILLAN	CHECKED BY:
PROJECT #: 17-17	
SHEET NO.:	3



**PROPOSED TYPICAL SECTION
ALTERNATE BID**
 STA. 0+00.00 TO STA 31+50.89
 APPROX 31.5 STAS.
 STA. 33+08.98 TO STA 36+93.88
 APPROX 3.85 STAS.
 (EXCEPTION STA. 31+96.90 TO STA. 33+08.98)

- 2" 110#/S.Y./IN. H.M.A.C. (TY. "D")
- #4 GRADE GRAVEL
- EMULSIFIED ASPHALT TREATMENT AC-5 (0.25 GAL/SY)
- EMULSIFIED ASPHALT TREATMENT MC-30 (0.15 GAL/SY)
- 8" TY. "A" GR. 1 LIMESTONE (NEW) (EST @ 75 CY/STA.)
- GEO-GRID BASE REINFORCEMENT
- RE-GRADED SUBGR.



**PROPOSED TYPICAL SECTION
ALTERNATE BID**
 STA. 31+50.89 TO STA 31+96.90
 APPROX 0.5 STAS.

- 2" 110#/S.Y./IN. H.M.A.C. (TY. "D")
- #4 GRADE GRAVEL
- EMULSIFIED ASPHALT TREATMENT AC-5 (0.25 GAL/SY)
- EMULSIFIED ASPHALT TREATMENT MC-30 (0.15 GAL/SY)
- 8" TY. "A" GR. 1 LIMESTONE (NEW) (EST @ 75 CY/STA.)
- GEO-GRID BASE REINFORCEMENT
- RE-GRADED SUBGR.

PROPOSED TYPICAL SECTIONS
ALTERNATE BID OPTION

2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

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DATE: 02/14/2017	SCALE: NTS
DRAWN: S.SANTILLAN	CHECKED BY:
PROJECT: 17-17	
SHEET NO: 4	

Project Number: Bid 17-17

County: Kleberg

Highway: Santa Gertrudis Avenue

GENERAL NOTES & SPECIFICATIONS

PLANS ARE REQUIRED FOR THIS PROJECT.

General

Water required for curing base materials, emulsified asphalt treatment, maintenance of roadways, and dust control will not be paid for directly, but shall be considered subsidiary to the various contract items.

At the end of each working day, the contractor shall patch any existing open cuts in the roadway asphaltic surface which will be open to traffic during non-working hours. This patch must consist of an acceptable asphaltic mat with the patch thickness being no less than 1-1/2". This work will not be paid for directly but shall be considered subsidiary to the various bid items.

At the end of each working day, the contractor shall, grade out vertical cuts. Where cuts are excessive, the vertical drop off will be adequately marked as directed by the engineer. Typical markings will include cw21-13 signs supplemented with vertical panels.

The contractor will not be able to bury unsalvageable material within state highway right of way.

FLEXIBLE BASE - LIMESTONE

Flexible Base may be used for a foundation for a surface course or for other base courses; shall be composed of crusher run broken stone; and shall be constructed as herein specified, in conformity with sections shown on plans, and to the lines and grades as established by the ENGINEER.

The materials shall be crushed limestone from an approved source and shall consist of durable particles of stone mixed with approved binding material. The material shall conform to TxDOT Specifications (2014) Item 247, "Flexible Base", Type A, Grade 1.

Flexible base shall be placed by methods conforming to TxDOT Specifications (2014) Item 247.4. Compacted thickness of crushed limestone base shall be as shown on the plans with not less than 95% of maximum dry unit weight obtained by compaction of ASTM D-1557 procedure.

ASPHALTS, OILS AND EMULSIONS

This specification shall govern all work for asphalt cement, cut-back asphalts, emulsified asphalts, other miscellaneous asphaltic materials and latex additives required to complete the project.

When tested according to Texas Department of Transportation Test Methods, the various materials shall meet the applicable requirements of this specification.

ASPHALT CEMENT. The asphalt cement shall be homogeneous, shall be free from water, shall not foam when heated to 347 F and shall meet the requirements in Table 1 in Section 025404 of the Technical Specifications.

LATEX MODIFIED ASPHALT. The latex additive shall be an emulsion of styrene-butadiene low-temperature copolymer in water. The emulsion shall have good storage stability and possess the properties outlined in Section 025404 of the Technical Specifications

CUTBACK ASPHALT. Cutback asphalt shall meet the requirements indicated in Tables 4 and 5 in Section 025404 of the Technical Specification for the specified type and grade.

EMULSIFIED ASPHALT. Emulsified asphalt shall be homogeneous, shall show no separation of asphalt after thorough mixing and shall meet the requirements for the specified type and grade shown in Tables 6 through 9 in Section 025404 of the Technical Specifications.

FLUXING MATERIAL. Fluxing material shall be free from foreign matter and shall be comprised of flux oil or a blend of flux oil and aromatic oil. The materials, when tested separately, shall meet the requirements outlined in Section 025404 of the Technical Specifications.

STORAGE, HEATING AND APPLICATION TEMPERATURES

Asphaltic materials should be applied at the temperature which provides proper and uniform distribution and within practical limits avoiding higher temperatures than necessary. Satisfactory application should usually be obtained within the recommended ranges shown in Sections 205404 of the Technical Specifications. No material shall be heated above the maximum temperatures shown in Table 10 of Section 205404 of the Technical Specifications.

PRIME COAT

Prime Coat shall not be applied when the air temperature is below 60 °F and falling, but it may be applied when the air temperature is above 50 °F and is rising, the air temperature being taken in the shade and away from artificial heat. Asphalt material shall not be placed when general weather conditions, in the opinion of the Engineer, are not suitable.

The asphalt material used for the prime coat shall be MC-30, unless otherwise specified, and when tested by approved laboratory methods shall meet the requirements of the specification 025404 - Asphalts, Oils and Emulsions.

Project Number: Bid 17-17

County: Kleberg

Highway: Santa Gertrudis Avenue

When, in the opinion of the Engineer, the area and/or base is satisfactory to receive the prime coat, the surface may be cleaned by sweeping or other approved methods. If found necessary by the Engineer, the surface shall be lightly sprinkled just prior to application of the asphalt material. The asphalt material shall be applied on the clean surface by an approved type of self-propelled pressure distributor so operated as to distribute the material in the quantity specified, evenly and smoothly under a pressure necessary for proper distribution. The Contractor shall provide all necessary facilities for determining the temperature of the asphalt material in all of the heating equipment and in the distributor, for determining the rate at which it is applied, and for securing uniformity at the junction of two distributor loads.

All storage tanks, piping, retorts, booster tanks and distributors used in storing or handling asphalt material shall be kept clean and in good operating condition at all times, and they shall be operated in such manner that there will be no contamination of the asphalt material with foreign material. It shall be the responsibility of the Contractor to provide and maintain in good working order a recording thermometer at the storage-heating unit at all times. The distributor shall have been recently calibrated and the Engineer shall be furnished an accurate and satisfactory record of such calibration. After beginning of the work, should the yield on the asphalt material applied appear to be in error, the distributor shall be calibrated in a manner satisfactory to the Engineer before proceeding with the work.

Prime shall be applied at a temperature within the recommended range per Standard Specification 025404 "Asphalts, Oils, and Emulsions with that range being 70 to 150 °F for MC-30. Application rate shall be 0.15 GAL/SY, unless otherwise specified.

The Contractor shall be responsible for the maintenance of the surface until the Engineer accepts the work.

No traffic hauling or placement of any subsequent courses shall be permitted over the freshly applied prime coat until authorized by the Engineer.

HOT MIX ASPHALTIC CONCRETE PAVEMENT

Materials

Aggregate: The aggregate shall consist of a blend of course aggregate, fine aggregate and, if required, a mineral filler.

Coarse Aggregate shall consist of that fraction of aggregate retained on a No. 10 sieve and shall consist of crushed furnace slag, crushed stone, or crushed gravel.

Deterious material in coarse aggregate shall not exceed 2% per TEX-217-F. Course aggregate shall be crushed such that a minimum of 85% of the particles have more than one crushed face, unless noted otherwise on plans. Los Angeles abrasion losses for course aggregate shall not exceed 40% by weight for the surface course and 45% for the binder and base courses per TEX-410-A.

Polish Value not less than 30 for aggregate used in the surface course per TEX-438-A.

Fine Aggregate is defined as the fraction passing a No. 10 sieve and shall be of uniform quality.

Fine aggregate shall consist of screenings of material that passes the Los Angeles abrasion requirements per above. Screenings shall be blended with a maximum of 15% un-crushed aggregate or field sand for Type D mixes or a maximum of 10% uncrushed aggregate or field sand for Type A, B, and C mixes.

Filler shall consist of dry stone dust, Portland cement, hydrated lime, or other approved by the Engineer.

Paving Mixture

Mix Design: The mixture shall be designed in accordance with TX DOT Bulletin C-14 and TEX-204-F to conform to the requirements of this specification. The Contractor shall furnish the mix design for the job-mix to be used for the project, unless shown otherwise on the drawings. The mix design shall be submitted prior to placement of mixture.

The design procedures are actually intended to result at a job-mix with properties in compliance with these specifications and when properly placed the job-mix will be durable and stable. The sieve analysis of the job-mix shall be within the range of the Master Gradation and Tolerances specified herein. The job-mix shall meet the density and stability requirements as specified and shall be included with the mix design as submitted per above.

If the specific gravity of any of the types of aggregates differ by more than 0.3, use volume method.

Plot sieve analysis of job-mix; percent passing versus size on four-cycle semi-log paper or other appropriate type paper. Show tolerance limits and Limits of Master Gradation.

Master Gradation of Aggregate: The aggregate for the type of mix specified shall be within the tabulated limits per TEX-200-F (Dry Sieve Analysis)

Tolerances: The mixture delivered to the job site shall not vary from the job-mix by more than the tolerances specified in section 025424 of the Technical Specifications. The gradation of the produced mix shall not fall outside the Master Grading Limits, with the following exceptions: for Type B material courser than 3/8" and for Type D material courser than #4. Variations from job-mix shall not exceed the limits outlined in Section 025424 of the Technical Specifications, except as noted above.

Project Number: Bid 17-17

County: Kleberg

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Equipment

Mixing Plants. Mixing plants shall be either the weight batching type or the drum mix type. Both types shall be equipped with satisfactory conveyors, power units, aggregate handling equipment, aggregate screens and bins (weigh batch only), and pollution control devices as required.

Truck Scales. A set of truck scales, if needed for measurement, shall be placed at a location approved by the Engineer.

Asphalt Material Heating Equipment. Asphalt material heating equipment shall be adequate to heat the required amount of material to the desired temperature. Agitation with steam or air will not be permitted. The heating apparatus shall be equipped with a recording thermometer with a 24-hour continuous chart that will record the temperature of the asphalt at the highest temperature.

Surge-Storage System. A surge-storage system may be used provided that the mixture coming out of the bins is of equal quality to that coming out of the mixer. The system shall be equipped with a gob hopper, rotating chute, or other devices designed to minimize segregation of the asphalt mixture.

Laydown Machine. The laydown machine shall be capable of producing a surface that will meet the requirements of the typical cross section, of adequate power to propel the delivery vehicles, and produce the surface tolerances herein required. It shall be wide enough to lay a 28-foot back-back street in a maximum of two passes.

Rollers. All rollers shall be self-propelled and of any type capable of obtaining the required density. Rollers shall be in satisfactory operating condition and free from fuel, hydraulic fluid, or any other fluid leaks.

Storage, Proportioning, and Mixing

Storage and Heating of Asphalt Materials. Asphalt cement shall not be heated to a temperature in excess of that recommended by the producer. Asphalt storage equipment shall be maintained in a clean condition and operated in such a manner that there will be no contamination with foreign matter.

Feeding and Drying of Aggregates. The feeding of various sizes of aggregate to the dryer shall be done in such a manner that a uniform and constant flow of materials in the required proportions will be maintained. In no case shall the aggregate be introduced into the mixing unit at a temperature in excess of 350 degrees F.

Proportioning. All materials shall be handled and proportioned in a manner that yield an acceptable mixture as herein specified and as defined by the job-mix.

Mixing.

Weight Batch Plant. In charging the weigh box and in charging the pugmill from the weigh box, such methods or devices shall be used as necessary to minimize segregation of the mixture.

Mix Plant. The amount of aggregate and asphalt cement entering the mixer and the rate of travel through the mixer shall be coordinated so that a uniform mixture of the desired gradation and asphalt content will be produced.

The mixture produced from each type of plant shall not vary from the job-mix by more than the tolerances and restrictions herein specified. The mixture when discharged from the plant shall have a moisture content not greater than one percent by weight of total mix when determined by Test Method TEX-212-F.

The mixture produced from each type of plant shall be at a temperature between 250 and 325 degrees F. After a target mixing temperature has been established, the mixture when discharged from the mixer shall not vary from this temperature by more than 25 degrees F.

Construction Methods

Construction conditions. For mat thicknesses greater than 1.5 inches, the asphalt material may be placed with a laydown machine when the air temperature is 40 degrees F. and rising but not when the air temperature is 50 degrees and falling. In addition, mat thickness less than and including 1.5 inches shall not be placed when the temperature of the surface on which the mat is placed is below 50 degrees F.

Prime Coat. If a prime coat is required, it shall be applied and paid for as a separate item conforming to the requirements of the specification, "Prime Coat", except the application temperature shall be as provided above. The tack coat or asphaltic concrete shall not be applied on a previously primed flexible base until the primed base has completely cured to the satisfaction of the Engineer.

Tack Coat. Before the asphalt mixture is laid, the surface upon which the tack coat is to be placed shall be thoroughly cleaned to the satisfaction of the Engineer. The surface shall be given a uniform application of tack coat using materials and rates herein specified and/or as shown on the plans. The tack coat shall be rolled with a pneumatic tire roller as necessary.

Transporting Asphalt Concrete. The asphalt mixture shall be hauled to the job site in tight vehicles previously cleaned of all foreign matter. In cool weather or for long hauls, canvas covers and insulated truck beds may be necessary. The inside of the bed may be given a light coating of lime water or other suitable release agent necessary to prevent from adhering. Diesel oil not allowed.

Placing. The asphalt mixture shall be spread on the approved prepared surface with a laydown machine or other approved equipment in such a manner such that when properly compacted, the finished surface will be smooth or uniform density, and meet the requirements of the typical cross sections as shown on the plans.

County: Kleberg

Highway: Santa Gertrudis Avenue

Flush Structures. Adjacent to flush curbs, gutters, liners and structures, the surface shall be finished uniformly high so that when compacted, it will be slightly above the edge of the curb and flush structure.

Construction joints of successive courses of asphaltic material shall be offset at least six inches. Construction joints on surface courses shall coincide with lane lines, or as directed by the Engineer.

Compacting. The asphalt mixture shall be compacted thoroughly and uniformly with the necessary rollers to obtain the required density and surface tolerances herein described and any requirements as shown on the plans. Regardless of the method of compaction control followed, all rolling shall be completed before the mixture temperature drops below 175 degrees F.

In-Place Density. In-place density control is required for all mixtures except for thin, irregular level-up courses. Material should be compacted to between 96% and 92% of maximum theoretical density or between 4% and 8% air voids. Average density shall be greater than 92% and not individual determination shall be lower than 90%. Testing shall be in accordance with TEX-207-F and TEX-227-F. Pavement specimens, which shall be either cores or sections of the compacted mixture, will be tested as required to determine the percent air voids. Other methods, such as nuclear determination of in-place density, which correlate satisfactorily with actual project specimens may be used when approved by the Engineer.

Thickness. The total compacted average thickness of the combined HMAC courses shall not be less than the amount specified on the drawings. No more than 10% of the measured thicknesses shall be more than 1/4" less than the plan thickness(es). If so, the quantity for pay shall be decreased as deemed appropriate by the Engineer.

Surface smoothness criteria and tests. The pavement surface after compaction, shall be smooth and true to the established lines, grade, and cross-section. The surface shall be tested by the City with the Mays Roughness Meter.

Localized Defects (obvious settlements, humps, ridges, etc.) shall be tested with a ten-foot straightedge placed parallel to the roadway centerline. The maximum deviation shall not exceed 1/8 inch in ten feet. Areas not meeting this criteria shall be corrected to the satisfaction of the Engineer.

Opening to Traffic. The pavement shall be opened to traffic when directed by the Engineer. The Contractor's attention is directed to the fact that all construction traffic allowed on pavement open to the public will be subject to the State laws governing traffic on highways.

If the surface ravel, it will be the contractor's responsibility to correct this condition at his expense.

TRAFFIC CONTROL

The traffic control plan shall be as shown in the plans or as directed by the engineer, and shall conform with the Texas Manual of Uniform Traffic Control Devices.

The contractor will be responsible for maintaining the existing roadway surface when the traffic control plan is being utilized. This work will not be paid for directly but shall be considered subsidiary to the various bid items. The CONTRACTOR shall provide and maintain at all times an all weather driving surface and unencumbered ingress and egress to businesses and residences.

Modifications of the traffic control plan described herein shall be approved by the ENGINEER.

GEOGRID BASE REINFORCEMENT

Provide geogrid base reinforcement, of the type shown on the plans, meeting the requirements of DMS-6240 "Geogrid for Base/Embankment Reinforcement." Use roll widths and lengths shown on the plans or as approved.

Prepare the subgrade as indicated on the plans or as directed. Set string lines for alignment if directed. Install geogrid in accordance with the lines and grades as shown on the plans. Place base material in lift thicknesses and compact as shown on the plans or as directed. Do not operate tracked construction equipment on the geogrid until a minimum fill cover of 6 in. is achieved. Rubber tire construction equipment may operate directly on the geogrid at speeds of less than 5 mph if the underlying material will support the loads. Where excessive substructure deformation is apparent, correct grid placement operations as recommended by the manufacturer or as directed

Geogrid Placement. Orient the geogrid length as unrolled parallel to the direction of roadway. Overlap geogrid sections as shown on the plans or as directed. Use plastic ties at overlap joints or as directed. Placement of geogrid around corners may require cutting and diagonal lapping. Pin geogrid at the beginning of the backfill section as directed. Keep geogrid taut at the beginning of the backfilling section but not restrained from stretching or flattening.

Longitudinal Joints. Overlap longitudinal joints by a minimum of 1 ft. Space longitudinal ties 10 ft. to 20 ft. or as directed.

Transverse Joints. Overlap transverse joints by a minimum of 1 ft. Space transverse ties 4 ft. to 5 ft. or as directed.

Damage Repair. As directed, remove and replace contractor damaged or excessively deformed areas without additional compensation. Lap repair areas a minimum of 3 ft. in all directions. Tie each side of repair grid in at least 3 locations but do not exceed normal construction spacing; tie spacing for odd shapes will be as directed. Repair excessively deformed materials underlying the grid as directed

Project Number: Bid 17-17

County: Kleberg

Highway: Santa Gertrudis Avenue

EROSION CONTROL

After temporary erosion control devices are no longer required, reshaping of those areas will be required. This work will not be paid for directly, but shall be considered subsidiary to the various bid items.

FILL MATERIAL

The contractor will provide and shape fill material, where needed, in the area located behind the curb and gutter and sidewalk to the right of way line. This material shall be of a type that is suitable for growing vegetation, and shall be approved by the engineer before placement. All labor and materials furnished for this work will not be paid for directly but shall be considered subsidiary to the various bid items.

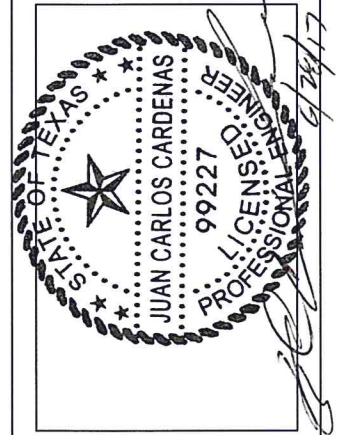
QUANTITY SHEET

2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

						PROJECT		AL T	ITEM-CODE			DESCRIPTION	UNIT	TOTAL	
						CONTROL			ITEM NO.	DESC CODE	SP NO			EST.	TOTAL
						ROADWAY VARIOUS									
EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL								
									A-1			LIME TREAT SUBGRADE (3% LIME, 6")	SY	14596	
									A-2			8" LIMESTONE FLEXIBLE BASE (TY A,GR 1)	TON	6325	
									A-3			MC-30 (PRIME COAT)	GAL	2189	
									A-4			AC-5 (SINGLE COURSE SEAL)	GAL	3649	
									A-5			#4 GRADE GRAVEL (SINGLE COURSE SEAL)	TON	161	
									A-6			2" HMAC PAVEMENT (TY D)	TON	1606	
									A-7			REFL PAV MRK TY 1 (W) (4") (SLD) (090MIL)	LF	6142	
									A-8			REFL PAV MRK TY 1 (Y) 4" (SLD) (090MIL)	LF	6142	
									A-9			PREFAB PAV MRK TY C (W) (12") (SLD)	LF	452	
									A-10			PREFAB PAV MRK TY C (W) (24") (SLD)	LF	98	
									A-11			REFL PAV MRK TY 11-A-A	EA	180	
									B1			GEO-GRID BASE REINFORCEMENT	SY	14596	

FOR CONTRACTOR'S INFORMATION ONLY

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DRAWN:	S.SANTILLAN	CHECKED BY:	
PROJECT #	17-17		
SHEET NO:	10		

SUMMARY OF MANHOLE &
VALVE ADJUSTMENTS

2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

SUMMARY OF MANHOLE & VALVE ADJUSTMENTS					
STATION	LOCATION		DESCRIPTION	VALVE BOXES	MANHOLES
27+70.00	27.08'	RT	WATRE VALVE	1	
27+72.25	6.75'	LT	WATER VALVE	ABANDON	
27+72.25	23.75'	RT	WATER VALVE	1	
35+28.65	3.28'	LT	SANITARY SEWER		1
35+43.81	13.39'	RT	WATER VALVE	1	
36+44.02	9.00'	RT	WATER VALVE	1	
36+56.02	9.00'	RT	WATER VALVE	1	
TOTAL				5	1

FOR CONTRACTOR'S INFORMATION ONLY

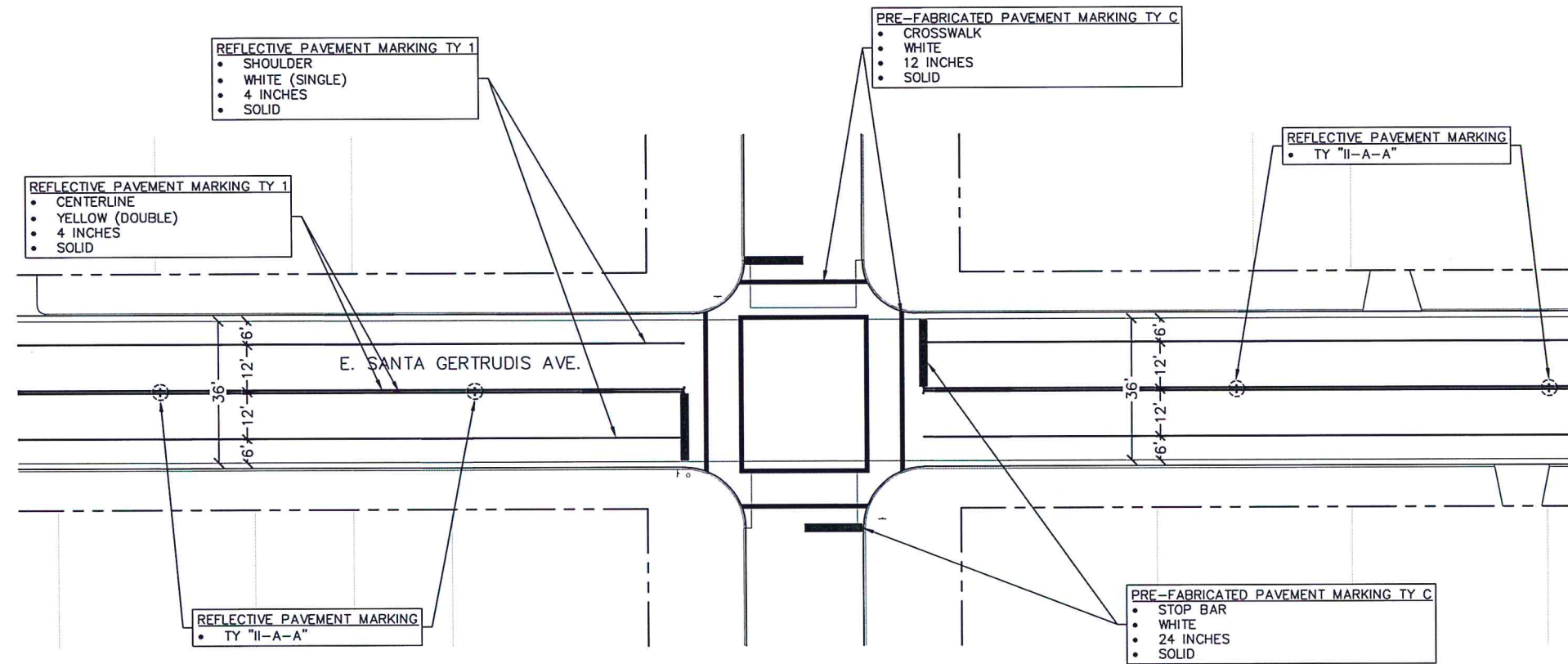
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PROJECT #	17-17		
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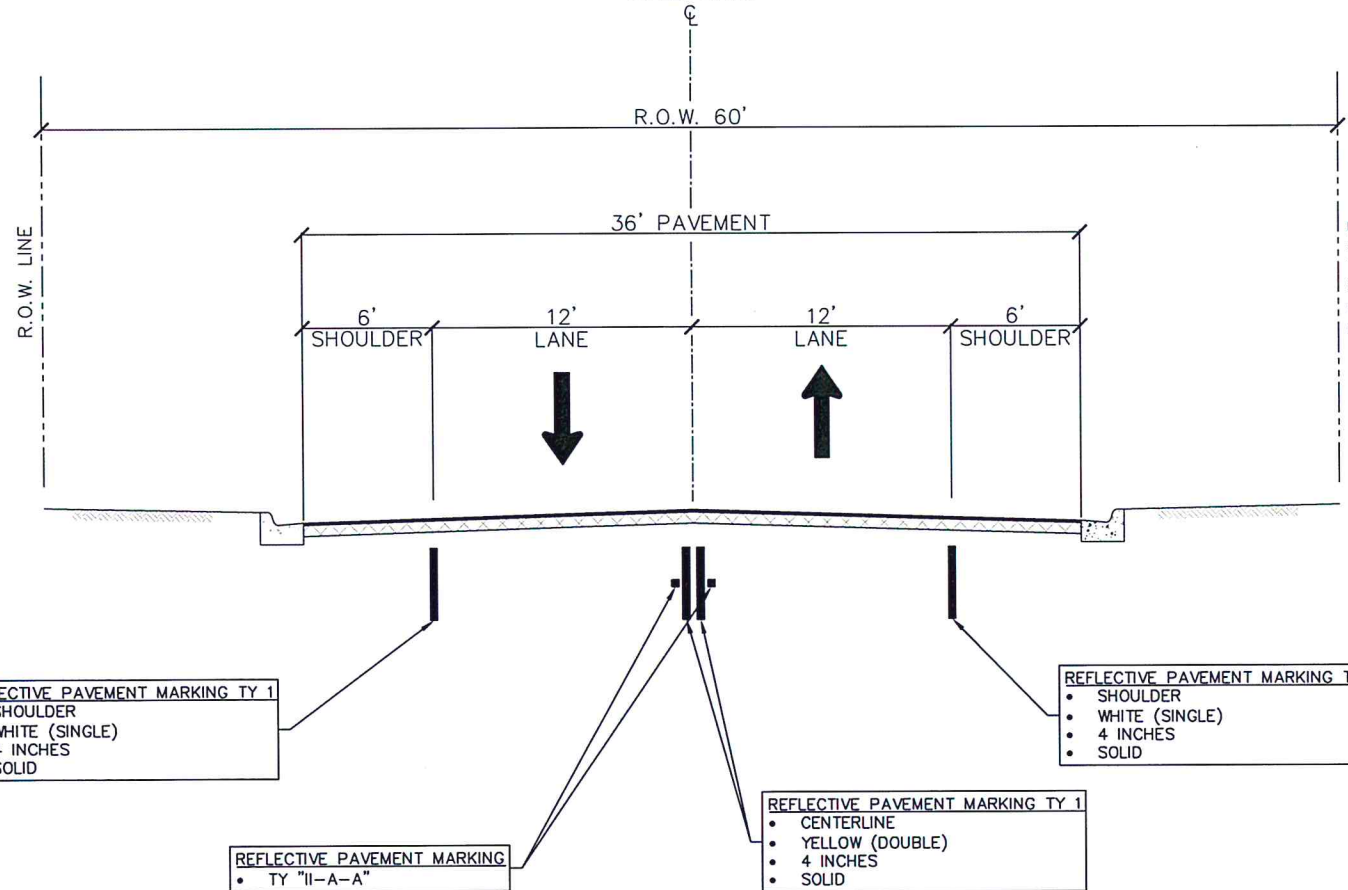
PAVEMENT MARKING
TYPICAL PLAN VIEW

SCALE: 1" = 40'



PAVEMENT MARKING
TYPICAL SECTION

SCALE: N.T.S.



LOCATION	REFL PAV MRK TY I		PREFAB PAV MRK TY C		REFL PAV MARK TY II-A-A
	(W) (4") (SLD) (90 MIL)	(Y) (4") (SLD) (90 MIL)	(W) (12") (SLD) (90 ML)	(W) (24") (SLD) (90 ML)	
	LF	LF	LF	LF	
SANTA GERTRUDIS AVENUE					
6TH TO 14TH	6142	6142	452	98	180
PROJECT TOTAL:	6142	6142	452	98	180

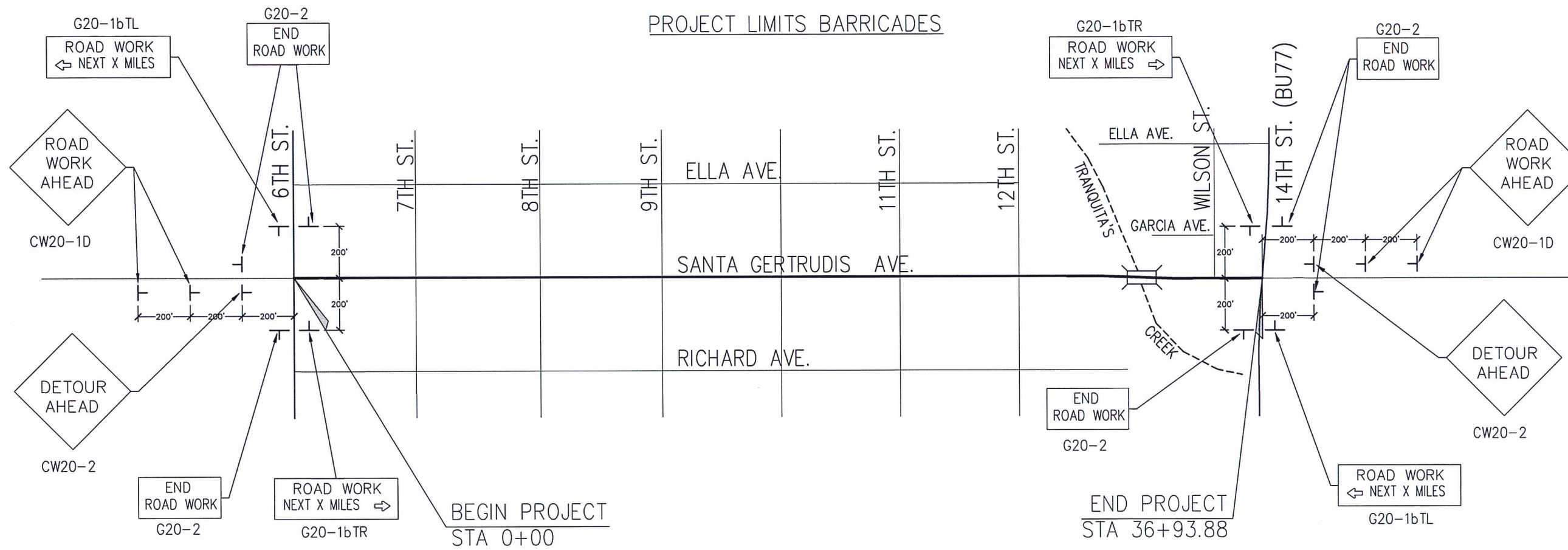
FOR CONTRACTOR'S INFORMATION ONLY



DATE: 02/14/2017 SCALE: 1" = 40'
 DRAWN: S.SANTILLAN CHECKED BY:
 PROJECT # 17-17
 SHEET NO: 12

SUMMARY OF
PAVEMENT MARKINGS
2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

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PROJECT LIMITS BARRICADES

SEQUENCE OF WORK

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW THE SEQUENCE OF WORK AS NOTED BELOW. THE CONTRACTOR MAY SUBMIT AN ALTERNATE TRAFFIC CONTROL PLAN SUBJECT TO THE APPROVAL OF THE ENGINEER.

