Fort Bend County, Texas
Invitation for Bid

Construction of Stella Road from Cottonwood School Road to W. Fairgrounds Road
for Fort Bend County Mobility Bond Project No. 20116
BID 24-076

SUBMIT BIDS TO:

Fort Bend County
Purchasing Department
Travis Annex
301 Jackson, Suite 201
Richmond, TX 77469

Note: All correspondence must include the term "Purchasing Department" in address to assist in proper delivery

SUBMIT NO LATER THAN:

Tuesday, August 20, 2024
2:00 PM (Central)

LABEL ENVELOPE:

BID 24-076
Construction of Stella Road

ALL BIDS MUST BE RECEIVED IN AND TIME/DATE STAMPED BY THE PURCHASING OFFICE OF FORT BEND COUNTY ON OR BEFORE THE SPECIFIED TIME/DATE STATED ABOVE.

BIDS RECEIVED AS REQUIRED WILL THEN BE OPENED AND PUBLICLY READ.

BIDS RECEIVED AFTER THE SPECIFIED TIME, WILL BE RETURNED UNOPENED.

Results will not be given by phone.
Results will be provided to bidder in writing after Commissioners Court award.

Requests for information must be in writing and directed to:
LeAnn Cernoch
Senior Buyer
LeAnn.Cernoch@fortbendcountytx.gov

Vendor Responsibilities:

- Download and complete any addendums. (Addendums will be posted on the Fort Bend County website no Later than 48 hours prior to bid opening)
- Submit response in accordance with requirements stated on the cover of this document.
- DO NOT submit responses via email or fax.

Prepared: 7/25/24
Issued: 7/28/24

COUNTY PURCHASING AGENT
Fort Bend County, Texas

Vendor Information

Jaime Kovar
Purchasing Agent
Office (281) 341-8640

Legal Company Name (top line of W9)			
Business Name (if different from legal name)			
Type of Business	☐ Corporation/LLC ☐ Partnership ☐ Sole Proprietor/Individual ☐ Tax Exempt		Age in Business?
Federal ID # or S.S. #		SAM.gov Unique Entity ID #	
SAM.gov CAGE / NCAGE			
Publicly Traded Business	___ No ___ Yes Ticker Symbol _____		
Remittance Address			
City/State/Zip			
Physical Address			
City/State/Zip			
Phone Number			
E-mail			
Contact Person			
Check all that apply to the company listed above and provide certification number.	DBE-Disadvantaged Business Enterprise ☐ SBE-Small Business Enterprise ☐ HUB-Texas Historically Underutilized Business ☐ WBE-Women's Business Enterprise ☐	**Certification #** _____ **Certification #** _____ **Certification #** _____ **Certification #** _____	Cert Date / Exp Date _____ _____ _____ _____ _____ _____ _____ _____
Company's gross annual receipts	<$500,000 _____	$500,000-$4,999,999 _____	
	$5,000,000-$16,999,999 ___	$17,000,000-$22,399,999 _____	>$22,400,000 _____
NAICs codes (Please enter all that apply)			
Signature of Authorized Representative			
Printed Name			
Title			
Date			

THIS FORM MUST BE SUBMITTED WITH THE SOLICITATION RESPONSE

1.0 GENERAL REQUIREMENTS:

1.1 Read this entire document carefully. Follow all instructions. You are responsible for fulfilling all requirements and specifications. Be sure you understand them.

1.2 General Requirements apply to all advertised bids; however, these may be superseded, whole or in part, by the scope, special requirements, specifications, special specifications or other data contained herein.

1.3 Governing Law: Bidder is advised that these requirements shall be fully governed by the laws of the State of Texas and that Fort Bend County may request and rely on advice, decisions and opinions of the Attorney General of Texas and the County Attorney concerning any portion of these requirements.

1.4 Bid Form Completion: Fill out, sign, and return to the Fort Bend County Purchasing Department one (1) complete bid form. An authorized representative of the bidder must sign the Contract Sheet. The Contract will be binding only when signed by the County Judge, Fort Bend County and a purchase order authorizing the item(s) desired has been issued. The use of corrective fluid is not acceptable and may result in the disqualification of bid. If an error is made, the bidder must draw a line through error and initial each change.

1.5 Bid Returns: Bidders must return all completed bids to the Fort Bend County Purchasing Department at 301 Jackson, Suite 201 Richmond Texas no later than 2:00 P.M. on the date specified. Late bids will not be accepted. Bids must be submitted in a sealed envelope, addressed as follows: Fort Bend County Purchasing Agent, Travis Annex, 301 Jackson, Suite 201 Richmond, Texas 77469.

1.6 Addenda: No interpretation of the meaning of the drawings, specifications or other bid documents will be made to any bidder orally. All requests for such interpretations must be made in writing addressed to LeAnn Cernoch, Senior Buyer, 301, Jackson, Suite 201, Richmond, Texas, 77469, E-mail: LeAnn.Cernoch@fortbendcountytx.gov. Any and all interpretations and any supplemental instructions will be in the form of written addenda to the contract documents which will be posted on Fort Bend County's website. Addenda will **ONLY** be issued by the Fort Bend County Purchasing Agent. It is the sole responsibility of each bidder to insure receipt of any and all addenda. All addenda issued will become part of the contract documents. Bidders must sign and include it in the returned bid package. Deadline for submission of questions and/or clarification is no later than **Tuesday, August 13, 2024 at 9:30AM (central)** Requests received after the deadline will not be responded to due to the time constraints of this bid process.

1.7 References: All bidders must submit, **WITH BID**, at least three (3) references from clients for whom a project similar to that specified herein has been

Initials of Bidder: _____

successfully accomplished. References must include clients name, contact person and telephone number.

1.8 Bid Bond: All bidders must submit, **WITH BID**, a cashier's check or certified check for at least five percent (5%) of the total bid price, payable to the order of Fort Bend County, or a Bid Bond in the same amount issued by a surety, acceptable to Fort Bend County, authorized to do business in the State of Texas, as a guarantee that the Bidder will do the work described herein at the rates stated herein. Unsuccessful bidder's Cashier's Check or Certified Check will be returned only after a written request to do so have been received in the Office of the Fort Bend County Purchasing Agent.

1.9 Material Safety Data Sheets: Under the "Hazardous Communication Act", commonly known as the "Texas Right to Know Act", a bidder must provide to Fort Bend County and using departments, with each delivery, material safety data sheets, which are, applicable to hazardous substances defined in the Act. Bidders are obligated to maintain a current, updated file in the Fort Bend County Purchasing Department. Failure of the bidder to maintain such a file will be cause to reject any bid applying thereto.

1.10 Pricing: Prices for all goods and/or services shall be firm for the duration of this Contract and shall be stated on the bid sheet. Prices shall be all inclusive. No price changes, additions, or subsequent qualifications will be honored during the course of the Contract. All prices must be written in ink or typewritten. If there are any additional charges of any kind, other than those mentioned above, specified or unspecified, bidder MUST indicate the items required and attendant costs or forfeit the right to payment for such items.

1.11 Term Contracts: If the Contract is intended to cover a specific time period, said time will be given in the specifications under scope.

1.12 Recycled Materials: Fort Bend County encourages the use of products made of recycled materials and shall give preference in purchasing to products made of recycled materials if the products meet applicable specifications as to quantity and quality. Fort Bend County will be the sole judge in determining product preference application.

1.13 Evaluation: Evaluation shall be used as a determinant as to which bid items or services are the most efficient and/or most economical for Fort Bend County. It shall be based on all factors which have a bearing on price and performance of the items in the user environment. All bids are subject to tabulation by the Fort Bend County Purchasing Department and recommendation to Fort Bend County Commissioners Court. Compliance with all bid requirements, delivery and needs of the using department are considerations in evaluating bids. Pricing is NOT the only criteria for making a recommendation. The Fort Bend County Purchasing Department reserves the right to contact any bidder, at any time, to clarify, verify or request information with regard to any bid.

Initials of Bidder: _____

1.14 Disqualification of Bidder: Upon signing this bid document, a bidder offering to sell supplies, materials, services, or equipment to Fort Bend County certifies that the bidder has not violated the antitrust laws of this state codified in section 15.01, et seq., Business & Commerce Code, or the federal antitrust laws, and has not communicated directly or indirectly the bid made to any competitor or any other person engaged in such line of business. Any or all bids may be rejected if Fort Bend County believes that collusion exists among the bidders. Bids in which the prices are obviously unbalanced may be rejected. If multiple bids are submitted by a bidder and after the bids are opened, one of the bids is withdrawn, the result will be that all of the bids submitted by that bidder will be withdrawn; however, nothing herein prohibits a vendor from submitting multiple bids for different products or services.

1.15 Awards: Fort Bend County reserves the right to award this Contract on the basis of lowest and best bid in accordance with the laws of the State of Texas, to waive any formality or irregularity, to make awards to more than one bidder, to reject any or all bids. In the event the lowest dollar bidder meeting specifications is not awarded a contract, the bidder may appear before the Commissioners Court and present evidence concerning its responsibility.

1.16 Contract Obligation: Fort Bend County Commissioners Court must award the Contract and the County Judge or other person authorized by the Fort Bend County Commissioners Court must sign the Contract before it becomes binding on Fort Bend County or the bidders. Department heads are not authorized to sign agreements for Fort Bend County. Binding agreements shall remain in effect until all products and/or services covered by this purchase have been satisfactorily delivered and accepted.

2.0 SCOPE:

It is the intent of Fort Bend County to contract with one (1) vendor for all materials, supplies, equipment, tools, services, labor and supervision necessary to complete the Construction of Stella Road from Cottonwood School Road to W. Fairgrounds Road, hereinafter referred to as the "Project," as specified herein.

2.1 *Work* means the procurement, delivery and proper construction and/or installation of all materials and facilities and associated appurtenances necessary to fulfill the winning bidder's obligations (hereinafter the "Contractor") under the Contract as awarded for the Project specified herein, including the coordination and administration of all services necessary for Contractor, and/or its agents and/or subcontractors, to fulfill Contractor's obligations under the Contract.

3.0 PRE-BID CONFERENCE:

A pre-bid conference will be conducted on **Tuesday, August 6, 2024 at 9:30 AM** (CST). The

Initials of Bidder: _____

pre-bid conference will be held at the Fort Bend County Purchasing Department located in the Travis Annex at 301 Jackson, Suite 201, Richmond, Texas 77469. All bidders are encouraged to attend.

4.0 LIQUIDATED DAMAGES:

The County and the Contractor recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the County if the work is not complete on time. Accordingly, instead of requiring any such proof, the County and the Contractor agree that as liquidated damages for delay (but not as a penalty) the Contractor shall pay the County $1,500.00 for each day that expires after the time specified herein for completion until the Work is complete, unless contract time has been adjusted by extension of time approved by Commissioner's Court.

The Contractor will be placed on one (1) year probation if liquidated damages are accrued. During the probation period, if the Contractor accrues liquidated damages on another project, they will be disqualified from being awarded any County work for two (2) years.

5.0 COMPLETION TIME & PAYMENT:

5.1 Fort Bend County shall pay the Contractor in current funds for the Contractor's performance of the Contract the contract sum, as stated herein, after receipt of notice to proceed and a purchase order issued by the Fort Bend County Purchasing Agent.

5.2 Based upon Applications for payment submitted to the County Auditor, Fort Bend County shall make progress payments on account of the contract sum to the Contractor as provided below and elsewhere in the contract documents.

5.2.1 The period covered by each application for payment shall be one calendar month ending on the last day of the month.

5.2.2 Provided a customary, accurate and complete application for payment is received by the County Auditor not later than the 15th day of a month, Fort Bend County shall make payment of all undisputed amounts to the Contractor not later than the 15th day of the next month. If an application for payment is received by the County Auditor after the application deadline fixed above, payment shall be made by Fort Bend County not later than 30 days after the County Auditor receives the application for payment.

5.2.3 Application for payment shall indicate the percentage of completion of each portion of the Project as of the end of the period covered by the application for payment.

5.2.4 Subject to the provisions of the contract documents, the amount of each progress payment shall be computed as follows:

Initials of Bidder: _____

5.2.4.1 Take that portion of the contract sum properly allocable to completed Project less retainage of ten percent (10%).

5.2.4.2 Add that portion of the contract sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved by Fort Bend County, suitably stored off the site at a location agreed upon in writing), less retainage of ten percent (10%).

5.2.4.3 Subtract the aggregate of previous payments made by Fort Bend County.

5.2.4.4 The progress payment amount as determined in above shall be further modified under the following circumstances:

Upon substantial completion of the Project, add a sum sufficient to increase the total payments to one hundred percent (100%) of the contract sum, less such amounts as Fort Bend County shall determine should be deducted for incomplete work and unsettled claims.

5.2.4.5 Final payment, constituting the entire unpaid undisputed balance of the contract sum, shall be made by Fort Bend County to the Contractor when Fort Bend County and the Contractor agree that the Contract has been fully performed by the Contractor.

5.3 Before the first application for payment, the Contractor shall submit to the Engineering Department a schedule of values allocated to various portions of the work, prepared in such form and supported by such data to substantiate its accuracy as the Engineering Department may require. This schedule, unless objected to by the Engineering Department shall be used as a basis for reviewing the Contractor's application for payment.

5.4 Contractor must provide with each application for payment a contractor's affidavit certifying bills against the Contractor for labor, material and expendable equipment employed in the performance of Contractor have been paid in full prior to acceptance of final payment from Fort Bend County.

5.5 The Contractor will permit Fort Bend County, or any duly authorized agent of Fort Bend County, to inspect and examine the books and records of the Contractor for the purpose of verifying the amount of work performed under the Contract. Fort Bend County's right to inspect survives the termination of the Contract for a period of five years.

Initials of Bidder: _____

6.0 LIMIT OF APPROPRIATION:

Prior to the execution of this Contract, Contractor has been advised by County, and Contractor clearly understands and agrees, such understanding and agreement being of the absolute essence to this Contract, that County shall have available only those funds specifically allocated in this Contract to fully discharge any and all liabilities which may be incurred by County in bringing this Project to an absolute conclusion, resulting in a complete, fully furnished, fully equipped and fully usable facility, and that the total of any and all basic construction costs, costs of providing the required services and materials, all fees and compensation of any sort to the Contractor, and any and all costs for any and all things or purposes coming inuring under or out of this Contract, irrespective of the nature thereof, shall not exceed said specifically allocated sum, notwithstanding any word, statement or thing contained in or inferred from the preceding provision of this Contract which might in any light by any person be interpreted to the contrary.

7.0 RIGHT TO ASSURANCE:

Whenever Fort Bend County in good faith has reason to question the Contractor's intent or ability to perform, Fort Bend County may demand that the Contractor give written assurance of its intent to perform and its plan to properly continue performance, including a reasonably detailed timeline. In the event that a demand is made and no assurance is given within five (5) business days, Fort Bend County may treat this failure as an anticipatory repudiation of the Contract.

8.0 PERFORMANCE & PAYMENT BONDS:

Performance and Payment Bonds: In the event the total accepted bid price exceeds $25,000 the Contractor must provide to the Office of the County Purchasing Agent, a performance bond and a payment bond, each in the amount of 100% of the total contract sum within ten (10) calendar days after receipt of notification of bid award. Such bonds shall be executed by a corporate surety duly authorized and admitted to do business in the State of Texas and licensed in the State of Texas to issue surety bonds with a Best Rating of "A" or better. Fort Bend County reserves the right to accept or reject any surety company proposed by the Contractor. In the event Fort Bend County rejects, the proposed surety company, the Contractor will be afforded five (5) additional days to submit the required bonds issued by a surety company acceptable to Fort Bend County.

9.0 POWER OF ATTORNEY:

An attorney-in-fact who signs a bid bond, performance bond or payment bond must file with each bond a certified and effectively dated copy of his or her power of attorney.

10.0 INSURANCE:

10.1 All respondents shall submit, with response, a <u>current</u> certificate of insurance indicating coverage in the amounts stated below. In lieu of submitting a certificate of insurance, respondents may submit, with response, a notarized

Initials of Bidder: _____

statement from an Insurance company, authorized to conduct business in the State of Texas, and acceptable to Fort Bend County, guaranteeing the issuance of an insurance policy, with the coverage stated below, to the firm named therein, if successful, upon award of this Contract.

10.2 At contract execution, contractor shall furnish County with properly executed certificates of insurance which shall evidence all insurance required and provide that such insurance shall not be canceled, except on 30 days prior written notice to County. Contractor shall provide certified copies of insurance endorsements and/or policies if requested by County. Contractor shall maintain such insurance coverage from the time Services commence until Services are completed and provide replacement certificates, policies and/or endorsements for any such insurance expiring prior to completion of Services. Contractor shall obtain such insurance written on an Occurrence form (or a Claims Made form for Professional Liability insurance) from such companies having Best's rating of A/VII or better, licensed or approved to transact business in the State of Texas, and shall obtain such insurance of the following types and minimum limits:

10.2.1 Workers' Compensation insurance. Substitutes to genuine Workers' Compensation Insurance will not be allowed.

10.2.2 Employers' Liability insurance with limits of not less than $1,000,000 per injury by accident, $1,000,000 per injury by disease, and $1,000,000 per bodily injury by disease.

10.2.3 Commercial general liability insurance with a limit of not less than $1,000,000 each occurrence and $2,000,000 in the annual aggregate. Policy shall cover liability for bodily injury, personal injury, and property damage and products/completed operations arising out of the business operations of the policyholder.

10.2.4 Business Automobile Liability coverage with a combined Bodily Injury/Property Damage limit of not less than $1,000,000 each accident. The policy shall cover liability arising from the operation of licensed vehicles by policyholder.

10.3 County and the members of Commissioners Court shall be named as additional insured to all required coverage except for Workers' Compensation and Professional Liability (if required). All Liability policies including Workers' Compensation written on behalf of contractor, excluding Professional Liability, shall contain a waiver of subrogation in favor of County and members of Commissioners Court.

10.4 If required coverage is written on a claims-made basis, contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of the contract; and that continuous coverage will be maintained or an

Initials of Bidder: _____

extended discovery period will be exercised for a period of two (2) years beginning from the time that work under the agreement is completed.

10.5 Contractor shall not commence any portion of the work under this Contract until it has obtained the insurance required herein and certificates of such insurance have been filed with and approved by Fort Bend County.

10.6 No cancellation of or changes to the certificates, or the policies, may be made without sixty (60) days prior, written notification to Fort Bend County.

10.7 Approval of the insurance by Fort Bend County shall not relieve or decrease the liability of the Contractor.

11.0 INDEMNIFICATION:

Respondent shall save harmless County from and against all claims, liability, and expenses, including reasonable attorney's fees, arising from activities of respondent, its agents, servants or employees, performed under this agreement that result from the negligent act, error, or omission of respondent or any of respondent's agents, servants or employees.

11.1 Respondent shall timely report all such matters to Fort Bend County and shall, upon the receipt of any such claim, demand, suit, action, proceeding, lien or judgment, not later than the fifteenth day of each month; provide Fort Bend County with a written report on each such matter, setting forth the status of each matter, the schedule or planned proceedings with respect to each matter and the cooperation or assistance, if any, of Fort Bend County required by Respondent in the defense of each matter.

11.2 Respondent's duty to defend, indemnify and hold Fort Bend County harmless shall be absolute. It shall not abate or end by reason of the expiration or termination of any contract unless otherwise agreed by Fort Bend County in writing. The provisions of this section shall survive the termination of the contract and shall remain in full force and effect with respect to all such matters no matter when they arise.

11.3 In the event of any dispute between the parties as to whether a claim, demand, suit, action, proceeding, lien or judgment appears to have been caused by or appears to have arisen out of or in connection with acts or omissions of Respondent, Respondent shall never-the-less fully defend such claim, demand, suit, action, proceeding, lien or judgment until and unless there is a determination by a court of competent jurisdiction that the acts and omissions of Respondent are not at issue in the matter.

11.4 Respondent's indemnification shall cover, and Respondent agrees to indemnify Fort Bend County, in the event Fort Bend County is found to have been negligent for having selected Respondent to perform the work described in this request.

