

**CONTRACT DOCUMENTS
&
TECHNICAL SPECIFICATIONS
FOR**

**BID # 21-01
2021 N. ARMSTRONG STREET IMPROVEMENTS FROM
SANTA GERTRUDIS AVENUE TO KENEDY AVENUE
FOR
CITY OF KINGSVILLE, TEXAS**

City Manager
Mark McLaughlin

Mayor
Sam Fugate

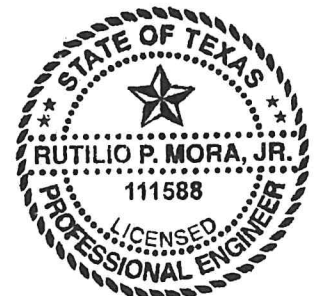
Commissioner(s)
Hector Hinojosa
Norma Nelda Alvarez
Edna Lopez
Ann Marie Torres

DECEMBER 2020

Prepared by:



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



Rutilio P. Mora Jr.
12/18/2020

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CONTRACT DOCUMENTS

ADVERTISEMENT AND INVITATION FOR BIDS

The City of Kingsville, Texas will receive sealed bids for the "2021 N. Armstrong Street Improvements from Santa Gertrudis Avenue to Kenedy Avenue" until 2:00 p.m. on January 12th, 2021. Sealed proposals will be addressed to the Purchasing Manager for the City of Kingsville, Charlie Sosa, 400 W. King Avenue, Kingsville, Texas 78363. The bids will be publicly opened and read aloud at 2:00 p.m. on January 12th, 2021 at Kingsville City Hall, 400 W. King Avenue, Kingsville, Texas 78363. A Pre-Bid Conference will be held on January 5th, 2021 at 10:00 a.m. at 400 W. King Avenue, Kingsville, Texas 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, geogrid on subgrade, flexible base material, seal coat, hot mix asphalt pavement and concrete sidewalk 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.

<https://www.cityofkingsville.com/department/purchasing/rfpbid-opening-fy-2020/>

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 orientation, 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 60 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
/s/ Mark McLaughlin, 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 clarification shall be made in writing to the Purchasing Manager 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 Tuesday, January 12th, 2021 at 10:00 A.M. at the City Hall Community Room, 400 W. King Avenue, Kingsville, TX, 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. Additive Alternative No. 1
 - a. Additive Alternative shall have the Contractor install a 4-foot-wide sidewalk on the east side of Armstrong Street. Between Henrietta Ave. & Yoakum Ave and Kleberg Ave and King Ave.

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 the 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 that provides goods or services at the best value for the City and the selected alternate bid items, if any. The contract will require the completion of the work in accordance with the contract documents.
- F. **In addition to other requirements stated herein, contractor must bid the following, Base Bid and Additive Alternative No. 1 in order for the bid proposal to be considered a Responsive Bid.**

Bid Modifications 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 communications 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 prior to the closing time, no consideration will be given to the telegraphic communication.
- B. Likewise, any bidder may modify a bid 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 Bidders 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 its 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 shown 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 its 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 public works contract in excess of certain dollar amounts with the State, any department, Board, agency, municipality, county, school district or any division or subdivision thereof. The successful bidder shall obtain a Payment Bond and a Performance Bond in the amount of the contract before commencing with work.
- B. The failure of the successful bidder to execute the agreement and supply the required bonds within ten (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 race, color, creed, religion, sex, sexual identity, gender identity, or national origin, and other civil rights requirements.

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 "2021 N. ARMSTRONG STREET IMPROVEMENTS FROM SANTA GERTRUDIS AVENUE TO KENEDY AVENUE." 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 120 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
<u>BASE BID – 2021 N. ARMSTRONG STREET IMPROVEMENTS FROM SANTA GERTRUDIS AVENUE TO KENEDY AVENUE.</u>					
B-1)	11808	SY	3” HMAC PAVEMENT (TYPE D) per plans and specifications, complete in place.	_____	_____
B-2)	11808	SY	SINGLE COURSE SEAL (AC-5 & #4 GRADE GRAVEL) per plans and specifications, complete in place.	_____	_____
B-3)	1783	GAL	PRIME COAT (MC-30) per plans and specifications, complete in place.	_____	_____
B-4)	11808	SY	10” LIMESTONE FLEXIBLE BASE (TYPE A, GRADE 1-2) per plans and specifications, complete in place.	_____	_____
B-5)	11808	SY	GEO-GRID BASE REINFORCEMENTS ON COMPACTED SUBGRADE per plans and specifications, complete in place.	_____	_____
B-6)	9	EA	MANHOLE ADJUSTMENT WITH CONC. COLLAR per plans and specifications, complete in place.	_____	_____
B-7)	1	EA	VALVE BOX ADJUSTMENT WITH CONC. COLLAR per plans and specifications, complete in place.	_____	_____
B-8)	4778	LF	REFLECTORIZED PAVEMENT MARKING (TY 1, W, 4”, SLD, 090 MIL) per plans and specifications, complete in place.	_____	_____

B-9)	4743	LF	REFLECTORIZED PAVEMENT MARKING (TY 1, Y, 4", SLD, 090 MIL) per plans and specifications, complete in place.	_____	_____
B-10)	3696	LF	REFLECTORIZED PAVEMENT MARKING (TY 1, Y, 4", BRK, 090 MIL) per plans and specifications, complete in place.	_____	_____
B-11)	76	LF	PREFAB PAVEMENT MARKING (TY C, W, 12", SLD, 090 MIL) STOP BAR per plans and specifications, complete in place.	_____	_____
B-12)	636	LF	PREFAB PAVEMENT MARKING (TY C, W, 24", SLD, 090 MIL) CROSSWALK per plans and specifications, complete in place.	_____	_____
B-13)	73	EA	REFLECTORIZED PAVEMENT MARKING (TY 1, 11-A-A) per plans and specifications, complete in place.	_____	_____
B-14)	16	EA	REFLECTORIZED PAVEMENT MARKING (TY 1, W, SGL ARW, 100 MIL) per plans and specifications, complete in place.	_____	_____
B-15)	6	EA	REFLECTORIZED PAVEMENT MARKING (TY 1, W, DBL ARW, 100 MIL) per plans and specifications, complete in place.	_____	_____
B-16)	3	EA	REFLECTORIZED PAVEMENT MARKING (TY 1, W, WORD, 100 MIL) plans and specifications, complete in place.	_____	_____

B-17)	6	EA	REFLECTORIZED PAVEMENT MARKING (TY 1, W, BIKE SYML, 100 MIL) per plans and specifications, complete in place.	_____	_____
B-18)	6	EA	REFLECTORIZED PAVEMENT MARKING (TY 1, W, BIKE ARW, 100 MIL) per plans and specifications, complete in place.	_____	_____
B-19)	303	LF	REFLECTORIZED PAVEMENT MARKING (TY 1, W, 8", SOLID, 090 MIL) per plans and specifications, complete in place.	_____	_____

TOTAL BASE BID – (ITEMS B-1 - B-19) \$ _____

ITEM	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE
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ALTERNATE BID NO. 1- 2021 N. ARMSTRONG STREET IMPROVEMENTS FROM SANTA GERTRUDIS AVENUE TO KENEDY AVENUE

A1-1)	25	SY	6" CONCRETE PAVEMENT WITH 4" LIMESTONE BASE per plans and specifications, complete in place.	_____	_____
A1-2)	119	SY	4" THICK CONCRETE SIDEWALK per plans and specifications, complete in place.	_____	_____
A1-3)	20	SY	ASPHALT DRIVEWAY REPAIR – 2" HMAC PAVEMENT (TYPE D) 8" LIMESTONE BASE per plans and specifications, complete in place.	_____	_____

TOTAL ALTERNATIVE BID NO. 1 – (ITEMS A1-1- A1-3) \$ _____

TOTAL BASE BID \$ _____

TOTAL BASE BID + ALTERNATIVE BID NO. 1 \$ _____

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 as 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 21-01 2020 N. ARMSTRONG STREET IMPROVEMENTS FROM SANTA GERTRUDIS AVENUE TO KENEDY AVENUE”

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 120 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 in the amount of _____, total base bid + Alternate bid No. 1 in the 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 21-01

**2020 N. ARMSTRONG STREET IMPROVEMENTS FROM SANTA GERTRUDIS AVENUE TO KENEDY
AVENUE**

**FOR
CITY OF KINGSVILLE, TEXAS**

City Manager

Mark McLaughlin

Mavor

Sam Fugate

Commissioner(s)

Hector Hinojosa

Edna Lopez

Ann Marie Torres

Norma Nelda Alvarez

DECEMBER 2020

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.

8.4 A set of drawings consisting of FIFTY-THREE (53) sheets titled:

Description

1. COVER SHEET
2. GENERAL NOTES AND OVERALL SITE PLAN
3. STA. 0+00 TO STA. 3+50
4. STA. 3+50 TO STA. 7+00
5. STA. 7+00 TO STA. 10+50
6. STA. 10+50 TO STA. 14+00
7. STA. 14+00 TO STA. 17+50
8. STA. 17+50 TO STA. 21+00
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18. TCP – PHASE II & VI
19. SUMMARY OF PAVEMENT MARKINGS
20. STA. 0+00 TO STA. 3+50
21. STA. 3+50 TO STA. 7+00
22. STA. 7+00 TO STA. 10+50
23. STA. 10+50 TO STA. 14+00
24. STA. 14+00 TO STA. 17+50
25. STA. 17+50 TO STA. 21+00
26. STA. 21+00 TO STA. 24+50
27. STA. 24+50 TO STA. 28+00
28. STA. 28+00 TO END
29. BARRICADE AND CONSTRUCTION SHEETS
30. EROSION CONTROL SHEETS
31. TRAFFIC CONTROL SHEETS
32. PAVEMENT MARKING SHEETS

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: _____
Mark McLaughlin, City Manager

By: _____

Attest: _____
Mary Valenzuela, City Secretary

Attest: _____

Address for giving notices:

Address for giving notices:

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

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]

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 I(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 l(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 l(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 1 01 0, 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. | | |
| 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. | |
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| 3.9 | Prohibited payroll deductions. | |
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| 3.11 | Regulations part of contract. | |

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.

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

_____, for **2021 N. ARMSTRONG STREET IMPROVEMENTS FROM SANTA GERTRUDIS AVENUE TO KENEDY AVENUE. - FOR CITY OF KINGSVILLE, TEXAS**

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)

(SEAL) Attest: By: _____

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

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

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)

(Principal Secretary) By _____ (s)

(SEAL)

(Witness as to Principal) (Address)

(Address)

ATTEST: _____
(Surety)

(Witness as to Surety) By _____
(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.

INSERT CERTIFICATE OF LIABILITY INSURANCE

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 Attorneys Name: _____

Texas State Bar Number: _____

SPECIAL CONDITIONS

SPECIAL CONDITIONS

DESCRIPTION OF WORK:

“2021 N. ARMSTRONG STREET IMPROVEMENTS FROM SANTA GERTRUDIS AVENUE TO KENEDY AVENUE”

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.

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 facility 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 12 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.

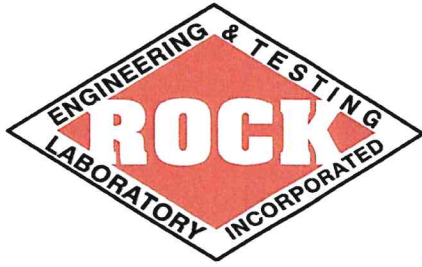
39. Contract Period

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 120 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.

GEO TECHNICAL REPORT



- GEOTECHNICAL ENGINEERING
- MATERIALS ENGINEERING & TESTING
- SOILS • ASPHALT • CONCRETE

GEOTECHNICAL SUBSURFACE INVESTIGATION AND
PAVEMENT RECOMMENDATIONS
FOR THE PROPOSED
ARMSTRONG STREET REHABILITATION
GERTRUDIS STREET TO KENNEDY AVENUE
KINGSVILLE, TEXAS

RETL REPORT NUMBER: G120362

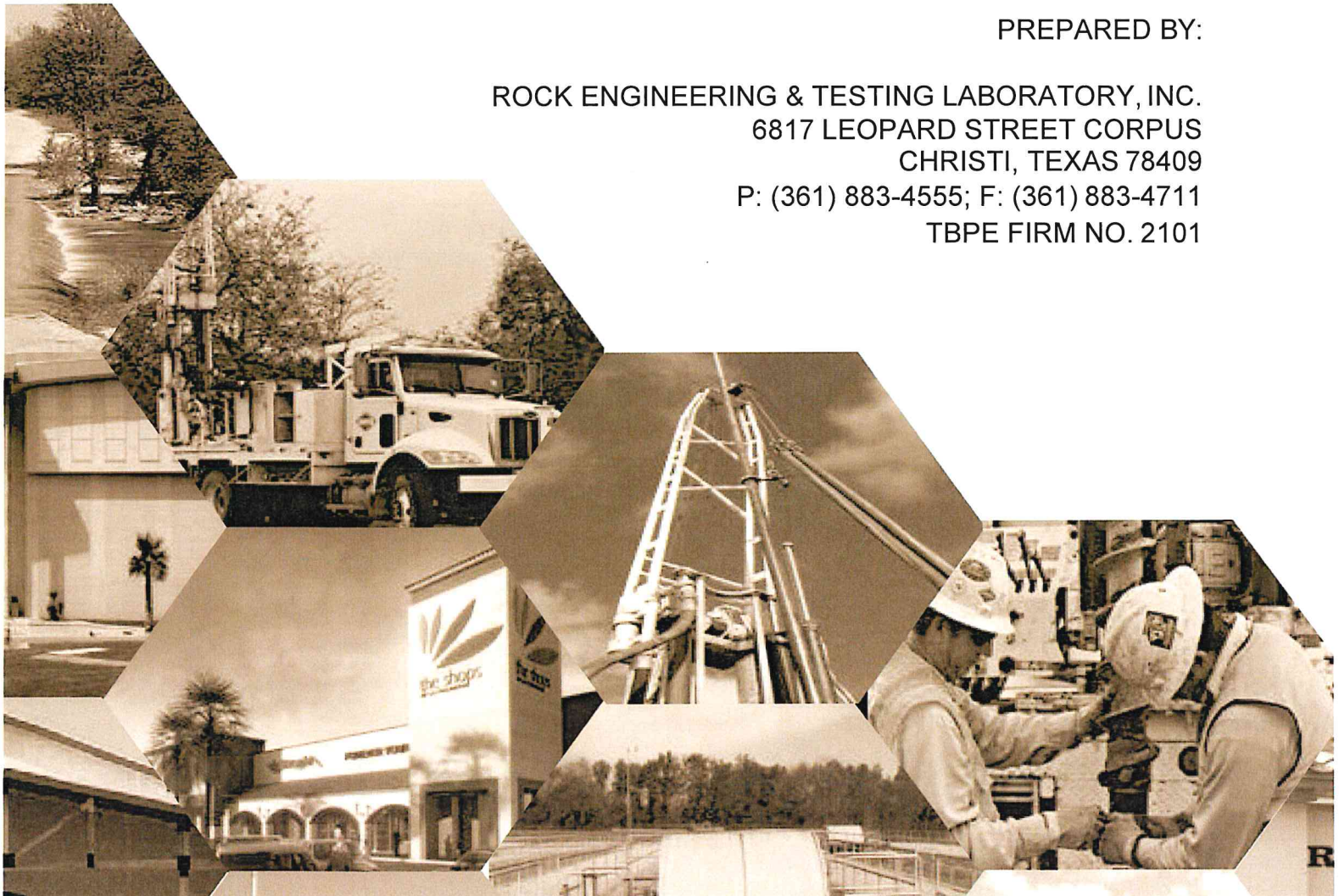
PREPARED FOR:

CITY OF KINGSVILLE ENGINEERING DEPARTMENT
400 WEST KING AVENUE
KINGSVILLE, TEXAS 78363

AUGUST 20, 2020

PREPARED BY:

ROCK ENGINEERING & TESTING LABORATORY, INC.
6817 LEOPARD STREET CORPUS
CHRISTI, TEXAS 78409
P: (361) 883-4555; F: (361) 883-4711
TBPE FIRM NO. 2101





- GEOTECHNICAL ENGINEERING
- CONSTRUCTION MATERIALS ENGINEERING & TESTING
- SOILS • ASPHALT • CONCRETE

August 20, 2020

City of Kingsville Engineering Department
400 West King Avenue
Kingsville, Texas 78363

Attention: Mr. Joseph Ramirez

SUBJECT: SUBSURFACE EXPLORATION, LABORATORY TESTING PROGRAM, AND PAVEMENT RECOMMENDATIONS FOR THE PROPOSED ARMSTRONG STREET REHABILITATION Santa Gertrudis Street to Kennedy Avenue Kingsville, Texas RETL Job No. – G120362

Dear Mr. Ramirez,

In accordance with our agreement, we have conducted a subsurface exploration for the above referenced project. The results of this investigation, together with our recommendations, are to be found in the accompanying report, one electronic copy of which is being transmitted for distribution to the design team.

Often, because of design and construction details that occur on a project, questions arise concerning soil conditions, and Rock Engineering and Testing Laboratory, Inc. (RETL), a Texas Professional Engineering Firm (No. – 2101), would be pleased to continue its role as Geotechnical Engineer during the project implementation.

RETL also has great interest in providing materials testing and observation services during the construction phase of this project. If you will advise us of the appropriate time to discuss these engineering services, we will be pleased to meet with you at your convenience. If you have any questions, or if we can be of further assistance, please contact us at (361) 883-4555.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark C. Rock".

Mark C. Rock, P.E.
Senior Consultant

ROCK ENGINEERING & TESTING LABORATORY, INC. (TBPE FIRM NO. 2101)

Corpus Christi
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Round Rock, TX 78664

**SUBSURFACE INVESTIGATION, LABORATORY TESTING PROGRAM, AND
PAVEMENT RECOMMENDATIONS
FOR THE PROPOSED
ARMSTRONG STREET REHABILITATION
SANTA GERTRUDIS STREET TO KENNEDY AVENUE
KINGSVILLE, TEXAS**

RETL REPORT NUMBER: G120362

PREPARED FOR:

**CITY OF KINGSVILLE ENGINEERING DEPARTMENT
400 WEST KING AVENUE
KINGSVILLE, TEXAS 78363**

AUGUST 20, 2020

PREPARED BY:

**ROCK ENGINEERING AND TESTING LABORATORY, INC.
6817 LEOPARD STREET
CORPUS CHRISTI, TEXAS 78409
PHONE: (361) 883-4555; FAX: (361) 883-4711**

TEXAS PROFESSIONAL ENGINEERING FIRM NO. 2101



**James P. Bauer, P.E.
Corpus Christi Branch Manager
Cell: 361 502 1996**



**Mark C. Rock, P.E.
Senior Consultant
Cell: 361 438 8755**



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INTRODUCTION

This report presents the results of a soils exploration for the proposed Armstrong Street Rehabilitation project in Kingsville, Texas. This study was conducted for the City of Kingsville Engineering Department.

Authorization

The work for this project was performed in accordance with Rock Engineering and Testing Laboratory, Inc. (RETL) proposal number P061620C (Revision 1) dated July 1, 2020. The scope of work and fee was approved July 2, 2020 by Mr. Mark A. McLaughlin, Kingsville City Manager, and returned to RETL via email transmission.

Purpose and Scope

The purpose of this exploration was to evaluate the subsurface soils within the limits of the proposed roadway rehabilitation and to provide pavement recommendations suitable for the proposed project. The scope of the exploration and analysis included the subsurface exploration, field and laboratory testing, engineering analysis and evaluation of the subsurface soils, provision of pavement recommendations, and preparation of this report.

The scope of services did not include an environmental assessment. Any statements in this report, or on the boring log, regarding odors, colors, unusual or suspicious items or conditions are strictly for the information of the client.

General

The exploration and analysis of the subsurface conditions reported herein are considered sufficient in detail and scope to provide pavement recommendations for the proposed project. The information submitted for the proposed project is based on project details provided by the City of Kingsville and the soil information obtained at the boring locations. If the designers require additional soil parameters to complete the design of the proposed pavement systems, and this information can be obtained from the soil data and laboratory tests performed within the scope of work included in our proposal for this project, RETL will provide the additional information requested as a supplement to this report.

The Geotechnical Engineer states that the findings, recommendations, specifications or professional advice contained herein have been prepared after being prepared in a manner consistent with that level of care and skill ordinarily exercised by reputable members of the Geotechnical Engineer's profession practicing contemporaneously under similar conditions in the locality of the project. RETL operates in general accordance with "*Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction*, (ASTM D3740)." No other representations are expressed or implied, and no warranty is included or intended.

This report has been prepared for the exclusive use of the City of Kingsville Engineering Department for the specific application for the proposed Armstrong Street Rehabilitation project in Kingsville, Texas.

DESCRIPTION OF SITE

The proposed Armstrong Street rehabilitation project site is approximately 3,000 feet in length and located between Santa Gertrudis Street and Kennedy Avenue in Kingsville, Texas. The existing roadway is a relatively flat, two-lane, asphaltic concrete roadway with a width on the order of 30 to 35 feet. Overhead utilities are present along the northbound lane of Armstrong Street, while below-grade utilities are present adjacent to the roadway. The existing roadway is slightly lower in elevation than the adjacent properties, with curbs on both sides of the street. The ground surface was firm at the time of our field investigation and did not inhibit RETL's access to the site.

FIELD EXPLORATION

Scope

The field exploration, to evaluate the engineering characteristics of the subsurface materials, included reconnaissance of the project site, coring the existing pavement materials, performing the test boring operations and obtaining relatively undisturbed Shelby tube samples. During the sample recovery operations, the soils encountered were classified and recorded on the boring logs in accordance with “*Standard Guide for Field Logging of Subsurface Exploration of Soil and Rock, (ASTM D5434).*”

Ten borings were performed for the purpose of providing geotechnical recommendations for the proposed project. The table below provides the boring identification, boring depth and GPS coordinates.

Summary of Boring Information		
Boring Identification	Boring Depth (ft)	GPS Coordinates
B-1	5	N 27.51460° W 97.87769°
B-2	5	N 27.51527° W 97.87775°
B-3	5	N 27.51620° W 97.87769°
B-4	5	N 27.51723° W 97.87778°
B-5	5	N 27.51818° W 97.87774°
B-6	5	N 27.51921° W 97.87779°
B-7	5	N 27.52002° W 97.87777°
B-8	5	N 27.52089° W 97.87788°
B-9	5	N 27.52177° W 97.87780°
B-10	5	N 27.52240° W 97.87786°

GPS coordinates were obtained at the boring locations using a commercially available GPS and are provided in this report and on the boring logs. The City of Kingsville determined the scope of the field work. RETL staked the borings in the field and performed the drilling operations.

Upon completion of the drilling operations and obtaining the groundwater observations, the boreholes were backfilled with excavated soil, patched with cold mix, and the site cleaned as required. Boring Location Plans are provided in the Appendix.

The borings performed for this project were used to determine the classification and strengths of the subgrade soils. The information provided on the boring logs includes the boring location, boring depth, soil classifications, soil strengths, and laboratory test results. The boring logs are included in the Appendix.

Drilling and Sampling Procedures

At the boring locations, the pavement constituents were cored using a diamond core barrel until subgrade soils were encountered. After coring, the pavement constituents were removed and measured for thickness. The borings were then advanced using a drill rig equipped with a rotary head turning solid stem augers to the termination depths of 5 feet. Relatively undisturbed soil samples were obtained using thin-wall tube sampling procedures in accordance with, "*Thin Walled Tube Sampling of Soils, (ASTM D1587).*" The samples obtained by this procedure were extruded by a hydraulic ram in the field.

The samples were placed in plastic bags, marked according to boring numbers, depths, and any other pertinent field data, stored in special containers, and delivered to the laboratory for testing.

Field Observations

Water Level Observations – Water level observations were obtained during the test boring operations. Water level observations are noted on the boring logs provided in the Appendix. In relatively pervious soils, such as sands, the indicated depths are usually reliable groundwater levels. In relatively impervious soils, such as clay, a suitable estimate of the groundwater depth may not be possible, even after several days of observation. Seasonal variations, temperature, land-use, proximity to water bodies and recent rainfall conditions may influence the depth to the groundwater. The amount of water in open boreholes largely depends on the permeability of the soils encountered at the boring locations.

Ground Surface Elevation – The ground surface elevations at the boring locations were not provided at the time of this report. Therefore, the depths referred to in this report are from the actual ground surface at the boring locations during the time of our field investigation.

LABORATORY TESTING PROGRAM

In addition to the field investigation, a laboratory testing program was conducted to determine additional pertinent engineering characteristics of the subsurface materials necessary in analyzing the behavior of the pavement systems for the proposed project.

The laboratory testing program included supplementary visual classification (ASTM D2487) and water content tests (ASTM D2216) on the samples. In addition, selected samples were subjected to Atterberg limits tests (ASTM D4318) and percent material finer than the #200 sieve tests (ASTM D1140).

The laboratory testing program was conducted in general accordance with applicable ASTM Specifications. The results of these tests are to be found on the accompanying boring logs provided in the Appendix.

SUBSURFACE CONDITIONS

General

The types of surficial and subsurface materials encountered in the borings have been visually classified and are described in detail on the boring logs. The results of the water level observations and the field and laboratory tests are presented also on the boring logs. Representative samples of the soils were placed in polyethylene bags and are now stored in the laboratory for further analysis, if desired. Unless notified to the contrary, the samples will be disposed of three months after issuance of this report.

The stratification of the soil, as shown on the boring logs, represents the soil conditions at the actual boring locations. Variations may occur between, or beyond, the boring locations. Lines of demarcation represent the approximate boundary between different soil types, but the transition may be gradual, or not clearly defined.

It should be noted that, whereas the test borings were drilled and sampled by experienced drillers, it is sometimes difficult to record changes in stratification within narrow limits. In the absence of foreign substances, it is also difficult to distinguish between discolored soils and clean soil fill.

Existing Pavement and Soil Conditions

The borings were drilled through existing pavements. The description and thicknesses of the existing pavement constituents encountered at the boring locations are provided in the following table:

Existing Pavement Constituents							
Boring Number	HMAC Thickness (Inches)	Base Material Thickness (Inches)	Total Pavement Thickness (Inches)	Base Material Properties			
				Material Type	LL	PI	#200
B-1	1¾	10¼	12	Clayey Sand with Aggregate	---	---	---
B-2	1½	10¼	11¼	Clayey Sand with Aggregate	---	---	---
B-3	2	9½	11½	Clayey Sand with Aggregate	37	15	30
B-4	2½	8½	10½	Clayey Sand with Aggregate	---	---	---
B-5	2	9	11	Clayey Sand with Aggregate	---	---	---
B-6	1¾	8¼	10	Clayey Sand with Aggregate	---	---	---
B-7	2	8½	10½	Clayey Sand with Aggregate	34	11	25
B-8	2¼	7¼	9½	Clayey Sand with Aggregate	---	---	---
B-9	1¾	9¼	11	Clayey Sand with Aggregate	---	---	---
B-10	1¾	10¼	12	Clayey Sand with Aggregate	31	8	20
Average	2	9	11	Clayey Sand with Aggregate	34	11	25

The subgrade soils immediately below the existing pavement base materials were tested using a phenolphthalein solution. Phenolphthalein is a chemical compound that can be used as an indicator of the presence of lime, as it is colorless in acidic solutions and turns pink in basic solutions. Based upon the phenolphthalein testing on the subgrade at each boring location, it appears that lime is not present in the subgrade soils at any of the boring locations.

The soil conditions encountered at the boring locations and beneath the existing pavement constituents are fairly consistent. The soil properties including soil classification, plasticity, undrained shear strength, angle of internal friction, and effective unit weight are provided in the following table.

Soil Profile Table							
D	Description	LL	PI	C	φ	γ _e	#200
1 - 5	Sandy Lean CLAY and Lean CLAY with Sand	22 - 43	9 - 25	2,000	0	120	52 - 72

Where:

- D = Average depth in feet below existing grade
- PI = Plasticity Index
- C = Soil Cohesion, psf (undrained)
- ϕ = Angle of Internal Friction, deg. (undrained)
- γ_e = Effective soil unit weight, pcf
- #200 = Percent passing the No. 200 sieve (%)

Detailed descriptions of the soils encountered at the boring location are provided on the boring logs included in the Appendix.

Groundwater Observations

Groundwater was not encountered during drilling, nor was it measured in the boreholes upon completion of the drilling and sampling operations. Therefore, based on the moisture contents obtained in the laboratory and the observations made during the drilling operations, the groundwater elevation at this site is at a depth greater than 5 feet, the termination depth of the borings performed.

It should be noted that water levels in open boreholes may require several hours to several days to stabilize depending on the permeability of the soils and that groundwater levels at this site will be subject to seasonal conditions, recent rainfall, drought or temperature effects.

PROJECT DESCRIPTION

Based on information provided to RETL, the project will consist of rehabilitation of the Armstrong Street pavements, between its intersections with Santa Gertrudis Street and Kennedy Avenue, in Kingsville, Texas. We have been informed that there are currently three pavement rehabilitation options that are being considered as follows:

- Complete removal of all existing asphaltic pavement constituents and reconstruction of new flexible asphalt pavements,
- Complete removal of all existing asphaltic pavement constituents and reconstruction of new rigid concrete pavements, or
- Reclamation and compaction of existing pavement materials, and placement of new asphalt.

PAVEMENT RECOMMENDATIONS

The conditions that influence pavement design can be summarized as follows:

- Bearing values of the subgrade. These can be represented by a California Bearing Ratio (CBR) for the design of flexible pavements,

- Vehicular traffic, in terms of the number and frequency of vehicles and their range of axle loads,
- Probable increase in vehicular use over the life of the pavement, and
- The availability of suitable materials to be used in the construction of the pavement and their relative costs.

Specific laboratory testing to define the subgrade strength (i.e. CBR values) has not been performed for this analysis. **Based upon local experience and soil classification, the estimated CBR value for the natural sandy lean clay soils encountered at this site is 4.**

Specific information regarding the vehicular traffic loads for Armstrong Street was not provided to RETL for consideration. Based on the location of roadway and the presence of varying types of properties and uses, we anticipate the roadway would be consistent with a local, non-residential road or a collector, as defined within the City of Corpus Christi Department of Engineering Services Infrastructure Design Manual dated March 2013. Local non-residential roads and collectors are typically designed for 18-kip Equivalent Single Axle Loading (ESALS) on the order 1,000,000 and 2,000,000, respectively.

RETL is providing pavement recommendations herein that are appropriate for 1,000,000 and 2,000,000 18-kip Equivalent Single Axle Loading (ESALS). The owner should select the more appropriate design ESAL value based upon current and projected trafficking information. In addition, we have considered typical pavement design parameters as outlined in the table below. If the owner or consultant provides considerations that conflict with the design traffic or parameters which have been assumed, then RETL should be given the opportunity, prior to final issue of the plans and specifications, to determine if supplemental or revised recommendations are warranted.

Pavement Design Parameters		
Flexible Pavement ESAL's	1,000,000	2,000,000
Reliability (percent)	80	90
Initial Serviceability (flexible pavements)	4.2	4.2
Initial Serviceability (rigid pavements)	4.5	4.5
Terminal Serviceability	2.0	2.5
Standard Deviation (flexible pavements)	0.45	0.45
Standard Deviation (rigid pavements)	0.35	0.35
Resilient Modulus of Subgrade (psi)	5,014	5,014
Modulus of Subgrade Reaction (pci)	120	120
Minimum Required Structural Number (flexible pavements)	3.57	4.50

Flexible Pavement Recommendations

The recommended flexible pavement sections calculated using the American Association of the State Highway and Transportation Officials, "GUIDE FOR DESIGN OF PAVEMENT STRUCTURES," are provided in the following tables.

Recommended Flexible Pavement Sections (New Pavement Constituents)				
Pavement Constituent	1,000,000 ESALs		2,000,000 ESALs	
	Option 1	Option 2	Option 1	Option 2
HMAC Type D and/or B	3 inches	4 inches	5 inches	6 inches
Limestone Base (Type A, Gr. 1-2)	10 inches	8 inches	10 inches	8 inches
Geogrid TX5	Yes	Yes	Yes	Yes
Total Section Thickness	13 inches	12 inches	15 inches	14 inches
Calculated SN	3.63	3.73	4.51	4.61

The flexible pavement options presented below are based upon cement stabilization of the existing clayey sand base materials. The cumulative thickness of the new pavement constituents required to achieve the design ESAL values exceed the cumulative thickness of the existing pavement constituents. Accordingly, if the elevation of the street surface can not be raised due to existing curb and gutter elevations, in-place pulverization and stabilization of the existing base material will not be a viable option. However, the existing pavements may be removed in their entirety and pulverized and stockpiled at an off-site location until the soil subgrade is lowered to the required elevation. Two pavement section options are being provided below and consist of:

Option 1 - Fully utilize the existing pavement materials through removal and off-site pulverization.

Option 2 - Utilize the minimum recommended stabilized base section thickness to minimize required subgrade cut depths.

Recommended Flexible Pavement Sections (Reclaimed Base Material, New Asphalt)				
Pavement Constituent	1,000,000 ESALs		2,000,000 ESALs	
	Option 1	Option 2	Option 1	Option 2
HMAC Type D and/or B	5.5 inches	6.5 inches	7.5 inches	8.5 inches
Cement Stabilized Base	9 inches	6 inches	9 inches	6 inches
Total Section Thickness	14.5 inches	12.5 inches	16.5 inches	14.5 inches
Calculated SN	3.68	3.70	4.56	4.58

Subgrade Preparation - Once existing pavement materials have been removed and the proper subgrade elevation has been achieved, the exposed subgrade soils shall be proof-rolled in accordance with Texas Department of Transportation Standard Specification Item 216; "PROOF ROLLING". The equipment performing the proof rolling shall be a pneumatic tire roller with minimum weight of 25 tons and maximum weight of 50 tons. The roller shall meet the requirements of Texas Department of Transportation Standard Specification Item 210; Section 210.2.D, "Pneumatic Tire Rollers." The contact pressure shall be less than or equal to 150 psi for a pneumatic tire roller that weighs between 25 to 50 tons. A pneumatic tire roller weighing between 25 to 50 tons is a "Heavy Pneumatic".

Any soft areas identified shall be removed to firm soils and replaced with properly compacted "**Select Fill**" soils. Once any soft areas have been remediated, then the subgrade soils shall be compacted to a minimum of 95 percent of the maximum dry density, as determined by the standard Proctor (ASTM D698), and at, or above the optimum moisture content.

Upon completion of the raw subgrade preparation, and if the planned pavement rehabilitation selected for this project includes the use of geogrid, a layer of the specified geogrid shall be placed on the properly prepared raw subgrade. The geogrid shall be placed in accordance with the manufacturer's recommendations.

Cement Stabilized Base - Where stockpiling, cement stabilization and reuse of the existing base material is to be performed, cement stabilization shall be performed in accordance with Texas Standard Specifications 2014; Item 275, "CEMENT TREATMENT (ROAD MIXED)." Prior to construction, further testing will be required to quantify the actual amount of cement required to treat the subgrade soils. For preliminary planning, the contractor may estimate that cement shall be mixed with the reclaimed base material at a minimum rate of 4 to 6 percent based on the maximum dry unit weight of the raw reclaimed materials, as determined by the standard Proctor test (ASTM D698). The actual amount of cement required to stabilize the reclaimed pavement constituents shall be determined based on a cement curve to determine the percentage of cement required to achieve a strength of at least 300 pounds per square inch (psi) per TxDOT Item 120-E. The contractor shall have appropriate means and methods to assure uniform placement of cement.

The cement stabilized material shall be compacted to a minimum density of 95 percent of the standard Proctor test (ASTM D698) and within ± 2 -percentage points of the optimum moisture content.

Micro-Cracking - If cement stabilization of the existing base material is performed, micro-cracking of the treated materials should be performed to reduce the potential of reflective cracking in the overlying asphalt. The following provides a discussion of micro-cracking to mitigate the development of reflective cracking. If micro-cracking is not desired for the proposed project, then RETL recommends that a pavement section utilizing compacted subgrade soils and crushed limestone base material reinforced with geogrid be utilized.

Cement stabilized soils are well-known for developing shrinkage cracks, which can reflect through the asphalt concrete surface and accelerate the deterioration of the pavement. Micro-cracking is a special reflective-cracking mitigation technique that produces a fine network of hairline cracks through vibratory roller compaction on the cement stabilized soils shortly after the base construction. The micro-cracks will help relieve the contracting stress of the cement stabilized layer during its curing process, thus preventing it from forming wider shrinkage cracks, which are more likely to be reflected to the pavement surface.

Observations from studies performed by varying state transportation agencies indicated that:

- When properly applied, microcracking does not result in pavement damage. The surface does not break up, and the subgrade modulus of the cement stabilized material recovers.
- Without microcracking, excessively high cement contents result in problematic cracking in the cement stabilized materials. This problematic cracking could be increased crack width, increased total crack length, or both.
- Microcracking reduces the severity of shrinkage cracks in the cement stabilized soils, regardless of cement content, and in some cases also significantly reduces total crack length.
- The positive effect of microcracking means the technique is a valid method for reducing the likelihood of reflective cracking through the roadway surfacing.
- Proper lab design combined with microcracking by three passes of the vibratory roller at high amplitude after 2 to 3 days cure has provided a marked reduction in shrinkage cracking problems.
- Moist curing without microcracking results in more severe (wider) cracks that will, thus, reflect sooner through the surfacing.
- After cement stabilization and compaction of the stabilized materials to project specifications, moist cure the stabilized section to an age of 2 days.
- Microcrack the section by using the same (or equivalent) vibratory steel wheel roller that was employed for compaction. If microcracking after 2 days is not feasible, waiting until the cement stabilized section age reaches 3 days is preferable to microcracking after only 1 day cure.
- Perform three full passes (one pass is down and back) over the entire section traveling 2 to 3 mph with the roller vibrating on maximum amplitude, unless otherwise directed by the Engineer. A minimum 12-ton roller should be used. Ideally microcracking should be applied after 2 days of moist curing.
- After microcracking, continue moist curing the layer to an age of 3 days. At the completion of the curing stage, place the base course.

Crushed Limestone Base - Crushed Limestone base materials in flexible pavement areas should meet the requirements set forth in Texas Standard Specifications 2014; Item 247, Type A, Grade 1-2 and should be placed in maximum 8-inch thick loose lifts and compacted to a minimum density of 98 percent of the maximum dry density as determined by the modified Proctor test (ASTM D1557) and within $\pm 1\frac{1}{2}$ percent of the optimum moisture content.

Surface Treatment and Asphalt - RETL recommends placing a single course surface treatment underseal, a prime coat (MC-30 or MC-70), or both, on the finished flexible base material prior to placing the HMAC courses. A single course surface treatment underseal should be utilized if opened to traffic.

Hot mix asphaltic concrete should meet the requirements set forth in TxDOT Item 340. Maximum and minimum thicknesses of HMAC placement for the types of HMAC recommended are provided in the following table.

Minimum/Maximum Recommended HMAC Compacted Lift Thickness		
HMAC Mixture Type	Minimum Compacted Lift Thickness (in)	Maximum Compacted Lift Thickness (in)
Type D HMAC	1.5	3
Type B HMAC	2.5	5

Rigid Pavement Recommendations

The use of concrete for paving has become more prevalent in recent years due to a decrease in the material cost of concrete and the long-term maintenance cost benefits of concrete pavement compared to asphaltic pavements. The recommended rigid pavement section calculated using the American Association of the State Highway and Transportation Officials, "GUIDE FOR DESIGN OF PAVEMENT STRUCTURES," are provided in the following table.

Recommended Rigid Pavement Section		
Pavement Constituent	1,000,000 ESALs	2,000,000 ESALs
Reinforced Concrete	6 inches	7.5 inches
Crushed Limestone Base Material (TxDOT Item 247 Type A; Gr. 1-2)	6 inches	6 inches
Compacted Subgrade	12 inches	12 inches

Once existing pavement materials have been removed and the proper subgrade elevation has been achieved, the exposed subgrade soils shall be proof-rolled in accordance with Texas Department of Transportation Standard Specification Item 216; "PROOF ROLLING". The equipment performing the proof rolling shall be a pneumatic tire roller with minimum weight of 25 tons and maximum weight of 50 tons. The roller shall meet the requirements of Texas Department of Transportation Standard Specification Item 210; Section 210.2.D, "Pneumatic Tire Rollers." The contact pressure shall be less than or equal to 150 psi for a pneumatic tire roller that weighs between 25 to 50 tons. A pneumatic tire roller weighing between 25 to 50 tons is a "Heavy Pneumatic".

Any soft areas identified shall be removed to firm soils and replaced with properly compacted "**Select Fill**" soils. Once any soft areas have been remediated, then the subgrade soils shall be compacted to a minimum of 95 percent of the maximum dry density, as determined by the standard Proctor (ASTM D698), and at, or above the optimum moisture content.

Upon completion of the raw subgrade preparation, crushed limestone base materials should be placed. The crushed limestone base materials in rigid pavement areas should meet the requirements set forth in Texas Standard Specifications 2014; Item 247, Type A, Grade 1-2 and should be placed in maximum 8-inch thick loose lifts and compacted to a minimum density of 98 percent of the maximum dry density as determined by the standard Proctor test (ASTM D698) and within $\pm 1\frac{1}{2}$ percent of the optimum moisture content.

The concrete pavement should be reinforced and jointed as per applicable TxDOT specifications and should have a minimum 28-day compressive strength of 4,500 psi or flexural strength of 620 psi. Expansion joints should be sealed with an appropriate sealant so that moisture infiltration into the subgrade soils and resultant concrete deterioration at the joints is minimized. The joints should be thoroughly cleaned, and sealant should be installed without overfilling before pavement is opened to traffic.

Select Fill

Imported "**Select Fill**" material used at this site shall be homogenous, free from organics, and clay balls, and other deleterious materials and shall have a maximum liquid limit of 40 percent and a plasticity index (PI) between 7 and 18. The select fill soils shall have a minimum of 35 percent passing the No. 200 sieve and no soil particles exceeding $1\frac{1}{2}$ inches will be permitted. The fill should be placed in no greater than 8-inch thick loose lifts and compacted to a minimum density of 95 percent of the maximum dry density, as determined by the standard Proctor test (ASTM D698), and at, or above, the optimum moisture content.

Routine Maintenance of Rigid and Flexible Pavement Systems

The pavement sections provided in this report are designed based on the indicated 18-kip equivalent single axle loads. During the design life, the roadway will require routine maintenance such as crack sealing and seal coats for flexible pavements and joint maintenance for rigid pavement sections in order to achieve a desirable life of pavement. Without proper maintenance, moisture infiltration into the base material and subgrade will result in rapid deterioration of the pavement system. RETL recommends that the City of Kingsville protect their investment by incorporating an aggressive maintenance program.

CONSTRUCTION CONSIDERATIONS

Earthwork and Subgrade Acceptance

Exposure to the environment may weaken the soils if excavations remain open for long periods of time. RETL recommends that provision for proper drainage during and after construction are designed and implemented. Therefore, it is recommended that all excavations be extended to final grade and the pavements are constructed as soon as possible to minimize potential damage to the bearing soils. The bearing level should be free of loose soil, ponded water or debris and should be observed by the Geotechnical Engineer, or his designated representative.

Pavement constituents should not be placed on soils that have been disturbed by rainfall or seepage. If the bearing soils are softened by surface water intrusion, or by desiccation, the unsuitable soils must be removed from the excavation and replaced with properly compacted fill.

The Geotechnical Engineer or his designated representative shall monitor and test for compliance to project plans and specifications the placement of all roadway constituents. Any areas not meeting the required compaction shall be recompacted and retested until compliance is met.

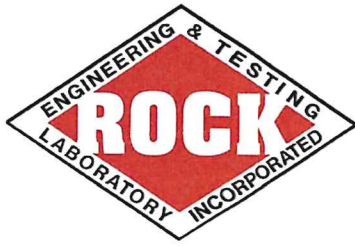
GENERAL COMMENTS

If significant changes are made in the character or location of the proposed project, a consultation should be arranged to review any changes with respect to the prevailing soil conditions. At that time, it may be necessary to submit supplementary recommendations.

It is recommended that the services of RETL be engaged to test and evaluate the subgrade soils in the pavement excavations prior to placing pavement constituents in order to verify that the bearing soils are consistent with those encountered in the borings. RETL cannot accept any responsibility for any conditions that deviate from those described in this report, nor for the performance of the pavement systems if not engaged to also provide construction observation and testing for this project. If it is required for RETL to accept any liability, then RETL must agree with the plans and perform such observation during construction as we recommend.

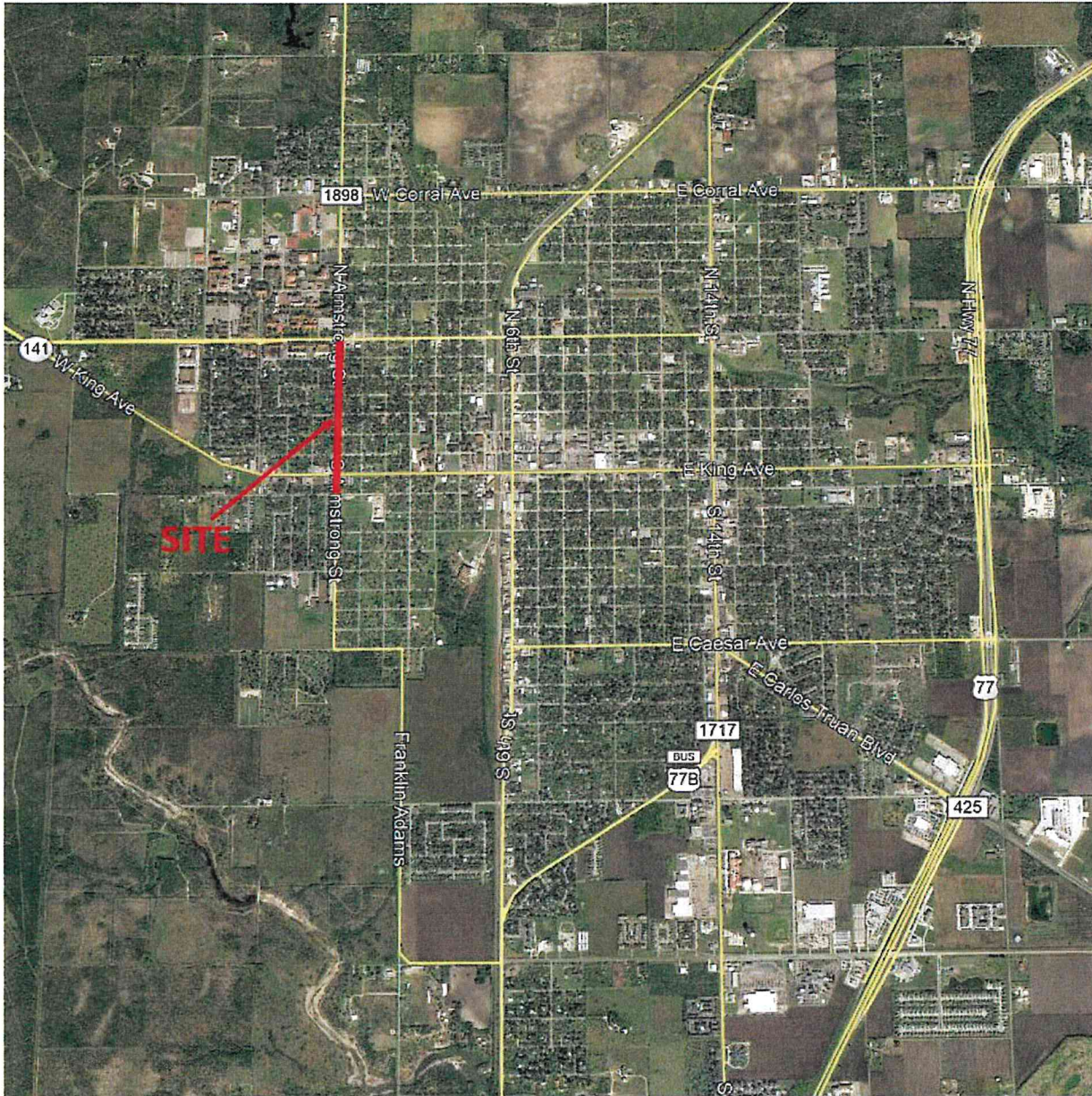
All sheeting, shoring, and bracing of trenches, pits and excavations should be made the responsibility of the contractor and should comply with all current and applicable local, state and federal safety codes, regulations and practices, including the Occupational Safety and Health Administration.