GENERAL NOTES

THE PROJECT IS SUBDIVIDED INTO THE FOLLOWING TWO SECTIONS FOR TRAFFIC CONTROL:

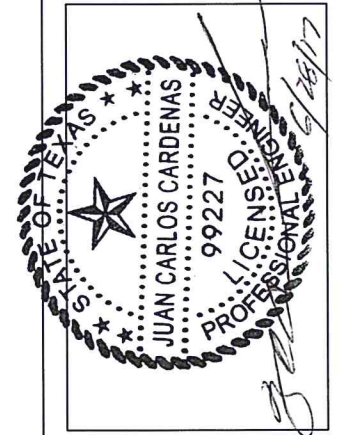
- SECTION 1: FROM 6TH ST (STA. 0+00.00) TO 10TH ST (STA. 18+29.50)
- SECTION 2: FROM 10TH ST (STA. 18+29.50) TO 14TH ST (STA. 36+93.88)

- PHASE I: CLOSE SECTION 1 ROADWAY SEGMENT TO THRU TRAFFIC.
 - (A) CONSTRUCT BOTH LANES OF ROADWAY THRU SINGLE COURSE SEAL COAT W/ EMULSIFIED ASPHALT TREATMENT AC-5 AND #4 GRADE GRAVEL.
- PHASE II: CLOSE SECTION 2 ROADWAY SEGMENT TO THRU TRAFFIC.
 - (A) CONSTRUCT BOTH LANES OF ROADWAY THRU SINGLE COURSE SEAL COAT W/ EMULSIFIED ASPHALT TREATMENT AC-5 AND #4 GRADE GRAVEL.
- PHASE III: CLOSE SECTION 1 ROADWAY SEGMENT TO THRU TRAFFIC.
 - (A) PLACE TY "D" ACP SURFACE UTILIZING STANDARD LANE CLOSURE BARRICADING AND SIGNING AS SHOWN ON STANDARD SHEET TCP(1) WITH FLAGMEN AT INTERSECTIONS FOR TRAFFIC CONTROL.
- PHASE IV: CLOSE SECTION 2 ROADWAY SEGMENT TO THRU TRAFFIC.
 - (A) PLACE TY "D" ACP SURFACE UTILIZING STANDARD LANE CLOSURE BARRICADING AND SIGNING AS SHOWN ON STANDARD SHEET TCP(1) WITH FLAGMEN AT INTERSECTIONS FOR TRAFFIC CONTROL.

- ADDITIONAL BARRICADES AND WARNING SIGNS MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE ROADWAY SURFACE WITHIN THE PROJECT LIMITS WHILE THE T.C.P. IS IN EFFECT.
- THE CONTRACTOR SHALL MARK THE LOCATION OF TRAFFIC CONTROL STRIPING AND ALL PERMANENT STRIPING AS DIRECTED BY THE ENGINEER.
- THE CONTRACTOR SHALL REMOVE ALL CONFLICTING PAVEMENT MARKINGS.
- THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL SIDE STREETS AND DRIVEWAYS AT ALL TIMES.
- ALL LANE CLOSURES SHALL BE IN ACCORDANCE WITH PLAN STANDARD SHEETS TCP(1).
- BEGINNING AND ENDING BARRICADES & SIGNS SHALL REMAIN IN PLACE FOR DURATION OF CONTRACT.
- CONTRACTOR SHALL PERFORM ALL PERMANENT STRIPING IN ACCORDANCE WITH APPLICABLE SPECIFICATIONS.

TRAFFIC CONTROL PLAN
 ADVANCED WARNING
 2017 SANTA GERTRUDIS AVENUE
 STREET IMPROVEMENTS

No.	DATE	REVISION
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DATE: 02/14/2017 SCALE: 1" = 450'

DRAWN: S.SANTILLAN CHECKED BY:

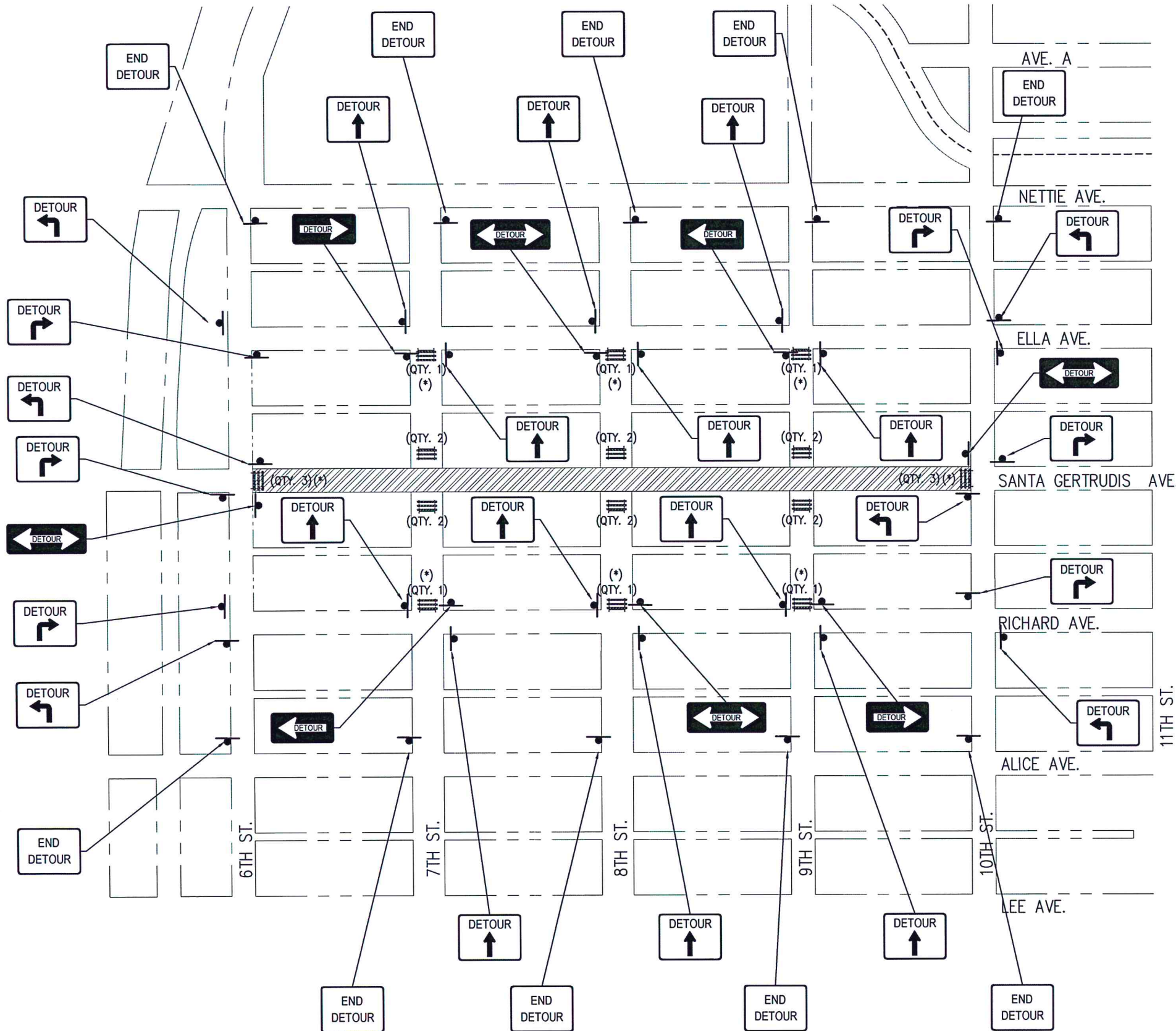
PROJECT # 17-17

SHEET NO: 13

TRAFFIC CONTROL – DETOUR PLAN

PHASE I

NOTE: THIS SAME BARRICADE SET-UP IS TO BE USED IN PHASE I AND III.



LEGEND

SYMBOL	DESCRIPTION	QTY.
	CONSTRUCTION LIMITS	STA. 0+00 TO STA. 18+29.50
	M4-10	4
	M4-10R	2
	M4-10L	2
	M4-9s	12
	M4-9TL	6
	M4-9TR	6
	M4-8a	10
	TY III BARRICADE	24
	R11-5(16)*	8

TRAFFIC CONTROL PLAN
 PHASE I
 2017 SANTA GERTRUDIS AVENUE
 STREET IMPROVEMENTS

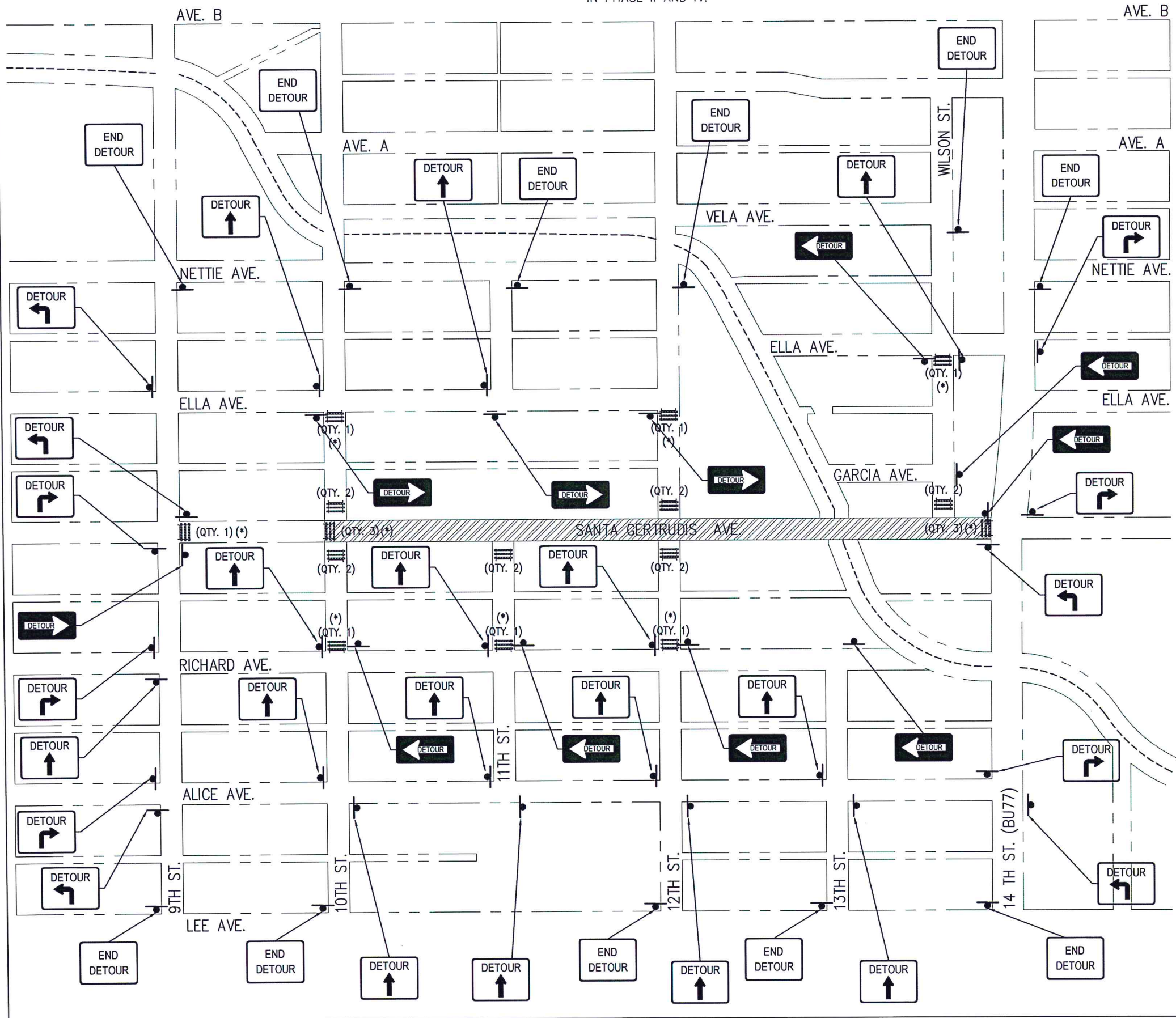
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DATE: 02/14/2017	SCALE: 1" = 300'
DRAWN: S.SANTILLAN	CHECKED BY:
PROJECT: 17-17	
SHEET NO: 14	

TRAFFIC CONTROL - DETOUR PLAN PHASE II

NOTE: THIS SAME BARRICADE SET-UP IS TO BE USED
IN PHASE II AND IV.

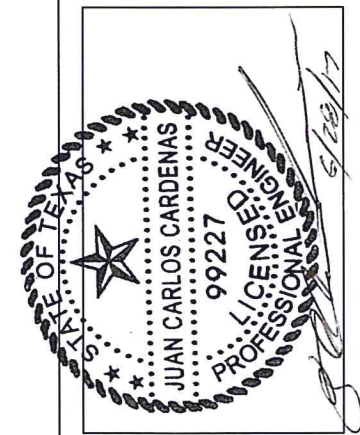


LEGEND

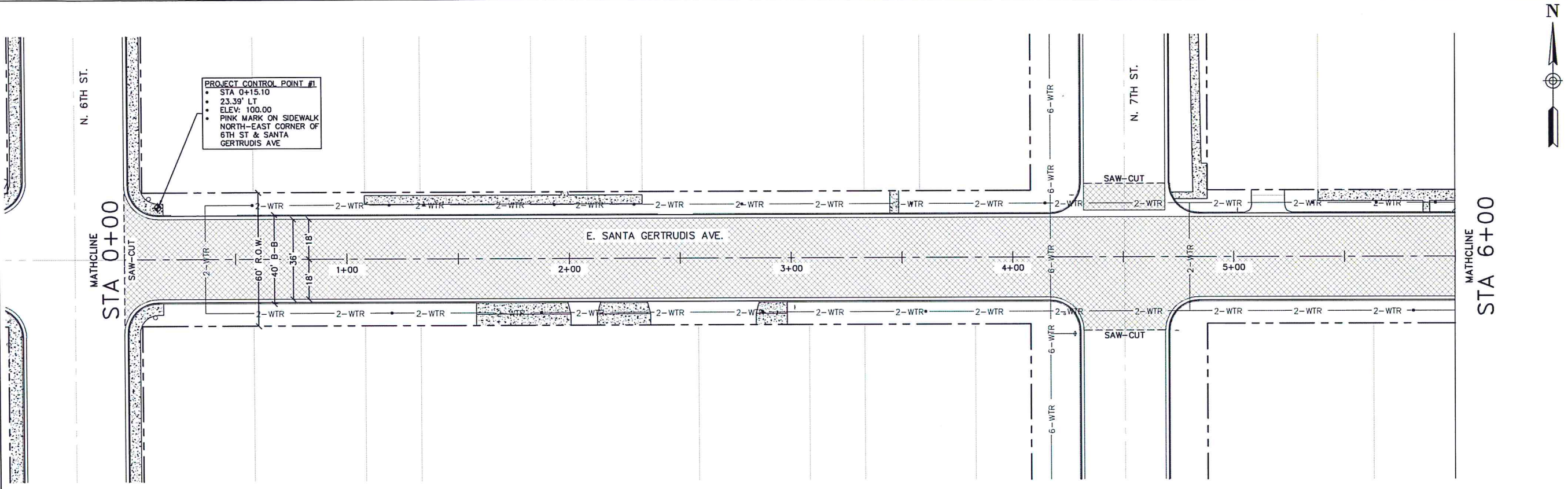
SYMBOL	DESCRIPTION	QTY.
	CONSTRUCTION LIMITS	STA. 18+29.50 TO STA. 36+93.88
	M4-10	0
	M4-10R	4
	M4-10L	7
	M4-9s	15
	M4-9TL	5
	M4-9TR	6
	M4-8a	11
	TY III BARRICADE	24
	R11-5(16)*	8

TRAFFIC CONTROL PLAN
 PHASE II
 2017 SANTA GERTRUDIS AVENUE
 STREET IMPROVEMENTS

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DATE:	02/14/2017	SCALE:	1" = 300'
DRAWN:	S.SANTILLAN	CHECKED BY:	
PROJECT #	17-17		
SHEET NO.:	15		

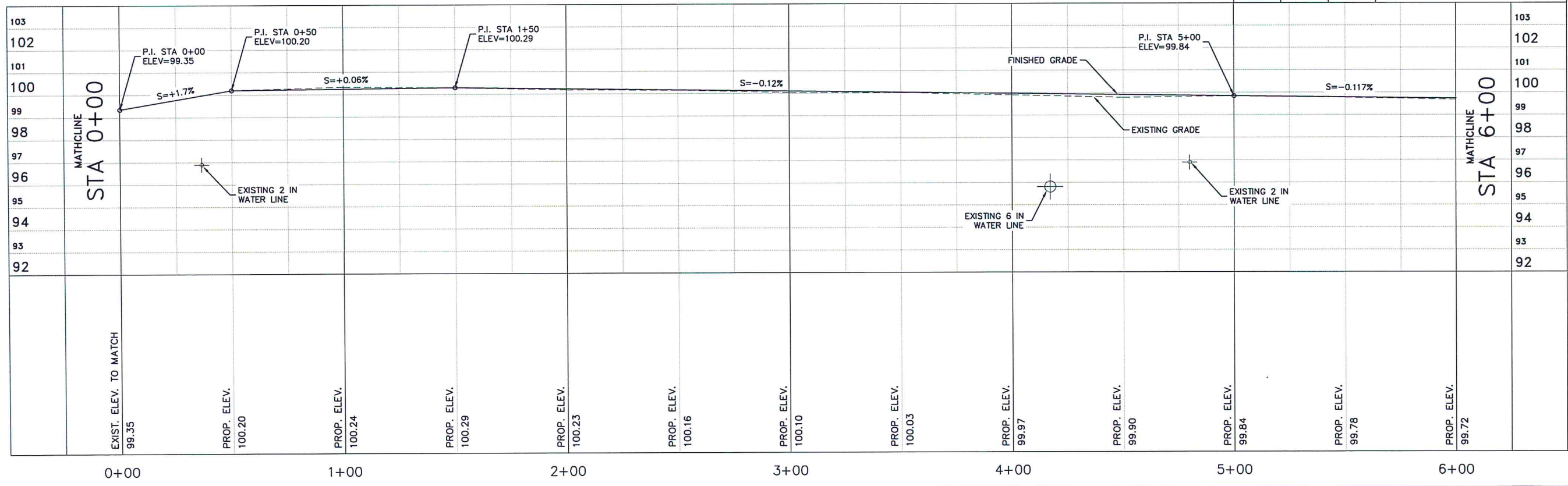


CAUTION !!!
UNDERGROUND UTILITIES

EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION SUPPLIED BY VARIOUS OWNERS OF THE FACILITIES. CITY OF KINGSVILLE DOES NOT ACCEPT THE RESPONSIBILITY CONSTRUCTION, TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING FACILITIES. THE CONTRACTOR SHALL PRESERVE FOR THE UTILITY LOCATIONS SHOWN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION. ANY DAMAGE BY THE CONTRACTOR TO EXISTING UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OR HER EXPENSE. CONTACT ALL POSSIBLE UTILITY AND UNDERGROUND FACILITY OWNERS. CALL 1-800-DIG-TESS AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION IN VICINITY.

FOR CONTRACTOR'S INFORMATION ONLY

SHEET TOTALS			
EST.	FINAL	UNIT	DESCRIPTION
2533		SY	LIME TREAT SUBGRADE (3% LIME, 6")
2533		SY	GEO-GRID BASE REINFORCEMENT
1098		TON	8" LIMESTONE FLEX BASE (TY A, GR 1)
380		GAL	PRIME COAT (MC-30)
633		GAL	BINDING MATERIAL (AC-5)
28		TON	#4 GRADE GRAVEL
279		TON	2" HMAC PAVEMENT (TY D)



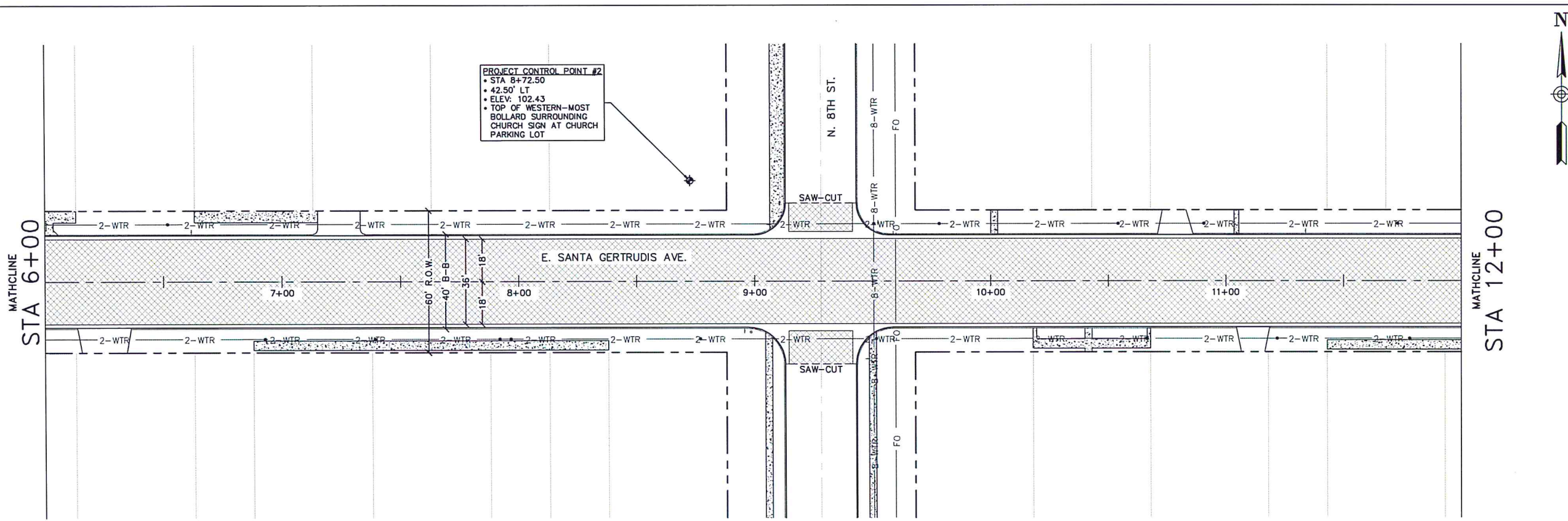
STA 0+00 TO STA 6+00
PLAN & PROFILE

2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

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DATE: 02/14/2017	SCALE: 1" = 50'
DRAWN: S.SANTILLAN	CHECKED BY:
PROJECT # 17-17	
SHEET NO. 16	

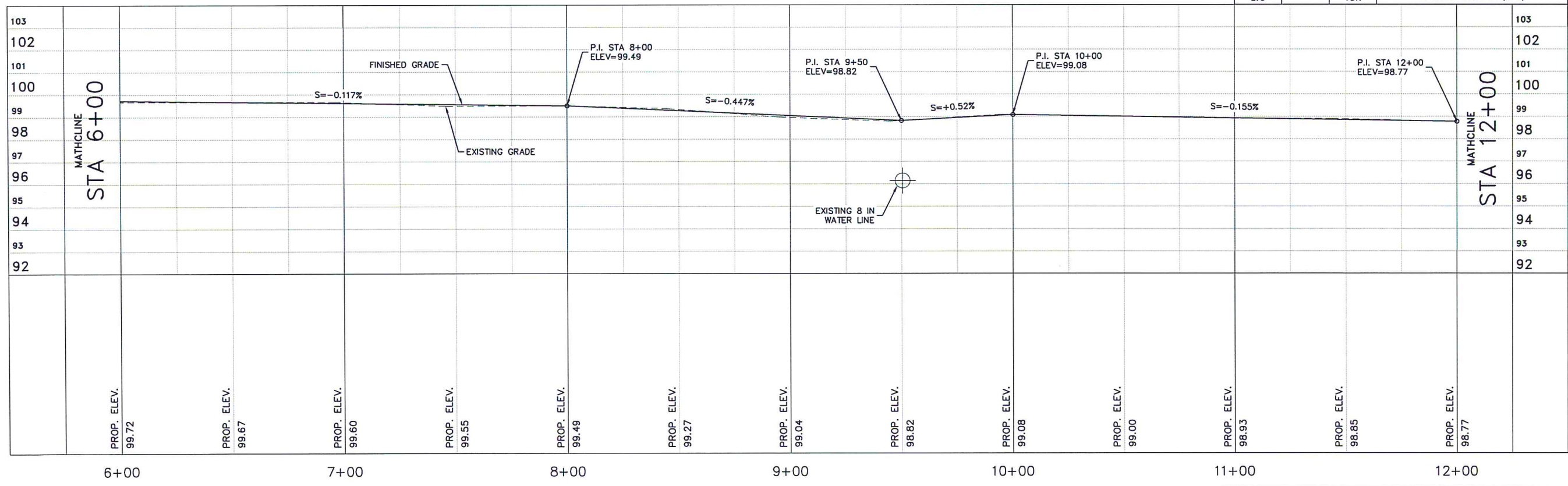


CAUTION !!!
UNDERGROUND UTILITIES

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FOR CONTRACTOR'S INFORMATION ONLY

SHEET TOTALS			
EST.	FINAL	UNIT	DESCRIPTION
2478		SY	LIME TREAT SUBGRADE (3% LIME, 6")
2478		SY	GEO-GRID BASE REINFORCEMENT
1074		TON	8" LIMESTONE FLEX BASE (TY A, GR 1)
372		GAL	PRIME COAT (MC-30)
620		GAL	BINDING MATERIAL (AC-5)
27		TON	#4 GRADE GRAVEL
273		TON	2" HMAC PAVEMENT (TY D)



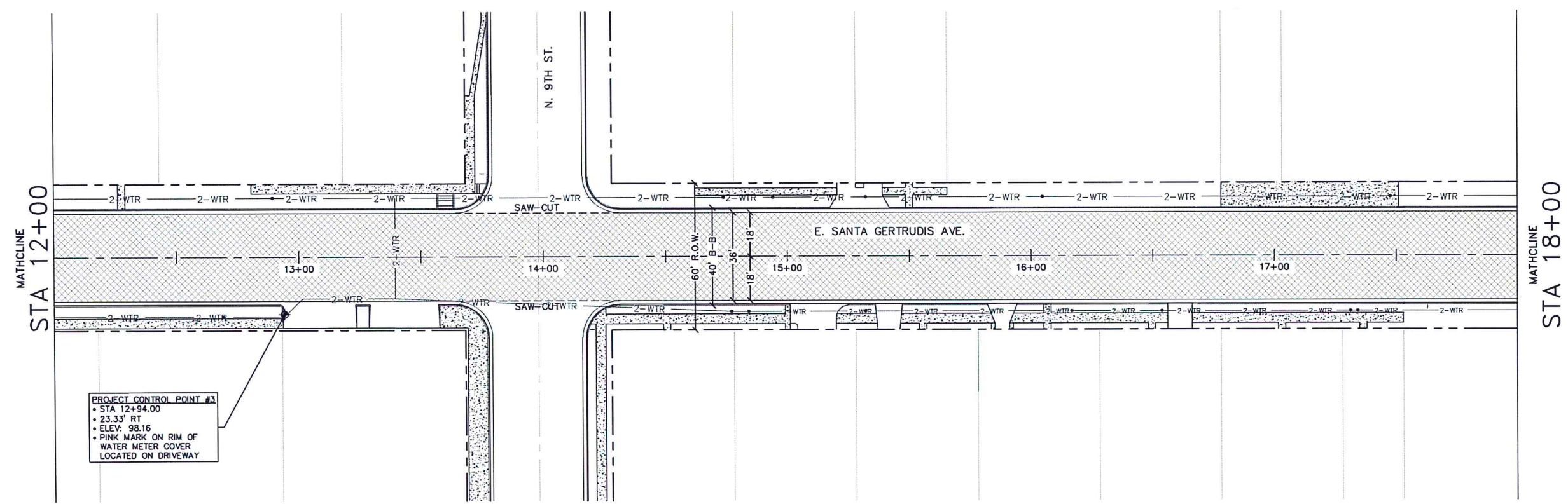
STA 6+00 TO STA 12+00
PLAN & PROFILE

2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

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DATE: 02/14/2017	SCALE: 1" = 50'
DRAWN: S.SANTILLAN	CHECKED BY:
PROJECT: 17-17	
SHEET NO: 17	



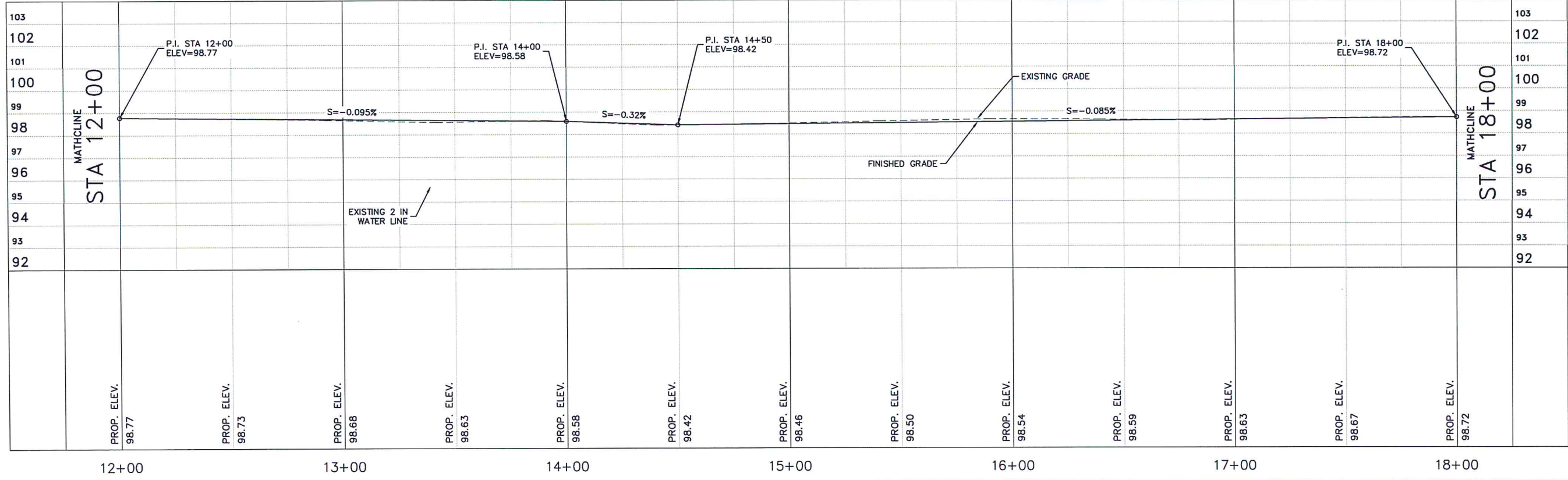
PROJECT CONTROL POINT #3
 • STA 12+94.00
 • 23.33' RT
 • ELEV: 98.16
 • PINK MARK ON RIM OF WATER METER COVER LOCATED ON DRIVEWAY