Initials of Bidder: _____

11.5 The provision by Respondent of insurance shall not limit the liability of Respondent under an agreement.

11.6 Respondent shall cause all trade contractors and any other contractor who may have a contract to perform construction or installation work in the area where work will be performed under this request, to agree to indemnify Fort Bend County and to hold it harmless from all claims for bodily injury and property damage that may arise from said Respondent's operations. Such provisions shall be in form satisfactory to Fort Bend County.

11.7 Loss Deduction Clause - Fort Bend County shall be exempt from, and in no way liable for, any sums of money which may represent a deductible in any insurance policy. The payment of deductibles shall be the sole responsibility of Respondent and/or trade contractor providing such insurance.

12.0 PREVAILING WAGES:

This project is subject to the prevailing wage rate requirements of Chapter 2258 of the Government Code. All persons employed by Contractor shall be compensated at not less than the rates shown below. Contractor shall keep detailed records of each of its workers and said records shall be made available to County for inspection at all reasonable times. The Contractor shall pay Fort Bend County sixty dollars ($60.00) for each worker employed by the Contractor for the provision of services described herein for each calendar day or part of the day that the worker is paid less than the below stated rates. Contractors may also visit www.wdol.gov/dba.aspx.

General Decision Number: TX20240038 01/05/2024
Superseded General Decision Number: TX20230038

State: Texas
Construction Type: Highway

Counties: Austin, Brazoria, Chambers, Fort Bend, Galveston, Hardin, Harris, Jefferson, Liberty, Montgomery, Orange, San Jacinto and Waller Counties in Texas.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).
If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022, Executive Order 14026 generally

applies to the contract. The contractor must pay all covered workers at least $17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022, Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least $12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/05/2024

SUTX2011-013 08/10/2011

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER (Paving and Structures)	$ 12.98 **	
ELECTRICIAN	$ 27.11	
FORM BUILDER/FORM SETTER		
Paving & Curb	$ 12.34 **	
Structures	$ 12.23 **	
LABORER		
Asphalt Raker	$ 12.36 **	
Flagger	$ 10.33 **	
Laborer, Common	$ 11.02 **	
Laborer, Utility	$ 11.73 **	
Pipelayer	$ 12.12 **	
Work Zone Barricade Servicer	$ 11.67 **	
PAINTER (Structures)	$ 18.62	
POWER EQUIPMENT OPERATOR:		

Initials of Bidder: _____

Asphalt Distributor	$ 14.06 **
Asphalt Paving Machine	$ 14.32 **
Broom or Sweeper	$ 12.68 **
Concrete Pavement Finishing Machine	$ 13.07 **
Concrete Paving, Curing, Float, Texturing Machine	$ 11.71 **
Concrete Saw	$ 13.99 **
Crane, Hydraulic 80 Tons or less	$ 13.86 **
Crane, Lattice boom 80 tons or less	$ 14.97 **
Crane, Lattice boom over 80 Tons	$ 15.80 **
Crawler Tractor	$ 13.68 **
Excavator, 50,000 pounds or less	$ 12.71 **
Excavator, Over 50,000 pounds	$ 14.53 **
Foundation Drill, Crawler Mounted	$ 17.43
Foundation Drill, Truck Mounted	$ 15.89 **
Front End Loader 3 CY or Less	$ 13.32 **
Front End Loader, Over 3 CY	$ 13.17 **
Loader/Backhoe	$ 14.29 **
Mechanic	$ 16.96 **
Milling Machine	$ 13.53 **
Motor Grader, Fine Grade	$ 15.69 **
Motor Grader, Rough	$ 14.23 **
Off Road Hauler	$ 14.60 **
Pavement Marking Machine	$ 11.18 **
Piledriver	$ 14.95 **
Roller, Asphalt	$ 11.95 **
Roller, Other	$ 11.57 **
Scraper	$ 13.47 **
Spreader Box	$ 13.58 **
Servicer	$ 13.97 **
Steel Worker	
Reinforcing Steel	$ 15.15 **
Structural Steel Welder	$ 12.85 **
Structural Steel	$ 14.39 **
TRUCK DRIVER	
Low Boy Float	$ 16.03 **
Single Axle	$ 11.46 **
Single or Tandem Axle Dump	$ 11.48 **
Tandem Axle Tractor w/Semi Trailer	$ 12.27 **

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Initials of Bidder: _____

** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($17.20) or 13658 ($12.90). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average

rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Initials of Bidder: _____

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

13.0 PERMITS:

It shall be the sole responsibility of the successful bidder to obtain all required permits in the name of Fort Bend County.

14.0 CONTRACTOR'S RESPONSIBILITY FOR WORK:

14.1 Preconstruction Work. Contractor shall do (or cause to be done) the following as preconstruction work:

14.1.1 On written demand as requested by Fort Bend County, cause the Contractor's personnel to meet with Fort Bend County and the Engineer to discuss the status of the Project.

14.1.2 On written demand as requested by Fort Bend County, review drawings and specifications with the Engineer to permit the Contractor and the Engineer to determine the compliance of the proposed facility with applicable building codes.

14.2 Construction Work. Contractor shall do (or cause to be done) the following as construction work:

14.2.1 Perform (or cause to be performed) all preparatory work at the construction site required herein, including (without limitation) soil and

Initials of Bidder: _____

concrete testing and demolition of improvements existing at the construction site and all actions necessary for compliance with all laws and regulations as to actions to be taken by owners or contractors before construction begins, including without limitation those in regard to archaeological and environmental requirements.

14.2.2 Construct and install (or cause to be constructed and installed) the Project on the construction site in accordance with this Contract and the drawings and specifications approved by Fort Bend County.

14.2.3 Furnish (or cause to be furnished) all materials, supplies, equipment, tools, labor, supervision, utilities, transportation, and other materials and services necessary to complete the Project described herein.

14.2.4 Materials testing necessary for the Project and required by laws and regulations, construction industry standards as approved by Fort Bend County and this Contract; the frequency of testing shall be approved by Fort Bend County. **It is the contractor's responsibility to engage a material testing laboratory to perform testing on the structural concrete to be used for foundation work in this project. The cost of testing shall be incidental to bid item for drill shaft foundation. Testing of concrete shall comply with current TXDOT criteria. Contractor has to submit the name of the testing laboratory, intended to be used by the contractor for this project, for County's approval.**

14.3 Standards for Review and Approval. Fort Bend County acknowledges that in order to meet the deadlines for the completion of the Project, and in order to accomplish the efficient completion of the Project, the Contractor may submit matters to Fort Bend County in stages for approval or consent. Upon receipt of any matter submitted by the Contractor for review and approval, Fort Bend County shall review the same and shall diligently and promptly (but in any event within 14 calendar days for any such matter, other than a proposed change order, and within 28 calendar days for a proposed change order) give the Contractor notice of Fort Bend County's approval or disapproval, setting forth in detail all reasons for any disapproval. Fort Bend County's right to disapprove any such matter submitted (other than a proposed change order) shall be limited to the elements thereof (a) which do not conform substantially to matters previously approved, (b) which are new elements not previously presented and approved and the Contractor is unable to demonstrate that such new element is reasonably necessary for completion of the Project, or (c) which depict matters that are violations of this Contract or applicable laws and regulations.

14.3.1 If Fort Bend County disapproves of a particular matter or Proposed Change Order, the Contractor shall have the right to resubmit such matter or Proposed Change Order to Fort Bend County, altered to satisfy Fort Bend County's basis for disapproval. Any resubmission shall be subject to review and approval by Fort Bend County.

Initials of Bidder: _____

14.3.2 Fort Bend County and the Contractor shall attempt in good faith to resolve any disputes concerning the approval of any aspect of the Project expeditiously, so as not to delay the completion of the Project in accordance with this Contract.

14.3.3 Expedited Approvals. Fort Bend County recognizes the importance of expeditious action upon all matters submitted to Fort Bend County for review and approval and of expeditious response to those aspects of the Project requiring approval by governmental authorities having jurisdiction there over. Fort Bend County agrees to exercise its rights of review and approval hereunder with due diligence, reasonableness, and good faith. Fort Bend County shall use its reasonable efforts to expedite any required review of the Project or other matters by any governmental authority.

14.4 Changes.

14.4.1 General. Fort Bend County may make changes to the Project by altering, adding to, or deducting from the Project. All changes in the Project which (a) require an adjustment in the contract sum or an adjustment in the final completion date or (b) involve a material change in the overall scope or function of the Project shall be requested and authorized before commencing such changes by use of written change order notices, Proposed Change Orders and Change Orders, which change order procedure shall be the exclusive means to effect such changes in the Project.

14.4.2 Change Order Procedure. If at any time Fort Bend County desires to make any change in the Project requiring the issuance of a Change Order, Fort Bend County shall so advise the Contractor in writing by delivery to the Contractor of a written notice describing the change. Upon receipt of such notice initiated by Fort Bend County, the Contractor shall within a reasonable period of time advise Fort Bend County of the Contractor's proposal for the adjustments, if any, in the contract sum, the schedule of values, and the final completion date attributable to such change by delivering a written notice thereof (the "Proposed Change Order") to Fort Bend County. Such Proposed Change Order shall contain a description of the proposed change and shall set forth the Contractor's estimate of the increase or decrease, if any, in the contract sum and the change, if any, in the schedule of values and the final completion date attributable to such change. If the Contractor desires to make a change in the Project requiring the issuance of a change order, the Contractor shall deliver to Fort Bend County a Proposed Change Order. Upon execution by Fort Bend County, a Proposed Change Order shall constitute (and be defined herein as) a "Change Order" for purposes of this Contract. The Contractor shall forthwith perform the work as changed in accordance with such Change Order. All work performed pursuant to a Change Order shall be performed in accordance with the terms of this Contract. All Proposed Change Orders

shall be submitted for approval by Fort Bend County. No action, acquiescence or inaction by Fort Bend County or any representative of Fort Bend County shall be construed to be a waiver of requirements set forth in this Contract in regard to Change Orders or ratification of a violation of such requirements, and all acts in violation of this provision shall be considered void.

14.4.3 Change Order Authorization. Each Change Order shall be signed by Fort Bend County and an authorized representative of the Contractor.

14.4.4 Contract Sum Adjustments. The contract sum and the schedule of values shall be adjusted only as a result of a Change Order requiring such adjustment. Any extra work performed without a proper Change Order shall be considered voluntary and not subject to additional compensation. The Contractor shall not be entitled to an adjustment in the contract sum (or a Change Order permitting such adjustment) or to damages as a result of any delays in the Project caused by the acts or omissions of Fort Bend County, provided that this sentence is not applicable to delays that constitute more than 90 days in any 365-day period or cause the Project to be interrupted for a continuous period of 45 days through no fault of the Contractor.

14.4.5 When Fort Bend County and the Contractor agree upon the adjustments in the contract sum, the schedule of values, and the final completion date attributable to such adjustment, such agreement will be documented by preparation and if approved by the Fort Bend County Commissioners Court, execution of an appropriate Change Order.

14.5 Site Access. Prior to the transfer date, Fort Bend County and the Contractor shall have uninterrupted access to the construction site. Subsequent to the transfer date, Fort Bend County will permit the Contractor, the Engineer, and their representatives and subcontractors to enter upon the Project at times reasonably necessary to complete the punch list items.

14.6 Applicable Laws and Regulations. Contractor shall in its performance of the Project comply with all applicable laws and regulations. Any delays in the prosecution of the Project caused by any changes in the laws and regulations or the application or enforcement of the laws and regulations may entitle the Contractor to an extension of time.

14.7 Familiarity with Project. The Contractor represents and accepts that it has: (a) visited the property(ies), (b) taken such other steps as may be necessary to ascertain the nature and location of the Project and the general and local conditions which affect the Project or the cost thereof, (c) investigated the labor situation as regards to the Project, (d) examined the property(ies), the obstacles which may be encountered and all other observable conditions having a bearing upon the performance of the Project, the superintendence of the Project, the time of completion and all other relevant matters, and (e) reported to Fort Bend County

Initials of Bidder: _____

the results of all of the foregoing. The Contractor represents that it is familiar with all phases of the Project and the matters that may affect the Project or its prosecution under this Contract.

14.8 Standard of Performance. The Contractor shall prosecute (or cause to be prosecuted) the Project in accordance with the best efforts for the construction and development of projects similar to the Project in the State of Texas, using qualified, careful, and efficient contractors and workers and in conformity with the provisions of this Contract. The Contractor shall perform the work in a good and workmanlike manner.

14.9 Warranty of Contractor. The Contractor warrants to Fort Bend County that: (i) the Contractor possesses the skill and knowledge ordinarily possessed by well-informed members of its trade or profession and the Contractor will use its best efforts to ensure that the services provided under this Contract will be performed, delivered, and conducted in accordance with the best professional standards and in accordance with industry standards, and (ii) the Contractor is fully experienced and properly qualified to perform the class of work provided for herein, and that it is properly equipped, organized and financed to perform such work, and (iii) following the date of acceptance of this Contract, the services provided by the Contractor to Fort Bend County will conform to the representations contained in this Contract, including all attachments, schedules and exhibits. All warranties provided by the Contractor in this Contract shall be cumulative, shall be deemed consistent and not in conflict, are intended to be given full force and effect and to be interpreted expansively to give the broadest warranty protection to Fort Bend County.

14.10 Contractor's Personnel. Contractor shall employ only competent, skilled personnel for the Project. Prior to the final completion date, the Contractor shall maintain a superintendent who shall be authorized to act on behalf of the Contractor and with whom Fort Bend County may consult at all reasonable times. The superintendent shall not be transferred from the Project without Fort Bend County's consent (which shall not be unreasonably withheld or delayed); provided, however, the superintendent shall not be assigned solely to the Project and shall be entitled to spend reasonable time working on matters unrelated to the Project so long as such work on other matters does not render the superintendent unavailable to the Project or unavailable to Fort Bend County. However, such obligation to furnish the superintendent and such staff personnel shall not be construed (a) to preclude the promotion within the Contractor's organization of any person assigned to the Project or (b) to give rise to any liability of the Contractor if any person assigned to the Project (including, without limitation, the superintendent) leaves the Contractor's employment. If the superintendent is transferred from the Project, Fort Bend County shall have the right to approve the replacement superintendent (which approval will not be unreasonably withheld or delayed). The Contractor, the Architect, and the other subcontractors shall comply with all applicable health, safety, and loss prevention rules of applicable governmental authorities. The

Contractor shall, at its own expense, remove from the Project any person who fails to comply with such rules and instructions. The Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ on the Project any unfit person or anyone not skilled in the work assigned to him. Fort Bend County may, upon written notice to the Contractor, require the Contractor to remove an individual immediately from providing services for the following reasons: violation of the terms and conditions of this Contract; violation of Fort Bend County's or the Contractor's work rules and regulations; criminal activity; or violation of state, federal, or municipal statutes. Fort Bend County may, upon thirty (30) days written notice to the Contractor, require the removal of any individual from providing services without cause.

14.11 Inspection. The Project and all parts thereof shall be subject to inspection from time to time by inspectors designated by Fort Bend County. No such inspections shall relieve The Contractor of any of its obligations hereunder. Neither failure to inspect nor failure to discover or reject any of the work as not in accordance with the drawings and specifications or any provision of this Contract shall be construed to imply an acceptance of such work or to relieve the Contractor of any of its obligations hereunder. Fort Bend County agrees that its right of inspection shall be used reasonably and in a timely manner so as not to delay orderly completion of the Project.

14.12 Protection Against Risks. The Contractor shall take all precautions which are necessary and adequate, against conditions created during the progress of the Project which involve a risk of bodily harm to persons or a risk of damage or loss to any property. The Contractor shall regularly inspect all work, materials and equipment to discover and determine any such conditions and shall be responsible for discovery, determination, and correction of any such conditions. The Contractor shall comply with all federal, state, and local occupational hazard and safety standards, codes and regulations applicable in the jurisdiction where the Project is being performed. The Contractor shall include the substance of this clause in its entirety in all subcontracts for any work to be performed at the construction site.

14.13 Equipment. Except as expressly provided herein to the contrary, the Contractor shall furnish (or cause to be furnished) all construction, transportation, installation, tools, and other equipment and facilities required for the performance of the Project within the times specified herein. Such equipment and facilities shall be serviceable and kept fit for the uses intended. Defective items shall be removed from the construction site promptly and at the Contractor's cost. The Contractor shall schedule (or cause to be scheduled) its other operations so as to not interfere with its duty to timely furnish the necessary equipment and facilities and personnel to operate the same at the times necessary for the orderly completion of the Project.

Initials of Bidder: _____

14.14 Materials. Except as may be specifically provided otherwise in the Contract or approved in advance by Fort Bend County, the Contractor shall provide Fort Bend County with copies of material testing reports and to cause all materials, equipment, and fabricated items incorporated in the Project to be new and of a suitable grade of their respective kinds for their intended use.

14.15 Delay, Disruption or Hindrance Damages. Contractor and the County contemplate that Contractor's performance may be delayed, disrupted or interfered with by unanticipated causes including but not limited to the following:

a) Severe and unavoidable natural disasters such as fires, floods, epidemics and earthquakes;
b) Abnormal weather conditions;
c) Acts or failures to act of the County , third party utility owners or other third – party entities; and
d) Acts of war or terrorism.

Contractor and the County agree and stipulate that an extension of the Contract Time shall be the sole remedy of Contractor for delays in performance of the Work, whether or not such delays are foreseeable, except for delays caused solely by acts of the County that constitute fraud, intentional misrepresentation, gross negligence, intentional arbitrary or capricious acts and/or omissions or intentional interference with Contractor's performance of the Work and then only to the extent such acts continue after Contractor notifies Owner in writing of such conduct. For delays caused by any act(s) other than fraud, intentional misrepresentation, gross negligence, intentional arbitrary or capricious acts and/or omissions or intentional interference with Contractor's performance of the Work Contractor shall not be entitled to any compensation or recovery of any damages including, without limitation, those damages prohibited or limited in Sections 14.15.1 – 14.15.8 below. The County's exercise of any of its rights or remedies under the Contract including, without limitation, ordering changes in the Work or directing suspension, rescheduling, or correction of the Work, in response to any breach or failure by the Contractor to comply with the terms of the Contract Documents or the Contractor's obligations arising therefrom, shall not be construed as intentional interference with Contractor's performance of the Work regardless of the extent or frequency of the County's exercise of such rights or remedies.

Without limiting the foregoing, except as otherwise expressly provided in this Agreement in calculating the amount of any claim recoverable by Contractor, the following limitations on the recovery of damages shall apply:

14.15.1 No indirect or consequential damages will be allowed.

14.15.2 No recovery shall be based on a comparison of planned expenditures to

Initials of Bidder: _____

total actual expenditures, or on estimated losses of labor efficiency, or on a comparison of planned manloading to actual manloading, or any other analysis that is used to show damages indirectly.

14.15.3 Damages, to the extent recoverable, are limited to the additional, actual costs specifically shown to have been directly incurred by the Contractor and solely caused by the proven wrong.

14.15.4 No damages will be allowed for home office overhead or other home office charges.

14.15.5 No exemplary damages or unjust enrichment damages shall be recoverable.

14.15.6 No recovery of attorney's fees shall be recoverable except as expressly permitted under the Agreement.

14.15.7 No profit will be allowed on any damage claim, except as expressly recoverable under the Agreement as Fee on Cost of the Work incurred.

14.15.8 Notwithstanding any other damage limitation herein the County and the Contractor recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the Contractor if the County is found to have intentionally interfered with Contractor's performance of the Work by fraud, misrepresentation, gross negligence, or intentional arbitrary or capricious acts and/or omissions. Accordingly, instead of requiring any such proof, the County and the Contractor agree that as liquidated damages (in lieu of any other remedy or damages) for delay, disruption or hindrance (but not as a penalty) the County shall pay the Contractor $1,500.00 for each day that a court of competent jurisdiction finds the County's conduct referenced in Section14.15 (above) is the sole cause of Contractor's delay in completing the Work.