APPENDIX



- GEOTECHNICAL ENGINEERING
- CONSTRUCTION MATERIALS ENGINEERING & TESTING
- SOILS • ASPHALT • CONCRETE

SITE VICINITY MAP



August 20, 2020
Attn: Mr. Joseph Ramirez
RETL Job Number: G120362

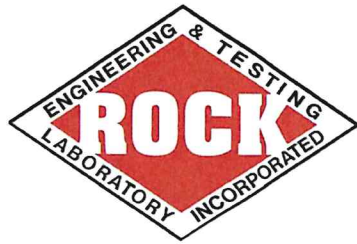
ARMSTRONG STREET REHABILITATION
Santa Gertrudis Street to Kennedy Avenue
Kingsville, Texas

ROCK ENGINEERING & TESTING LABORATORY, INC. (TBPE FIRM NO. 2101)

Corpus Christi
Office: 361.883.4555
Fax: 361.883.4711
6817 Leopard St.
Corpus Christi, TX 78409

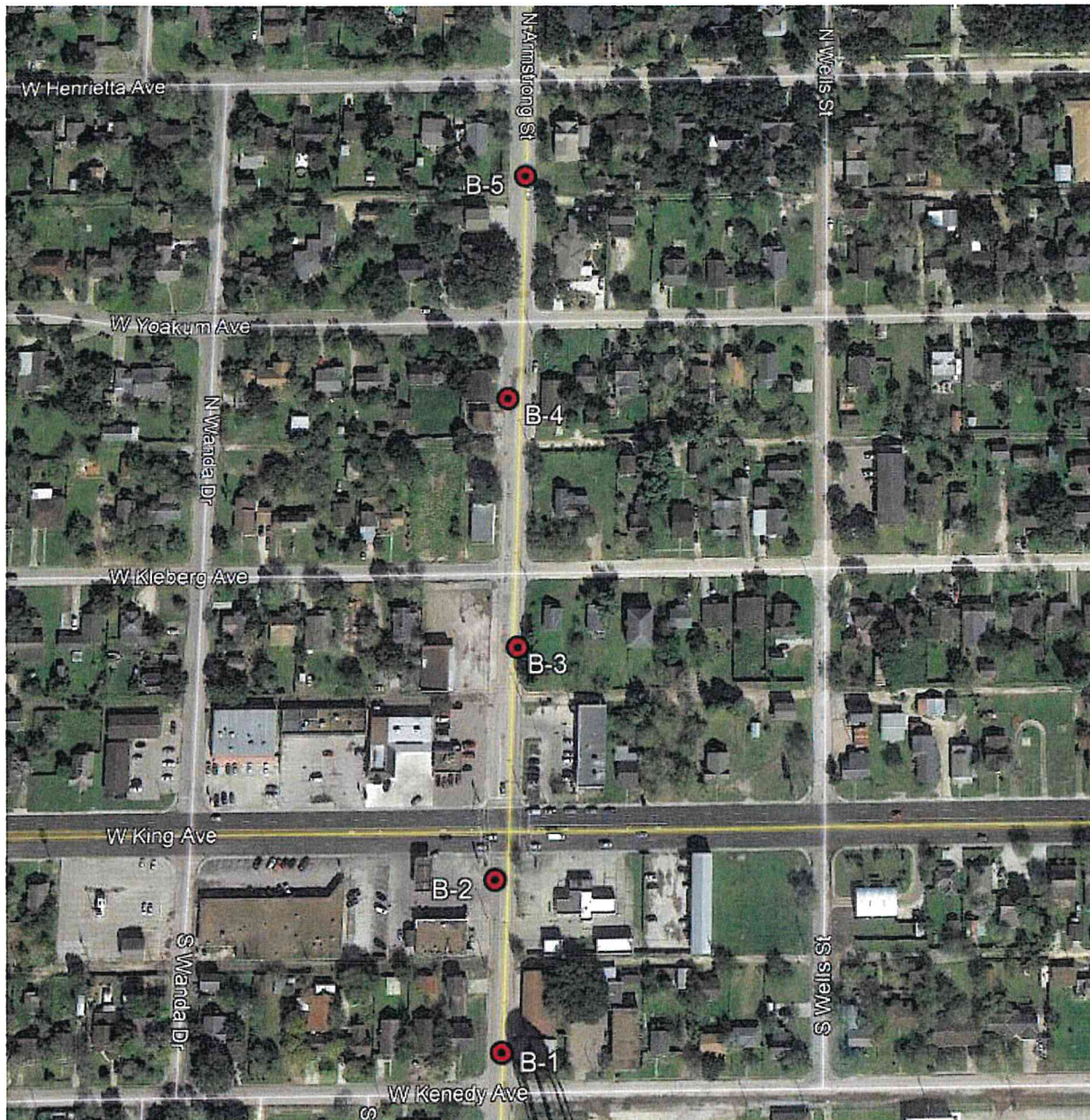
San Antonio
Office: 210.495.8000
Fax: 210.495.8015
10856 Vandale
San Antonio, TX 78216

Round Rock
Office: 512.284.8022
Fax: 512.284.7764
7 Roundville Ln.
Round Rock, TX 78664



- GEOTECHNICAL ENGINEERING
- CONSTRUCTION MATERIALS ENGINEERING & TESTING
- SOILS • ASPHALT • CONCRETE

BORING LOCATION PLAN 1



August 20, 2020
Attn: Mr. Joseph Ramirez
RETL Job Number: G120362

ARMSTRONG STREET REHABILITATION
Santa Gertrudis Street to Kennedy Avenue
Kingsville, Texas

ROCK ENGINEERING & TESTING LABORATORY, INC. (TBPE FIRM NO. 2101)

Corpus Christi
Office: 361.883.4555
Fax: 361.883.4711
6817 Leopard St.
Corpus Christi, TX 78409

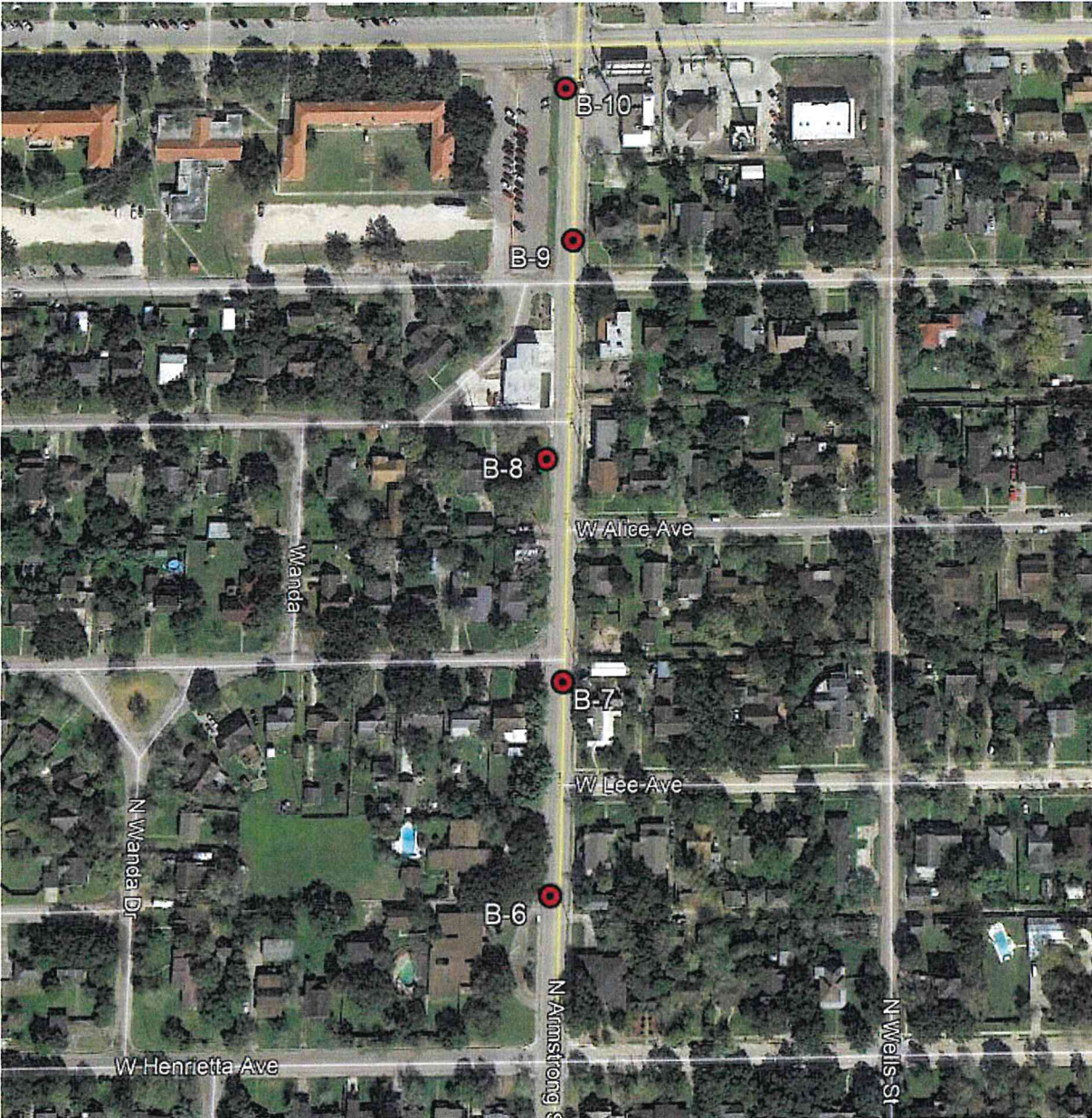
San Antonio
Office: 210.495.8000
Fax: 210.495.8015
10856 Vandale
San Antonio, TX 78216

Round Rock
Office: 512.284.8022
Fax: 512.284.7764
7 Roundville Ln.
Round Rock, TX 78664



- GEOTECHNICAL ENGINEERING
- CONSTRUCTION MATERIALS ENGINEERING & TESTING
- SOILS • ASPHALT • CONCRETE

BORING LOCATION PLAN 2



August 20, 2020
Attn: Mr. Joseph Ramirez
RETL Job Number: G120362

ARMSTRONG STEET REHABILITATION
Santa Gertrudis Street to Kennedy Avenue
Kingsville, Texas

ROCK ENGINEERING & TESTING LABORATORY, INC. (TBPE FIRM NO. 2101)

Corpus Christi
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Fax: 361.883.4711
6817 Leopard St.
Corpus Christi, TX 78409

San Antonio
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Fax: 210.495.8015
10856 Vandale
San Antonio, TX 78216

Round Rock
Office: 512.284.8022
Fax: 512.284.7764
7 Roundville Ln.
Round Rock, TX 78664

LOG OF BORING B-1



Rock Engineering & Testing Lab. Inc
6817 Leopard Street
Corpus Christi, Texas 78409
Telephone: 361-883-4555
Fax: 361-883-4711

CLIENT: City of Kingsville
PROJECT: Armstrong Street Rehabilitation
LOCATION: Kingsville, Texas
NUMBER: G120362

DATE(S) DRILLED: 7/21/2020

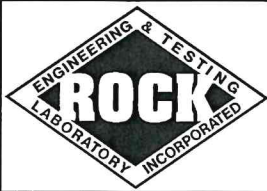
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						LL	PL	PI				SURFACE ELEVATION: N/A
DESCRIPTION OF STRATUM												
<u>ASPHALT</u> , approximately 1.75 inches												
<u>BASE</u> , approximately 10.25 inches, Clayey Sand, with aggregate, brown, moist.												
1												
		SH S-1		P= 3.0	17	30	15	15			52	<u>SANDY LEAN CLAY</u> , dark gray, moist, stiff. (CL)
2												
3												
4		SH S-2		P= 2.0	14							Same as above, dark gray and brown.
5												Boring was terminated at a depth of 5 feet.

N - STANDARD PENETRATION TEST RESISTANCE
Qc - STATIC CONE PENETROMETER TEST INDEX
P - POCKET PENETROMETER RESISTANCE
Tv - TORVANE SHEAR STRENGTH TEST

REMARKS:
Drilling operations were performed by RETL at GPS Coordinates
N° 27.51460 W° 97.87769

LOG OF BORING B-2

SHEET 1 of 1



Rock Engineering & Testing Lab. Inc
6817 Leopard Street
Corpus Christi, Texas 78409
Telephone: 361-883-4555
Fax: 361-883-4711

CLIENT: City of Kingsville
PROJECT: Armstrong Street Rehabilitation
LOCATION: Kingsville, Texas
NUMBER: G120362

DATE(S) DRILLED: 7/21/2020

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): Core/Solid Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT Qc: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION: Dry and Open upon completion of drilling.
						LL	PL	PI				SURFACE ELEVATION: N/A
DESCRIPTION OF STRATUM												
<u>ASPHALT</u> , approximately 1.5 inches												
<u>BASE</u> , approximately 10.25 inches, Clayey Sand, with aggregate, brown, moist.												
1				P= 3.5	21	43	19	24			72	<u>LEAN CLAY WITH SAND</u> , dark gray, moist, very stiff. (CL)
2		SH S-1										
3												
4		SH S-2		P= 2.5	20							Same as above, greenish gray, stiff.
5												Boring was terminated at a depth of 5 feet.
<p>N - STANDARD PENETRATION TEST RESISTANCE Qc - STATIC CONE PENETROMETER TEST INDEX P - POCKET PENETROMETER RESISTANCE Tv - TORVANE SHEAR STRENGTH TEST</p>												<p>REMARKS: Drilling operations were performed by RETL at GPS Coordinates N° 27.51527 W° 97.87775</p>

LOG OF BORING G120362.GPJ ROCK_ETL_GDT_8/18/20

LOG OF BORING B-3



Rock Engineering & Testing Lab. Inc
6817 Leopard Street
Corpus Christi, Texas 78409
Telephone: 361-883-4555
Fax: 361-883-4711

CLIENT: City of Kingsville
PROJECT: Armstrong Street Rehabilitation
LOCATION: Kingsville, Texas
NUMBER: G120362

DATE(S) DRILLED: 7/21/2020

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): Core/Solid Stem Auger			
SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT T: TONS/SQ.FT Qc: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION: Dry and Open upon completion of drilling.
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI				SURFACE ELEVATION: N/A
DESCRIPTION OF STRATUM												
												<u>ASPHALT</u> , approximately 2 inches
					20	37	22	15			30	<u>BASE</u> , approximately 9.5 inches, Clayey Sand, with aggregate, dark gray, moist.
1												<u>SANDY LEAN CLAY</u> , dark gray, moist, stiff.
	2	SH S-1		P= 2.5	19							Same as above, brown, very stiff.
	3											
	4	SH S-2		P= 4.5+	15							Boring was terminated at a depth of 5 feet.
	5											

N - STANDARD PENETRATION TEST RESISTANCE
Qc - STATIC CONE PENETROMETER TEST INDEX
P - POCKET PENETROMETER RESISTANCE
Tv - TORVANE SHEAR STRENGTH TEST

REMARKS:
Drilling operations were performed by RETL at GPS Coordinates
N° 27.51620 W° 97.87769

LOG OF BORING B-4



Rock Engineering & Testing Lab. Inc
6817 Leopard Street
Corpus Christi, Texas 78409
Telephone: 361-883-4555
Fax: 361-883-4711

CLIENT: City of Kingsville
PROJECT: Armstrong Street Rehabilitation
LOCATION: Kingsville, Texas
NUMBER: G120362

DATE(S) DRILLED: 7/21/2020

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S):	
SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT T: TONS/SQ.FT Qc: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	Core/Solid Stem Auger
						LL	PL	PI				GROUNDWATER INFORMATION: Dry and Open upon completion of drilling.
SURFACE ELEVATION: N/A												
DESCRIPTION OF STRATUM												
<u>ASPHALT</u> , approximately 2.5 inches												
<u>BASE</u> , approximately 8.5 inches, Clayey Sand, with aggregate, brown, moist.												
	1											
	2	SH S-1		P= 2.0	20	41	16	25			66	<u>SANDY LEAN CLAY</u> , dark gray, moist, stiff. (CL)
	3											
	4	SH S-2		P= 1.5	21							Same as above, firm.
	5											Boring was terminated at a depth of 5 feet.
<p>N - STANDARD PENETRATION TEST RESISTANCE Qc - STATIC CONE PENETROMETER TEST INDEX P - POCKET PENETROMETER RESISTANCE Tv - TORVANE SHEAR STRENGTH TEST</p>												
<p>REMARKS: Drilling operations were performed by RETL at GPS Coordinates N° 27.51723 W° 97.87778</p>												

LOG_OF_BORING_G120362.GPJ ROCK_ETL_GDT_8/18/20

LOG OF BORING B-5



Rock Engineering & Testing Lab. Inc
6817 Leopard Street
Corpus Christi, Texas 78409
Telephone: 361-883-4555
Fax: 361-883-4711

CLIENT: City of Kingsville
PROJECT: Armstrong Street Rehabilitation
LOCATION: Kingsville, Texas
NUMBER: G120362

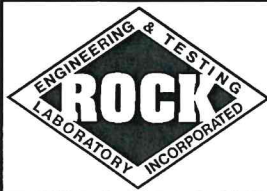
DATE(S) DRILLED: 7/21/2020

FIELD DATA		LABORATORY DATA								DRILLING METHOD(S): Core/Solid Stem Auger		
SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT Qc: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	
						LL	PL	PI				
												GROUNDWATER INFORMATION: Dry and Open upon completion of drilling.
												SURFACE ELEVATION: N/A
												DESCRIPTION OF STRATUM
												<u>ASPHALT</u> , approximately 2 inches
												<u>BASE</u> , approximately 9 inches, Clayey Sand, with aggregate, dark gray, moist.
	1											
	2	SH S-1		P= 4.0	13							<u>SANDY LEAN CLAY</u> , dark gray, moist, very stiff.
	3											
	4	SH S-2		P= 3.0	17	29	13	16		61		Same as above, brown, stiff. (CL)
	5											Boring was terminated at a depth of 5 feet.
N - STANDARD PENETRATION TEST RESISTANCE Qc - STATIC CONE PENETROMETER TEST INDEX P - POCKET PENETROMETER RESISTANCE Tv - TORVANE SHEAR STRENGTH TEST											REMARKS: Drilling operations were performed by RETL at GPS Coordinates N° 27.51818 W° 97.87774	

LOG_OF_BORING_G120362.GPJ ROCK_ETL_GDT_8/18/20

LOG OF BORING B-6

SHEET 1 of 1



Rock Engineering & Testing Lab. Inc
6817 Leopard Street
Corpus Christi, Texas 78409
Telephone: 361-883-4555
Fax: 361-883-4711

CLIENT: City of Kingsville
PROJECT: Armstrong Street Rehabilitation
LOCATION: Kingsville, Texas
NUMBER: G120362

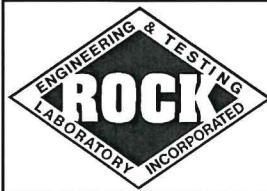
DATE(S) DRILLED: 7/21/2020

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S):	
SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT Qc: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION:
						LL	PL	PI				Dry and Open upon completion of drilling.
SURFACE ELEVATION: N/A												
DESCRIPTION OF STRATUM												
<u>ASPHALT</u> , approximately 1.75 inches												
<u>BASE</u> , approximately 8.25 inches, Clayey Sand, with aggregate, brown, moist.												
	1											<u>SANDY LEAN CLAY</u> , dark brown, moist, very stiff.
	2	SH S-1		P= 4.0	9	22	13	9				
	3											Same as above, brown.
	4	SH S-2		P= 4.5+	12							
	5											Boring was terminated at a depth of 5 feet.
N - STANDARD PENETRATION TEST RESISTANCE Qc - STATIC CONE PENETROMETER TEST INDEX P - POCKET PENETROMETER RESISTANCE Tv - TORVANE SHEAR STRENGTH TEST										REMARKS: Drilling operations were performed by RETL at GPS Coordinates N° 27.51921 W° 97.87779		

LOG_OF_BORING G120362.GPJ ROCK_ETL_GDT_8/18/20

LOG OF BORING B-7

SHEET 1 of 1



Rock Engineering & Testing Lab. Inc
 6817 Leopard Street
 Corpus Christi, Texas 78409
 Telephone: 361-883-4555
 Fax: 361-883-4711

CLIENT: City of Kingsville
 PROJECT: Armstrong Street Rehabilitation
 LOCATION: Kingsville, Texas
 NUMBER: G120362

DATE(S) DRILLED: 7/21/2020

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): Core/Solid Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT T: TONS/SQ.FT Qc: TONS/SQ.FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION: Dry and Open upon completion of drilling.
						LL	PL	PI				SURFACE ELEVATION: N/A
DESCRIPTION OF STRATUM												
1					16	34	23	11			25	<u>ASPHALT</u> , approximately 2 inches
2		SH S-1		P= 2.5	16							<u>BASE</u> , approximately 8.5 inches, Clayey Sand, with aggregate, brown, moist.
3												<u>SANDY LEAN CLAY</u> , dark brown, moist, stiff.
4		SH S-2		P= 3.5	14							
5												Boring was terminated at a depth of 5 feet.

N - STANDARD PENETRATION TEST RESISTANCE
 Qc - STATIC CONE PENETROMETER TEST INDEX
 P - POCKET PENETROMETER RESISTANCE
 Tv - TORVANE SHEAR STRENGTH TEST

REMARKS:
 Drilling operations were performed by RETL at GPS Coordinates
 N° 27.52002 W° 97.87777

LOG_OF_BORING_G120362.GPJ_ROCK_ETL_GDT_8/18/20

LOG OF BORING B-8



Rock Engineering & Testing Lab. Inc
6817 Leopard Street
Corpus Christi, Texas 78409
Telephone: 361-883-4555
Fax: 361-883-4711

CLIENT: City of Kingsville
PROJECT: Armstrong Street Rehabilitation
LOCATION: Kingsville, Texas
NUMBER: G120362

DATE(S) DRILLED: 7/21/2020

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): Core/Solid Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT Qc: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION: Dry and Open upon completion of drilling.
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI				SURFACE ELEVATION: N/A
DESCRIPTION OF STRATUM												
<u>ASPHALT</u> , approximately 2.25 inches												
<u>BASE</u> , approximately 7.25 inches, Clayey Sand, with aggregate, brown, moist.												
1												<u>SANDY LEAN CLAY</u> , dark brown and brown, moist, very stiff.
2		SH S-1		P= 4.5+	13							
3												Same as above, brown. (CL)
4		SH S-2		P= 4.5+	12	34	11	23		68		
5												Boring was terminated at a depth of 5 feet.

N - STANDARD PENETRATION TEST RESISTANCE
Qc - STATIC CONE PENETROMETER TEST INDEX
P - POCKET PENETROMETER RESISTANCE
Tv - TORVANE SHEAR STRENGTH TEST

REMARKS:
Drilling operations were performed by RETL at GPS Coordinates
N° 27.52089 W° 97.87788

LOG OF BORING B-9



Rock Engineering & Testing Lab. Inc
6817 Leopard Street
Corpus Christi, Texas 78409
Telephone: 361-883-4555
Fax: 361-883-4711

CLIENT: City of Kingsville
PROJECT: Armstrong Street Rehabilitation
LOCATION: Kingsville, Texas
NUMBER: G120362

DATE(S) DRILLED: 7/21/2020

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): Core/Solid Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT Qc: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ.FT)	MINUS NO. 200 SIEVE (%)	
						LL	PL	PI				
												GROUNDWATER INFORMATION: Dry and Open upon completion of drilling.
												SURFACE ELEVATION: N/A
												DESCRIPTION OF STRATUM
												<u>ASPHALT</u> , approximately 1.75 inches
												<u>BASE</u> , approximately 9.25 inches.
1				P= 3.0							57	<u>SANDY LEAN CLAY</u> , dark brown and brown, moist, stiff. (CL)
2		SH S-1			14	30	14	16				
3												
4		SH S-2		P= 3.0	19							Same as above, brown.
5												Boring was terminated at a depth of 5 feet.
N - STANDARD PENETRATION TEST RESISTANCE Qc - STATIC CONE PENETROMETER TEST INDEX P - POCKET PENETROMETER RESISTANCE Tv - TORVANE SHEAR STRENGTH TEST											REMARKS: Drilling operations were performed by RETL at GPS Coordinates N° 27.52177 W° 97.87780	

LOG OF BORING G120362.GPJ ROCK_ETL_GDT_8/18/20

LOG OF BORING B-10



Rock Engineering & Testing Lab. Inc
6817 Leopard Street
Corpus Christi, Texas 78409
Telephone: 361-883-4555
Fax: 361-883-4711

CLIENT: City of Kingsville
PROJECT: Armstrong Street Rehabilitation
LOCATION: Kingsville, Texas
NUMBER: G120362

DATE(S) DRILLED: 7/21/2020

FIELD DATA				LABORATORY DATA								DRILLING METHOD(S): Core/Solid Stem Auger
SOIL SYMBOL	DEPTH (FT)	SAMPLE NUMBER	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT Qc: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	MINUS NO. 200 SIEVE (%)	GROUNDWATER INFORMATION: Dry and Open upon completion of drilling.
						LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI				SURFACE ELEVATION: N/A
DESCRIPTION OF STRATUM												
1					16	31	23	8			20	<u>ASPHALT</u> , approximately 1.75 inches
2		SH S-1		P= 4.0	18	41	16	25				<u>BASE</u> , approximately 10.25 inches, Clayey Sand, with aggregate, brown, moist.
3												<u>SANDY LEAN CLAY</u> , dark brown and brown, moist, very stiff.
4		SH S-2		P= 3.5	15							
5												Boring was terminated at a depth of 5 feet.

N - STANDARD PENETRATION TEST RESISTANCE
Qc - STATIC CONE PENETROMETER TEST INDEX
P - POCKET PENETROMETER RESISTANCE
Tv - TORVANE SHEAR STRENGTH TEST

REMARKS:
Drilling operations were performed by RETL at GPS Coordinates
N° 27.52240 W° 97.87786



Engineering & Testing
Laboratory, Inc.

Rock Engineering & Testing Laboratory
6817 Leopard Street
Corpus Christi, TX 78409-1703
Telephone: 361-883-4555
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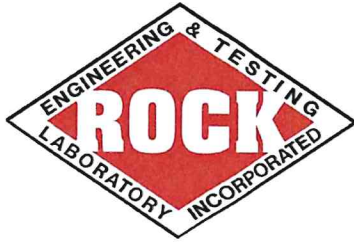
KEY TO SOIL CLASSIFICATION AND SYMBOLS

UNIFIED SOIL CLASSIFICATION SYSTEM			TERMS CHARACTERIZING SOIL STRUCTURE	
MAJOR DIVISIONS	SYMBOL	NAME		
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well Graded Gravels or Gravel-Sand mixtures, little or no fines	SLICKENSIDED - having inclined planes of weakness that are slick and glossy in appearance FISSURED - containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical LAMINATED (VARVED) - composed of thin layers of varying color and texture, usually grading from sand or silt at the bottom to clay at the top
		GP	Poorly Graded Gravels or Gravel-Sand mixtures, little or no fines	
		GM	Silty Gravels, Gravel-Sand-Silt mixtures	
		GC	Clayey Gravels, Gravel-Sand-Clay Mixtures	
	SAND AND SANDY SOILS	SW	Well Graded Sands or Gravelly Sands, little or no fines	CRUMBLY - cohesive soils which break into small blocks or crumbs on drying CALCAREOUS - containing appreciable quantities of calcium carbonate, generally nodular WELL GRADED - having wide range in grain sizes and substantial amounts of all intermediate particle sizes POORLY GRADED - predominantly of one grain size uniformly graded) or having a range of sizes with some intermediate size missing (gap or skip graded)
		SP	Poorly Graded Sands or Gravelly Sands, little or no fines	
		SM	Silty Sands, Sand-Silt Mixtures	
		SC	Clayey Sands, Sand-Clay mixtures	
FINE GRAINED SOILS	SILTS AND CLAYS LL < 50	ML	Inorganic Silts and very fine Sands, Rock Flour, Silty or Clayey fine Sands or Clayey Silts	<p style="text-align: center;">SYMBOLS FOR TEST DATA</p> — Groundwater Level (Initial Reading) — Groundwater Level (Final Reading) — Shelby Tube Sample — SPT Samples — Auger Sample — Rock Core
		CL	Inorganic Clays of low to medium plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays	
		OL	Organic Silts and Organic Silt-Clays of low plasticity	
	SILTS AND CLAYS LL > 50	MH	Inorganic Silts, Micaceous or Diatomaceous fine Sandy or Silty soils, Elastic Silts	
		CH	Inorganic Clays of high plasticity, Fat Clays	
		OH	Organic Clays of medium to high plasticity, Organic Silts	
HIGHLY ORGANIC SOILS	PT	Peat and other Highly Organic soils		

TERMS DESCRIBING CONSISTENCY OF SOIL

COARSE GRAINED SOILS		FINE GRAINED SOILS		
DESCRIPTIVE TERM	NO. BLOWS/FT. STANDARD PEN. TEST	DESCRIPTIVE TERM	NO. BLOWS/FT. STANDARD PEN. TEST	UNCONFINED COMPRESSION TONS PER SQ. FT.
Very Loose	0 - 4	Very Soft	< 2	< 0.25
Loose	4 - 10	Soft	2 - 4	0.25 - 0.50
Medium	10 - 30	Firm	4 - 8	0.50 - 1.00
Dense	30 - 50	Stiff	8 - 15	1.00 - 2.00
Very Dense	over 50	Very Stiff	15 - 30	2.00 - 4.00
		Hard	over 30	over 4.00

Field Classification for "Consistency" is determined with a 0.25" diameter penetrometer



- GEOTECHNICAL ENGINEERING
- CONSTRUCTION MATERIALS ENGINEERING & TESTING
- SOILS • ASPHALT • CONCRETE

September 8, 2020

City of Kingsville Engineering Department
400 West King Avenue
Kingsville, Texas 78363

Attention: Mr. Joseph Ramirez

**SUBJECT: GEOTECHNICAL SUPPLEMENT NO. 1
SUBSURFACE INVESTIGATION, LABORATORY TESTING PROGRAM AND
PAVEMENT RECOMMENDATIONS
ARMSTRONG STREET REHABILITATION
Santa Gertrudis Street to Kennedy Avenue
Kingsville, Texas
RETL Job No. – G120362-S1**

Dear Mr. Ramirez,

Rock Engineering and Testing Laboratory, Inc. (RETL) is providing this Geotechnical Supplement No. 1 for the referenced project. Supplement No. 1 provides additional pavement recommendations based upon recently provided traffic data collected by the City of Kingsville. One electronic copy of this Supplement No. 1 is being issued for your files and distribution to the design team.

Project Discussion

RETL performed a geotechnical study and provided a geotechnical engineering report (RETL Job No. – G120362, dated August 20, 2020) for the referenced project. At the time of our original geotechnical study and report, design traffic information was not made available to RETL. Accordingly, RETL estimated probable traffic information based upon the street type and apparent use and provided recommendations for both 1,000,000 and 2,000,000 design 18-kip Equivalent Single Axle Loading (ESALS).

Subsequent to submittal of our report, the City of Kingsville provided results of a traffic study that was conducted between the dates of June 25, 2020 and July 2, 2020. RETL was asked to evaluate the results of the traffic study and provide revised recommendations based upon the actual traffic information, including a growth factor, over the design life of the pavements.

ROCK ENGINEERING & TESTING LABORATORY, INC. (TBPE FIRM NO. 2101)

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10856 Vandale
San Antonio, TX 78216

Round Rock
Office: 512.284.8022
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7 Roundville Ln.
Round Rock, TX 78664

Design Information

Based on our interpretation of the traffic study provided, RETL has determined the approximate design ESAL value for the rehabilitated pavements to be on the order of 1,500,000. In addition, we have considered typical pavement design parameters as outlined in the table below. If the owner or consultant provides considerations that conflict with the design traffic or parameters which have been assumed, then RETL should be given the opportunity, prior to final issue of the plans and specifications, to determine if supplemental or revised recommendations are warranted.

Pavement Design Parameters	
Flexible Pavement ESAL's	1,500,000
Design Life (years)	20
Growth Rate (percent)	4
Reliability (percent)	85
Initial Serviceability (flexible pavements)	4.2
Initial Serviceability (rigid pavements)	4.5
Terminal Serviceability	2.5
Standard Deviation (flexible pavements)	0.45
Standard Deviation (rigid pavements)	0.35
Resilient Modulus of Subgrade (psi)	5,014
Modulus of Subgrade Reaction (pci)	120
Minimum Required Structural Number (flexible pavements)	4.14

Flexible Pavement Recommendations

The recommended flexible pavement sections calculated using the American Association of the State Highway and Transportation Officials, "GUIDE FOR DESIGN OF PAVEMENT STRUCTURES," are provided in the following tables.

Recommended Flexible Pavement Sections (New Pavement Constituents)		
Pavement Constituent	1,500,000 ESALs	
	Option 1	Option 2
HMAC Type D and/or B	4 inches	5 inches
Limestone Base (Type A, Gr. 1-2)	11 inches	8 inches
Geogrid TX5	Yes	Yes
Total Section Thickness	15 inches	13 inches
Calculated SN	4.21	4.17

The flexible pavement options presented below are based upon cement stabilization of the existing clayey sand base materials. The cumulative thickness of the new pavement constituents required to achieve the design ESAL values exceed the cumulative thickness of the existing pavement constituents. Accordingly, if the elevation of the street surface cannot be raised due to existing curb and gutter elevations, in-place pulverization and stabilization of the existing base material will not be a viable option. However, the existing pavements may be removed in their entirety and pulverized and stockpiled at an off-site location until the soil subgrade is lowered to the required elevation. Two pavement section options are being provided below and consist of:

- Option 1 - Fully utilize the existing pavement materials through removal and off-site pulverization.
- Option 2 - Utilize the minimum recommended stabilized base section thickness to minimize required subgrade cut depths.

Recommended Flexible Pavement Sections (Reclaimed Base Material, New Asphalt)		
Pavement Constituent	1,500,000 ESALs	
	Option 1	Option 2
HMAC Type D and/or B	7 inches	7.5 inches
Cement Stabilized Base	9 inches	6 inches
Total Section Thickness	16 inches	13.5 inches
Calculated SN	4.34	4.14

Hot mix asphaltic concrete should meet the requirements set forth in TxDOT Item 340. Maximum and minimum thicknesses of HMAC placement for the types of HMAC recommended are provided in the following table.

Minimum/Maximum Recommended HMAC Compacted Lift Thickness		
HMAC Mixture Type	Minimum Compacted Lift Thickness (in)	Maximum Compacted Lift Thickness (in)
Type D HMAC	1.5	3
Type B HMAC	2.5	5

Rigid Pavement Recommendations

The use of concrete for paving has become more prevalent in recent years due to a decrease in the material cost of concrete and the long-term maintenance cost benefits of concrete pavement compared to asphaltic pavements. The recommended rigid pavement section calculated using the American Association of the State Highway and Transportation Officials, "GUIDE FOR DESIGN OF PAVEMENT STRUCTURES," are provided in the following table.

Recommended Rigid Pavement Section	
Pavement Constituent	1,500,000 ESALs
Reinforced Concrete	7 inches
Crushed Limestone Base Material (TxDOT Item 247 Type A; Gr. 1-2)	6 inches
Compacted Subgrade	12 inches

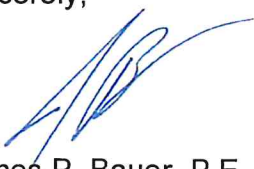
The concrete pavement should be reinforced and jointed as per applicable TxDOT specifications and should have a minimum 28-day compressive strength of 4,500 psi or flexural strength of 620 psi. Expansion joints should be sealed with an appropriate sealant so that moisture infiltration into the subgrade soils and resultant concrete deterioration at the joints is minimized. The joints should be thoroughly cleaned, and sealant should be installed without overfilling before pavement is opened to traffic.

Closing

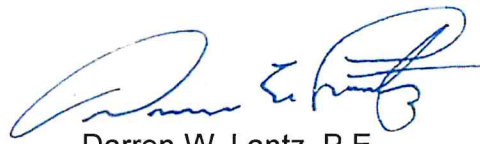
The information and recommendations contained in this Supplement No. 1 are intended to supplement the original recommendations and therefore our original recommendations remain valid for the indicated design traffic. Additionally, all recommendations contained in the original report including material and placement specifications, subgrade preparation recommendations, and earthwork and maintenance recommendations shall remain unchanged.

Often, because of design and construction details that occur on a project, questions arise concerning soil conditions, and Rock Engineering and Testing Laboratory, Inc. (RETL), Texas Professional Engineering Firm No. – 2101, would be pleased to continue its role as Geotechnical Engineer during the project implementation.

Sincerely,



James P. Bauer, P.E.
Corpus Christi Branch Manager



Darren W. Lantz, P.E.
Senior Geotechnical Engineer

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 sledgeing 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 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 Part 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 022040
STREET EXCAVATION

1. DESCRIPTION

This specification shall govern all work for Street Excavation required to complete the project.

2. CONSTRUCTION METHODS

(A) Stripping and Excavation

Strip the top 6 inches in all areas to underlay compacted fill, curbs, base or pavement, by removing all humus, vegetation and other unsuitable materials. Unless otherwise noted, remove existing trees, shrubs, fences, curb, gutter, sidewalk, drives, paving, pipe and structures and other items within the graded area which interfere with new construction of finished grading.

All suitable excavated materials shall be utilized, insofar as practicable, in constructing the required roadway sections or in uniformly widening embankments, flattening slopes, etc., as directed by the Engineer, provided that the material meets the requirements for roadway embankment as specified in Article 3 below. Unwanted or unsuitable roadway excavation and roadway excavation in excess of that needed for construction shall become the property of the Contractor to be disposed of by him outside the limits of the right-of-way at a location suitable to the Engineer. "Unsuitable" material encountered below subgrade elevation in roadway cuts, when declared unwanted by the Engineer, shall be replaced as directed by the Engineer with suitable material from the roadway excavation or with other suitable material.

Maintain moisture and density until covered and protected by the subbase or base course. Remove soft or wet areas found at any time, replace with suitable material, and recompact (especially utility trenches).

(B) Subgrade Preparation

That area shown on the drawings for street construction shall be cut to grade, scarified to a depth not less than 6 inches, or as otherwise indicated on the drawings, and compacted to 95% Standard Proctor density (ASTM D698) to within 0 to +3% of optimum moisture. The section may be accepted if no more than 1 in 5 of the most recent moisture or density tests is beyond +1% deviation from the required moisture or density requirement. Irregularities exceeding 1/2 inch in 16 feet shall be corrected. Soft areas found at any time shall be removed, replaced with suitable material and compacted (especially at utility trenches). The correct moisture density relationship shall be maintained until the subgrade is protected. Excessive loss of moisture shall be prevented by sprinkling, sealing, or covering with a subsequent layer.

Should the subgrade, due to any reason or cause, lose the required stability, density, or moisture before it is protected by placement of the next layer, it shall be re-compacted and refinished and retested at the expense of the Contractor until acceptable to the City.

(C) Curb Backfill and Topsoil (Sidewalk* Parkways, Islands, etc.)

Fill and compact areas behind curbs and adjacent to sidewalks and driveways within 48 hours after completion of concrete work. The top 6 inches (where disturbed by construction or where unsatisfactory material is exposed by excavation) of finish earth grade shall be clean excavated material or topsoil capable of supporting a good growth of grass when fertilized and seeded or sodded. It shall be free of concrete, asphalt, shell, caliche, debris and any other material that detracts from its appearance or hampers the growth of grass. Topsoil shall meet the requirements specified in City Standard Specification Section 028020 "Seeding".

(D) Matching Grades at Right-of-Way. Line

Finish grade at the property line shall be as shown on the drawings. The Engineer may require a reasonable amount of filling on private property where the sidewalk grade is above the property elevation. Use suitable material from the excavation. Unless otherwise directed, cuts at right-of way lines shall be made at a slope of three horizontal to one vertical (3:1) or flatter.

(E) Drainage

During construction, the roadbed and ditches shall be maintained in such condition as to insure proper drainage at all times, and ditches and channels shall be so constructed and maintained as to avoid damage to the roadway section.

All slopes which, in the judgment of the Engineer, require variation, shall be accurately shaped, and care shall be taken that no material is loosened below the required slopes. All breakage and slides shall be removed and disposed of as directed.

SELECTION OF ROAD BED MATERIALS

Where shown on the plans, Select Material shall be utilized to improve the roadbed, in which case the work shall be performed in such manner and sequence that suitable materials may be selected, removed separately, and deposited in the roadway within limits and at elevations required. Material used for roadway embankment shall meet the requirements of City Standard Specification Section 022100 Select Material.

GEOGRID

If indicated on the drawings, geogrid shall be placed in the base layer according to the pavement details to provide a mechanically stabilized aggregate base layer within the pavement structure. Geogrid shall be "Tensar TX5 Triaxial Geogrid", or pre-approved equivalent. Use (and approval)

of a different product must be supported by documentation showing that the alternate pavement section will meet or exceed the required number of 18-kip equivalent single axle loads (ESAL) and structural number (SN) over the stated pavement design life, and the pavement design must be sealed and signed by a Texas professional engineer. Documentation must also include the structural design value used for the geogrid structural contribution, based on and supported by validated test data. Alternate pavement designs shall utilize the same structural design values for other pavement structural components (HMAC, base, sub-base) as used in the original pavement design, and the pavement designs must be approved by the Engineer and the geotechnical consultant.

Contractor shall take care to protect geogrid from damage. Overlap edges of geogrid in accordance with the manufacturer's recommendations, but not less than 12 inches. Do not drive tracked equipment directly on the geogrid. Provide at least 6 inches of compacted aggregate base material over the geogrid before driving any tracked equipment over the geogrid area. Standard highway-legal rubber-tired trucks may drive over the geogrid at very slow speeds (less than 5 mph). Avoid turns and sudden starts and stops when driving on the geogrid. Any damaged geogrid shall be replaced by the Contractor at no additional cost to the City. Proper replacement shall consist of replacing the affected area adding 3 feet of geogrid in each direction beyond the limits of the affected area.

MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, street excavation shall be measured and paid for by the square yard to the limits shown on the drawings including excavation for street transitions. Payment shall be full compensation for furnishing all labor, materials, tools, equipment, borrow material and incidentals necessary to complete the work.

Unless otherwise specified on the Bid Form, compacted subgrade shall be measured and paid for by the square yard to the limits shown on the drawings. Payment shall be full compensation for furnishing all labor, materials, tools, equipment, bon-ow material and incidentals necessary to complete the work.

Unless otherwise specified on the Bid Form, geogrid shall be measured and paid for by the square yard to the limits shown on the drawings, excluding overlaps. Payment shall be full compensation for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work.

All work required for disposing of waste, including hauling will not be paid for directly but shall be considered subsidiary to the various contract items.

**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 ranges 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 022420
SILT FENCE

DESCRIPTION

This specification shall govern all work necessary for providing and installing silt fencing required to control sedimentation and erosion during construction of the project.

MATERIAL REQUIREMENTS

- A. Geotextile shall meet the requirements for temporary silt fence per AASHTO M288.
- B. Fence Reinforcement Materials:

Silt fence reinforcement shall be one of the following systems.

Type 1 : Self-Supported Fence - This system consists of fence posts, spaced no more than 8 1/2 feet apart, and geotextile without net reinforcement. Fence posts shall be a minimum of 42 inches long, embedded at least one (1) foot into the ground, and constructed of either wood or steel. Soft wood posts shall be at least 3 inches in diameter or nominal 2 x 4 inches in cross section and essentially straight. Hardwood posts shall be a minimum of 1.5 x 1.5 inches in cross section. Fabric attachment may be by staples or locking plastic ties at least every 6 inches, or by sewn vertical pockets. Steel posts shall be T or L shaped with a minimum weight of 1.3 pounds per foot. Attachment shall be by pockets or by plastic ties if the posts have suitable projections

Type 2: Net-Reinforced Fence - This system consists of fence posts, spaced no more than 8-1/2 feet apart, and geotextile with an attached reinforcing net. Fence posts shall meet the requirements of Self-Supported Fence. Net reinforcement shall be galvanized welded wire mesh of at least 12.5-gauge wire with maximum opening size of 4 x 2 inches. The fabric shall be attached to the top of the net by crimping or cord at least every 2 feet, or as otherwise specified.

Type 3: Triangular Filter Dike - This system consists of a rigid wire mesh, at least 6-gauge, formed into an equilateral triangle cross-sectional shape with sides measuring 18 inches, wrapped with geotextile silt fence fabric. The fabric shall be continuously wrapped around the dike, with a skirt extending at least 12 inches from its upslope corner.

- C. Packaging Requirements: Prior to installation, the fabric shall be protected from damage due to ultraviolet light and moisture by either wrappers or inside storage.

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- D. Certification and Identification: Each lot or shipment shall be accompanied by a certification of conformance to this specification. The shipment must be identified by a ticket or by labels securely affixed to the fabric rolls. This ticket or label must list the following information:
- a. Name of manufacturer or supplier
 - b. Brand name and style
 - c. Manufacturer's lot number or control number
 - d. Roll size (length and width)
 - e. Chemical composition

MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, silt fence shall be measured by the linear foot. Payment shall be at the bid price for the unit of measurement specified and shall be full compensation for furnishing all labor, materials, tools, equipment and incidentals necessary to complete the work. Payment shall include, but not be limited to, placing, maintaining and removing the silt fence.

SECTION 025202
SCARIFYING AND RESHAPING BASE COURSE

DESCRIPTION

"Scarifying and Reshaping Base Course" shall consist of scarifying and reshaping the existing base course (with or without asphalt surface) to the line, grade and section as indicated on the drawings.

CONSTRUCTION METHODS

The existing base and surface shall be scarified to the width and depth indicated on the drawings. Subgrade shall remain undisturbed, unless indicated otherwise on the drawings. Any asphalt surfacing shall be broken into particles no larger than 2 h inches. The asphalt surfacing shall then be uniformly mixed with the existing base. Additional base material, where required to achieve the lines and grades shown on the drawings, shall also be added to and uniformly mixed with the existing scarified base material. If indicated on the drawings, geogrid shall be installed in the pavement section.

The base material shall be shaped and rolled after mixing and allowed to set at least 48 hours before final compaction. Moisture content shall be maintained in the material during the 48-hour period. Material shall be sprinkled with water or aerated to optimum moisture content, and compacted in layers (10-inch maximum loose depth) to a minimum density of 98% Modified Proctor density (AASHTO T 180), at a moisture content on the wet side of optimum (+3% maximum). Use mechanical tamps in areas inaccessible to rollers.

Upon completion of compaction, the surface shall be smooth and shall conform to line, grade and section as shown on the drawings. Areas with any deviation in excess of 1/4 inch in cross-section, and in lengths of 16 feet measured longitudinally, shall be corrected by loosening, adding or removing material, reshaping, and re-compacting by sprinkling and rolling. Moisture content shall be maintained on the wet side of optimum (+3% maximum) until paving is complete.

If required, lime shall be applied in the amount indicated on the drawings. Lime shall be applied and the treated base mixed, cured, compacted and finished in accordance with City Standard Specification Section 025210 "Lime Stabilization."

MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, scarifying and reshaping base course shall not be measured and paid for separately, but shall be subsidiary to other work.

SECTION 025203
GEOGRID BASE REINFORCEMENT

DESCRIPTION

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

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.

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

MEASUREMENT 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	
	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	-	450	-	900	-	1500	-	3000	-	600	-	900
Ductility, 77 F, 5 cm per min., cm	100	-	100	-	100	-	100	-	70	0	50	0
	*											

*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, percent by weight	-	45
Viscosity of Emulsion at 77 ± 1 F, cps, max (No. 3 spindle, 20 rpm, Brookfield RVT Viscometer)	-	2000

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	
Property	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol at 77 F, sec 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

	Rapid Setting		Medium Setting	
Type - Grade	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 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.

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 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.

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 025802
TEMPORARY TRAFFIC CONTROLS DURING CONSTRUCTION

DESCRIPTION

This specification shall govern all work required for Temporary Traffic Controls during construction. The work shall include furnishing, installing, moving, replacing, and maintaining all temporary traffic controls including, but not limited to, barricades, signs, barriers, cones, lights, signals, temporary detours, temporary striping and markers, flagger, temporary drainage pipes and structures, blue business signs, and such temporary devices as necessary to safely complete the project.

MATERIALS

Traffic control devices shall conform to the latest edition of the "Texas Manual on Uniform Traffic Control Devices", unless indicated otherwise on the Traffic Control Plan.

METHODS

Sufficient traffic control measures shall be used to assure a safe condition and to provide a minimum of inconvenience to motorists and pedestrians.

If the Traffic Control Plan (TCP) is included in the drawings, any changes to the TCP by the Contractor shall be prepared by a Texas licensed professional engineer and submitted to the City Traffic Engineer for approval, prior to construction. If the TCP is not included in the drawings, the Contractor shall provide the TCP prepared by a Texas licensed professional engineer and submit the TCP to the City Traffic Engineer for approval, prior to construction.

The Contractor is responsible for implementing and maintaining the traffic control plan and will be responsible for furnishing all traffic control devices, temporary signage and ATSSA certified flaggers. The construction methods shall be conducted to provide the least possible interference to traffic so as to permit the continuous movement of traffic in all allowable directions at all times. The Contractor shall cleanup and remove from the work area all loose material resulting from construction operations at the end of each workday.

All signs, barricades, and pavement markings shall conform to the BC standard sheets, TCP sheets and the latest version of the "Texas Manual on Uniform Traffic Control Devices".

The Contractor may be required to furnish additional barricades, signs, and warning lights to maintain traffic and promote motorist's safety. Any such additional signs and barricades will be considered subsidiary to the pay item for traffic control. All signs, barricades, and posts will be either new or freshly painted.

The contractor and any traffic control subcontractor must be ATSSA certified for Traffic Control.

A competent person, responsible for implementation of the TCP and for traffic safety, shall be designated by the Contractor.

The name and off-hours phone number of the competent person shall be provided in writing at the Pre-Construction Conference.

The competent person shall be on site, during working hours and on call at all times in the event of off-hour emergency.

The contractor must provide temporary blue sign boards that direct traffic to businesses and driveways during each phase of construction — see example below. The sign boards may be either skid mounted, or barrel mounted. The City will assist the contractor in determining which businesses and driveways will receive signage during various construction phases. The provision, installation, and removal of signage will be subsidiary to the contract items provided for "Traffic Control."

Example Blue Sign



MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, temporary traffic controls during construction shall be measured as a lump sum. Payment shall include, but not be limited to, furnishing, installing, moving, replacing and maintaining all temporary traffic controls including, but not limited to, barricades, signs, banners, cones, lights, signals, temporary striping and markers, flaggers, removable and non-removable work zone pavements markings and signage, channelizing devices, temporary detours, temporary flexible-reflective roadway marker tabs, temporary traffic

markers, temporary drainage pipes and structures, blue business signs, and such temporary devices and relocation of existing signs and devices. Payment shall be full compensation for all labor, equipment, materials, personnel, and incidentals necessary to provide a safe condition during construction of all phases and elements of the project and to complete the work.

Payment will be made on the following basis: The initial monthly estimate will include 50% of the lump sum bid amount minus retention (typically 5%). The balance will be paid with the final estimate, upon completion of the project.