CAUTION !!!
UNDERGROUND UTILITIES

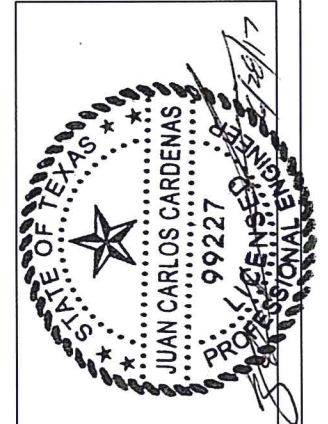
EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION SUPPLIED BY VARIOUS OWNERS OF THE FACILITIES. CITY OF KINGSVILLE DOES NOT ACCEPT THE RESPONSIBILITY CONSTRUCTION, TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING FACILITIES. THE CONTRACTOR SHALL PRESERVE FOR THE UTILITY LOCATIONS SHOWN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION. ANY DAMAGE BY THE CONTRACTOR TO EXISTING UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OR HER EXPENSE. CONTACT ALL POSSIBLE UTILITY AND UNDERGROUND FACILITY OWNERS.
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FOR CONTRACTOR'S INFORMATION ONLY

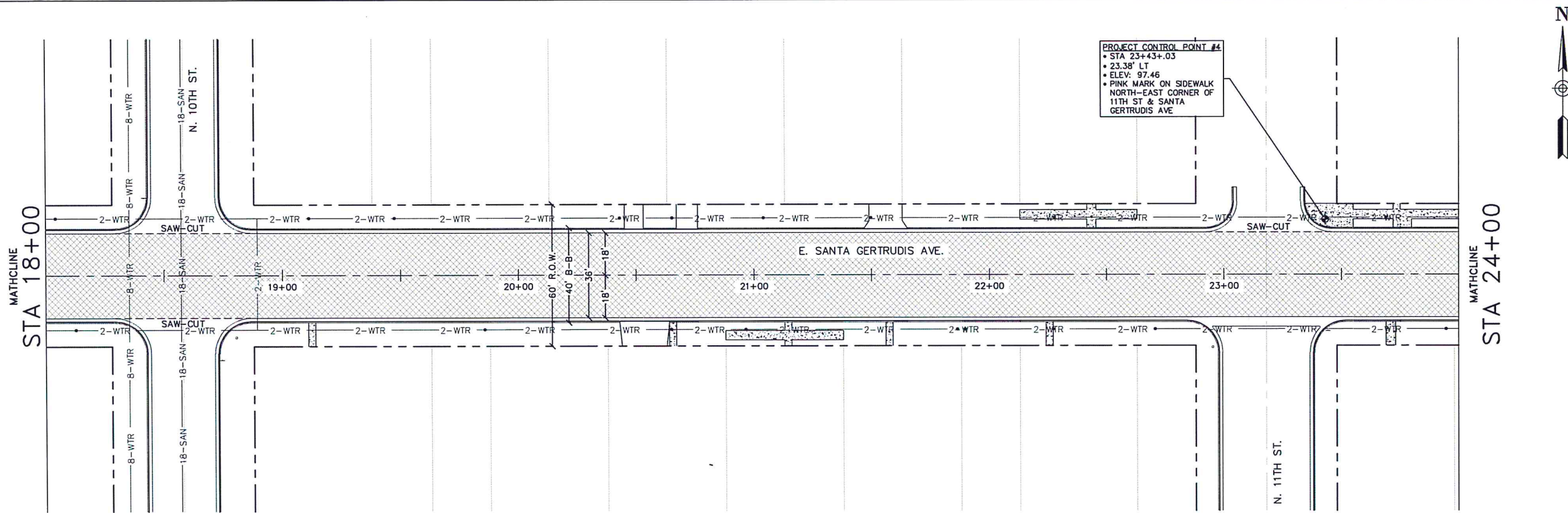
SHEET TOTALS			
EST.	FINAL	UNIT	DESCRIPTION
2400		SY	LIME TREAT SUBGRADE (3% LIME, 6")
2400		SY	GEO-GRID BASE REINFORCEMENT
1040		TON	8" LIMESTONE FLEX BASE (TY A, GR 1)
360		GAL	PRIME COAT (MC-30)
600		GAL	BINDING MATERIAL (AC-5)
26		TON	#4 GRADE GRAVEL
264		TON	2" HMAC PAVEMENT (TY D)



No.	DATE	REVISION
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DATE: 02/14/2017 SCALE: 1" = 50'
 DRAWN: S.SANTILLAN CHECKED BY:
 PROJECT: 17-17
 SHEET NO.: 18

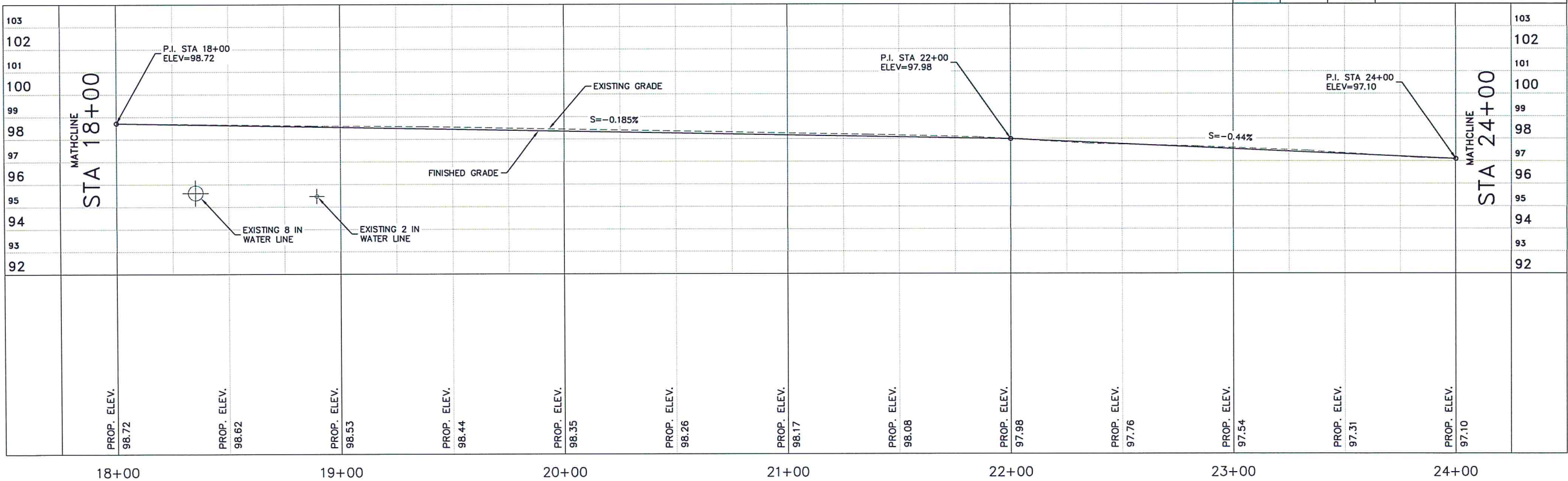


CAUTION !!!
UNDERGROUND UTILITIES

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 CALL 1-800-DIG-TESS AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION IN VICINITY.

FOR CONTRACTOR'S INFORMATION ONLY

SHEET TOTALS			
EST.	FINAL	UNIT	DESCRIPTION
2400		SY	LIME TREAT SUBGRADE (3% LIME, 6")
2400		SY	GEO-GRID BASE REINFORCEMENT
1040		TON	8" LIMESTONE FLEX BASE (TY A, GR 1)
360		GAL	PRIME COAT (MC-30)
600		GAL	BINDING MATERIAL (AC-5)
26		TON	#4 GRADE GRAVEL
264		TON	2" HMAC PAVEMENT (TY D)



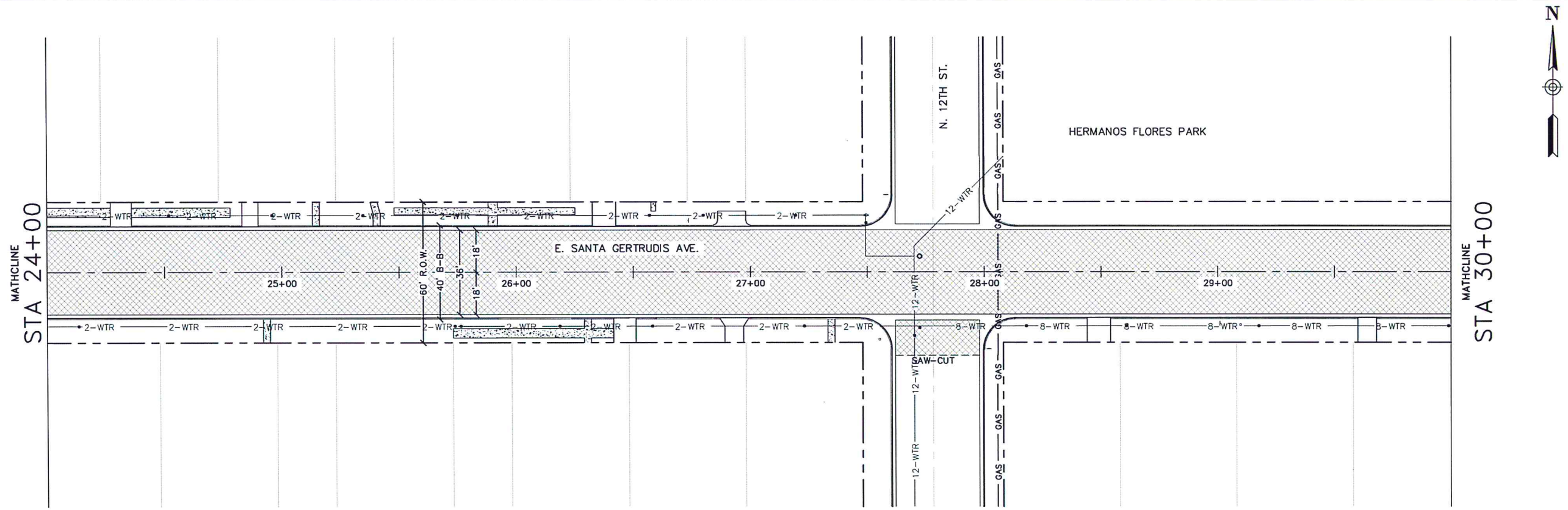
STA 18+00 TO STA 24+00
 PLAN & PROFILE

2017 SANTA GERTRUDIS AVENUE
 STREET IMPROVEMENTS

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DATE: 02/14/2017	SCALE: 1" = 50'
DRAWN: S.SANTILLAN	CHECKED BY:
PROJECT # 17-17	
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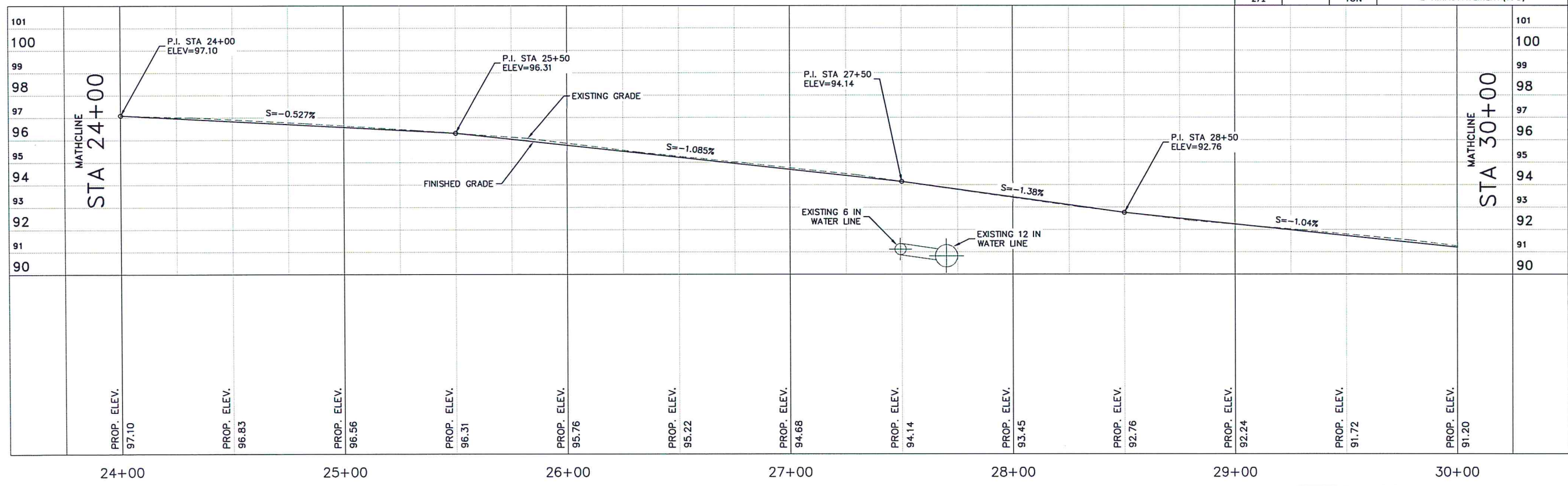


**CAUTION !!!
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FOR CONTRACTOR'S INFORMATION ONLY

SHEET TOTALS			
EST.	FINAL	UNIT	DESCRIPTION
2460		SY	LIME TREAT SUBGRADE (3% LIME, 6")
2460		SY	GEO-GRID BASE REINFORCEMENT
1066		TON	8" LIMESTONE FLEX BASE (TY A, GR 1)
369		GAL	PRIME COAT (MC-30)
615		GAL	BINDING MATERIAL (AC-5)
27		TON	#4 GRADE GRAVEL
271		TON	2" HMAC PAVEMENT (TY D)



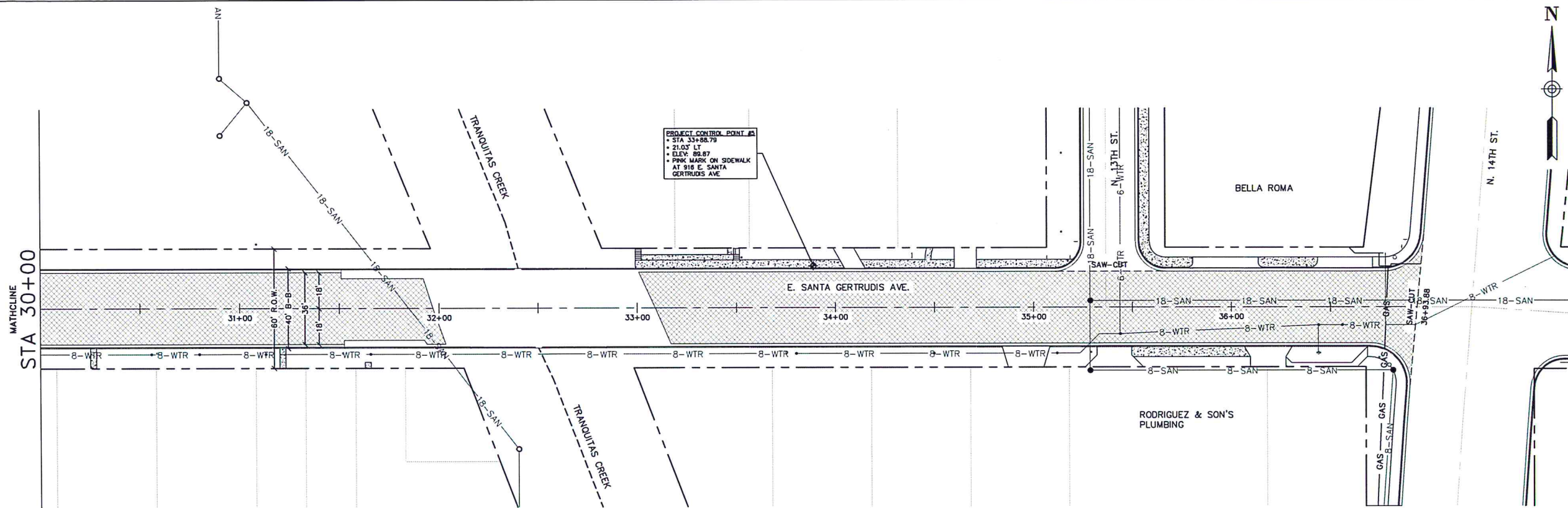
STA 24+00 TO STA 30+00
PLAN & PROFILE

2017 SANTA GERTRUDIS AVENUE
STREET IMPROVEMENTS

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DATE:	02/14/2017	SCALE:	1" = 50'
DRAWN:	S.SANTILLAN	CHECKED BY:	
PROJECT #	17-17		
SHEET NO:	20		



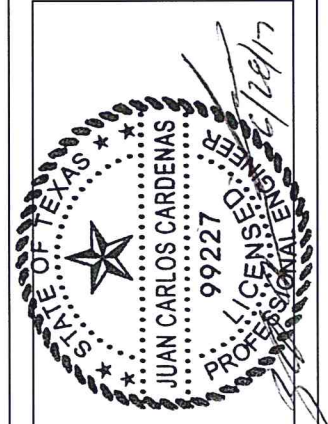
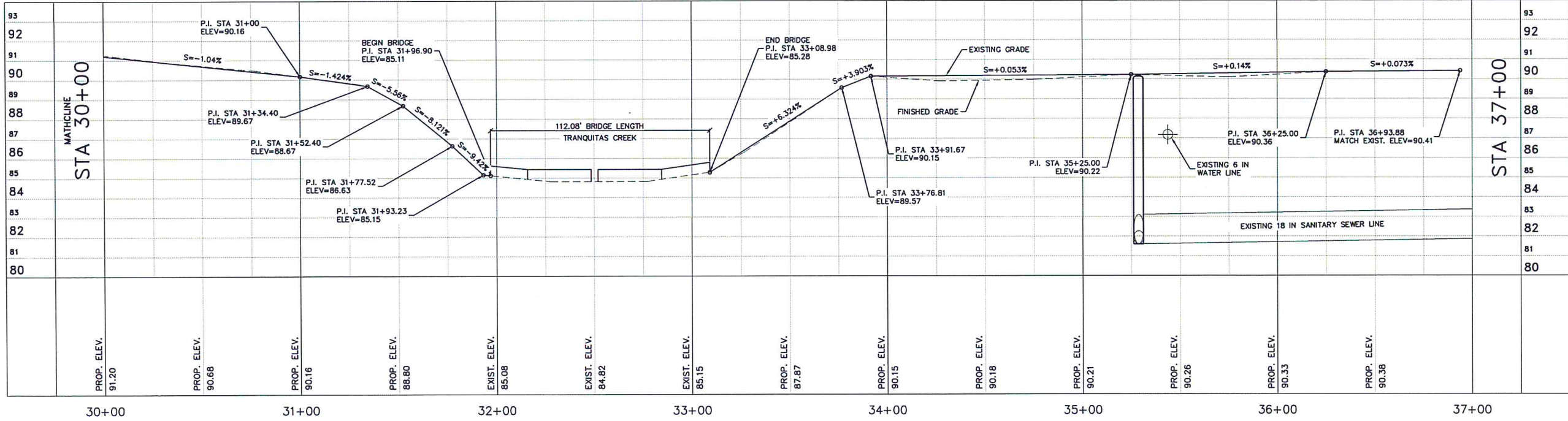
STA 30+00 TO STA 37+00
 PLAN & PROFILE
 2017 SANTA GERTRUDIS AVENUE
 STREET IMPROVEMENTS

**CAUTION !!!
 UNDERGROUND UTILITIES**

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FOR CONTRACTOR'S INFORMATION ONLY

SHEET TOTALS			
EST.	FINAL	UNIT	DESCRIPTION
2325		SY	LIME TREAT SUBGRADE (3% LIME, 6")
2325		SY	GEO-GRID BASE REINFORCEMENT
1008		TON	8" LIMESTONE FLEX BASE (TY A, GR 1)
349		GAL	PRIME COAT (MC-30)
581		GAL	BINDING MATERIAL (AC-5)
26		TON	#4 GRADE GRAVEL
256		TON	2" HMAC PAVEMENT (TY D)

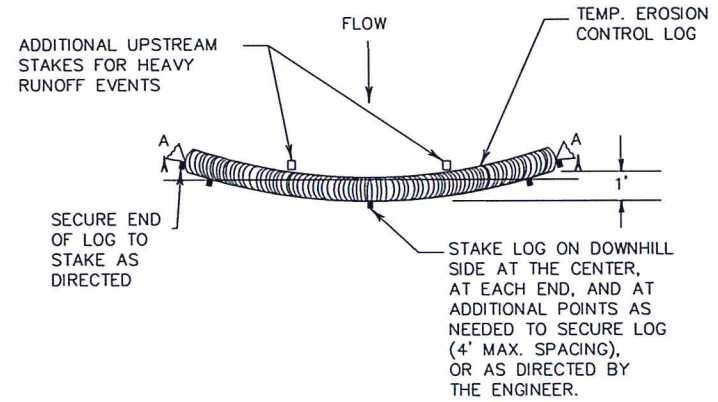


DATE: 02/14/2017 SCALE: 1" = 60'
 DRAWN: S.SANTILLAN CHECKED BY:
 PROJECT: 17-17
 SHEET NO: 21

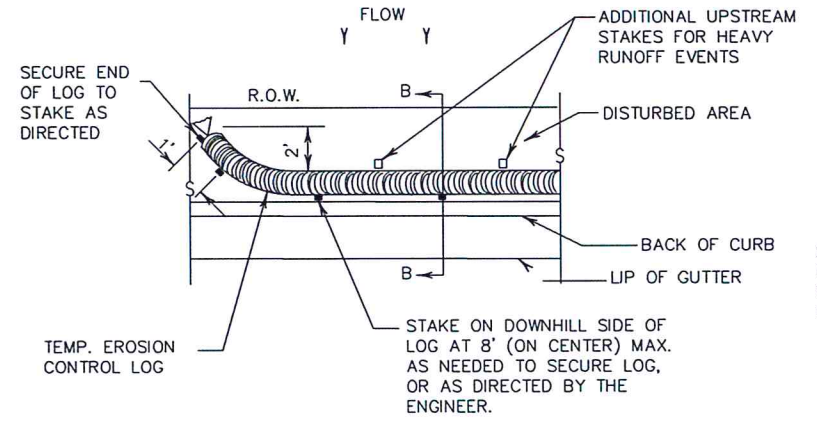
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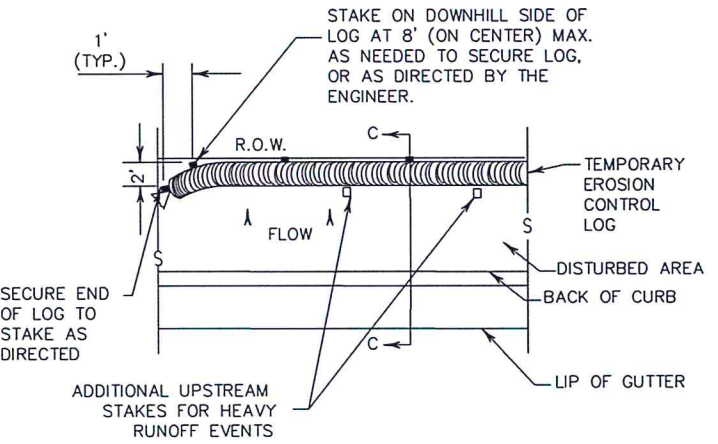
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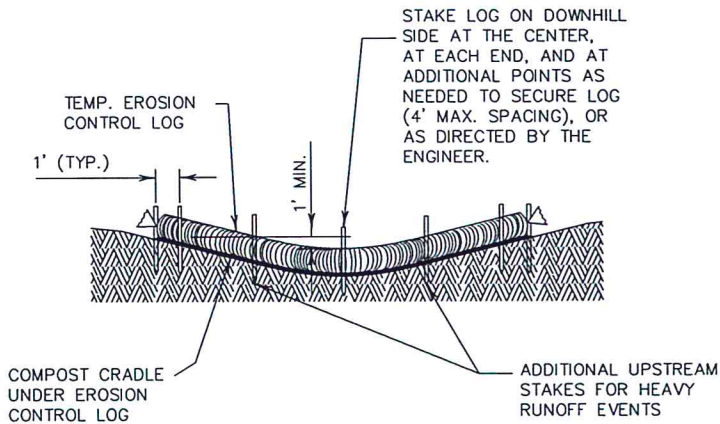
PLAN VIEW



PLAN VIEW



PLAN VIEW

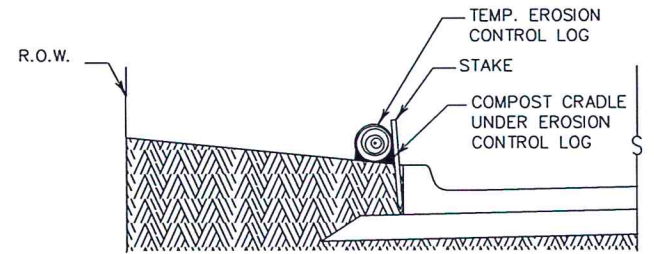


SECTION A-A

EROSION CONTROL LOG DAM

LEGEND

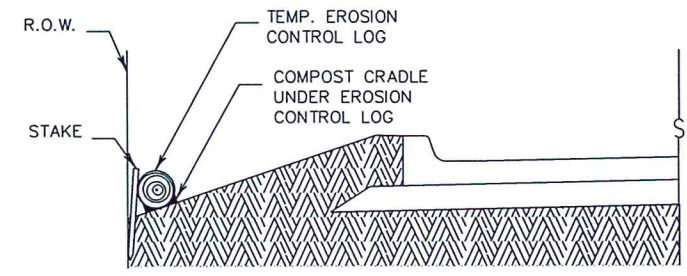
- CL-D EROSION CONTROL LOG DAM
- CL-BOC EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI EROSION CONTROL LOG AT DROP INLET
- CL-CI EROSION CONTROL LOG AT CURB INLET
- CL-GI EROSION CONTROL LOG AT CURB & GRATE INLET



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

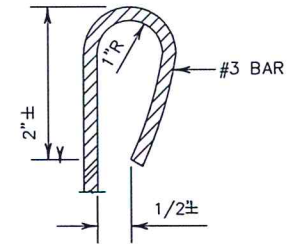
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

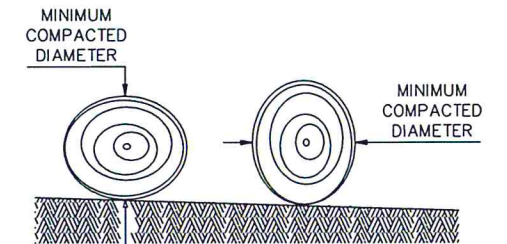
1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



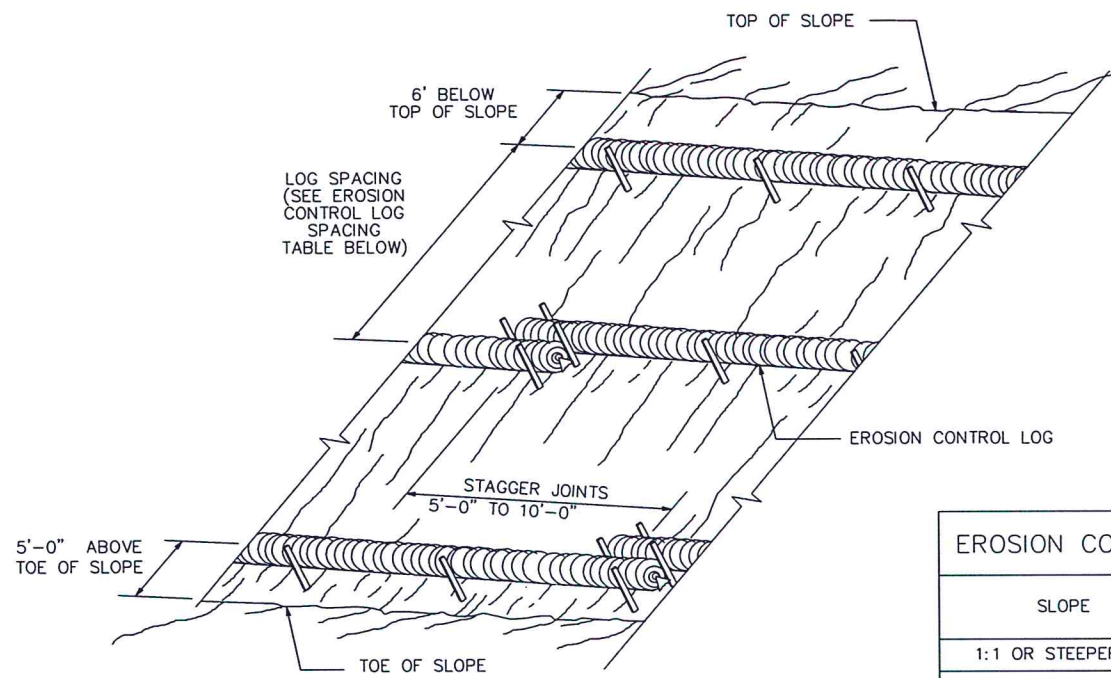
DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

<p>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</p> <p>EROSION CONTROL LOG</p> <p>EC(9)-16</p>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY
		SHEET NO.	
		22	

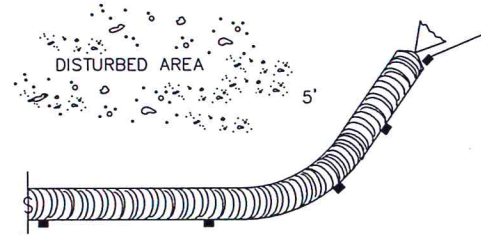
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DATE:
FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