15.0 TERMINATION:

15.1 Fort Bend County may terminate the Contract for cause if the Contractor:

15.1.1 Persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials.

15.1.2 Fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractor.

Initials of Bidder: _____

15.1.3 Persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction.

15.1.4 Otherwise commits substantial breach of a provision of the Contract Documents.

15.2 When any of the above reasons exists, Fort Bend County may, without prejudice to any other rights or remedies of Fort Bend County and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

15.2.1 Take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor.

15.2.2 Finish the Project by whatever reasonable method Fort Bend County may deem expedient.

15.2.3 When Fort Bend County terminates the Contract for one of the reasons stated in this section, the Contractor shall not be entitled to receive further payment until the Project is finished. Therefore, the Contractor shall be promptly paid for all work actually and satisfactorily completed.

15.3 Termination for Convenience of Fort Bend County

Fort Bend county reserves the right, without breach, to terminate the Contract prior to, or during the performance of the Work, for any reason. Upon such an occurrence, the following shall apply.

15.3.1 The County will notify Contractor in writing of the county’s determination to terminate the contract for convenience and the effective date of the Contract termination. The notice may also contain instructions necessary for the protection, storage or decommissioning of incomplete work or systems, and for safety.

15.3.2 Upon receipt of the notice of termination, Contractor shall immediately proceed with the following obligations, regardless of any dispute in determining or adjusting any amounts due at that point in the Contract:

15.3.2.1 Stop all work.

15.3.2.2 Place no further subcontracts or orders for materials or services.

15.3.2.3 Terminate all subcontracts for convenience.

15.3.2.4 Cancel all materials and equipment orders as applicable.

Initials of Bidder: _____

15.3.2.5 Take appropriate action that is necessary to protect and preserve all property related to the Contract which is in the possession of Contractor.

15.3.2.6 When the Contract is terminated for Owner's convenience, Contractor may recover from Owner payment for all Work executed. Contractor may not claim lost profits or lost business opportunities.

15.4 Settlement on Termination. When the Contract is terminated by the County under 15.3, at any time prior to one hundred eighty (180) days after the effective date of termination, Contractor shall submit a final termination settlement proposal to the County based upon recoverable costs as provided under the Contract. If Contractor fails to submit the proposal within the time allowed, the County may unilaterally determine the amount due to Contractor because of the termination and pay the determined amount to Contractor.

16.0 COMPLETION, TRANSFER, & ACCEPTANCE:

16.1 Final Completion. Upon the occurrence of the final completion date, the punch list items shall be promptly commenced and thereafter completed within thirty (30) days after final completion.

16.2 Transfer and Acceptance. Upon the occurrence of final completion, care, custody and control of the Project shall pass to Fort Bend County. As referenced herein, the "Transfer Date" shall mean the date on which the care, custody and control of the Project passes to Fort Bend County. Subsequent to the Transfer Date all risk of loss with respect to the Project shall be by Fort Bend County and the Contractor shall be thereafter obligated to cover the Project with their Insurance.

17.0 SUSPENSION BY FORT BEND COUNTY FOR CONVENIENCE:

17.1 Fort Bend County may, without cause, order the Contractor in writing to suspend, delay or interrupt the Project in whole or in part for such period of time as Fort Bend County may determine.

17.2 An adjustment shall be made for increase in the cost of performance, caused by suspension, delay or interruption. No adjustment shall be made to the extent:

17.2.1 That performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible.

17.2.2 That an equitable adjustment is made or denied under another provision of this Contract.

Initials of Bidder: _____

17.3 Adjustments made in the cost of performance may have a mutually agreed fixed or percentage fee.

18.0 INDEPENDENT CONTRACTOR:

The Contractor shall be an independent contractor and any provisions of this Contract that may appear to give Fort Bend County the right to direct the Contractor as to the details of the manner of doing the Project shall be deemed to mean that the Contractor shall follow the desires of Fort Bend County in the results of the Project only and not in the means whereby the Project is to be accomplished. The Contractor shall be responsible as to the details of completing the Project. Neither the agents, representatives, nor employees of the Contractor, shall be deemed to be the agents, representatives, or employees of Fort Bend County. The Contractor further represents that it accepts a fiduciary role and responsibility with respect to Fort Bend County and will, to its best abilities, act in the best interests of Fort Bend County and the timely completion of the Project. The Contractor agrees and understands that neither it nor any of its agents or employees may act in the name of Fort Bend County except and unless specifically authorized in writing by Fort Bend County to do so. The Contractor shall furnish construction administration and management services and use the Contractor's best efforts to complete the Project in an expeditious and economical manner consistent with the interests of Fort Bend County.

19.0 NOTICE

19.1 All written notices, demands, and other papers or documents to be delivered to Fort Bend County under this Contract shall be delivered to the Engineering Department, 301 Jackson, Richmond, Texas 77469, or at such other place or places as Fort Bend County may from time to time designate by written notice delivered to the Contractor. For purposes of notice under this Contract, a copy of any notice or communication hereunder shall also be forwarded to the following address: Fort Bend County, 301 Jackson Street, Richmond, Texas 77469, Attention: County Judge.

19.2 All written notices, demands, and other papers or documents to be delivered to the Contractor under this Contract shall be delivered to the Authorized Representative identified in the Contract documents or such other place or places as the Contractor may designate by written notice delivered to Fort Bend County.

20.0 RECORDS:

20.1 Fort Bend County shall be the absolute and unqualified owner of all drawings, preliminary layouts, record drawings, sketches and other documents prepared pursuant to the Contract by Contractor.

20.2 The Contractor agrees to maintain and preserve for a period of at least five years after the earlier of the expiration of the defects period or termination of this Contract, accurate and complete records relating to the performance of the

Initials of Bidder: _____

Project. The Contractor agrees to, upon request, provide Fort Bend County with such records.

21.0 SUCCESSORS & ASSIGNS:

21.1 Fort Bend County and the Contractor bind themselves and their successors, executors, administrators and assigns to the other party of this Contract and to the successors, executors, administrators and assigns of such other party, in respect to all covenants of this Contract.

21.2 Neither Fort Bend County nor the Contractor shall assign, sublet or transfer its interest in this Contract without the prior written consent of the other.

21.3 Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of any public and/or governmental body that may be a party hereto.

22.0 PUBLIC CONTACT:

Contact with the news media, citizens of Fort Bend County or governmental agencies shall be the sole responsibility of Fort Bend County. Under no circumstances, whatsoever, shall Contractor release any material or information developed in the performance of its services hereunder without the express written permission of Fort Bend County, except where required to do so by law.

23.0 MODIFICATIONS:

This instrument contains the entire Contract between the parties relating to the rights herein granted and obligations herein assumed. Any oral or written representations or modifications concerning this instrument shall be of no force and effect excepting a subsequent written modification signed by both parties hereto.

24.0 SILENCE OF SPECIFICATIONS:

The apparent silence of specifications as to any detail, or the apparent omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and that only material and workmanship of the finest quality are to be used. All interpretations of specifications shall be made on the basis of this statement. The items furnished under this contract shall be new, unused of the latest product in production to commercial trade and shall be of the highest quality as to materials used and workmanship. Manufacturer furnishing these items shall be experienced in design and construction of such items and shall be an established supplier of the item bid.

25.0 SEVERABILITY:

In the event one or more of the provisions contained in these requirements or the specifications shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity,

illegality, or unenforceability shall not affect any other provision hereof and these requirements or the specifications shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

26.0 GOVERNING FORMS:

In the event of any conflict between the terms and provisions of these requirements and the specifications, the specifications shall govern. In the event of any conflict of interpretation of any part of this overall document, Fort Bend County's interpretation shall govern.

27.0 TAX EXEMPT:

Fort Bend County is exempt from state and local sales and use taxes under Section 151.309 of the Texas Tax Code. This Contract is deemed to be a separate contract for Texas tax purposes, and as such, Fort Bend County hereby issues its Texas Exemption for the purchase of any items qualifying for exemption under this Contract. Contractor is to issue its Texas Resale Certificate to vendors and subcontractors for such items qualifying for this exemption, and further, contractor should state these items at cost.

28.0 ENTIRE AGREEMENT:

The Parties agree that this Contract contains all of the terms and conditions of the understanding of the parties relating to the subject matter hereof. All prior negotiations, discussions, correspondence and preliminary understandings between the parties and others relating hereto are superseded by this Contract. By entering into this Contract, the parties do not intend to create any obligations, express or implied, other than those specifically set out in this Contract.

29.0 APPLICABLE LAW & VENUE

This Contract shall be construed under and in accord with the laws of the State of Texas, and all obligations of the parties created hereunder are performable in Fort Bend County, Texas, and that venue for any litigation arising out of or related to this Contract shall lie solely in the court of appropriate jurisdiction located in Fort Bend County, Texas.

30.0 ENCLOSURE:

The following being incorporated herein by reference for all purposes as though fully set forth herein word for word.

Enclosure #1 – Specifications and Plans

31.0 PRICING: Complete excel unit pricing form.

32.0 PROJECT DURATION:

Bidder agrees, if awarded the contract, to complete all work required by the contract documents **within _____ calendar days (maximum 365 days)** after issuance of a purchase order by the

Initials of Bidder: _____

County Purchasing Agent and notice to proceed by the Engineering Department.

33.0 AWARD:

This contract will be awarded to the overall lowest and best bid.

34.0 TEXAS ETHICS COMMISSION FORM 1295:

34.1 Effective January 1, 2016 all contracts executed by Commissioners Court, regardless of the dollar amount, will require completion of Form 1295 "Certificate of Interested Parties", per the new Government Code Statute §2252.908. All vendors submitting a response to a formal Bid, RFP, SOQ or any contracts, contract amendments, renewals or change orders are required to complete the Form 1295 online through the State of Texas Ethics Commission website. Please visit: https://www.ethics.state.tx.us/filinginfo/1295/

34.2 On-line instructions:

34.2.1 Name of governmental entity is to read: Fort Bend County

34.2.2 Identification number used by the governmental entity is: B24-076

34.2.3 Description is the title of the solicitation: Construction of Stella Road from Cottonwood School Road to W. Fairgrounds Road.

34.3 Apparent low bidder(s) will be required to provide the Form 1295 within three (3) calendar days from notification; however, if your company is publicly traded you are not required to complete this form.

35.0 STATE LAW REQUIREMENTS FOR CONTRACTS:

The contents of this section are required by Texas Law and are included by County regardless of content.

35.1 Agreement to Not Boycott Israel Chapter 2271 Texas Government Code: Contractor verifies that if Contractor employs ten (10) or more full-time employees and this Agreement has a value of $100,000 or more, Contractor does not boycott Israel and will not boycott Israel during the term of this Agreement.

35.2 Texas Government Code Section 2251.152 Acknowledgment: By signature on vendor form, Contractor represents pursuant to Section 2252.152 of the Texas Government Code, that Contractor is not listed on the website of the Comptroller of the State of Texas concerning the listing of companies that are identified under Section 806.051, Section 807.051 or Section 2253.153.

Initials of Bidder: _____

36.0 HUMAN TRAFFICKING:

By acceptance of this contract, Contractor acknowledges that Fort Bend County is opposed to human trafficking and that no County funds will be used in support of services or activities that violate human trafficking laws

37.0 INDEMNITY FOR BODILY INJURY OR DEATH CLAIMS

Indemnity for certain bodily injury or death claims. To the fullest extent permitted by law, contractor shall indemnify, defend and hold harmless the county from and against all claims, losses, expenses, costs, demands, suits, causes of action, and damages, including without limitation, attorneys' fees and expenses, for bodily injury or death of any employee of contractor, its agents, or its subcontractors of every tier, even if the bodily injury or death is caused by or alleged to have been caused by the sole or partial negligence, fault or strict liability of any indemnitee.

Indemnity for all other claims. For all claims not addressed in the preceding section or section 11.0 above , including, without limitation, claims for damage to or loss of use of property and claims for bodily injury to or death of any person other than that addressed in the immediately preceding section, to the fullest extent permitted by law, contractor shall indemnify, defend and hold harmless the county from and against all claims, losses, expenses, costs, demands, suits, causes of action, and damages, including without limitation, attorneys' fees and expenses, of any nature whatsoever arising out of or related to this contract or the work to be performed under this contract, but only to the extent of the negligence or other fault of the contractor, its agents, representatives, employees or subcontractors of any tier.

38.0 AGREEMENT TO ARBITRATE UNDER THE FEDERAL ARBITRATION ACT

To the maximum extent allowed by law, any controversy or claim arising out of or relating to this contract, or the breach thereof, shall be settled by arbitration under the Federal Arbitration Act, 9 U.S.C. § 1, et seq. administered by the American Arbitration Association under its Construction Industry Arbitration Rules, and judgment on the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof. For cases in which the amount in controversy is less than $250,000, there shall be no discovery other than an expeditious and complete exchange of documents relative to the dispute. For cases in which the amount in controversy is between $250,000 and $1,000,000, there shall be no discovery except for an expeditious and complete exchange of such documentary information and up to three (3) depositions per side (including expert depositions, if any). For cases in which the amount in controversy exceeds $1,000,000, there shall be no discovery except for an expeditious and complete exchange of such documentary information up to five (5) depositions per side (including expert depositions, if any). No formal interrogatories, request for admissions or formal request for production of documents shall be allowed in the arbitration process. The hearing on the merits will be completed no later than ninety (90) days after the initial demand for arbitration is made for disputes involving amounts in controversy of up to $250,000; no later than no later than one hundred twenty (120) days after the initial demand for arbitration is made for disputes involving amounts in controversy of between $250,000 and $1,000,000; and, no

Initials of Bidder: _____

later than three hundred sixty five (365) days after the initial demand for arbitration is made for disputes involving amounts in controversy of over $1,000,000.

39.0 ADDITIONAL REQUIRED FORMS:

All vendors submitting are required to complete and return with submission

39.1 Vendor Form

39.2 W9 Form

39.3 Tax Form/Debt/Residence Certification

39.4 Contractor Acknowledgement of Stormwater Management Program

Initials of Bidder: _____

Contract Sheet
Bid 24-076

THE STATE OF TEXAS
COUNTY OF FORT BEND

This memorandum of agreement made and entered into on the _____ day of _____, 20_____, by and between Fort Bend County in the State of Texas (hereinafter designated County), acting herein by County Judge KP George, by virtue of an order of Fort Bend County Commissioners Court, and _____ (hereinafter designated Contractor).

(company name)

WITNESSETH:

The Contractor and the County agree that the bid and specifications for the **Construction of Stella Road from Cottonwood School Road to W. Fairgrounds Road for Fort Bend County Mobility Bond Project No. 20116** which are hereto attached and made a part hereof, together with this instrument and the bond (when required) shall constitute the full agreement and contract between parties and for furnishing the items set out and described; the County agrees to pay the prices stipulated in the accepted bid.

It is further agreed that this contract shall not become binding or effective until signed by the parties hereto and a purchase order authorizing the items desired has been issued.

Executed at Richmond, Texas this _____day of _____20_____.

Fort Bend County, Texas

By:_____
County Judge, KP George

By:_____
Signature of Contractor

By:_____
Printed Name and Title

Form **W-9**
(Rev. December 2014)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See **Specific Instructions** on page 2.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification; check only **one** of the following seven boxes:

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____

Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number

			–		–				

or

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here	**Signature of U.S. person** ▶	**Date** ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

Note. If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),
3. The IRS tells the requester that you furnished an incorrect TIN,
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or
5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code* on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships* above.

What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note. ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

Limited Liability Company (LLC). If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)

2—The United States or any of its agencies or instrumentalities

3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

4—A foreign government or any of its political subdivisions, agencies, or instrumentalities

5—A corporation

6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession

7—A futures commission merchant registered with the Commodity Futures Trading Commission

8—A real estate investment trust

9—An entity registered at all times during the tax year under the Investment Company Act of 1940

10—A common trust fund operated by a bank under section 584(a)

11—A financial institution

12—A middleman known in the investment community as a nominee or custodian

13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 5[2]
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note. You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code* earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account[1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor[2]
4. a. The usual revocable savings trust (grantor is also trustee) b. So-called trust account that is not a legal or valid trust under state law	The grantor-trustee[1] The actual owner[1]
5. Sole proprietorship or disregarded entity owned by an individual	The owner[3]
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	**Give name and EIN of:**
7. Disregarded entity not owned by an individual	The owner
8. A valid trust, estate, or pension trust	Legal entity[4]
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 2.

***Note.** Grantor also must provide a Form W-9 to trustee of trust.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov.* You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.ftc.gov/idtheft* or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

Job No.: _____

TAX FORM/DEBT/ RESIDENCE CERTIFICATION
(for Advertised Projects)

Taxpayer Identification Number (T.I.N.): _____

Company Name submitting Bid/Proposal: _____

Mailing Address: _____

Are you registered to do business in the State of Texas? Yes No

If you are an individual, list the names and addresses of any partnership of which you are a general partner or any assumed name(s) under which you operate your business

_____

_____

I. **Property:** List all taxable property in Fort Bend County owned by you or above partnerships as well as any d/b/a names. Include real and personal property as well as mineral interest accounts. (Use a second sheet of paper if necessary.)

Fort Bend County Tax Acct. No.*	Property address or location**
_____	_____
_____	_____
_____	_____
_____	_____

** This is the property account identification number assigned by the Fort Bend County Appraisal District.*

*** For real property, specify the property address or legal description. For business personal property, specify the address where the property is located. For example, office equipment will normally be at your office, but inventory may be stored at a warehouse or other location.*

II. **Fort Bend County Debt** - Do you owe any debts to Fort Bend County (taxes on properties listed in I above, tickets, fines, tolls, court judgments, etc.)?

Yes No If yes, attach a separate page explaining the debt.

III. **Residence Certification** - Pursuant to Texas Government Code §2252.001 *et seq.*, as amended, Fort Bend County requests Residence Certification. §2252.001 *et seq.* of the Government Code provides some restrictions on the awarding of governmental contracts; pertinent provisions of §2252.001 are stated below:

(3) "Nonresident bidder" refers to a person who is not a resident.

(4) "Resident bidder" refers to a person whose principal place of business is in this state, including a contractor whose ultimate parent company or majority owner has its principal place of business in this state.

I certify that _____ is a Resident Bidder of Texas as defined in Government Code
[Company Name]
§2252.001.

I certify that _____ is a Nonresident Bidder as defined in Government Code
[Company Name]
§2252.001 and our principal place of business is _____.
[City and State]

Mandatory Form

Contractor Acknowledgement of Storm Water Management Program

I hereby acknowledge that I am aware of the stormwater management program and standard operating procedures developed by Fort Bend County in compliance with the TPDES General Permit No. TXR040000. I agree to comply with all applicable best management practices and standard operating procedures while conducting my services for Fort Bend County. I agree to conduct all services in a manner that does not introduce illicit discharges of pollutants to streets, stormwater inlets, drainage ditches or any portion of the drainage system. The following materials and/or pollutant sources must not be discharged to the drainage system as a result of any services provided:

1. Grass clippings, leaves, mulch, rocks, sand, dirt or other waste materials resulting from landscaping activities, (except those materials resulting from ditch mowing or maintenance activities)
2. Herbicides, pesticides and/or fertilizers, (except those intended for aquatic use)
3. Detergents, fuels, solvents, oils and/or lubricants, other equipment and/or vehicle fluids,
4. Other hazardous materials including paints, thinners, chemicals or related waste materials,
5. Uncontrolled dewatering discharges, equipment and/or vehicle wash waters,
6. Sanitary waste, trash, debris, or other waste products
7. Wastewater from wet saw machinery,
8. Other pollutants that degrade water quality or pose a threat to human health or the environment.

Furthermore, I agree to notify Fort Bend County immediately of any issue caused by or identified by:

_____

(Company/Contractor)

that is believed to be an immediate threat to human health or the environment.