SECTION 025807
PAVEMENT MARKINGS (PAINT AND THERMOPLASTIC)

DESCRIPTION

This item shall consist of markings and stripes on the surface of the roadways or parking facilities applied in accordance with this specification and at the locations shown on the drawings or as directed by the Engineer.

MATERIALS

Type I Pavement Marking Materials shall be in accordance with TxDOT Departmental Material Specification DMS-8220 "Hot Applied Thermoplastic". All roadway markings shall be thermoplastic.

Type II Pavement Marking Materials shall be in accordance with TxDOT Departmental Material Specification DMS-8200 "Traffic Paint" and are not to be used for roadway markings except as primer/sealer for Type 1 markings. Type II Pavement Markings shall be allowed for parking facilities if called for in the plans.

Glass Traffic Beads shall be drop-on glass beads conforming to TxDOT Departmental Material Specification DMS-8290 "Glass Traffic Beads".

CONSTRUCTION METHODS

- 3.1 Weather Limitations - Pavement marking shall be performed only when the existing surface is dry and clean, when the atmospheric temperature is above 40⁰F., and when the weather is not excessively windy, dusty, or foggy. The suitability of the weather will be determined by the Engineer.
- 3.2 Equipment - All equipment for the work shall be approved by the Engineer and shall include the apparatus necessary to properly clean the existing surface, and mechanical marking machine, and such auxiliary hand painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an approved atomizing spray-type marking machine suitable for application of pavement markings. It shall produce an even and uniform film thickness at the required coverage and shall be designed so as to apply markings of uniform cross-sections and clear-out edges without running or spattering and within the limits for straightness set for herein.

Suitable adjustments shall be provided on the sprayer(s) of a single machine or by furnishing additional equipment for marking the width required.

3.3 Preparation of Existing Surface - Immediately before application of the paint or thermoplastic, the existing surface shall be dry and entirely free from old pavement markings and markers, dirt, grease, oil, acids, laitance, or other foreign matter which could reduce the bond between the marking and the pavement. The surface shall be thoroughly cleaned by sweeping and blowing as required to remove all dirt, laitance and loose materials. Areas that cannot be satisfactorily cleaned by brooming and blowing shall be scrubbed as directed with a water solution of trisodium phosphate (10% Na₃P₀₄ by weight) or an approved equal solution. After scrubbing, the solution shall be rinsed off and the surface dried prior to marking.

3.4 Layouts and Alignments - Suitable layouts and lines of proposed stripes shall be spotted in advance of the marking application. Control points shall be spaced at such intervals as will insure accurate location of all markings.

The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimensions, and application of the markings.

At least 72 hours prior to applying the permanent pavement markings, the Contractor shall notify the Engineer and City Construction Inspector to obtain City approval for the location, alignment and layout of the pavement markings.

3.5 Application - Markings shall be applied at the locations and to the dimensions and spacing indicated on the plans or as specified. Markings shall not be applied until the layouts, indicated alignment, and the condition of the existing surface have been approved by the Engineer.

In the application of straight stripes, any deviation of the edges exceeding 1/2 inch in 50 feet shall be obliterated and the marking corrected. The width of the markings shall be as designated within a tolerance of 5%. All markings shall be performed to the satisfaction of the Engineer.

Paint shall be applied uniformly by suitable equipment at a rate of not less than 105 or more than 115 square feet per gallon.

The Contractor shall furnish a certified report on the quality of materials ordered for the work. This report shall not be interpreted as a basis for final acceptance. The Engineer shall be notified upon an-ival of shipment for inspecting and sampling of the materials. When required, all emptied containers shall be returned to the paint material storage or made available for tallying by the Engineer. The containers shall not be removed from the job site or destroyed without permission. The Contractor shall make an accurate accounting of the paint materials used in the accepted work.

3.6 Protection - After application, all markings shall be protected while drying. The fresh markings shall be protected from damage of any kind. The Contractor shall be directly responsible for protecting the markings and shall erect or place suitable warning signs, flags or barricades, protective screens or coverings as required. All surfaces shall be protected from disfiguration by spatter, splashes, spillage, drippings of paint or other materials.

3.7 Defective Workmanship or Material - When any material not conforming to the requirements of the specifications or drawings has been delivered to the project or incorporated in the work, or any work performed is of inferior quality, such material or work shall be corrected as directed by the Engineer, at the expense of the Contractor.

MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, pavement markings shall be measured by the square foot or linear foot of each type of marking. Eliminating existing pavement markings and markers will not be measured and paid for separately but shall be subsidiary to the pavement marking items.

Payment shall be full compensation for furnishing all materials and for eliminating existing pavement markings and markers, for all preparation, layout and application of the materials, and for all labor, equipment, tools and incidentals necessary to complete the work.

SECTION 030020
PORTLAND CEMENT CONCRETE

DESCRIPTION

This specification shall govern for the materials used; for the storing and handling of materials; and for the proportioning and mixing of concrete for culverts, manholes, inlets, curb and gutter, sidewalks, driveways, curb ramps, headwalls and wingwalls, riprap, and incidental concrete construction.

The concrete shall be composed of Portland cement, aggregates (fine and coarse), admixtures if desired or required, and water, proportioned and mixed as hereinafter provided.

MATERIALS

(1) Cement

The cement shall be either Type I, II or III Portland cement conforming to ASTM Designation: C150, modified as follows:

Unless otherwise specified by the Engineer, the specific surface area of Type I and II cements shall not exceed 2000 square centimeters per gram (Wagner Turbidimeter — TxDOT Test Method Tex-310-D). For concrete piling, the above limit on specific surface area is waived for Type II cement only. The Contractor shall furnish the Engineer, with each shipment, a statement as to the specific surface area of the cement expressed in square centimeters per gram.

For cement strength requirements, either the flexural or compressive test may be used.

Either Type I or II cement shall be used unless Type II is specified on the plans. Except when Type II is specified on the plans, Type III cement may be used when the anticipated air temperature for the succeeding 12 hours will not exceed 60°F. Type III cement may be used in all precast prestressed concrete, except in piling when Type II cement is required for substructure concrete.

Different types of cement may be used in the same structure, but all cement used in any one monolithic placement shall be of the same type and brand. Only one brand of each type will be permitted in any one structure unless otherwise authorized by the Engineer.

Cement may be delivered in bulk where adequate bin storage is provided. All other cement shall be delivered in bags marked plainly with the name of the manufacturer and the type of cement. Similar

information shall be provided in the bills of lading accompanying each shipment of packaged or bulk cement. Bags shall contain 94 pounds net. All bags shall be in good condition at time of delivery.

All cement shall be properly protected against dampness. No caked cement will be accepted.

Cement remaining in storage for a prolonged period of time may be retested and rejected if it fails to conform to any of the requirements of these specifications.

(2) Mixing Water

Water for use in concrete and for curing shall be free from oils, acids, organic matter or other deleterious substances and shall not contain more than 1000 parts per million of chlorides as CL nor more than 1000 parts per million of sulfates as S04.

Water from municipal supplies approved by the State Health Department will not require testing, but water from other sources will be sampled and tested before use in structural concrete.

Tests shall be made in accordance with the "Method of Test for Quality of Water to be Used in Concrete" (AASHTO Method T26), except where such methods are in conflict with provisions of this specification.

(3) Coarse Aggregate

Coarse aggregate shall consist of durable particles of gavel, crushed blast furnace slag, crushed stone, or combinations thereof; free from frozen material or injurious amount of salt, alkali, vegetable matter, or other objectionable material either free or as an adherent coating; and its quality shall be reasonably uniform throughout. It shall not contain more than 0.25 percent by weight of clay lumps, nor more than 1.0 percent by weight of shale, nor more than 5 percent by weight of laminated and/or friable particles when tested in accordance with TxDOT Test Method Tex-413-A. It shall have a wear of not more than 40 percent when tested in accordance with TxDOT Test Method Tex-410-A.

Unless otherwise specified on the plans, coarse aggregate will be subjected to five cycles of the soundness test in accordance with TxDOT Test Method Tex-411-A. The loss shall not be greater than 12 percent when sodium sulfate is used, or 18 percent when magnesium sulfate is used.

Permissible sizes of aggregate shall be governed by Table 4 and Table 1, except that when exposed aggregate surfaces are required, coarse aggregate gradation will be as specified on the plans.

When tested by approved methods, the coarse aggregate, including combinations of aggregates when used, shall conform to the grading requirements shown in Table 1.

TABLE 1
Coarse Aggregate Gradation Chart

<u>Percent Retained on Each Sieve</u>										
<u>Aggregate Grade No.</u>	<u>Nominal Size</u>	<u>2- 1/2 in.</u>	<u>2 in.</u>	<u>1-1/2 in.</u>	<u>1 in.</u>	<u>3/4 in.</u>	<u>1/2 in.</u>	<u>3/8 in.</u>	<u>No. 4</u>	<u>No. 8</u>
1	2 in.	0	0 to 20	15 to 50		60 to 80			95 to 100	
2 (467)*	1-1/2 in.		0	0 to 5		30 to 65		70 to 90	95 to 100	
4 (57)*	1 in.			0	0 to 5		40 to 75		90 to 100	95 to 100
8	3/8 in.						0	0 to 5	24 to 80	90 to 100

*Numbers in parenthesis indicate conformance with ASTM C33.

The aggregate shall be washed. The Loss by Decantation (TxDOT Test Method Tex-406-A) plus the allowable weight of clay lumps, shall not exceed one percent, or the value shown on the plans, whichever is smaller.

(4) Fine Aggregate

Fine aggregate shall consist of clean, hard, durable and uncoated particles of natural or manufactured sand or a combination thereof, with or without a mineral filler. It shall be free from frozen material or injurious amounts of salt, alkali, vegetable matter or other objectionable material and it shall not contain more than 0.5 percent by weight of clay lumps. When subjected to the color test for organic impurities (TxDOT Test Method Tex-408-A), it shall not show a color darker than standard.

The fine aggregate shall produce a mortar having a tensile strength equal to or greater than that of Ottawa sand mortar when tested in accordance with TxDOT Test Method Tex-317-D.

Where manufactured sand is used in lieu of natural sand for slab concrete subject to direct traffic, the acid insoluble residue of the fine aggregate shall be not less than 28 percent by weight when tested in accordance with TxDOT Test Method Tex-612-J.

When tested by approved methods, the fine aggregate or combination of aggregates, including mineral filler, shall conform to the grading requirements shown in Table 2.

TABLE 2
Fine Aggregate Gradation Chart

(a) Percent Retained on Each Sieve								
(b) <u>Aggr</u> <u>egate Grade</u> <u>No.</u>	(c) <u>3</u> <u>/8 In.</u>	(d) <u>N</u> <u>o. 4</u>	(e) <u>N</u> <u>o. 8</u>	(f) <u>N</u> <u>o. 16</u>	(g) <u>N</u> <u>o. 30</u>	(h) <u>N</u> <u>o. 50</u>	(i) <u>N</u> <u>o. 100</u>	(j) <u>N</u> <u>o. 200</u>
(k) 1	(l) 0	(m) 0 to 5	(n) 0 to 20	(o) 1 5 to 50	(p) 3 5 to 75	(q) 7 0 to 90	(r) 9 0 to 100	(s) 9 7 to 100

NOTE 1: Where manufactured sand is used in lieu of natural sand, the percent retained on the No. 200 sieve shall be 94 to 100.

NOTE 2: Where the sand equivalent value is greater than 85, the retainage on the No. 50 sieve may be 70 to 94 percent.

Fine aggregate will be subjected to the Sand Equivalent Test (TxDOT Test Method Tex-203-F). The sand equivalent shall not be less than 80 nor less than the value shown on the plans, whichever is greater.

For concrete Classes 'A' and 'C', the fineness modulus as defined below for fine aggregates shall be between 2.30 and 3.10.

The fineness modulus will be determined by adding the percentages by weight retained on the following sieves, and dividing by 100; Nos. 4, 8, 16, 30, 50 and 100.

(5) Mineral Filler

Mineral filler shall consist of stone dust, clean crushed sand, or other approved inert material.

(6) Mortar (Grout)

Mortar for repair of concrete shall consist of 1 part cement, 2 parts finely graded sand, and enough water to make the mixture plastic. When required to prevent color difference, white cement shall be added to produce the color required. When required by the Engineer, latex adhesive shall be added to the mortar.

(7) Admixtures

Calcium Chloride will not be permitted. Unless otherwise noted, air-entraining, retarding and water reducing admixtures may be used in all concrete and shall conform to the following requirements:

A "water-reducing, retarding admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency and will retard the initial set of the concrete.

A "water-reducing admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency.

(t) Retarding and Water-Reducing Admixtures. The admixture shall meet the requirements for Type A and Type D admixture as specified in ASTM Designation: C494, modified as follows:

- (1) The water-reducing retarder shall retard the initial set of the concrete a minimum of 2 hours and a maximum of 4 hours, at a specified dosage rate, at a temperature of 90°F.
- (2) The cement used in any series of tests shall be either the cement proposed for specific work or a "reference" Type I cement from one mill.
- (3) Unless otherwise noted on the plans, the minimum relative durability factor shall be 80.

The air-entraining admixture used in the referenced and test concrete shall be neutralized Vinsol resin.

(u) Air-Entraining Admixture. The admixture shall meet the requirements of ASTM Designation: C260, modified as follows:

- (1) The cement used in any series of tests shall be either the cement proposed for specific work or a "reference". Type I cement from one mill.
- (2) Unless otherwise noted on the plans, the minimum relative durability factor shall be 80.

The air-entraining admixture used in the referenced concrete shall be neutralized Vinsol resin.

STORAGE OF CEMENT

All cement shall be stored in well-ventilated weatherproof buildings or approved bins, which will protect it from dampness or absorption of moisture. Storage facilities shall be ample, and each shipment of packaged cement shall be kept separated to provide easy access for identification and inspection.

The Engineer may permit small quantities of sacked cement to be stored in the open for a maximum of 48 hours on a raised platform and under waterproof covering.

STORAGE OF AGGREGATE

The method of handling and storing concrete aggregate shall prevent contamination with foreign materials. If the aggregates are stored on the ground, the sites for the stockpiles shall be clear of all vegetation and level. The bottom layer of aggregate shall not be disturbed or used without recleaning.

When conditions require the use of two or more sizes of aggregates, they shall be separated to prevent intermixing. Where space is limited, stockpiles shall be separated by physical barriers.

Methods of handling aggregates during stockpiling and subsequent use shall be such that segregation will be minimized.

Unless otherwise authorized by the Engineer, all aggregate shall be stockpiled at least 24 hours to reduce the free moisture content.

MEASUREMENT OF MATERIALS

The measurement of the materials, except water, used in batches of concrete, shall be by weight. The fine aggregate, coarse aggregate and mineral filler shall be weighed separately. Where bulk cement is used, it shall be weighed separately, but batch weighing of sacked cement will not be required. Where sacked cement is used, the quantities of material per batch shall be based upon using full bags of cement. Batches involving the use of fractional bags will not be permitted.

Allowance shall be made for the water content in the aggregates.

Bags of cement varying more than 3 percent from the specified weight of 94 pounds may be rejected, and when the average weight per bag in any shipment, as determined by weighing 50 bags taken at random, is less than the net weight specified, the entire shipment may be rejected. If the shipment is accepted, the Engineer will adjust the concrete mix to a net weight per bag fixed by an average of all individual weights which are less than the average weight determined from the total number weighed.

CLASSIFICATION AND MIX DESIGN

It shall be the responsibility of the Contractor to furnish the mix design, using a coarse aggregate factor acceptable to the Engineer, for the class(es) of concrete specified. The mix shall be designed by a qualified concrete technician to conform with the requirements contained herein and in accordance with the THD Bulletin C-11. The Contractor shall perform, at his own expense, the work required to substantiate the design, except the testing of strength specimens, which will be done by the Engineer. Complete concrete design data shall be submitted to the Engineer for approval.

It shall also be the responsibility of the Contractor to determine and measure the batch quantity of each ingredient, including all water, so that the mix conforms to these specifications and any other requirements shown on the plans.

Trial batches will be made and tested using all of the proposed ingredients prior to placing the concrete, and when the aggregate and/or brand of cement or admixture is changed. Trial batches shall be made in the mixer to be used on the job. When transit mix concrete is to be used, the trial designs will be made in a transit mixer representative of the mixers to be used. Batch size shall not be less than 50 percent of the rated mixing capacity of the truck.

Mix designs from previous or concurrent jobs may be used without trial batches if it is shown that no substantial change in any of the proposed ingredients has been made.

The coarse aggregate factor shall not be more than 0.82, except that when the voids in the coarse aggregate exceed 48 percent of the total dry loose volume, the coarse aggregate factor shall not exceed 0.85. The coarse aggregate factor shall not be less than 0.70 for Grades 1, 2 and 3 aggregates.

If the strength required for the class of concrete being produced is not secured with the cement specified in Table 4, the Contractor may use an approved water-reducing or retarding admixture, or he shall furnish aggregates with different characteristics which will produce the required results. Additional cement may be required or permitted as a temporary measure until the redesign is checked.

Water-reducing or retarding agents may be used with all classes of concrete at the option of the Contractor.

When water-reducing or retarding agents are used at the option of the Contractor, reduced dosage of the admixture will be permitted.

Entrained air will be required in accordance with Table 4. The concrete shall be designed to entrain 5 percent air when Grade 2 coarse aggregate is used and 6 percent when Grade 3 coarse aggregate is used. Concrete as placed in the structure shall contain the proper amount as required above with a tolerance of plus or minus 1.5 percentage points. Occasional variations beyond this tolerance will not be cause for rejection. When the quantity of entrained air is found to be above 7 percent with Grade 2 coarse aggregate or above 8 percent for Grade 3 coarse aggregate, additional test beams or cylinders will be made. If these beams or cylinders pass the minimum flexural or compressive requirements, the concrete will not be rejected because of the variation in air content.

CONSISTENCY

In cases where the consistency requirements cannot be satisfied without exceeding the maximum allowable amount of water, the Contractor may use, or the Engineer may require, an approved water reducing or retarding agent, or the Contractor shall furnish additional aggregates or aggregates with different characteristics, which will produce the required

results. Additional cement may be required or permitted as a temporary measure until aggregates are changed and designs checked with the different aggregates or admixture.

The consistency of the concrete as placed should allow the completion of all finishing operations without the addition of water to the surface. When field conditions are such that additional moisture is needed for the final concrete surface finishing operation, the required water shall be applied to the surface by fog spray only, and shall be held to a minimum. The concrete shall be workable, cohesive, possess satisfactory finishing qualities, and of the stiffest consistency that can be placed and vibrated into a homogenous mass. Excessive bleeding shall be avoided. Slump requirements will be as specified in Table 3.

TABLE 3
Slump Requirements

<u>Concrete Designation</u>	<u>Structural</u>	<u>Desired Slump</u>	<u>Max. Slump</u>
Concrete:			
(1) Thin-Walled Sections (9" or less)		4 inches	5 inches
(2) Slabs, Caps, Columns, Piers,			
Wall Sections over 9", etc.		3 inches	4 inches
Underwater or Seal Concrete		5 inches	6 inches
Riprap, Curb, Gutter and Other			
Miscellaneous Concrete		2.5 inches	4 inches

NOTE: No concrete will be permitted with slump in excess of the maximums shown.

QUALITY OF CONCRETE

General

The concrete shall be uniform and workable. The cement content, maximum allowable water-cement ratio, the desired and maximum slump and the strength requirements of the various classes of concrete shall conform to the requirements of Table 3 and Table 4 and as required herein.

During the process of the work, the Engineer or his designated representative will cast test cylinders or beams as a check on the compressive or flexural strength of the concrete actually placed. Test cylinders must be picked up by the testing lab within 24 hours.

A test shall be defined as the average of the breaking strength of two cylinders or two beams, as the case may be. Specimens will be tested in accordance with TxDOT Test Methods Tex-418-A or Tex-420-A.

Test beams or cylinders will be required as specified in the contract documents. For small placements on structures such as manholes, inlets, culverts, wingwalls, etc., the Engineer may vary the number of tests to a minimum of one for each 25 cubic yards placed over a several day period.

All test specimens, beams or cylinders, representing tests for removal of forms and/or falsework shall be cured using the same methods, and under the same conditions as the concrete represented.

'Design Strength' beams and cylinders shall be cured in accordance with THD Bulletin C-11.

The Contractor shall provide and maintain curing facilities as described in THD Bulletin C-11 for the purpose of curing test specimens. Provision shall be made to maintain the water in the curing tank at temperatures between 70°F and 90°F.

When control of concrete quality is by twenty-eight-day compressive tests, job control will be by seven-day compressive tests which are shown to provide the required twenty-eight-day strength, based on results from trial batches. If the required seven-day strength is not secured with the cement specified in Table 4, changes in the batch design will be made.

TABLE 4

Class of Concrete	(x) Sacks cement per C.Y. (min)	(y) Minimum Compressive Strength (fc) 28- Day (psi)	(z) Min. Beam Strength (aa) 7- Day (psi)	(bb) Maximum Water- Cement Ratio (gal/sack)	(cc) Coarse Aggregate No.
(d) A*	(ee) 5.0	(ff) 3000	(gg) 500* **	(hh) 6.5	(ii) 2-4- 8****
(j) B*	(kk) 4.5	(ll) 2500	(mm) 417	(nn) 8.0	(oo) 2-4- 8****
(p) C*	(qq) 6.0	(rr) 3600	(ss) 600* **	(tt) 6.0	(uu) 1-2-4**
(v) D	(ww) 6.0	(xx) 3000	(yy) 500	(zz) 7.0	(aaa) 2-4
(bbb) S	(ccc) 6.5	(ddd) 4000	(eee) 570	(fff) 5.0	(ggg) 2-4

Classes of Concrete

*Entrained Air (slabs, piers and bent concrete).

**Grade 1 Coarse Aggregate may be used in foundation only (except cased drilled shafts).

***When Type II Cement is used with Class C Concrete, the 7-day beam break requirement will be 550 psi; with Class A Concrete, the minimum 7-day beam break requirement will be 460 psi.

****Permission to use Grade 8 Aggregate must have prior approval of the Engineer.

MIXING CONDITIONS

The concrete shall be mixed in quantities required for immediate use. Any concrete which is not in place within the limits outlined in City Standard Specification Section 038000 "Concrete Structures", Article "Placing Concrete-General", shall not be used. Retamping of concrete will not be permitted.

In threatening weather, which may result in conditions that will adversely affect the quality of the concrete to be placed, the Engineer may order postponement of the work. Where work has been started and changes in weather conditions require protective measures, the Contractor shall furnish adequate shelter to protect the concrete against damage from rainfall, or from freezing temperatures. If necessary to continue operations during rainfall, the Contractor shall also provide protective coverings for the material stockpiles. Aggregate stockpiles need be covered only to the extent necessary to control the moisture conditions in the aggregates to adequately control the consistency of the concrete.

MIXING AND MIXING EQUIPMENT

All equipment, tools, and machinery used for hauling materials and performing any part of the work shall be maintained in such condition to insure completion of the work underway without excessive delays for repairs or replacements.

The mixing shall be done in a batch mixer of approved type and size that will produce uniform distribution of the material throughout the mass. Mixers may be either the revolving drum type or the revolving blade type, and shall be capable of producing concrete meeting the requirements of these specifications.

After all the ingredients are assembled in the drum, the mixing shall continue not less than 1 minute for mixers of one cubic yard or less capacity plus 15 seconds for each additional cubic yard or portion thereof.

The mixer shall operate at the speed and capacity designated by the Mixer Manufacturers Bureau of the Associated General Contractors of America. The mixer shall have a plate affixed showing the manufacturer's recommended operating data.

The absolute volume of the concrete batch shall not exceed the rated capacity of the mixer.

The entire contents of the drum shall be discharged before any materials are placed therein for the succeeding batch.

The first batch of concrete materials placed in the mixer for each placement shall contain an extra quantity of sand, cement and water sufficient to coat the inside surface of the drum.

Upon the cessation of mixing for any considerable length of time, the mixer shall be thoroughly cleaned.

The concrete mixer shall be equipped with an automatic timing device which is put into operation when the skip is raised to its full height and dumping. This device shall lock the discharging mechanism and prevent emptying of the mixer until all the materials have been mixed together for the minimum time required, and it shall ring a bell after the specified time of mixing has elapsed.

The water tank shall be arranged so that the amount of water can be measured accurately, and when the tank starts to discharge, the inlet supply shall cut off automatically.

Whenever a concrete mixer is not adequate or suitable for the work, it shall be removed from the site upon a written order from the Engineer and a suitable mixer provided by the Contractor.

Pick-up and thro-over blades in the drum of the mixer which are worn down more than 10 percent in depth shall be repaired or replaced with new blades.

Improperly mixed concrete shall not be placed in the structure.

Job mix concrete shall be concrete mixed in an approved batch mixer in accordance with the requirements stated above, adjacent to the structure for which the concrete is being mixed, and moved to the placement site in non-agitating equipment.

READY-MIX PLANTS

A. General. It shall be the Contractor's responsibility to furnish concrete meeting all requirement of the governing specification sections, and concrete not meeting the slump, workability and consistency requirements of the governing specification sections shall not be placed in the structure or pavement.

Ready-Mixed Concrete shall be mixed and delivered by means of one of the following approved methods.

- (1) Mixed completely in a stationary mixer and transported to the point of delivery in a truck agitator or a truck mixer operating at tuck agitator or tuck mixer agitation speed. (Central-Mix Concrete)
- (2) Mixed complete in a tuck mixer and transported to the placement site at mixing and/or agitating speed (Transit-Mix Concrete), subject to the following provisions:
 - (a) Truck mixers will be permitted to transport concrete to the job site at mixing speed if equipped with double actuated counters which will separate revolutions at mixing speed from total revolutions.
 - (b) Truck mixers equipped with a single actuated counter counting total revolutions of the drum shall mix the concrete at the plant not

less than 50 nor more than 70 revolutions at mixing speed, transport it to the job site at agitating speed and complete the required mixing before placing the concrete.

- (3) Mixed completely in a stationery mixer and transported to the job site in approved non-agitating. trucks with special bodies. This method of transporting will be permitted for concrete pavement only.

B. Equipment.

- (1) Batching Plant. The batching plant shall be provided with adequate bins for batching all aggregates and materials required by the specifications.

Bulk cement shall be weighed on a scale separate from those used for other materials and in a hopper entirely free and independent of that used for weighing the aggregates.

- (2) Mixers and Agitators.

- (a) General: Mixers shall be of an approved stationary or truck-type capable of combining the ingredients into a thoroughly mixed and uniform mass.

Facilities shall be provided to permit ready access to the inside of the drum for inspection, cleaning and repair of blades.

Mixers and agitators shall be subject to daily examination for changes in condition due to accumulation of hardened concrete and/or wear of blades, and any hardened concrete shall be removed before the mixer will be permitted to be used. Worn blades shall be repaired or replaced with new in accordance with the manufacturer's design and arrangement for that particular unit when any part or section is worn as much as 10 percent below the original height of the manufacturer's design.

- (b) Stationary Mixers: These shall conform to the requirements of Article "Mixing and Mixing Equipment". Truck mixers mounted on a stationary base will not be considered as a stationary mixer.
- (c) Truck Mixers: In addition, truck mixers shall comply with the following requirements:

An engine in satisfactory working condition and capable of accurately gauging the desired speed of rotation shall be mounted as an integral part of the mixing unit for the purpose of rotating the drum. Truck mixers equipped with a transmission that will govern the speed of the

drum within the specified revolutions per minute (rpm) will not require a separate engine.

All truck mixers shall be equipped with actuated counters by which the proper number of revolutions of the drum, as specified in Article 11. A. above, may be readily verified. The counters shall be read and recorded at the start of mixing at mixing speeds.

Each until shall have adequate water supply and accurate metering or gauging devices for measuring the amount used.

- (d) Agitators: Concrete agitators shall be of the truck type, capable of maintaining a thoroughly mixed and uniform concrete mass and discharging it within the same degree of uniformity specified for mixers. Agitators shall comply with all of the requirements for truck mixers, except for the actual mixing requirements.

C. Operation of Plant and Equipment.

Delivery of ready-mixed concrete shall equal or exceed the rate approved by the Engineer for continuous placement. In all cases, the delivery of concrete to the placement site shall assure compliance with the time limits in the applicable specification for depositing successive batches in any monolithic unit. The Contractor shall satisfy the Engineer that adequate standby trucks are available.

A standard ticket system will be used for recording concrete batching, mixing and delivery date.

Tickets will be delivered to the job inspector.

Loads arriving without ticket and/or in unsatisfactory condition shall not be used.

When a stationary mixer is used for the entire mixing operation, the mixing time for one cubic yard of concrete shall be one minute plus 15 seconds for each additional cubic yard or portion thereof. This mixing time shall start when all cement, aggregates and initial water have entered the drum.

The mixer shall be charged so that some of the mixing water will enter the drum in advance of the cement and aggregate. All of the mixing water shall be in the drum by the end of the first one-fourth of the specified mixing time. Water used to flush down the blades after charging shall be accurately measured and included in the quantity of mixing water. The introduction of the initial mixing water, except blade wash down water and that permitted in this Article, shall be prior to or simultaneous with the charging of the aggregates and cement.

The loading of truck mixers shall not exceed 63 percent of the total volume of the drum. When used as an agitator only, the loading shall not exceed 80 percent of the drum volume.

When Ready-Mix Concrete is used, additional mortar (one sack cement, three parts sand and sufficient water) shall be added to the batch to coat the drum of the mixer or agitator tuck, and this shall be required for every load of Class C concrete only and for the first batch from central mix plants.

A portion of the mixing water, required by the batch design to produce the desired slump, may be withheld and added at the job site, but only with permission of the Engineer and under his supervision. When water is added under the above conditions, it shall be thoroughly mixed as specified below for water added at the job site.

Mixing speed shall be attained as soon as all ingredients are in the mixer, and each complete batch (containing all the required ingredients) shall be mixed not less than 70 nor more than 100 revolutions of the drum at mixing speed except that when water is added at the job site, 25 revolutions (minimum) at mixing speed will be required to uniformly disperse the additional water throughout the mix. Mixing speed shall be as designated by the manufacturer.

All revolutions after the prescribed mixing time shall be at agitating speed. The agitating speed shall be not less than one (1) nor more than five (5) rpm. The drum shall be kept in continuous motion from the time mixing is started until the discharge is completed.

PLACING, CURING AND FINISHING

The placing of concrete, including construction of forms and falsework, curing and finishing, shall be in accordance with City Standard Specification Section 038000 "Concrete Structures".

MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, the quantities of concrete of the various classifications which will constitute the completed and accepted structure(s) in-place will be measured by the cubic yard, per each, square foot, square yard or linear foot, as the case may be. Measurement will be as shown on the drawings and/or in the Bid Form.

Payment shall be full compensation for furnishing, hauling, mixing, placing, curing and finishing all concrete; all grouting and pointing; furnishing and placing drains; furnishing and placing metal flashing strips; furnishing and placing expansion joint material required by this specification or shown on the plans; and for all forms and falsework, labor, tools, equipment and incidentals necessary to complete the work.

SECTION 032020
REINFORCING STEEL

1. DESCRIPTION

This specification shall govern the furnishing and placing of reinforcing steel, deformed and smooth, of the size and quantity designated on the plans and in accordance with these specifications.

2. MATERIALS

Unless otherwise designated on the plans, all bar reinforcement shall be deformed, and shall conform to ASTM Designation: A 615, Grades 60 or 75, and shall be open hearth, basic oxygen, or electric furnace new billet steel.

Large diameter new billet steel (Nos. 14 and 18), Grade 75, will be permitted for straight bars only.

Where bending of bar sizes No. 14 or No. 18 of Grade 60 is required, bend testing shall be performed on representative specimens as described for smaller bars in the applicable ASTM Specification. The required bend shall be 90 degrees around a pin having a diameter of 10 times the nominal diameter of the bar.

Spiral reinforcement shall be smooth (not deformed) bars or wire of the minimum diameter shown on the plans and shall be made by one or more of the following processes: open hearth, basic oxygen, or electric furnace. Bars shall be rolled from billets reduced from ingots and shall comply with ASTM Designation: A 306, Grade 65 minimum (references to ASTM Designation: A 29 is voided). Dimensional tolerances shall be in accordance with ASTM Designation: A 615, or ASTM Designation: A 615, Grade 60, except for deformations. Wire shall be cold-drawn from rods that have been hot-rolled from billets and shall comply with ASTM Designation: A 185.

In cases where the provisions of this specification are in conflict with the provisions of the ASTM Designation to which reference is made, the provisions of this specification shall govern.

Report of chemical analysis showing the percentages of carbon, manganese, phosphorus and Sulphur will be required for all reinforcing steel when it is to be welded.

The nominal size and area and the theoretical weight of reinforcing steel bars covered by this specification are as follows:

Bar Size Number	Nominal Diameter, In.	Nominal Area, Sq. In.	Weight per Linear Foot, Pounds
2	0.250	0.050	0.167
3	0.375	0.110	0.376
4	0.500	0.200	0.668
5	0.625	0.310	1.043
6	0.750	0.440	1.502
7	0.875	0.600	2.044
8	1.000	0.790	2.670
9	1.128	1.000	3.400
10	1.270	1.270	4.303
11	1.410	1.560	5.313
14	1.693	2.250	7.600

Smooth round bars shall be designated by size number through No. 4. Smooth bars larger than No. 4 shall be designated by diameter in inches.

2 Gauge Number	4 Equivalent Diameter, Inches	5 Gauge Number	7 Equivalent Diameter, Inches
8 0	9 0.3065	10 8	11 0.1620
12 1	13 0.2830	14 9	15 0.1483
16 2	17 0.2625	18 10	19 0.1350
20 3	21 0.2437	22 11	23 0.1205
24 4	25 0.2253	26 12	27 0.1055
28 5	29 0.2070	30 13	31 0.0915
32 6	33 0.1920	34 14	35 0.0800
36 7	37 0.1770	38	39

When wire is ordered by gauge numbers, the following relation between gauge number and diameter, in inches, shall apply unless otherwise specified:

3. BENDING

The reinforcement shall be bent cold, true to the shapes indicated on the plans. Bending shall preferably be done in the shop. Irregularities in bending shall be cause for rejection.

Unless otherwise shown on the plans, the inside diameter of bar bends, in terms of the nominal bar diameter (d), shall be as follows:

Bends of 90 degrees and greater in stirrups, ties and other secondary bars that enclose another bar in the bend:

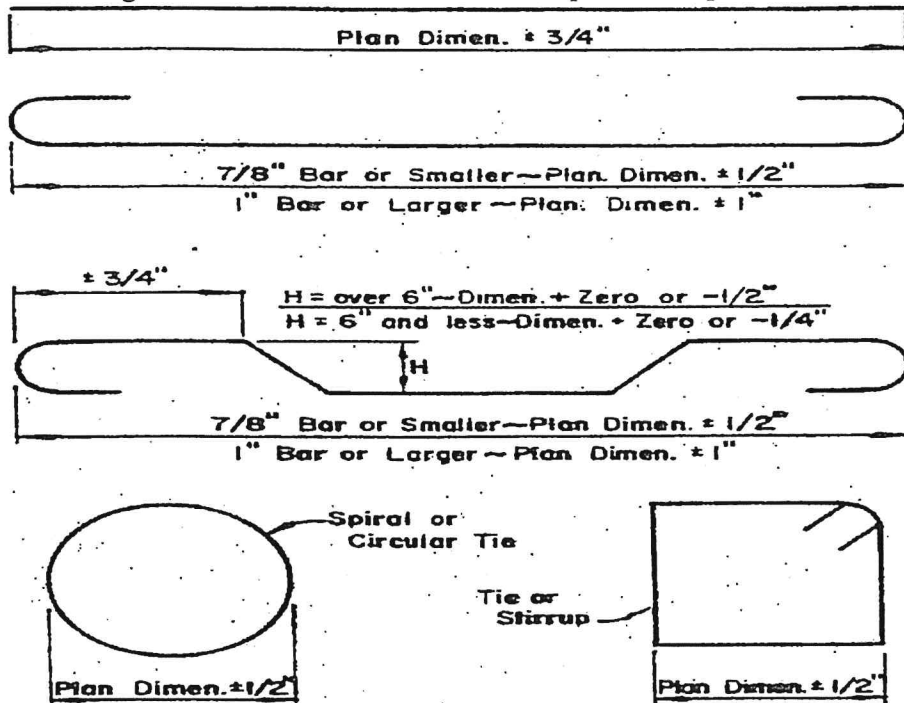
	<u>Grade 60</u>
#3, #4, #5	4d
#6, #7, #8	5d

All bends in main bars and in secondary bars not covered above:

	<u>Grade 60</u>	<u>Grade 75</u>
#3 thru #8	6d	--
#9, #10	8d	--
#11	8d	8d
#14, #18	10d	--

4. TOLERANCES

Fabricating tolerances for bars shall be within 3 percent of specified or as follows:



5. STORING

Steel reinforcement shall be stored above the surface of the ground upon platforms, skids or other supports, and shall be protected as far as practicable from mechanical injury and surface deterioration caused by exposure to conditions producing rust. When placed in the work, reinforcement shall be free from dirt, paint, grease, oil, or other foreign materials. Reinforcement shall be free from injurious defects such as cracks and laminations. Rust, surface seams, surface irregularities or mill scale will not be cause for rejection, provided the minimum dimensions, cross sectional area and tensile properties of a hand wire crushed specimen meets the physical requirements for size and grade of steel specified.

6. SPLICES

No splicing of bars, except when provided on the plans or specified herein, will be permitted without written approval of the Engineer.

Splices will not be permitted in main reinforcement at points of maximum stress. When permitted in main bars, splices in adjacent bars shall be staggered a minimum of two splice lengths.

TABLE 1
Minimum Lap Requirements

<u>Lap</u>	<u>Uncoated</u>	<u>Coated</u>
Lap in inches \geq	40d	60d

Where: d = bar diameter in inches

Welding of reinforcing bars may be used only where shown on the plans or as permitted herein. All welding operations, processes, equipment, materials, workmanship and inspection shall conform to the requirements of the drawings and industry standards. All splices shall be of such dimension and character as to develop the full strength of bar being spliced.

End preparation for butt welding reinforcing bars shall be done in the field. Delivered bars shall be of sufficient length to permit this practice.

For box culvert extensions with less than one foot of fill, the existing longitudinal bars shall have a 20-diameter lap with the new bars. For box culvert extensions with more than one foot of fill, a minimum of 6 inches lap will be required.

Unless otherwise shown on the plans, dowel bars transferring tensile stresses shall have a minimum embedment equal to the minimum lap requirements shown in Table 1. Shear transfer dowels shall have a minimum embedment of 12 inches.

7. PLACING

Reinforcement shall be placed as near as possible in the position shown on the plans. Unless otherwise shown on the plans, dimensions shown for reinforcement are to the centers of the bars. In the plane of the steel parallel to the nearest surface of concrete, bars shall not vary from plan placement by more than one-twelfth of the spacing between bars. In the plane of the steel perpendicular to the nearest surface of concrete, bars shall not vary from plan placement by more than one-quarter inch. Cover of concrete to the nearest surface of steel shall meet the above requirements but shall never be less than one inch or as otherwise shown on the plans.

Vertical stirrups shall always pass around the main tension members and be attached securely thereto. The reinforcing steel shall be spaced its required distance from the form surface by means of approved galvanized metal spacers, metal spacers with plastic coated tips, stainless steel spacers, plastic spacers, or approved pre-cast mortar or concrete blocks. For approval of plastic spacers on the project, representative samples of the plastic shall show no visible indications of deterioration after immersion in a 5 percent solution of sodium hydroxide for 120 hours.

All reinforcing steel shall be tied at all intersections, except that where spacing is less than one foot in each direction, alternate intersections only need be tied.

Before any concrete is placed, all mortar shall be cleaned from the reinforcement. Precast mortar or concrete blocks to be used for holding steel in position adjacent to formed surfaces shall be cast in molds meeting the approval of the Engineer and shall be cured by covering with wet burlap or cotton mats for a period of 72 hours.

The blocks shall be cast in the form of a frustum of a cone or pyramid with the smaller face placed against the forms.

A suitable tie wire shall be provided in each block, to be used for anchoring to the steel. Except in unusual cases, and when specifically, otherwise authorized by the Engineer, the size of the surface to be placed adjacent to the forms shall not exceed two and one-half inches square or the equivalent thereof in cases where circular or rectangular areas are provided. Blocks shall be cast accurately to the thickness required, and the surface to be placed adjacent to the forms shall be a true plane free of surface imperfections.

Reinforcement shall be supported and tied in such manner that a sufficiently rigid cage of steel is provided. If the cage is not adequately supported to resist settlement or floating upward of the steel, overturning of truss bars or movement in any direction during concrete placement, permission to continue concrete placement will be withheld until corrective measures are taken. Sufficient measurements shall be made during concrete placement to ensure compliance with the first paragraph of Article 7 of this specification.

Mats of wire fabric shall overlap each other sufficiently to maintain a uniform strength and shall be fastened securely at the ends and edges.

No concrete shall be deposited until the Engineer has inspected the placement of the reinforcing steel and given permission to proceed.

8. MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, reinforcing steel is considered subsidiary to the various items shown in the Bid Form and shall not be measured and paid for as a separate item.

SECTION 038000
CONCRETE STRUCTURES

1. DESCRIPTION

This specification shall govern for construction of all types of structures involving the use of structural concrete, except where the requirements are waived or revised by other governing specifications.

All concrete structures shall be constructed in accordance with the design requirements and details shown on the plans; in conformity with the pertinent provisions of the items contracted for; the incidental specifications referred to; and in conformity with the requirements herein.

2. MATERIALS

- (1) Concrete. All concrete shall conform to the provisions of City Standard Specification Section 030020 "Portland Cement Concrete".

The class of concrete for each type of structure or unit shall be as specified on the plans or by pertinent governing specifications.

- (2) Expansion Joint Material.

- (a) Preformed Fiber Material. Preformed fiber expansion joint material shall be of the dimensions shown on the plans. The material shall be one of the following types, unless otherwise noted on the plans:

1. Preformed Bituminous Fiber Materials shall meet the requirements of ASTM Designation: DI 751 "Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)".
2. Preformed Non-Bituminous Fiber Material shall meet the requirements of ASTM Designation: DI 751 "Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types) ", except that the requirements pertaining to bitumen content, density and water absorption shall be voided.

3. Redwood.

- (b) Joint Sealing Materials. Unless otherwise shown on the drawings, joint sealing material shall conform to the following requirements. The material shall adhere to the sides of the concrete joint or crack and shall form an effective seal against infiltration of water and incompressibles. The material shall not crack or break when exposed to low temperatures.

1. Class I-a. (Two-Component, Synthetic Polymer, Cold-Extruded Type). Curing is to be by polymerization and not by evaporation of solvent or fluxing of harder particles. This type is specifically designed for vertical or sloping joints and hence not self-leveling. It shall cure sufficiently at an average temperature of 77 degrees F \pm 3 degrees F in a maximum of 24 hours. For performance requirements see under 2.(2)(b)2. below.
2. Class I-b. (Two-Component, Synthetic Polymer, Cold-Pourable, Self-Leveling Type). Curing is to be by polymerization and not by evaporation of solvent or fluxing of harder particles. It shall cure sufficiently at an average temperature of 77 degrees F \pm 3 degrees F in a maximum of 3 hours.

Performance Requirements: Class I-a and Class I-b joint materials, when tested in accordance with TxDOT Test Method Tex-525-C, shall meet the above curing times and the following requirements:

It shall be of such consistency that it can be mixed and poured, or mixed and extruded into joints at temperatures above 60 degrees F.

Penetration, 77° F . :	
150 gm. cone, 5 sec., max, cm	0.90
Bond and Extension 75%, 0° F, 5 cycles:	
Dry Concrete Blocks	Pass
Wet Concrete Blocks	Pass
Steel Blocks...(Primed if specified by manuf.).	Pass
Flow at 200° F	None
Water Content % by weight, max	5.0
Resilience:	
Original sample min. % (cured)	50
Oven aged at 158° F min. %	50
For Class 2-a Material Only:	
Cold Flow (10 min.)	None

(c) Asphalt Board. Asphalt Board shall consist of two liners of 0.016-inch asphalt impregnated paper, filled with a mastic mixture of asphalt and vegetable fiber and/or mineral filler. Boards shall be smooth, flat and sufficiently rigid to permit installation. When tested in accordance with TxDOT Test Method Tex-524-C, the asphalt board shall not deflect from the horizontal more than one inch in three and one-half inches (1 " in 3 h').

(d) Rebonded Neoprene Filler. Rebonded neoprene filler shall consist of ground closed-cell neoprene particles, rebonded and molded into sheets of uniform thickness, of the dimensions shown on plans.

Filler material shall have the following physical properties and shall meet the requirements of ASTM Designation: D 1752 "Standard Specification for Preformed

Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction", Type 1, where applicable:

<u>PROPERTY</u>	<u>METHOD</u>	<u>REQUIREMENT</u>
Color	ASTM DI 752, Type 1	Black
Density	ASTM D1752, Type 1	40 lb./ft ³ Min.
Recovery	ASTM DI 752, Type 1	90%Min.
Compression	ASTM D1752, Type 1	50 to 500 psi
Extrusion	ASTM DI 752, Type 1	0.25 inch Max.
Tensile Strength	ASTM D1752, Type 1	20 psi Min.
Elongation		75% Min.

The manufacturers shall furnish the Engineer with certified test results as to compliance with the above requirements and a 12 inch x 12 inch x 1 inch sample from the shipment for approval.

(3) Curing Materials.

(a) Membrane curing materials shall comply with ASTM Designation: C 309 "Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete", Type 1 clear or translucent, or Type 2 white-pigmented. The material shall have a minimum flash-point of 80 degrees F when tested by the "Pensky-Martin Closed Cup Method".

It shall be of such consistency that it can be satisfactorily applied as a fine mist through an atomizing nozzle by means of approved pressure spraying equipment at atmospheric temperatures above 40 degrees F.

It shall be of such nature that it will not produce permanent discoloration of concrete surfaces nor react deleteriously with the concrete or its components. Type 1 compound shall contain a fugitive dye that will be distinctly visible not less than 4 hours nor more than 7 days after application. The compound shall produce a firm, continuous, uniform moisture impermeable film free from pinholes and shall adhere satisfactorily to the surfaces of damp concrete. It shall, when applied to the damp concrete surface at the rate of coverage specified herein, be dry to the touch in not more than 4 hours, and shall adhere in a tenacious film without running off or appreciable sagging. It shall not disintegrate, check, peel or crack during the required curing period.

The compound shall not peel or pick up under traffic and shall disappear from the surface of the concrete by gradual disintegration.

The compound shall be delivered to the job only in the manufacturer's original containers, which shall be clearly labeled with the manufacturer's name, the trade name of the material, and a batch number or symbol with which test samples may be correlated.

The water retention test shall be in accordance with TxDOT Test Method Tex-219-F. Percentage loss shall be defined as the water lost after the application of the curing material was applied. The permissible percentage moisture loss (at the rate of coverage specified herein) shall not exceed the following:

- 24 hours after application.....2 percent
- 72 hours after application.....4 percent

Type 1 (Resin Base Only) curing compound will be permitted for slab concrete in bridge decks and top slabs of direct traffic culverts.

(b) Mat curing of concrete is allowed where permitted by Table 1 in this specification or where otherwise approved by the Engineer.

3. EXPANSION JOINTS

Joints and devices to provide for expansion and contraction shall be constructed where and as indicated herein or on the plans.

All open joints and joints to be filled with expansion joint material, shall be constructed using forms adaptable to loosening or early removal. To avoid expansion or contraction damage to the adjacent concrete, these forms shall be loosened as soon as possible after final concrete set to permit free movement without requiring full form removal.

Prior to placing the sealing material, the vertical facing the joint shall be cleaned of all laitance by sandblasting or by mechanical routing. Cracked or spalled edges shall be repaired. The joint shall be blown clean of all foreign material and sealed. Where preformed fiber joint material is used, it shall be anchored to the concrete on one side of the joint by light wire or nails, to prevent the material from falling out. The top one inch (1") of the joint shall be filled with joint sealing material.

Finished joints shall conform to the indicated outline with the concrete sections completely separated by the specified opening or joint material.

Soon after form removal and again where necessary after surface finishing, all projecting concrete shall be removed along exposed edges to secure full effectiveness of the expansion joints.

4. CONSTRUCTION JOINTS

The joint formed by placing plastic concrete in direct contact with concrete that has attained its initial set shall be deemed a construction joint. The term "monolithic placement" shall be interpreted to mean at the manner and sequence of concrete placing shall not create construction joints.

Construction joints shall be of the type and at the locations shown on the plans. Additional joints will not be permitted without written authorization from the Engineer, and when authorized, shall have details equivalent to those shown on the plans for joints in similar locations.

Unless otherwise provided, construction joints shall be square and normal to the forms. Bulkheads shall be provided in the forms for all joints, except when horizontal.

Construction joints requiring the use of joint sealing material shall be as detailed on the plans. The material will be specified on the plans without referenced to joint type.

A concrete placement terminating at a horizontal construction joint shall have the top surface roughened thoroughly as soon as practicable after initial set is attained. The surfaces at bulkheads shall be roughened as soon as the forms are removed.

The hardened concrete surface shall be thoroughly cleaned of all loose material, laitance, dirt or foreign material, and saturated with water so it is moist when placing fresh concrete against it. Forms shall be drawn tight against the placing of the fresh concrete.

5. FORMS

(1) General. Except where otherwise specified, forms may be of either timber or metal.

Forms for round columns exposed to view shall be of steel, except that other materials will be allowed with written permission of the Engineer.