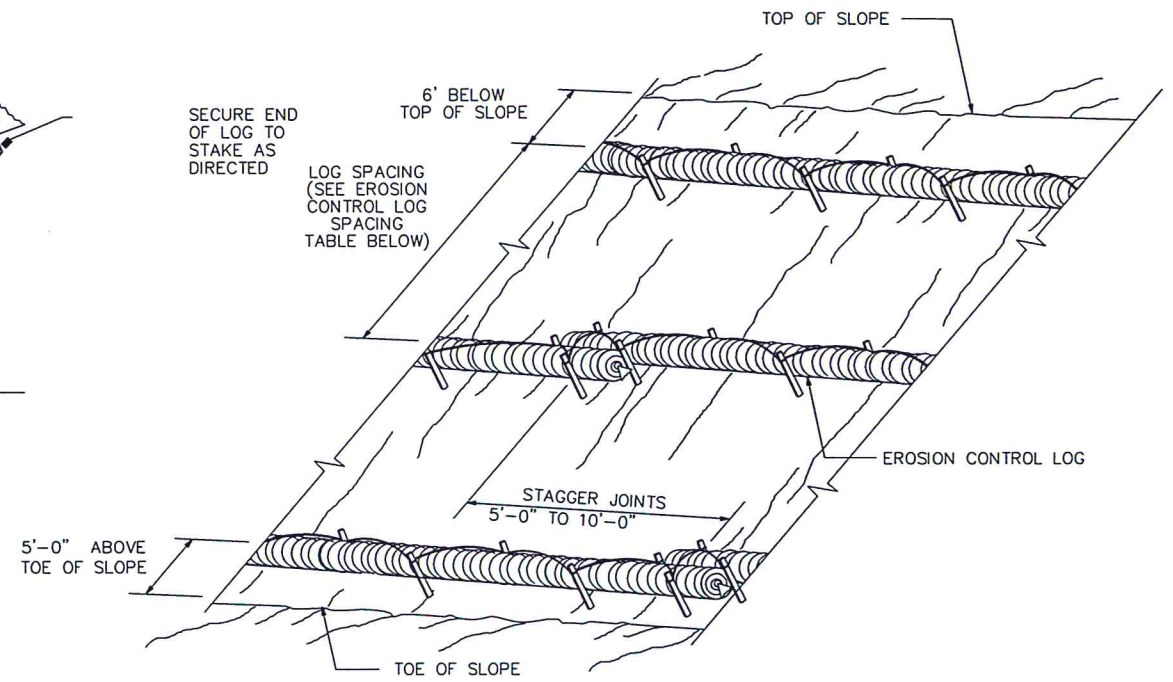
CL-SST



END SECTION RAP DETAIL

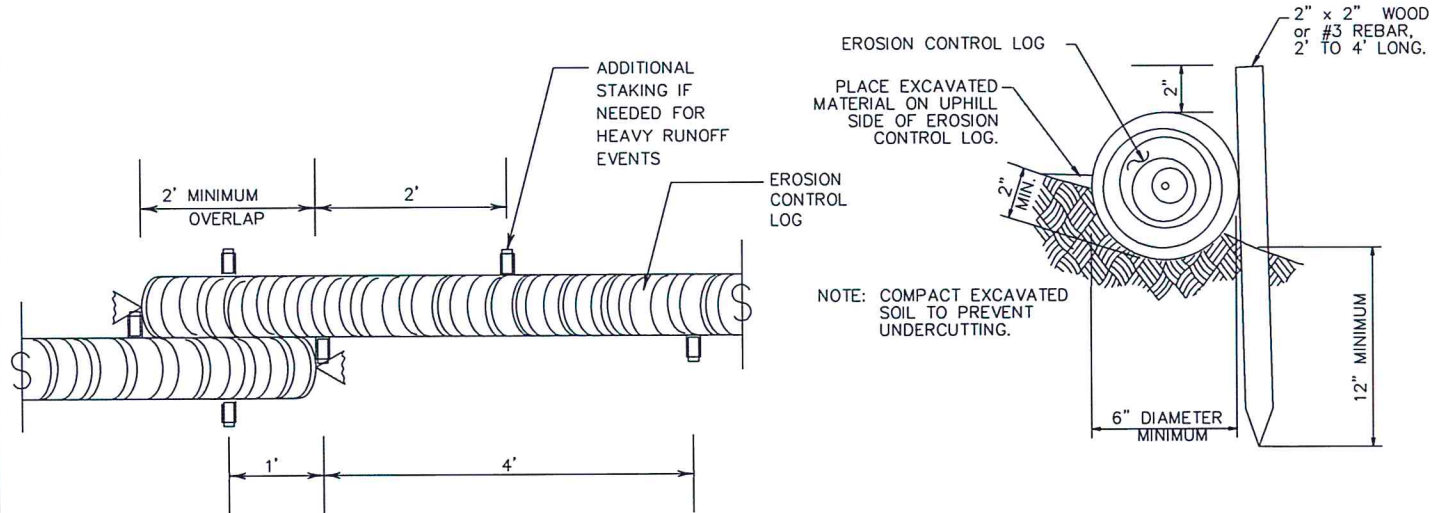
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS—ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS— ADJUST ROWS FARTHER APART



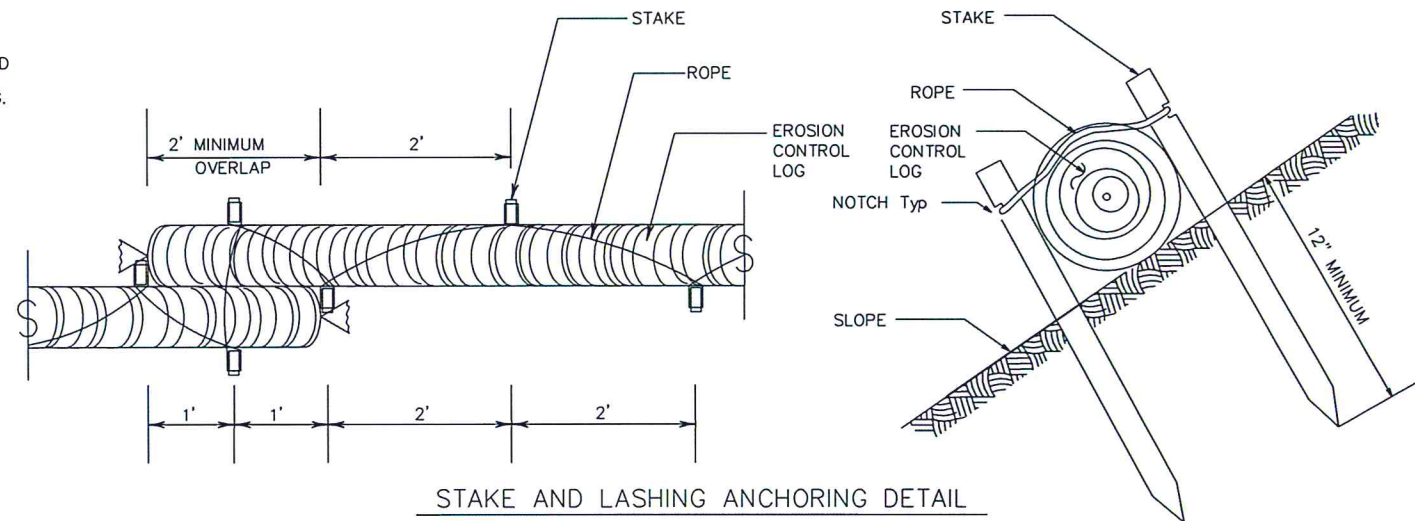
EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

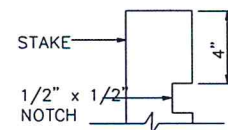
CL-SST



STAKE AND LASHING ANCHORING DETAIL

CL-SSL

LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"



STAKE NOTCH DETAIL

SHEET 2 OF 3

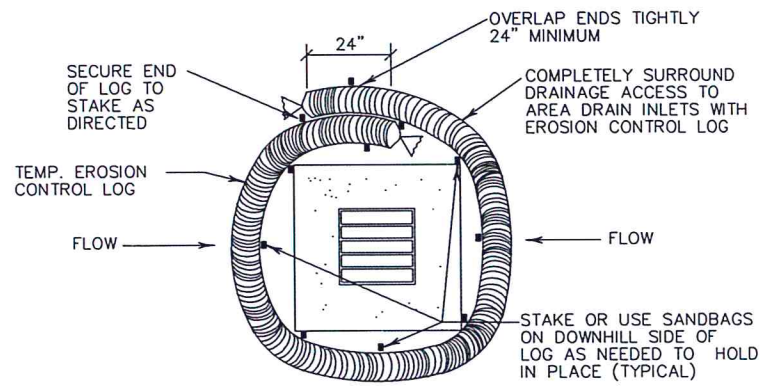


TEMPORARY EROSION,
SEDIMENT AND WATER
POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CL: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY	SHEET NO.	

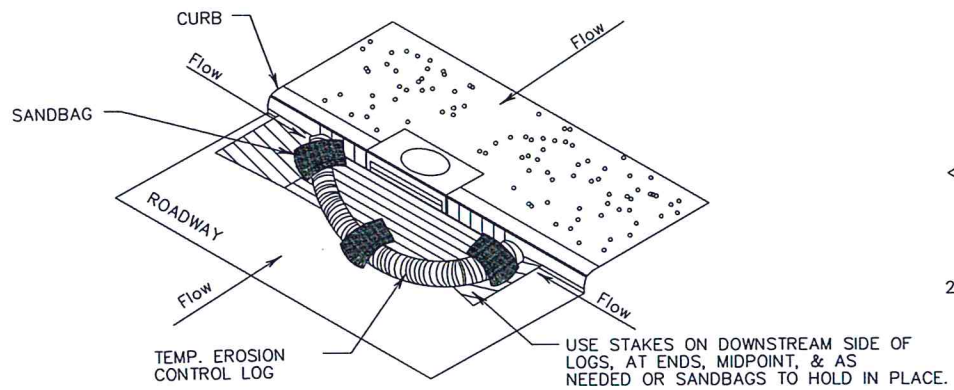
23

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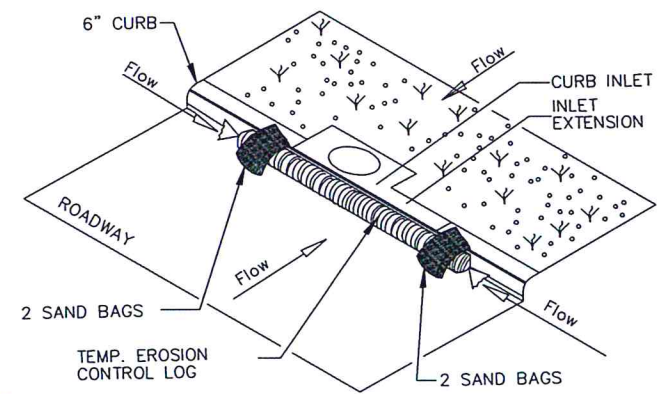
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

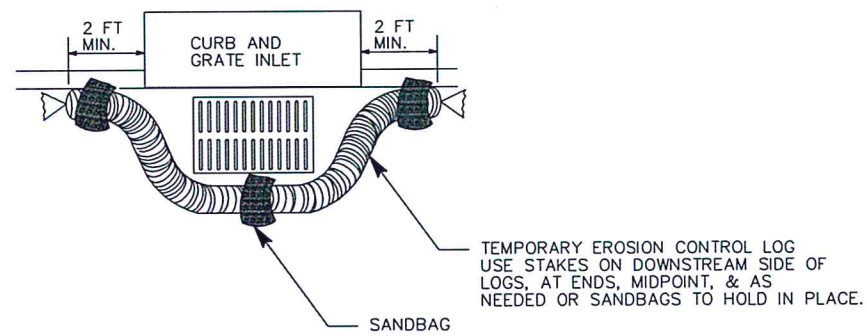
CL-CI



EROSION CONTROL LOG AT CURB INLET

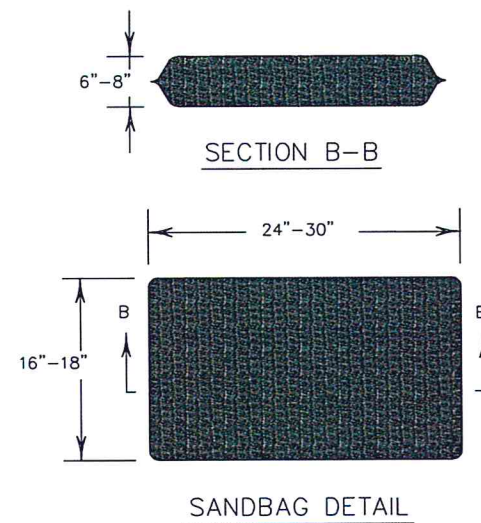
CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

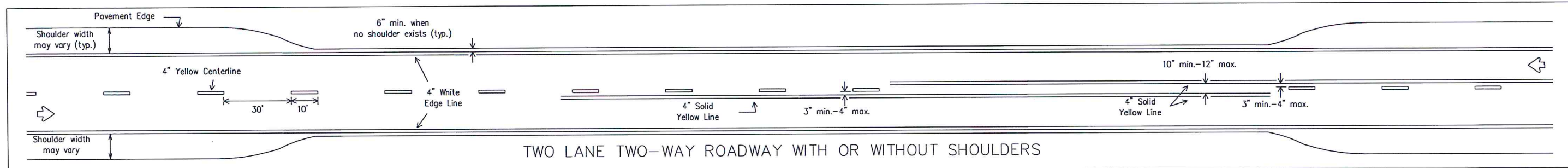


SHEET 3 OF 3

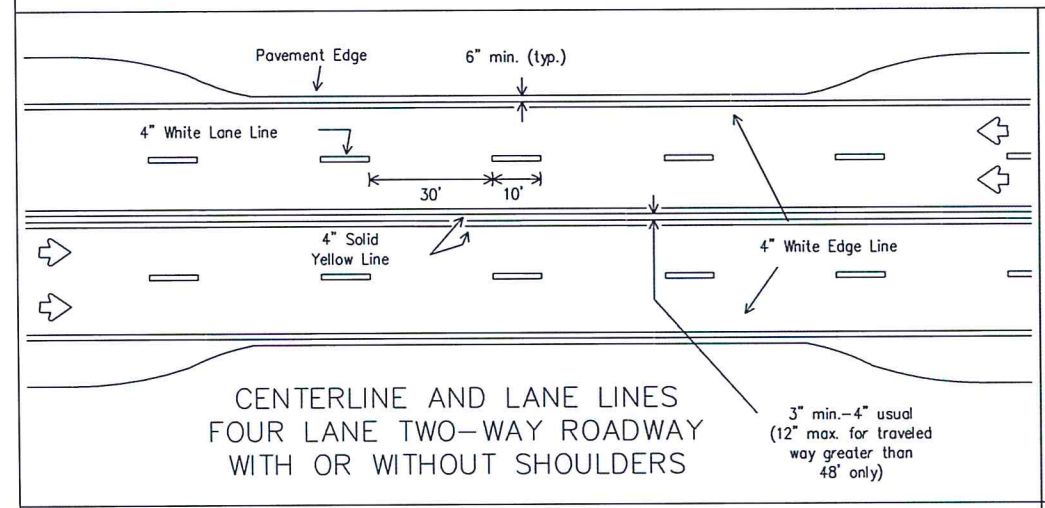
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC(9)-16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS			HIGHWAY
	DIST	COUNTY	SHEET NO.
			24

DATE:
FILE:

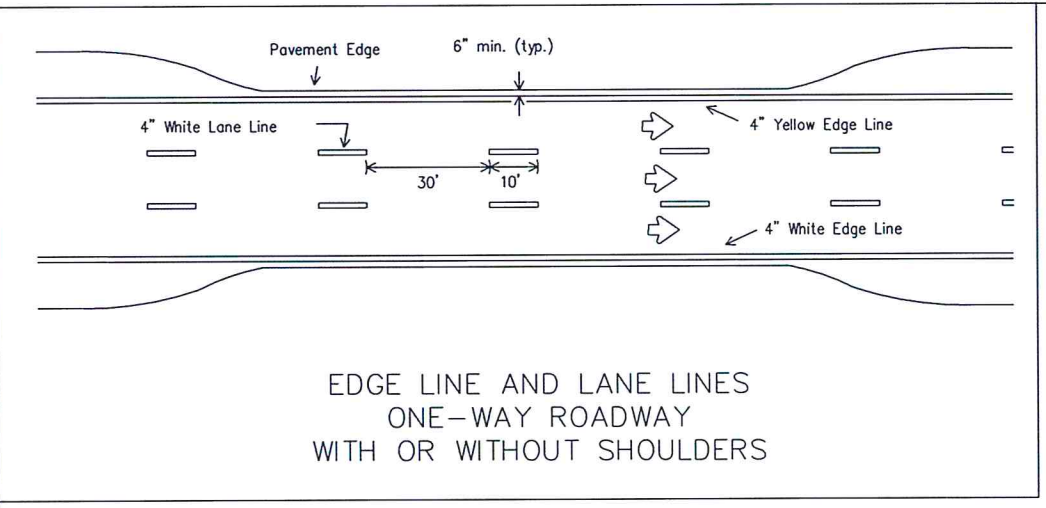
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



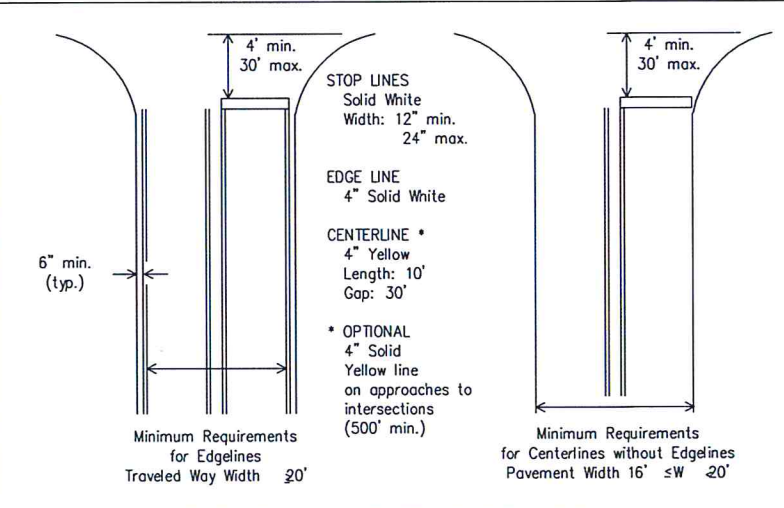
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



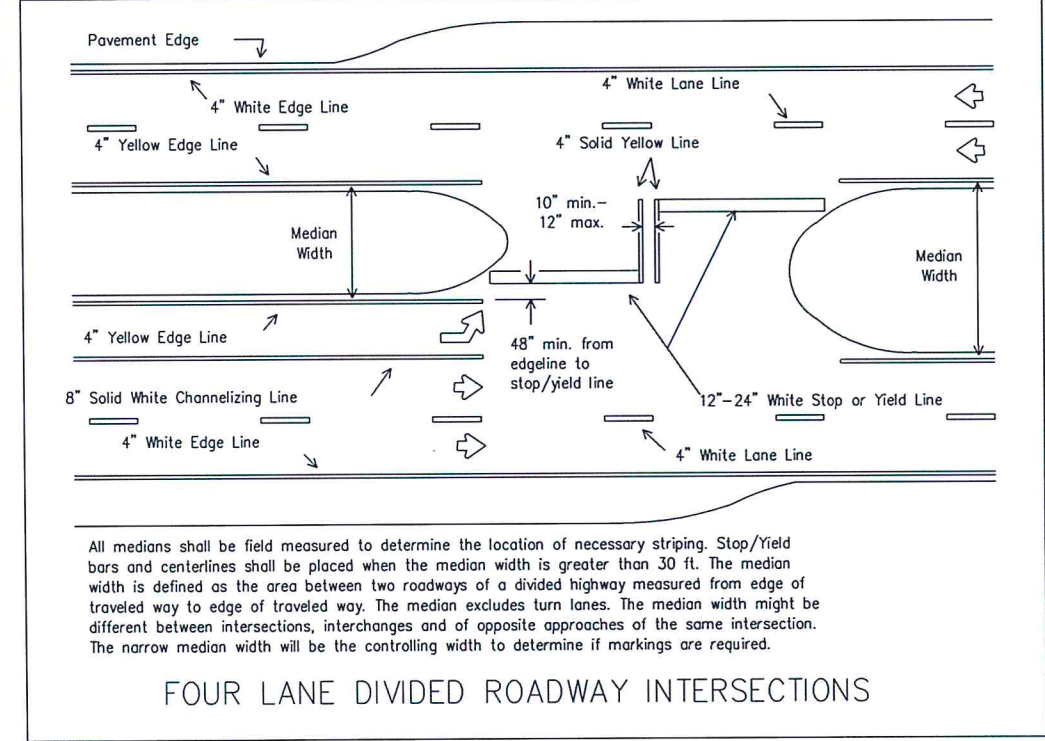
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

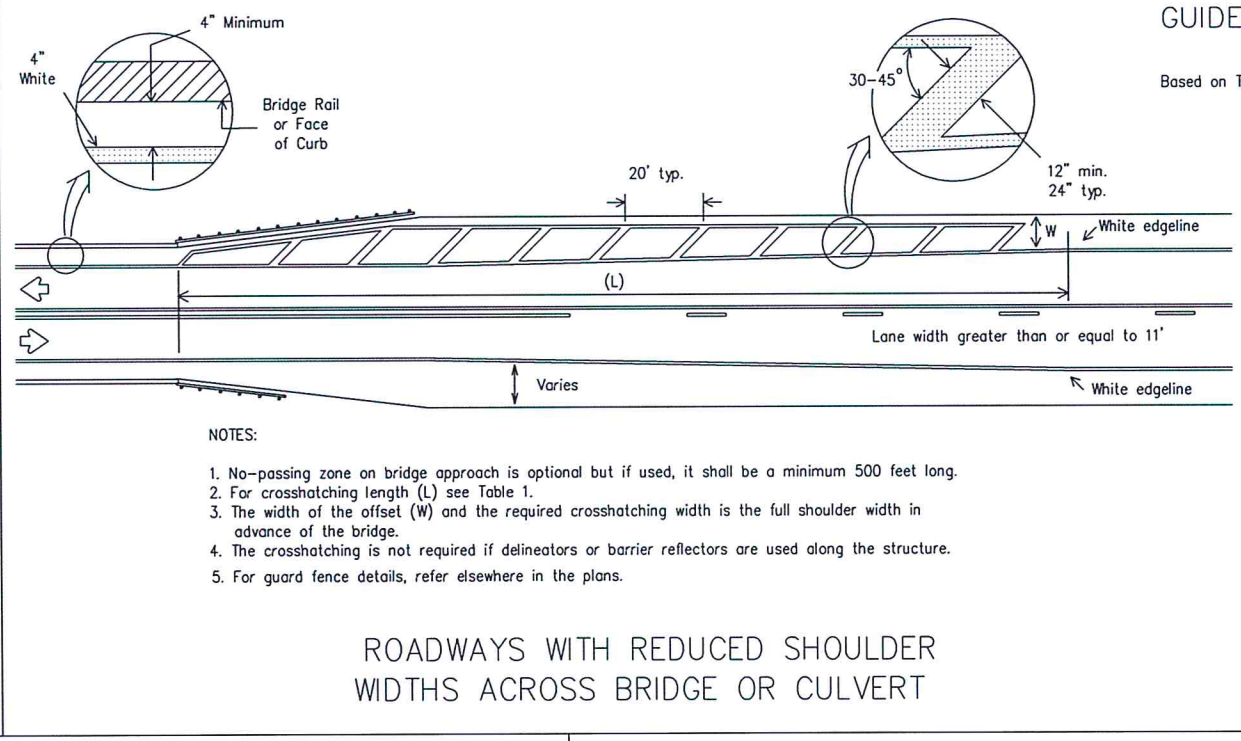


GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths for Undivided Highways



FOUR LANE DIVIDED ROADWAY INTERSECTIONS

All medians shall be field measured to determine the location of necessary striping. Stop/Yield bars and centerlines shall be placed when the median width is greater than 30 ft. The median width is defined as the area between two roadways of a divided highway measured from edge of pavement. This distance may vary due to pavement raveling or other conditions. The median width might be different between intersections, interchanges and of opposite approaches of the same intersection. The narrow median width will be the controlling width to determine if markings are required.



NOTES:

- No-passing zone on bridge approach is optional but if used, it shall be a minimum 500 feet long.
- For crosshatching length (L) see Table 1.
- The width of the offset (W) and the required crosshatching width is the full shoulder width in advance of the bridge.
- The crosshatching is not required if delineators or barrier reflectors are used along the structure.
- For guard fence details, refer elsewhere in the plans.

ROADWAYS WITH REDUCED SHOULDER
WIDTHS ACROSS BRIDGE OR CULVERT

TABLE 1 - TYPICAL LENGTH (L)

Posted Speed *	Formula
≤ 40	$L = \frac{WS^2}{60}$
≥ 45	L=WS

* 85th Percentile Speed may be used on roads where traffic speeds normally exceed the posted speed limit. Crosshatching length should be rounded up to nearest 5 foot increment.
L=Length of Crosshatching (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

EXAMPLES:

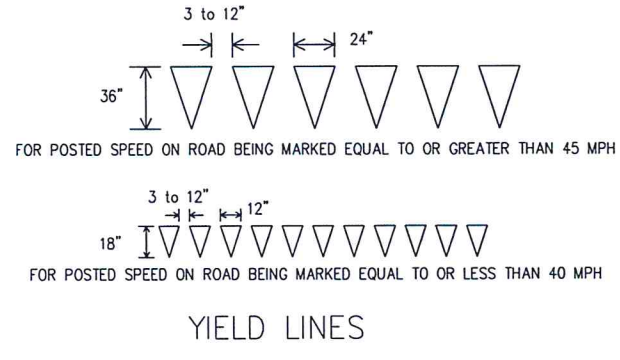
An 8 foot shoulder in advance of a bridge reduces to 4 feet on a 70 MPH roadway. The length of the cross-hatching should be:
 $L = 8 \times 70 = 560$ ft.
A 4 foot shoulder in advance of a bridge reduces to 2 feet on a 40 MPH roadway. The length of the cross-hatching should be:
 $L = 4(40)^2 / 60 = 106.67$ ft. rounded to 110 ft.

GENERAL NOTES

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should typically be placed a minimum of 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.
- The traveled way includes only that portion of the roadway used for vehicular travel and not the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to inside of edgeline of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



YIELD LINES

Texas Department of Transportation
Traffic Operations Division

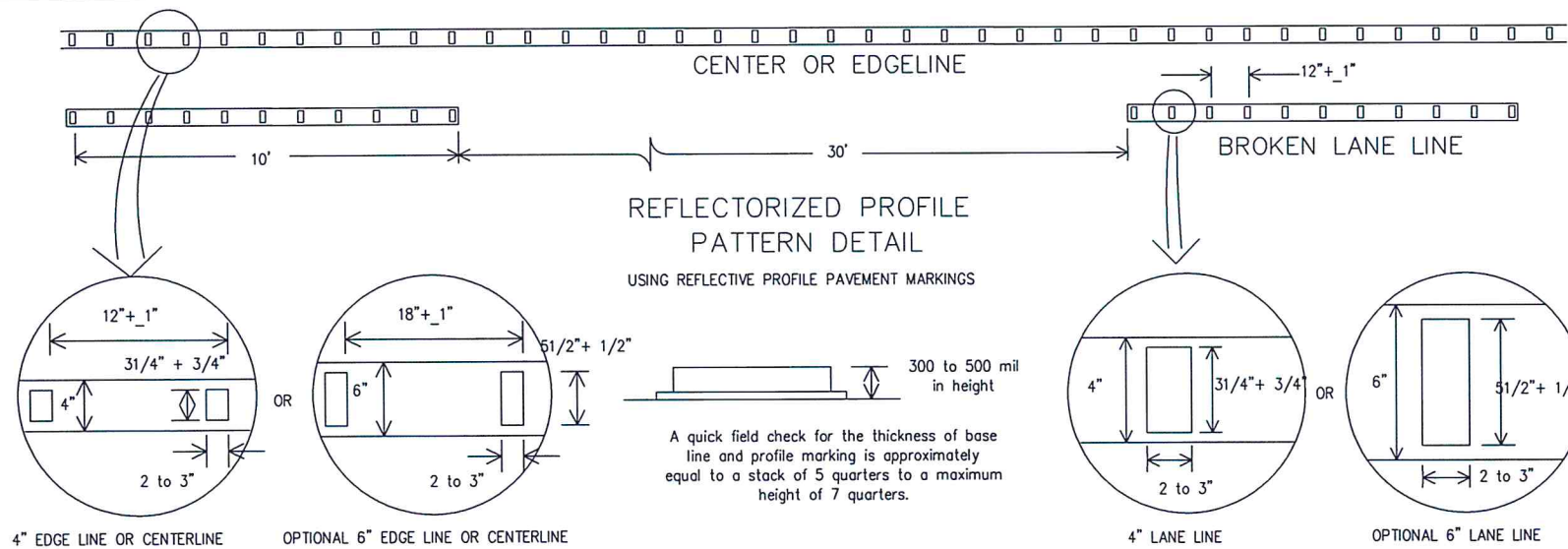
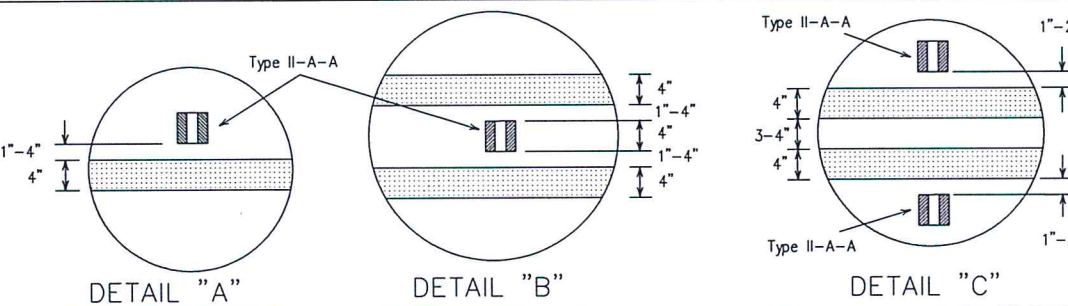
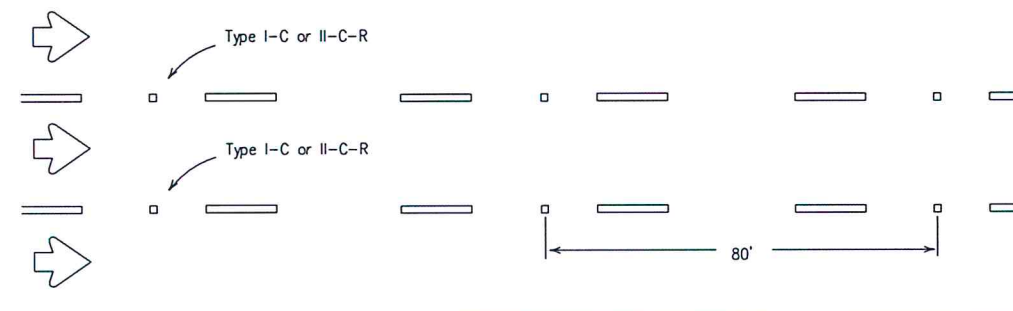
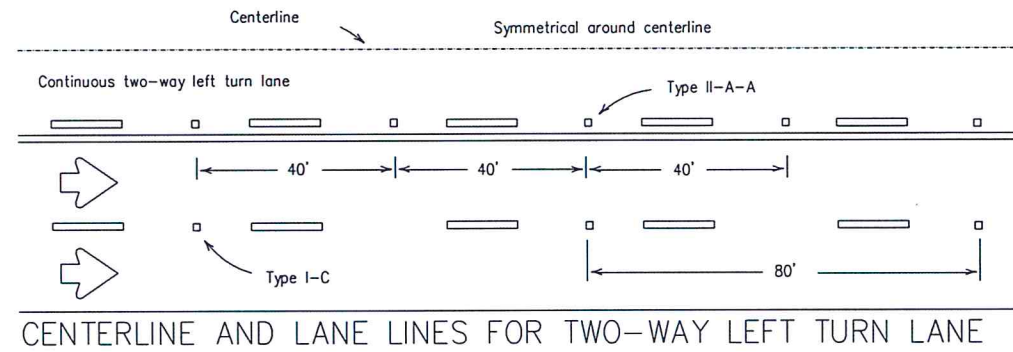
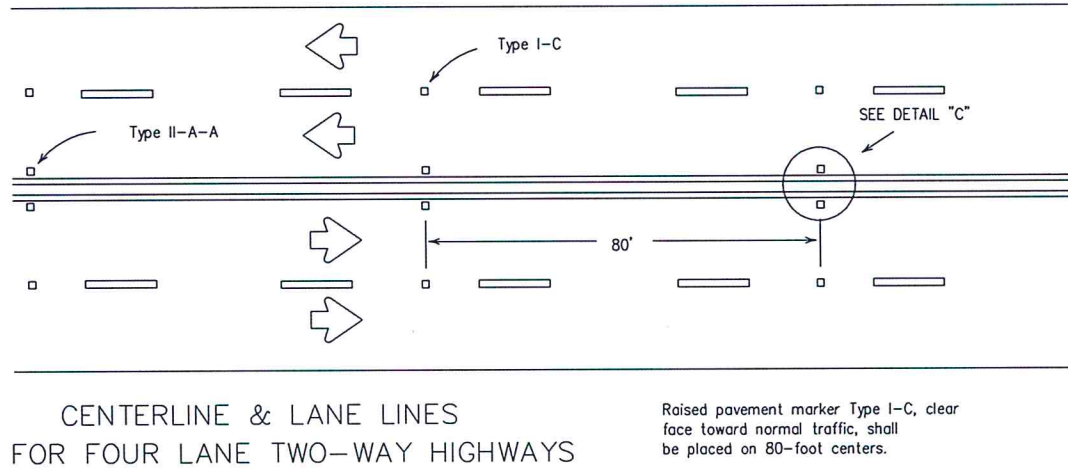
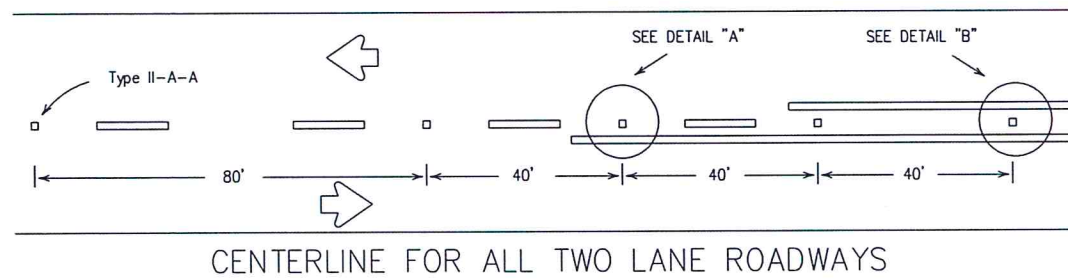
TYPICAL STANDARD
PAVEMENT MARKINGS