_____ _____

Contractor Signature Date

_____

Printed Name

_____

Title

SCOPE OF WORK

STELLA ROAD

The project scope includes demolishing the existing two-lane asphalt roadway and reconstructing it as a two 12-foot lane asphalt roadway with 6-foot shoulders on either side. The existing open ditch storm drainage is to be regraded and detention is to be provided to help mitigate impacts from the roadway improvements to the drainage outfall locations.

Work includes hot mix asphalt concrete surface course, hot mix asphalt concrete base course, lime stabilized subgrade, grading, driveways, culverts, seeding and sodding, placement of signs, pavement markings, etc.

Contractor is responsible for establishing and maintaining a traffic control plan in accordance to the latest version of Texas Manual on Uniform Traffic Control Devices (TMUTCD) and measures shown in the plans.

This description of the scope of work is general in nature and is intended as an overview of the project only. The complete detailed scope of work and bid items are contained in the construction drawings and specifications.

TECHNICAL SPECIFICATIONS

Technical Specifications are to the latest version of specifications from Harris County Engineering Department, Harris County Flood Control District, and City of Houston. These referenced specifications are incorporated herein as if they are copied verbatim including any supplementary specification, or amendments thereto and related specifications herein unless indicated otherwise in the drawings or specifications. Specifications can be found in the following links:

http://www.eng.hctx.net/Consultants/Standards-Specifications/Standard-Engineering-Design-Specifications

https://www.hcfcd.org/Resources/Technical-Manuals/Standard-Specifications-Related-Drawings?folderId=15985&view=gridview&pageSize=10

https://www.houstonpermittingcenter.org/office-city-engineer/design-and-construction-standards#agency-links-1476

Stella Road: From Cottonwood School Road to W Fairgrounds Road
for Fort Bend County
Bid 24-076

INDEX OF TECHNICAL SPECIFICATIONS

Reference Harris County Standard Engineering Design Specifications (2023 revision) where applicable.

Harris County Specifications

Item No.	Specification Title
100	Preparing Right-of-Way
103	Existing Fence and Gates
104	Removing Concrete
105	Removing Base and Asphalt Pavament
106	Salvage, Hauling, and Stockpiling Reclaimable Asphalt Pavament
108	Removing Structures
110	Excavation
130	Borrow
132	Embankment
140	Eliminating Existing Pavment Markings and Markers
160	Topsoil
162	Sodding for Erosion Control
164	Seeding for Erosion Control
166	Fertilizer
216	Subgrade
247	Flexible Base
260	Lime Treatment (Road-Mixed)
265	Fly Ash or Lime-Fly Ash Treatment (Road-Mixed)
275	Cement Treatment (Road-Mixed)
276	Cement Treatment (Plant-Mixed)
292	Dense-Graded Hot-Mix Asphalt Base Course
295	Full-Depth Reclamation Using Cement (Road-Mixed)
296	Full-Depth Reclamation Using Asphalt Emulsion (Road-Mixed)
312	Tack Coat
314	Emulsified Asphalt (Prime Coat)
340	Dense-Graded Hot-Mix Asphalt
341	Dense-Graded Hot-Mix Asphalt Surface Course
358	Hot In-Place Recycling of Asphalt Concrete Surfaces
360	Concrete Pavement
361	Repair of Concrete Pavement
400	Excavation and Backfill for Strcutures
401	Flowable Backfill
402	Trench Excavation Protection
404	Driving Piling
407	Temporary Steel Sheet Piling
409	Prestressed Concrete Piling
416	Drilled Shaft Foundations
420	Concrete Structures
421	Hydraulic Cement Structures
424	Prestressed Concrete Members (Fabrication)
425	Precast Prestressed Concrete Structural Members
426	Bridge Plaque
432	RipRap
434	Elastomeric Materials
438	Joint Sealants
440	Reinforcement for Concrete
441	Steel Structures
442	Metal for Structures
446	Painting and Protective Coating
447	Structural Bolting
448	Structural Field Welding
450	Railing
451	Retrofit Railing
462	Reinforced Concrete Box Culverts
464	Reinforced Concrete Pipe
465	Concrete Manholes and Junction Boxes
466	Inlets
467	Safety End Treatment
476	Jacking, Boring, or Tunneling Pipe or Box
479	Adjusting Monholes, Junction Boxes, and Inlets

Item No.	Specification Title
481	Pipe for Drains
482	Thermoplastic Pipe Culverts and Drains
501	Tree protection and Trimming
502	Traffic Signs, Roadside Signs, and Mailboxes
520	Weighing and Measurement Equipment
528	Colored Concrete for Median Noses
530	Concrete Curb, Concrete Curb and Gutter, Sidewalks and Driveways
536	Concrete Medians and Directional Islands
540	Metal Beam Guard Fence
550	Chain Link Fencing
552	Wire Fence
554	Wood Fence
556	Construction Safety Fence
560	Project Site Cleanup and Maintenance
561	Project Site Documentation
580	Precast Concrete Wheel Stop
590	Notice of Intent
591	Temporary Erosion, Sedimentation, and Enironmental Controls
610	Roadway Illumination Assemblies
618	Conduit
625	Zinc-Coated Steel Wire Strand
627	Treated Timber Poles
636	Signs
644	Roadside Sign Supports
658	Delineators and Object Markers
662	Work Zone Pavement Markings
666	Reflectorized Pavement Markings
668	Prefabricated Pavement Markers
672	Raised Pavement Markers
678	Pavement Surface Preparation for Markings
682	Traffic Signal Heads
683	Pedestrian Signal Head
684	Traffic Signal Cables
685	Roadside Flashing Assemblies
686	Traffic Signal Pole Assemblies
687	Pedestal Pole Assemblies
688	Accessible Pedestrian Signals
690	Traffic Signal Installation and Modification
691	Twelve Inch Signal Head with Programmable Visibility of Signal Faces
692	Intelligent Transportation System (ITS) Controller Cabinet Assembly
693	Advanced Traffic Controller (ATS)
694	Temporary Traffic Control
695	Uniformed Law Enforcement Officer
696	Barricades
697	Constructing Detours
698	Low Profile Concrete Barrier
699	Temporary Polyethylene Water-Filled Barrier
720	Repair Base Using Dense-Graded Hot-Mix Asphalt
776	Metal Rail Repair
800	Hydraulic Cement
801	Fly Ash
802	Membrane Curing
820	Lime and Lime Slurry
821	Fly Ash for Soil Treatment
860	Sign Face Materials
861	Traffic Paint (Solvent Based)
862	Glass Reflective Spheres for Traffic Paint
863	Twelve Inch LED Traffic Signal Lamp Unit
864	Pedestrian LED Traffic Signal Lamp Unit
865	Flasher Assemblies
866	LED Sign Lights for Traffic Signals

INDEX OF TECHNICAL SPECIFICATIONS (CONTINUED)

City of Houston Standard Specifications

For water line construction of this project, the contractor shall reference the City of Houston, Department of Public Works and Engineering, STANDARD CONSTRUCTION SPECIFICATIONS (2021 revision), when identified in the Bid Form specification reference as "COH"

Item No.	Specification Title
02511	Water Lines
02512	Water Tap and Service Line Installation
02513	Wet Connections
02514	Disinfection of Water Lines
02515	Hydrostatic Testing of Pipelines
02516	Cut, Plug, and Abandonment of Mains
02517	Water Line in Tunnels
02520	Fire Hydrant
02521	Gate Valves
02525	Tapping Sleeves and Valves
02526	Water Meters
02527	Polyurethane Coatings on Steel or Ductile Iron Pipe
02528	Polyethylene Wrap
02529	Tape Coatings on Steel Pipe

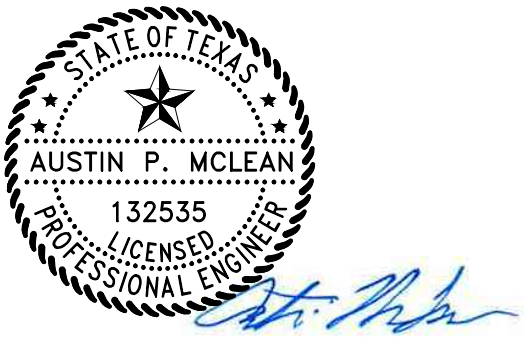
Harris County Flood Control District Specifications

Reference 2020 Standard Construction Specifications and Details for Harris County Flood Control District where applicable when identified in the Bid Form specification reference as "HCFCD"

Item No.	Specification Title
02120	Material Disposal
02316	Structural Excavating and Backfilling
02321	Cement Stabilized Sand
02922	Sod
03310	Concrete

Other specifications to be listed as applicable.

Geotechnical Investigation (included herein)



AVILES
ENGINEERING CORP.

GEOTECHNICAL INVESTIGATION

STELLA ROAD IMPROVEMENTS
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
FORT BEND COUNTY, TEXAS

Reported to:
McDonough Engineering Corporation
Houston, Texas

by

Aviles Engineering Corporation
5790 Windfern
Houston, Texas 77041
713-895-7645

REPORT NO. G126-21 (Revision 1)

August 2022

AVILES
ENGINEERING CORP.

August 29, 2022

Austin McLean, P.E.
Project Manager
McDonough Engineering Corporation
5625 Schumacher Lane
Houston, Texas 77057

Reference: **Geotechnical Investigation**
Stella Road Improvements
From Cottonwood School Road to Band Road
Fort Bend County Mobility Bond Project #21060
Fort Bend County, Texas
AEC Report No. G126-21 (Revision 1)

Dear Mr. McLean,

Aviles Engineering Corporation (AEC) is pleased to present this report of the results of our geotechnical investigation for the above referenced project. Project terms and conditions were in accordance with the Professional Services Consultant Agreement between McDonough Engineering Corporation (MEC) and AEC, dated May 13, 2021. The project scope of services is in accordance with AEC Proposal No. G2021-03-02R2, dated March 31, 2021, and AEC Proposal G2021-03-02SR, dated January 14, 2022.

AEC appreciates the opportunity to be of service to you. Please call us if you have any questions or comments concerning this report or when we can be of further assistance.

Respectfully submitted,
Aviles Engineering Corporation
(TBPELS Firm Registration No. F-42)

Wilber L. Wang, P.E. 08/29/2022
Senior Engineer

Reports Submitted: 1 McDonough Engineering Corporation (electronic)
1 File (electronic)

Z:\ENGINEERING\REPORTS\2021\G126-21 STELLA ROAD RECONSTRUCTION FROM COTTONWOOD SCHOOL TO BAND ROAD - MCDONOUGH ENGINEERING\G126-21 FINAL R1.DOCX

AVLES
ENGINEERING CORP.

TABLE OF CONTENTS

AVLES
ENGINEERING CORP.

APPENDICES

APPENDIX A

Plate A-1	Vicinity Map
Plate A-2	Boring Location Plan
Plates A-3 to A-25	Boring Logs
Plate A-26	Key to Symbols
Plate A-27	Classification of Soils for Engineering Purposes
Plate A-28	Terms Used on Boring Logs
Plate A-29	ASTM & TXDOT Designation for Soil Laboratory Tests
Plate A-30	Crumb Test Results
Plates A-31 and A-32	Mohr-Coulomb Diagrams (from CU Triaxial Tests)

APPENDIX B

Plates B-1a to B-1c	Generalized Soil Profiles

APPENDIX C

Plates C-1 to C-3	DARWin v3.0 Outputs for Asphalt Pavement Design

APPENDIX D

Plates D-1 and D-2	r.g. Miller Engineers drawings, Detention Basin Layout and Cross Sections, dated June 28, 2022
Plate D-3	Design Soil Parameters for Slope Stability Analyses
Plates D-4 to D-9	Detention Basin Slope Stability Analyses

AVILES
ENGINEERING CORP.

EXECUTIVE SUMMARY

The report submitted herein presents the results of Aviles Engineering Corporation's (AEC) geotechnical investigation for Fort Bend County's (FBC) proposed Stella Road Improvements from Cottonwood School Road to Band Road project in Precinct 1, Fort Bend County, Texas (Fort Bend County Key Map Nos.: 604X, and 644 B & C). A project vicinity map is presented on Plate A-1, in Appendix A. According to the information provided by McDonough Engineering Corporation (MEC), Stella Road along the project alignment is an existing 2 lane (one lane in each direction) asphalt roadway, which will be reconstructed to a new 2 lane (one lane in each direction) asphalt roadway with the main traffic lanes widened to 12 feet plus new 6 foot wide shoulders. The roadway will have roadside drainage swales. There will be a detention basin with a depth of 3.4 to 4.3 feet and slope inclination of H:V = 4:1 at the approximate mid-point of the alignment.

AEC notes that the project alignment has been updated after AEC completed its original borings (Borings B-1 through B-17). At its west limit, Stella Road will connect to Cottonwood School Road approximately 400 feet to the south from its current location. The east limit of the project has also changed from Band Road to W. Fairgrounds Road. The S-curve portion of the alignment from approximately Station 25+00 to 48+00 no longer follows the existing Stella Road alignment. After the alignment was updated, additional borings (Borings B-18 and B-19) were drilled along the new roadway alignment in March 2022, and detention basin borings (Borings B-20 through B-23) were drilled in May 2022.

1. Existing Pavement Conditions: In general, approximately 3.25 to 7 inches of asphalt surface with 5 to 15 inches of sand and gravel base was encountered along Stella Road. A summary of existing pavement sections encountered in AEC's borings is presented on Table 4 in Section 4.0 of this report.

2. Subsurface Soil Conditions: Details of the soils encountered during drilling are presented in the boring logs (see Plates A-3 through A-25, in Appendix A). Generalized soil profiles along the roadway alignment are presented on Plates B-1a through B-1c, in Appendix B. Based on Borings B-1 through B-19, the subsurface conditions along the project alignment generally consist of soft to hard lean/fat clay (CL/CH), including fill. Approximately 1 to 3 feet of clayey sand (SC) fill material was encountered at the ground surface in Borings B-2, B-5, B-10, B-13, and B-21. Granular soils such as loose to very dense silty sands (SM) and medium dense to very dense silts (ML) were encountered beginning from a depth of 14 to 16 feet down to the boring termination depths in Borings B-1, B-2, B-9, B-11 through B-13, B-15 through B-17, B-19, and B-22.

3. Subsurface Soil Properties: The subsurface clayey soils (including fill but excluding clayey sand) encountered in the borings have medium to very high plasticity (see "Degree of Plasticity of Cohesive Soils" on Plate A-27, in Appendix A), with liquid limits (LL) ranging from 27 to 98, and plasticity indices (PI) ranging from 11 to 69. The cohesive soils encountered are classified as "CL", "CL-ML", and "CH" type soils, and granular soils encountered are classified as "ML", "SC", "SC-SM", and "SM" type soils in accordance with ASTM D 2487.

4. Groundwater Conditions: Groundwater was not encountered in any of the boreholes during or upon completion of drilling.

5. Hazardous Materials: No signs of visual staining or odors were encountered during field drilling or during processing of the soil samples in the laboratory.

AVLES
ENGINEERING CORP.

EXECUTIVE SUMMARY (Cont.)

6. Geologic Conditions: AEC performed a desk top fault study which included a review of public maps, available literature, and aerial photographs. AEC reviewed a University of Houston Master's Thesis entitled A Geophysical Study of Active Faulting in Fort Bend County, Texas concerning faulting in Fort Bend County, Texas (Schmidt, May 2013). According to the thesis, the closest fault to the project alignment is the northeast-southwest oriented Pleak Fault located approximately 3.9 miles south of the southeastern end of the project alignment. This fault is too distant to have an impact on the project alignment. Additional fault study is not recommended.

7. Roadway Reconstruction: Recommendations for reconstructing the existing asphalt pavement roadway are presented in Section 5.1 of this report. As directed, AEC first considered an asphalt pavement section that meets Fort Bend County's minimum pavement thickness requirements, which includes a 3 inch asphalt surface, 8 inch asphalt stabilized base, and 8 inch thick stabilized subgrade. Based on available traffic data, AEC estimates that FBC's minimum pavement section would provide a service life of approximately 8 years. AEC estimates an asphalt pavement section consisting of 3.5 inch asphalt surface, 10 inch asphalt-stabilized base, and 8 inch thick stabilized subgrade will be needed to provide a 20 year service life. Based on our borings, AEC estimates that most of the new roadway subgrade will be within highly expansive fat clay (CH) soil, which will require stabilization with a minimum of 7 percent lime. However, clayey sand (SC) fill material (likely placed when the original roadway was constructed) was encountered at the ground surface in Borings B-2 and B-5. Where sandy soils are exposed at the ground surface, the subgrade should be stabilized with a minimum of 3 percent lime and 7 percent fly ash.

8. Detention Basin: Recommendations for the detention basin is presented in Section 5.2 of this report. Based on Borings B-22 and B-23, the detention basin excavation will encounter very stiff to hard fat clay (CH). Groundwater was not encountered in the borings during drilling. The calculated minimum factor of safety (FS) for slope stability of the southeast bank of the detention basin ranges from 17.66 to 19.43 for short term condition, ranges from 1.85 to 2.22 for long term condition, and ranges from 1.31 to 1.52 for rapid drawdown condition. None of the soil excavated from the detention basin can be reused as select clay fill.

This Executive Summary is intended as a summary of the investigation and should not be used without the full text of this report.

AVILES
ENGINEERING CORP.

GEOTECHNICAL INVESTIGATION

STELLA ROAD IMPROVEMENTS
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
FORT BEND COUNTY, TEXAS

1.0 INTRODUCTION

The contents of this revised report (G126-21 Revision 1, dated August 29. 2022) prepared by Aviles Engineering Corporation (AEC) supersede AEC's geotechnical investigation report (G126-21, dated May 9, 2022) previously issued for this project.

1.1 General

The report submitted herein presents the results of AEC's geotechnical investigation for Fort Bend County's (FBC) proposed Stella Road Improvements from Cottonwood School Road to Band Road project in Precinct 1, Fort Bend County, Texas (Fort Bend County Key Map Nos.: 604X, and 644 B & C). A project vicinity map is presented on Plate A-1, in Appendix A. According to the information provided by McDonough Engineering Corporation (MEC), Stella Road along the project alignment is an existing 2 lane (one lane in each direction) asphalt roadway, which will be reconstructed to a new 2 lane (one lane in each direction) asphalt roadway with the main traffic lanes widened to 12 feet plus new 6 foot wide shoulders. The roadway will have roadside drainage swales. There will be a detention basin with a depth of 3.4 to 4.3 feet and slope inclination of H:V = 4:1 at the approximate mid-point of the alignment.

AEC notes that the project alignment has been updated after AEC completed its original borings (Borings B-1 through B-17). At its west limit, Stella Road will connect to Cottonwood School Road approximately 400 feet to the south from its current location. The east limit of the project has also changed from Band Road to W. Fairgrounds Road. The S-curve portion of the alignment from approximately Station 25+00 to 48+00 no longer follows the existing Stella Road alignment. After the alignment was updated, additional borings (Borings B-18 and B-19) were drilled along the new roadway alignment in March 2022, and detention basin borings (Borings B-20 through B-23) were drilled in May 2022.

AVLES ENGINEERING CORP.

1.2 Purpose and Scope

The purpose of this geotechnical investigation is to evaluate the subsurface soil and groundwater conditions along the project alignment and develop geotechnical engineering recommendations for design and construction of asphalt pavement and the detention basin. The scope of this geotechnical investigation is summarized below:

1. Drilling and sampling twenty-three geotechnical borings ranging from 15 to 20 feet below existing grade.
2. Soil laboratory testing on selected soil samples.
3. Engineering analyses and recommendations for reconstruction of roadways with asphalt pavement, including pavement thickness design and subgrade preparation.
4. Engineering analyses and recommendations for the detention basin, including slope stability analysis, erosion protection requirements (if required), and evaluation of excavated soil for use as select fill.
5. Construction recommendations and groundwater control guidelines for the proposed roadway and detention basin.