Forming plans shall be submitted to the Engineer for approval as specified. Forms shall be designed for the pressure exerted by a liquid weighing 150 pounds per cubic foot. The rate of placing the concrete shall be taken into consideration in determining the depth of the equivalent liquid. For job fabricated forms, an additional live load of 50 pounds per square foot shall be allowed on horizontal surfaces. The maximum unit stresses shall not exceed 125 percent of the allowable stresses used by the Texas Department of Transportation for the design of structures.

Commercially produced structural units used in formwork shall not exceed the manufacturer's maximum allowable working load for moment, shear or end reaction. The maximum working load shall include a live load of 35 pounds per square foot of horizontal form surface, and

sufficient details and data shall be submitted for use in checking formwork details for approval.

Forms shall be practically mortar-tight, rigidly braced and strong enough to prevent bulging between supports, and maintained to the proper line and grade during concrete placement. Forms shall be maintained in a manner that will prevent warping and shrinkage.

Offset at form joints shall not exceed one-sixteenth of an inch (1/16").

Deflections due to cast-in-place slab concrete and railing shown in the dead load deflection diagram shall be taken into account in the setting of slab forms.

All forms and footing areas shall be cleaned of any extraneous matter before placing concrete.

Permission to place concrete will not be given until all such work is completed to the satisfaction of the Engineer.

If, at any stage of the work, the forms show signs of bulging or sagging, the portion of the concrete causing such condition shall be removed immediately, if necessary, and the forms shall be reset and securely braced against further movement.

(2) Timber Forms. Lumber for forms shall be properly seasoned, of good quality, and free from imperfections which would affect its strength or impair the finished surface of the concrete. The lumber used for facing or sheathing shall be finished on at least one side and two edges and shall be sized to uniform thickness.

Form lining will be required for all formed surfaces, except for the inside of culvert barrels, inlets and manholes; surfaces that are subsequently covered by backfill material or are completely enclosed; and, any surface formed by a single finished board. Lining will not be required when plywood forms are used.

Form lining shall be of an approved type such as Masonite or plywood. Thin membrane sheeting, such as polyethylene sheets, shall not be used for form lining.

Forms may be constructed of plywood not less than one-half inch in thickness, with no form lining required. The grain of the face plies on plywood forms shall be placed parallel to the span between the supporting studs or joists.

Plywood used for forming surfaces that remain exposed shall be equal to that specified as B-B Plyform Class I or Class II Exterior, of the U. S. Department of Commerce, National Bureau of Standards and Technology, latest edition.

Forms or form lumber to be reused shall be maintained clean and in good condition. Any lumber which is split, warped, bulged, marred, or has defects that will produce inferior work, shall not be used and, if condemned, shall be promptly removed from the work.

Studs and joists shall be spaced so that the facing form material remains in true alignment under the imposed loads.

Wales shall be spaced close enough to hold forms securely to the designated lines and scabbed at least 4 feet on each side of joints to provide continuity. A row of wales shall be placed near the bottom of each placement.

Facing material shall be placed with parallel and square joints and securely fastened to supporting studs.

Forms for surfaces receiving only an ordinary finish and exposed to view shall be placed with the form panels symmetrical, i.e., long dimensions set in the same direction. Horizontal joints shall be continuous.

Molding specified for chamfer strips or other uses shall be made of materials of a grade that will not split when nailed and which can be maintained to a true line without warping. Wood molding shall be mill cut and dressed on all faces. Unless otherwise provided, forms shall be filleted at all sharp corners and edges with triangular chamfer strips measuring three-quarter inch (3/4") on the sides.

Forms for railing and ornamental work shall be constructed to standards equivalent to first-class millwork. All moldings, panel work and bevel strips shall be straight and true with nearly mitered joints designed so the finished work is true, sharp and clean cut.

All forms shall be constructed to permit their removal without marring or damaging the concrete. The forms may be given a slight draft to permit ease of removal.

Metal form ties of an approved type or a satisfactory substitute shall be used to hold forms in place and shall be of a type that permits ease of removal of the metal as hereinafter specified.

All metal appliances used inside of forms for alignment purposes shall be removed to a depth of at least one-half inch (1/2") from the concrete surface. They shall be made so the metal may be removed without undue chipping or spalling, and when removed, shall leave a smooth opening in the concrete surface. Burning off of rods, bolts or ties will not be permitted.

Any wire ties used shall be cut back at least one-half inch (1/2") from the face of the concrete.

Devices holding metal ties in place shall be capable of developing the strength of the tie and adjustable to allow for proper alignment.

Metal and wooden spreaders which are separate from the forms shall be removed entirely as the concrete is being placed.

Adequate clean-out openings shall be provided for narrow walls and other locations where access to the bottom of the forms is not readily attainable.

Prior to placing concrete, the facing of all forms shall be treated with oil or other bond breaking coating of such composition that it will not discolor or otherwise injuriously affect the concrete surface. Care shall be exercised to prevent coating of the reinforcing steel.

(3) Metal Forms. The foregoing requirements for timber forms regarding design, mortar-tightness, filleted corners, beveled projections, bracing, alignment, removal, reuse and wetting shall also apply to metal forms, except that these will not require lining, unless specifically noted on the plans.

The thickness of form metal shall be as required to maintain the true shape without warping or bulging. All bolt and rivet heads on the facing sides shall be countersunk. Clamps, pins or other connecting devices shall be designed to hold the forms rigidly together and to allow removal without injury to the concrete. Metal forms which do not present a smooth surface or line up properly shall not be used. Metal shall be kept free from rust, grease or other foreign materials.

6. PLACING REINFORCEMENT

Reinforcement in concrete structures shall be placed carefully and accurately and rigidly supported as provided in the City Standard Specification Section 032020 "Reinforcing Steel". Reinforcing steel supports shall not be welded to I-beams or girders.

7. PLACING CONCRETE-GENERAL

The minimum temperature of all concrete at the time of placement shall be not less than 50 degrees F.

The consistency of the concrete as placed should allow the completion of all finishing operations without the addition of water to the surface. When conditions are such that additional moisture is needed for finishing, the required water shall be applied to the surface by fog spray only, and shall be held to a minimum amount. Fog spray for this purpose may be applied with hand operated fogging equipment.

The maximum time interval between the addition of cement to the batch and the placing of concrete in the forms shall not exceed the following:

<u>Air or Concrete</u> <u>Temperature</u>	<u>Maximum Time</u>
<u>Non-Agitated Concrete:</u>	
Above 80 degrees F	15 minutes
Up to 80 degrees F	30 minutes
<u>Agitated Concrete:</u>	
Above 90 degrees F	45 minutes
75 degrees F to 90 degrees F	60 minutes
35 degrees F to 74 degrees F	90 minutes

The use of an approved retarding agent in the concrete will permit the extension of each of the above temperature-time maximums by 30 minutes for direct traffic culverts, and one hour for all other concrete except that the maximum time shall not exceed 30 minutes for non-agitated concrete.

Before starting work, the Contractor shall inform the Engineer fully of the construction methods he proposes to use, the adequacy of which shall be subject to the approval of the Engineer.

The Contractor shall give the Engineer sufficient advance notice before placing concrete in any unit of the structure to permit the inspection of forms, reinforcing steel placement, and other preparations. Concrete shall not be placed in any unit prior to the completion of formwork and placement of reinforcement therein.

Concrete mixing, placing and finishing shall be done during daylight hours, unless adequate provisions are made to light the entire site of all operations.

Concrete placement will not be permitted when impending weather conditions will impair the quality of the finished work. If rainfall should occur after placing operations are started, the Contractor shall provide ample covering to protect the work. In case of drop in temperature, the provisions set forth in Article "Placing Concrete in Cold Weather" of this specification shall be applied.

The placing of concrete shall be regulated so the pressures caused by the plastic concrete shall not exceed the loads used in form design.

The method of handling, placing and consolidation of concrete shall minimize segregation and displacement of the reinforcement, and produce a uniformly dense and compact mass. Concrete shall not have a free fall of more than 5 feet, except in the case of thin walls such as in culverts. Any hardened concrete spatter ahead of the plastic concrete shall be removed.

The method and equipment used to transport concrete to the forms shall be capable of maintaining the rate of placement approved by the Engineer. Concrete may be transported by buckets, chutes, buggies, belt conveyors, pumps or other acceptable methods.

When belt conveyors or pumps are used, sampling for testing will be done at the discharge end. Concrete transported by conveyors shall be protected from sun and wind, if necessary, to prevent loss of slump and workability. Pipes through which concrete is pumped shall be shaded and/or wrapped with wet burlap, if necessary, to prevent loss of slump and workability. Concrete shall not be transported through aluminum pipes, tubes or other aluminum equipment.

Chutes, troughs, conveyors or pipes shall be arranged and used so that the concrete ingredients will not be separated. When steep slopes are necessary, the chutes shall be equipped with baffle boards or made in short lengths that reverse the direction of movement, or the chute ends shall terminate in vertical downspouts. Open troughs and chutes shall extend, if necessary, down inside the forms or through holes left in them. All transporting equipment shall be kept clean and free from hardened concrete coatings. Water used for cleaning shall be discharged clear of the concrete.

Each part of the forms shall be filled by depositing concrete as near its final position as possible. The coarse aggregate shall be worked back from the face and the concrete forced under and around the reinforcement bars without displacing them. Depositing large quantities at one point and running or working it along the forms will not be allowed.

Concrete shall be deposited in the forms in layers of suitable depth but not more than 36 inches in thickness, unless otherwise directed by the Engineer.

The sequence of successive layers or adjacent portions of concrete shall be such that they can be vibrated into a homogenous mass with the previously placed concrete without a cold joint. Not more than one hour shall elapse between adjacent or successive placements of concrete. Unauthorized construction joints shall be avoided by placing all concrete between the authorized joints in one continuous operation.

An approved retarding agent shall be used to control stress cracks and/or unauthorized cold joints in mass placements where differential settlement and/or setting time may induce stress cracking.

Openings in forms shall be provided, if needed, for the removal of laitance or foreign matter of any kind.

All forms shall be wetted thoroughly before the concrete is placed therein.

All concrete shall be well consolidated and the mortar flushed to the form surfaces by continuous working with immersion type vibrators. Vibrators which operate by attachment to

forms or reinforcement will not be permitted, except on steel forms. At least one stand-by vibrator shall be provided for emergency use in addition to those required for placement.

The concrete shall be vibrated immediately after deposit. Prior to the beginning of work, a systematic spacing of the points of vibration shall be established to insure complete consolidation and thorough working of the concrete around the reinforcement, embedded fixtures, and into the corners and angles of the forms. Immersion type vibrators shall be inserted vertically, at points 18 to 30 inches apart, and slowly withdrawn. The vibrator may be inserted in a sloping or horizontal position in shallow slabs. The entire depth of each lift shall be vibrated, allowing the vibrator to penetrate several inches into the preceding lift. Concrete along construction joints shall be thoroughly consolidated by operating the vibrator along and close to but not against the joint surface, The vibration shall continue until thorough consolidation, and complete embedment of reinforcement and fixtures is produced, but not long enough to cause segregation. Vibration maybe supplemented by hand spading or rodding, if necessary, to insure the flushing of mortar to the surface of all forms.

Slab concrete shall be mixed in a plant located off the structure. Carting or wheeling concrete batches over completed slabs will not be permitted until they have aged at least four (4) full curing days. If carts are used, timber planking will be required for the remainder of the curing period. Carts shall be equipped with pneumatic tires. Curing operations shall not be interrupted for the purpose of wheeling concrete over finished slabs.

After concrete has attained its initial set, at least one (1) curing day shall elapse before placing strain on projecting reinforcement to prevent damage to the concrete.

The storing of reinforcing or structural steel on completed roadway slabs generally shall be avoided and, when permitted, shall be limited to quantities and distribution that will not induce excessive stresses.

8. PLACING CONCRETE IN COLD WEATHER

(1) Cast-in-Place Concrete. Concrete maybe placed when the atmospheric temperature is not less than 35 degrees F. Concrete shall not be placed in contact with any material coated with frost or having a temperature less than 32 degrees F.

Aggregates shall be free from ice, frost and frozen lumps. When required, in order to produce the minimum specified concrete temperature, the aggregate and/or the water shall be heated uniformly, in accordance with the following:

The water temperature shall not exceed 180 degrees F, and/or the aggregate temperature shall not exceed 150 degrees F. The heating apparatus shall heat the mass of aggregate uniformly. The temperature of the mixture of aggregates and water shall be between 50 degrees F and 85 degrees F before introduction of the cement.

All concrete shall be effectively protected as follows:

- (a) The temperature of slab concrete of all unformed surfaces shall be maintained at 50 degrees F or above for a period of 72 hours from time of placement and above 40 degrees F for an additional 72 hours.
- (b) The temperature at the surface of all concrete in piers, culverts walls, retaining walls, parapets, wingwalls, bottoms of slabs, and other similar formed concrete shall be maintained at 40 degrees F or above for a period of 72 hours from time of placement.
- (c) The temperature of all concrete, including the bottom slabs of culverts placed on or in the ground, shall be maintained above 32 degrees F for a period of 72 hours from time of placement.

Protection shall consist of providing additional covering, insulated forms or other means, and if necessary, supplementing such covering with artificial heating. Curing as specified under Article "Curing Concrete" of this specification shall be provided during this period until all requirements for curing have been satisfied.

When impending weather conditions indicate the possibility of the need for such temperature protection, all necessary heating and covering material shall be on hand ready for use before permission is granted to begin placement.

Sufficient extra test specimens will be made and cured with the placement to ascertain the condition of the concrete as placed, prior to form removal and acceptance.

(2) Precast Concrete. A fabricating plant for precast products which has adequate protection from cold weather in the form of permanent or portable framework and covering, which protects the concrete when placed in the forms, and is equipped with approved steam curing facilities, may place concrete under any low temperature conditions provided:

- (a) The framework and covering are placed and heat is provided for the concrete and the forms within one hour after the concrete is placed. This shall not be construed to be one hour after the last concrete is placed, but that no concrete shall remain unprotected longer than one hour.
- (b) Steam heat shall keep the air surrounding the concrete between 50 degrees F and 85 degrees F for a minimum of three hours prior to beginning the temperature rise which is required for steam curing.
- (c) For fabricating plants without the above facilities and for job site precast products, the requirements of the Article "Curing Concrete" of this specification shall apply.

The Contractor is responsible for the protection of concrete placed under any and all weather conditions. Permission given by the Engineer for placing concrete during freezing weather will in no way relieve the Contractor of the responsibility for producing concrete equal in quality to that placed under normal conditions. Should concrete placed under such conditions prove unsatisfactory, it shall be removed and replaced at no additional cost.

9. PLACING CONCRETE IN WATER

Concrete shall be deposited in water only when specified on the plans or with written permission by the Engineer. The forms or cofferdams shall be sufficiently tight to prevent any water current passing through the space in which the concrete is being deposited. Pumping will not be permitted during the concrete placing, nor until it has set for at least 36 hours.

The concrete shall be placed with a tremie, closed bottom-dump bucket, or other approved method, and shall not be permitted to fall freely through the water nor shall it be disturbed after it has been placed. The concrete surface shall be kept approximately level during placement.

The tremie shall consist of a water-tight tube 14 inches or less in diameter. It shall be constructed so that the bottom can be sealed and opened after it is in place and fully charged with concrete. It shall be supported so that it can be easily moved horizontally to cover all the work area and vertically to control the concrete flow.

Bottom-dump buckets used for underwater placing shall have a capacity of not less than one-half cubic yard. It shall be lowered gradually and carefully until it rests upon the concrete already placed and raised very slowly during the upward travel; the intent being to maintain still water at the point of discharge and to avoid agitating the mixture.

The placing operations shall be continuous until the work is complete.

10. PLACING CONCRETE BOX CULVERTS

In general, construction joints will be permitted only where shown on the plans.

Where the top slab and walls are placed monolithically in culverts more than 4 feet in clear height, an interval of not less than one (1) nor more than two (2) hours shall elapse before placing the top slab to allow for shrinkage in the wall concrete.

The base slab shall be finished accurately at the proper time to provide a smooth uniform surface. Top slabs which carry direct traffic shall be finished as specified for roadway slabs in Article "Finish of Roadway Slabs". Top slabs of fill type culverts shall be given a reasonably smooth float finish.

11. PLACING CONCRETE IN FOUNDATIONS AND SUBSTRUCTURE

Concrete shall not be placed in footings until the depth and character of the foundation has been inspected by the Engineer and permission has been given to proceed.

Placing of concrete footings upon seal concrete courses will be permitted after the caissons or cofferdams are free from water and the seal concrete course cleaned. Any necessary pumping or bailing during the concreting operation shall be done from a suitable sump located outside the forms.

All temporary wales or braces inside cofferdams or caissons shall be constructed or adjusted as the work proceeds to prevent unauthorized construction joints in footings or shafts.

When footings can be placed in a dry excavation without the use of cofferdams or caissons, forms may be omitted, if desired by the Contractor and approved by the Engineer, and the entire excavation filled with concrete to the elevation of the top of footing; in which case, measurement for payment will be based on the footing dimensions shown on the plans.

12. TREATMENT AND FINISHING OF HORIZONTAL SURFACES EXCEPT ROADWAY SLABS

All unformed upper surfaces shall be struck off to grade and finished. The use of mortar topping for surfaces under this classification will not be permitted.

After the concrete has been struck off, the surface shall be floated with a suitable float. Sidewalks shall be given a wood float or broom finish, or may be striped with a brush, as specified by the Engineer. Other surfaces shall be wood float finished and striped with a fine brush leaving a fine grained texture.

13. FINISH OF ROADWAY SLABS

As soon as the concrete has been placed and vibrated in a section of sufficient width to permit working, the surface shall be approximately leveled, struck off and screeded, carrying a slight excess of concrete ahead of the screed to insure filling of all low spots. The screed shall be designed rigid enough to hold true to shape and shall have sufficient adjustments to provide for the required camber. A vibrating screed may be used if heavy enough to prevent undue distortion. The screeds shall be provided with a metal edge.

Longitudinal screeds shall be moved across the concrete with a saw-like motion while their ends rest on headers or templates set true to the roadway grade or on the adjacent finished slab.

The surface of the concrete shall be screened a sufficient number of times and at such intervals to produce a uniform surface, true to grade and free of voids.

If necessary, the screened surface shall be worked to smooth finish with a long handled wood or metal float of the proper size, or hand floated from bridges over the slab.

When required by the Engineer, the Contractor shall perform sufficient checks with a long handled 10-foot straightedge on the plastic concrete to ensure that the final surface will be within the tolerances specified below. The check shall be made with the straightedge parallel to the centerline. Each pass thereof shall lap half of the preceding pass. All high spots shall be removed and all depressions over one-sixteenth inch (1/16") in depth shall be filled with fresh concrete and floated. The checking and floating shall be continued until the surface is true to grade and free of depressions, high spots, voids or rough spots.

Rail support holes shall be filled with concrete and finished to match the top of the slab.

Surface Texturing.

Perform surface texturing using either carpet drag or metal tinning as indicated on the drawings. Complete final texturing before the concrete has attained its initial set. Draw the carpet drag longitudinally along the pavement surface with the carpet contact surface area adjusted to provide a satisfactory coarsely textured surface. A metal-tine texture finish is required using a tinning machine unless otherwise shown on the plans. Provide the metal-tine finish immediately after the concrete surface has set enough for consistent tinning. Operate the metal-tine device to obtain grooves spaced at 1 in., approximately 3/16 in. deep, with a minimum depth of 1/8 in., and approximately 1/12 in. wide. Do not overlap a previously tined area. Use manual methods for achieving similar results on ramps and other irregular sections of pavements. Repair damage to the edge of the slab and joints immediately after texturing. Do not tine pavement that will be overlaid.

Upon completion of the floating and/or straight edging and before the disappearance of the moisture sheen, the surface shall be given a broom or burlap drag finish. The grooves of these finishes shall be parallel to the structure centerline. It is the intent that the average texture depth resulting from the number of tests directed by the Engineer be not less than 0.035 inch with a minimum texture depth of 0.030 inch for any one test when tested in accordance with TxDOT Test Method Tex-436-A. Should the texture depth fall below that intended, the finishing procedures shall be revised to produce the desired texture.

After the concrete has attained its final set, the roadway surface shall be tested with a standard 10-foot straightedge. The straightedge shall be placed parallel to the centerline of roadway to bridge any depressions and touch high spots. Ordinates of irregularities measured from the face of the straightedge to the surface of the slab shall not exceed one-eighth of an inch (1/8"), making proper allowances for camber, vertical curvature and surface texture. Occasional variations, not exceeding three-sixteenth of an inch (3/16") will be acceptable, if in the opinion of the Engineer it will not affect the riding qualities.

When directed by the Engineer, irregularities exceeding the above requirements shall be corrected.

In all roadway slab finishing operations, camber for specified vertical curvature and transverse slopes shall be provided.

14. CURING CONCRETE

The Contractor shall inform the Engineer fully of the methods and procedures proposed for curing; shall provide the proper equipment and material in adequate amounts; and shall have the proposed methods, equipment and material approved prior to placing concrete.

Inadequate curing and/or facilities, therefore, shall be cause for the Engineer to stop all construction on the job until remedial action is taken. All concrete shall be cured for a period of four (4) curing days except as noted herein.

EXCEPTIONS TO 4-DAY CURING

<u>Description</u>	<u>Required Curing</u>
Upper Surfaces of Bridge Slabs and Top Slabs of Direct Traffic Culverts	8 curing days (Type I or III) cement 10 curing days (Type II cement)
Concrete Piling (non-prestressed)	6 curing days

When the air temperature is expected to drop below 35 degrees F, the water curing mats shall be covered with polyethylene sheeting, burlap-polyethylene blankets or other material to provide the protection required by Article "Placing Concrete in Cold Weather" of these specifications.

A curing day is defined as a calendar day when the temperature, taken in the shade away from artificial heat, is above 50 degrees F for at least 19 hours (colder days if satisfactory provisions are made to maintain the temperature of all surfaces of the concrete above 40 degrees F for the entire 24 hours). The required curing period shall begin when all concrete therein has attained its initial set.

The following methods are permitted for curing concrete subject to the restrictions of Table I and the following requirements for each method of curing.

(1) Form Curing. When forms are left in contact with the concrete, other curing methods will not be required except for cold weather protection.

(2) Water Curing. All exposed surfaces of the concrete shall be kept wet continuously for the required curing time. The water used for curing shall meet the requirements for concrete mixing water as specified in the specification Section 030020 "Portland Cement Concrete". Seawater will not be permitted. Water which stains or leaves an unsightly residue shall not be used.

(a) Wet Mat. Cotton mats shall be used for this curing method. They shall be placed as soon as possible after the surface has sufficiently hardened to prevent damage to the concrete. (See Article, "Placing Concrete" of this specification.) Damp burlap blankets made from nine-ounce stock may be placed on the damp concrete surface for temporary protection prior to the application of the cotton mats which may be placed dry and wetted down after placement.

The mats shall be weighted down adequately to provide continuous contact with all concrete surfaces where possible. The surfaces of the concrete shall be kept wet for the required curing time. Surfaces which cannot be cured by contact shall be enclosed with mats and anchored positively to the forms or to the ground so that outside air cannot enter the enclosure. Sufficient moisture shall be provided inside the enclosure to keep all surfaces of the concrete wet.

(b) Water Spray. This curing method shall consist of overlapping sprays or sprinklers that keep all unformed surfaces continuously wet.

(c) Ponding. This curing method requires the covering of the surfaces with a minimum of two inches (2") of clean granular material, kept wet at all times, or a minimum of one-inch (1") depth of water. Satisfactory provisions shall be made to provide a dam to retain the water or saturated granular material.

(3) Membrane Curing. This consists of curing concrete pavement, concrete pavement (base), curbs, gutters, retards, sidewalks, driveways, medians, islands, concrete riprap, cement-stabilized riprap, concrete structures and other concrete as indicated on the plans by impervious membrane method.

Unless otherwise provided herein or shown on the plans, either Type I-D or Type 2 membrane curing compound may be used where permitted except that Type I-D (Resin Base Only) will be required for slab concrete in bridge decks and top slabs of direct traffic culverts.

TABLE 1

(3)	(4)	(5) REQUIRED		(6) PERMITTED	
(7)	(8) STRUCTURE UNIT DESCRIPTION	(9) WATER FOR CURING	(10) MEMBRANE FOR INTERIM CURING	(11) WATER FOR CURING	(12) MEMBRANE FOR INTERIM CURING
(13) 1	(14) Top slabs of direct traffic culverts	(15) X	(16) X	(17)	(18)

(19)	2	(20) Top surface of any concrete unit upon which concrete is to be placed and bonded at a later interval (Stub walls, risers, et.). Other superstructure concrete (wing walls, parapet walls, etc.)	(21) X	(22)	(23)	(24)
(25)	3	(26) Concrete pavement (base), curbs, gutters, retards, sidewalks, driveways, medians, islands, concrete structures, concrete riprap, etc.	(27)	(28)	(29) X*	(30) X*
(31)	4	(32) All substructure concrete, culverts, box sewers. Inlets, manholes, retaining walls	(33)	(34)	(35) X*	(36) X*

*Polyethylene sheeting, burlap-polyethylene mats or laminated mats to prevent outside air from entering will be considered equivalent to water or membrane curing for items 3 and 4.

Membrane curing shall not be applied to dry surfaces, but shall be applied just after free moisture has disappeared. Formed surfaces and surfaces which have been given a first rub shall be dampened and shall be moist at the time of application of the membrane.

When membrane is used for complete curing, the film shall remain unbroken for the minimum curing period specified. Membrane which is damaged shall be corrected immediately by reapplication of membrane. Unless otherwise noted herein or on the plans, the choice of membrane type shall be at the option of the Contractor. Only one type of curing compound will be permitted on any one structure.

The membrane curing compound shall be applied after the surface finishing has been completed, and immediately after the free surface moisture has disappeared. The surface shall be sealed with a single uniform coating of curing compound applied at the rate of coverage recommended by the manufacturer and directed by the Engineer, but not less than 1 gallon per 180 square feet of area. The Contractor shall provide satisfactory means and facilities to properly control and check the rate of application of the compound.

The compound shall be thoroughly agitated during its use and shall be applied by means of approved mechanical power pressure sprayers. The sprayers used to apply the membrane to concrete pavement or concrete pavement (base) shall travel at uniform speed along the forms and be mechanically driven. The equipment shall be of such design that it will insure uniform and even application of the membrane material. The sprayers shall be equipped with satisfactory atomizing nozzles. Only on small miscellaneous items will the Contractor be permitted to use hand-powered spray equipment. For all spraying equipment, the Contractor shall provide facilities to prevent the loss of the compound between the nozzle and the concrete surface during the spraying operations.

The compounds shall not be applied to a dry surface. If the surface of the concrete has become dry, it shall be moistened prior to application of membrane by fogging or mist application. Sprinkling or coarse spraying will not be allowed.

At locations where the coating shows discontinuities, pinholes or other defects, or if rain falls on the newly-coated surface before the film has dried sufficiently to resist damage, an additional coat of the compound shall be applied immediately at the same rate of coverage specified herein.

To ensure proper coverage, the Engineer shall inspect all treated areas after application of the compound for the period of time designated in the governing specification for curing, either for membrane curing or for other methods. Should the foregoing indicate that any area during the curing period is not protected, an additional coat or coats of the compound shall be applied immediately, and the rate of application of the membrane compound shall be increased until all areas are uniformly covered.

When temperatures are such as to warrant protection against freezing, curing by this method shall be supplemented with an approved insulating material capable of protecting the concrete for the specified curing period.

If at any time there is reason to believe that this method of curing is unsatisfactory or is detrimental to the work, the Contractor, when notified, shall immediately cease the use of this method and shall change to curing by one of the other methods specified under this contract.

15. REMOVAL OF FORMS

Except as herein provided, forms for vertical surfaces may be removed when the concrete has aged not less than one day (24 hours) when Type I and Type II cement is used, and not less than one-half day (12 hours) when Type III cement is used, provided it can be done without damage to the concrete.

Forms for inside curb faces may be removed in approximately three hours provided it can be done without damage to the curb.

16. FINISHING EXPOSED SURFACES

Concrete shall be finished as required in the specification Section for the respective item or as otherwise specified on the plans.

An ordinary surface finish shall be applied to all concrete surfaces either as a final finish or preparatory to a higher finish.

Ordinary Surface Finish shall be as follows:

After form removal, all porous or honey-combed areas and spalled areas shall be corrected by chipping away all loose or broken material to sound concrete..

Feather edges shall be eliminated by cutting a face perpendicular to the surface. Shallow cavities shall be repaired using adhesive grout or epoxy grout. If judged repairable by the Engineer, large defective areas shall be corrected using concrete or other material approved by the Engineer.

Holes and spalls caused by removal of metal ties, etc., shall be cleaned and filled with adhesive grout or epoxy grout. Exposed parts of metal chairs on surfaces to be finished by rubbing, shall be chipped out to a depth of one-half inch (1/2") and the surface repaired.

All fins, runs, drips or mortar shall be removed from surfaces which remain exposed. Form marks and chamfer edges shall be smoothed by grinding and/or dry rubbing.

Grease, oil, dirt, curing compound, etc., shall be removed from surfaces requiring a higher grade of finish. Discolorations resulting from spillage or splashing of asphalt, paint or other similar material shall be removed.

Repairs shall be dense, well bonded and properly cured, and when made on surfaces which remain exposed and do not require a higher finish, shall be finished to blend with the surrounding concrete.

17. MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, no direct measurement or payment will be made for the work to be done or the equipment to be furnished under this specification, but it shall be considered subsidiary to the particular items required by the plans and the contract documents.

SECTION 055420
FRAMES, GRATES, RINGS AND COVERS

DESCRIPTION

This specification shall govern for the furnishing and installation of frames, grates, rings and covers for inlets, manholes and other structures in accordance with those details. Steel shall conform to the requirements of ASTM Designation: A36 "Standard Specification for Carbon Structural Steel".

MATERIALS

Welded steel grates and frames shall conform to the member size, dimensions and details shown on the plans and shall be welded into an assembly in accordance with those details. Steel shall conform to the requirements of ASTM Designation: A36.

Castings, whether Carbon-Steel, Gray Cast Iron or Ductile Iron, shall conform to the shape and dimensions shown on the plans and shall be clean substantial castings, free from burnt-on sand or blow holes, and shall be reasonable smooth. Runners, risers, fins, and other cast-on pieces shall be removed from the castings and such areas ground smooth. Bearing surfaces between manhole rings and covers or grates and frames shall be cast or machined with such precision that uniform bearing shall be provided throughout the perimeter contact area. Pairs of machined castings shall be matchmarked to facilitate subsequent identification at installation.

Steel castings shall conform to the requirements of ASTM Designation: A27 "Standard Specification for Steel Castings, Carbon, for General Application". Grade 70-36 shall be furnished unless otherwise specified.

Cast Iron castings shall conform to the requirements of ASTM Designation: A48 "Standard Specification for Gray Iron Castings", Class 30.

Ductile iron castings shall conform to the requirements of ASTM Designation: A536 "Standard Specification for Ductile Iron Castings". Grade 60-40-18 shall be used otherwise specified.

CONSTRUCTION METHODS

Frames, grates, rings and covers shall be constructed of the materials as specified and in accordance with the details shown on the plans, and shall be placed carefully to the lines and grades indicated on the plans or as directed by the Engineer.

All welding shall conform to the requirements of the latest American Welding Society Specifications. Frames, grates, rings and covers shall be given one coat of a commercial grade red lead and oil paint and two coats of commercial grade aluminum paint. Painting on gray iron castings will not be required, except when used in conjunction with structural steel shapes. Commercial grade galvanized bolts and nuts shall be used. The zinc coating shall be uniform in thickness, smooth and continuous.

MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, frames, grates, rings and covers will not be measured for payment, but shall be considered subsidiary to other bid items.

DRAWINGS

CITY OF KINGSVILLE

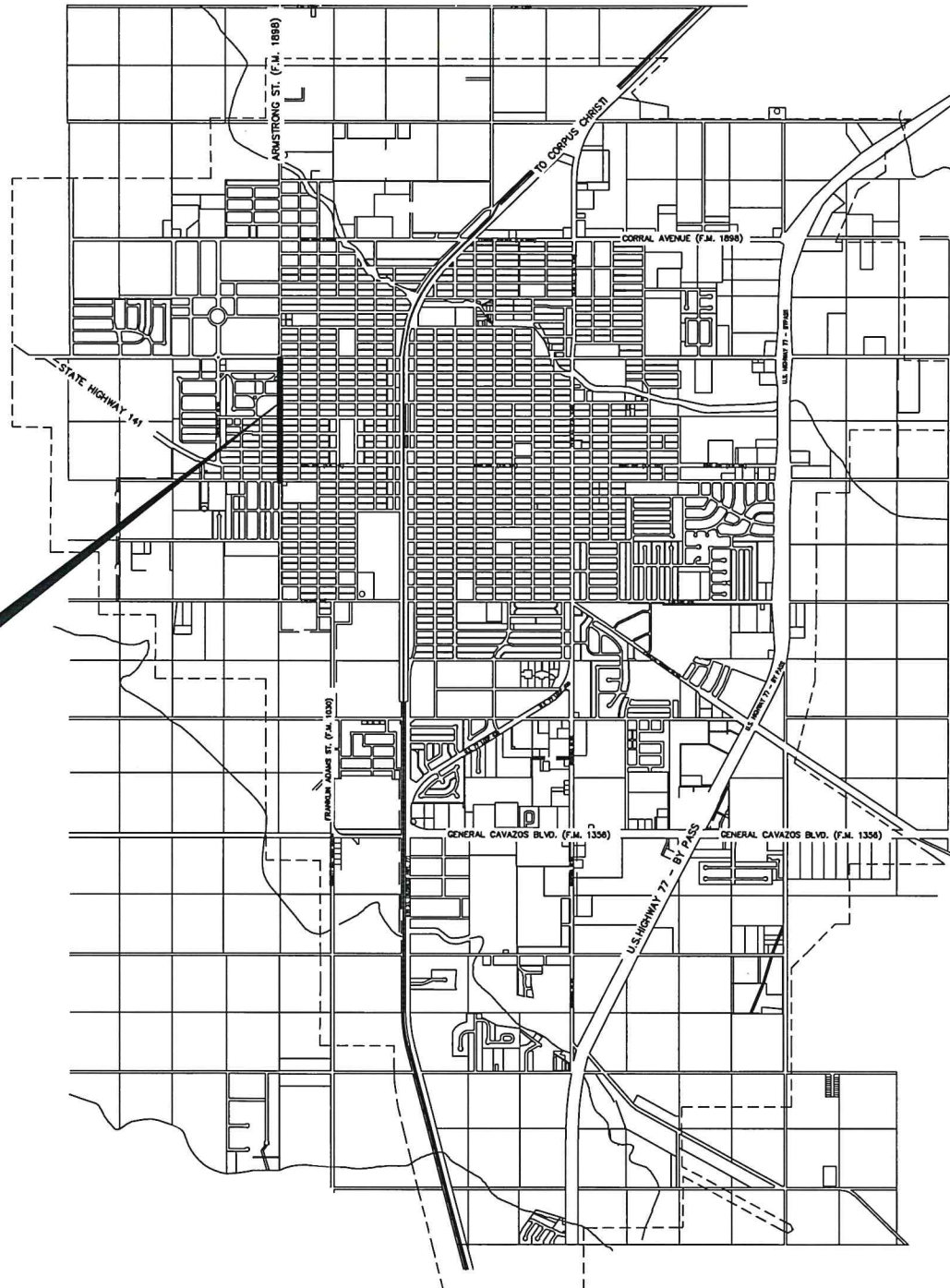
ARMSTRONG ST. FROM SANTA GERTRUDIS AVE. TO KENEDY AVE. STREET IMPROVEMENTS


MAYOR
SAM FUGATE

CITY MANAGER
MARK MCLAUGHLIN

CITY COMMISSIONERS
HECTOR M. HINOJOSA
NORMA NELDA ALVAREZ
ANN MARIE TORRES
EDNA LOPEZ

PROJECT LOCATION
ARMSTRONG ST. FROM
SANTA GERTRUDIS AVE.
TO KENEDY AVE.

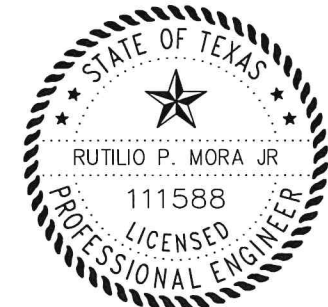



LOCATION MAP
 NOT TO SCALE

JANUARY 2021

SHEET	TITLE
1	COVER SHEET
2	GENERAL NOTES AND OVERALL SITE PLAN
3	PAVEMENT IMPROVEMENTS STA. 0+00 TO STA. 3+50
4	PAVEMENT IMPROVEMENTS STA. 3+50 TO STA. 7+00
5	PAVEMENT IMPROVEMENTS STA. 7+00 TO STA. 10+50
6	PAVEMENT IMPROVEMENTS STA. 10+50 TO STA. 14+00
7	PAVEMENT IMPROVEMENTS STA. 14+00 TO STA. 17+50
8	PAVEMENT IMPROVEMENTS STA. 17+50 TO STA. 21+00
9	PAVEMENT IMPROVEMENTS STA. 21+00 TO STA. 24+50
10	PAVEMENT IMPROVEMENTS STA. 24+50 TO STA. 28+00
11	PAVEMENT IMPROVEMENTS STA. 28+00 TO END
12	EXISTING AND PROPOSED TYP. STREET SECTIONS
13	SIDEWALK AND DRIVEWAY REPAIR DETAILS--ALTERNATE BID NO. 1
14	SUMMARY OF MANHOLE & VALVE BOX ADJUSTMENT DETAILS
15	TCP - ADVANCED WARNING & GENERAL NOTES
16	TCP - PHASE I & IV
17	TCP - PHASE II & V
18	TCP - PHASE III & VI
19	SUMMARY OF PAVEMENT MARKINGS
20	PAVEMENT MARKING STA. 0+00 TO STA. 3+50
21	PAVEMENT MARKING STA. 3+50 TO STA. 7+00
22	PAVEMENT MARKING STA. 7+00 TO STA. 10+50
23	PAVEMENT MARKING STA. 10+50 TO STA. 14+00
24	PAVEMENT MARKING STA. 14+00 TO STA. 17+50
25	PAVEMENT MARKING STA. 17+50 TO STA. 21+00
26	PAVEMENT MARKING STA. 21+00 TO STA. 24+50
27	PAVEMENT MARKING STA. 24+50 TO STA. 28+00
28	PAVEMENT MARKING STA. 28+00 TO END
29-33	BARRICADE AND CONSTRUCTION SHEETS
34	EROSION CONTROL SHEETS
35-36	TRAFFIC CONTROL SHEETS
37-38	PAVEMENT MARKING SHEETS

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RUTILIO P. MORA JR, P.E. NO. 111588 ON 12-18-2020. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.



Rutilio P. Mora Jr. 12/18/2020
 RUTILIO P. MORA JR, P.E. NO. 111588

CITY OF KINGSVILLE
 ENGINEERING DEPARTMENT
 400 West King
 Kingsville, Texas 78363
 Office 361.595.8007
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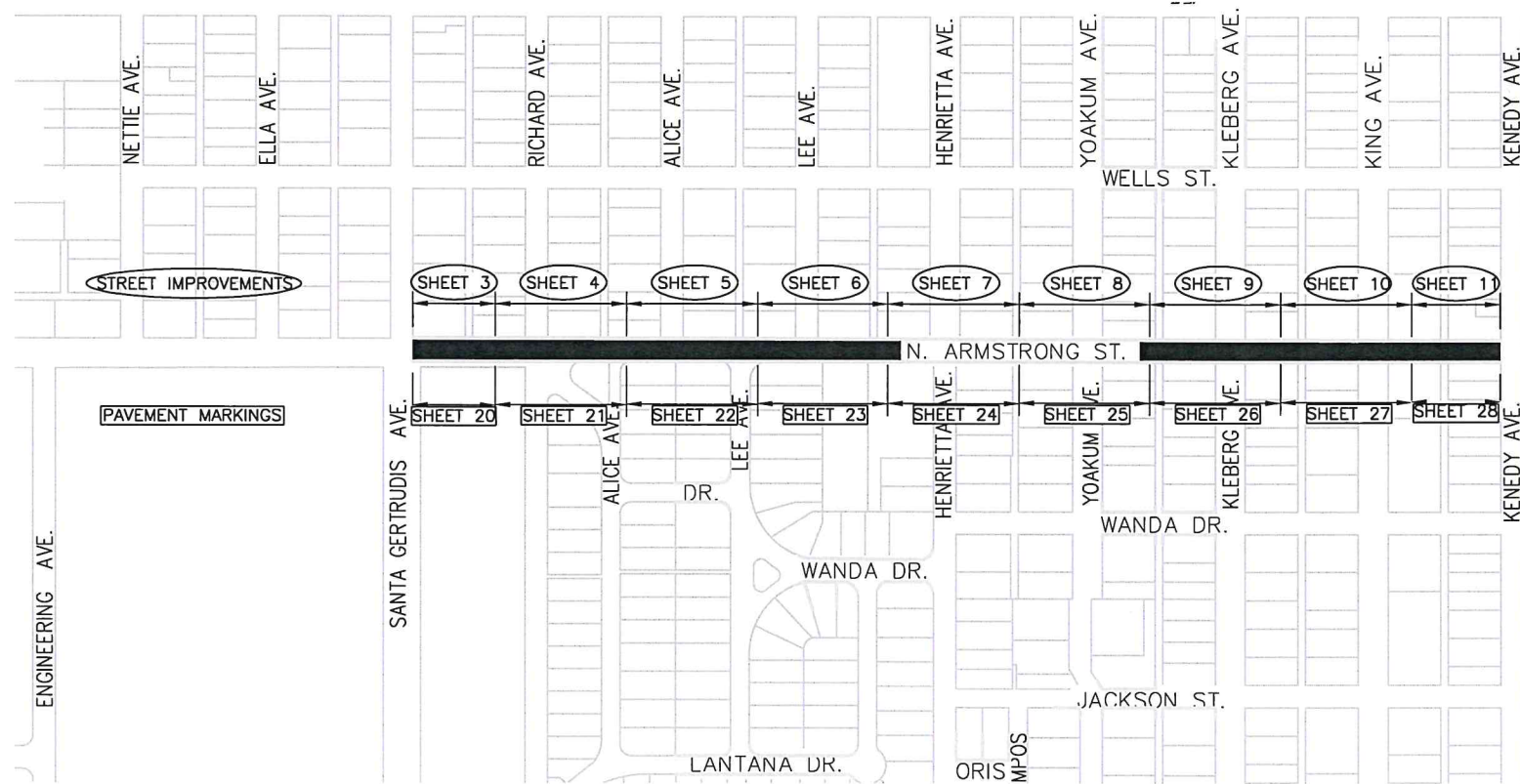
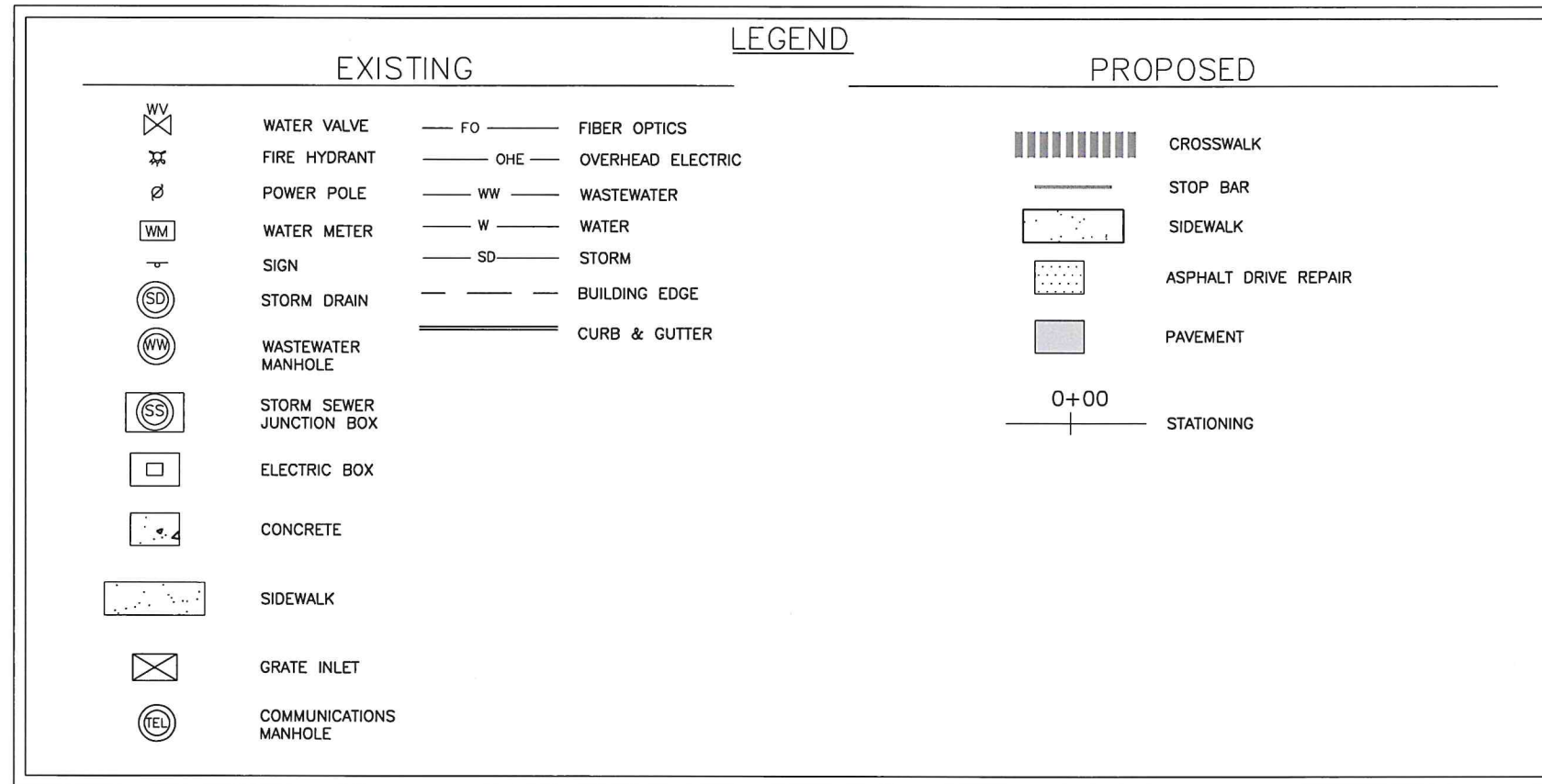
Drawn by: V. MARQUEZ
 Date: 08/19/2020
 Checked by: R. MORA
 Job:
 Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
 FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.**

COVER SHEET

GENERAL CONSTRUCTION NOTES:

- ALL IMPROVEMENTS TO BE IN ACCORDANCE WITH CITY OF KINGSVILLE CODES.
- CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING FACILITIES PRIOR TO CONSTRUCTION.
- CONTRACTOR TO PLAN AND PERFORM HIS WORK IN A MANNER THAT WILL PERMIT SAFE PUBLIC TRAFFIC MOVEMENT ON ALL STREETS.
- TEMPORARY TRAFFIC CONTROL DURING CONSTRUCTION TO BE IN ACCORDANCE WITH SPECIFICATIONS.
- CONTRACTOR SHALL PROVIDE PROTECTIVE DEVICES SUCH AS SIGNS, LIGHTS, AND SIGNALS FOR THE SAFETY OF THE PUBLIC AND WORKERS, AS REQUIRED, AND AS DIRECTED BY CITY INSPECTOR.
- CONTRACTOR TO BE RESPONSIBLE FOR PROTECTION AND/OR SAFETY OF THE WORK SITE, WORKERS, SUBCONTRACTORS, MATERIALS, AND/OR EQUIPMENT.
- MATERIAL TESTING SHALL BE PROVIDED BY THE CONTRACTOR AND AT CONTRACTOR'S EXPENSE. BASE LINES ARE STAKED AS SHOWN ON PLANS. ALL DIMENSIONS ARE TO BACK OF CURBS UNLESS SHOWN OTHERWISE.
- MATERIAL TESTING SHALL BE PROVIDED BY THE CITY OF KINGSVILLE. RE-TEST DUE TO FAILURES TO BE AT CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN FOR APPROVAL BY THE CITY ENGINEERING OFFICE PRIOR TO CONSTRUCTION. CONTRACTOR MAY CLOSE STREETS TO THRU TRAFFIC IN 1000' INCREMENTS AS LONG AS ACCESS IS MAINTAINED TO ALL RESIDENCES, BUSINESSES, & ADJOINING STREETS. TRAFFIC CONTROL PLAN WILL BE IN ACCORDANCE WITH TXDOT'S B&C SHEETS 4, 5, 8, 9, & 10 AND THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND AT CONTRACTOR'S EXPENSE.
- ANY DAMAGE TO EXISTING PAVEMENT, DRAINAGE OR EXISTING STRUCTURES SHALL BE REPAIRED TO PRE-CONSTRUCTION CONDITION AT CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL GIVE NOTICE TO ALL AUTHORIZED INSPECTORS, SUPERINTENDENTS, OR PERSONS IN CHARGE OF PRIVATE AND PUBLIC UTILITIES AFFECTED BY HIS OPERATIONS PRIOR TO COMMENCEMENT OF WORK. NOTIFY TEXAS ONE CALL FOR UTILITY LOCATIONS PRIOR TO ANY & ALL EXCAVATIONS. COORDINATION OF ALL RELOCATION OF UTILITY POLES, ETC. TO BE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR TO COORDINATE WITH THE CITY OF KINGSVILLE ON WORK SCHEDULES, TESTING, GENERAL INSPECTION, AND EXISTING LINES.
- CONTRACTOR TO EXERCISE CAUTION WHEN WORKING NEAR EXISTING FACILITIES AND/OR UTILITIES. ALL DAMAGE TO BE REPAIRED AT CONTRACTOR'S EXPENSE. ALL COSTS FOR INTERRUPTION OF GAS, ELECTRICAL, COMMUNICATIONS AND/OR WATER SERVICES DUE TO CONTRACTOR'S WORK SHALL BE BORNE BY THE CONTRACTOR.
- INFORMATION ON EXISTING UTILITIES IS FROM BEST AVAILABLE INFORMATION OF RECORD AND SPOT FIELD LOCATIONS. CONTRACTOR IS RESPONSIBLE FOR FIELD LOCATION OF THESE UNDERGROUND UTILITIES AS REQUIRED AT NO SEPARATE PAY. CITY OF KINGSVILLE PERSONNEL WILL BE AVAILABLE FOR ASSISTANCE AND OPERATION OF VALVES AS REQUIRED. CONTRACTOR TO COORDINATE WITH OTHER UTILITY COMPANIES, INCLUDING AEP ON ELECTRICAL UTILITIES, ENTEN ON GAS UTILITIES AND SOUTHWESTERN BELL ON TELEPHONE UTILITIES.
- ALL SPOIL MATERIAL AND DEBRIS SHALL BE DISPOSED OF BY CONTRACTOR. FURNISHING AND TRANSPORTATION OF ALL OFFSITE MATERIAL TO BE CONTRACTOR'S EXPENSE.
- UPON COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL RETURN THE SITE TO ORIGINAL CONTOURS UNLESS DIFFERENT FINISHED ELEVATIONS ARE SHOWN ON PLANS. CONTRACTOR TO INSURE NO AREAS OF PONDING ARE PRESENT.
- CONTRACTOR TO INSURE SAME DAY ACCESS TO SCHOOL ALL RESIDENCES AND BUSINESSES ADJACENT TO CONSTRUCTION.
- DEMOLITION, REMOVAL & DISPOSAL OF ALL EXCESS CONCRETE, CURBS, RUBBLE, ETC. TO BE AT CONTRACTOR'S EXPENSE.
- STREET & SUBGRADE EXCAVATION TO BE PROPERTY OF THE CITY AND TO BE STOCK PILED AT THE CITY OF KINGSVILLE LANDFILL AS DIRECTED BY THE CITY REPRESENTATIVE.