PM(1)-12

© TxDOT November 1978	DN: TxDOT	DC: TxDOT	DW: TxDOT	CK: TxDOT
8-95 2-12	CONT	SECT	JOB	HIGHWAY
5-00	DIST	COUNTY	SHEET NO.	
8-00				25
3-03				
22A				

DATE:
FILE:

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

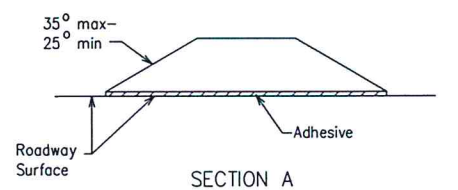
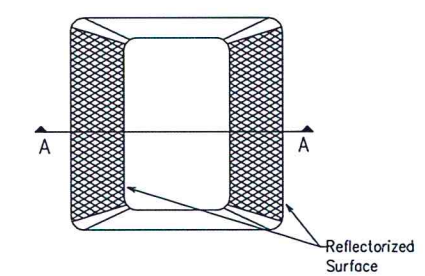
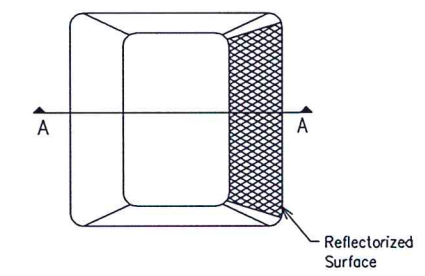


NOTE:
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

- GENERAL NOTES**
- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
 - On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



RAISED PAVEMENT MARKERS

Texas Department of Transportation
Traffic Operations Division

POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS

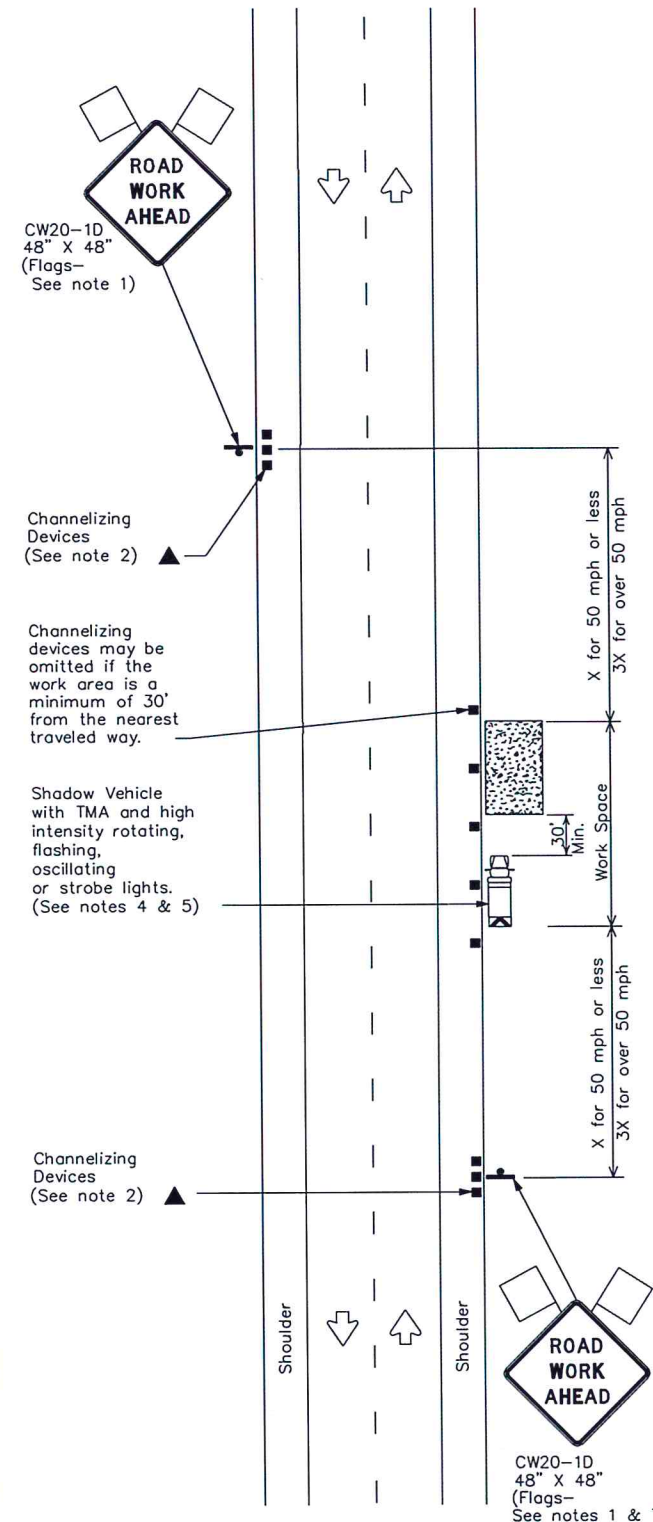
PM(2)-12

© TxDOT April 1977		DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10				
5-00	2-12				
8-00					
2-08					
		DIST	COUNTY	SHEET NO.	
				26	

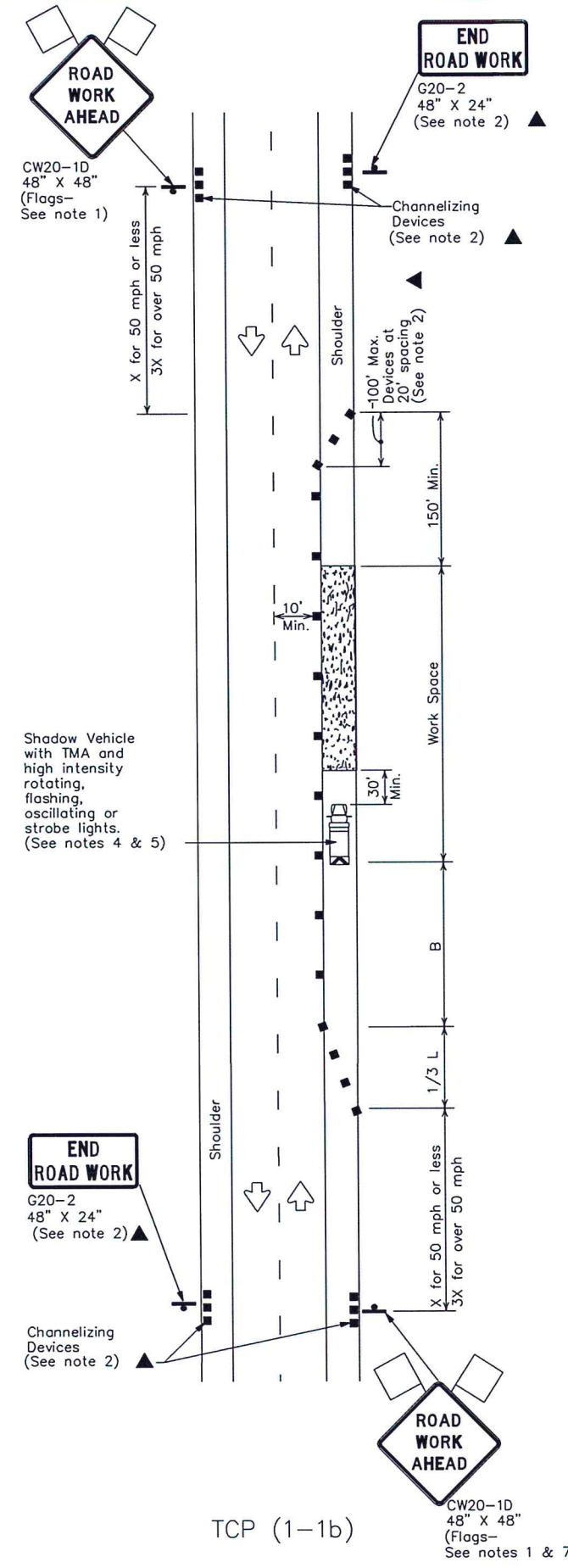
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FILE:

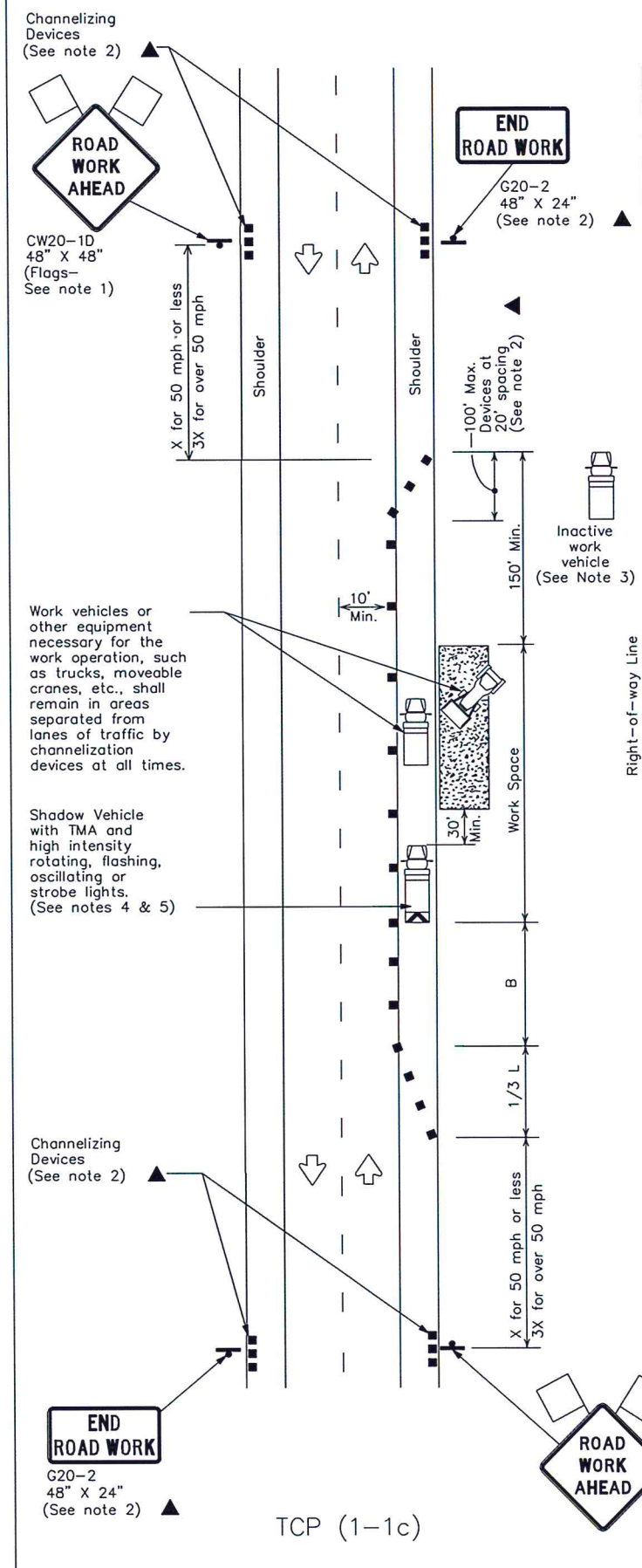
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TCP (1-1a)
WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)
WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)
WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = WS ² / 60	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

- GENERAL NOTES
- Flags attached to signs where shown are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
 - See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
 - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

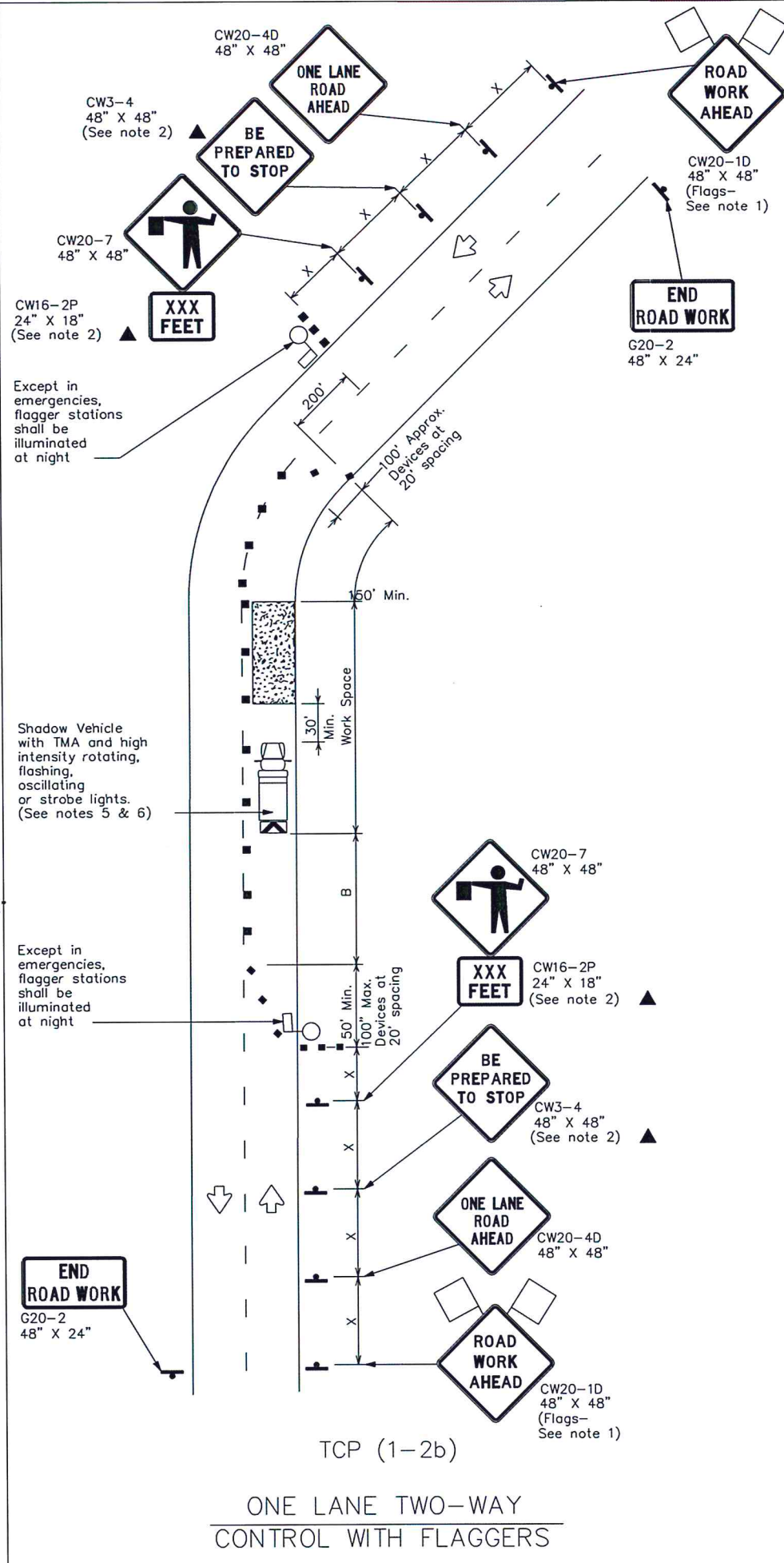
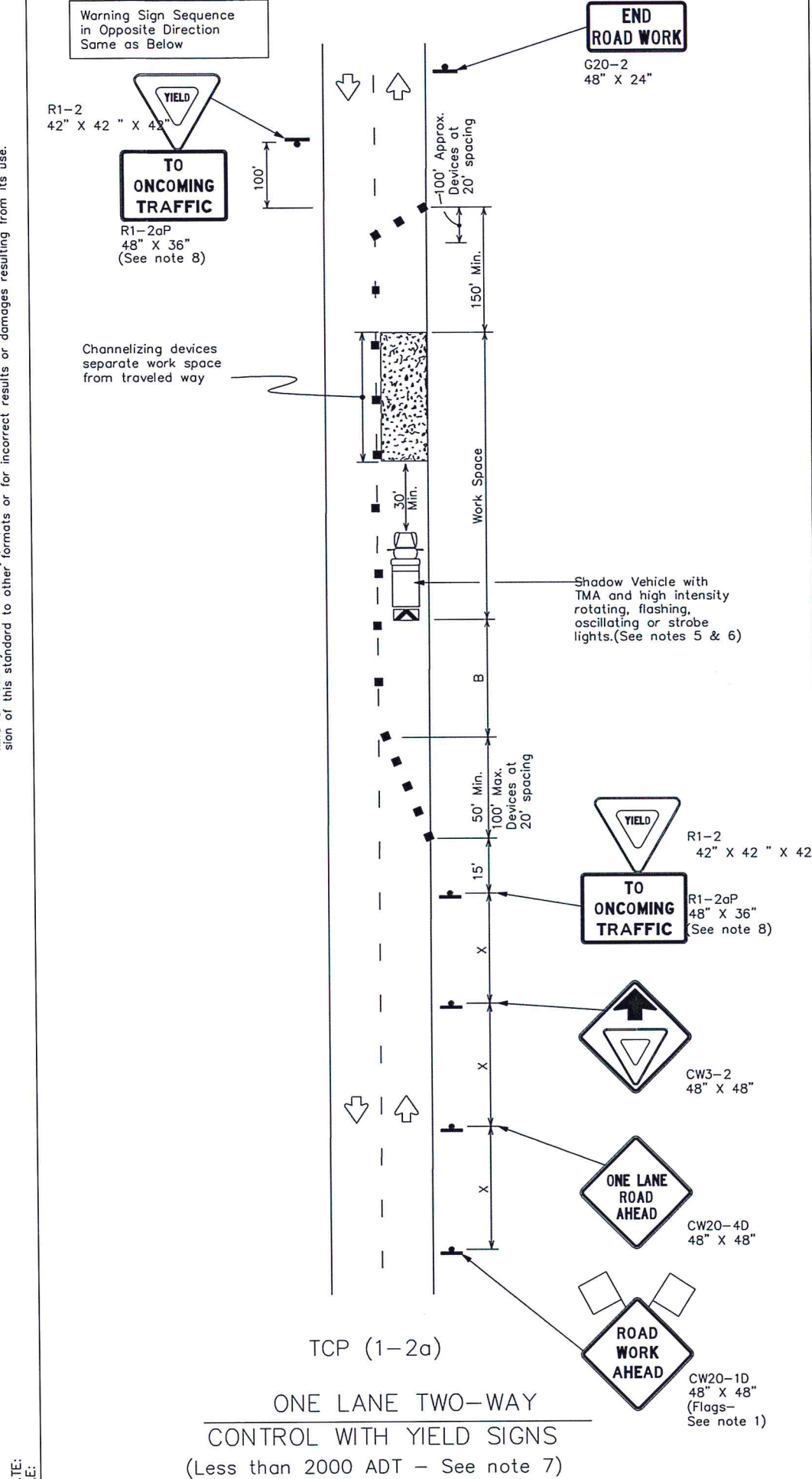
Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

TCP(1-1)-12

©TxDOT December 1985	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
2-94 2-12				
8-95				
1-97				
4-98				
	DIST	COUNTY		SHEET NO.
151				27

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LEGEND

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40	L=WS	265'	295'	320'	40'	80'	240'	155'	305'
45		450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

- GENERAL NOTES**
- Flags attached to signs where shown are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
 - Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

- TCP (1-2a)**
- R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
 - R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.
- TCP (1-2b)**
- Flaggers should use two-way radios or other methods of communication to control traffic.
 - Length of work space should be based on the ability of flaggers to communicate.
 - 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).
 - Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
 - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

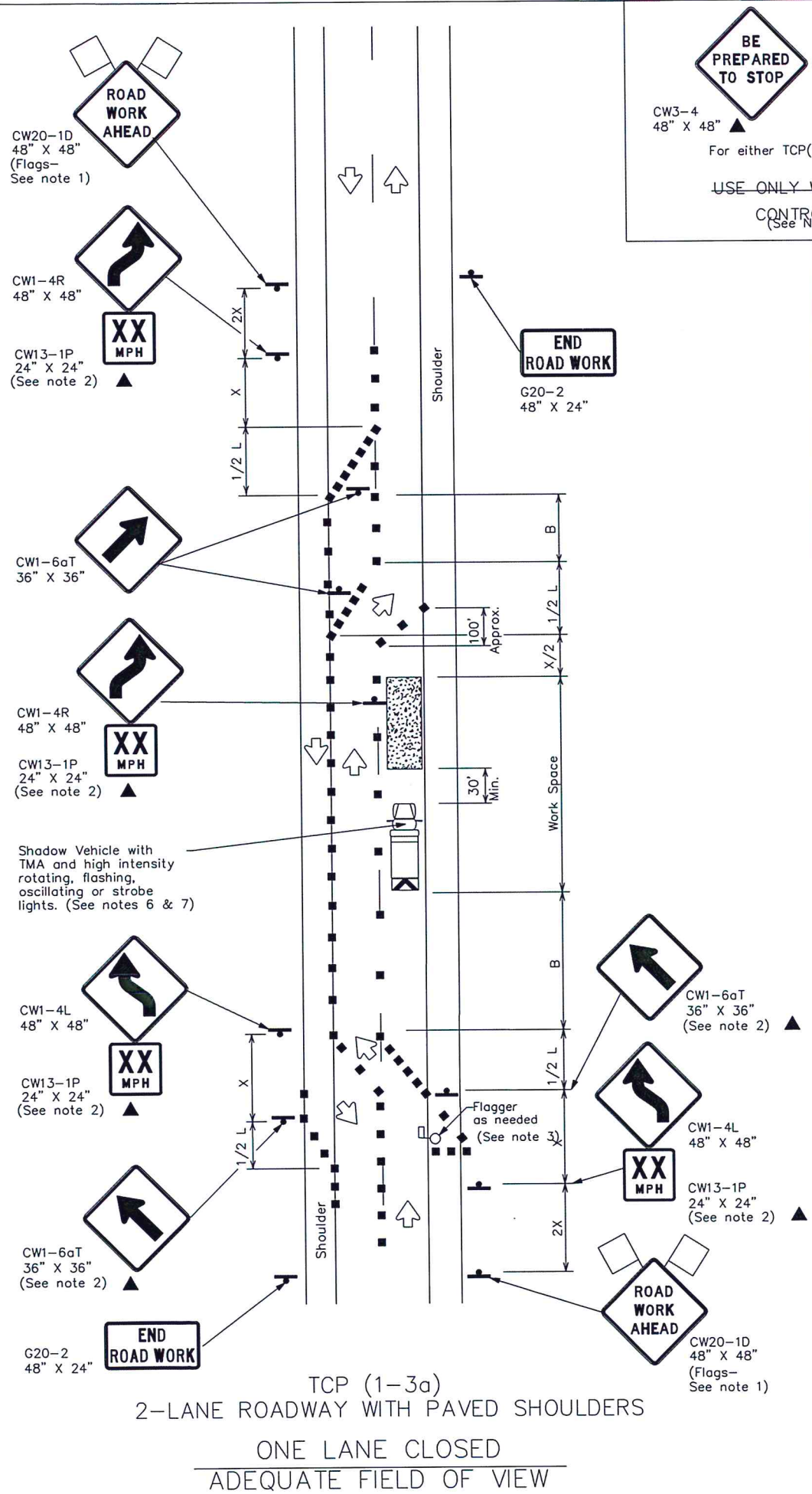
TCP(1-2)-12




©TxDOT December 1985		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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4-98					28

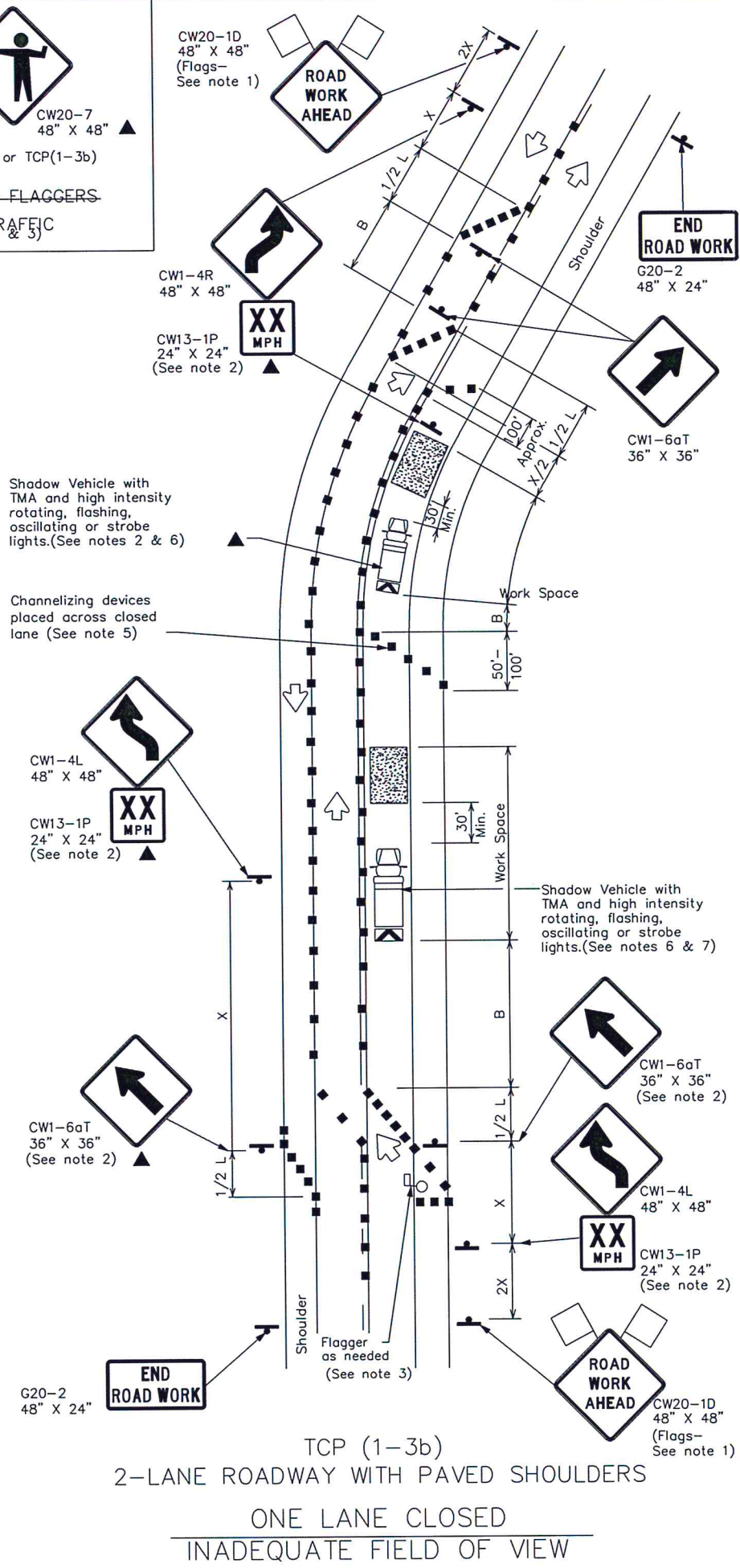
152

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









DATE:
FILE:



BE PREPARED TO STOP 
CW3-4 48" X 48"  CW20-7 48" X 48" 
For either TCP(1-3a) or TCP(1-3b)
USE ONLY WHEN FLAGGERS CONTROL TRAFFIC
(See Notes 2 & 3)



LEGEND

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	$L = WS$	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70	700'	770'	840'	70'	140'	800'	475'	
75	750'	825'	900'	75'	150'	900'	540'	

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

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

- GENERAL NOTES**
- Flags attached to signs where shown are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
 - DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
 - When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
 - Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

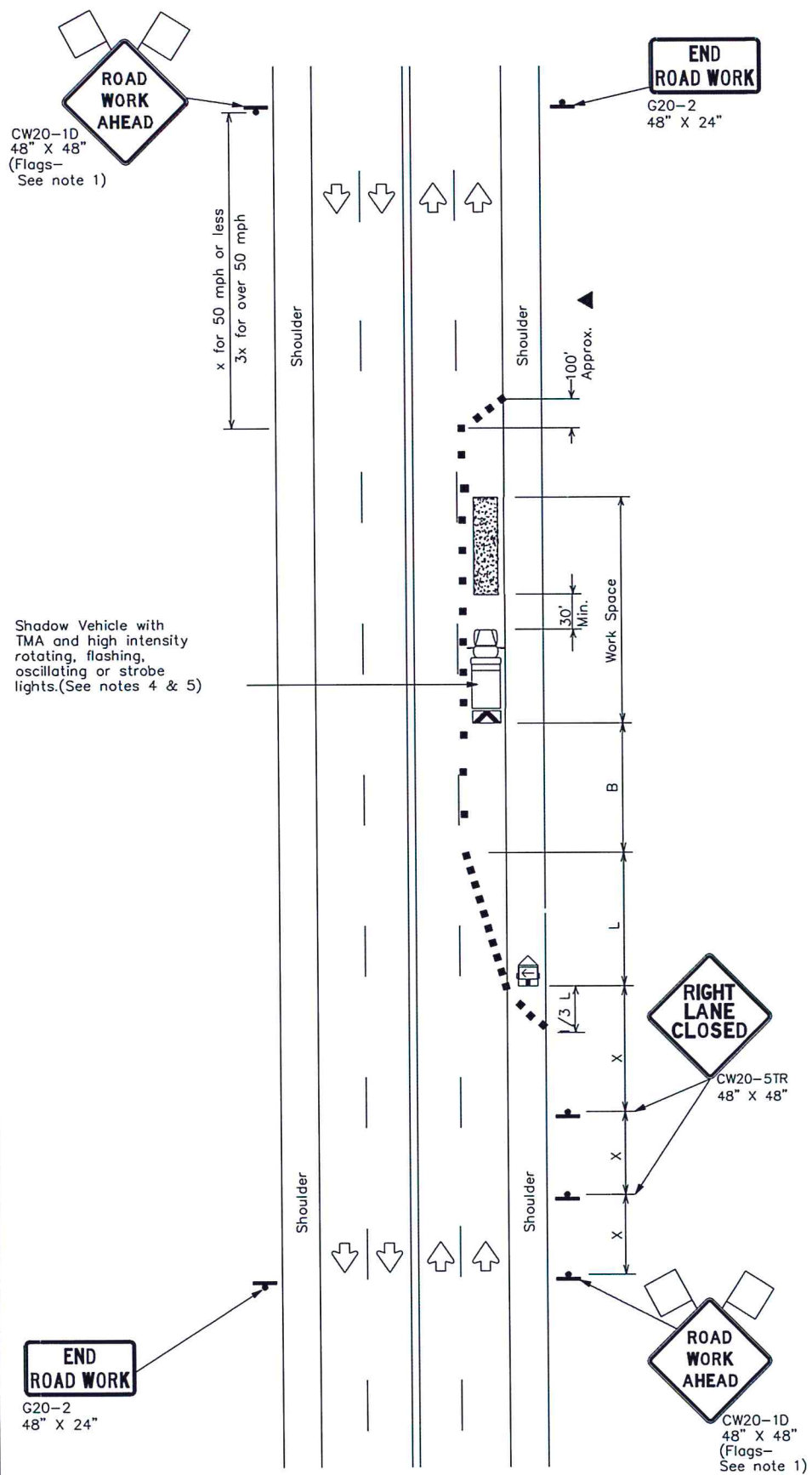
**TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON
TWO LANE ROADS**