2.0 SUBSURFACE EXPLORATION

2.1 Soil Borings

Boring spacing and depths were selected in general accordance with Chapter 8 of the August 2020 FBC Engineering Design Manual (Draft). AEC drilled a total of twenty-three soil borings (Borings B-1 through B-23) for the project improvements to depths ranging from 15 to 20 feet below existing grade. Boring locations were marked by AEC personnel in the field using a handheld GPS unit. The total drilling footage is 440 feet. After completion of drilling, the locations of Borings B-1 through B-19 were surveyed by Landtech, Inc. The locations of Borings B-20 through B-23 were not surveyed; AEC estimated the coordinates of the borings from the handheld GPS unit, and estimated the boring elevations from available topographic data in the drawings provided by MEC. The boring locations are shown on the Boring Location Plan on Plate A-2, in Appendix A. Boring survey data (in State Plane Grid Coordinates, Texas South Central Zone 4204, US Survey Feet) is summarized on Table 1 below and is also included on the representative boring logs.

AVLES ENGINEERING CORP.

Table 1. Summary of Boring Survey Data

Boring No.	Boring Depth (ft)	Northing [1] (Grid, ft)	Easting [1] (Grid, ft)	Boring Surface Elevation (ft)	Station (Stella Rd Baseline)	Offset (ft)
B-1	20	13,752,613.63	2,977,451.48	99.65	3+13.50	-29.76
B-2	20	13,752,122.69	2,977,409.05	97.70	7+91.95	-4.35
B-3	20	13,751,769.18	2,977,721.50	97.86	12+85.68	-5.67
B-4	20	13,751,439.93	2,978,079.39	97.58	17+72.04	-6.05
B-5	20	13,751,103.01	2,978,427.64	97.30	22+56.53	5.76
B-6	20	13,750,779.58	2,978,795.46	96.28	27+46.25	-5.63
B-7	20	13,750,466,84	2,979,177.94	96.38	32+44.94	-6.86
B-8	20	13,750,519.24	2,979,671.65	96.64	37+71.16	-6.59
B-9	20	13,750,858.76	2,980,018.92	96.11	42+58.29	7.52
B-10	20	13,751,072.08	2,980,400.76	96.26	47+14.00	6.22
B-11	20	13,750,890.73	2,980,828.65	96.32	52+00.53	7.47
B-12	20	13,750,586.11	2,981,181.36	96.07	56+66.37	-8.33
B-13	20	13,750,262.50	2,981,532.35	95.97	61+43.85	-9.00
B-14	20	13,749,931.30	2,981,888.21	95.67	66+30.04	-7.41
B-15	20	13,749,608.87	2,982,234.96	95.35	71+03.59	-6.08
B-16	20	13,749,294.44	2,982,576.06	95.16	75+67.57	-6.79
B-17	20	13,748,987.65	2,982,888.19	94.52	80+05.09	6.57
B-18	20	13,750,595.24	2,979,443.158	93.80	31+30.51	-6.82
B-19	20	13,750,882.72	2,980,368.432	94.19	41+31.40	73.75
B-20[2]	15	13,751,108.27	2,980,993.076	98	-	-
B-21[2]	15	13,750,814.12	2,981,100.064	97	-	-
B-22[2]	16	13,750,851.89	2,979,703.639	95	-	-
B-23[2]	15	13,750,724.23	2,979,319.16	95	-	-

Note: (1) Northing and easting coordinates referenced to Texas Coordinate System, South Central Zone 4204. Coordinates are provided in grid format.
(2) Boring location not surveyed. Coordinates and elevations are estimated.

2.2 Drilling and Sampling Methods

Prior to drilling, existing pavement at Borings B-1, B-4, B-8, B-11, and B-14 through B-17 were first cut with a core barrel. Borings were drilled using either a truck-mounted (Borings B-1 through B-17) or buggy-

mounted (Borings B-18 through B-23) drilling rig and advanced using dry auger method alone. Undisturbed samples of cohesive soils were obtained from the borings by pushing 3-inch diameter thin-wall, seamless steel Shelby tube samplers in general accordance with ASTM D 1587. Granular soils were sampled with a 2-inch split-barrel sampler in accordance with ASTM D 1586. Standard Penetration Test resistance (N) values were recorded for the granular soils as "Blows per Foot" and are shown on the boring logs. Strength of the cohesive soils was estimated in the field using a hand penetrometer. The undisturbed samples of cohesive soils were extruded mechanically from the core barrels in the field and wrapped in aluminum foil; all samples were sealed in plastic bags to reduce moisture loss and disturbance. The samples were then placed in core boxes and transported to the AEC laboratory for testing and further study. Groundwater was not encountered in any of the borings during or after completion of drilling. After completion of drilling, boreholes located on existing pavement were grouted with cement-bentonite grout and existing pavement was patched with cold-placed asphalt patch. Boreholes located on grass were backfilled with bentonite chips.

3.0 LABORATORY TESTING PROGRAM

Soil laboratory testing was performed by AEC personnel. Samples from the borings were examined and classified in the laboratory by a technician under the supervision of a geotechnical engineer. Laboratory tests were performed on selected soil samples to evaluate the engineering properties of the foundation soils in accordance with applicable ASTM Standards. Atterberg limits, moisture contents, percent passing a No. 200 sieve, and dry unit weight tests were performed on selected samples to establish the index properties and confirm field classification of the subsurface soils. Strength properties of cohesive soils were determined by means of torvane (TV), unconfined compression (UC), unconsolidated-undrained (UU), and consolidated-undrained (CU) triaxial tests performed on relatively undisturbed samples. The laboratory test results are presented on the representative boring logs (see Plates A-3 through A-25, in Appendix A). A key to the boring logs, classification of soils for engineering purposes, terms used on boring logs, and reference ASTM Standards for laboratory testing are presented on Plates A-26 through A-29, in Appendix A.

Crumb Dispersion Tests: To evaluate the dispersive characteristics of clayey soils in the detention basin, crumb tests were performed on selected soil samples in accordance with ASTM D 6572, Method A. The results of the crumb tests are summarized on Table 2 and are presented on Plate A-30, in Appendix A.

AVLES ENGINEERING CORP.

Table 2. Summary of Crumb Test Results

Sample ID and Description	Dispersive Grade	Dispersive Classification
B-20, 0'-2', Fill: Fat Clay (CH)	1	Non-dispersive
B-20, 6'-8', Fat Clay (CH)	1	Non-dispersive
B-21, 0'-2', Fill: Fat Clay (CH)	1	Non-dispersive
B-21, 8'-10', Fat Clay (CH)	1	Non-dispersive
B-22, 2'-4', Fat Clay (CH)	1	Non-dispersive
B-22, 6'-8', Fat Clay (CH)	1	Non-dispersive
B-23, 0'-2', Fat Clay (CH)	1	Non-dispersive
B-23, 6'-8', Fat Clay (CH)	1	Non-dispersive

Consolidated-Undrained Triaxial Tests: CU triaxial tests were performed in accordance with ASTM D 4767 to determine shear strength parameters of the soils in the detention basin. Using the CU data, AEC plotted the stress paths and determined the k_f (critical state) line from the stress paths in accordance with the US Army Corps of Engineers Engineering Manual, Appendix D, Section D-4. Based on the k_f line, AEC determined the strength parameters (cohesion and friction angle) of the soil. Mohr's circles were developed based on the failure criteria (either maximum effective stress obliquity or maximum deviator stress) presented in ASTM D 4767. The Mohr-Coulomb diagrams (with Mohr's Circles at failure) generated from the CU triaxial tests are included on Plates A-31 and A-32, in Appendix A. The shear strength parameters obtained from the CU triaxial tests are summarized below in Table 3.

Table 3. Summary of Shear Strength Parameters from CU Triaxial Tests

Sample ID and Description	Effective Stress		Total Stress	
	c′ (psf)	φ′ (deg)	c_{cu} (psf)	φ_{cu} (deg)
B-21, 6'-8', Fat Clay (CH)	480	12.5	450	9.7
B-23, 4'-6', Fat Clay (CH)	250	17.7	230	13.4

Notes: (1) c' = effective cohesion, φ' =effective friction angle, obtained from CU tests with pore pressure measurements.
(2) c_{cu} = cohesion in total stress, φ_{cu} = friction angle in total stress, obtained from CU tests.

4.0 SITE CONDITIONS

The existing roadway along the project alignment is a two-lane (one lane in each direction) asphalt roadway (no shoulder) with roadside drainage swales. During our site visit, AEC observed that the existing roadway

between W. Fairground Road and Band Road appears to be in average to good condition, while the roadway between W. Fairground Road and Cottonwood School Road is generally in poor condition. For the segment between W. Fairground Road and Cottonwood School Road, AEC observed numerous roadway longitudinal cracks, occasional transverse cracks, alligator cracking, and rutting in wheel paths AEC also observed asphalt patches at several areas along the roadway. A summary of existing pavement sections encountered in AEC's borings is presented on Table 4 below.

Table 4. Summary of Existing Pavement Thickness

Boring No.	Street	Pavement Section
B-1	Stella Road	5.5" asphalt, 6" gravel base, and 7.75" stabilized sand subbase
B-2	Stella Road	3.5" asphalt, 8.5" stabilized sand and gravel base
B-3	Stella Road	4.5" asphalt, 14" stabilized sand and gravel base
B-4	Stella Road	3.5" asphalt, 6" sand and gravel base, 2.5" asphalt, and 7.5" sand and gravel subbase
B-5	Stella Road	4.5" asphalt, 15" stabilized sand and gravel base
B-6	Stella Road	7" asphalt, 5" stabilized sand and gravel base
B-7	Stella Road	5" asphalt, 12" stabilized sand and gravel base
B-8	Stella Road	4" asphalt, 14.5" stabilized sand base
B-9	Stella Road	4" asphalt, 10" stabilized sand and gravel base
B-10	Stella Road	4" asphalt, 8" stabilized sand and gravel base
B-11	Stella Road	3.5" asphalt, 5.5" stabilized sand and gravel base, and 10" sand and gravel subbase
B-12	Stella Road	4" asphalt, 8" stabilized sand and gravel base
B-13	Stella Road	4" asphalt, 8" stabilized sand and gravel base
B-14	Stella Road	3.5" asphalt, 13.5" sand and gravel base
B-15	Stella Road	4" asphalt, 14" sand and gravel base
B-16	Stella Road	3.5" asphalt, 12.5" sand and gravel base
B-17	Stella Road	3.25" asphalt, 14.25" sand and gravel base

4.1 Subsurface Conditions

Details of the soils encountered during drilling are presented in the boring logs on Plates A-3 through A-25, in Appendix A. Soil strata encountered in the borings are summarized below. Boring log profiles along the project alignment are presented on Plates B-1a through B-1c, in Appendix B.

AVLES
ENGINEERING CORP.

Boring	Depth (ft)	Description of Stratum
B-1	0 - 1.6	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.6 - 12	Soft to very stiff, Fat Clay (CH), with slickensides
	12 - 16	Soft to very stiff, Lean Clay (CL), with calcareous nodules
	16 - 20	Loose to medium dense, Silty Sand (SM), wet
B-2	0 - 1	Pavement and base: see Table 4 in Section 4.0 of this report.
	1 - 2	Fill: Clayey Sand (SC), with gravel
	2 - 8	Stiff to very stiff, Fat Clay (CH), with ferrous nodules
	8 - 10	Very stiff, Lean Clay (CL), with fat clay and calcareous powder pockets, and calcareous and ferrous nodules
	10 - 12	Very stiff, Silty Clay (CL-ML), with lean clay pockets, calcareous nodules, and ferrous stains
	12 - 14	Very stiff, Sandy Lean Clay (CL), with sandy silt partings, silty clay pockets, calcareous nodules, and ferrous stains
	14 - 16	Sandy Silt (ML), with lean clay pockets, calcareous nodules, and ferrous stains
	16 - 18	Firm to very stiff, Lean Clay (CL), with silt and calcareous powder pockets, and calcareous nodules
	18 - 20	Stiff to very stiff, Fat Clay (CH), with slickensides, silt pockets and calcareous nodules
B-3	0 - 1.5	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.5 - 2	Fill: Clayey Sand (SC), with gravel
	2 - 6	Fill: stiff to very stiff, Fat Clay (CH), with gravel
	6 - 10	Very stiff, Fat Clay (CH), with slickensides
	10 - 14	Very stiff to hard, Lean Clay (CL), with calcareous nodules, pockets, and seams
	14 - 20	Stiff to hard, Fat Clay (CH), with slickensides
B-4	0 - 1.6	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.6 - 12	Very stiff to hard, Fat Clay (CH)
	12 - 14	Very stiff, Silty Clay (CL-ML), with ferrous and calcareous nodules, and fat clay pockets
	14 - 16	Very stiff, Lean Clay (CL), with calcareous nodules and powder pockets
	16 - 20	Very stiff to hard, Fat Clay (CH), with slickensides
B-5	0 - 1.6	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.6 - 4	Fill: Silty Clayey Sand (SC-SM), with gravel
	4 - 12	Stiff to hard, Fat Clay (CH)
	12 - 14	Hard, Lean Clay (CL), with calcareous nodules and powder pockets
	14 - 20	Very stiff to hard, Fat Clay (CH), with slickensides
B-6	0 - 1	Pavement and base: see Table 4 in Section 4.0 of this report.
	1 - 4	Fill: stiff to very stiff, Lean Clay (CL), with gravel
	4 - 20	Stiff to hard, Fat Clay (CH), with slickensides.

Boring	Depth (ft)	Description of Stratum
B-7	0 - 1.4	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.4 - 2	Fill: hard, Sandy Lean Clay (CL), with gravel
	2 - 4	Fill: very stiff, Fat Clay (CH), with gravel and lean clay seams
	4 - 20	Stiff to hard, Fat Clay (CH), with slickensides
B-8	0 - 1.5	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.5 - 2	Fill: stiff to very stiff, Fat Clay (CH), with gravel and sand pockets
	2 - 20	Stiff to hard, Fat Clay (CH), with slickensides
B-9	0 - 1.2	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.2 - 2	Fill: stiff, Fat Clay (CH), with gravel and lean clay pockets
	2 - 12	Stiff to very stiff, Fat Clay (CH), with slickensides
	12 - 14	Very stiff, Lean Clay (CL), with sandy silt partings
	14 - 20	Medium dense to dense, Sandy Silt (ML)
B-10	0 - 1	Pavement and base: see Table 4 in Section 4.0 of this report.
	1 - 4	Fill: Clayey Sand (SC), with gravel
	4 - 20	Stiff to hard, Fat Clay (CH), with slickensides
B-11	0 - 1.6	Pavement: see Table 4 in Section 4.0 of this report.
	1.6 - 2	Fill: Clayey Sand (SC), with gravel
	2 - 18	Stiff to hard, Fat Clay (CH), with slickensides
	18 - 20	Dense, Sandy Silt (ML), with lean clay pockets and siltstone nodules
B-12	0 - 1	Pavement: see Table 4 in Section 4.0 of this report.
	1 - 2	Fill: stiff to very stiff, Fat Clay (CH), with sandy lean clay seams and gravel
	2 - 16	Stiff to hard, Fat Clay (CH), with slickensides
	16 - 20	Dense to very dense, Sandy Silt (ML)
B-13	0 - 1	Pavement and base: see Table 4 in Section 4.0 of this report.
	1 - 4	Fill: Clayey Sand (SC), with gravel
	4 - 14	Firm to hard, Fat Clay (CH), with slickensides
	14 - 20	Very dense, Sandy Silt (ML), with siltstone nodules
B-14	0 - 1.4	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.4 - 20	Stiff to hard, Fat Clay (CH), with slickensides
B-15	0 - 1.5	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.5 - 12	Stiff to very stiff, Fat Clay (CH), with slickensides
	12 - 14	Stiff to hard, Lean Clay (CL), with sandy silt seams
	14 - 20	Dense to very dense, Silt with Sand (ML)
B-16	0 - 1.3	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.3 - 2	Fill: very stiff, Fat Clay (CH), with gravel, sandy lean clay seams, and asphalt pieces
	2 - 12	Stiff to very stiff, Fat Clay (CH), with slickensides
	12 - 14	Stiff to very stiff, Lean Clay (CL), with calcareous nodules and silt partings
	14 - 20	Medium dense, Silt with Sand (ML)

Boring	Depth (ft)	Description of Stratum
B-17	0 - 1.5	Pavement and base: see Table 4 in Section 4.0 of this report.
	1.5 - 2	Fill: very stiff, Sandy Fat Clay (CH), with gravel seams and shell fragments
	2 - 10	Stiff to very stiff, Fat Clay (CH), with slickensides
	10 - 12	Silt with Sand (ML)
	12 - 14	Stiff to very stiff, Lean Clay (CL), with silt seams
	14 - 20	Medium dense, Silt with Sand (ML)
B-18	0 - 20	Firm to hard, Fat Clay (CH), with slickensides
B-19	0 - 14	Stiff to hard, Fat Clay (CH), with slickensides
	14 - 16	Stiff, Lean Clay (CL), with silt partings and siltstone nodules
	16 - 20	Very dense, Silty Sand (SM), with cement sand nodules
B-20	0 - 4	Fill: hard, Fat Clay (CH), with silty sand pockets and gravel
	4 - 14	Stiff to hard, Fat Clay (CH), with slickensides
	14 - 15	Hard, Lean Clay (CL), with slickensides and ferrous nodules
B-21	0 - 2	Fill: hard, Fat Clay (CH), with calcareous nodules and roots
	2 - 4	Fill: Clayey Sand (SC), with gravel and asphalt pieces
	4 - 15	Stiff to hard, Fat Clay (CH), with slickensides and ferrous nodules
B-22	0 - 14	Very stiff to hard, Fat Clay (CH), with slickensides and ferrous nodules
	14 - 16	Very dense, Silt (ML), with sandy lean clay pockets
B-23	0 - 15	Stiff to hard, Fat Clay (CH), with slickensides and ferrous nodules

Subsurface Soil Properties: The subsurface clayey soils (including fill but excluding clayey sand) encountered in the borings have medium to very high plasticity (see "Degree of Plasticity of Cohesive Soils" on Plate A-27, in Appendix A), with liquid limits (LL) ranging from 27 to 98, and plasticity indices (PI) ranging from 11 to 69. The cohesive soils encountered are classified as "CL", "CL-ML", and "CH" type soils, and granular soils encountered are classified as "ML", "SC", "SC-SM", and "SM" type soils in accordance with ASTM D 2487. "CH" soils undergo significant volume changes due to seasonal changes in soil moisture contents. "CL" type soils with lower LL (less than 40) and PI (less than 20) generally do not undergo significant volume changes with changes in moisture content. However, "CL" soils with LL approaching 50 and PI greater than 20 essentially behave as "CH" soils and could undergo significant volume changes. Slickensides were encountered in most fat clay (CH) and some lean clay (CL) soils.

Groundwater Conditions: Groundwater was not encountered in any of the boreholes during or upon completion of drilling.

The information in this report summarizes conditions found on the dates the borings were drilled. However, it should be noted that our groundwater observations are short-term; groundwater depths and subsurface soil moisture contents will vary with environmental variations such as frequency and magnitude of rainfall and the time of year when construction is in progress.

4.2 Hazardous Materials

No signs of visual staining or odors were encountered during field drilling or during processing of the soil samples in the laboratory. However, AEC notes that the presence of potential hazardous material at other locations along the project alignments cannot be discounted based upon the very small and limited number of samples taken.

4.3 Geologic Hazards

AEC performed a desk top fault study which included a review of public maps, available literature, and aerial photographs. The project alignment is not covered by the maps entitled "*Principal Active Faults of the Houston Area (after O'Neill and Van Siclen, May 1984)*", and "*Principal Surface Faults in the Central Houston Metropolitan Area (after O' Neill, Van Siclen, with additions by C. Norman, May 13, 2004)"*. AEC reviewed a University of Houston Master's Thesis entitled *A Geophysical Study of Active Faulting in Fort Bend County, Texas* concerning faulting in Fort Bend County, Texas (Schmidt, May 2013). According to the thesis, the following fault systems are located in Fort Bend County: the Addicks, the Longpoint, the Needville, the Pleak, the Thompsons, and the Arcola, along with some other short unnamed faults in the eastern portion of the county. The closest fault to the project alignment is the northeast-southwest oriented Pleak Fault located approximately 3.9 miles south of the southeastern end of the project alignment. This fault is too distant to have an impact on the project alignment.