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY RUTILIO P. MORA JR, P.E. NO. 111588 ON 12-18-2020. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.



Rutilio P. Mora Jr 12/18/2020
RUTILIO P. MORA JR, P.E. NO. 111588

CALL BEFORE YOU DIG!

PARTICIPANTS REQUEST
48 HOURS NOTICE BEFORE YOU DIG,
DRILL OR BLAST - STOP AND CALL

811

THE LONE STAR
NOTIFICATION COMPANY
AT 1-800-669-8344



A OVERALL SITE PLAN
2 SCALE: 1:500

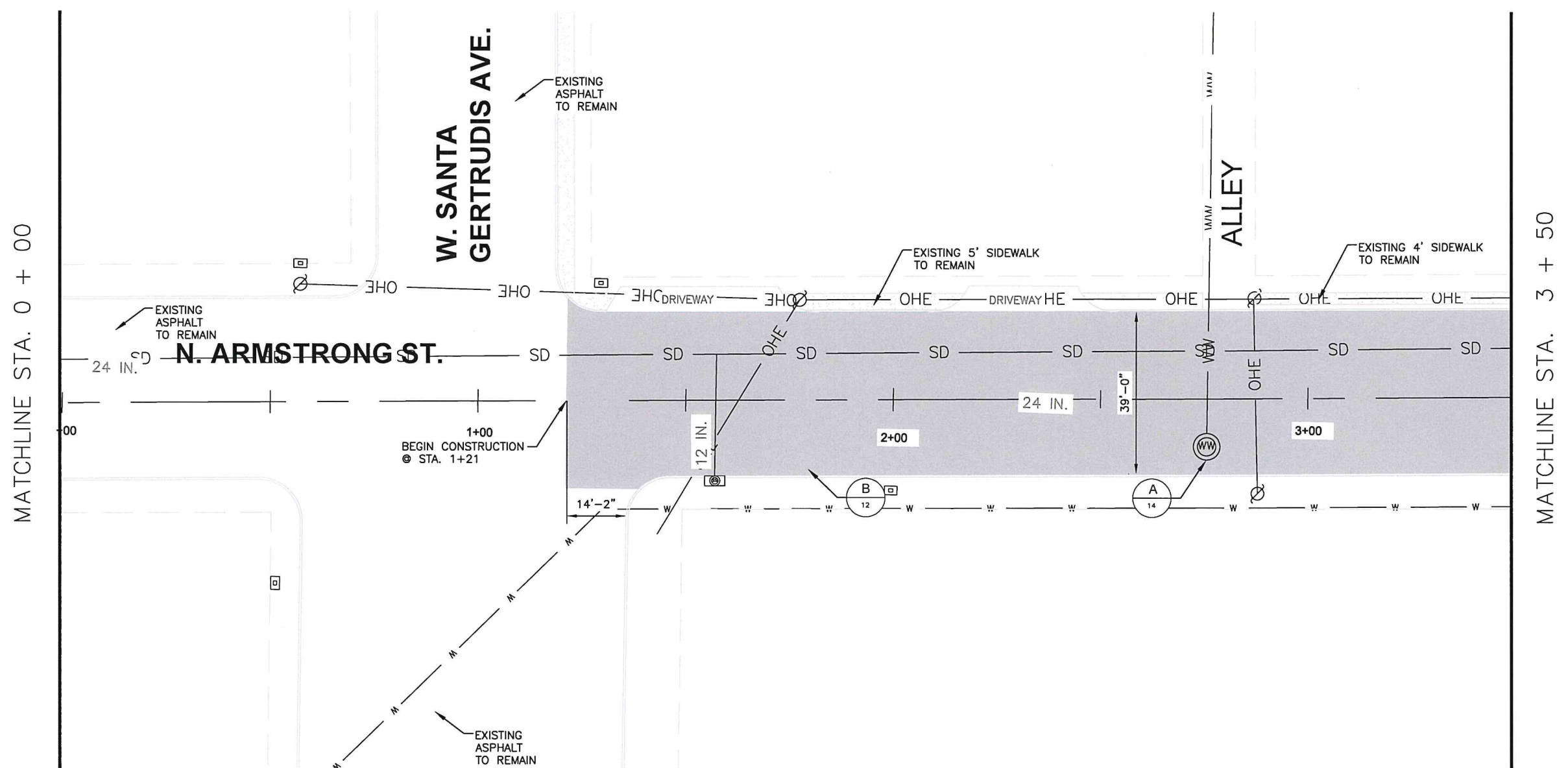
CITY OF KINGSVILLE
ENGINEERING DEPARTMENT
400 West King
Kingsville, Texas 78363
Office 361.595.8007
Fax 361.595.8035



Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:
Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.**

GENERAL NOTES AND OVERALL SITE PLAN



MATCHLINE STA. 0 + 00

MATCHLINE STA. 3 + 50

N. ARMSTRONG ST.

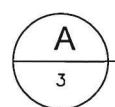
W. SANTA GERTRUDIS AVE.

ALLEY

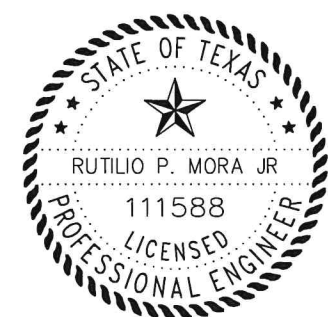
1+00
BEGIN CONSTRUCTION
@ STA. 1+21

**PAVEMENT IMPROVEMENTS
STA. 0+00 TO STA. 3+50**

SCALE: 1:30



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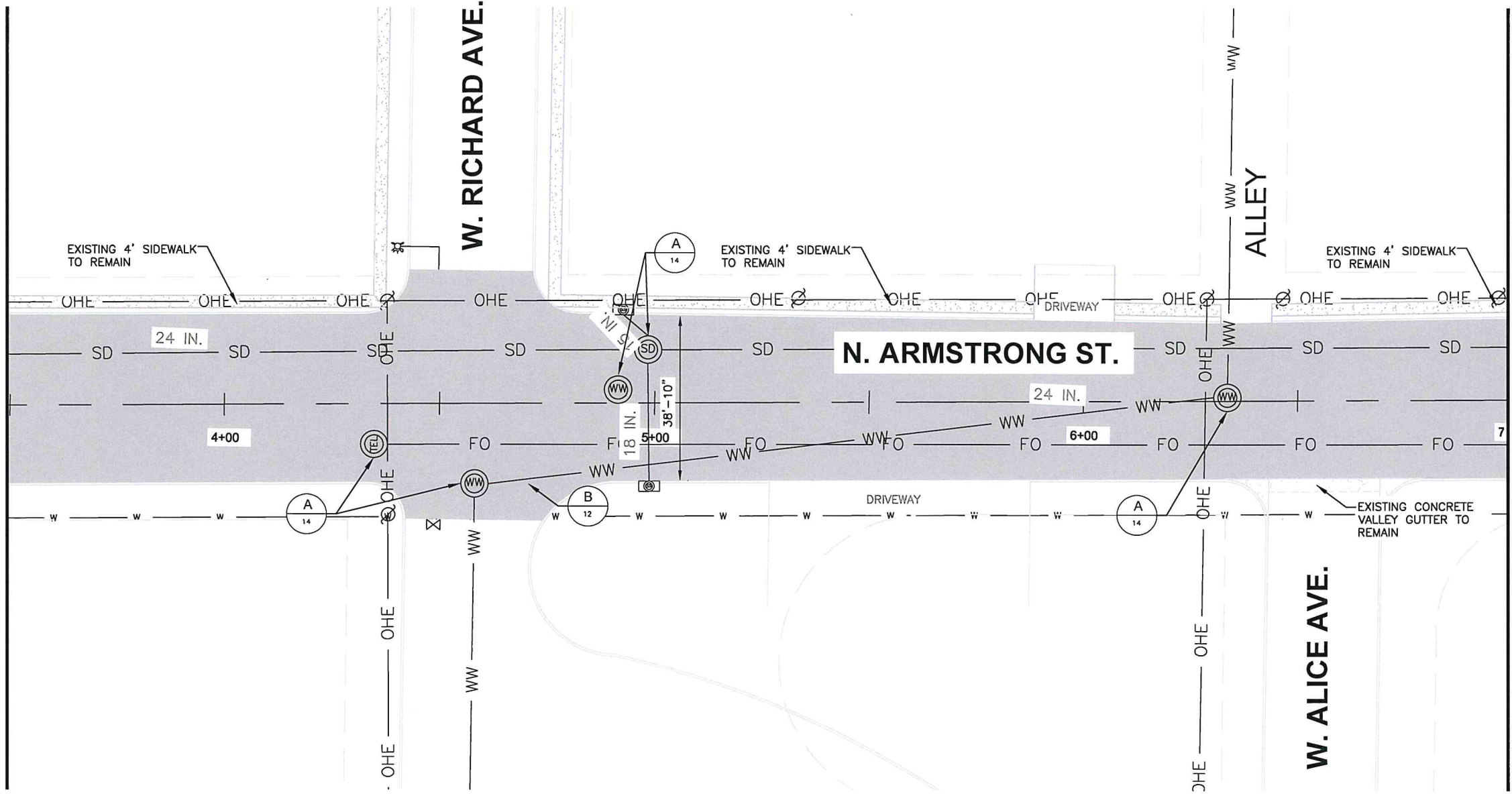
**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT IMPROVEMENTS
STA. 0+00 TO STA. 3+50**

Drawn by: V. MARQUEZ
Date: 08/19/2020
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Job:
Scale: N.T.S.

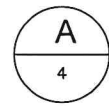
CITY OF KINGSVILLE
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400 West King
Kingsville, Texas 78363
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MATCHLINE STA. 3 + 50



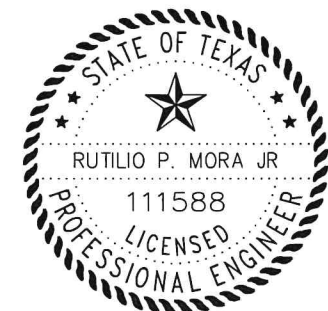
MATCHLINE STA. 7 + 00



**PAVEMENT IMPROVEMENTS
STA. 3+50 TO STA. 7+00**

SCALE: 1:30

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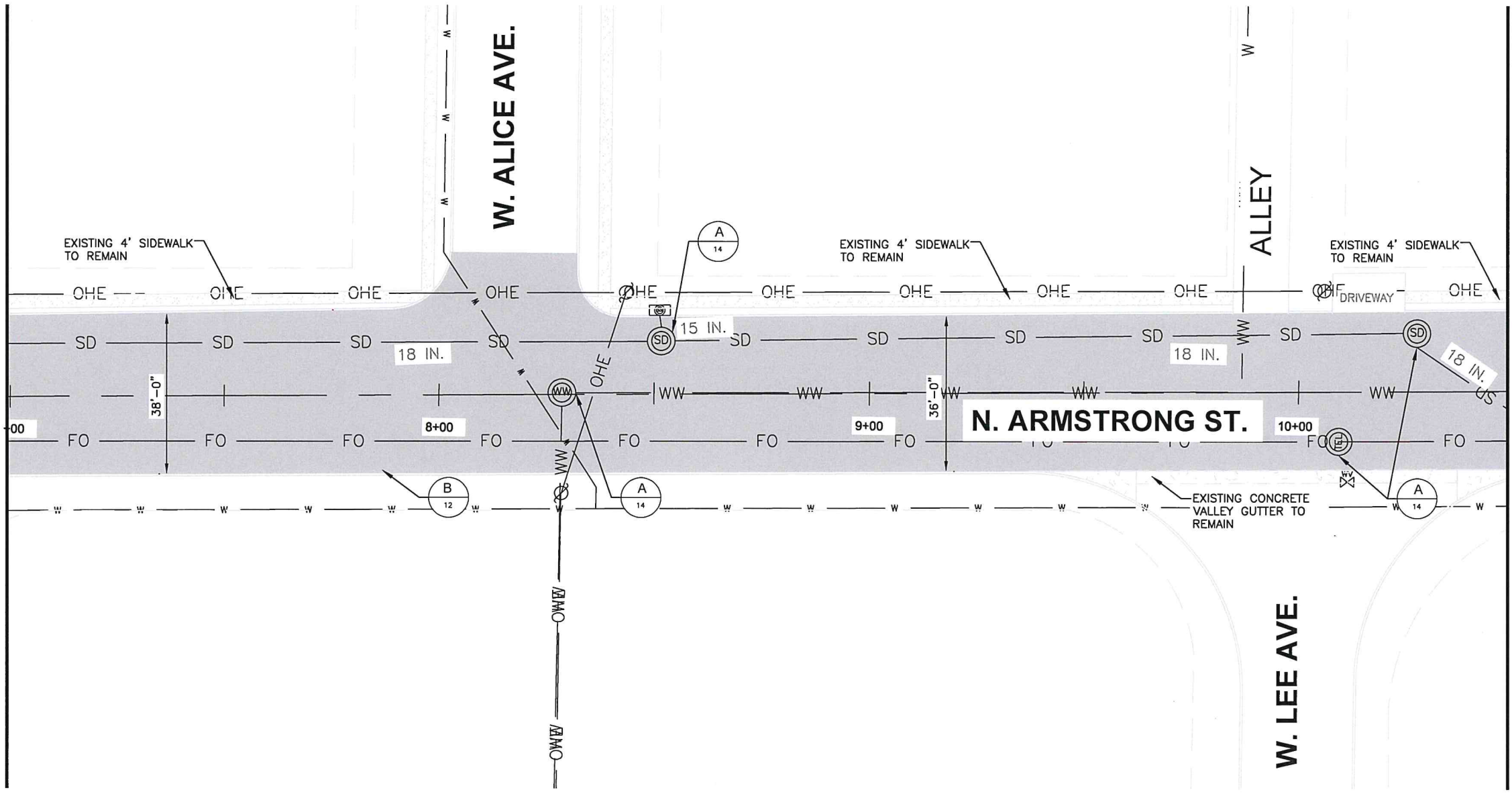
CITY OF KINGSVILLE
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Kingsville, Texas 78363
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Job:

**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT IMPROVEMENTS
STA. 3+50 TO STA. 7+00**

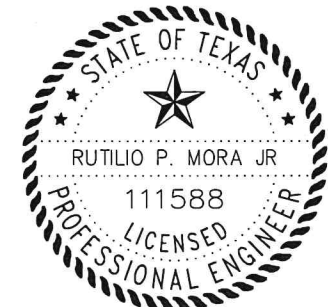
MATCHLINE STA. 7 + 00



MATCHLINE STA. 10 + 50



A
5
PAVEMENT IMPROVEMENTS
STA. 7+00 TO STA. 10+50
SCALE: 1:30



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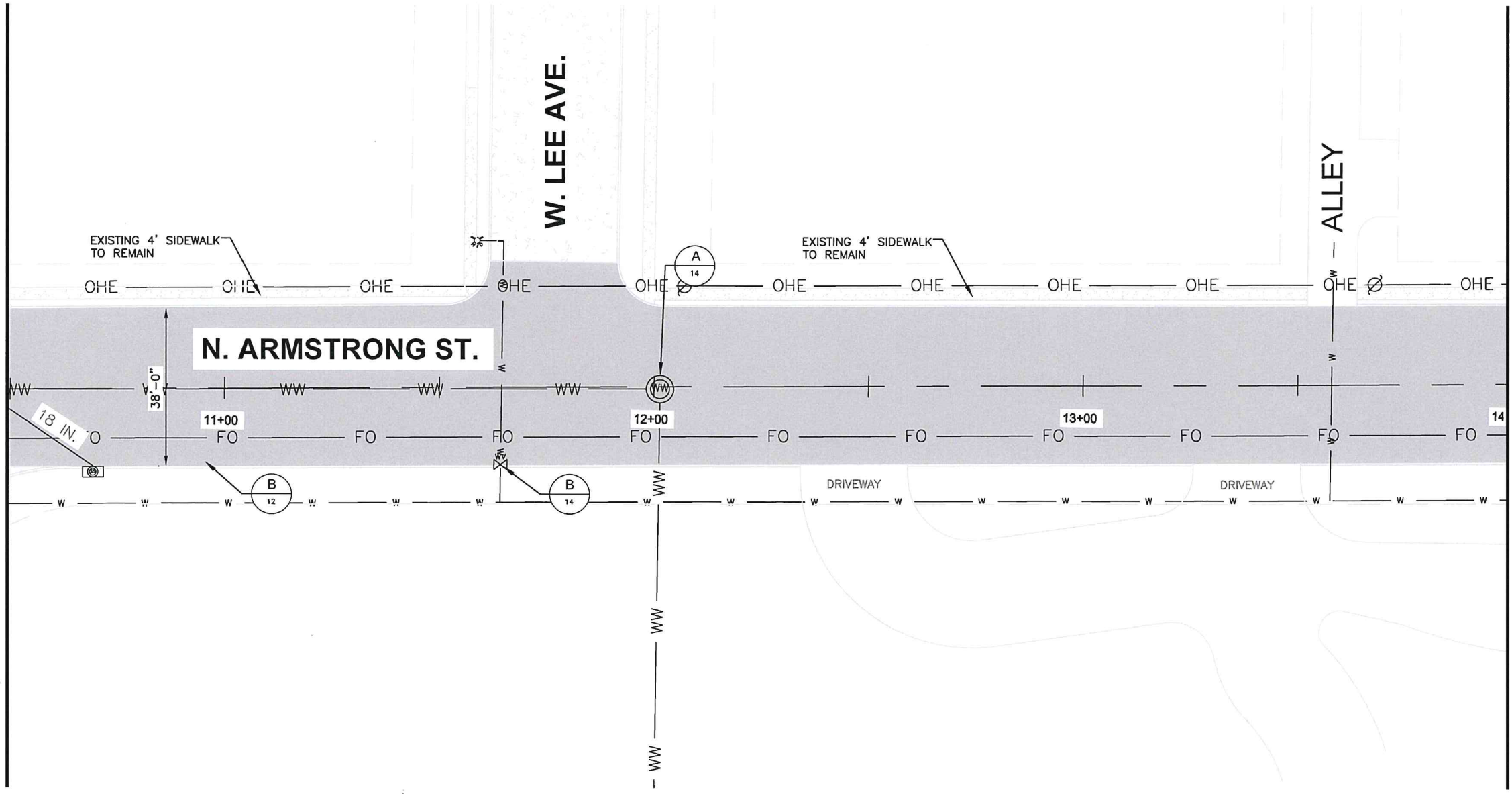
CITY OF KINGSVILLE
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Kingsville, Texas 78363
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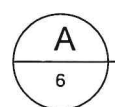
Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:
Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT IMPROVEMENTS
STA. 7+00 TO STA. 10+50**

MATCHLINE STA. 10 + 50



MATCHLINE STA. 14 + 00



PAVEMENT IMPROVEMENTS
 STA. 10+50 TO STA. 14+00
 SCALE: 1:30



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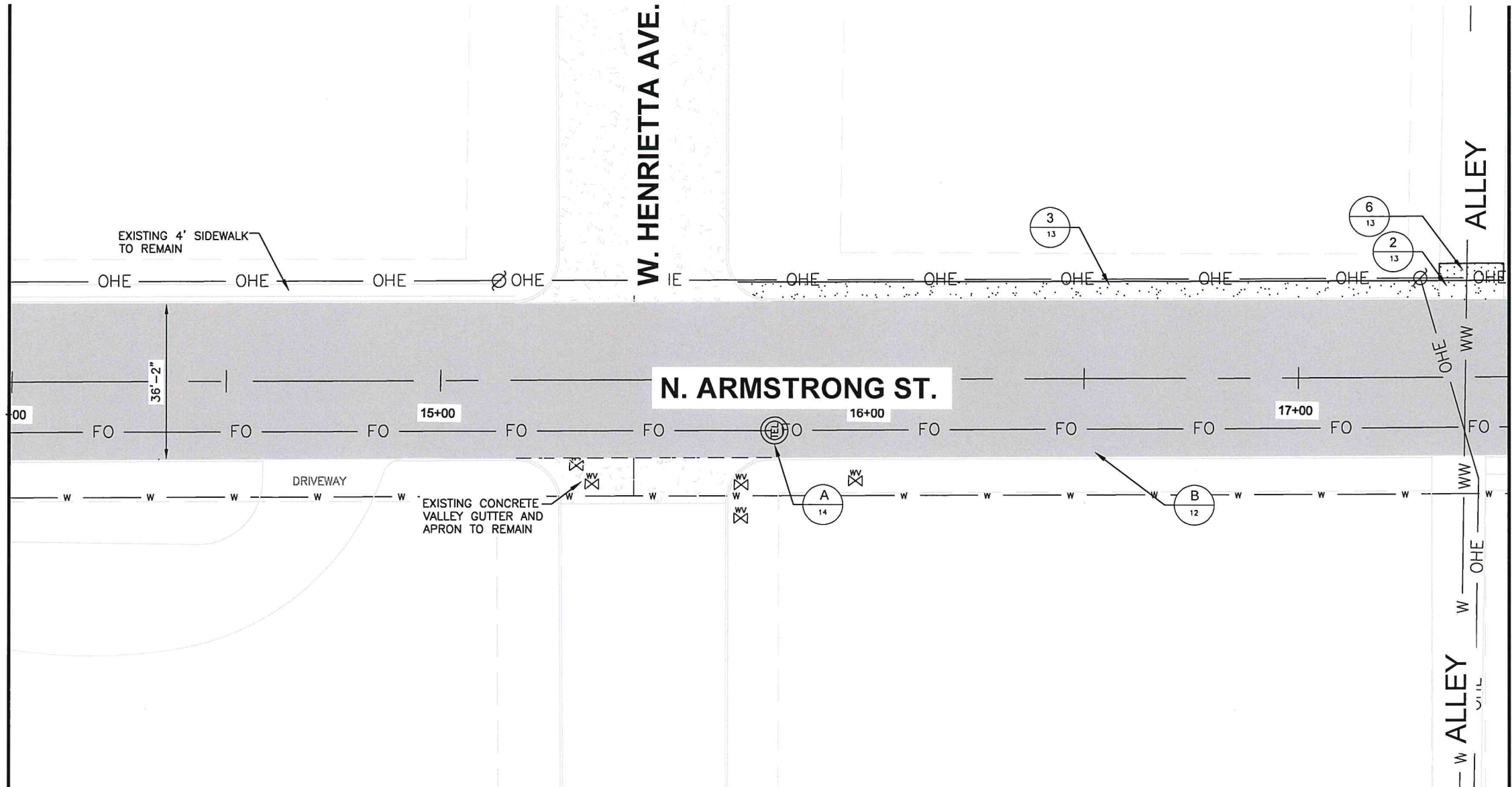
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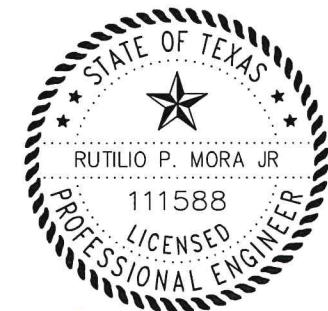
Drawn by: V. MARQUEZ
 Date: 08/19/2020
 Checked by: R. MORA
 Job:
 Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
 FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
 PAVEMENT IMPROVEMENTS
 STA. 10+50 TO STA. 14+00**

MATCHLINE STA. 14 + 00



A
7
PAVEMENT IMPROVEMENTS
STA. 14+00 TO STA. 17+50
SCALE: 1:30



Rutilio P Mora Jr 12/18/2020
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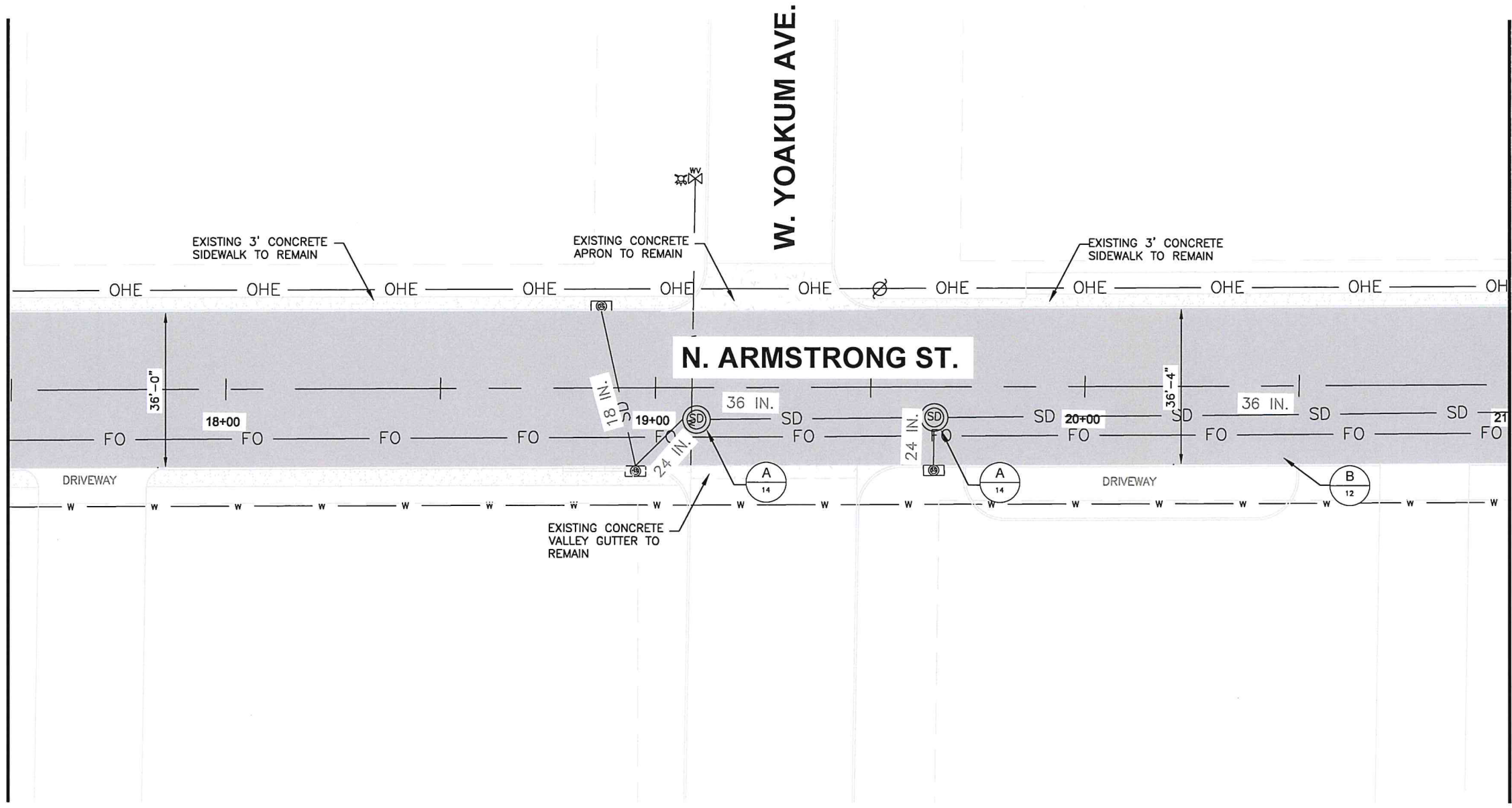
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Kingsville, Texas 78363
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Job:
Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT IMPROVEMENTS
STA. 14+00 TO STA. 17+50**

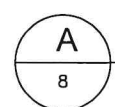
MATCHLINE STA. 17 + 50



W. YOAKUM AVE.

N. ARMSTRONG ST.

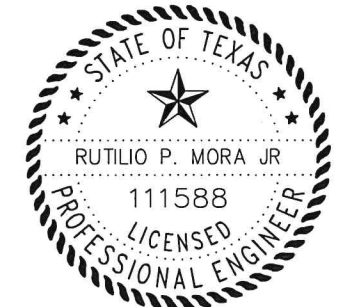
MATCHLINE STA. 21 + 00



PAVEMENT IMPROVEMENTS
 STA. 17+50 TO STA. 21+00

SCALE: 1:30

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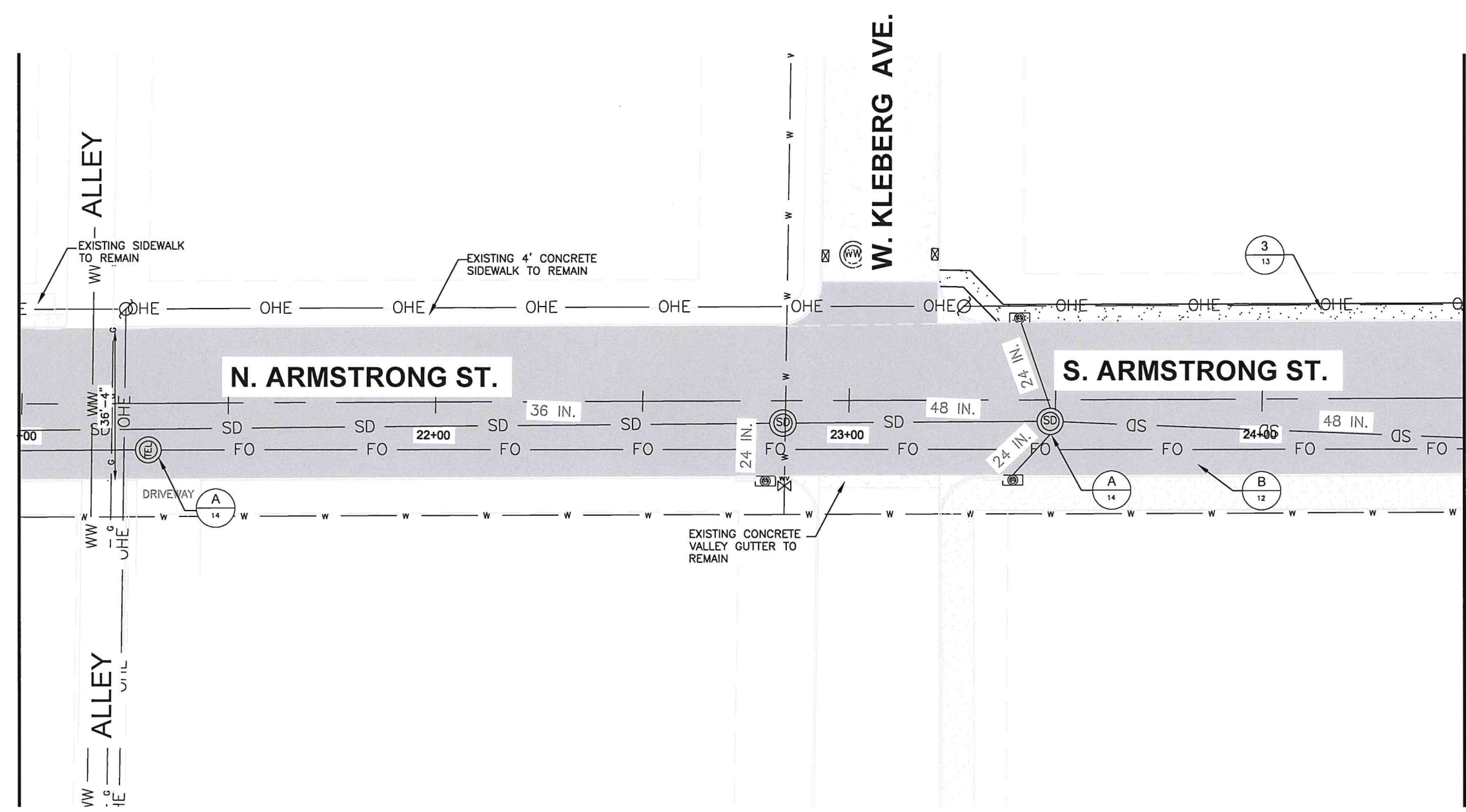


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 Date: 08/19/2020
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 Job:
 Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
 FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
 PAVEMENT IMPROVEMENTS
 STA. 17+50 TO STA. 21+00**

SHEET
 8

MATCHLINE STA. 21 + 00

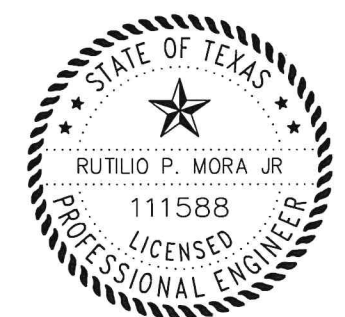


MATCHLINE STA. 24 + 50



A
6
PAVEMENT IMPROVEMENTS
STA. 21+00 TO STA. 24+50
SCALE: 1:30

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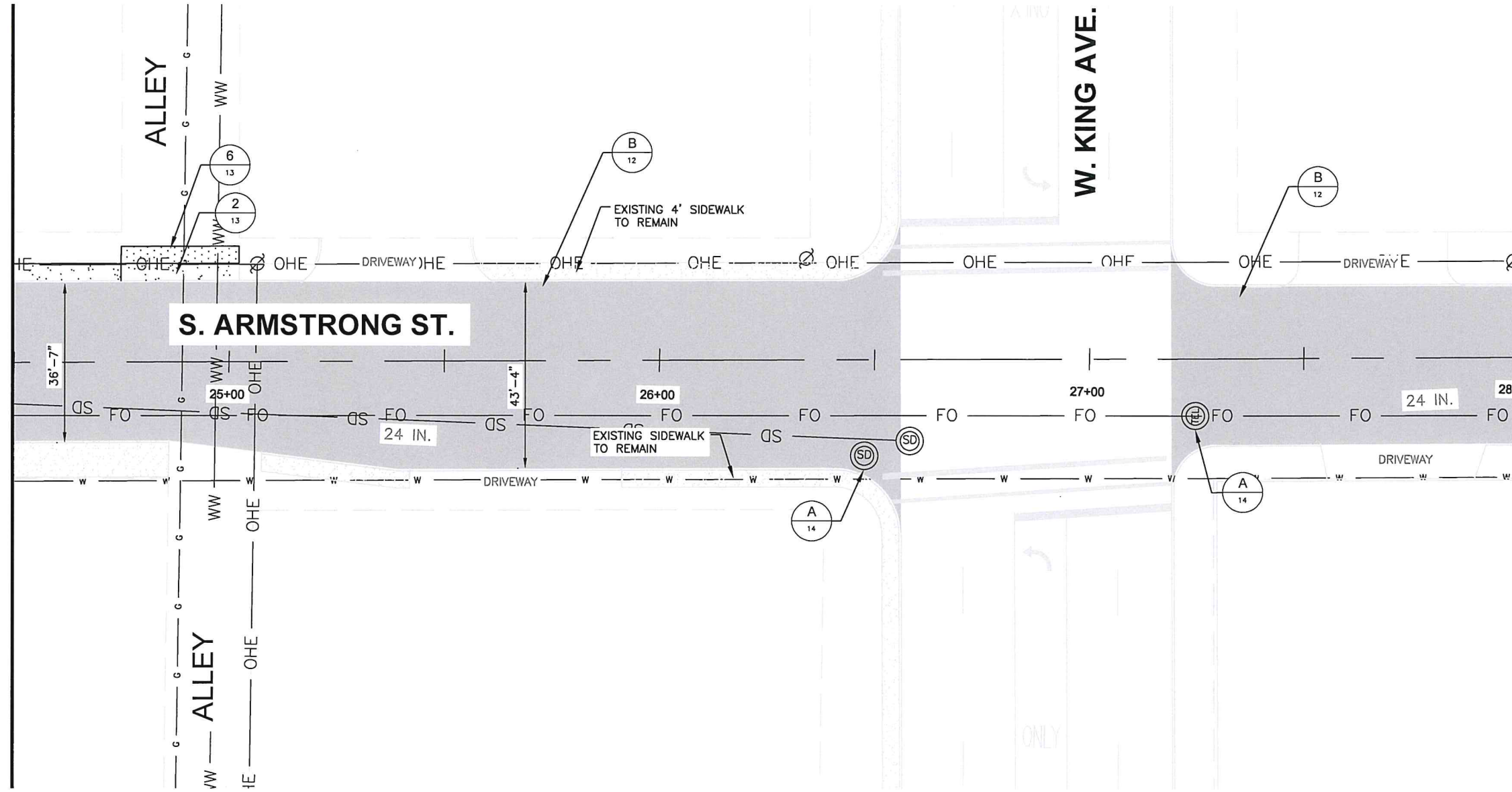
CITY OF KINGSVILLE
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Kingsville, Texas 78363
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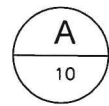
Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:
Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT IMPROVEMENTS
STA. 21+00 TO STA. 24+50**

MATCHLINE STA. 24 + 50



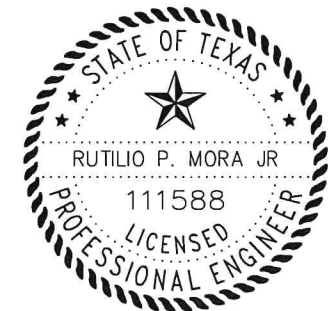
MATCHLINE STA. 28 + 00



**PAVEMENT IMPROVEMENTS
STA. 24+50 TO STA. 28+00**

SCALE: 1:30

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Drawn by: V. MARQUEZ

Date: 08/19/2020

Checked by: R. MORA

Job:

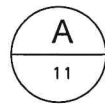
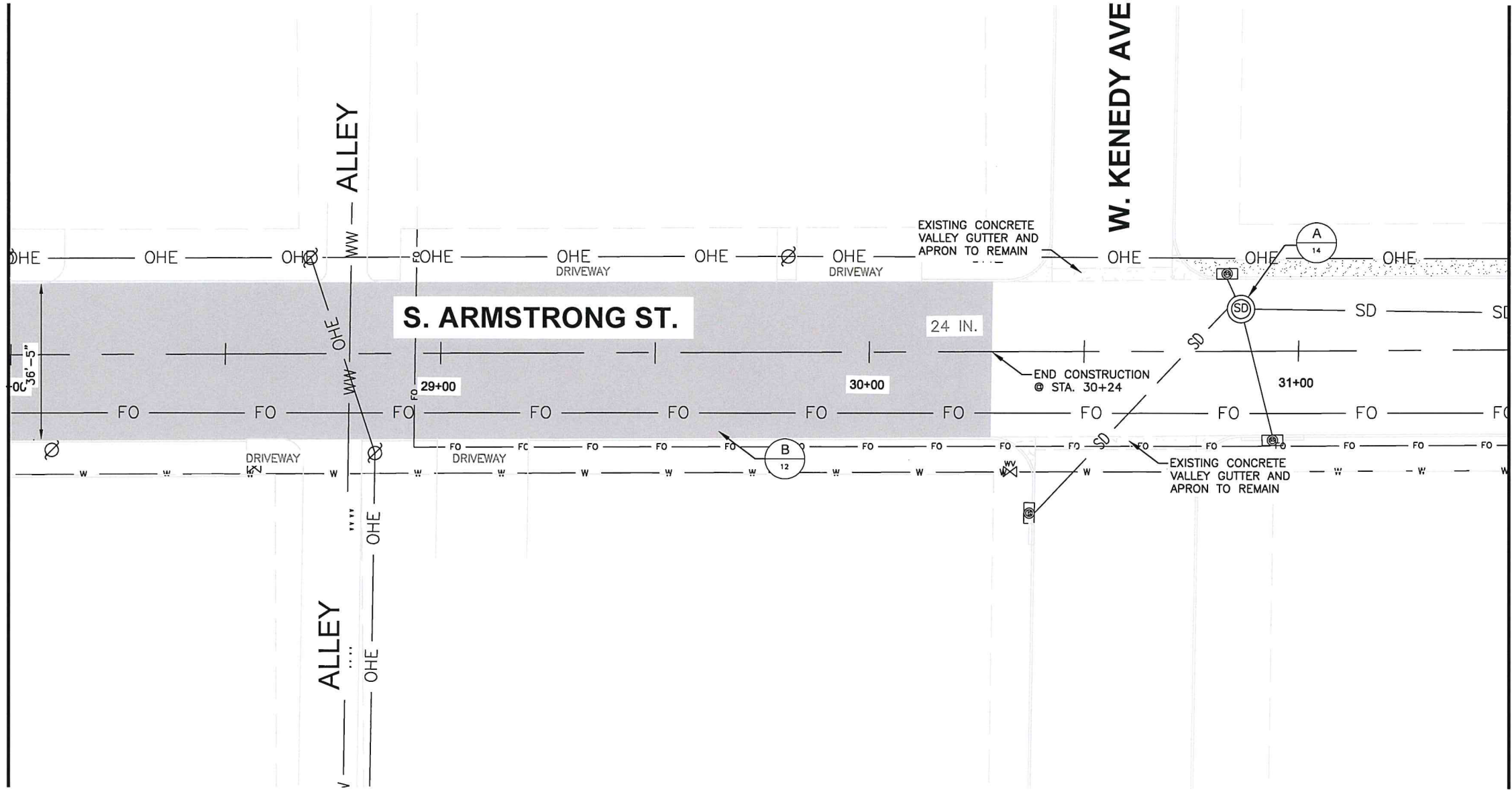
Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.**

**PAVEMENT IMPROVEMENTS
STA. 24+50 TO STA. 28+00**

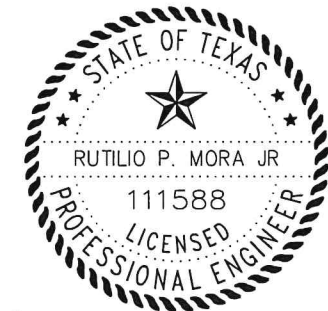
SHEET
10

MATCHLINE STA. 28 + 00



**PAVEMENT IMPROVEMENTS
STA. 28+00 TO STA. 31+50**

SCALE: 1:30



Rutilio P. Mora Jr. 12/18/2020
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MATCHLINE END

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Drawn by: V. MARQUEZ

Date: 08/19/2020

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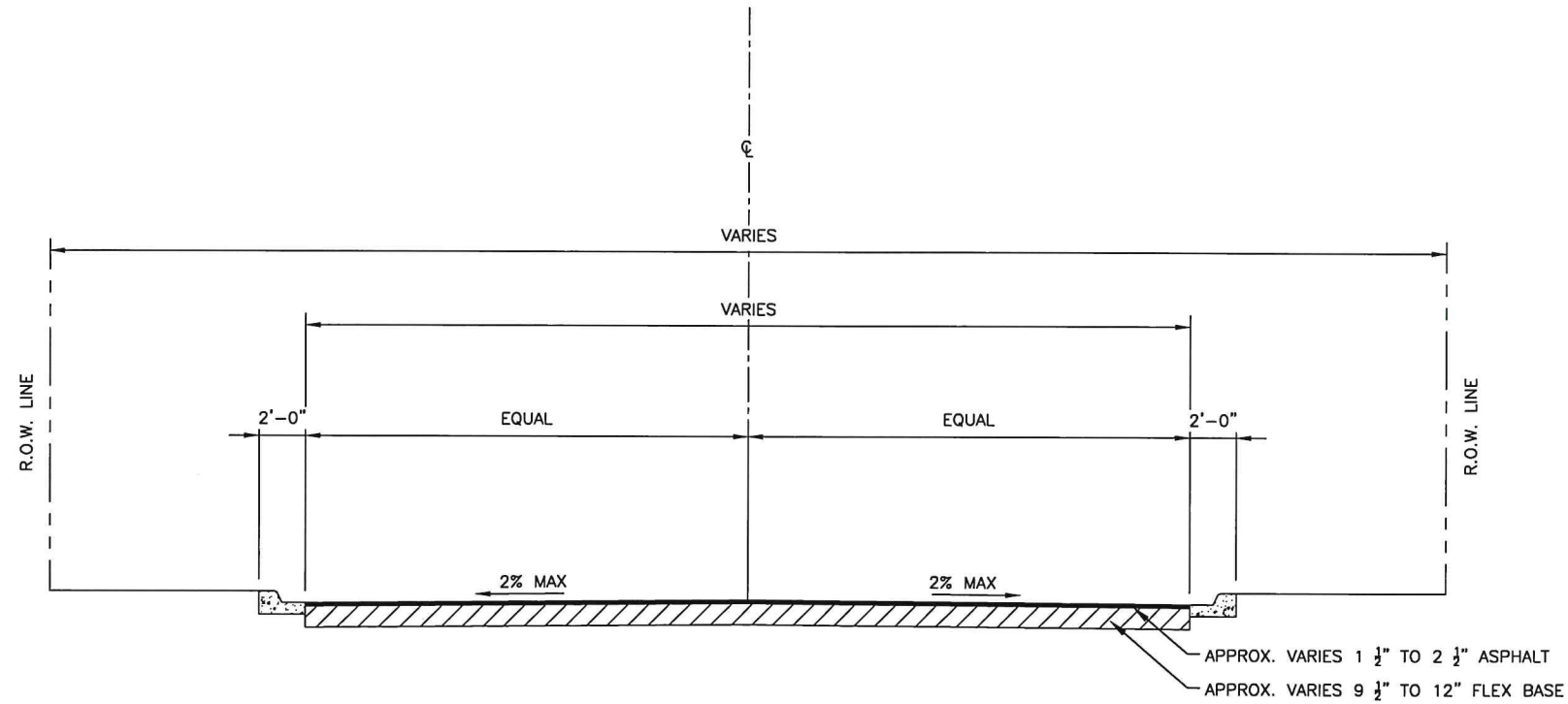
Job:

Scale: N.T.S.