TCP(1-3)-12

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REVISIONS		CONT	SECT	JOB	HIGHWAY
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8-95					
1-97					
4-98					
DIST		COUNTY		SHEET NO.	
153				29	

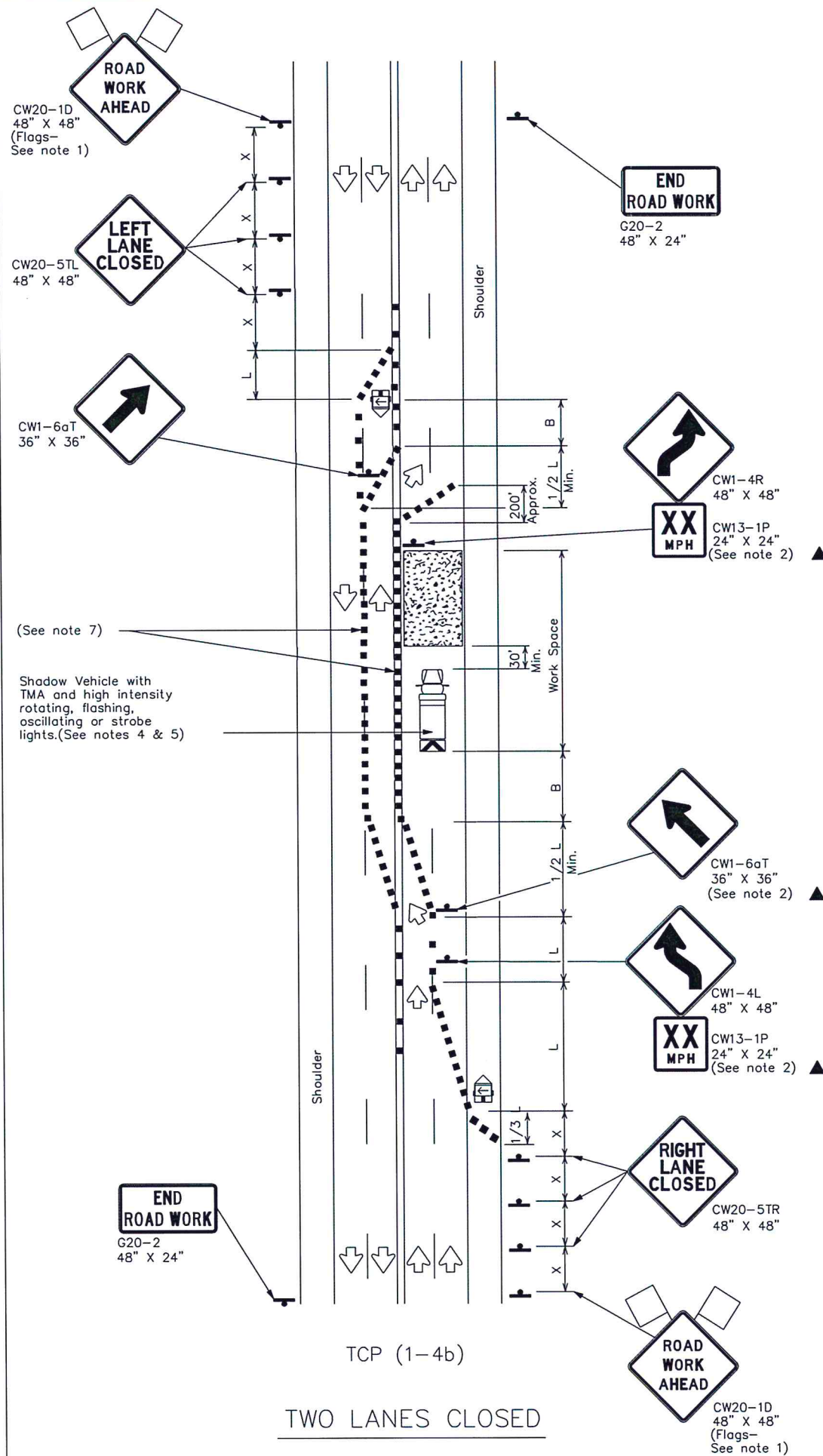
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DATE:
FILE:



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70	700'	770'	840'	70'	140'	800'	475'	
75	750'	825'	900'	75'	150'	900'	540'	

* Conventional Roads Only

** Taper lengths have been rounded off.

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

- Flags attached to signs where shown are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
- The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
- A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

- Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

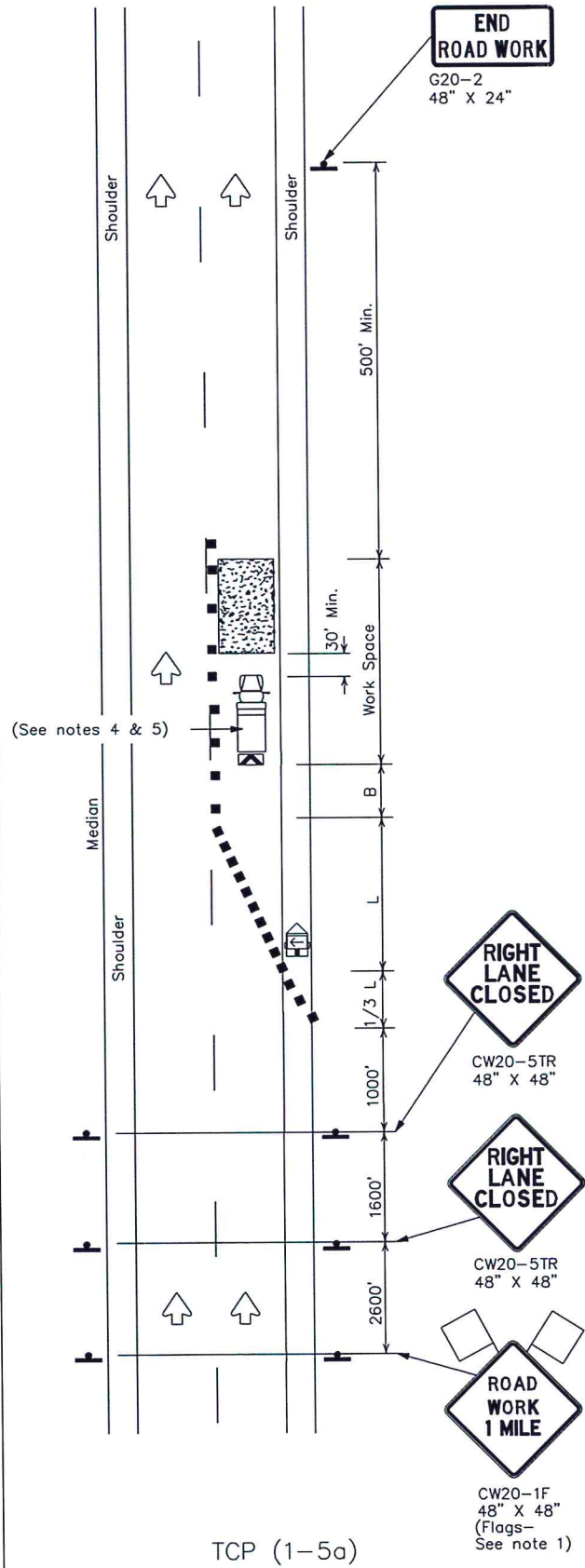
TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE
CONVENTIONAL ROADS

TCP(1-4)-12

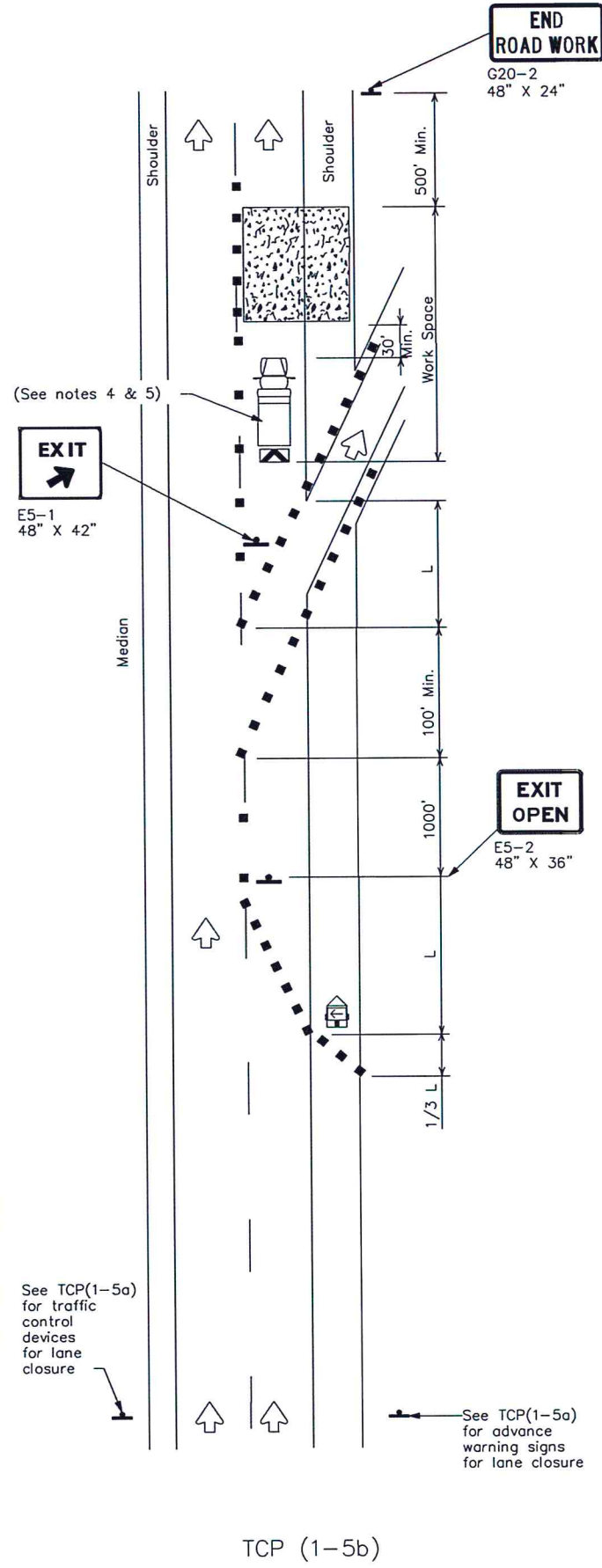
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REVISIONS					
2-94	2-12	CONT	SECT	JOB	HIGHWAY
8-95					
1-97					
4-98					
154					SHEET NO. 30

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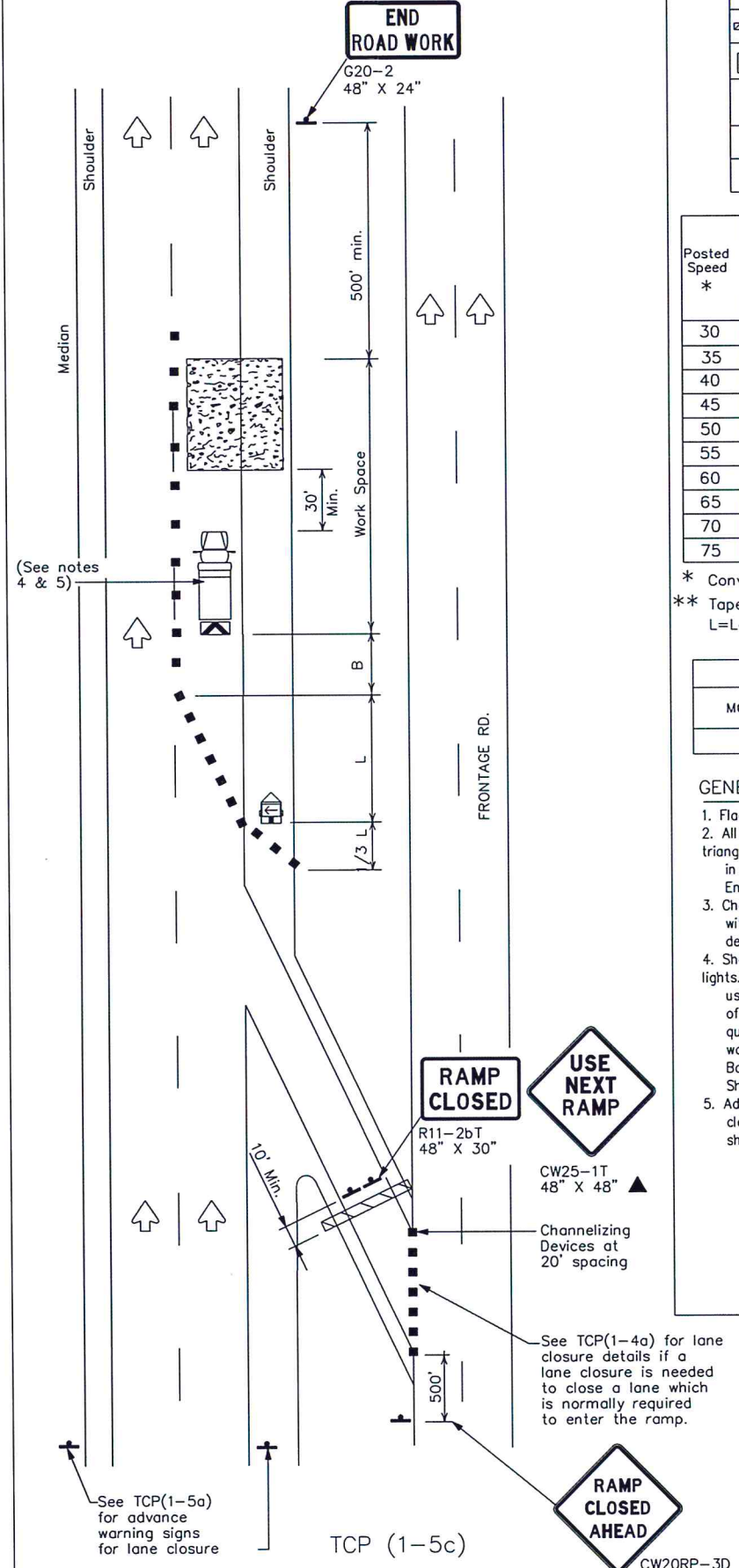
DATE:
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TCP (1-5a)
ONE LANE CLOSURE



TCP (1-5b)
LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)
LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	WS ² /60	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70	700'	770'	840'	70'	140'	800'	475'	
75	750'	825'	900'	75'	150'	900'	540'	

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓		

- GENERAL NOTES
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

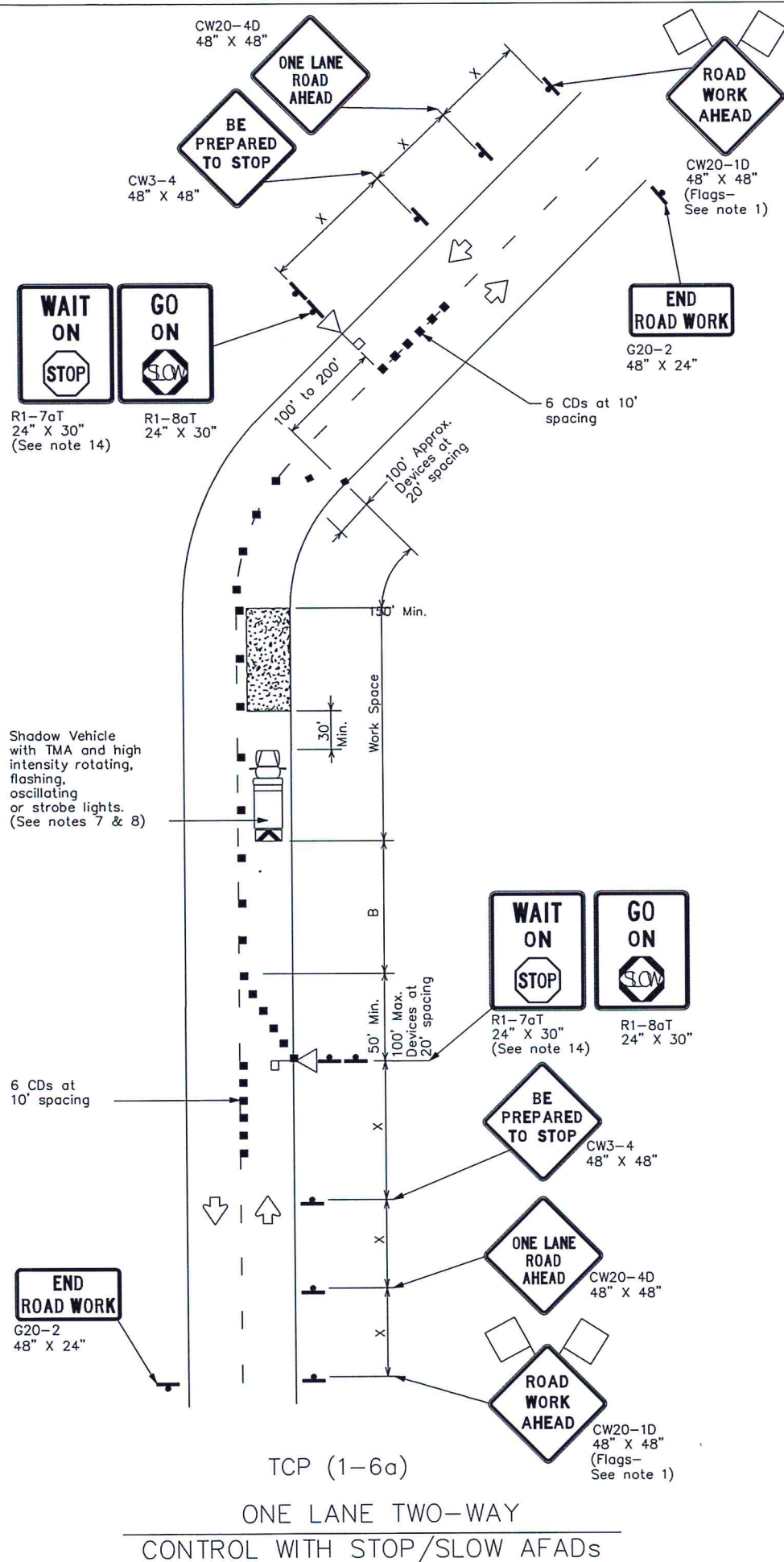
Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN
LANE CLOSURES FOR
DIVIDED HIGHWAYS

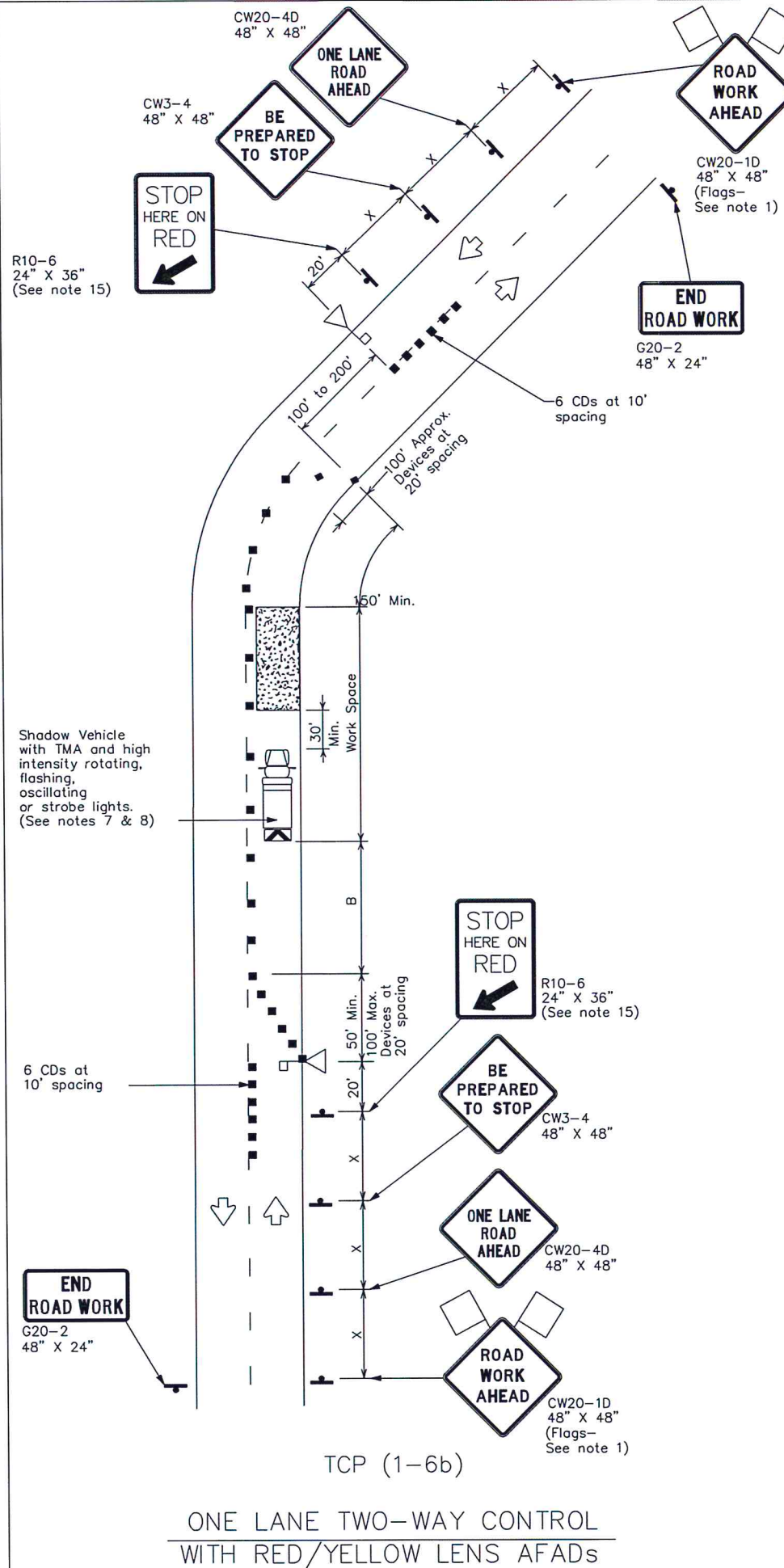
TCP(1-5)-12

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REVISIONS		CONT	SECT	JOB	HIGHWAY
DIST		COUNTY		SHEET NO.	
				31	

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TCP (1-6a)
ONE LANE TWO-WAY
CONTROL WITH STOP/SLOW AFADs



TCP (1-6b)
ONE LANE TWO-WAY CONTROL
WITH RED/YELLOW LENS AFADs

LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Automated Flagger Assistance Device (AFAD)		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

- Flags attached to signs where shown are REQUIRED.
- AFADs shall only be used in situations where there is one lane of approaching traffic in the direction to be controlled.
- Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See table above).
- Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADs shall not leave them unattended while they are in use.
- One flagger may operate two AFADs only when the flagger has an unobstructed view of both AFADs and of the approaching traffic in both directions.
- When pilot cars are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot car operator.
- All AFADs shall be equipped with gate arms with an orange or fluorescent red-orange flag attached to the end of the gate arm. The flag shall be a minimum of 16" square.
- A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- Flaggers should use two-way radios or other methods of communication to control traffic.
- Length of work space should be based on the ability of flaggers to communicate.
- If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the AFAD.
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
- The R1-7aT "WAIT ON STOP" sign and the R1-8aT "GO ON SLOW" sign shall be installed at the AFAD location on separate supports or they may be fabricated as one 48" x 30" sign. They shall not obscure the face of the STOP/SLOW AFAD.
- The R10-6 "STOP HERE ON RED" arrow sign shall be offset so as not to obscure the lenses of the AFAD.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN
AUTOMATED FLAGGER
ASSISTANCE DEVICES
(AFADs)

TCP(1-6)-12

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REVISIONS		CONT	SECT	JOB	HIGHWAY
		DIST	COUNTY		SHEET NO.

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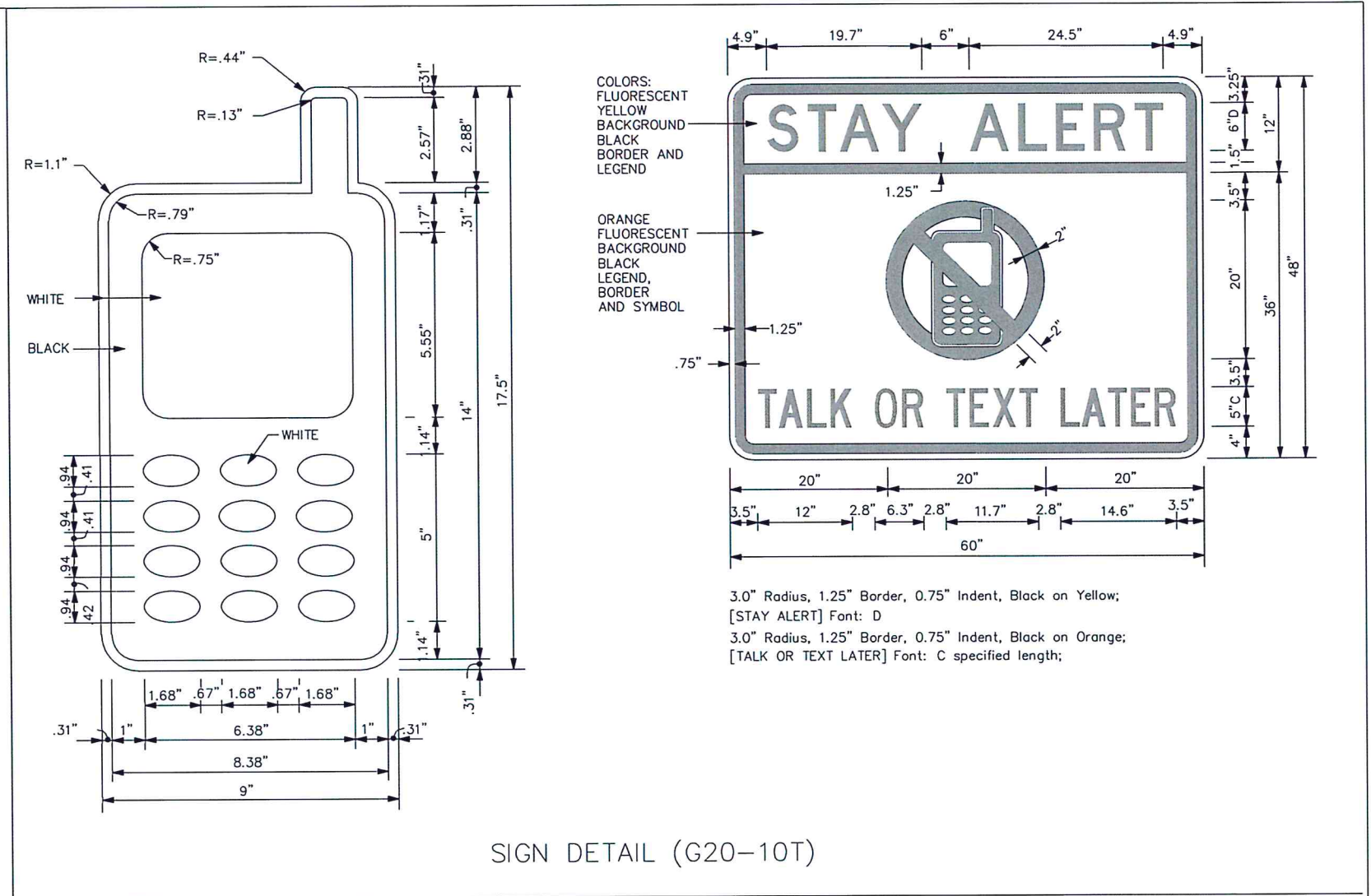
BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- 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).
- The development and design of the Traffic Control Plan (TCP) is the 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.
- 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.
- 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.
- 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 BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
- 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.
- 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.
- The Engineer has the final decision on the location of all traffic control devices.
- 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:

- 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.