Twenty-three Google Earth aerial photographs from 1985 to 2021 were reviewed. No evidence of faulting was observed from the review of the aerial photographs in or near the project alignment.

AEC does not recommend any further fault studies.

Limitations: The preliminary fault study investigation provided in this report is limited to a review of available literature, aerial photographs and maps, and limited field observations. Distances are scaled from maps. Faults may exist in, cross, or adjoin the project area which were not identified in this report due to the following reasons: limitations of the scope of work and cost; lack of documentation in the literature; the scale of the maps available; lack of visible displacement in the field; and not observed during the reconnaissance due to the presence of obscuring vegetation, man-made structures and environmental features, and modification of the land surface by human activities. Faults may also be present below ground but do not currently have surface expressions. Identification of these faults is beyond the scope of work for this study.

4.4 Subsurface Variations

It should be emphasized that: (i) at any given time, groundwater depths can vary from location to location, and (ii) at any given location, groundwater depths can change with time. Groundwater depths will vary with seasonal rainfall and other climatic/environmental events. Subsurface conditions may vary away from and between the boring locations.

Clay soils in the Greater Houston area typically have secondary features such as slickensides, calcareous and ferrous nodules, and contain sand/silt seams/lenses/layers/pockets/partings. It should be noted that the information in the boring logs is based on 3-inch diameter soil samples which were obtained continuously at intervals of 2 feet from the ground surface to the boring termination depths of 15 to 20 feet below grade. A detailed description of the soil secondary features may not have been obtained due to the small sample size and sampling interval between the samples. Therefore, while a boring log shows some soil secondary features, it should not be assumed that the features are absent where not indicated on the boring logs.

5.0 GEOTECHNICAL ENGINEERING RECOMMENDATIONS

According to the information provided by MEC, Stella Road along the project alignment is an existing 2 lane (one lane in each direction) asphalt roadway, which will be reconstructed to a new 2 lane (one lane in each direction) asphalt roadway with the main traffic lanes widened to 12 feet plus new 6 foot wide shoulders. The roadway will have roadside drainage swales. There will be a detention basin with a depth of 3.4 to 4.3 feet and slope inclination of H:V = 4:1 at the approximate mid-point of the alignment.

Design and Construction Standards: AEC performed the roadway design for Stella Road based on the May 2021 (Draft) FBC Engineering Design Manual (EDM). AEC has also referenced applicable Fort Bend County Construction Details (FBCCD) (dated March 1, 2022) wherever applicable for this project. For technical specifications, the FBCCD makes referrals to Harris County Standard Engineering Design Specifications (HCSEDS). AEC should be notified if different construction specifications should be used, so that our recommendations can be updated if necessary.

5.1 Roadway Reconstruction

The existing roadway along the project alignment is a two-lane (one lane in each direction) asphalt roadway (no shoulder) with roadside drainage swales. Based on drawings (dated April 21, 2022) prepared by MEC, the existing roadway will be reconstructed with two lanes (one lane in each direction), with the main lanes widened to 12 feet, plus 6 foot wide shoulders on each side of the roadway. The reconstructed roadway will have roadside drainage swales on both sides. Based on preliminary plan and profile drawings, AEC portions of the centerline of the new pavement will be placed at or near existing grade, although additional fill will need to be placed in some areas, such as within existing roadside swales to accommodate the roadway widening.

Fort Bend County's Engineering Design Manual (Draft) Requirements: Section 3.12 of the May 2021 FBC EDM requires that the minimum pavement structure for permanent asphalt roadways shall consist of a 3 inch asphalt surface, 8 inch asphalt stabilized base, and 8 inch thick stabilized subgrade.

Traffic Volume: AEC checked the FBC Engineering GIS, Texas A&M Transportation Institute (TTI) "Houston Regional Traffic Count Map", and the Texas Department of Transportation (TxDOT) "District Traffic Web Map" websites to determine the classification of the existing roadways within the project area and to check if any traffic count data was available. The FBC GIS website does not list Stella Road as either a 'collector' or 'major thoroughfare' roadway and traffic data for the Stella Road was not available at the time this report was prepared. The TTI and TxDOT websites also do not have traffic data for Stella Road, however it has 24 hour traffic volume counts for Cottonwood School Road with which Stella Road intersects. Traffic data for Cottonwood School Road are shown on Table 5 below.

Table 5. Summary of Available Traffic Data

Traffic Count Location	Year	24 Hour Traffic Volume (vpd)	Source of Traffic Data
1100 Cottonwood School Road	2006 2012	2,940 2,250	TTI
	2021	1,177	TxDOT

Form the traffic volume count from the TTI and TxDOT websites, it appears that the traffic volume on Cottonwood School Drive decreased from 2006 to 2021. However, traffic volume changes hour to hour, from weekdays to weekend, and season to season. AEC cannot validate the traffic volume decrease based on 24 hour volume counts from 2006, 2012, and 2021 unless further data becomes available. In the absence of other data, AEC conservatively used the 2006 traffic count data obtained from the TTI website for analyses. An annual traffic growth rate of 3 percent was assumed. A design life of 20 years was considered, which is typical for asphalt pavement roadways in the area. Based on the 2006 TTI traffic data and the assumed traffic volume growth rate, AEC estimated a 2022 ADT of 4,611 vpd. AEC should be notified if different traffic loads, design parameters, or pavement design life are required for pavement design at the site so that our recommendations can be updated accordingly.

5.1.1 Roadway Design Traffic Load

A traffic analysis was not available at the time this report was prepared and AEC understands that FBC is not planning to perform one for the Stella Road reconstruction project. As noted in Section 5.1 of this report, AEC has estimated roadway design traffic loading based on traffic count data from Cottonwood School Road in 2006, 2012, and 2021. **AEC notes that traffic data that is from an adjoining roadway should be considered *unreliable* for estimating the traffic loading on Stella Road. AEC recommends that a current traffic count be performed along the Stella Road alignment**, if possible, so that the roadway design traffic load estimate can be updated.

Estimated Traffic Loads: Pavement design is based on the anticipated design number of 18-kip Equivalent Single Axle Loads (ESAL) the pavement is subjected to during its design life. The equation to calculate the number of 18-kip ESAL repetitions to use for pavement design is presented in Equation (1). Assumptions made by AEC to estimate 18-kip ESAL repetitions are presented on Table 6.

$$\text{18-kip ESAL} = (ADT)(T)(T_f)(D)(L)(G)(Y)(365) \quad \text{.....Equation (1)}$$

where: ESAL = 18-kip Equivalent Single-Axle Load repetitions.
ADT = Average Daily Traffic, vehicles per day.
T = Percent of heavy trucks.
T_f = Truck factor.
D = Directional factor.
L = Lane factor.
G = Growth factor.
Y = Design life, in years.

Table 6. Traffic Volume Parameters for Asphalt Pavement Design

Traffic Parameter	Stella Road from Band Road to Cottonwood School Road
Average Daily Traffic (ADT) projected for 2022	4,611 vpd (conservatively estimated from 2006 data)
ADT projected for 2042	8,401 vpd
ADT Percent Heavy Duty Truck (T), FHWA Class 5 and higher	5% (assumed)
Truck Factor (T_f)	0.60 (assumed)
Directional Factor (D)	0.5 (two way road)
Lane Factor (L)	1.0 (one lane in each direction)
Total Growth Rate Factor (G)	1.34 (3% annual growth rate from 2022 to 2042, assumed)
Design Life (Y)	20 years (assumed)
Estimated 18-kip ESAL Loading over Design Life	**678,526**

AEC notes that the calculated number of 18-kip ESAL repetitions is highly sensitive to parameters such as percent heavy trucks, truck factor, and traffic volume growth rate in pavement design. Differences between assumed and actual traffic parameters can have significant effects on overall pavement thickness design and ultimate pavement performance. AEC should be notified if different traffic loads or design parameters are required for pavement design at the site so that our analysis can be updated accordingly.

5.1.2 Asphalt Pavement Design

Flexible pavement design procedure includes determination of the structural number (SN) for the proposed pavement, as well as the thickness of individual components of the surface course, base course, and subgrade. The basic equation developed by the AASHTO Road Test is:

$$SN = a_1(D_1) + a_2(D_2) + a_3(D_3) \quad \text{.....Equation (2)}$$

where: SN = Structural Number for the total flexible pavement structure.
a_1, a_2, a_3 = layer coefficients for surface, base, and subgrade course, respectively.
D_1, D_2, D_3 = thickness of surface, base, and subgrade course, respectively, in inches.

Layer coefficients used for design are presented on Table 7.

Table 7. Layer Coefficients for Asphalt Pavements

Pavement Layer	Layer Coefficient
Hot Mix Asphaltic Concrete (HMAC)	a1 = 0.44
Black Base	a2 = 0.34
Stabilized Subgrade*	a3 = 0.11

Note: (*) Subgrade stabilization recommendations are presented in Section 5.1.4 of this report.

The parameters that were used in computing the flexible pavement for the Stella Road are as follows:

Roadbed Soil Resilient Modulus (M_R)	1,500 psi
Drainage Coefficient (C_d)	1.0
Overall Standard Deviation (S_0)	0.45
Reliability Level (R)	90%
Initial Serviceability (P_0)	4.2
Terminal Serviceability (P_t)	2.5

AEC should be notified if different parameters are required for asphalt pavement design. As directed by MEC, AEC performed designs for two asphalt pavement sections. AEC first considered a pavement section that meets the FBC EDM minimum requirements and then estimated a service life based on the design roadway traffic load presented on Table 6 in Section 5.1.1 of this report. AEC then considered a pavement section that will provide a load capacity that meets the estimated 20 year design life roadway traffic load that was presented in Table 6. The pavement section that meets FBC EDM minimum thickness requirements is presented on Table 8.

Table 8. Asphalt Pavement Section based on FBC Minimum Thickness Requirement

Pavement Layer	Stella Road from Band Road to Cottonwood School Road
Hot Mix Asphaltic Concrete	3”

Pavement Layer	Stella Road from Band Road to Cottonwood School Road
Black Base (BB)	8”
Stabilized Subgrade*	8”
Structural Number (SN)	4.92
Pavement 18-kip ESAL Load Capacity	226,828
Estimated 18-kip ESAL Loading over Design Life (See Table 6)	678,526
Estimated Service Life	8 years

Note: (*) Subgrade stabilization recommendations are presented in Section 5.1.4 of this report.

Based on the DARWin v3.0 computer program, the pavement section presented in Table 8 should sustain 226,828 repetitions of 18-kip ESALs. As presented on Table 6 in Section 5.1.1 of this report, AEC estimated a traffic loading of 678,526 18-kip ESALs over a 20 year design life. Based on AEC’s current assumptions, AEC estimates that the service life of the FBC EDM minimum pavement section would be reached in about 8 years. As noted in Section 5.1.1 of this report, **AEC notes that our estimate of service life is based on traffic data from an adjacent roadway, as well as assumptions made without supporting data being available. The service life presented by AEC should therefore be considered a very rough estimate.**

As noted above, AEC performed a second pavement design which provides a load capacity that meets the estimated traffic loading of 678,526 18-kip ESALs over a 20 year design life. The pavement section that meets AEC’s estimated design loading is provided on Table 9 below.

Table 9. Recommended Asphalt Pavement Section based on 20 year Design Life

Pavement Layer	Stella Road from Band Road to Cottonwood School Road
Hot Mix Asphaltic Concrete	3.5”
Black Base (BB)	10”
Stabilized Subgrade*	8”
Structural Number (SN)	5.82

Pavement Layer	Stella Road from Band Road to Cottonwood School Road
Pavement 18-kip ESAL Load Capacity	760,267
Estimated 18-kip ESAL Loading over Design Life (See Table 6)	678,526

Note: (*) Subgrade stabilization recommendations are presented in Section 5.1.4 of this report.

Based on the DARWin v3.0 computer program, the pavement section presented on Table 9, should provide an estimated load capacity of 760,267 18-kip ESALs, which exceeds the estimated 20 year design traffic load. AEC notes that MEC's drawings (dated April 21, 2022) show a proposed pavement section that matches the section presented in Table 9 above.

The DARWin outputs for asphalt pavement are presented on Plate C-1 through C-3, in Appendix C, for reference. The design engineer should verify whether the proposed pavement section will provide enough ESALs for the anticipated amount of site traffic. AEC should be notified if different standards or constants are required for pavement design at the site, so that our recommendations can be updated accordingly.

Asphalt Pavement: HMAC pavement should be constructed in general accordance with Item 340 of the 2017 HCSEDS. The HMAC shall be placed and compacted in accordance with 'Compaction Criteria" requirements of Section 340.14 of HCSEDS Item 340, which is 3 to 8 percent air voids as determined by TxDOT test method Tex-207-F, Part III.

Black Base: Asphalt-stabilized (black) base shall be in accordance with Item 250 of the 2017 HCSEDS. The black base shall be placed and compacted in accordance with 'Compaction Criteria" requirements of Section 250.12 of HCSEDS Item 250, which is 3 to 8 percent air voids as determined by TxDOT test method Tex-207-F, Part III.

Prime Coat: The surface of the completed subgrade and base course should be primed in accordance with Item 310 of the 2017 HCSEDS.

5.1.3 Roadway Fill

For roadway areas that require fill to achieve final grade, existing pavement and base (if any), vegetation, trees, roots, organic soils, and other deleterious materials should first be removed and wasted. The exposed

soils should then be proof-rolled in accordance with Item 216 of the 2014 TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges to identify and remove any weak, compressible, or other unsuitable materials; such materials should be replaced with compacted clay fill. After proof rolling, compacted general clay fill should be used to raise existing grade to final grade.

For areas where new pavement will be placed, the top 8 inches of the exposed subgrade (after general clay fill has been placed) should then be stabilized with a minimum of 7 percent hydrated lime (by dry soil weight). Recommendations for lime subgrade stabilization and general clay fill are included in Sections 5.1.4 and 5.3.3 of this report, respectively.

5.1.4 Pavement Subgrade Preparation

As noted in Section 5.1 of this report, based on preliminary plan and profile drawings, AEC portions of the centerline of the new pavement will be placed at or near existing grade, although additional fill will need to be placed in some areas, such as within existing roadside swales to accommodate the roadway widening.

Based on Borings, B-2 through B-6, B-9, B-11, B-12, B-18, and B-19, the surficial soils along the existing Stella Road alignment primarily consist of lean/fat clay (CL/CH). However, more than 6 inches of clayey sand (SC) fill material was encountered at the ground surface in Borings B-2 and B-5, which AEC assumes is fill material placed for the original roadway construction, and AEC also assumes that this material will be left in place. In general, AEC anticipates that most of the pavement subgrade will require stabilization with hydrated lime. However, lime and fly ash stabilization will be required whenever clayey sand (SC) fill material is exposed along the roadway alignment.

Subgrade Preparation: Subgrade preparation should extend a minimum of 2 feet beyond the paved area perimeters. Existing pavement and base should be removed in accordance with Item 540 of the 2017 HCSEDS. Reclaimed asphalt pavement (RAP) can be reused for HMAC and/or asphalt-stabilized (black) base mixes in accordance with Items 340 and 250 of the 2017 HCSEDS, respectively. For new widening areas to be paved (that did not previously have pavement and base on top), a minimum of 3 inches of surface soils, existing vegetation, trees, roots, and other deleterious materials should be removed and wasted. The excavation depth should be increased when inspection indicates the presence of organics and deleterious materials to greater depths. The exposed soils should then be proof-rolled in accordance with Item 216 of the 2014 TxDOT Standard Specifications for Construction and Maintenance of Highways,

Streets, and Bridges to identify and remove any weak, compressible, or other unsuitable materials; such materials should be replaced with compacted clay fill. General clay fill recommendations are presented in Section 5.3.3 of this report.

After proof rolling, scarify the exposed subgrade to a depth of 8 inches and stabilize with either hydrated lime or lime fly ash, depending on type of exposed subgrade soil. Exposed clay should be stabilized with a minimum of 7 percent lime (by dry soil weight). Exposed sand or silt should be stabilized with a minimum of 3 percent hydrated lime and 7 percent fly ash (by dry soil weight). Lime and lime fly ash stabilization shall be performed in accordance with Items 220 and 223 of the 2017 HCSEDS, respectively. The percentage of lime and lime fly ash required for stabilization is a preliminary estimate for planning purposes only; laboratory testing (such as optimum lime content versus pH, in accordance with ASTM D6276) should be performed to determine optimum contents for stabilization prior to construction. The stabilized soils should be compacted to 95 percent of their ASTM D698 (Standard Proctor) dry density at a moisture content ranging from optimum to 3 percent above optimum.

5.1.5 Roadside Drainage Swales

Based on the drawings prepared by MEC, roadside drainage swales will be added on both sides of the new roadway. According to FBC EDM, a maximum slope inclination of H:V = 4:1 should be considered for the slope adjacent to the roadway, and a slope inclination of H:V = 3:1 for the slope on the opposite side can be considered. In general, AEC recommends that the flattest side slopes that are possible along the project alignments be used for swale design. Roadside drainage swale construction shall be performed in accordance with applicable 2018 FBCCD Construction Details.

5.2 Detention Basin

AEC notes that in April 2022, there were two detention basins shown on MEC's drawings that were available at the time Borings B-20 through B-23 were drilled. However, based on updated drawings provided by MEC in July 2022, the eastern detention basin (near the intersection of Stella Road and W. Fairground Road) was deleted from the project area. As a result, only Borings B-22 and B-23 are in the vicinity of the remaining west detention basin (near the S-curve at the mid-point of the project alignment).

Detention basin plan and cross section drawings (prepared by r.g. Miller Engineers) are presented on Plates D-1 and D-2, in Appendix D, for reference. The basin detention storage volume is 9.6 acre-feet (considering 1 foot of freeboard); the 100 year water surface elevation (WSE) is +94.20 feet Mean Sea Level (MSL). Top of bank around the basin has an elevation of +94.85 feet MSL. The toe of slope around the basin has an elevation range of +91.44 to +91.45 feet MSL. The bottom of basin flowline (i.e. pilot channels) is at an elevation of approximately +89.7 feet MSL. The resulting basin depths range from 3.4 to 4.3 feet, and the basin slopes will have an inclination of H:V = 4:1.

Soil and Groundwater Conditions in Basin Area: Based on Borings B-22 and B-23, the soil conditions in the detention basin area generally consist of stiff to hard fat clay (CH), considering a basin depth of 3.4 to 4.3 feet. Groundwater was not encountered in the borings during drilling.

5.2.1 Slope Stability Analysis

Based on AEC's borings and the basin cross section drawings (see Plate D-2, in Appendix D), AEC selected the southeast bank (closest to the Stella Road S-curve) of the detention basin (using Cross Section A-A) as the 'most critical' section to perform basin slope stability analysis on. AEC performed the slope stability analyses based on three different conditions: the short-term condition, long-term condition, and rapid drawdown condition. Based on AEC's previous discussions with the Fort Bend County Drainage District (FBCDD), there are no minimum factor of safety (FS) requirements for slope stability analyses for detention basins in Fort Bend County. AEC should be notified if FBCDD has different requirements so that our analyses can be revised if necessary.

Clay Desiccation Zone: AEC notes that the clay soils present in the top 10 feet of Borings B-22 and B-23 predominantly consist of fat clay (CH). These clays have plasticity indices that range from 41 to 57, indicating that the clay soils have high to very high expansive potential (see "Degree of Plasticity of Cohesive Soils" on Plate A-27, in Appendix A). Exposing these clays to the atmosphere and cycles of wetting-drying from seasonal moisture changes will result in desiccation, cracking, and a reduction in their shear strengths, which in turn will result in progressive slope movement and eventual slope failure. For fat clay soils, we considered a desiccation zone of approximately 8 feet below the ground/slope surface. For fat clay within the desiccation zone, we estimated effective stress residual shear strengths (c'_r and ϕ'_r) to evaluate slope stability for both the long-term condition and rapid drawdown condition based on A. Saleh and S. Wright (1977). We also reduced the c' and c_{cu} of lean clay soils (with a PI greater than 20) within the

non-desiccated (i.e. weathered) zone based on a combination of methods by G. Mesri (1999) and S. Wright (2005).