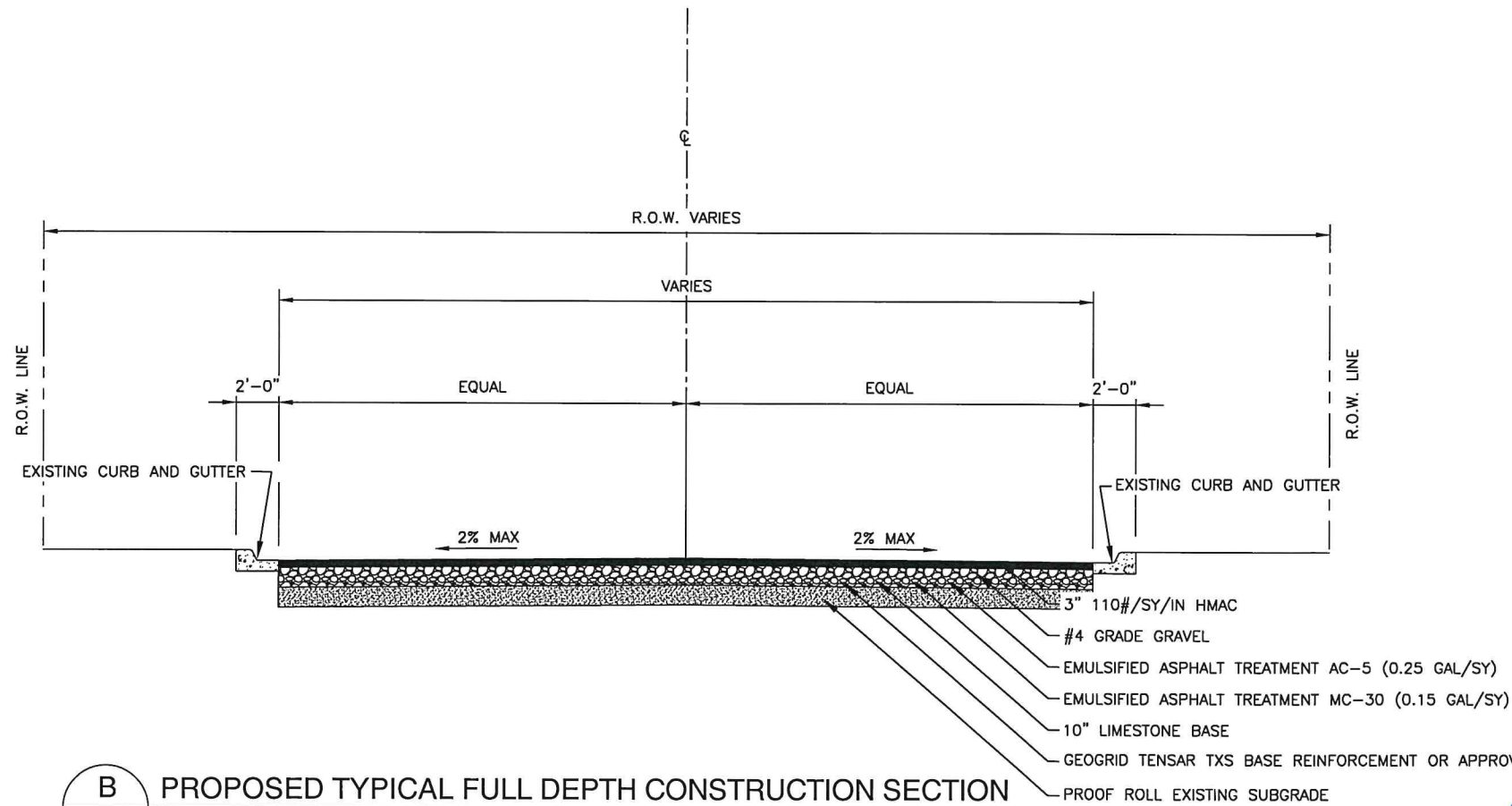
**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.**

**PAVEMENT IMPROVEMENTS
STA. 28+00 TO STA. 31+50**

SHEET
11

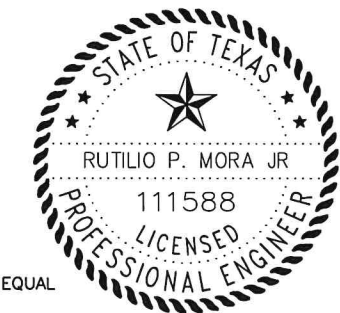


A EXISTING TYPICAL SECTION
 12 SCALE: 1/8":1'-0"



B PROPOSED TYPICAL FULL DEPTH CONSTRUCTION SECTION
 12 SCALE: 1/8":1'-0"

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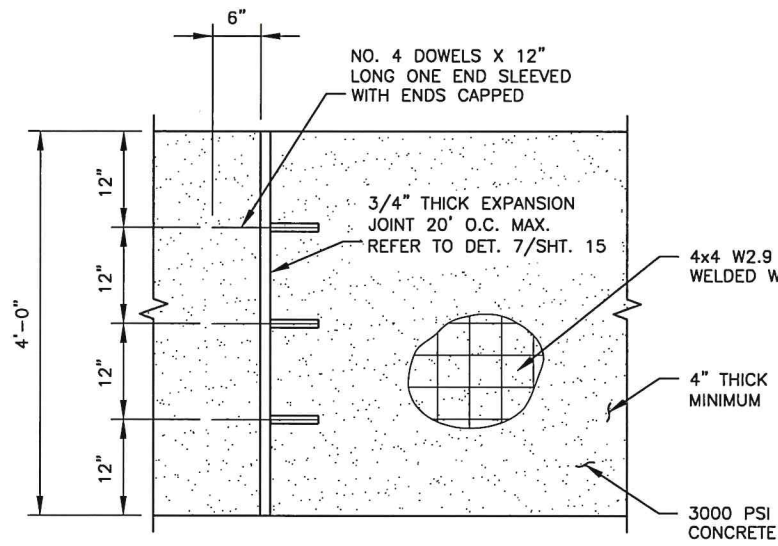


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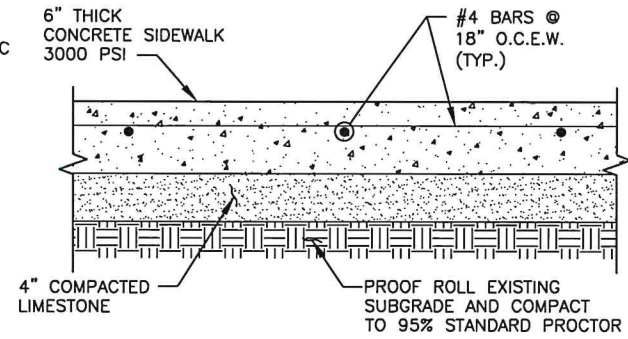


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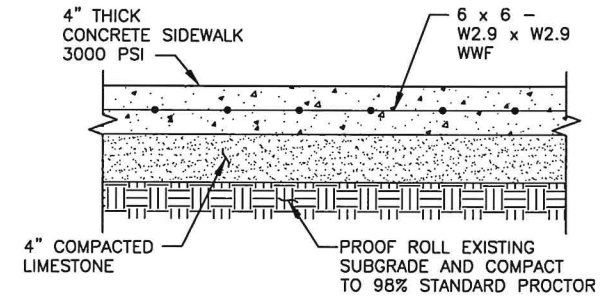
2021 N. ARMSTRONG STREET IMPROVEMENTS
 FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
 EXISTING AND PROPOSED TYPICAL STREET SECTIONS



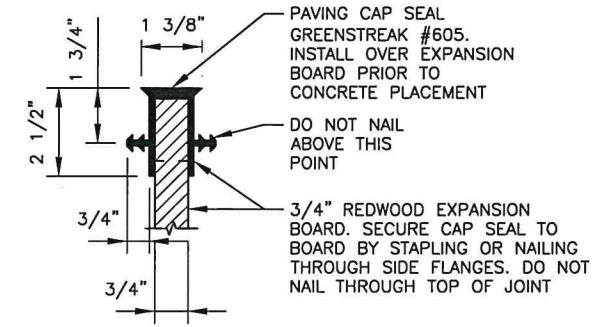
1 **SIDEWALK DETAIL**
13 SCALE: 1/2" = 1'-0"



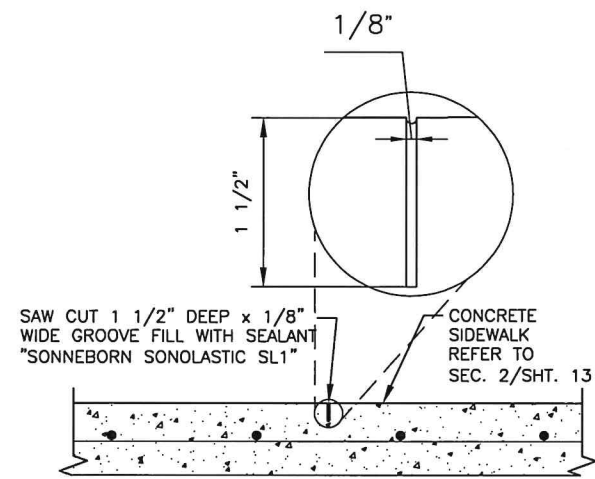
2 **6" THICK CONCRETE PAVEMENT SECTION**
13 SCALE: 3/4" = 1'-0"



3 **4" THICK CONCRETE SIDEWALK SECTION**
13 SCALE: 3/4" = 1'-0"

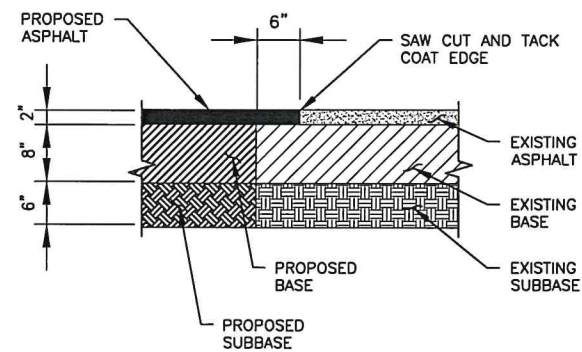


4 **CAP SEAL DETAIL**
13 SCALE: NOT TO SCALE

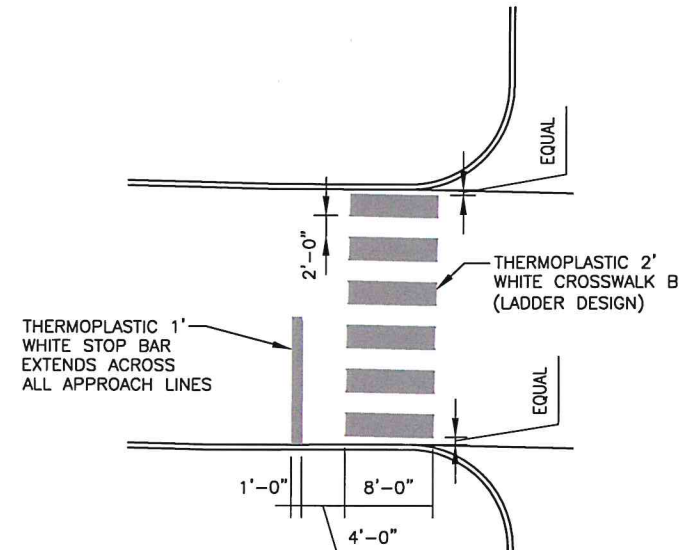


SAW CUT NOTE:
USE CONVENTIONAL SAW TO CUT JOINTS WITHIN 4 TO 12 HOURS AFTER FINISHING AND AS SOON AS THE CONCRETE HAS HARDENED SUFFICIENTLY TO PREVENT AGGREGATES FROM BEING DISLODGED BY THE SAW.

5 **TYP. CONCRETE PAVEMENT CONTROL JOINT DETAIL**
13 SCALE: NOT TO SCALE

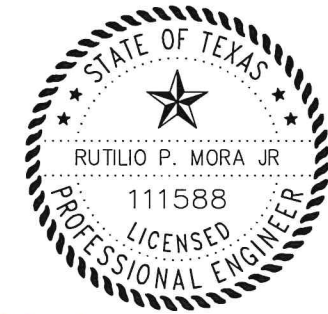


6 **TYPICAL ASPHALT PAVEMENT REPAIR DETAIL**
13 SCALE: NOT TO SCALE

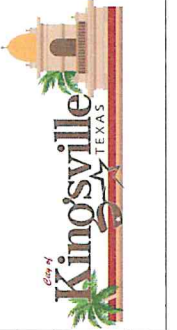


7 **CROSSWALK & STOP BAR DETAIL**
13 SCALE: NOT TO SCALE

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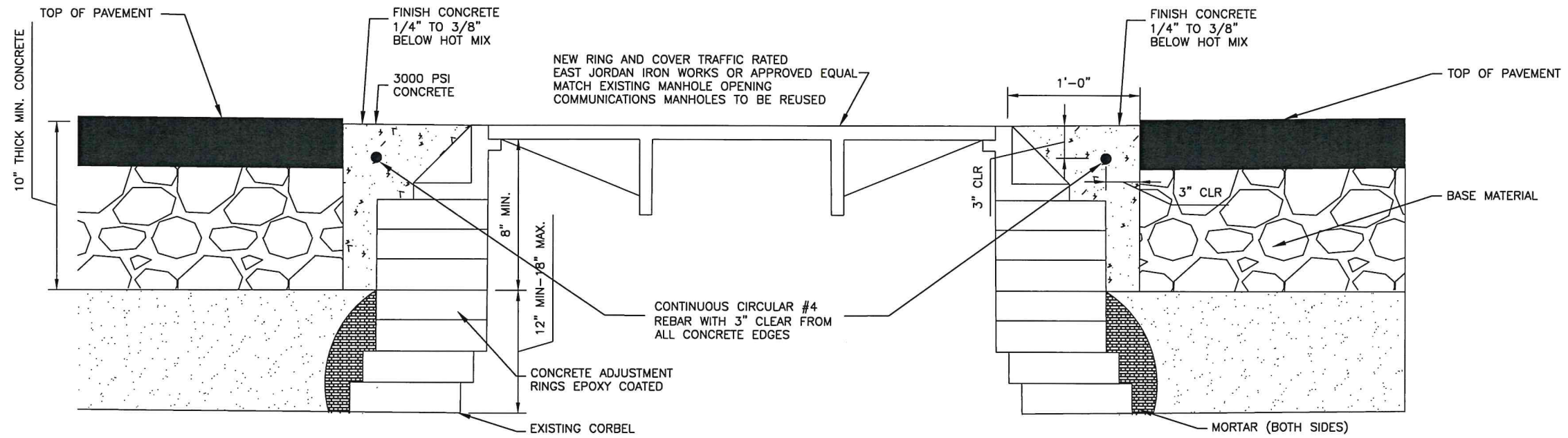


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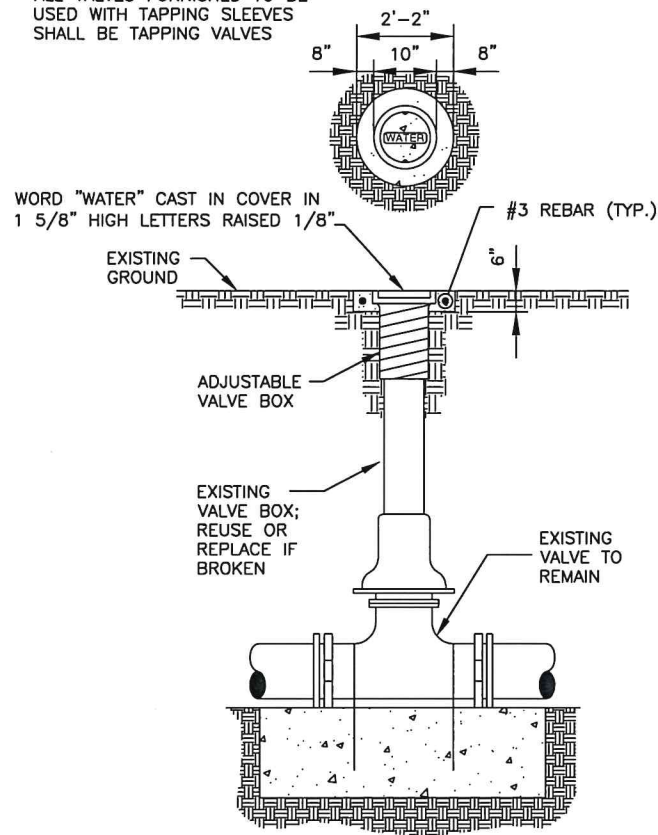
Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:

**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
SIDEWALK AND DRIVEWAY REPAIR
DETAILS - ALTERNATE BID NO. 1**



(A) MANHOLE ADJUSTMENT DETAIL
 14 SCALE: 1"=1'-0"

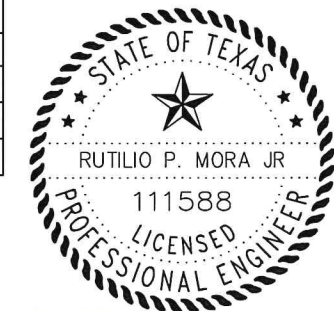
NOTE:
 ALL VALVES FURNISHED TO BE
 USED WITH TAPPING SLEEVES
 SHALL BE TAPPING VALVES



(B) WATER VALVE ADJUSTMENT DETAIL
 14 SCALE: NOT TO SCALE

SUMMARY OF MANHOLE AND VALVE ADJUSTMENT									
STATION	LOCATION	REF. SHEET	MANHOLE OPENING (IN.)	NEW RING & COVER (30" CLEAR OPENING)	REUSE EXISTING	TYPE OF MANHOLE			
						VALVE BOX	SEWER	STORM	COMMS.
2+76	13' RT	3	24		X		X		
4+35	10' RT	4	30		X				X
4+65	21' RT	4	24		X		X		
4+92	3' RT	4	24		X		X		
5+02	10' LT	4	24	X				X	
6+34	CENTER	4	24		X		X		
8+25	CENTER	5	24		X		X		
8+50	13' LT	5	30	X				X	
9+87	CENTER	5	24		X		X		
10+10	12' RT	5	30		X				X
10+27	13' LT	5	24		X		X		
11+65	17' RT	6				X			
12+02	CENTER	6	24		X		X		
15+80	12' RT	7	30		X				X
19+12	7' RT	8	24	X				X	
19+67	7' RT	8	24	X				X	
21+25	11' RT	9	30	X				X	
22+85	6' RT	9	30	X				X	
23+49	5' RT	9	30	X				X	
26+48	20' RT	10	24	X				X	
27+25	14' RT	10	30	X				X	

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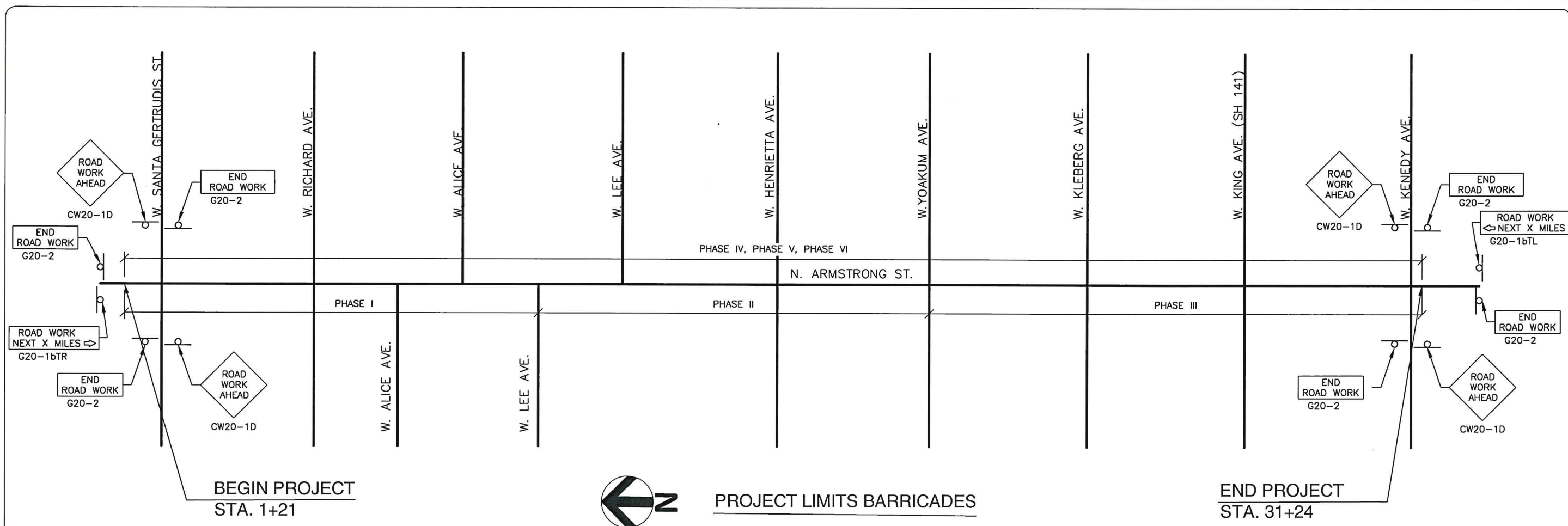


Rutilio P. Mora Jr 12/18/2020
 RUTILIO P. MORA JR, P.E. NO. 111588



Drawn by: V. MARQUEZ
 Date: 08/19/2020
 Checked by: R. MORA
 Job:
 Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
 FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
 SUMMARY OF MANHOLE AND VALVE BOX
 ADJUSTMENT AND DETAILS**



BEGIN PROJECT
STA. 1+21

END PROJECT
STA. 31+24

SEQUENCE OF WORK:

IT IS THE CONTRACTOR'S RESPONSIBILITY 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.

THE PROJECT IS SUBDIVIDED INTO THE FOLLOWING 3 SECTIONS FOR TRAFFIC CONTROL.

- SECTION 1: FROM W. SANTA GERTRUDIS ST. (STA. 0+00) TO W. LEE AVE. (STA. 10+00)
- SECTION 2: FROM W. LEE AVE. (STA. 10+00) TO W. YOAKUM AVE. (STA. 19+25)
- SECTION 3: FROM W. YOAKUM AVE. (STA. 19+25) TO W. KENEDY AVE. (STA. 31+50)

PHASE I: CLOSE SECTION 1 ROADWAY SEGMENT TO THRU TRAFFIC.
(A) PERFORM FULL DEPTH CONSTRUCTION ON BOTH LANES OF ROADWAY THRU SINGLE COURSE SEAL COAT WITH EMULSIFIED ASPHALT TREATMENT AC-5 AND #4 GRADE GRAVEL.

PHASE II: CLOSE SECTION 2 ROADWAY SEGMENT TO THRU TRAFFIC.
(A) PERFORM FULL DEPTH CONSTRUCTION ON BOTH LANES OF ROADWAY THRU SINGLE COURSE SEAL COAT WITH EMULSIFIED ASPHALT TREATMENT AC-5 AND #4 GRADE GRAVEL.

PHASE III: CLOSE SECTION 3 ROADWAY SEGMENT TO THRU TRAFFIC.
(A) PERFORM FULL DEPTH CONSTRUCTION ON BOTH LANES OF ROADWAY THRU SINGLE COURSE SEAL COAT WITH EMULSIFIED ASPHALT TREATMENT AC-5 AND #4 GRADE GRAVEL.

PHASE IV: CLOSE ALL SECTIONS OF 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.

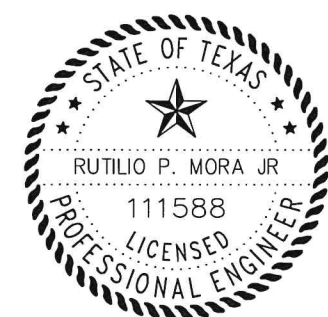
PHASE IV: CLOSE ALL SECTIONS OF ROADWAY SEGMENT TO THRU TRAFFIC.
(A) PLACE TY "D" ACP SURFACE UTILIZING STANDARD LANE CLOSURE BARRICADING AND SIGNING AS SHOWN ON STANDARD SHEET TCP(1) WITH FLAGMEN AT INTERSECTIONS FOR TRAFFIC CONTROL.

PHASE IV: CLOSE ALL SECTIONS OF 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.

GENERAL NOTES:

1. ADDITIONAL BARRICADES AND WARNING SIGNS MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE ROADWAY SURFACE WITHIN THE PROJECT LIMITS WHILE THE TCP IS IN EFFECT.
3. THE CONTRACTOR SHALL MARK THE LOCATION OF TRAFFIC CONTROL STRIPING AND ALL PERMANENT STRIPING AS DIRECTED BY THE ENGINEER.
4. THE CONTRACTOR SHALL REMOVE ALL CONFLICTING PAVEMENT MARKINGS.
5. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL SIDE STREETS AND DRIVEWAYS AT ALL TIMES.
6. ALL LANE CLOSURES SHALL BE IN ACCORDANCE WITH PLAN STANDARD SHEETS TCP(1).
7. BEGINNING AND ENDING BARRICADES & SIGNS SHALL REMAIN IN PLACE FOR THE DURATION OF THE CONTRACT.
8. CONTRACTOR SHALL PERFORM ALL PERMANENT STRIPING IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS.

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Rutilio P Mora Jr 12/18/2020
RUTILIO P. MORA JR, P.E. NO. 111588



Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:
Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
TRAFFIC CONTROL PLAN - ADVANCED WARNING &
GENERAL NOTES**



LEGEND

SYMBOL	DESCRIPTION	QUANTITY
	CONSTRUCTION LIMITS	STA. 1+50 TO STA. 10+00
	M4-10	6
	M4-10R	5
	M4-10L	2
	M4-9S	X
	M4-9TL	X
	M4-9TR	X
	M4-8A	12
	TY III BARRICADE	X
	R11-5(16)	7
	R11-2	5

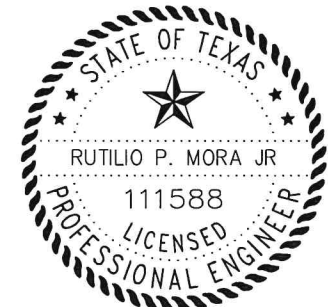


A
16

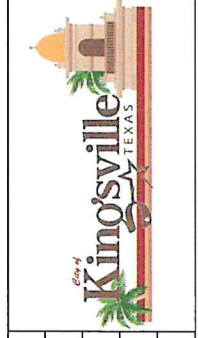
TRAFFIC CONTROL DETOUR PLAN - PHASE I & IV

SCALE: 1:250

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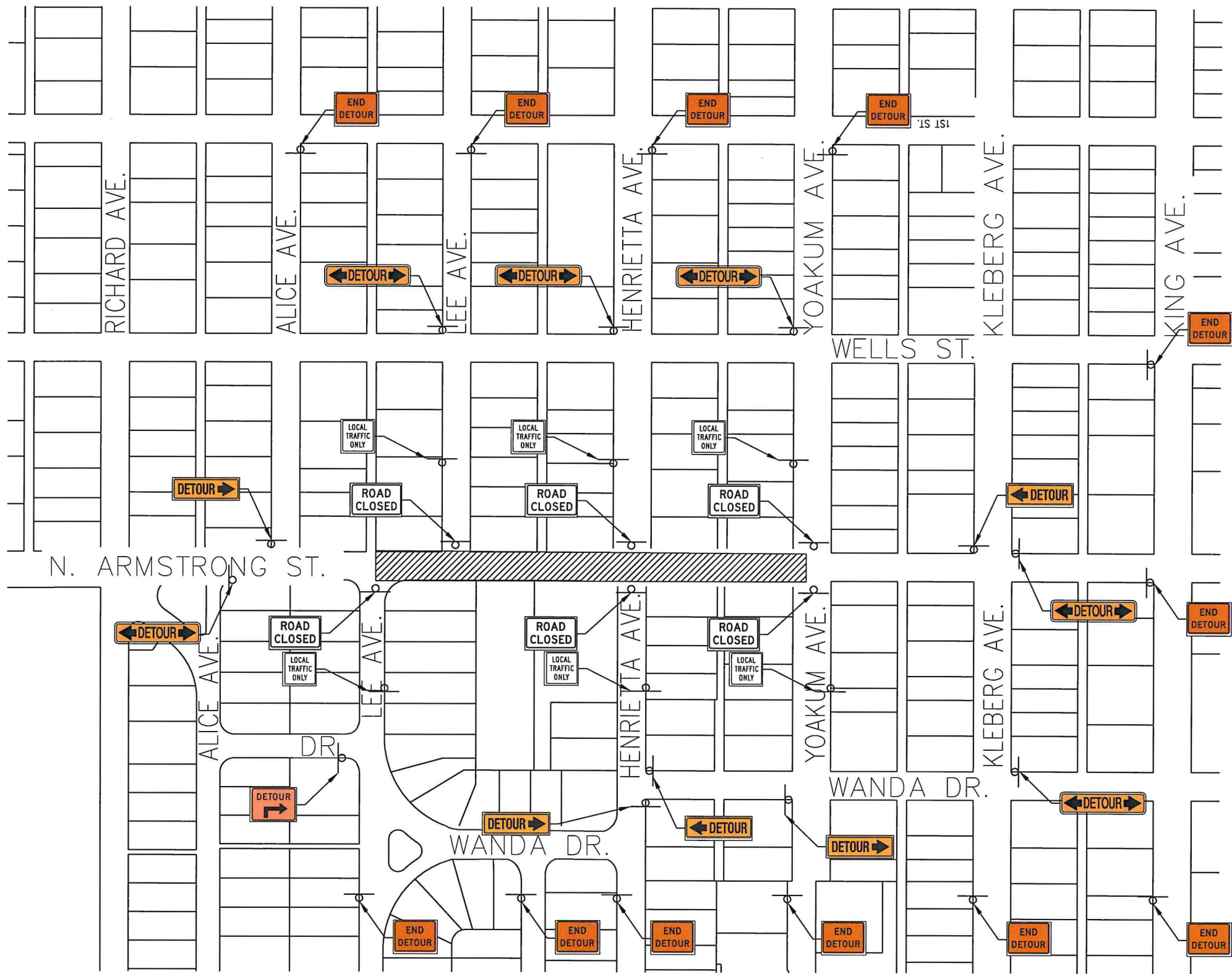


Rutilio P. Mora Jr. 12/18/2020
RUTILIO P. MORA JR, P.E. NO. 111588



Drawn by: V. MARQUEZ
Date: 08/19/2020
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Job:
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2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
TRAFFIC CONTROL DETOUR PLAN - PHASE I & IV



LEGEND

SYMBOL	DESCRIPTION	QUANTITY
	CONSTRUCTION LIMITS	STA. 10+00 TO STA. 19+25
	M4-10	6
	M4-10R	3
	M4-10L	2
	M4-9S	X
	M4-9TL	X
	M4-9TR	1
	M4-8A	12
	TY III BARRICADE	X
	R11-5(16)	6
	R11-2	6

N. ARMSTRONG ST.



A
17

TRAFFIC CONTROL DETOUR PLAN - PHASE II & V

SCALE: 1:250

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Job:
Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
TRAFFIC CONTROL DETOUR PLAN - PHASE II & V**



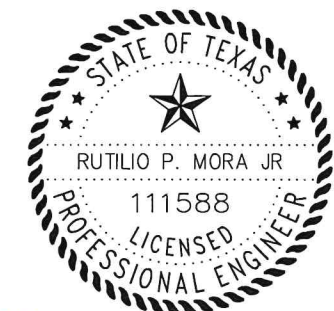
A
18

TRAFFIC CONTROL DETOUR PLAN -
PHASE III & VI

SCALE: 1:250

LEGEND		
SYMBOL	DESCRIPTION	QUANTITY
	CONSTRUCTION LIMITS	STA. 19+25 TO STA. 31+50
	M4-10	7
	M4-10R	1
	M4-10L	X
	M4-9S	X
	M4-9TL	2
	M4-9TR	1
	M4-8A	7
	TY III BARRICADE	X
	R11-5(16)	6
	R11-2	6

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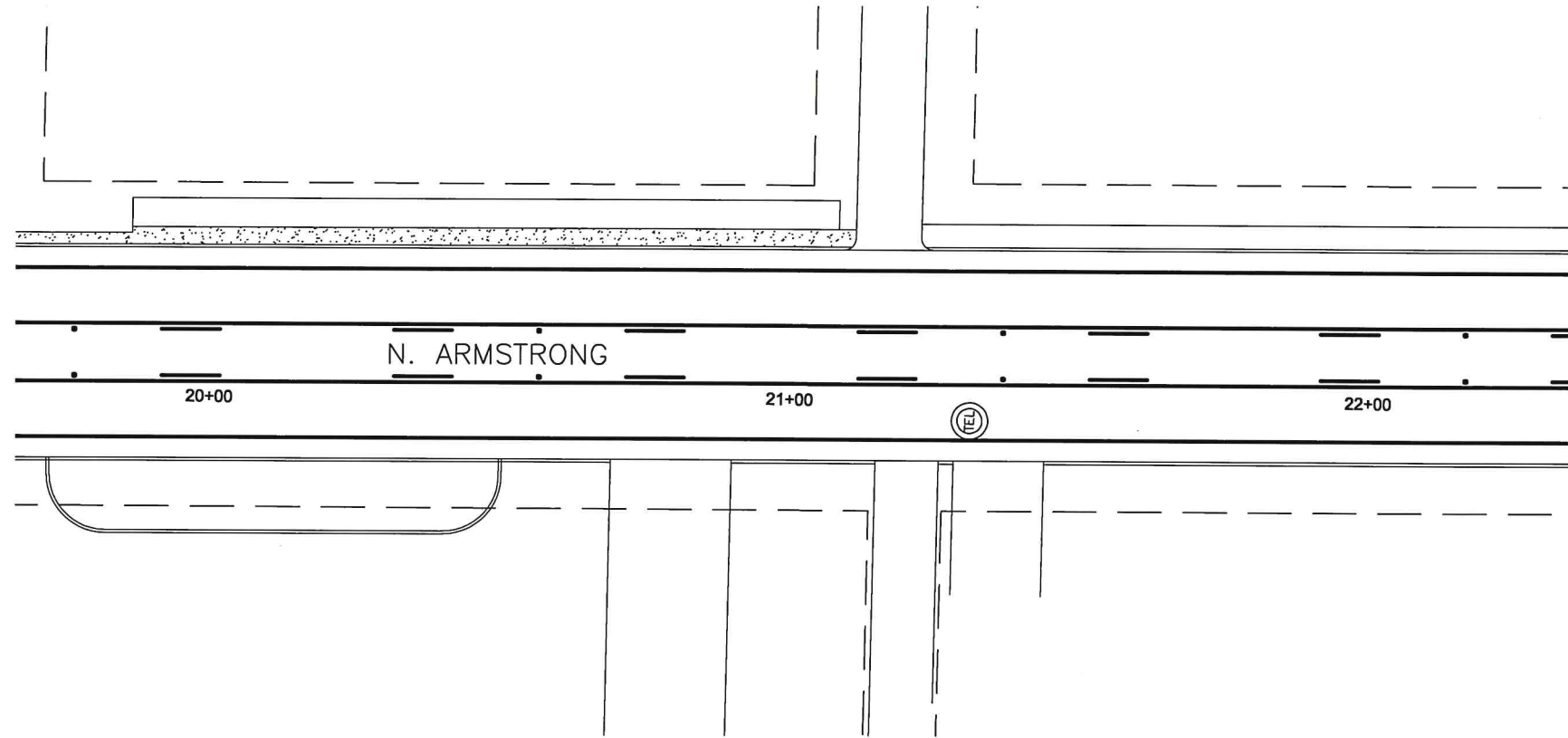


Rutilio P. Mora Jr, 12/18/2020
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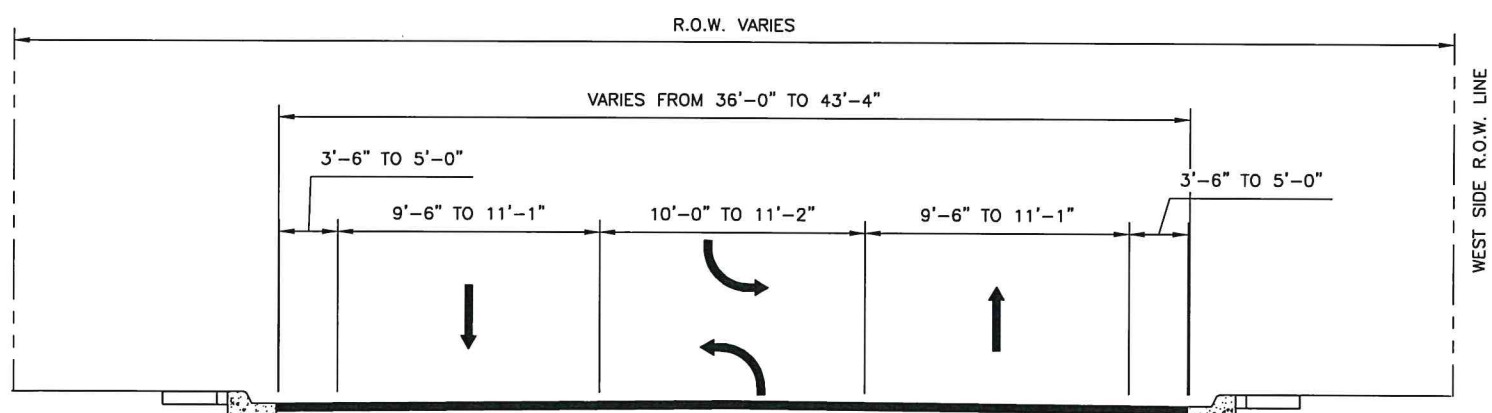
2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
TRAFFIC CONTROL DETOUR PLAN - PHASE III & VI



PAVEMENT MARKING TYPICAL PLAN VIEW

A
19

SCALE: 1:30



PAVEMENT MARKING TYPICAL SECTION

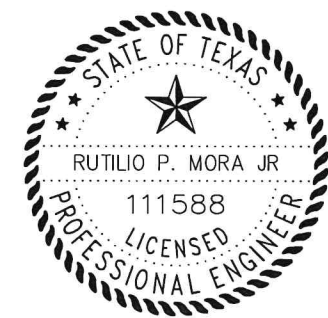
B
19

SCALE: N.T.S.

LOCATION	LEGEND					
	REFL PAV MRK TY I			REFL PAV MRK TY C		REFL PAV MRK
	(W) (4") (SLD) (90 MIL)	(Y) (4") (SLD) (90 MIL)	(Y) (8") (SLD) (90 MIL)	(W) (12") (SLD) (90 MIL)	(W) (24") (SLD) (90 MIL)	TY II-A-A
	LF	LF	LF	LF	LF	EA
ARMSTRONG ST. FROM STA. GERTRUDIS ST. TO KENEDY AVE.	4778	4743	303	76	636	73
TOTAL	4778	4743	303	76	636	73

FOR CONTRACTOR'S INFORMATION ONLY

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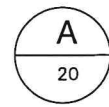
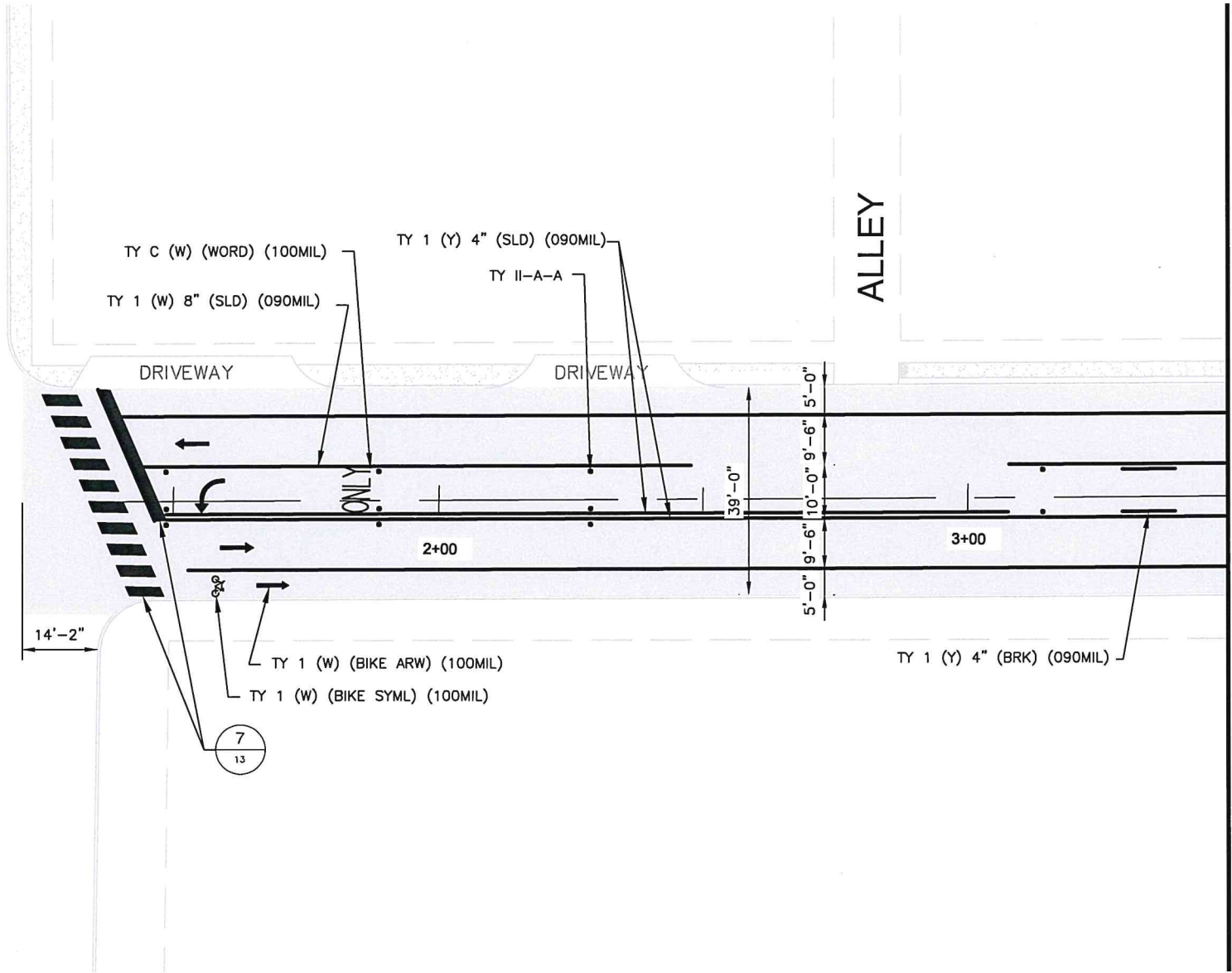
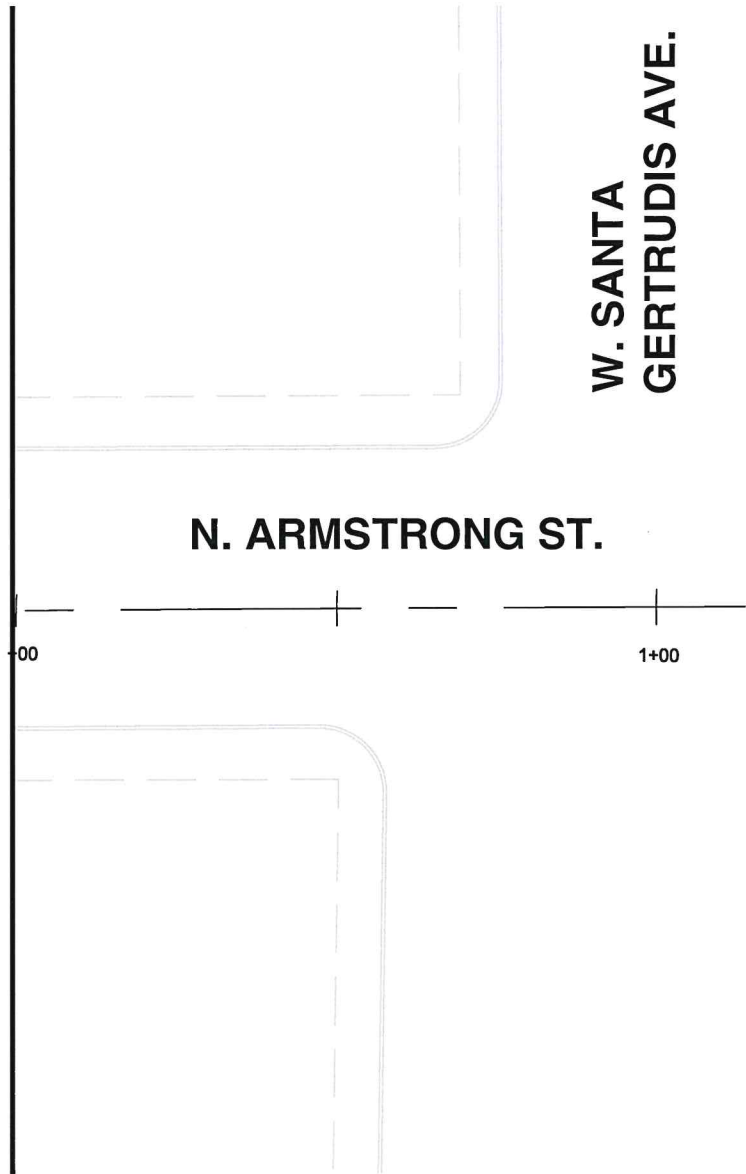
Rutilio P. Mora Jr. 12/18/2020
RUTILIO P. MORA JR, P.E. NO. 111588



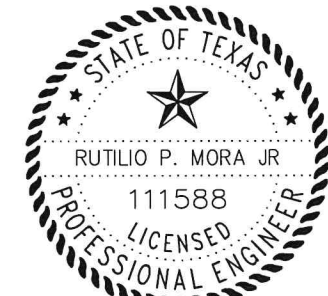
Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:
Scale: N.T.S.

2021 N. ARMSTRONG STREET IMPROVEMENTS FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
SUMMARY OF PAVEMENT MARKINGS

MATCHLINE STA. 0 + 00



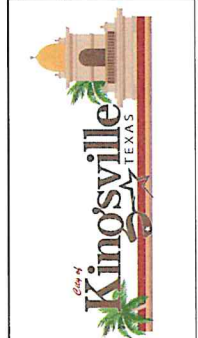
PAVEMENT MARKINGS
 STA. 0+00 TO STA. 3+50
 SCALE: 1:30



Rutilio P. Mora Jr., 12/18/2020
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 Kingsville, Texas 78363
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 Fax 361.595.8035

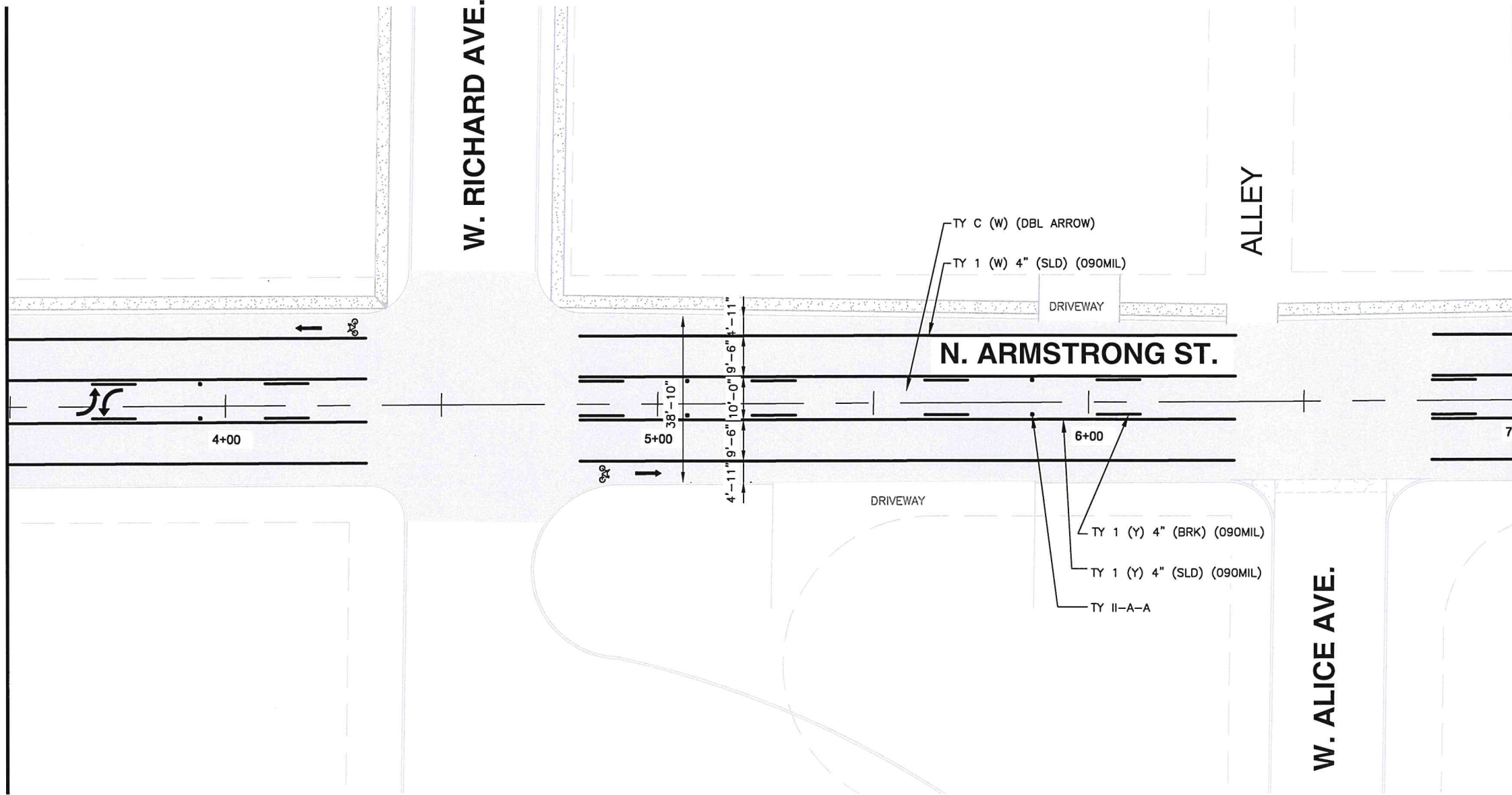


Drawn by: V. MARQUEZ
 Date: 08/19/2020
 Checked by: R. MORA
 Job:
 Scale: N.T.S.