DATE:
FILE:



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

Texas Department of Transportation
Traffic Operations Division Standard

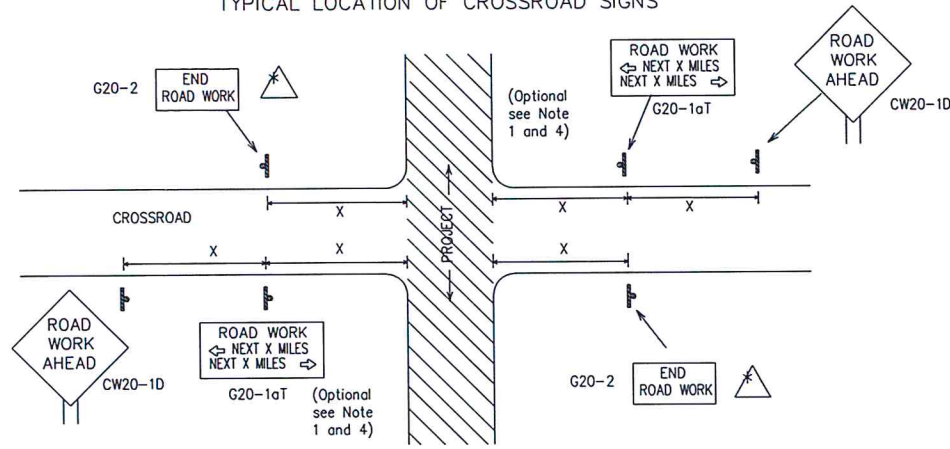
**BARRICADE AND CONSTRUCTION
GENERAL NOTES
AND REQUIREMENTS**

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DM: TxDOT	CR: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 7-13			33	
95				

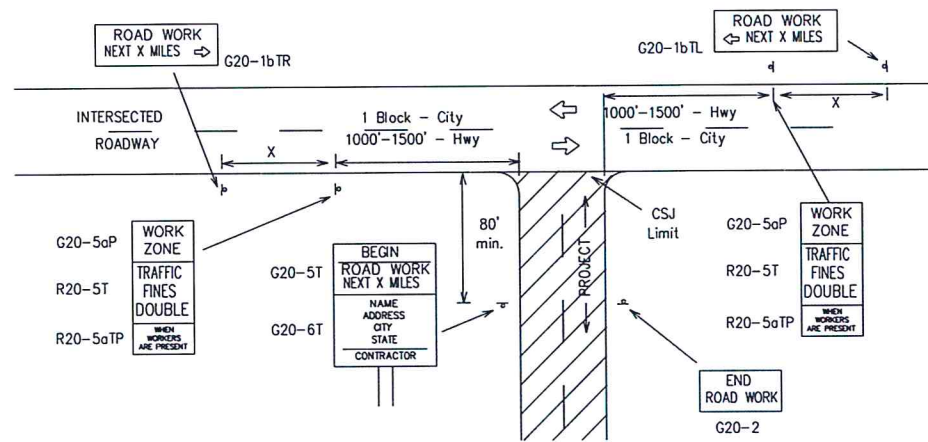
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ▲ May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)
- The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D) sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
 - The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
 - Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
 - The "ROAD WORK NEXT X MILES"(G20-1aT) sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
 - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
 - When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

- The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
- If construction closes the road at a T-intersection the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING 1.5.6

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Spacing "X" (Feet Apprx.)
CW20 ⁴ , CW21, CW22, CW23, CW25	48" x 48"	48" x 48"	30	120
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	35	160
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	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

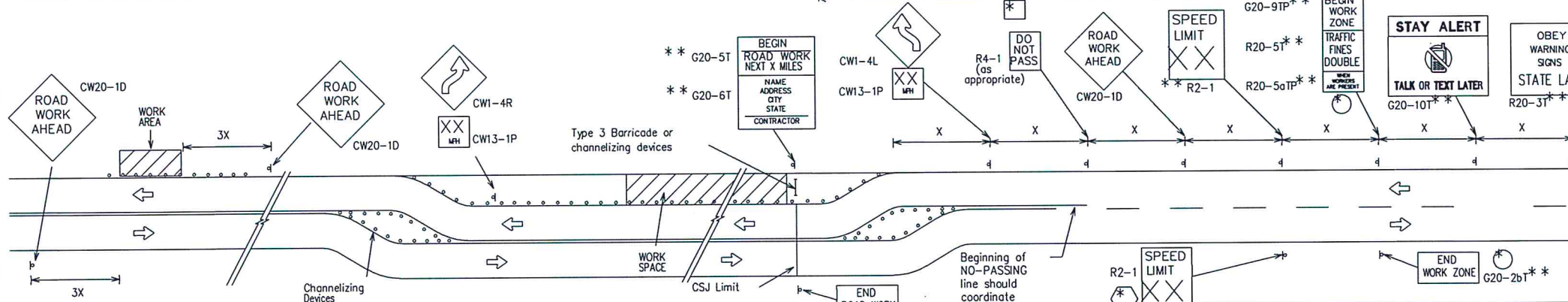
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

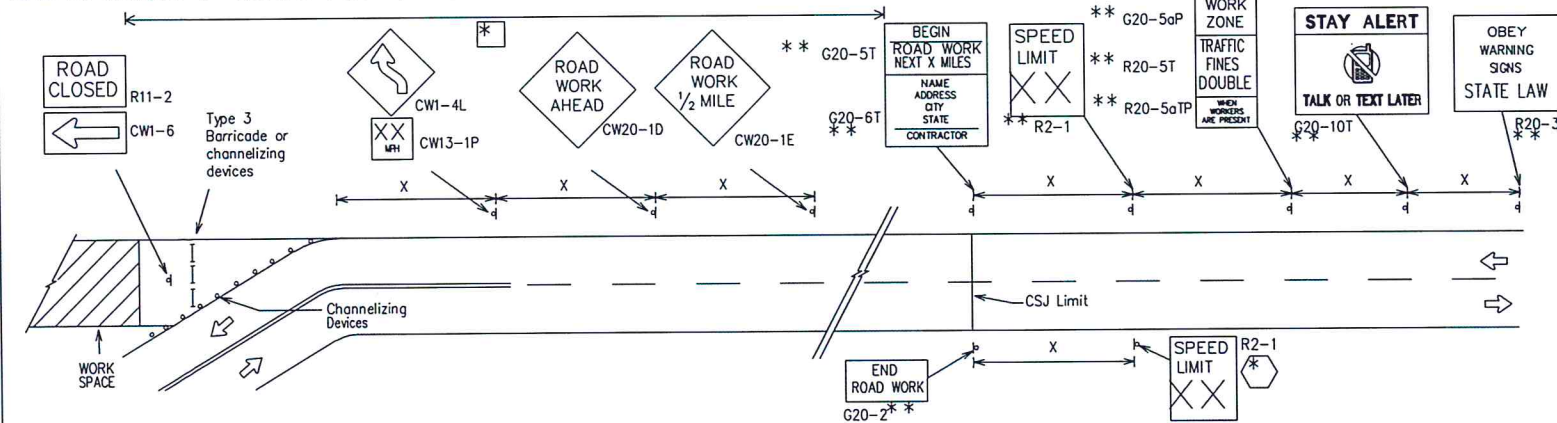
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

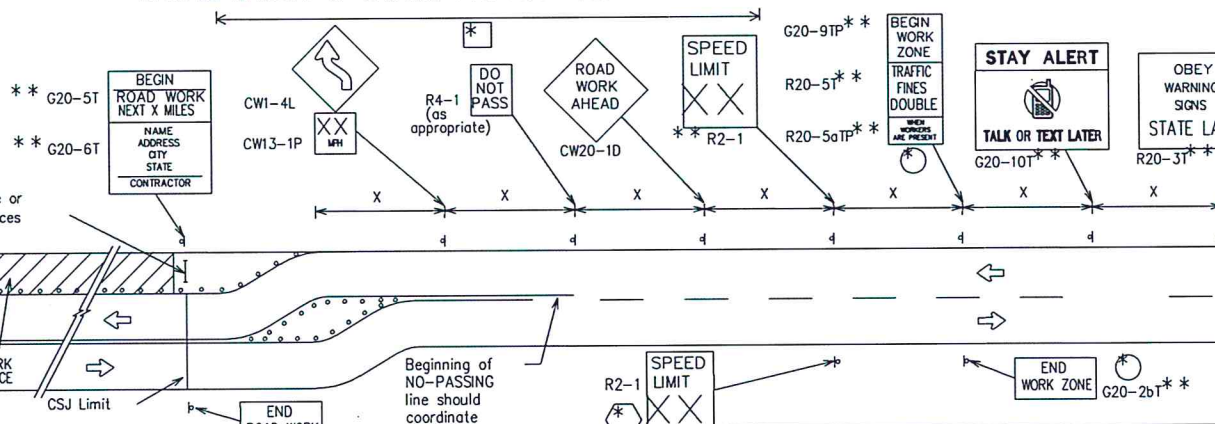


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

⊙ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

** Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

⊠ Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.

⊡ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

—	Type 3 Barricade
○ ○ ○	Channelizing Devices
⊠	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

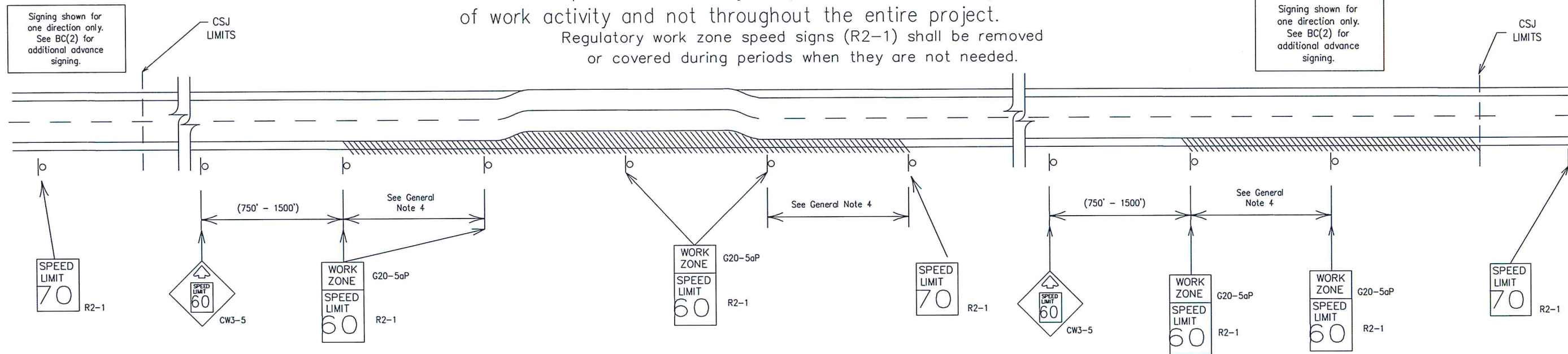
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.
Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the travelled 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)).

GENERAL NOTES

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:
 - 40 mph and greater 0.2 to 2 miles
 - 35 mph and less 0.2 to 1 mile
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- Fabrication, erection and maintenance of the "ADVANCE SPEED LIMIT"(CW3-5) sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1) signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - A. Law enforcement.
 - B. Flagger stationed next to sign.
 - C. Portable changeable message sign (PCMS).
 - D. Low-power (drone) radar transmitter.
 - E. Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 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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SHEET 3 OF 12



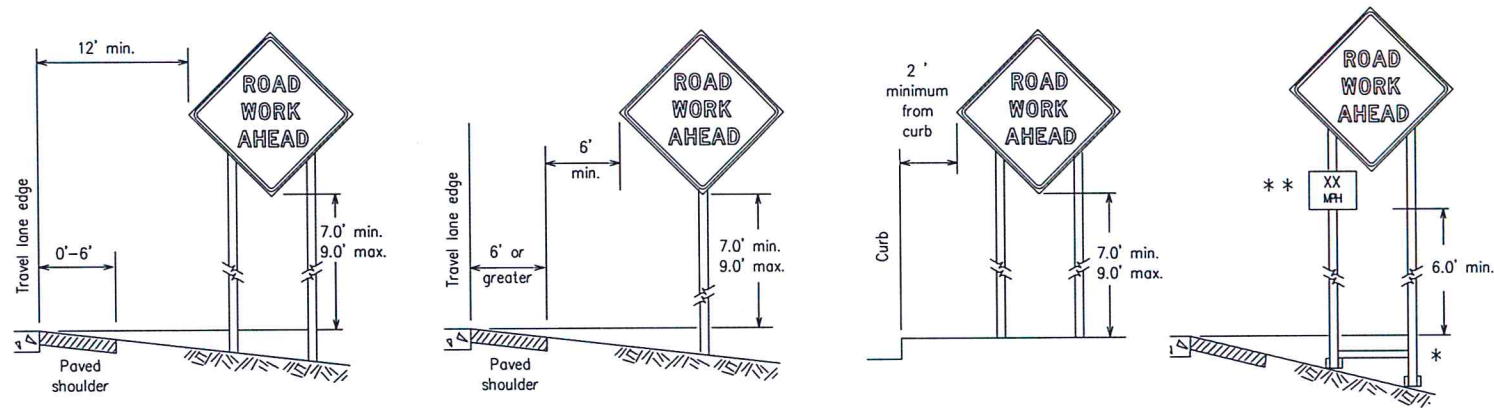
BARRICADE AND CONSTRUCTION
WORK ZONE SPEED LIMIT

BC(3)-14

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7-13			35	
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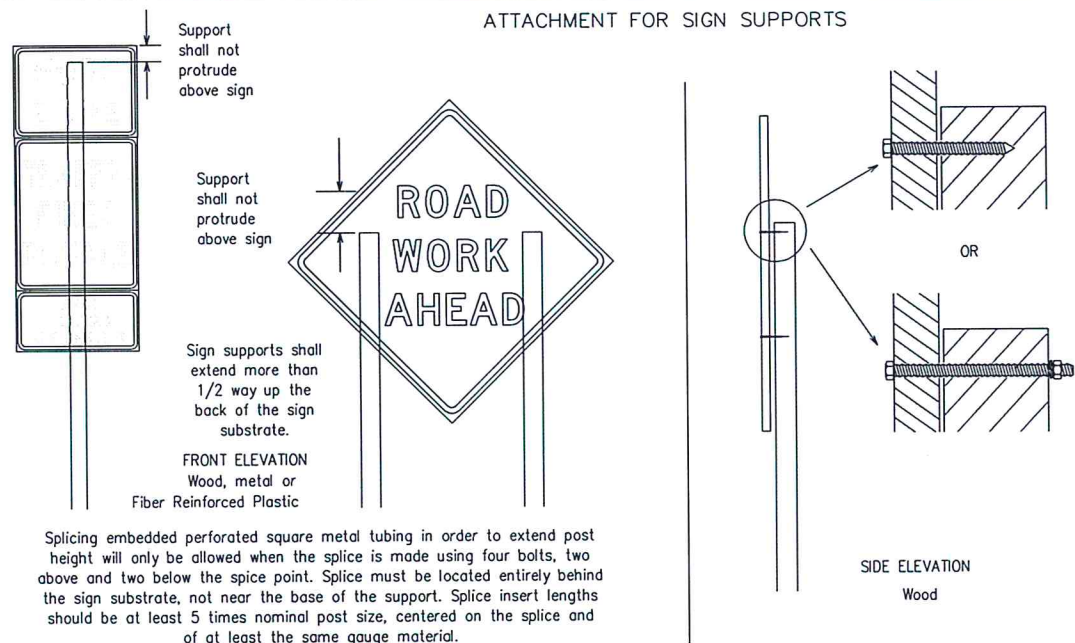
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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



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.

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 or Type C, 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

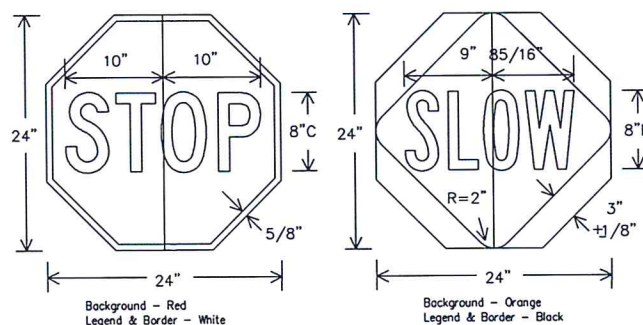
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not 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.

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.



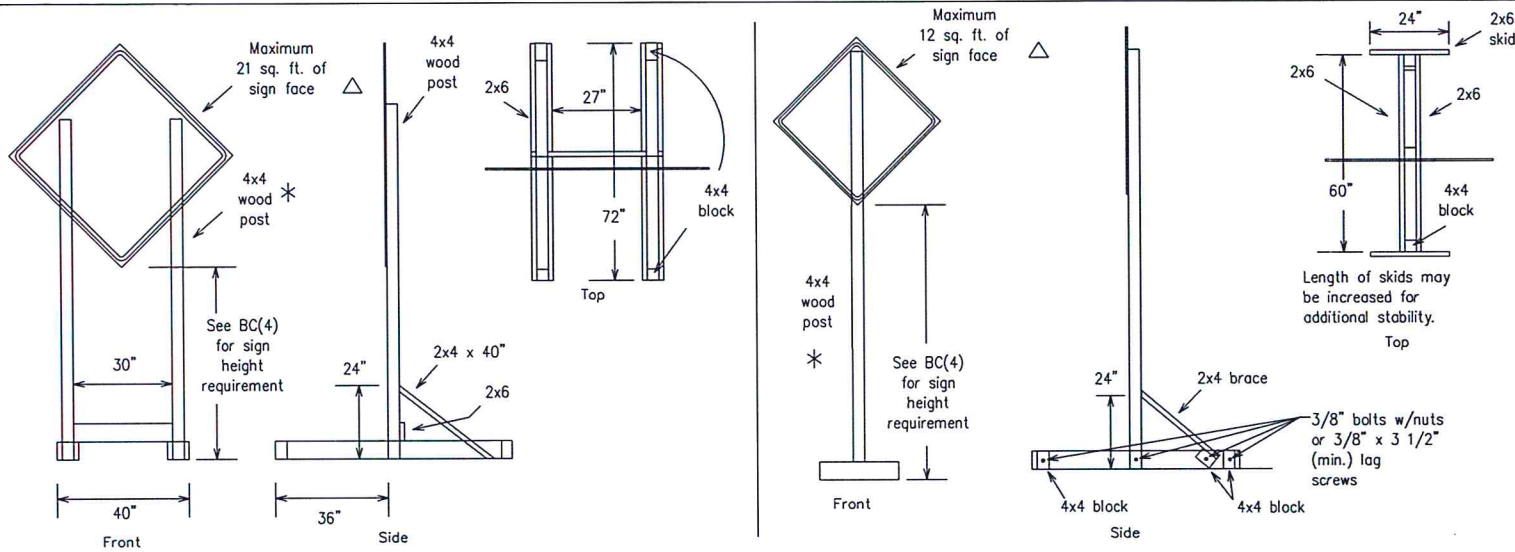
Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

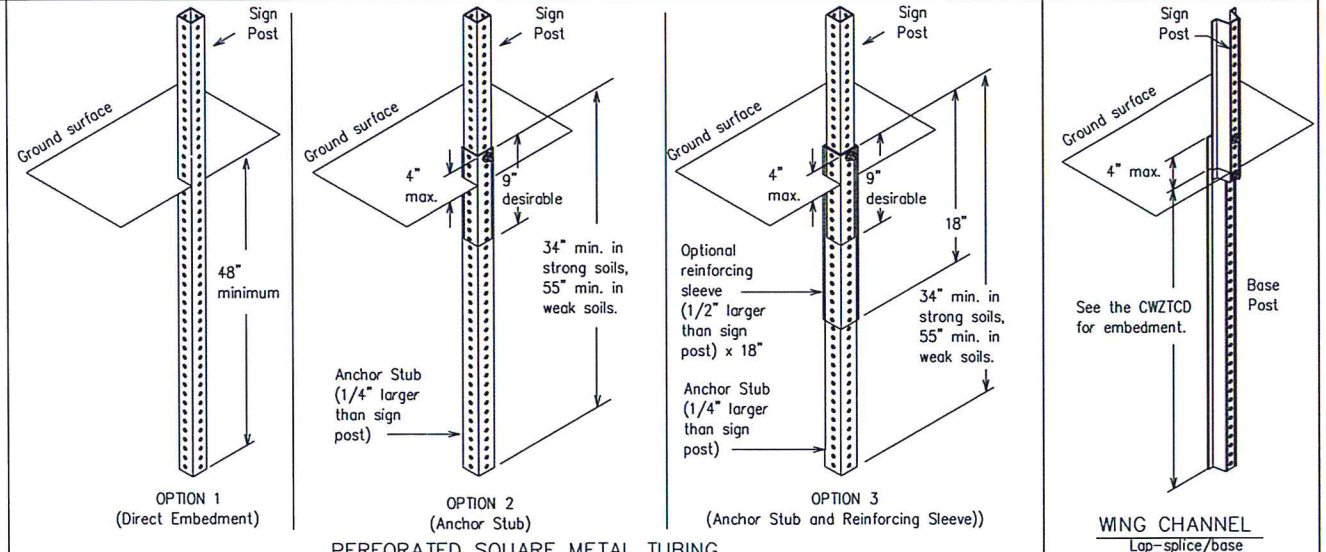
- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. 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.

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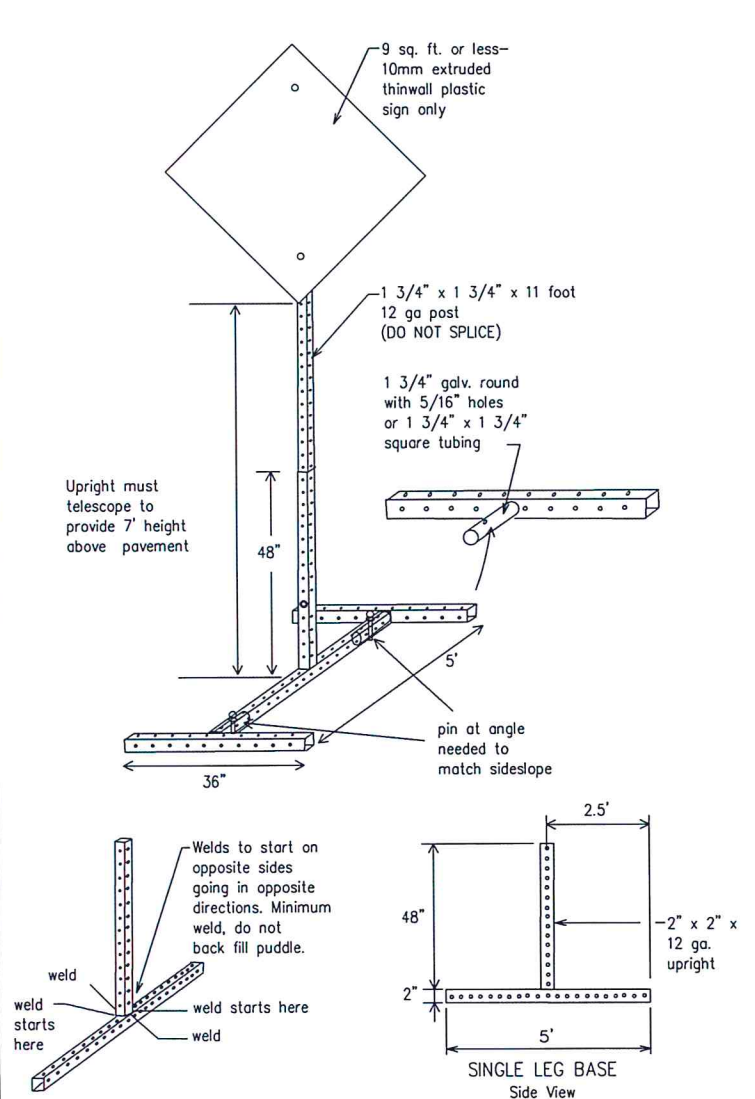
SKID MOUNTED WOOD SIGN SUPPORTS

LONG/INTERMEDIATE TERM STATIONARY – PORTABLE SKID MOUNTED SIGN SUPPORTS

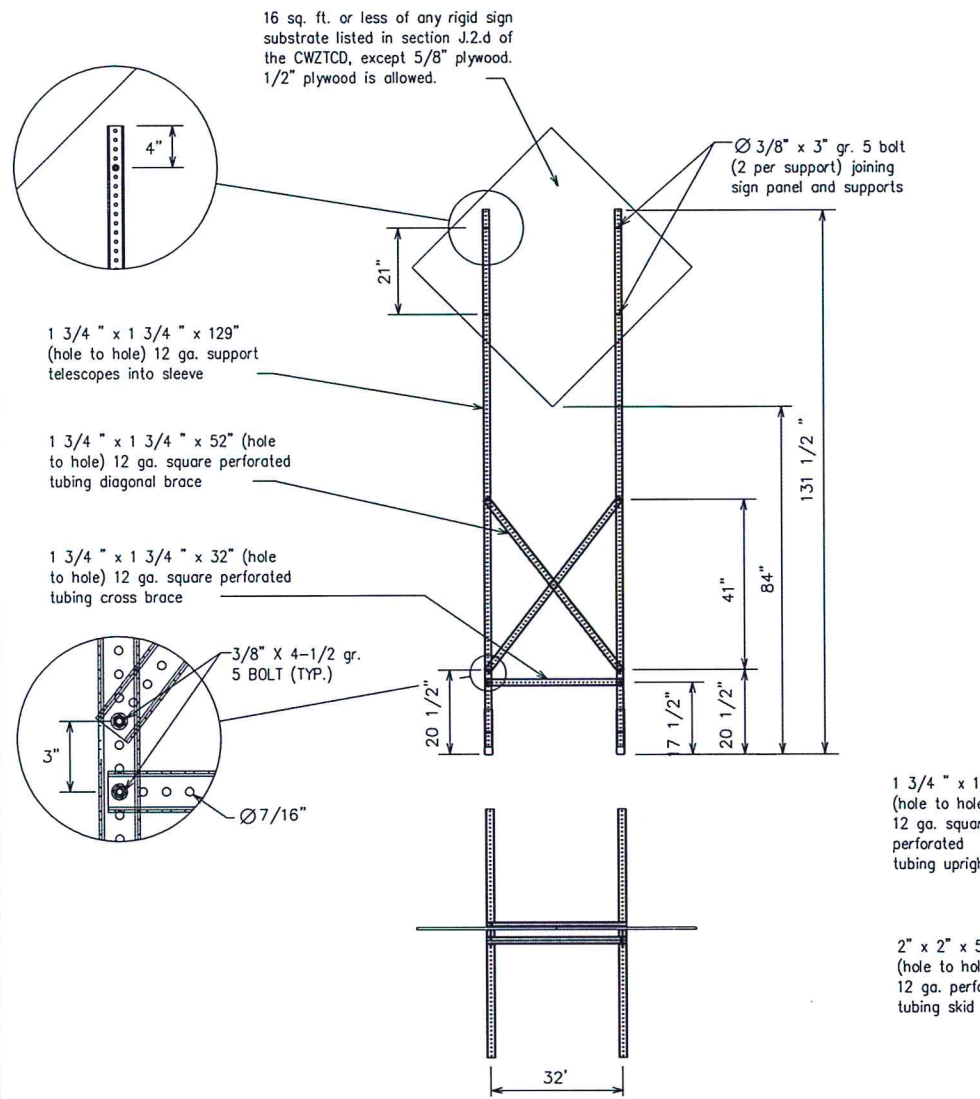


GROUND MOUNTED SIGN SUPPORTS

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.

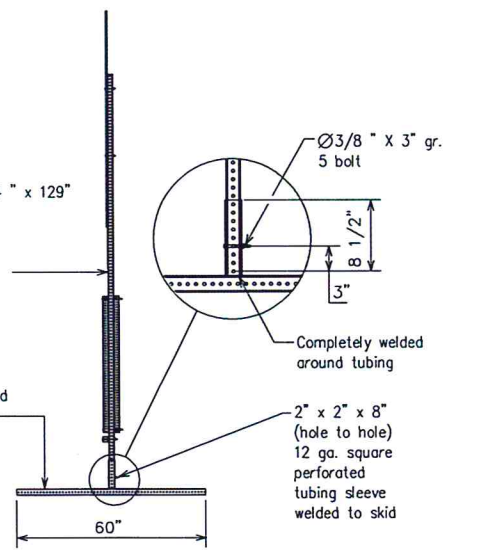


SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS



WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS

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



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."
- * Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- △ 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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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

PORTABLE CHANGEABLE MESSAGE SIGNS

- 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 eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
- 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.
- 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) 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 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.
- 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.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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.

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT
RIGHT X LANES CLOSED	RIGHT X LANES OPEN
CENTER LANE CLOSED	DAYTIME LANE CLOSURES
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE
EXIT CLOSED	RIGHT LN TO BE CLOSED
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI
XXXXXXXX BLVD CLOSED	

Other Condition 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	LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

MERGE RIGHT	FORM X LINES RIGHT
DETOUR NEXT X EXITS	USE XXXX RD EXIT
USE EXIT XXX	USE EXIT I-XX NORTH
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N
TRUCKS USE US XXX N	WATCH FOR TRUCKS
WATCH FOR TRUCKS	EXPECT DELAYS
EXPECT DELAYS	PREPARE TO STOP
REDUCE SPEED XXX FT	END SHOULDER USE
USE OTHER ROUTES	WATCH FOR WORKERS
STAY IN LANE *	

Location List

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXXX TO XXXXXXX
US XXX TO FM XXXX

Warning List

SPEED LIMIT XX MPH
MAXIMUM SPEED XX MPH
MINIMUM SPEED XX MPH
ADVISORY SPEED XX MPH
RIGHT LANE EXIT
USE CAUTION
DRIVE SAFELY
DRIVE WITH CARE

** Advance Notice List

TUE-FRI XX AM-X PM
APR XX-XX X PM-X AM
BEGINS MONDAY
BEGINS MAY XX
MAY X-X XX PM - XX AM
NEXT FRI-SUN
XX AM TO XX PM
NEXT TUE AUG XX
TONIGHT XX PM-XX AM

** See Application Guidelines Note 6.

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	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLRS
High-Occupancy	HOV	Tuesday	TUES
Vehicle Highway	HWY	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

Roadway designation # IH-number, US-number, SH-number, FM-number

APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 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.
- 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

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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 EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

- 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.
- 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.
- 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 same size arrow.

SHEET 6 OF 12



BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

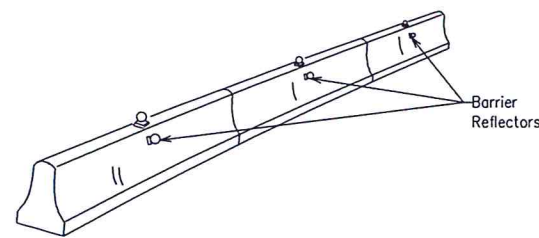
FILE: bc-14.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07	8-14	DIST	COUNTY	SHEET NO.
7-13				38
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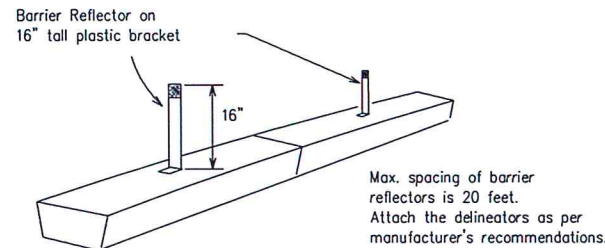
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

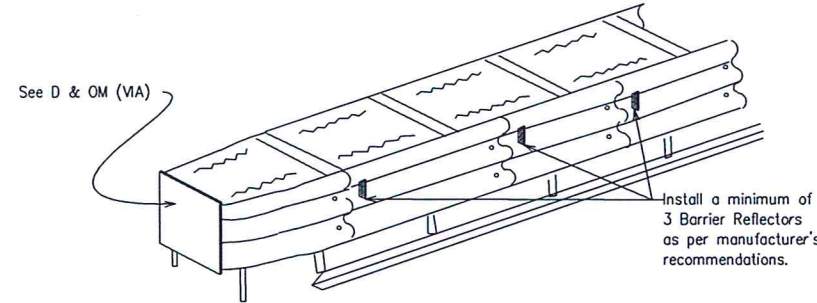


CONCRETE TRAFFIC BARRIER (CTB)

- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
- Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional) while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.



LOW PROFILE CONCRETE BARRIER (LPCB)



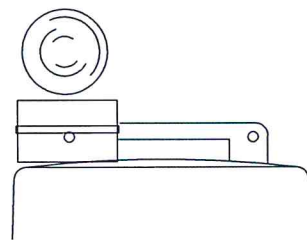
DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.

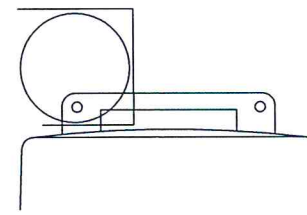
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B or C sheeting meeting the requirements of Departmental Material Specification DMS-8300.
- Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
- When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
- Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

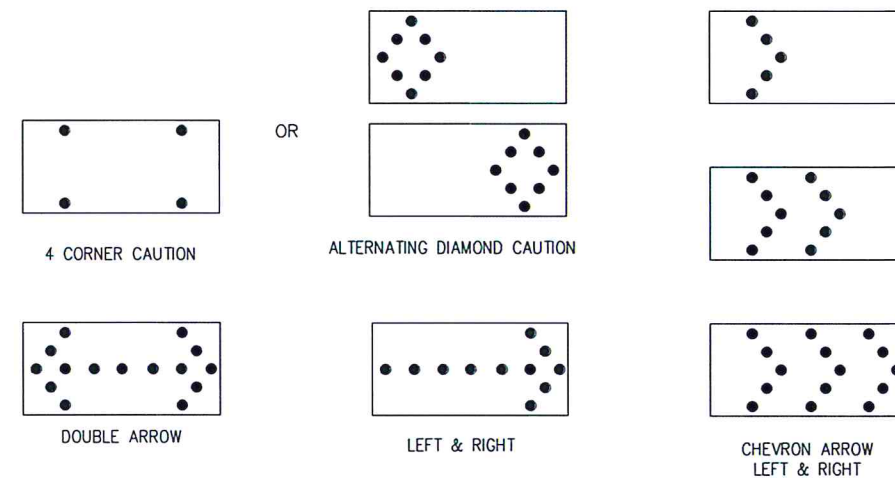
- A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
- The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
- The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

- The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
- Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
- The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board. The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
- Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
- Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.



BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC(7)-14

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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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:

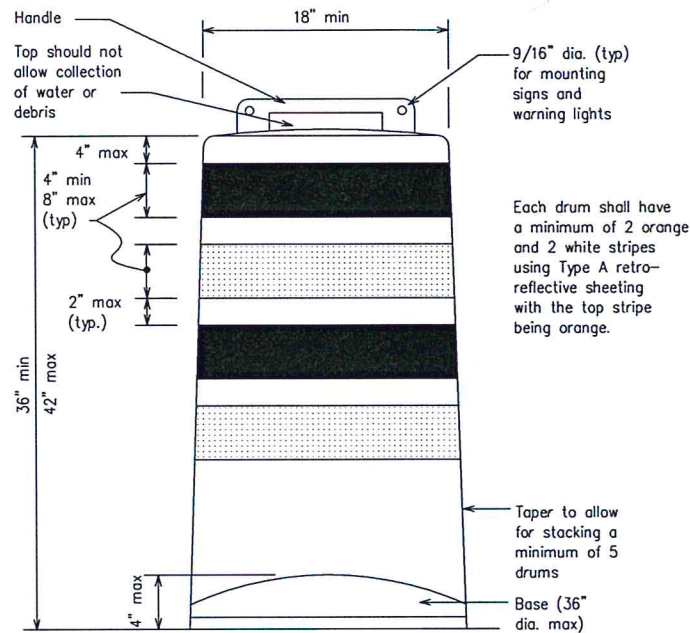
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.
- 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.
- 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.
- 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.
- Drum body shall have a maximum unballasted weight of 11 lbs.
- Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

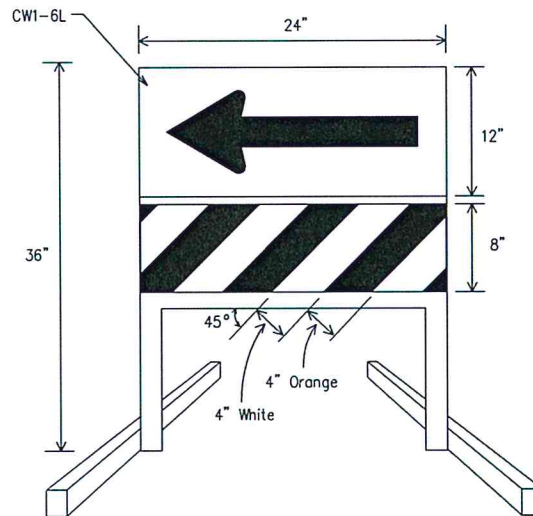
- The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
- The sheeting shall be suitable 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

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

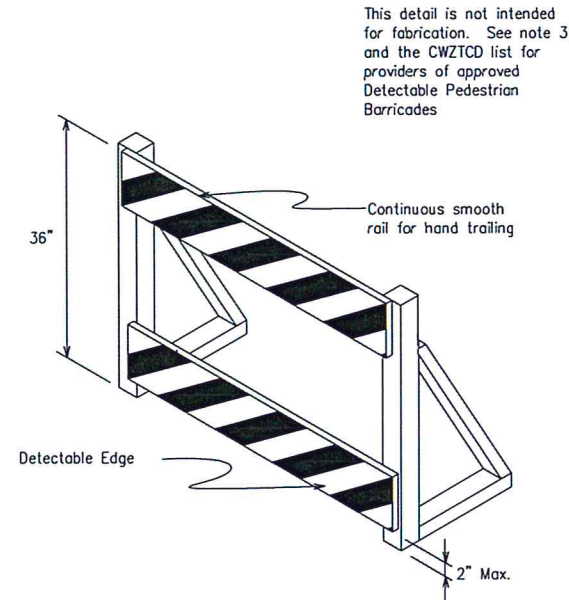


Each drum shall have a minimum of 2 orange and 2 white stripes using Type A retro-reflective sheeting with the top stripe being orange.



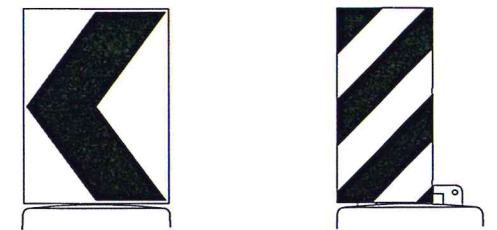
DIRECTION INDICATOR BARRICADE

- The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
- If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
- 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 or Type C 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.
- Double arrows on the Direction Indicator Barricade will not be allowed.
- Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



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.
- 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.
- 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.



18" x 24" Sign
(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.
- Chevrons and other work zone signs with an orange background shall be manufactured with Type B or Type C 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 Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
- 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.
- 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.

SHEET 8 OF 12



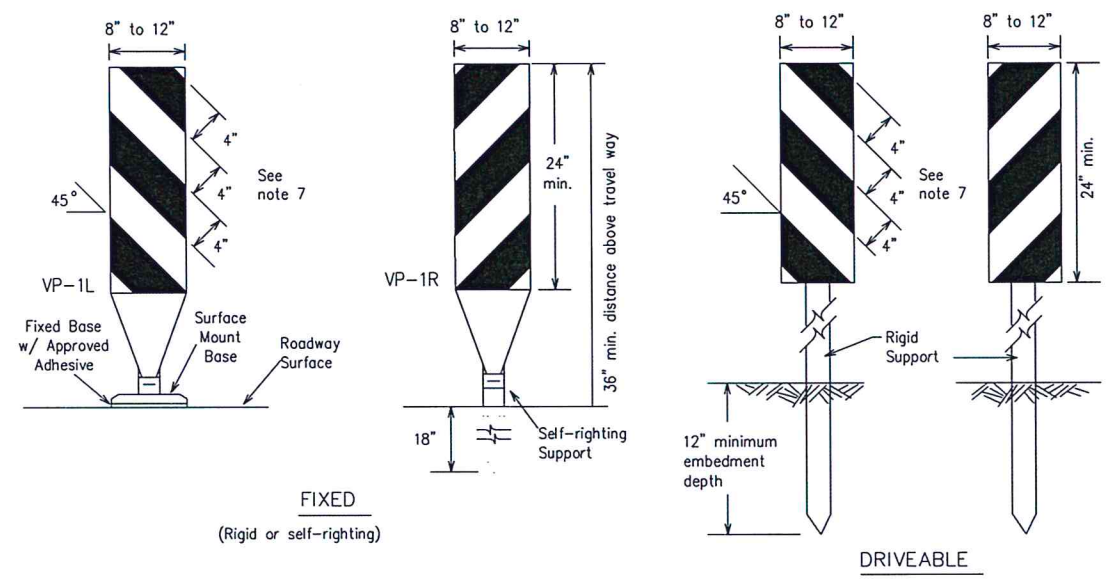
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

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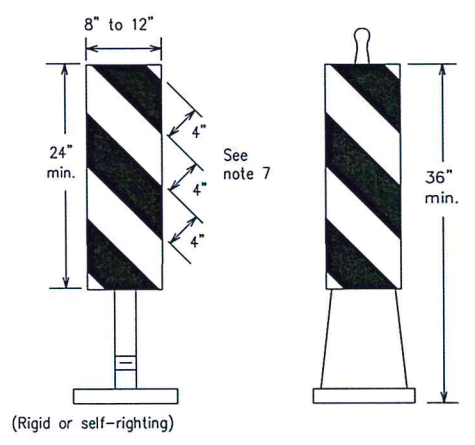
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FIXED
(Rigid or self-righting)

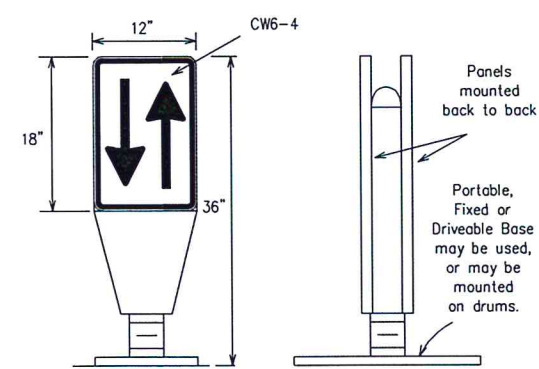
DRIVEABLE



PORTABLE

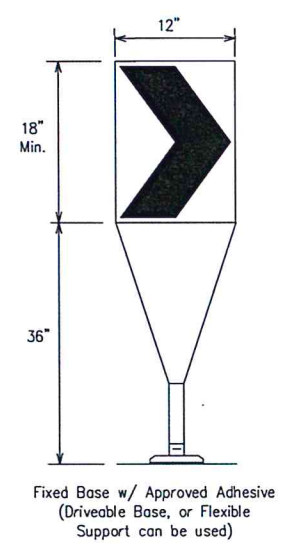
VERTICAL PANELS (VPs)

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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.
- 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.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

- 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.
- The OTLD may be used in combination with 42" cones or VP's.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VP's placed between the OTLD's should not exceed 100 foot spacing.
- The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B or Type C conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

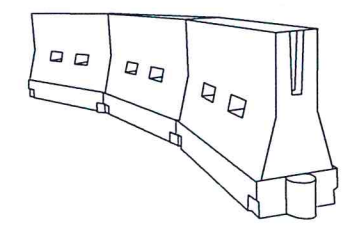


CHEVRONS

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B or Type C conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- 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.

GENERAL NOTES

- 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).
- 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.
- 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).
- 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.
- 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.
- 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.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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

- 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.
- 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.
- 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.

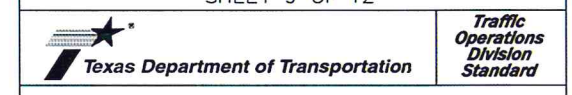
HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			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

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

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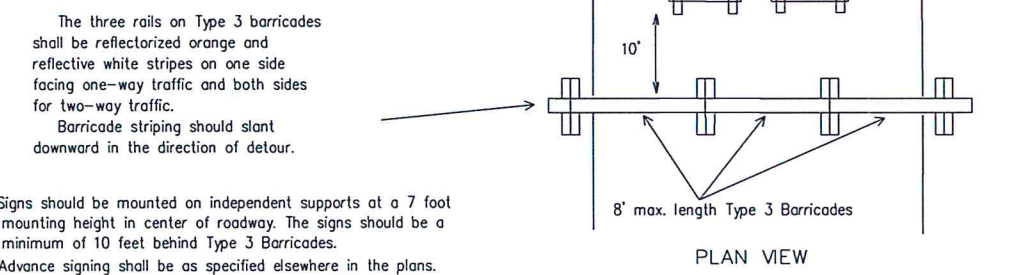
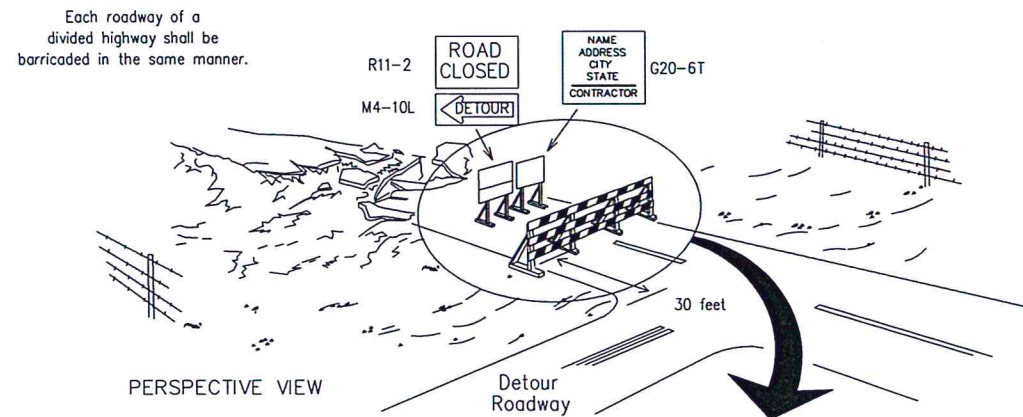
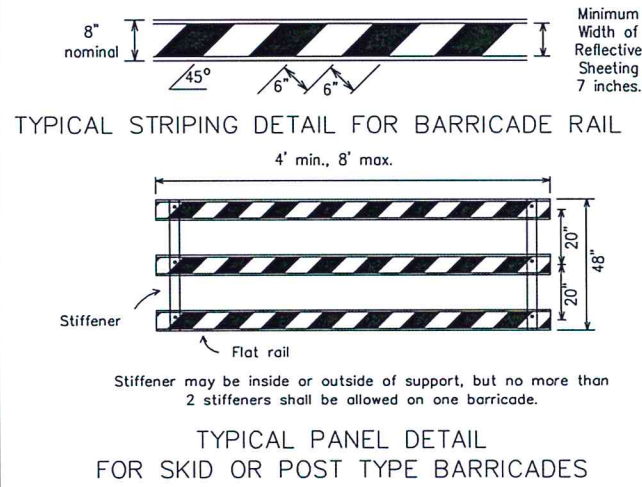
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TYPE 3 BARRICADES

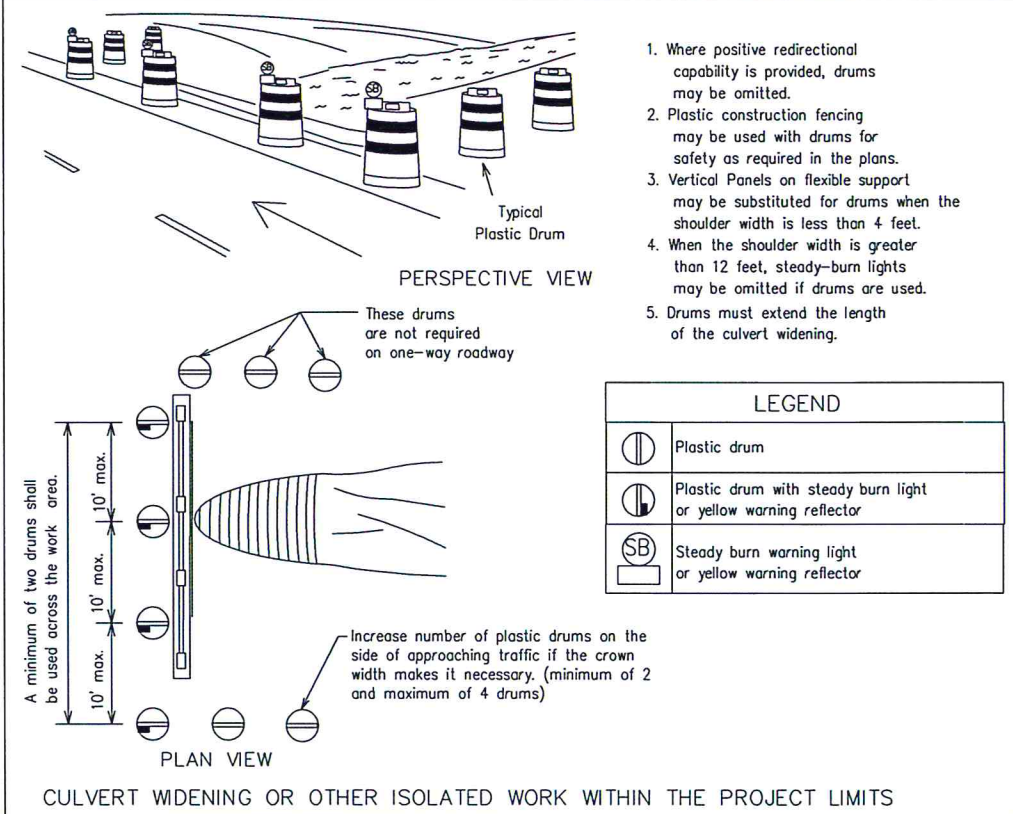
1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending 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.

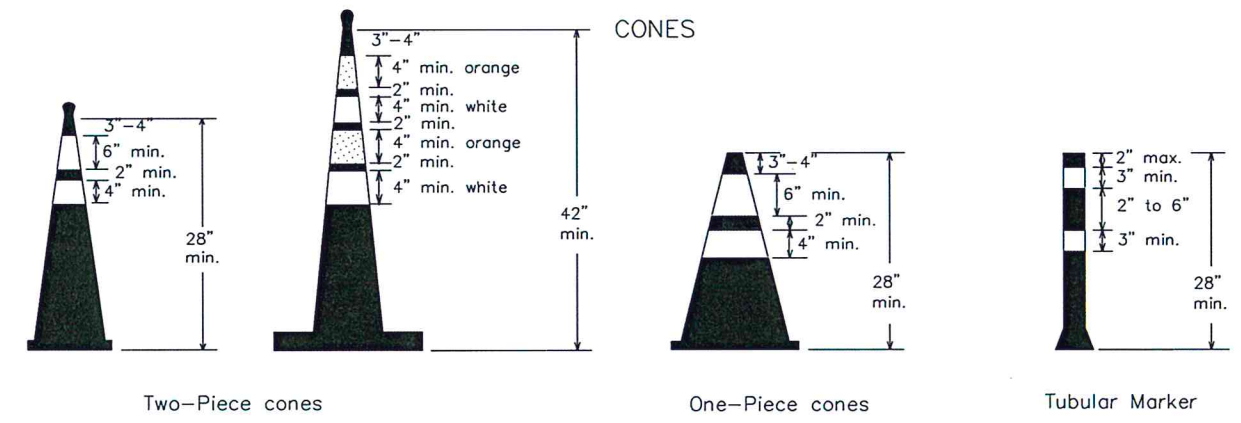


TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION

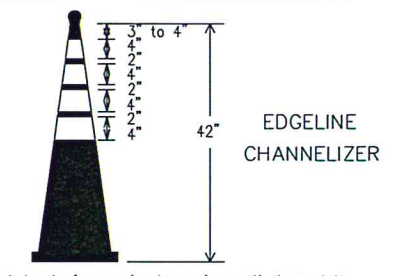
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.



CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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



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.

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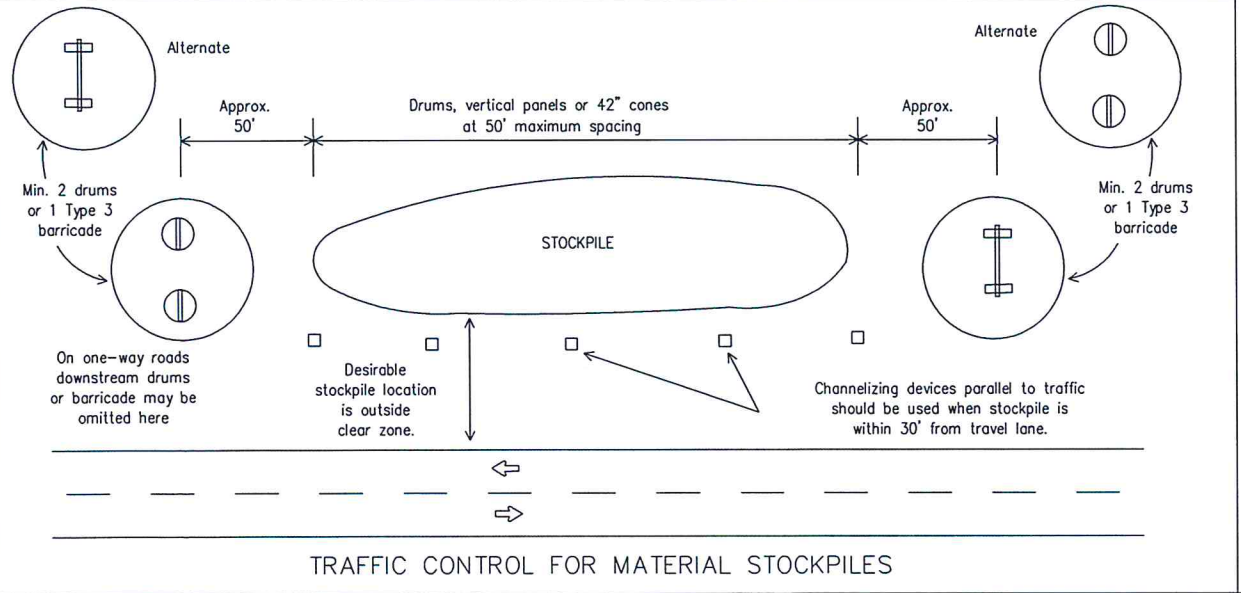
Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

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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.

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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.

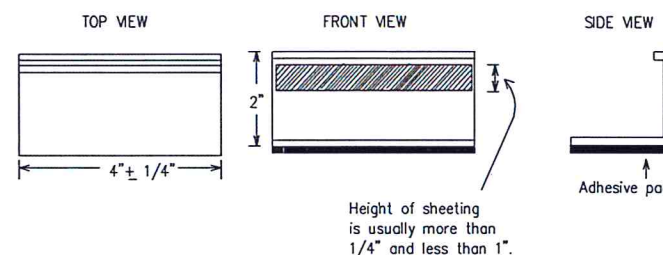
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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).

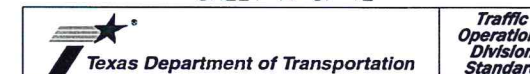
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY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

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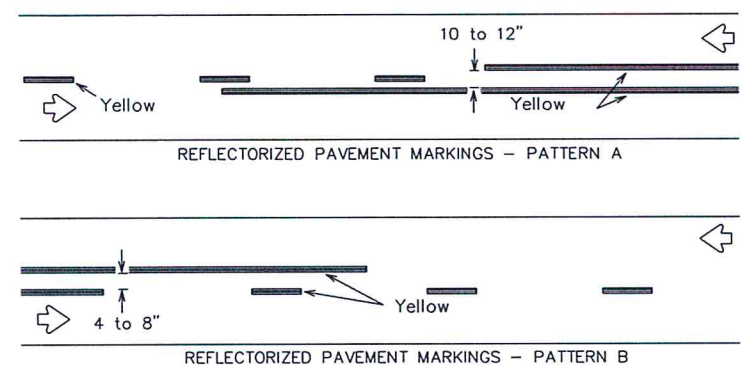
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

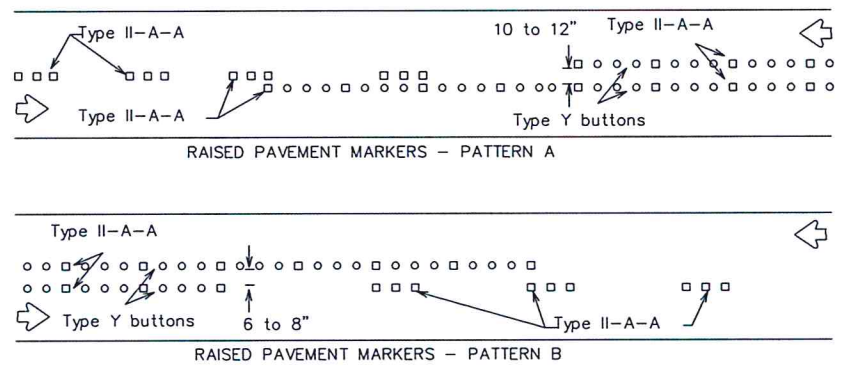
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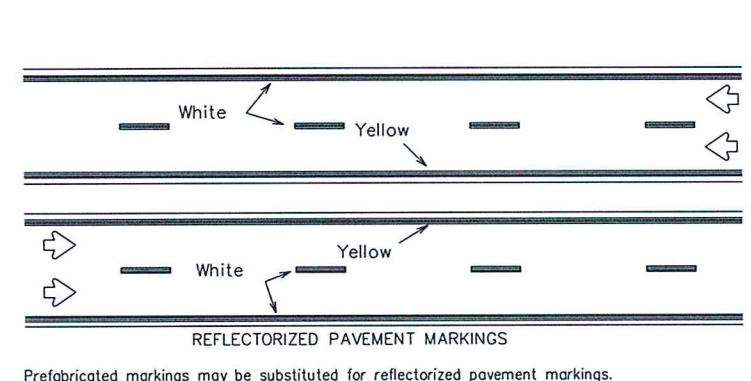
PAVEMENT MARKING PATTERNS



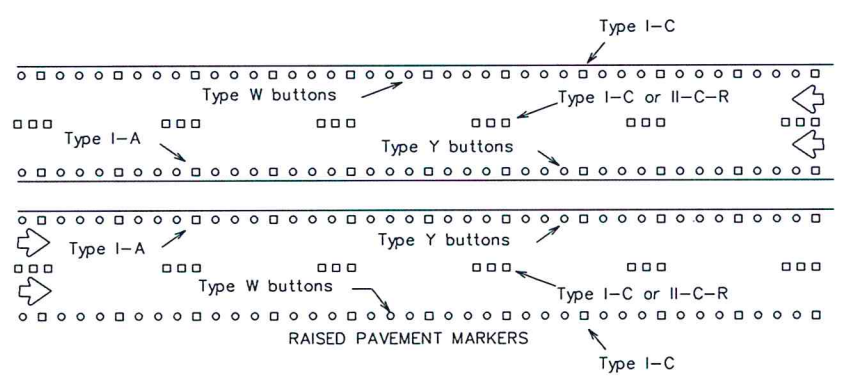
Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.



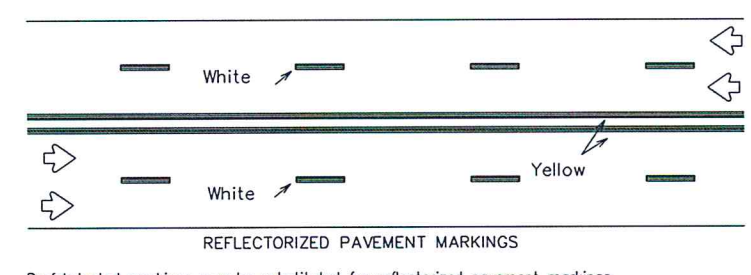
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



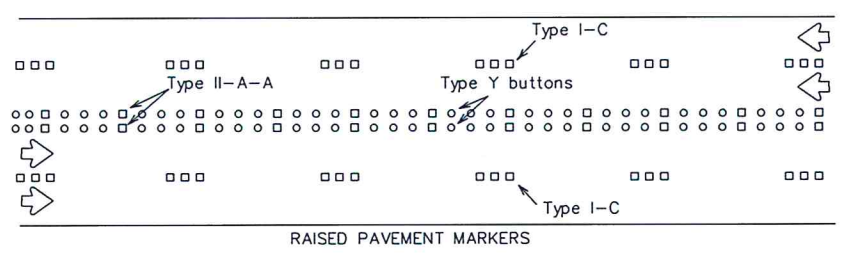
Prefabricated markings may be substituted for reflectORIZED pavement markings.



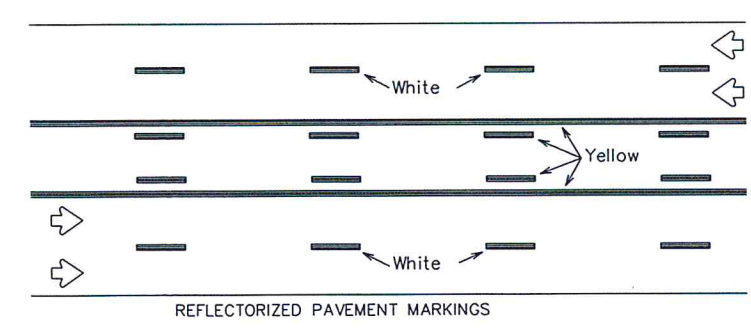
EDGE & LANE LINES FOR DIVIDED HIGHWAY



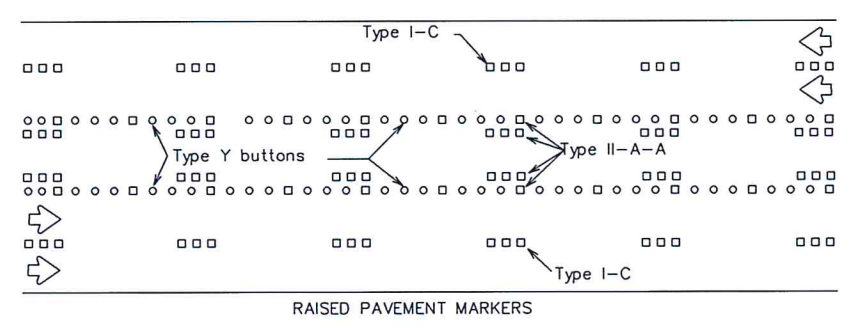
Prefabricated markings may be substituted for reflectORIZED pavement markings.



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

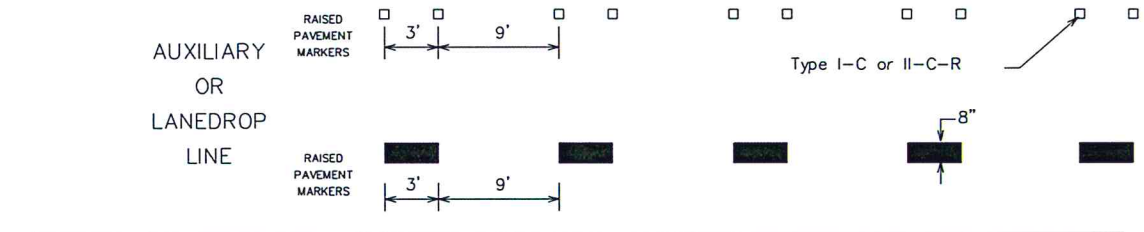
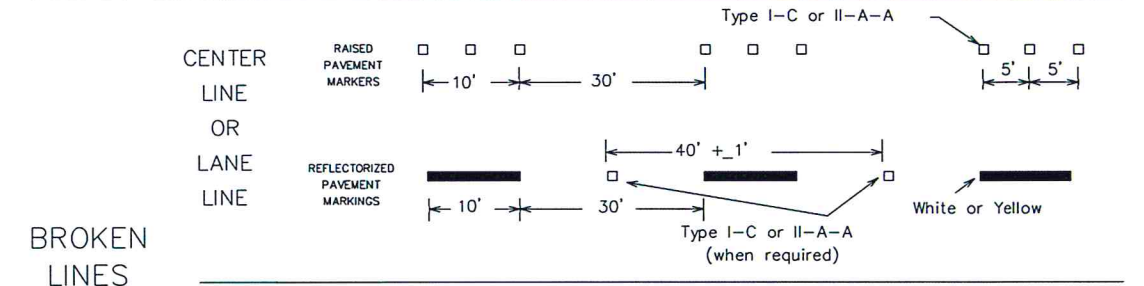
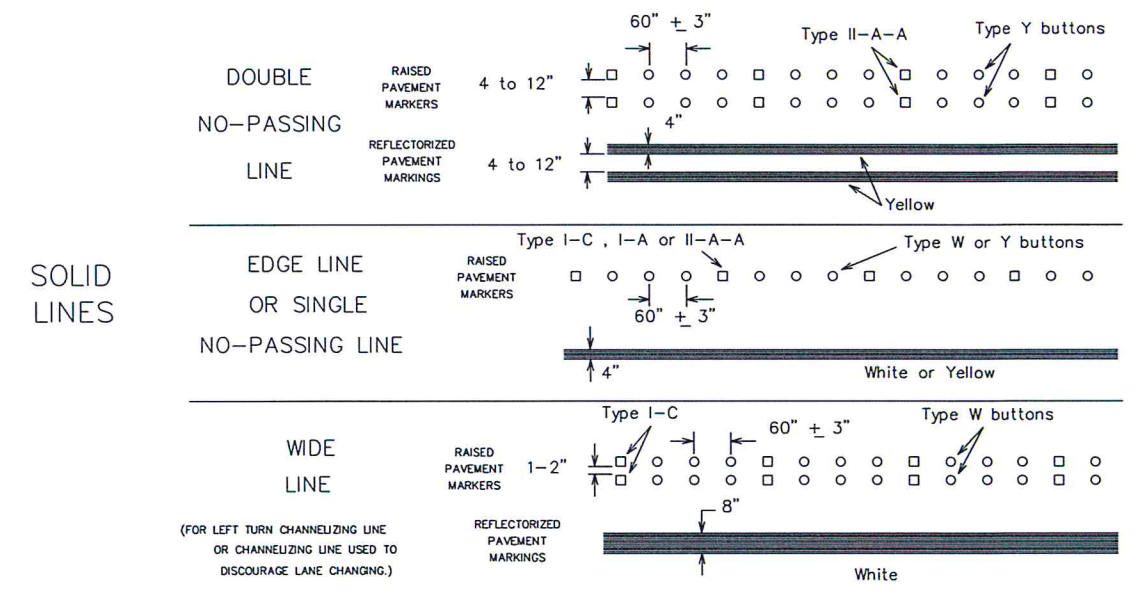


Prefabricated markings may be substituted for reflectORIZED pavement markings.



TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.

Centerline only - not to be used on edge lines

SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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