Soil Parameters: Soil parameters used in the analyses include moist unit weights, unconsolidated-undrained (UU) shear strengths, effective stress shear strength (developed using total stress parameters and pore water pressure measurements), and total stress shear strength obtained from consolidated-undrained (CU) triaxial tests. Design soil parameters used for AEC's slope stability analyses on the southeast bank of the detention basin are presented on Plate D-3, in Appendix D.

We used the Simplified Bishop Method of Slices option in the 2021 GeoStudio (SLOPE/W) computer program to analyze slope stability for 2-dimensional limiting equilibrium. The program has the capability to compute pore water pressures based on a defined piezometric surface.

Groundwater Level: For the analyses, we considered different groundwater conditions for short-term, long-term, and rapid drawdown conditions. Since groundwater was not encountered in Borings B-22 or B-23 during drilling, a groundwater table was not considered for either the short term or long term condition. For rapid drawdown condition, AEC considered the groundwater level to be at the ground surface, from top of the slope to the proposed basin bottom; this models a post-flood condition, where the basin fills with stormwater and then drains quickly, before pore-water pressures in the slope are allowed to dissipate.

Required Safety Factor: Stability analyses for the basin slopes were conducted for the short-term (end-of-construction), long-term, and rapid drawdown conditions. A brief description of these conditions is presented below:

1. Short Term/End-of-Construction Condition - This condition models rapid construction loading taking place, so that there is no time for the induced excess pore water pressure to dissipate or for consolidation to occur during the loading period. UU shear strength parameters were used for this analysis.

2. Long-Term Condition - This condition models long-term steady seepage through embankments and the long-term stability of slopes in stiff clays. Effective stress shear strength parameters (obtained from CU triaxial tests with pore water pressure measurements) were used for this analysis.

3. Rapid Drawdown Condition - Most slope failures in the Gulf Coast area occur under rapid drawdown conditions. This condition models when the slope becomes fully saturated and

consolidated and is at equilibrium with the existing stress system, then encounters rapid drawdown and simultaneously allows no drainage to occur. Total stress shear strength parameters (obtained from CU triaxial tests) were used for this analysis.

Basin Slope Stability: Using the soil information encountered in Boring B-23, AEC performed slope stability analyses on the southeast bank of the basin based on the "A-A" cross-section presented on r.g. Miller Engineers drawings (see Plate D-2, in Appendix D). Design soil parameters used for the slope stability analyses are presented on Plate D-3, in Appendix D. A 300 psf construction surcharge was added to the top of bank for the short-term condition while a 250 psf surcharge was added to the top of the bank for the long-term and rapid drawdown conditions.

The results of the basin slope stability analyses under short-term, long-term, and rapid drawdown conditions are presented on Plates D-4 through D-9, in Appendix D. A summary of the FS for the proposed basin slopes under short-term, long-term, and rapid drawdown conditions is presented on Table 10.

Table 10. Detention Basin Slope Stability Analysis Results (Based on Boring B-23)

Section Analyzed	Estimated Minimum Factor of Safety (FS)		
	Short-Term	Long-Term	Rapid Drawdown
Southeast Bank of Basin, H:V = 4:1, Global Slide	17.66 (Plate D-4)	2.22 (Plate D-6)	1.52 (Plate D-8)
Southeast Bank of Basin, H:V = 4:1, Local Slide	19.43 (Plate D-5)	1.85 (Plate D-7)	1.31 (Plate D-9)

5.2.2 Protection of Basin Slopes and Bottom

Erosion Protection: Based on AEC's borings, most of the soils that will be encountered in the basin slopes and bottom areas will consist of stiff to hard fat clay (CH) soils with low erosion potential. AEC does not anticipate that erosion protection (such as riprap, liners, or articulating blocks) will be required for the basin slopes or bottom.

Dispersive Soils: Based on the results of the crumb dispersion tests (see Table 2 in Section 3.0 of this report), the soils within the proposed basin consist of non-dispersive clays. Additional remediation of the basin slopes or bottoms for potentially dispersive soils is not required.

5.2.3 Basin Excavation

Basin Soil and Groundwater Conditions: Considering a basin depth ranging from 3.4 to 4.3 feet below grade, AEC anticipates that the basin excavation will generally encounter stiff to hard fat clay (CH) soils. Since groundwater was not encountered in Borings B-22 and B-23 (or any of AEC's borings), AEC does not anticipate that groundwater will be encountered during basin excavation. However, there could still be some groundwater seepage into the excavation; open drainage method (such as sump and pump) will likely be sufficient for groundwater control, if necessary. However, if the seepage rate into the excavation is insufficient for open drainage method to control, then pre-drainage method (such as ejector/eductor type systems) may be necessary. Generalized groundwater control recommendations are presented in Section 6.2 of this report.

Excavations: The contractor should be responsible for designing, constructing, and maintaining safe excavations and protecting existing structures in the vicinity of the proposed detention basin. Excavations should be in accordance with OSHA, Safety and Health Regulations, 29 CFR, Part 1926, Subpart P (Excavation and Trenches).

We recommend that the surcharge on the basin banks be limited to 300 psf or less during construction. AEC recommends that general clay fill be used for basin berm construction. If fill will be placed on slopes steeper than H:V = 4:1, then the slopes should be cut back into benches to provide a good construction joint between the existing soil and new fill. Where possible, each bench should be a minimum of 8 feet wide and a maximum of 3 feet high. Voids in the excavated slopes (if any) should be backfilled with general clay fill in accordance with Section 5.3.3 of this report.

Re-use of Basin Borrow Soil as Select Clay Fill: Based on Borings B-22 and B-23, none of the clay soils that will be excavated in the basin area (considering a basin depth of 3.4 to 4.3 feet) meet the requirements of select clay fill, as presented in Section 5.3.2 of this report. AEC recommends that the excavated basin soils be limited to use as general clay fill soil only, as presented in Section 5.3.3 of this report. Alternatively, the excavated soil can be treated with lime and then used as lime-stabilized clay, in accordance with Section 5.3.1 of this report.

5.3 Fill Requirements

5.3.1 Lime Stabilized Clay

Soils Stabilized with Hydrated Lime: AEC prefers that lime-stabilized clay be used as structural fill. Either: (i) imported lime-stabilized clay soils (stabilized offsite before delivery to the project site); or (ii) clay soils excavated onsite and treated with hydrated lime can be used. Clay soils excavated onsite should first be stabilized with a minimum of 7 percent hydrated lime (by dry soil weight). The amount of hydrated lime provided in this report is for estimation purposes only. The actual amount of lime required for stabilization should be determined by lime-series curve or pH method in a laboratory prior to construction. Lime stabilization should be done in general accordance with Item 220 of the 2017 HCSEDS. AEC prefers using stabilized soil as structural fill since compacted stabilized soil generally has high strength, low compressibility, and relatively low permeability.

Lifts and Compaction: Lime-stabilized clay fill should be placed in loose lifts not exceeding 8 inches in thickness. Backfill within 3 feet of walls or columns should be placed in loose lifts no more than 4-inches thick and compacted using hand tampers, or small self-propelled compactors.

Lime-stabilized clay should be compacted to a minimum of 95 percent of the ASTM D 698 (Standard Proctor) maximum dry unit weight at a moisture content ranging between optimum and 3 percent above optimum.

5.3.2 Select Clay Fill

'Select' Clay Fill: It is AEC's experience that 'select' clay fill material imported from sand and clay pits in the Greater Houston area is generally non-homogenous (i.e., composed of a mixture of sands, silts, and clays, instead of a homogenous sandy clay material) and of poor quality, and either contains too much sand or has large clay clods with high expansive potential. Use of this non-homogenous soil can result in poor long term performance of structures and pavements placed on top of the fill.

Precautions: Prior to construction, the Contractor should determine if they can obtain qualified select clay fill meeting the below select fill criteria. The closest sand and clay pit to the project site may not be able to deliver fill material that meets the requirements below. The Contractor should also be aware

that testing of select clay fill (see below) typically takes a minimum of 1.5 days to complete and they should accommodate testing in their fill placement in their project schedule. In addition, imported fill that is delivered to the project site may vary from day to day; material delivered to the site may pass one day but fail the next.

AEC notes that although lime-stabilized clay (see Section 5.3.1 of this report) may have a higher material and/or labor cost compared to select clay fill; the delays associated with locating, testing, and approving qualified select clay fill may exceed the costs of using lime stabilized clay instead. Potential risks associated with importing poor quality fill material to the site include: (i) accepting delivery of fill material that does not meet specifications, which could end up as wasted material if there is no use for it in other applications; (ii) removal of already placed lifts of compacted soil prior to laboratory testing results becoming available, resulting in schedule delays; and (iii) bringing additional equipment onsite to further manipulate the fill, such as a pulvimixer.

Requirements: Select clay fill (whether imported from offsite or if it is already onsite) should consist of *uniform*, non-active inorganic lean clays with a PI between 10 and 20 percent, and more than 50 percent passing a No. 200 sieve. Material intended for use as select fill shall not have clay clods with PI greater than 20, clay clods greater than 2 inches in diameter, or contain sands/silts with PI less than 10. Sand and clay mixtures/blends are unacceptable for use as select fill. Sand/silt with clay clods is unacceptable for use as select fill. Mixing sand into clay or mixing clay into sand/silt is also unacceptable for use as select fill. **The testing lab shall *reject* any material intended for use as select fill that does not meet the PI, sieve, and clay clod requirements above, without exceptions.**

Lifts and Compaction: All material intended for use as select fill should be tested prior to use to confirm that it meets select fill criteria. The fill should be placed in loose lifts not exceeding 8 inches in thickness. Backfill within 3 feet of walls or columns should be placed in loose lifts no more than 4-inches thick and compacted using hand tampers, or small self-propelled compactors.

Select fill should be compacted to a minimum of 95 percent of the ASTM D 698 (Standard Proctor) maximum dry unit weight at a moisture content ranging between optimum and 3 percent above optimum.

5.3.3 General Clay Fill

General Clay Fill: AEC recommends that general clay fill consist of a clean, cohesive soil (USCS Classification "CL" or "CH"). Granular soils (i.e., sands, silts, and gravel; not more than 50 percent retained on No. 200 sieve) should not be used as general clay fill.

General clay fill should be placed in loose lifts not exceeding 8 inches in thickness. General clay fill should be compacted to 95 percent of its ASTM D 698 (Standard Proctor) maximum dry unit weight at a moisture content ranging between optimum and 3 percent above optimum.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Site Preparation

To mitigate site problems that may develop following prolonged periods of rainfall, it is essential to have adequate drainage to maintain a relatively dry and firm surface prior to starting any work at the site. Adequate drainage should be maintained throughout the construction period. Methods for controlling surface runoff and basining include proper site grading, berm construction around exposed areas, and installation of sump pits with pumps.

6.2 Groundwater Control

The need for groundwater control will depend on the depth of excavation relative to the groundwater depth at the time of construction. If there is heavy rain prior to or during construction, the groundwater table may be higher than indicated in this report; higher seepage is also likely and may require a more extensive groundwater control program. In addition, groundwater may be pressurized in certain areas of the alignment, requiring further evaluation and consideration of the excess hydrostatic pressures. Groundwater control should be in general accordance with Item 436 of the 2017 HCSEDS.

The Contractor should be responsible for selecting, designing, constructing, maintaining, and monitoring a groundwater control system and adapt his operations to ensure the stability of the excavations. Groundwater information presented in Section 4.1 of this report and elsewhere, along with consideration for potential environmental and site variation between the time of our field exploration and construction, should

be incorporated in evaluating groundwater depths. The following recommendations are intended to guide the Contractor during design and construction of the dewatering system.

Groundwater control methods typically can be classified into three categories: (i) open pumping, where water is allowed to flow into an excavation and is collected in ditches or sumps and pumped away; (ii) predrainage, where the water table is lowered before excavation using wellpoints, ejector/eductor systems, deep wells, etc.; and (iii) cut off or exclusion, where the groundwater is prevented from entering the excavation by an impermeable barrier, such as by sheet piling, grouting, deep soil mixing, ground freezing, slurry shields, etc.

Cohesive Soils: Groundwater control in cohesive soils can typically be performed using open pumping methods. Seepage rates are lower than in granular soils and groundwater is usually collected in sumps and/or channeled by gravity flow to storm sewers. If cohesive soils contain significant secondary features, seepage rates will be higher. This may require larger sumps and drainage channels, or if significant granular layers are interbedded within the cohesive soils, methods used for granular soils may be required. Where it is present, pressurized groundwater will also yield higher seepage rates.

Granular Soils: Groundwater control in granular soils will typically require predrainage methods or cutoff/exclusion methods. For excavations that are less than 15 feet deep that will occur within saturated sands, a predrainage method such as wellpoints can be considered. For excavations that are greater than 15 feet deep, other predrainage methods that can be considered include multiple staged wellpoints, ejectors/eductors (primarily for use when silty soils are present), or deep wells with submersible pumps. Generally, with predrainage methods, the groundwater depth should be lowered at least 3 feet below the excavation bottom to be able to work on a firm surface when water-bearing granular soils are encountered.

If predrainage methods cannot be used, then a cutoff/exclusion method such as interlocking water-tight sheet piles, drilled shaft/secant pile wall (with grout between the shafts/piles), or jet grouting of the granular strata may be necessary.

Extended Dewatering: Extended and/or excessive dewatering can result in settlement of existing structures in the vicinity of the dewatering operations; the Contractor should take the necessary precautions to minimize the effect on existing structures in the vicinity of the dewatering operation. We recommend that the Contractor verify the groundwater depths and seepage rates prior to and during construction and retain

the services of a dewatering expert (if necessary) to assist them in identifying, implementing, and monitoring the most suitable and cost-effective method of controlling groundwater.

Bottom Heave or Boiling: For excavation in cohesive soils, the possibility of bottom heave must be considered due to the removal of the weight of excavated soil. In lean and fat clays, heave normally does not occur unless the ratio of Critical Height to Depth of Cut approaches one. In silty clays, heave does not typically occur unless an artificially large head of water is created using impervious sheeting in bracing the cut. If the excavation extends below groundwater and the soils at or near the bottom of the excavation are mainly sands or silts, the bottom can fail by blow-out (boiling) when a sufficient hydraulic head exists. The potential for boiling or in-flow of granular soils increases where the groundwater is pressurized. To reduce the potential for boiling of excavations terminating in granular soils below pressurized groundwater, the groundwater table should be lowered at least 3 feet below the excavation.

Perched Water (If Present): Although it may be present at a shallower depth than the normal groundwater level, perched water should still be considered a form of groundwater. If perched water is encountered during the construction phase, the groundwater control methods mentioned above would still be the same. Depending on the size of the perched reservoir and recharge rates, the contractor should not assume that perched water can be completely dewatered during a normal construction period.

6.3 Construction Monitoring

Pavement construction and subgrade preparation, as well as excavation of detention basin should be monitored by qualified geotechnical professionals to check for compliance with project documents and changed conditions, if encountered. AEC should be allowed to review the design and construction plans and specifications prior to release to check that the geotechnical recommendations and design criteria presented herein are properly interpreted.

7.0 LIMITATIONS

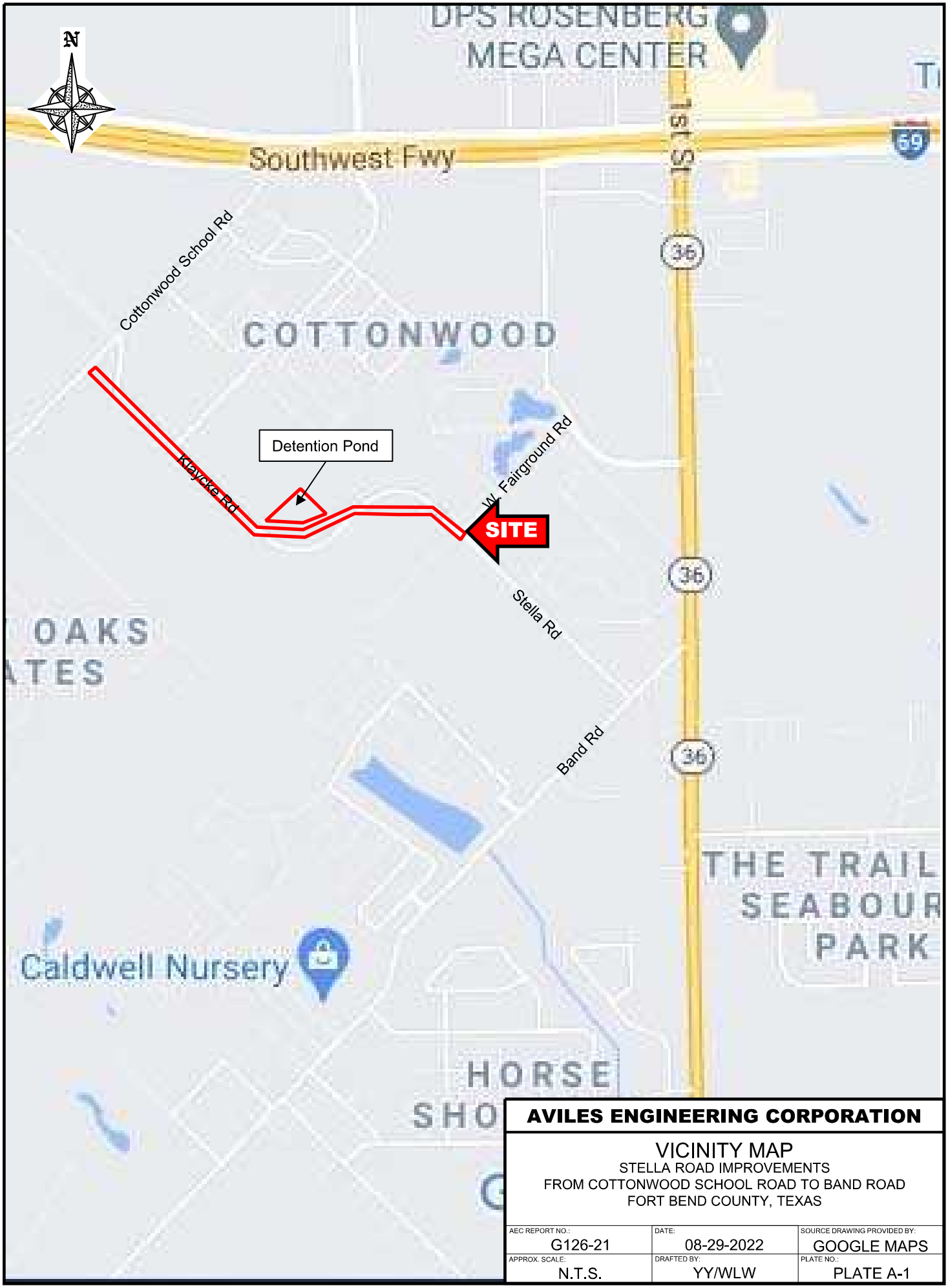
The information contained in this report summarizes conditions found on the dates the borings were drilled. The attached boring logs are true representations of the soils encountered at the specific boring locations on the dates of drilling. Reasonable variations from the subsurface information presented in this report should be anticipated. If conditions encountered during construction are significantly different from those

presented in this report; AEC should be notified immediately.

This investigation was performed using the standard level of care and diligence normally practiced by recognized geotechnical engineering firms in this area, presently performing similar services under similar circumstances. This report is intended to be used in its entirety. The report has been prepared exclusively for the project and location described in this report. If pertinent project details change or otherwise differ from those described herein, AEC should be notified immediately and retained to evaluate the effect of the changes on the recommendations presented in this report and revise the recommendations if necessary. The recommendations presented in this report should not be used for other structures located along the alignments or similar structures located elsewhere, without additional evaluation and/or investigation.

AVLES
ENGINEERING CORP.