**2021 N. ARMSTRONG STREET IMPROVEMENTS
 FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
 PAVEMENT MARKINGS
 STA. 0+00 TO STA. 3+50**

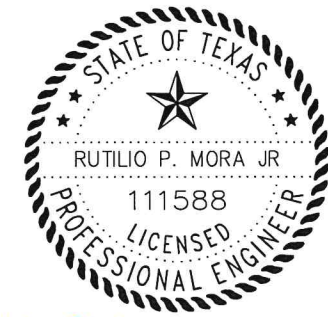
SHEET
 20

MATCHLINE STA. 3 + 50



A
21

PAVEMENT MARKINGS
STA. 3+50 TO STA. 7+00
SCALE: 1:30



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2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT MARKINGS
STA. 3+50 TO STA. 7+00

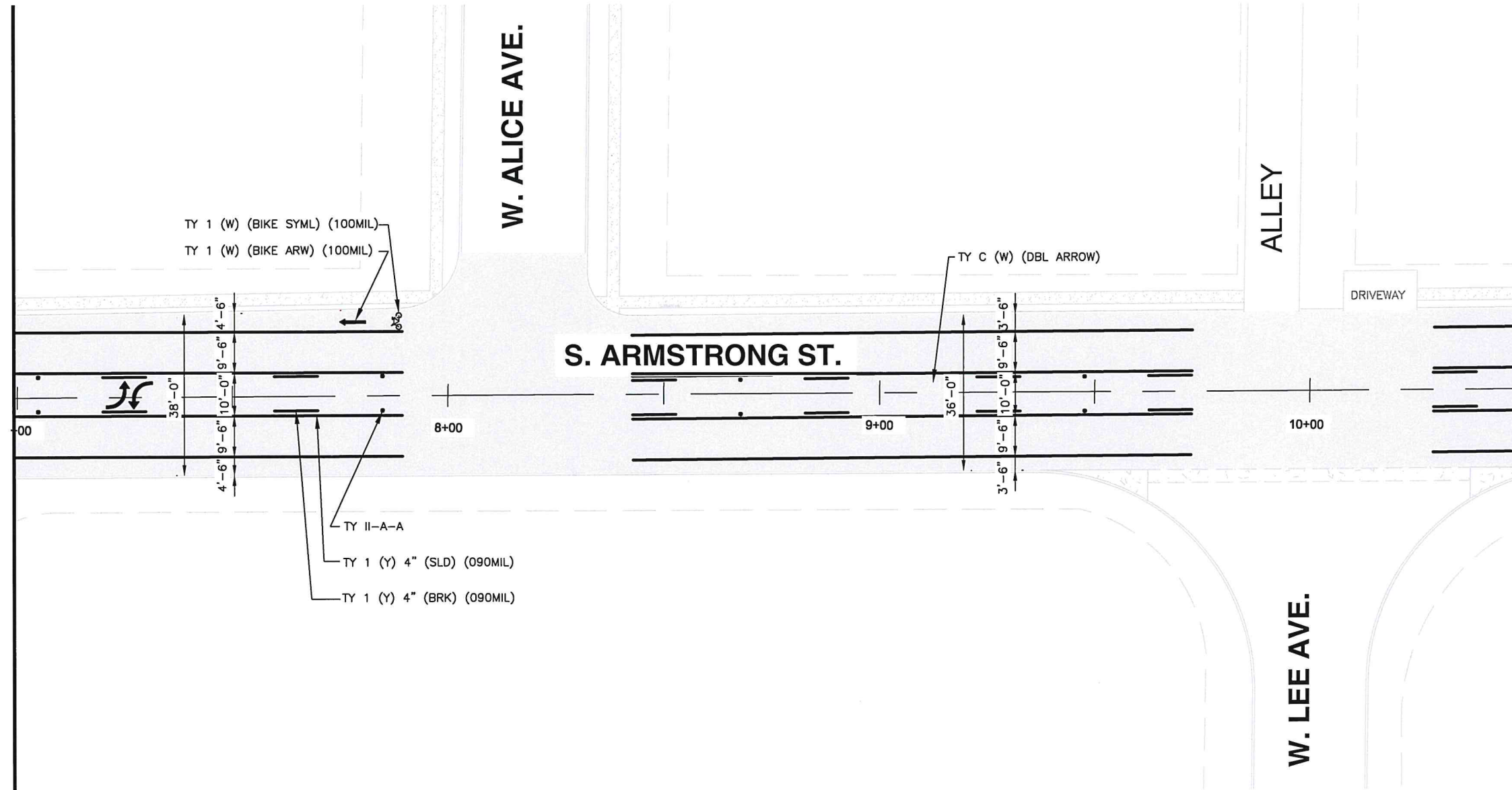
Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
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Office 361.595.8007

W. SANTA GERTRUDIS ST.

MATCHLINE STA. 7 + 00

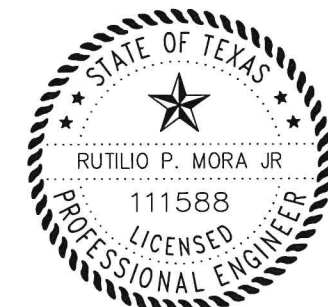


MATCHLINE STA. 10 + 50



A
22

PAVEMENT MARKINGS
STA. 7+00 TO STA. 10+50
SCALE: 1:30



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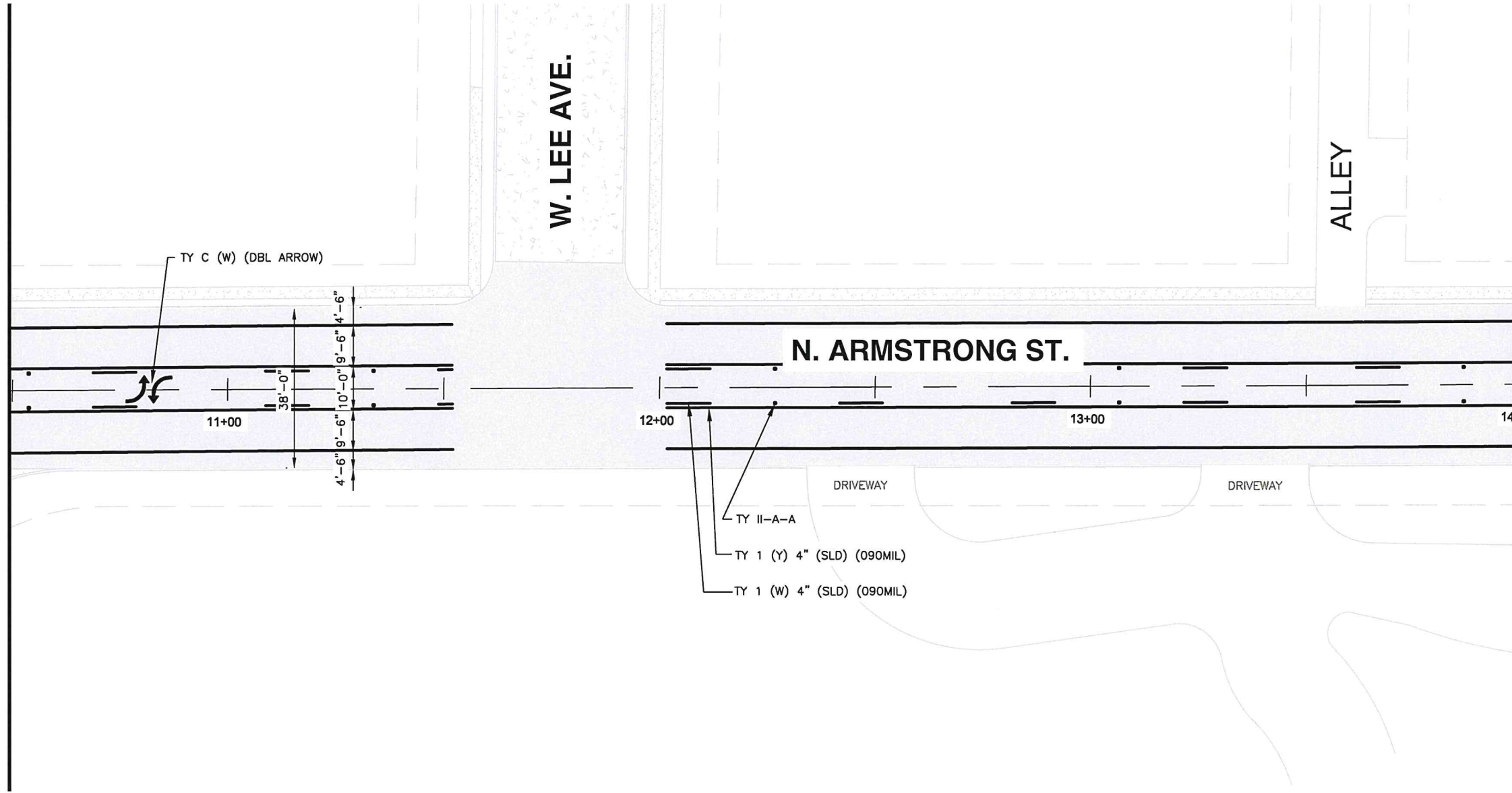


Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:
Scale: N.T.S.

2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT MARKINGS
STA. 7+00 TO STA. 10+50

SHEET
22

MATCHLINE STA. 10 + 50



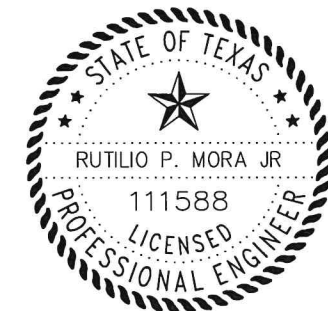
MATCHLINE STA. 14 + 00



A
23

PAVEMENT MARKINGS
STA. 10+50 TO STA. 14+00
SCALE: 1:30

- TY II-A-A
- TY 1 (Y) 4" (SLD) (090MIL)
- TY 1 (W) 4" (SLD) (090MIL)



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FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.

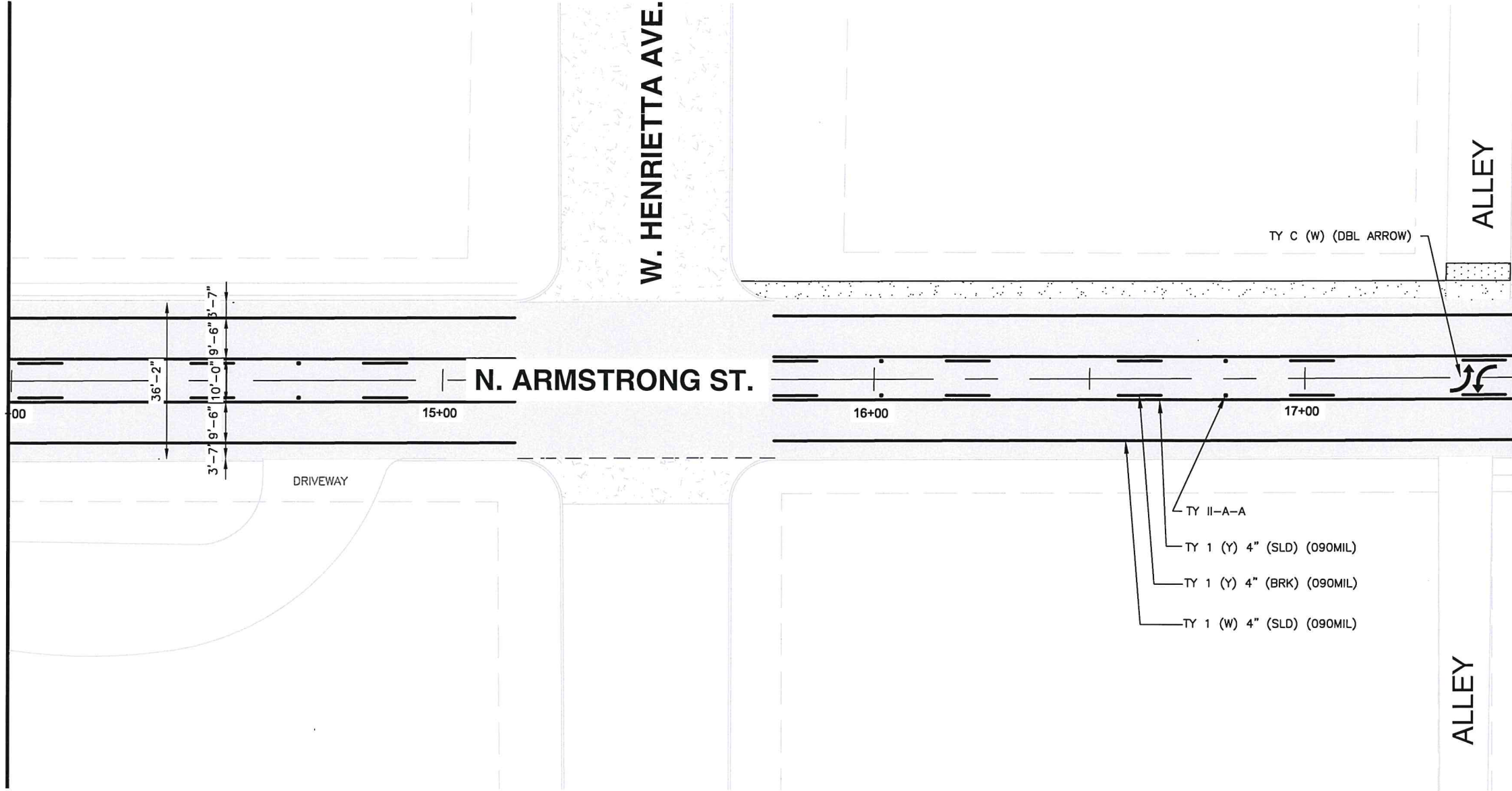
PAVEMENT MARKINGS
STA. 10+50 TO STA. 14+00

Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:
Scale: N.T.S.



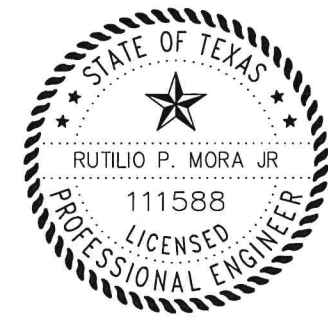
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400 West King
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MATCHLINE STA. 14 + 00



A
24

PAVEMENT MARKINGS
STA. 14+00 TO STA. 17+50
SCALE: 1:30



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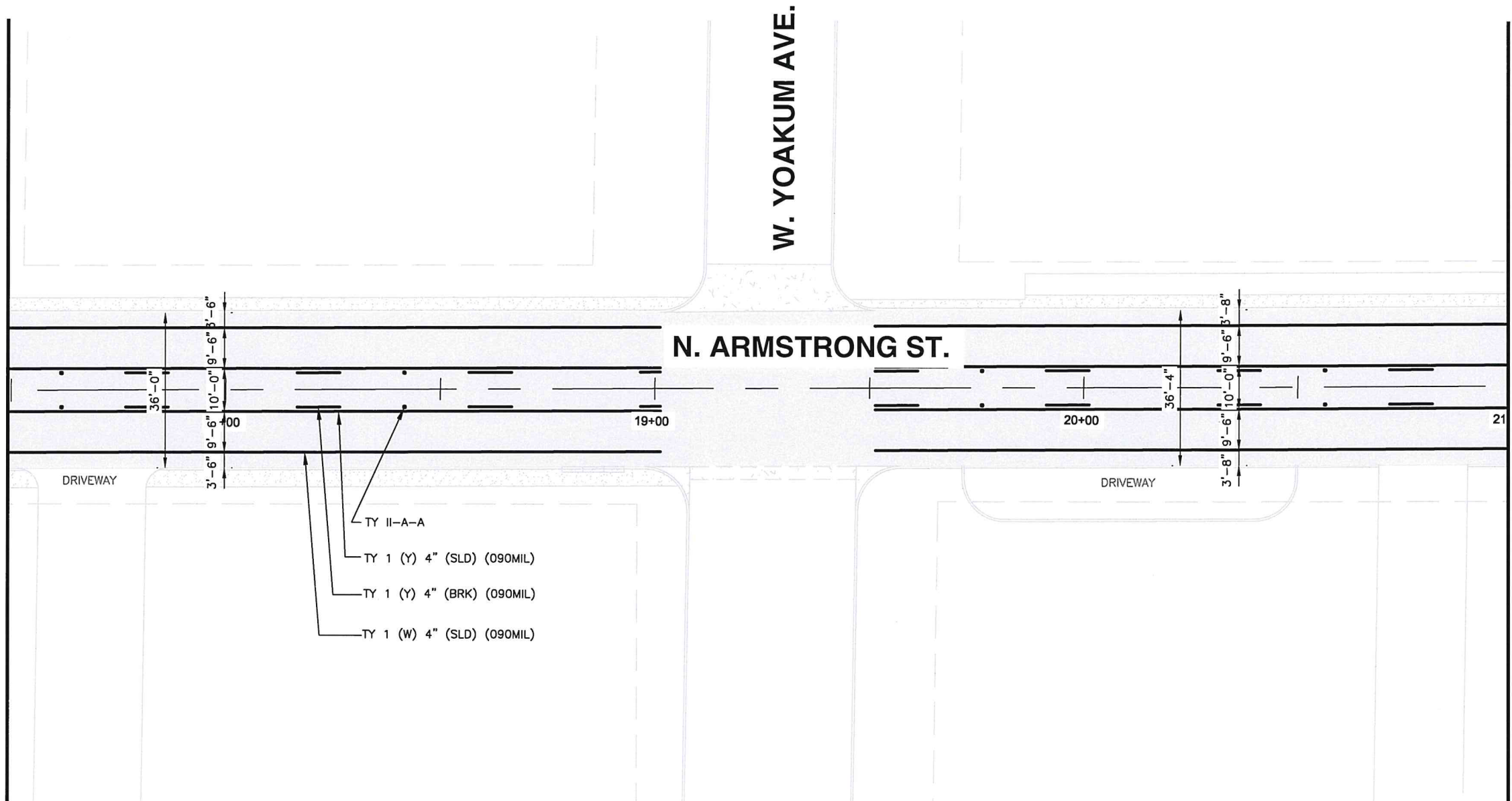


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Job:
Scale: N.T.S.

2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT MARKINGS
STA. 14+00 TO STA. 17+50

SHEET
24

MATCHLINE STA. 17 + 50

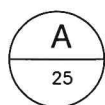


- TY II-A-A
- TY 1 (Y) 4" (SLD) (090MIL)
- TY 1 (Y) 4" (BRK) (090MIL)
- TY 1 (W) 4" (SLD) (090MIL)

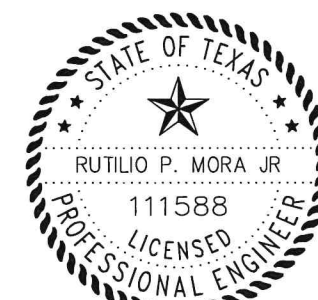
W. YOAKUM AVE.

N. ARMSTRONG ST.

MATCHLINE STA. 21 + 00



PAVEMENT MARKINGS
 STA. 17+50 TO STA. 21+00
 SCALE: 1:30



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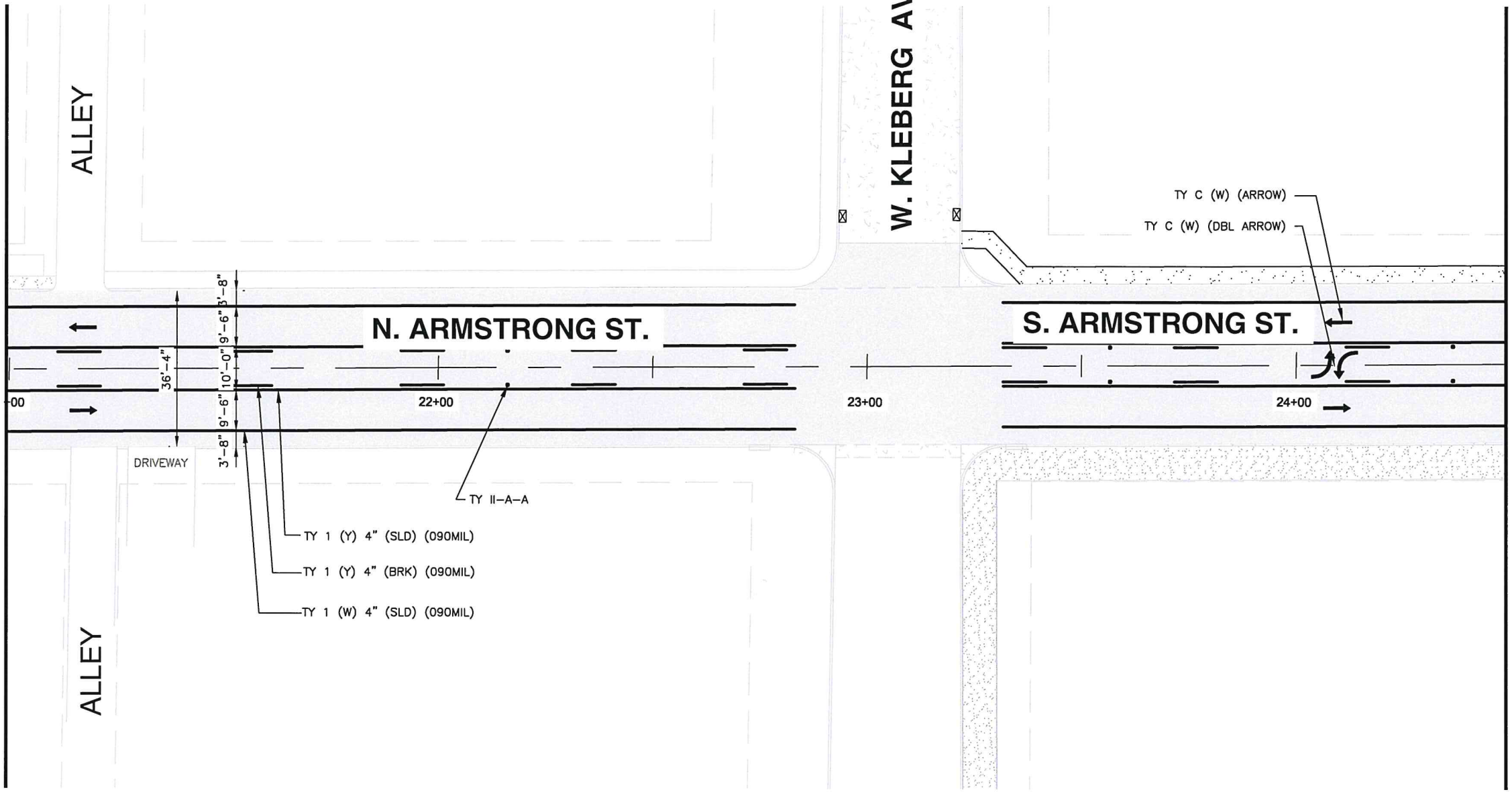
2021 N. ARMSTRONG STREET IMPROVEMENTS
 FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
 PAVEMENT MARKINGS
 STA. 17+50 TO STA. 21+00

Drawn by: V. MARQUEZ
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MATCHLINE STA. 21 + 00



ALLEY

ALLEY

W. KLEBERG AVE.

N. ARMSTRONG ST.

S. ARMSTRONG ST.

MATCHLINE STA. 24 + 50

DRIVEWAY

- TY 1 (Y) 4" (SLD) (090MIL)
- TY 1 (Y) 4" (BRK) (090MIL)
- TY 1 (W) 4" (SLD) (090MIL)

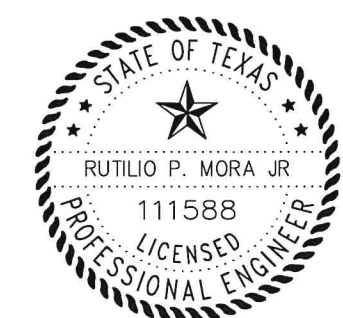
TY II-A-A

- TY C (W) (ARROW)
- TY C (W) (DBL ARROW)



A
26

PAVEMENT MARKINGS
STA. 21+00 TO STA. 24+50
SCALE: 1:30



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2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.

PAVEMENT MARKINGS
STA. 21+00 TO STA. 24+50

Drawn by: V. MARQUEZ

Date: 08/19/2020

Checked by: R. MORA

Job:

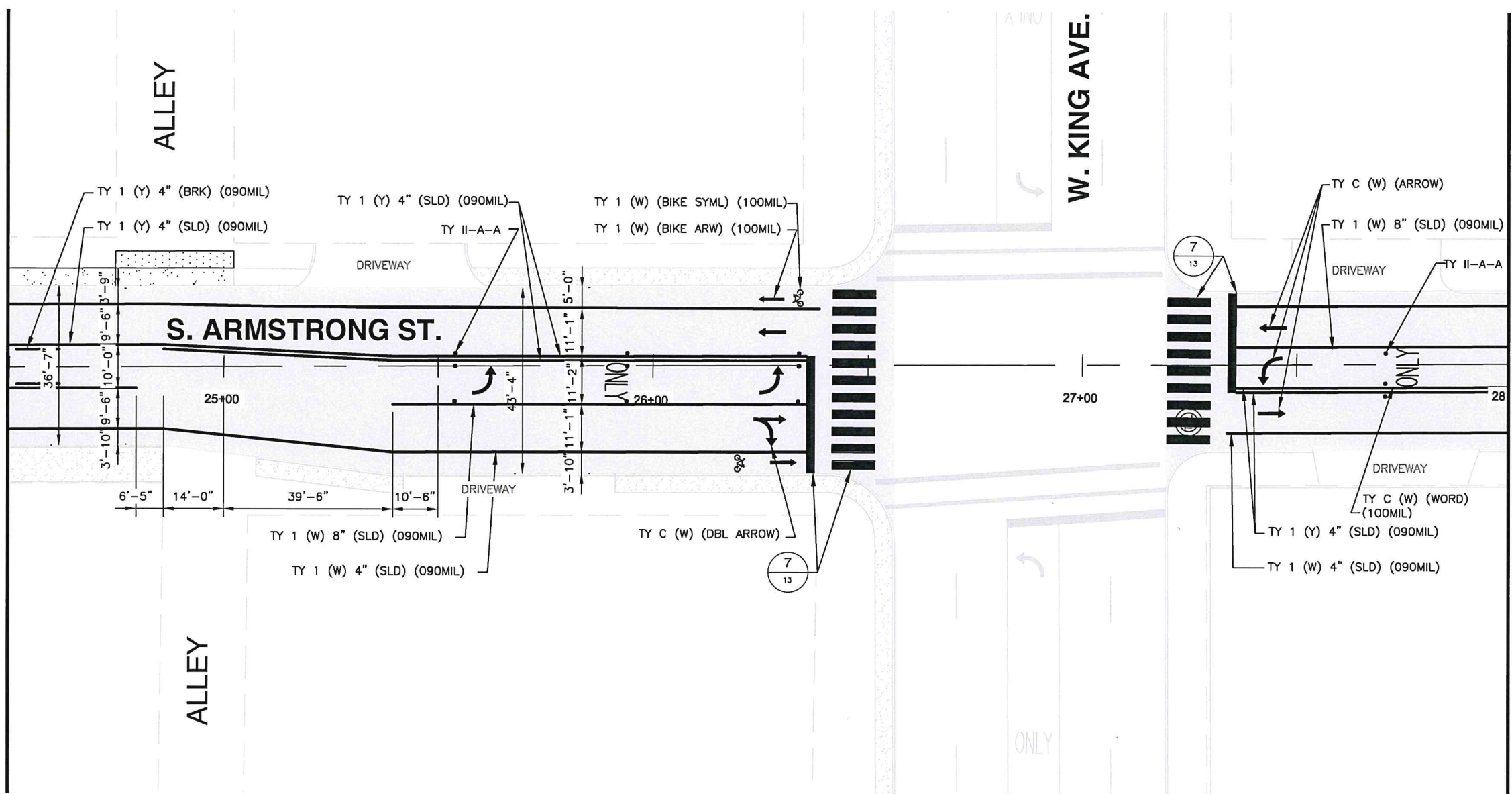
Scale: N.T.S.

CITY OF KINGSVILLE
ENGINEERING DEPARTMENT



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Office 361.595.8007
Fax 361.595.8035

MATCHLINE STA. 24 + 50



ALLEY

S. ARMSTRONG ST.

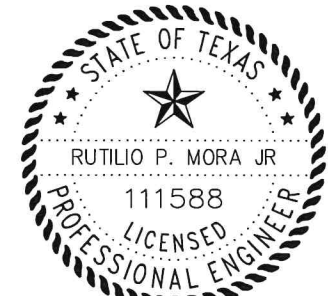
W. KING AVE.

MATCHLINE STA. 28 + 00



A
27

PAVEMENT MARKINGS
STA. 24+50 TO STA. 28+00
SCALE: 1:30



Rutilio P. Mora Jr. 12/18/2020
RUTILIO P. MORA JR, P.E. NO. 111588

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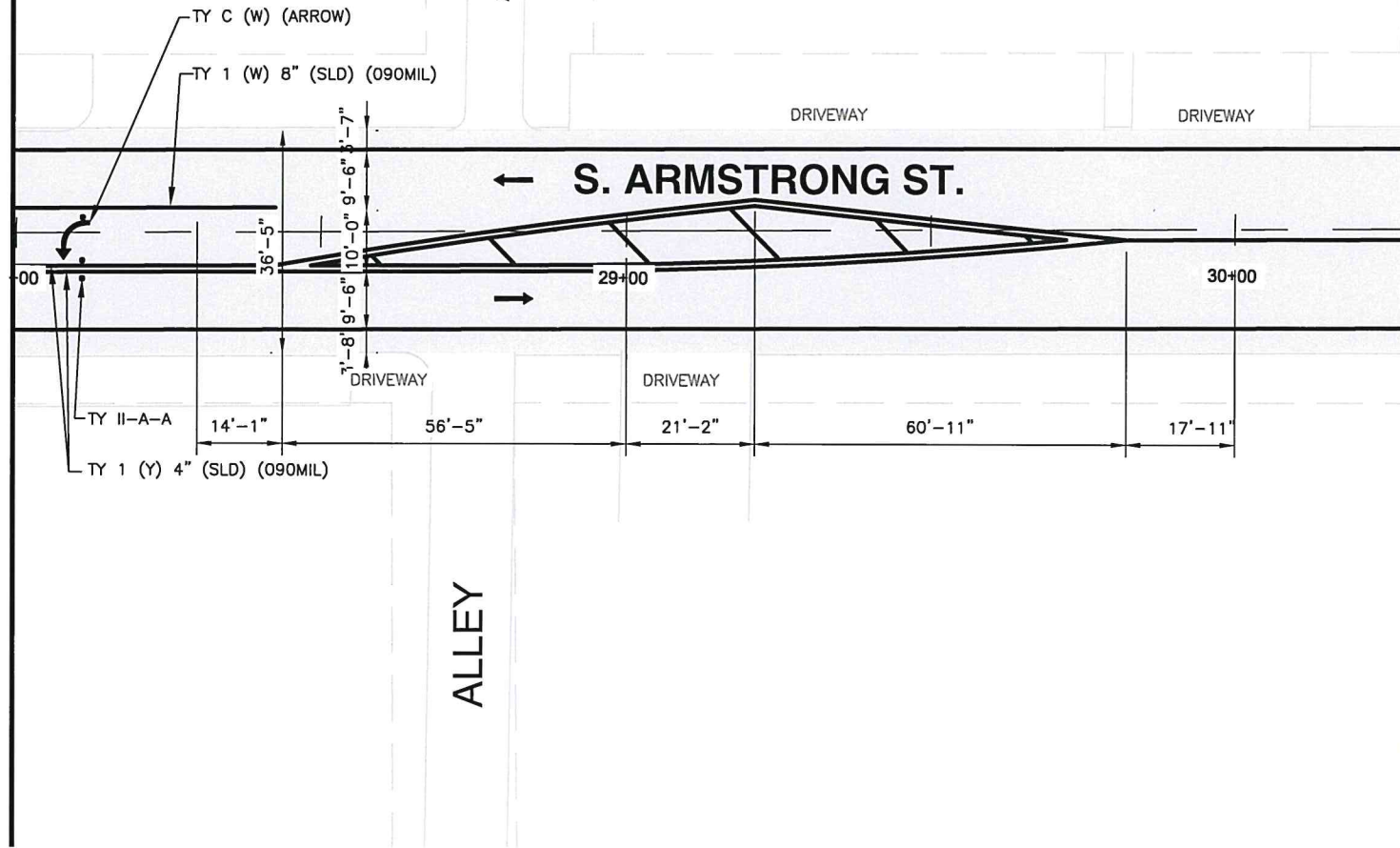
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Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:
Scale: N.T.S.

2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT MARKINGS
STA. 24+50 TO STA. 28+00

MATCHLINE STA. 28 + 00



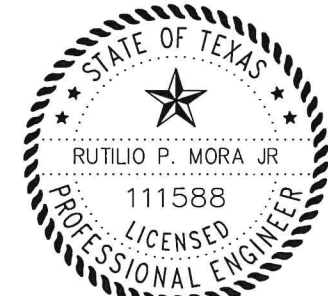
W. KENEDY AVE.

MATCHLINE END



A
28

PAVEMENT MARKINGS
STA. 28+00 TO END
SCALE: 1:30



Rutilio P. Mora Jr. 12/16/2020
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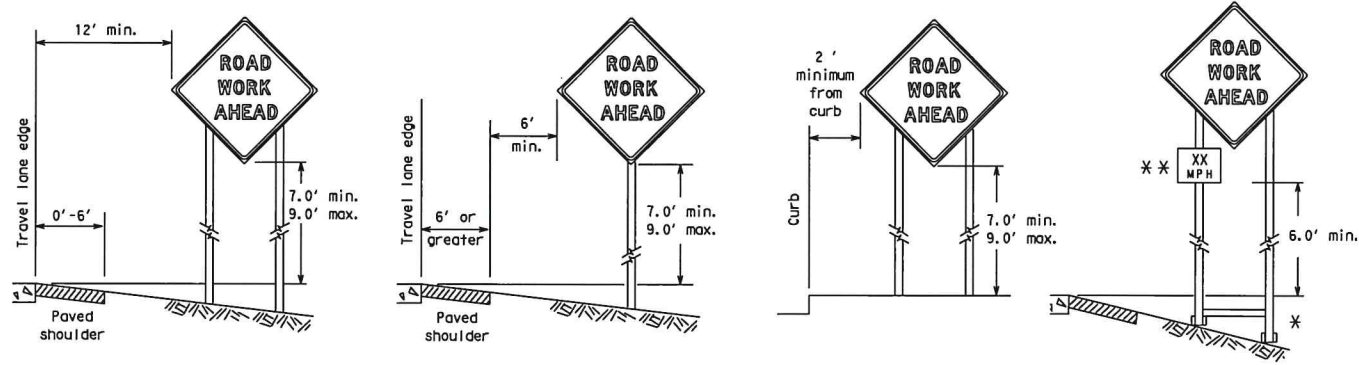
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2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
PAVEMENT MARKINGS
STA. 28+00 TO END

SHEET
28

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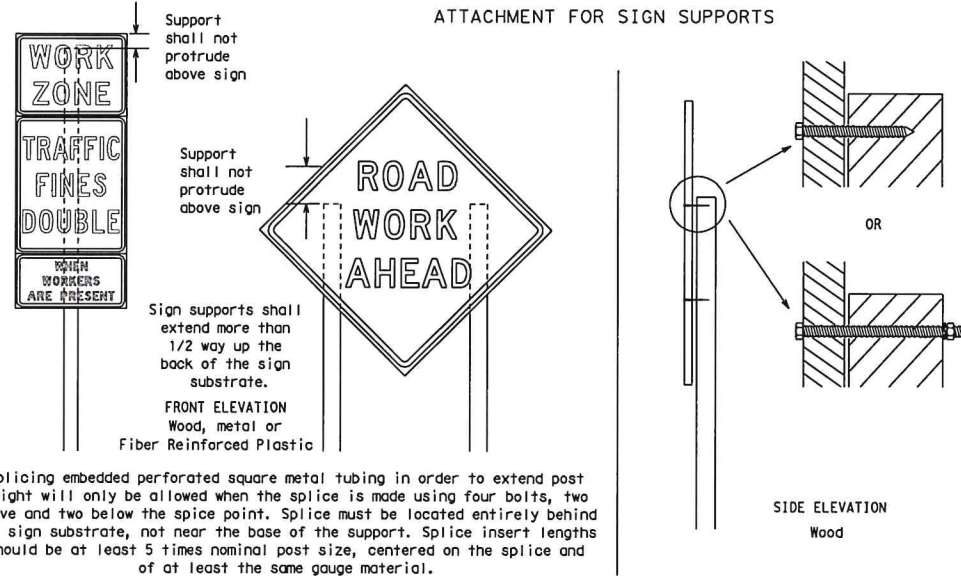
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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.

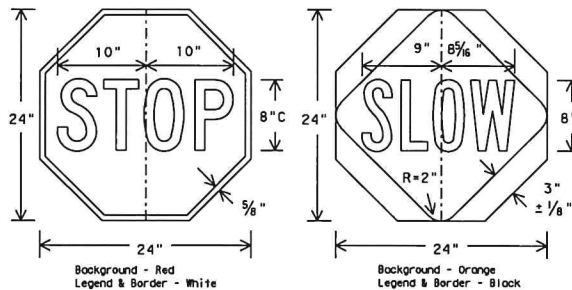
ATTACHMENT FOR SIGN SUPPORTS



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.

STOP/SLOW PADDLES

1. 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.
2. When used at night, the STOP/SLOW paddle shall be retroreflectORIZED.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. 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.
2. 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.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. 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.
5. 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.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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)

1. 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.
 - a. Long-term stationary - work that occupies a location more than 3 days.
 - b. 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.
 - c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - d. Short, duration - work that occupies a location up to 1 hour.
 - e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. 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.
2. 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.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. 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.
5. 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

1. 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

1. 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.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. 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

1. 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).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. 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

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. 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.
3. 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.
4. 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.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. 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.
7. 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.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

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

SHEET 4 OF 12

Texas Department of Transportation		Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES			
BC (4) - 14			
FILE: bc-14.dgn	DW: TxDOT	CK: TxDOT	CR: TxDOT
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REVISONS		HIGHWAY	
9-07	8-14	DIST	COUNTY
7-13			SHEET NO.
98			



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Date: 08/19/2020

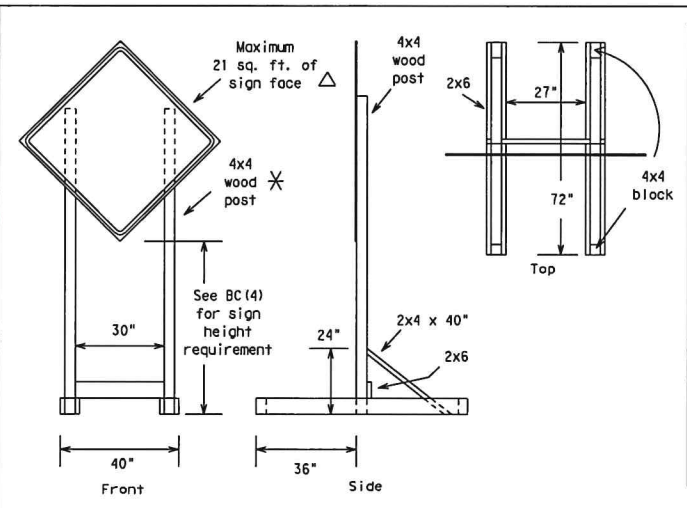
Checked by: R. MORA

Job:

2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.

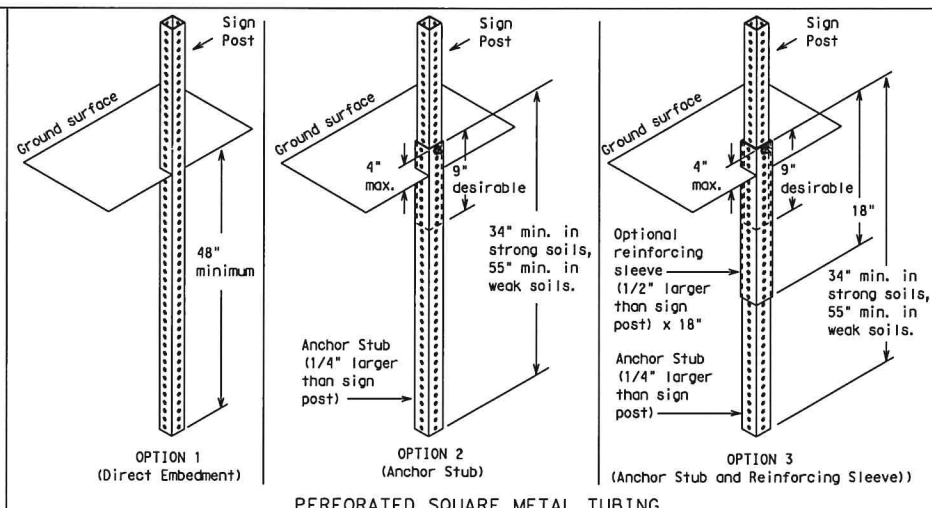
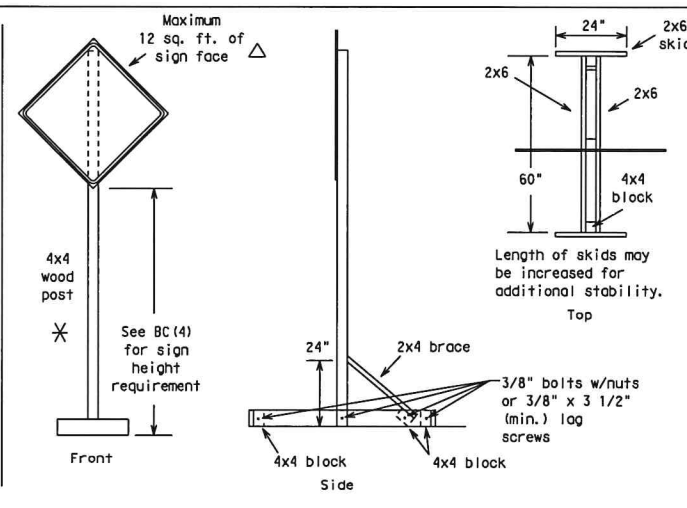
BC - TEMPORARY SIGN NOTES

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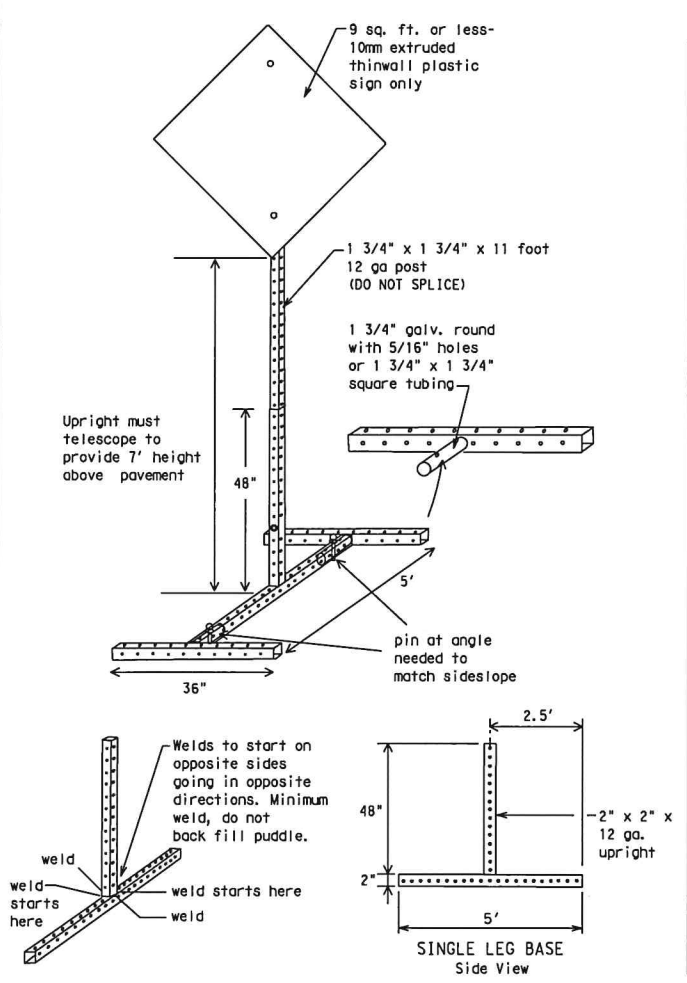
SKID MOUNTED WOOD SIGN SUPPORTS

LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

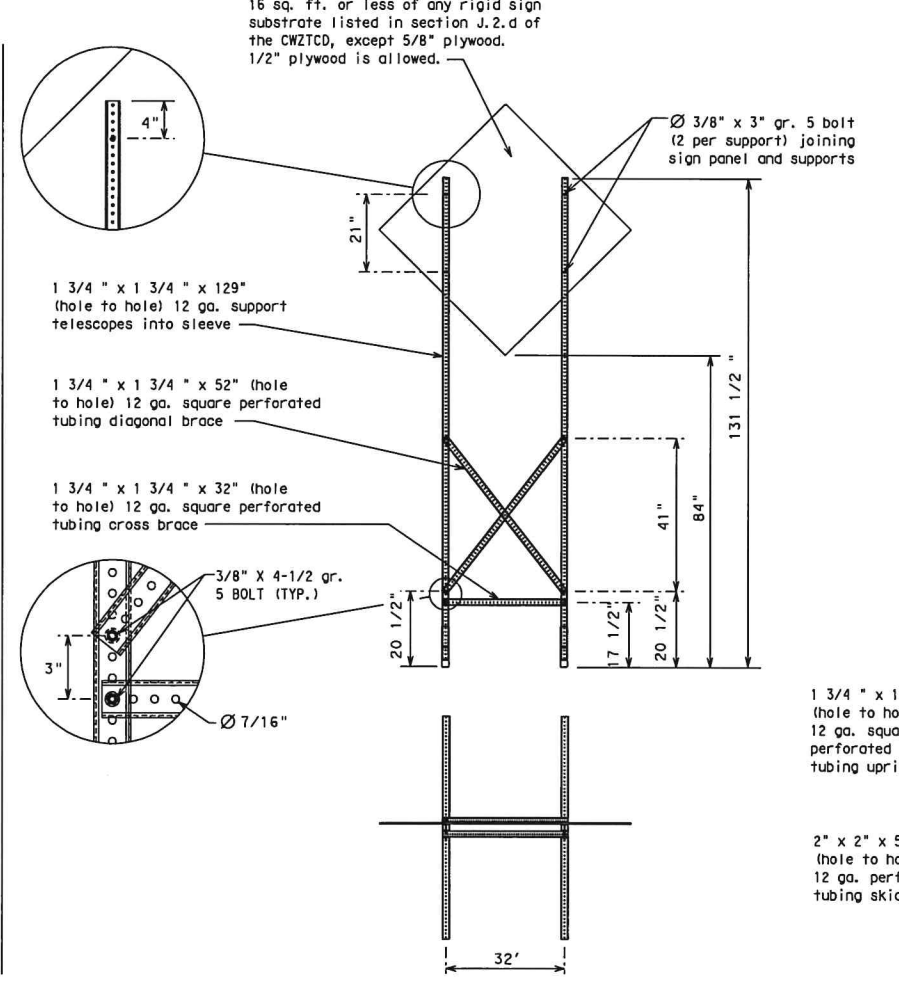


GROUND MOUNTED SIGN SUPPORTS

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 Holes 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

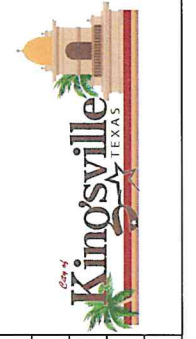
Texas Department of Transportation Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 14

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Job:

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BC - TYPICAL SIGN SUPPORT

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DATE: FILE:

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:

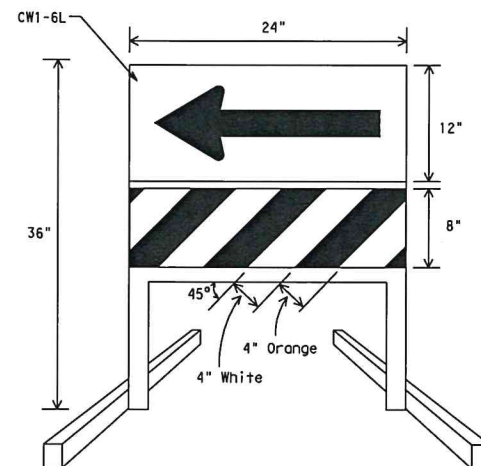
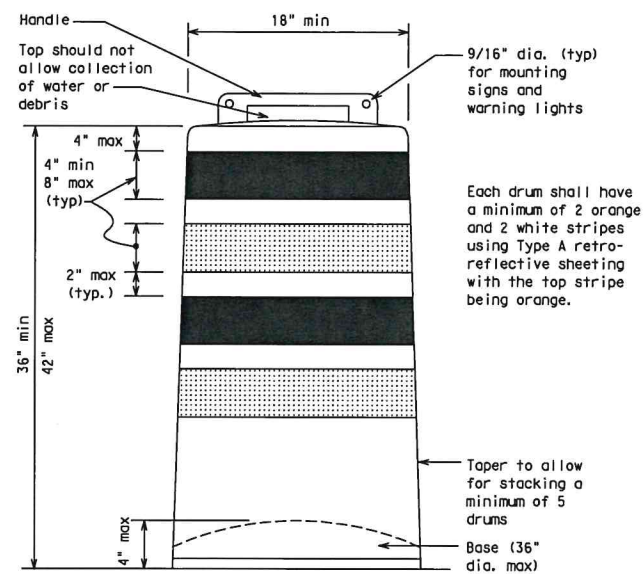
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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

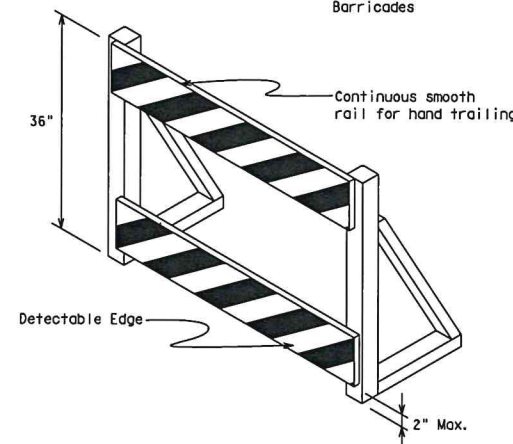
- Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other 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.



DIRECTION INDICATOR BARRICADE

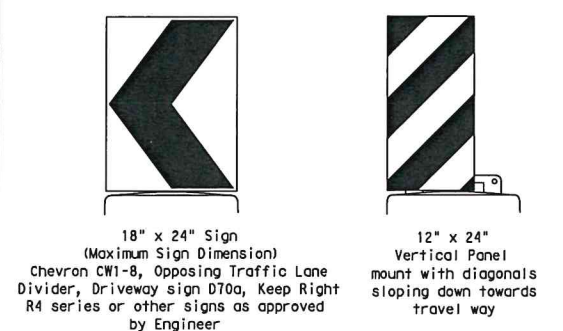
- The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
- If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
- The 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_{FL} or Type C_{FL} 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.

This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades



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.
- 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.
- 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.
- 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.



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

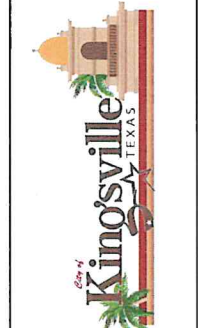
SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- 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_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
- Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A 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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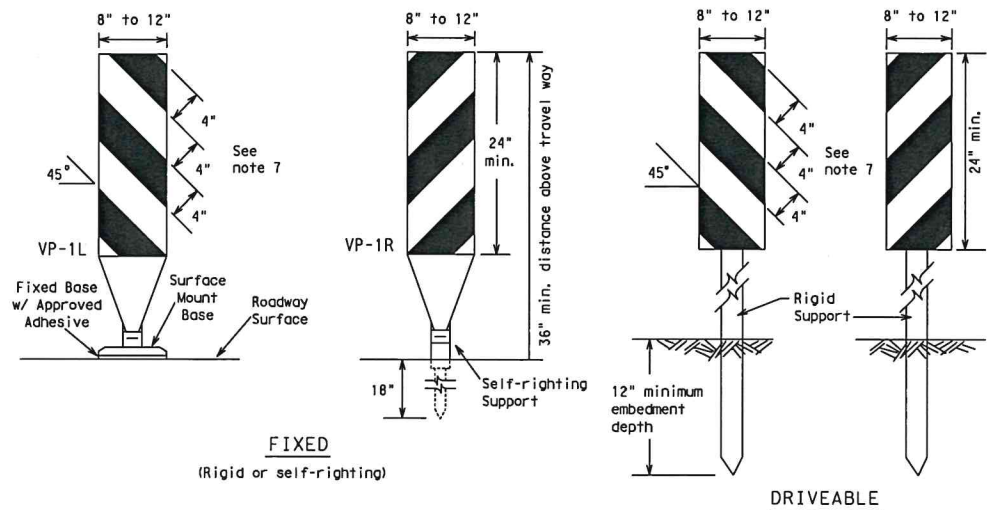


Drawn by: V. MARQUEZ
 Date: 08/19/2020
 Checked by: R. MORA
 Job:

**2021 N. ARMSTRONG STREET IMPROVEMENTS
 FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
 BC - CHANNELIZING DEVICES I**

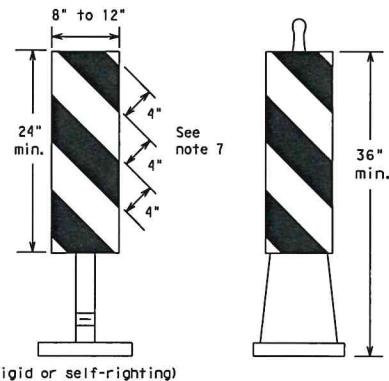
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DATE: FILE:



FIXED
(Rigid or self-righting)

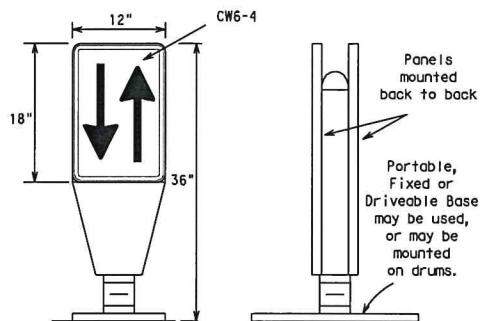
DRIVEABLE



PORTABLE

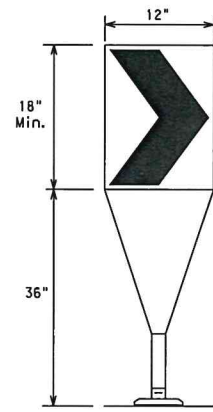
VERTICAL PANELS (VPs)

- 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)

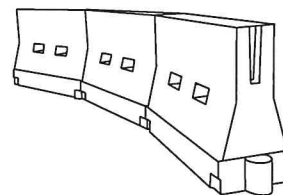
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base 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 VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs 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_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.



Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

- 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_{FL} or Type C_{FL} 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.

CHEVRONS



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

GENERAL NOTES

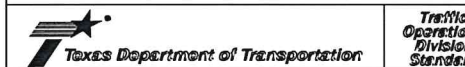
- Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control 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.

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 = WS ² / 60	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40	L = WS	265'	295'	320'	40'	80'
45		450'	495'	540'	45'	90'
50	L = WS	500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60	L = WS	600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70	L = WS	700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80	L = WS	800'	880'	960'	80'	160'
85		850'	945'	1020'	85'	170'

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13				
103				



Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:

2021 N. ARMSTRONG STREET IMPROVEMENTS FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.

BC - CHANNELING DEVICES II

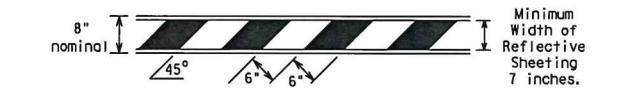
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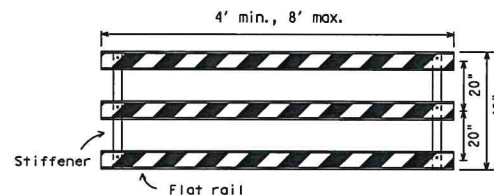
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

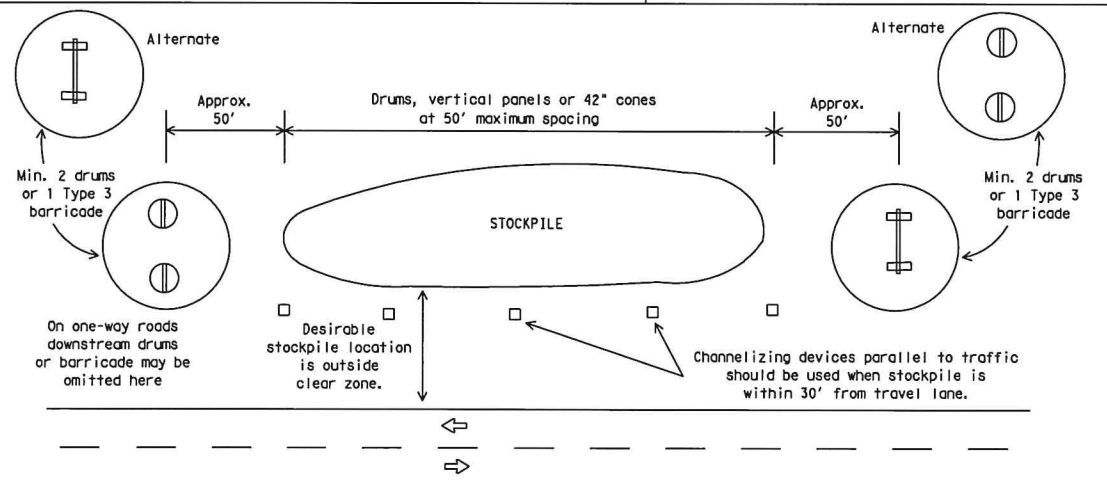


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



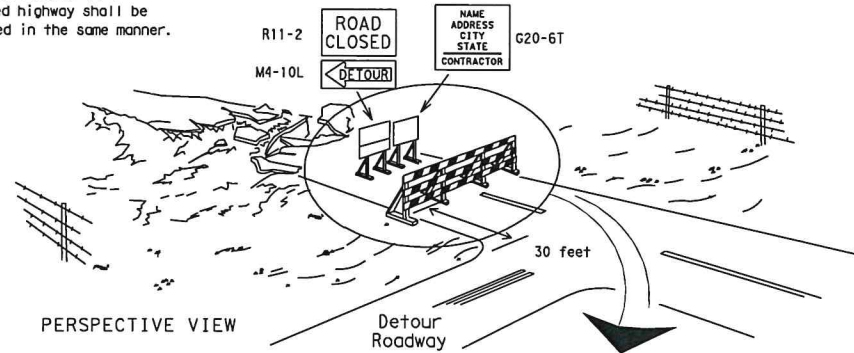
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



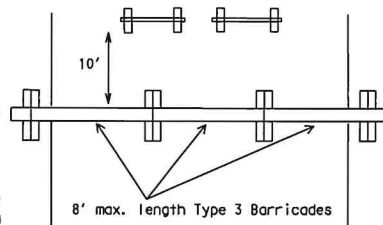
TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



PERSPECTIVE VIEW

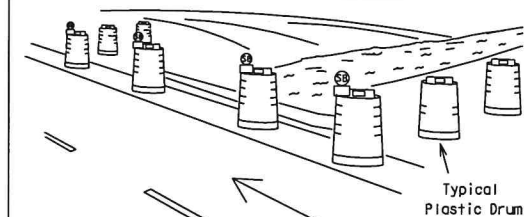
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



PLAN VIEW

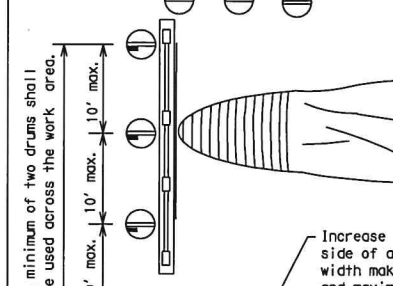
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

These drums are not required on one-way roadway



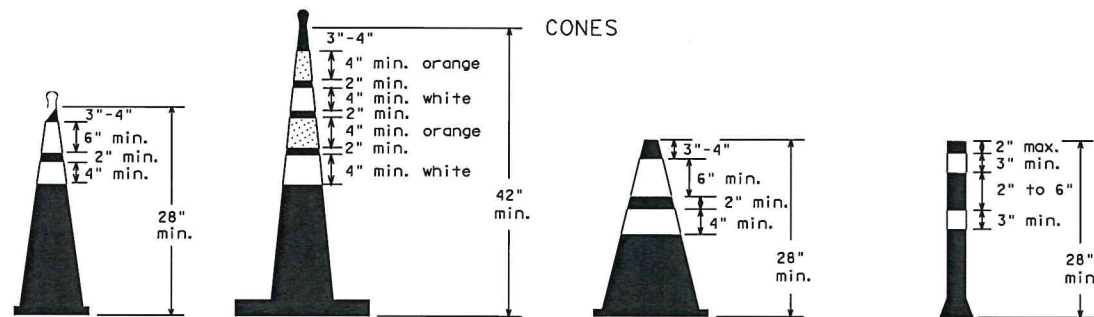
PLAN VIEW

A minimum of two drums shall be used across the work area. Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

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



Two-Piece cones

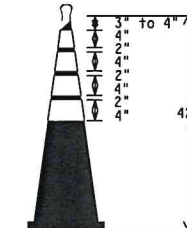
One-Piece cones

Tubular Marker

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

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

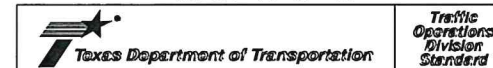
THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGE LINE CHANNELIZER

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

SHEET 10 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 14

FILE: bc-14.dgn	DW: TxDOT	CHK: TxDOT	DR: TxDOT	CR: TxDOT
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7-13				

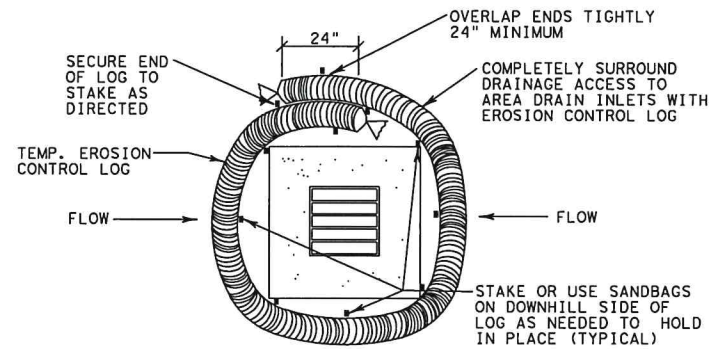
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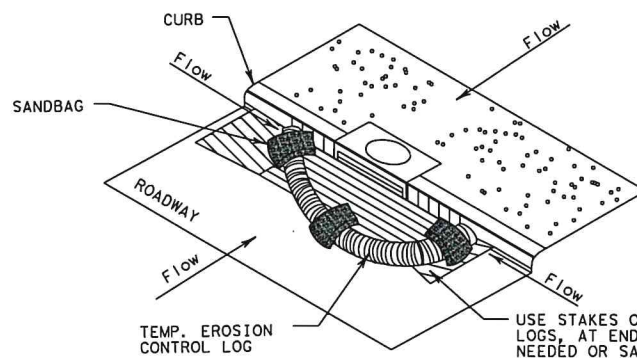
2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
BC - CHANNELIZING DEVICES III

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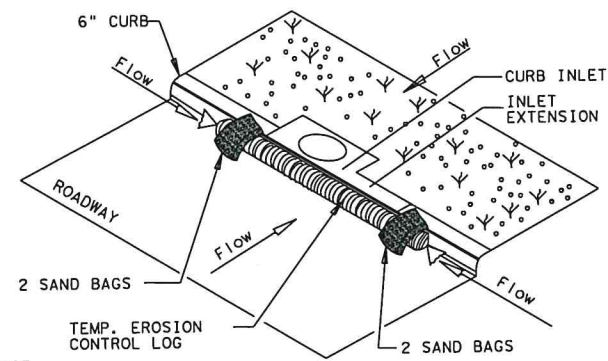
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

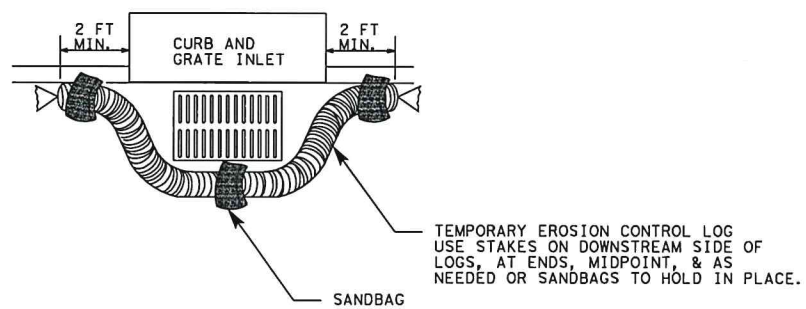
CL-CI



EROSION CONTROL LOG AT CURB INLET

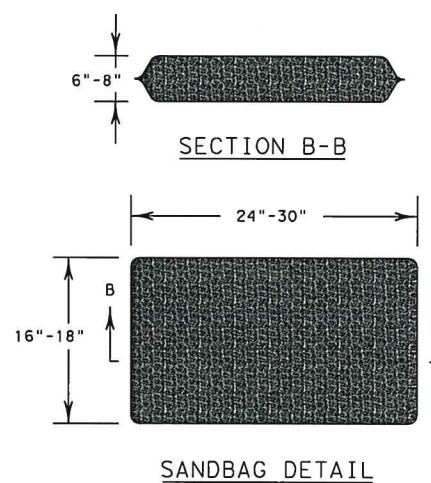
CL-CI

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

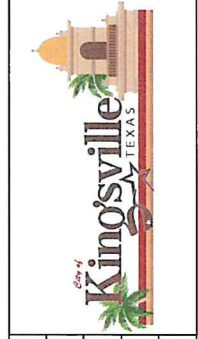
CL-GI



SHEET 3 OF 3

		<i>Design Division Standard</i>	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DR: LS/PT
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CITY OF KINGSVILLE
ENGINEERING DEPARTMENT
400 West King
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Fax 361.595.8035

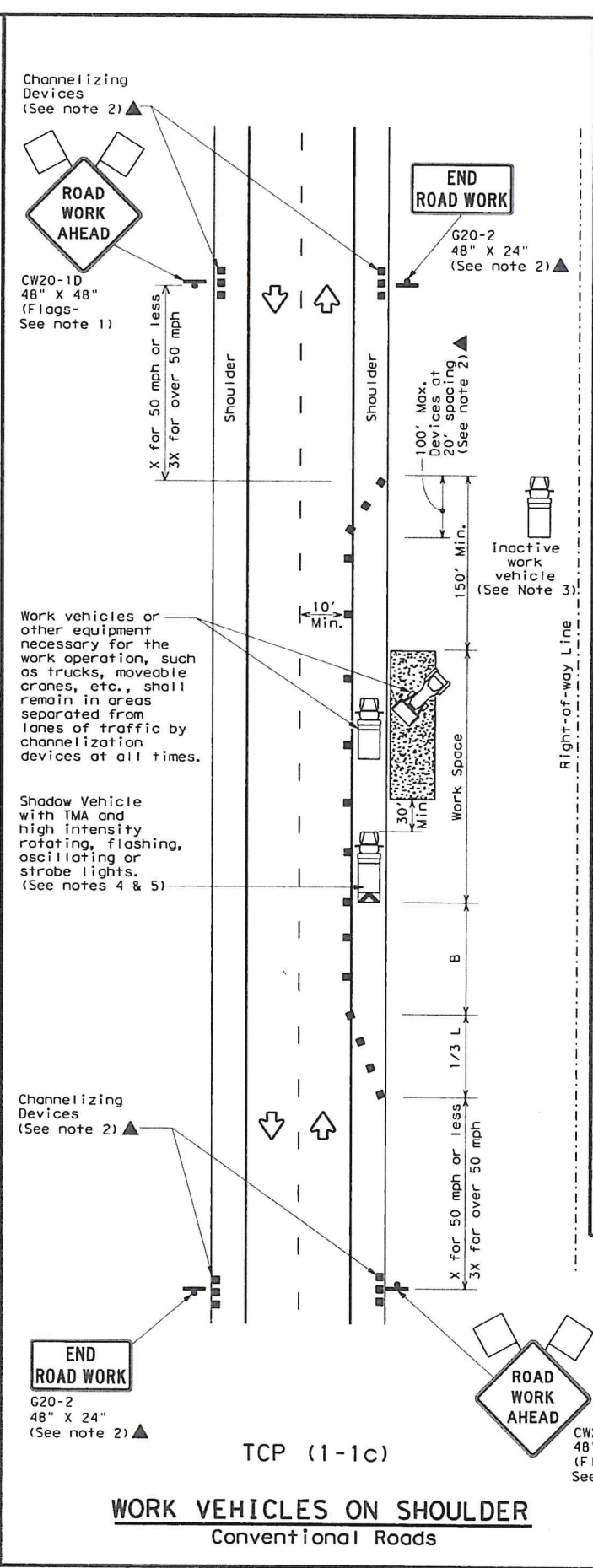
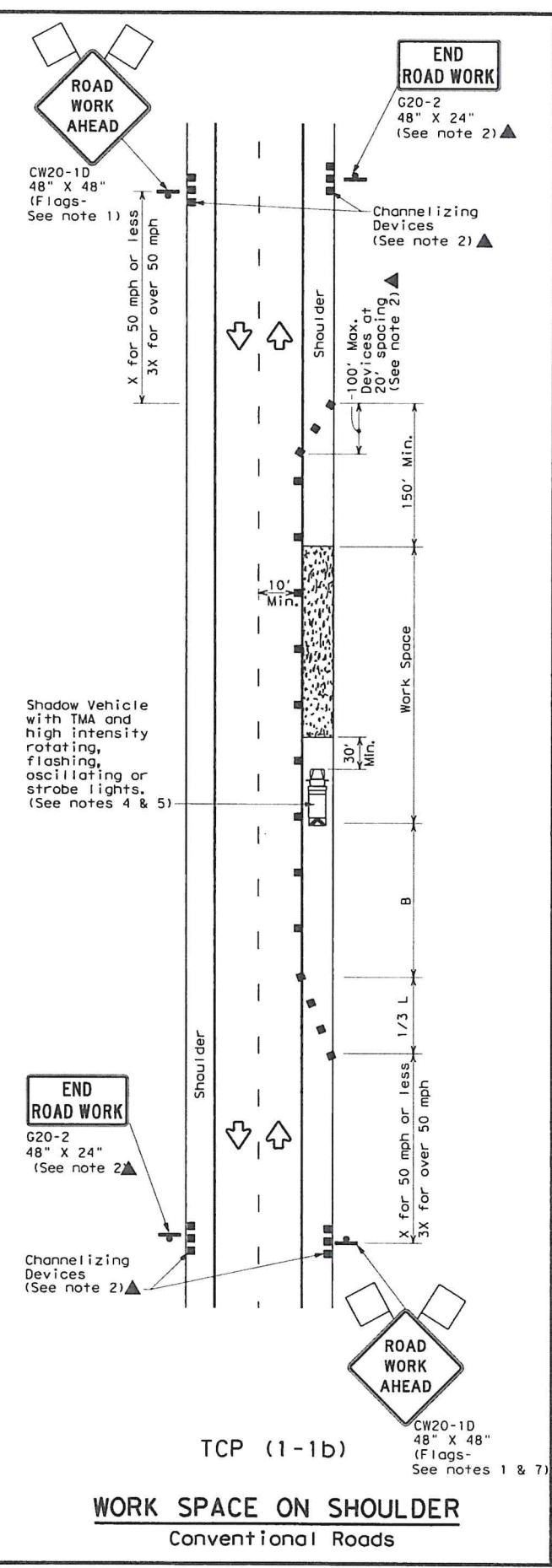
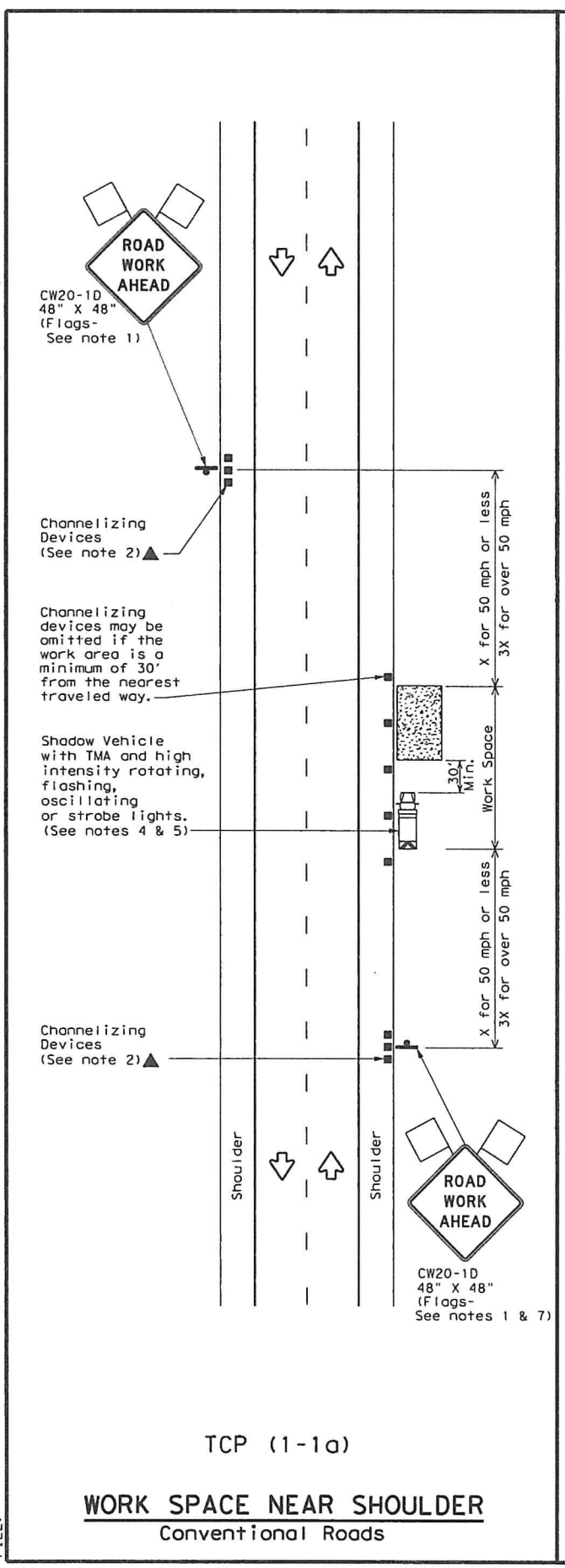


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Checked by: R. MORA
Job:

2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
EC - TEMPORARY EROSION, SEDIMENT AND WATER
POLLUTION CONTROL MEASURES III

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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"
		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

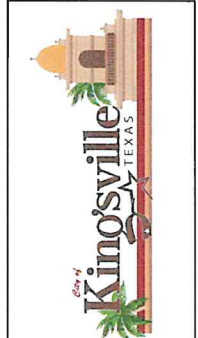
- Flags attached to signs where shown are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
- Inactive work vehicles or other 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(15-1) 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.

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP (1-1) - 18

FILE: tcp1-1-18.dgn	DN:	CK:	DN:	CK:
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REVISIONS				
2-94 4-98				
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1-97 2-18				

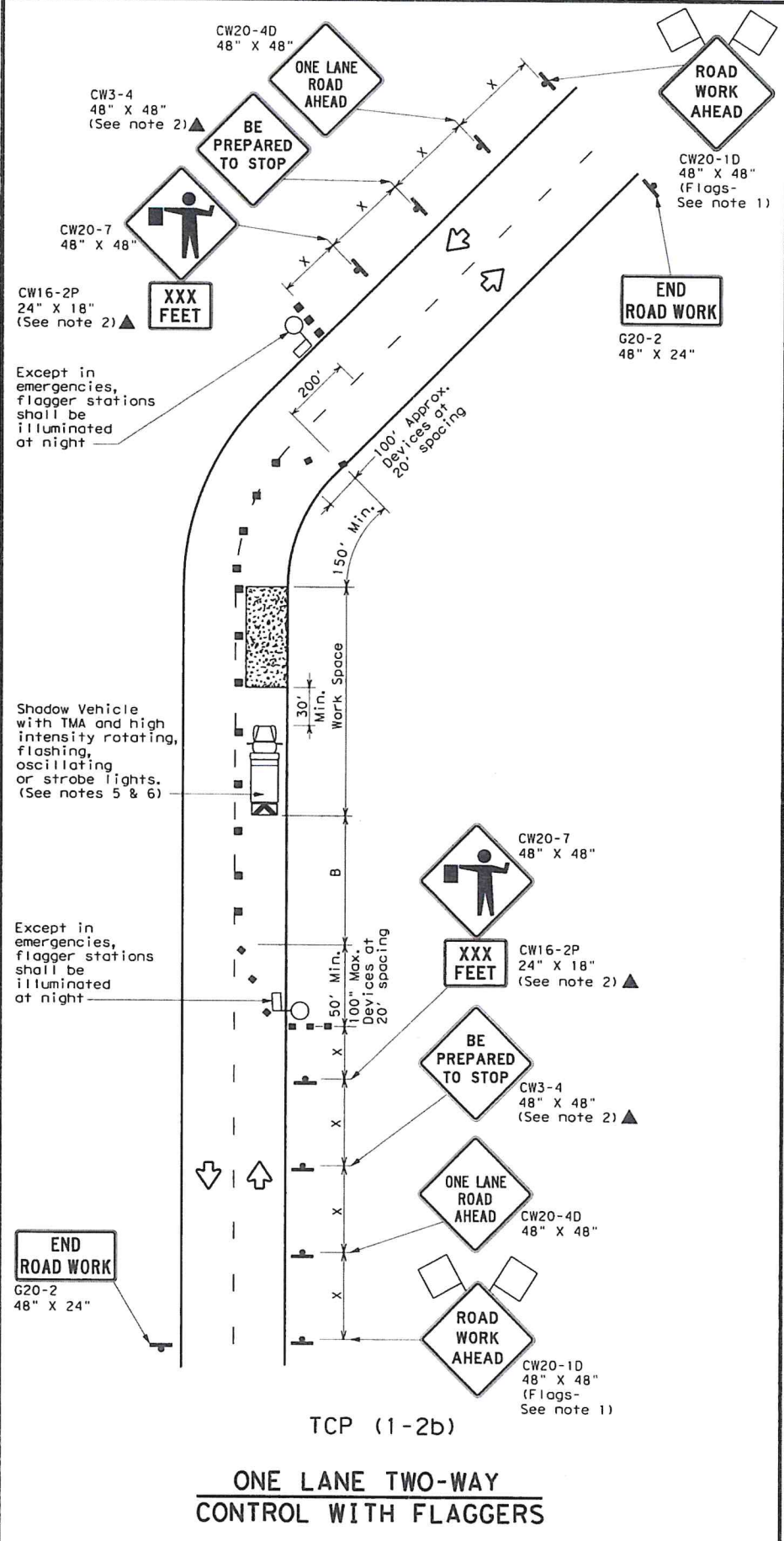
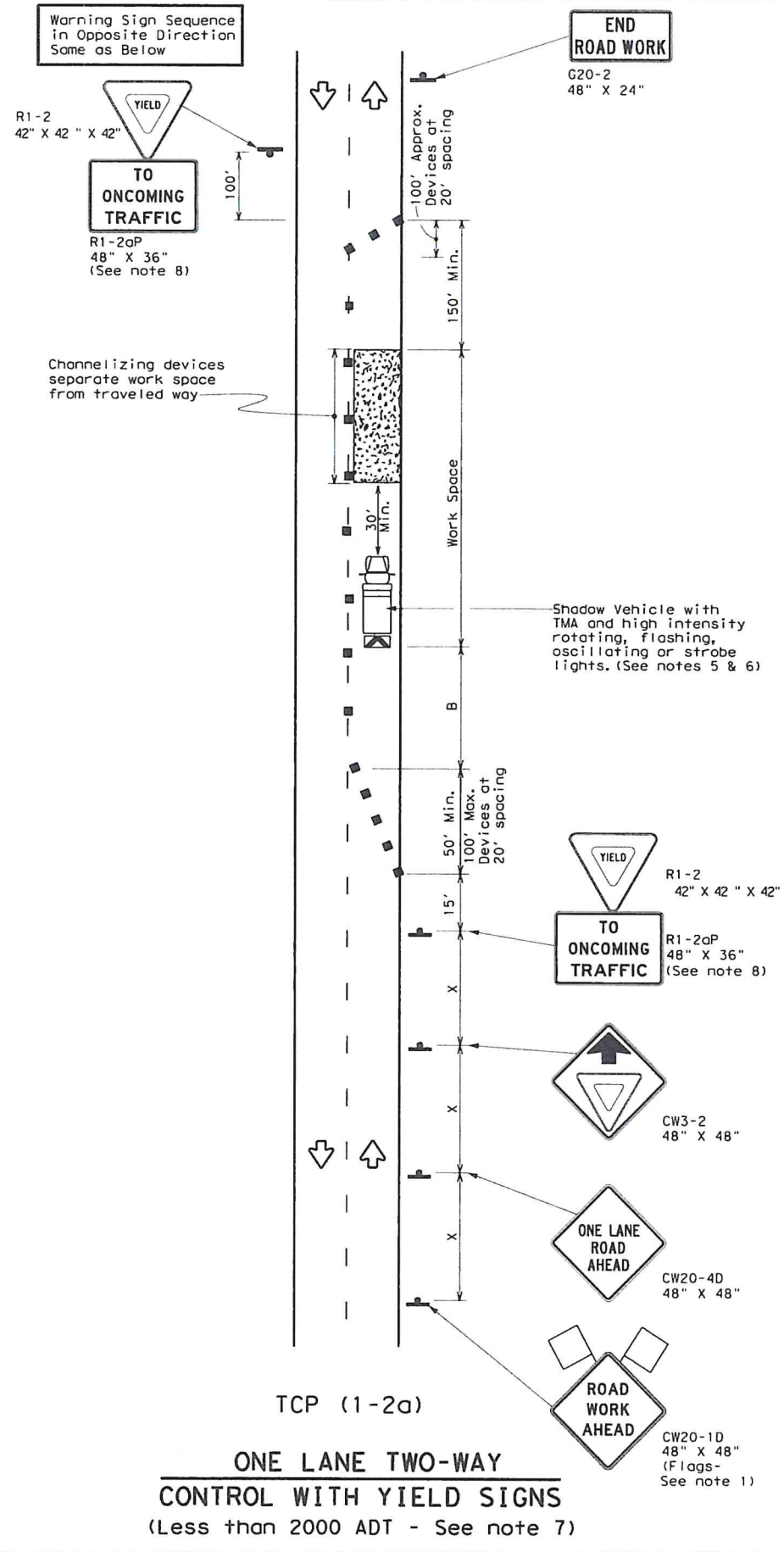


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Date: 08/19/2020
Checked by: R. MORA
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FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
TCP - CONVENTIONAL ROAD SHOULDER WORK

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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 * X			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 = WS / 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.
- 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.

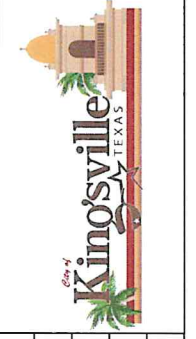
TCP (1-2b)

- 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.

Texas Department of Transportation
 Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY TRAFFIC CONTROL
TCP (1-2) - 18

FILE: tcp1-2-18.dgn	DW: []	CK: []	DW: []	CK: []
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 2-12				
1-97 2-18	DIST	COUNTY	SHEET NO.	

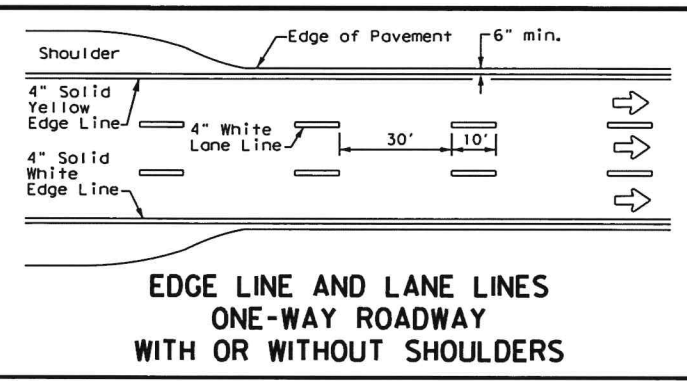


Drawn by: V. MARQUEZ
 Date: 08/19/2020
 Checked by: R. MORA
 Job:

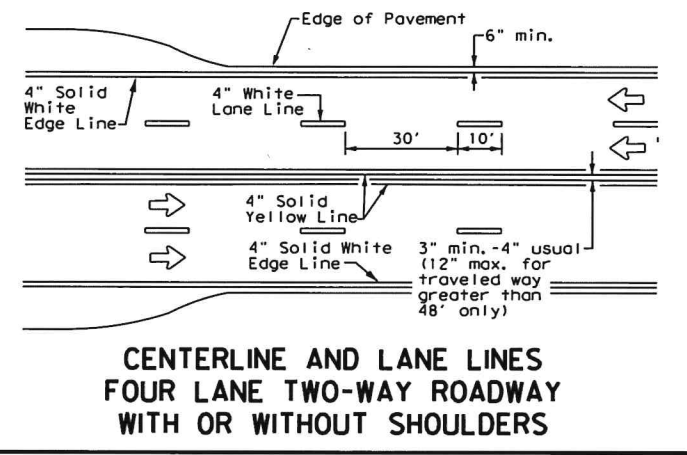
2021 N. ARMSTRONG STREET IMPROVEMENTS
FROM SANTA GERTRUDIS AVE. TO KENEDY AVE.
TCP - ONE-LANE TWO-WAY TRAFFIC CONTROL

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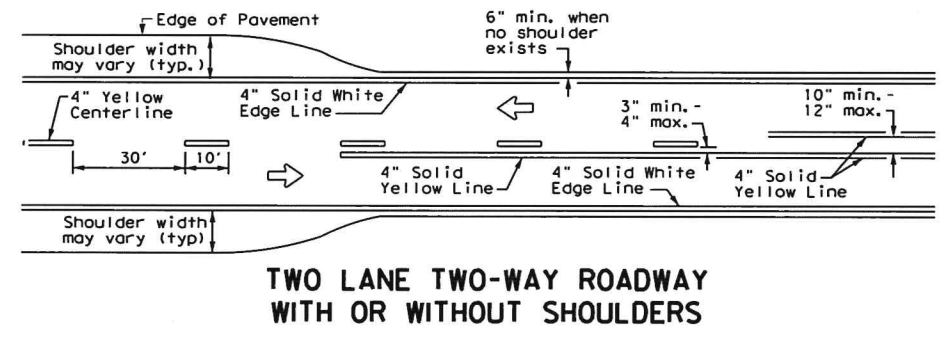
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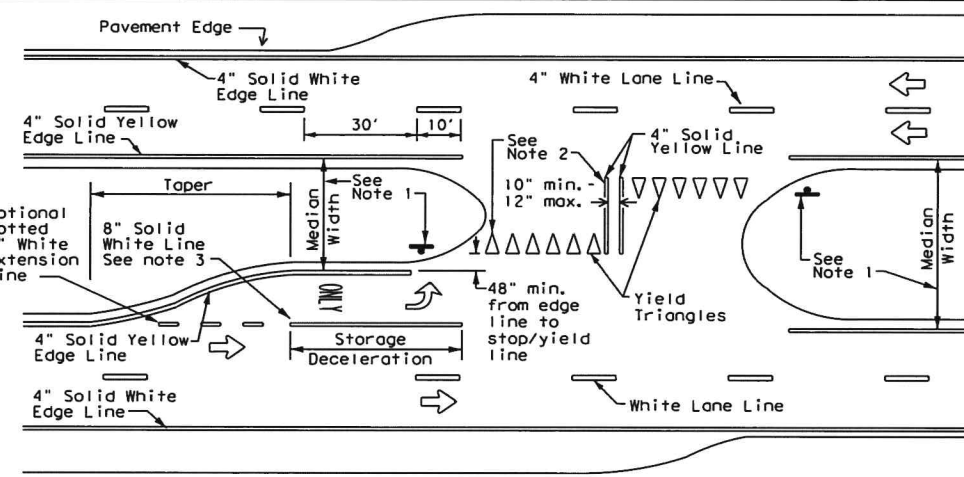
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



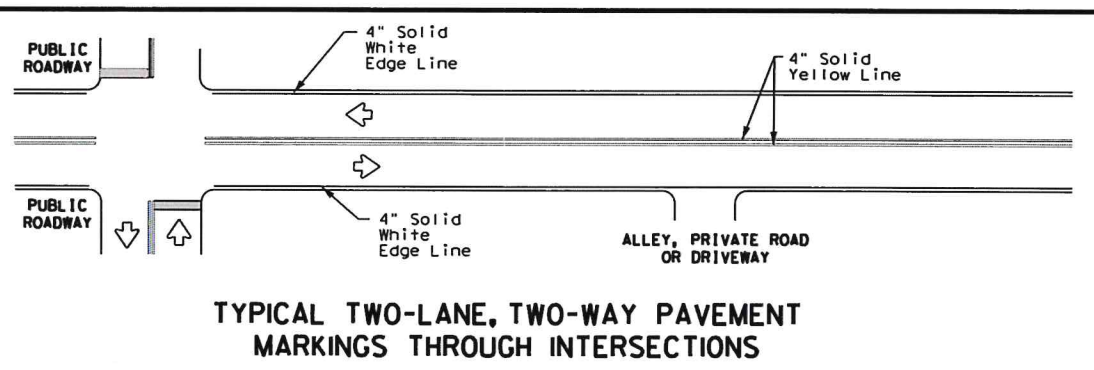
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



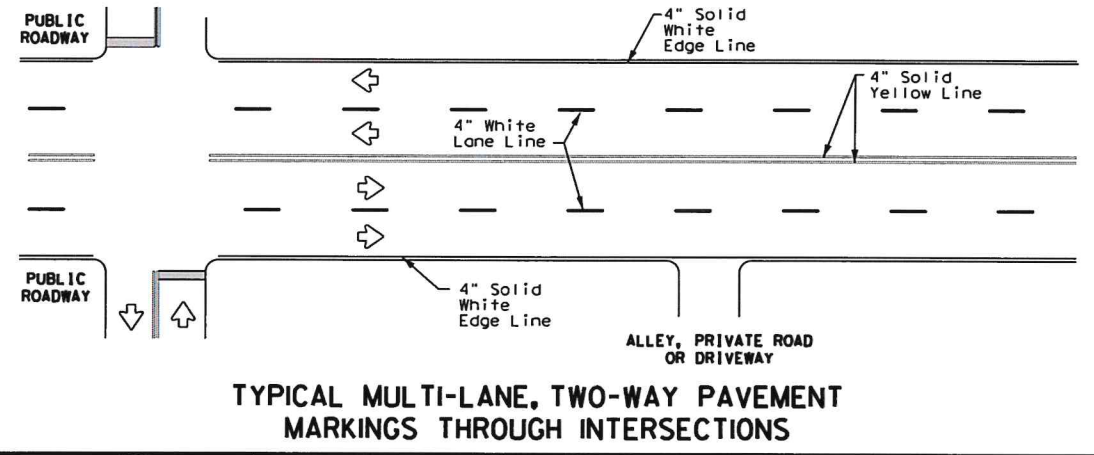
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



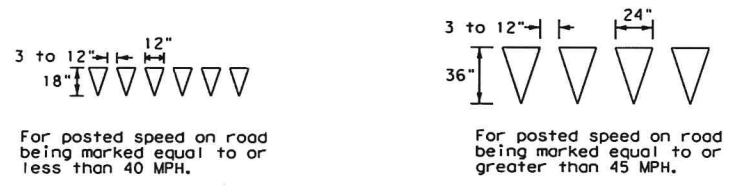
FOUR LANE DIVIDED ROADWAY CROSSOVERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



YIELD LINES

NOTES

- Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.
- Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield triangles shall only be used with yield signs.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

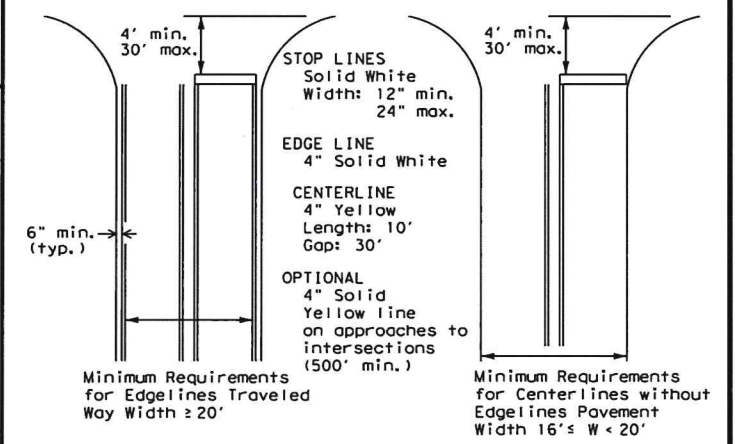
GENERAL NOTES

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less than 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. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the 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.



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

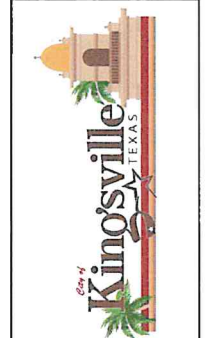


TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

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© TxDOT November 1978	CENT	SECT	JOB	HIGHWAY
8-95 3-03 REVISIONS				
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20				

CITY OF KINGSVILLE
ENGINEERING DEPARTMENT
400 West King
Kingsville, Texas 78363
Office 361.595.8007
Fax 361.595.8035



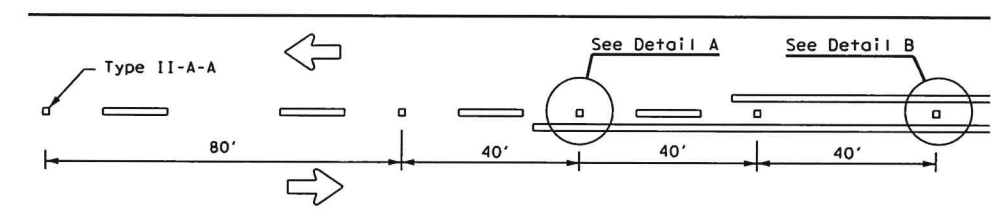
Drawn by: V. MARQUEZ
Date: 08/19/2020
Checked by: R. MORA
Job:

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TYPICAL STANDARD PAVEMENT MARKINGS
PM (1)-20

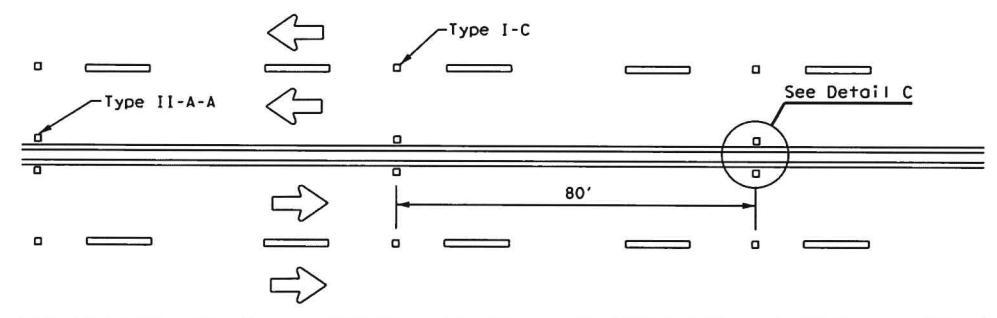
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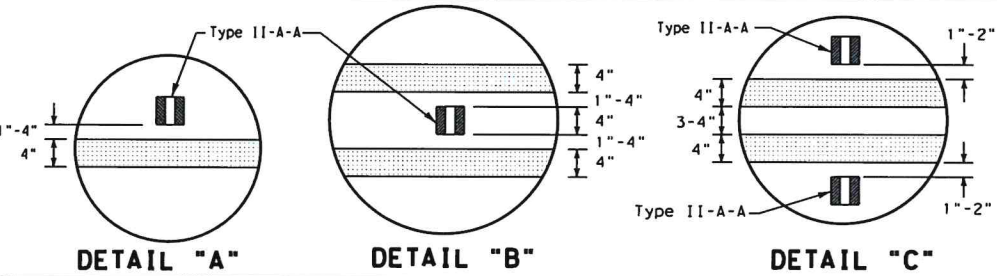
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



CENTERLINE FOR ALL TWO LANE ROADWAYS



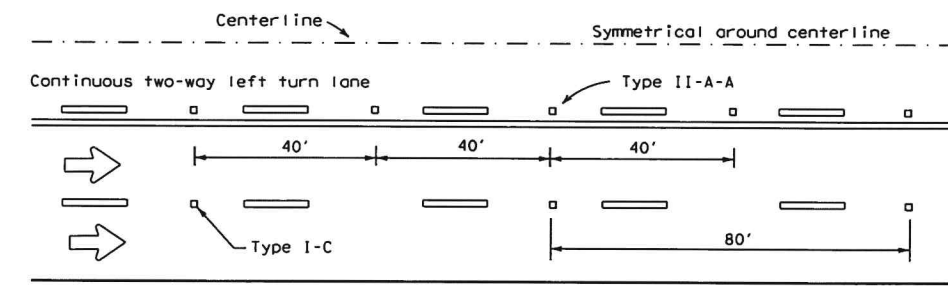
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



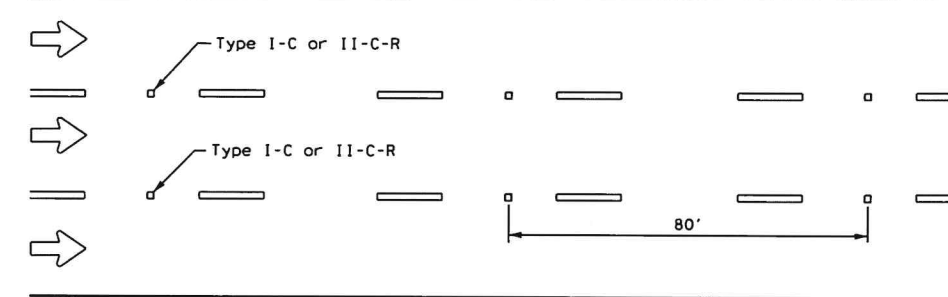
DETAIL "A"

DETAIL "B"

DETAIL "C"

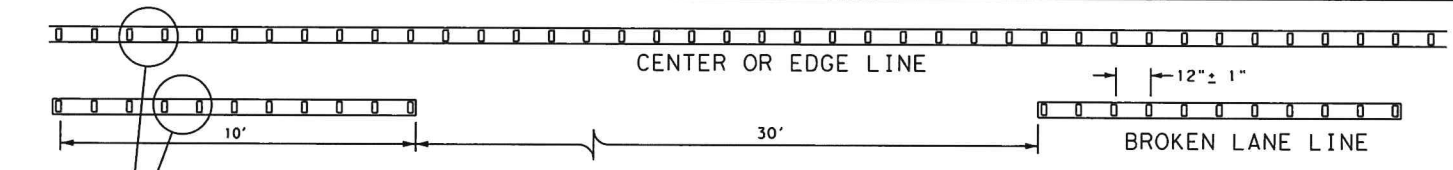


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



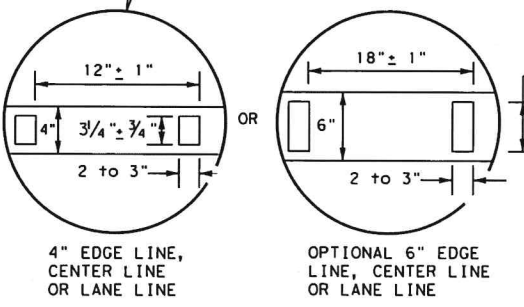
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

NOTE

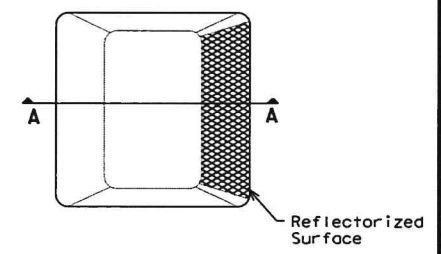
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

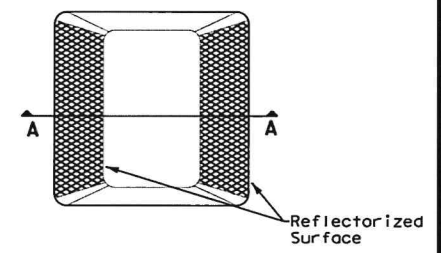
- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

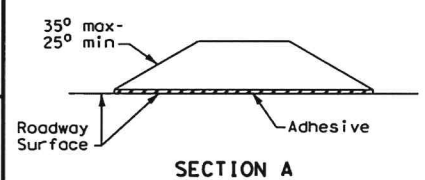
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

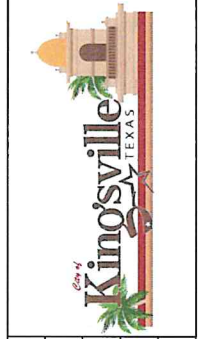
RAISED PAVEMENT MARKERS



POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2) -20

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4-92 2-10 REVISIONS				
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20				

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