APPENDIX A

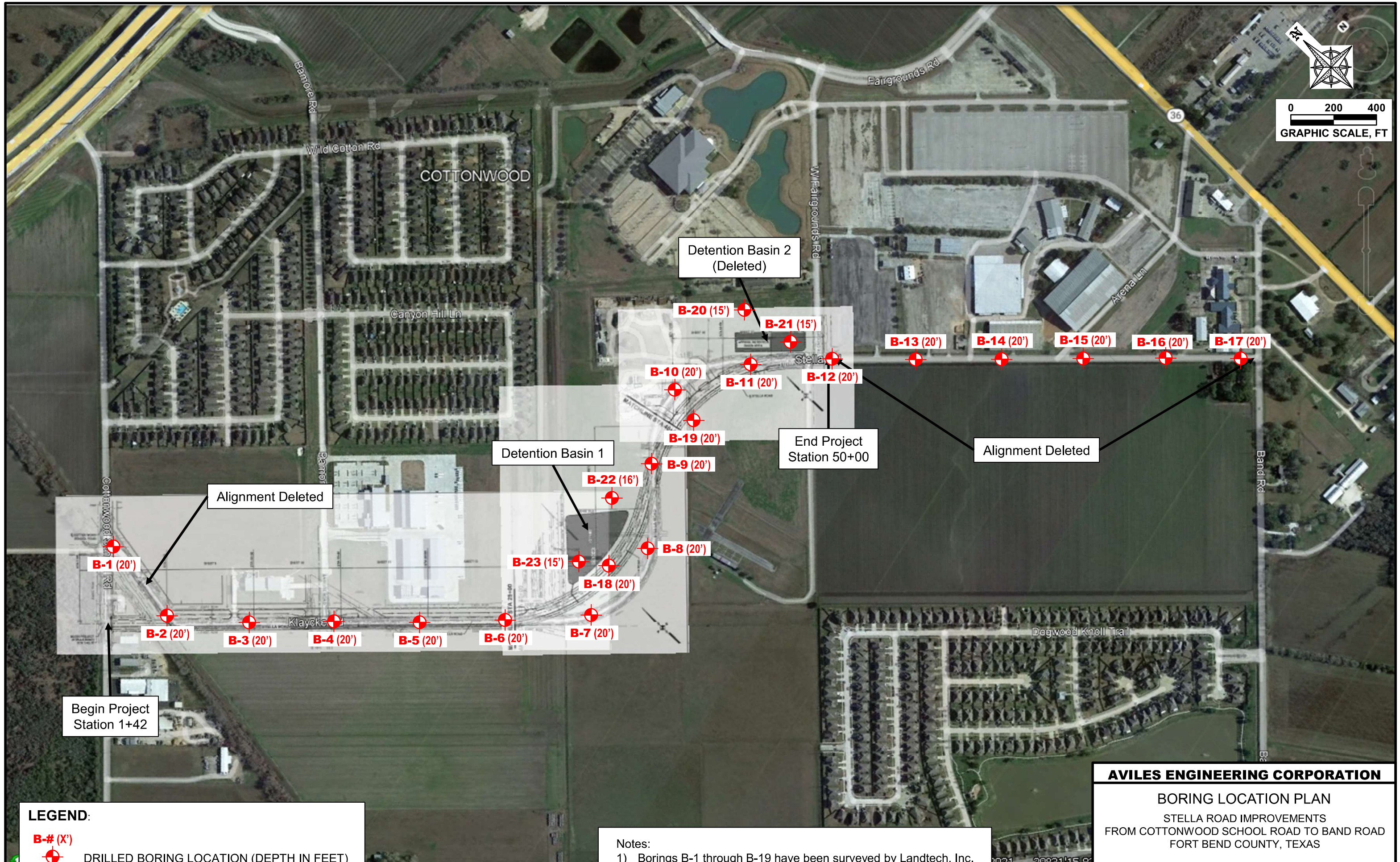


AVILES ENGINEERING CORPORATION

VICINITY MAP

STELLA ROAD IMPROVEMENTS
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
FORT BEND COUNTY, TEXAS

AEC REPORT NO.:	DATE:	SOURCE DRAWING PROVIDED BY:
G126-21	08-29-2022	GOOGLE MAPS
APPROX. SCALE:	DRAFTED BY:	PLATE NO.:
N.T.S.	YY/WLW	PLATE A-1



LEGEND:

B-# (X') DRILLED BORING LOCATION (DEPTH IN FEET)

Notes:
1) Borings B-1 through B-19 have been surveyed by Landtech, Inc.
2) Site plan is 'best fit' to aerial.

AVILES ENGINEERING CORPORATION

BORING LOCATION PLAN

STELLA ROAD IMPROVEMENTS
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
FORT BEND COUNTY, TEXAS

AEC PROJECT NO.:	DATE:	SOURCE DRAWING PROVIDED BY:
G126-21	08-29-2022	GOOGLE EARTH
SCALE:	DRAFTED BY:	PLATE NO.:
1" = 400'	WLW	PLATE A-2

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-1**

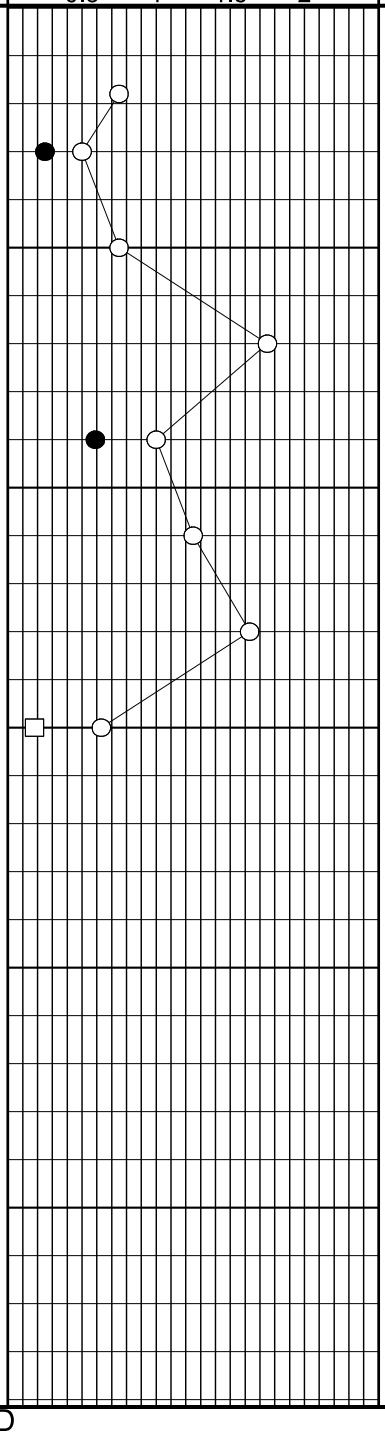
DATE **6/10/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 5.5" asphalt							
			Base: 6" gravel							
			Subbase: 7.75" stabilized sand		35		96	67	25	42
			Soft to very stiff, dark gray Fat Clay (CH), with slickensides		41	79.6				
4			-with ferrous nodules 2'-12'							
			-tannish gray 4'-6', with calcareous nodules 4'-12'		32					
			-dark brown and gray 6'-8'		25		96	60	19	41
8			-tannish gray 8'-10'		30	94.1				
			-tan, with calcareous powder pockets 10'-12'		24					
12			Soft to very stiff, tan and gray Lean Clay (CL), with calcareous nodules		17			40	15	25
			-with calcareous powder pockets 12'-14'							
			-with silty clay pockets and and silt seams 14'-16'		19					
16			Loose to medium dense, tan Silty Sand (SM), wet	13	22					
			-tan and light gray, with fat clay seams 18'- 20'	10	28		45			
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE**

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY/DN**

PROJECT NO. G126-21 **PLATE A-3**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-2**

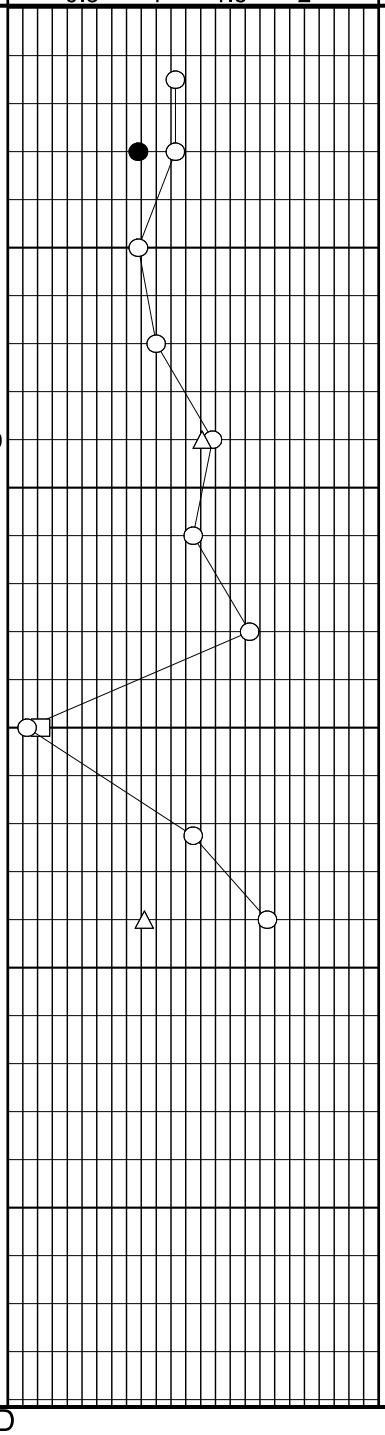
DATE **6/10/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 3.5" asphalt		8					
			Base: 8.5" stabilized sand and gravel		13		26	36	22	14
			Fill: brown Clayey Sand (SC), with gravel -with fat clay seams 1.5'-2'							
			Stiff to very stiff, gray Fat Clay (CH), with ferrous nodules		26	98.6				
4					25					
			-tan and gray, with calcareous nodules 6'-8'		21			63	19	44
8			Very stiff, tan and gray Lean Clay (CL), with fat clay and calcareous powder pockets, and calcareous and ferrous nodules		17	112.9				
			Very stiff, tan Silty Clay (CL-ML), with lean clay pockets, calcareous nodules, and ferrous stains		17					
12			Very stiff, tan Sandy Lean Clay (CL), with sandy silt partings, silty clay pockets, calcareous nodules, and ferrous stains		16		70	27	16	11
			Tan Sandy Silt (ML), with lean clay pockets, calcareous nodules, and ferrous stains		21					
16			Firm to very stiff, tan Lean Clay (CL), with silt and calcareous powder pockets, and calcareous nodules	7	24		97			
			Stiff to very stiff, reddish tan Fat Clay (CH), with slickensides, silt pockets, and calcareous nodules		26	97.3				
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY/DN**

PROJECT NO. G126-21 **PLATE A-4**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-3**

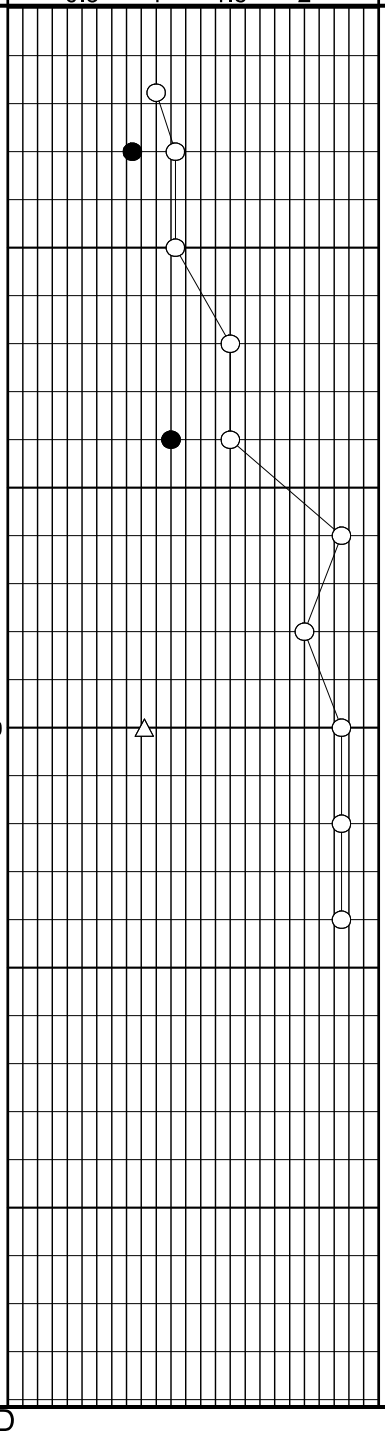
DATE **6/10/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 4.5" asphalt							
			Base: 14" stabilized sand with gravel		10					
			Fill: dark gray Clayey Sand (SC), with gravel		10		36	63	20	43
			Fill: stiff to very stiff, dark gray Fat Clay (CH), with gravel		25	97.1				
4			-with sand seams 4'-6'		24					
			Very stiff, gray Fat Clay (CH), with slickensides							
			-with ferrous nodules 6'-10'		22			57	16	41
8			-grayish tan, with calcareous nodules 8'-10'		25	99.3				
			Very stiff to hard, reddish brown Lean Clay (CL), with calcareous nodules, pockets, and seams		17					
12			-with silt pockets and ferrous stains 12'-14'		18			39	16	23
			Stiff to hard, reddish tan Fat Clay (CH), with slickensides				96			
			-with silt seams 14'-16'		16	114.9				
16			-with calcareous nodules 16'-20'		25					
					25			61	22	39
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY/DN**

PROJECT NO. G126-21 **PLATE A-5**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-4**

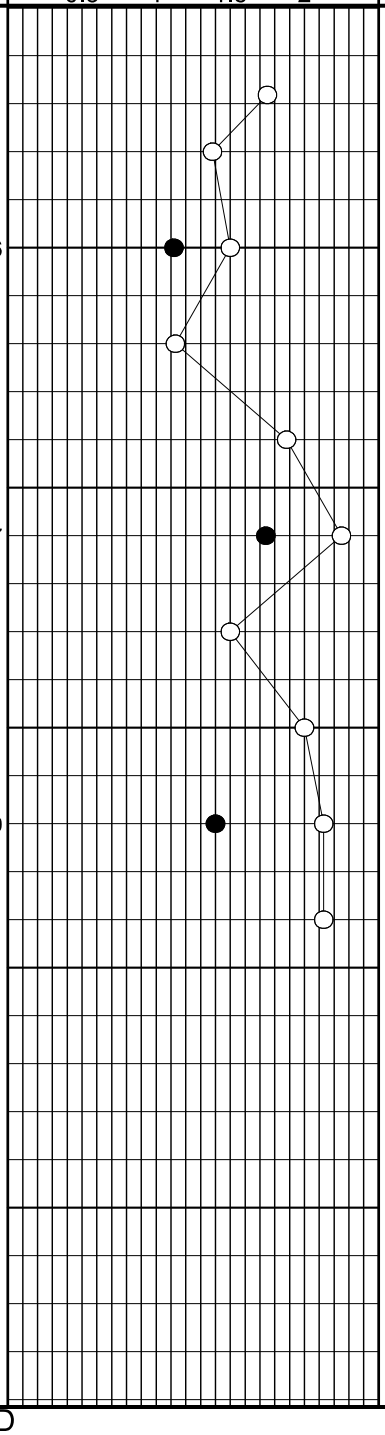
DATE **6/10/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			*GRID Coordinates (US Survey ft):* *Texas State Plane Zone: 4204* *Easting: 2978079.39* *Northing: 13751439.93* *Elevation: 97.58* Pavement: 3.5" asphalt							
			Base: 6" sand and gravel							
			Pavement: 2.5" asphalt		26					
			Subbase: 7.5" sand and gravel							
			Very stiff to hard, dark gray Fat Clay (CH) -with sandy lean clay partings 1.6'-2' and ferrous nodules 1.6'-10'		24		96	67	17	50
4			-gray, with calcareous nodules 2'-4'		23	101.6				
			-tan and grayish tan 6'-8', with calcareous nodules 6'-12'		24					
8			-brown and gray 8'-10', with calcareous powder pockets 8'-12'		20		89	56	17	39
			-tan 10'-12'		16	113.7				
12			Very stiff, reddish tan Silty Clay (CL-ML), with ferrous and calcareous nodules, and fat clay pockets		19					
			Very stiff, tan and light gray Lean Clay (CL), with calcareous nodules and powder pockets		16			47	17	30
16			Very stiff to hard, tan and light gray Fat Clay (CH), with slickensides -with calcareous nodules 16'-18' -with calcareous powder pockets 18'-20'		23	102.9				
					24					
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY/DN**

PROJECT NO. G126-21 **PLATE A-6**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-5**

DATE **6/10/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 4.5" asphalt							
			Base: 15" stabilized sand with gravel		12					
			Fill: gray Silty Clayey Sand (SC-SM), with gravel		7		15	24	20	4
			-with fat clay seams and lime pockets 2'-4'		8					
4			Stiff to hard, gray and dark gray Fat Clay (CH)							
			-with ferrous nodules 4'-6'		25	96.0				
			-gray, with calcareous nodules 6'-8'				95	62	18	44
					24					
8			-light grayish tan 8'-10'							
					27					
			-tan and grayish tan, with calcareous and ferrous nodules, and lean clay pockets 10'-12'		19	109.0				
12			Hard, tan Lean Clay (CL), with calcareous nodules and powder pockets		15			39	16	23
			Very stiff to hard, tan Fat Clay (CH), with slickensides		26					
16			-with calcareous nodules and ferrous stains 14'-18'							
			-tan and gray 16'-20'		21	108.4				
					25			65	25	40
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY/DN**

PROJECT NO. G126-21 **PLATE A-7**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-6**

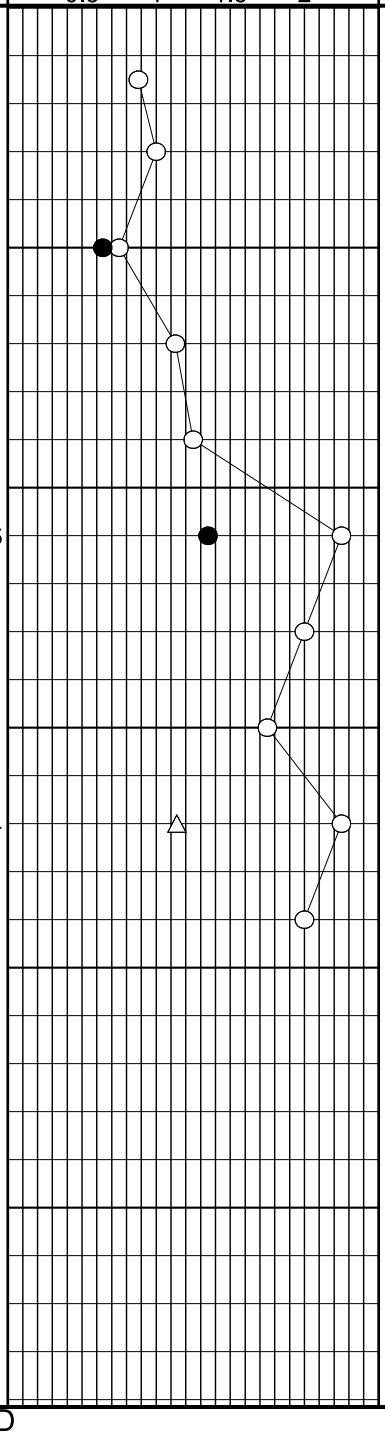
DATE **6/9/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 7" asphalt		8					
			Base: 5" stabilized sand and gravel		22		93	46	15	31
			Fill: stiff to very stiff, dark brown Lean Clay (CL), with gravel		24					
			-with ferrous nodules 1'-2'							
4			-with fat clay seams 2'- 4'							
			Stiff to hard, gray and dark gray Fat Clay (CH), with slickensides		28	93.5				
			-with ferrous nodules 4'-14'							
			-tannish gray 6'-8', with calcareous nodules 6'-16'		26			68	19	49
8			-tan 8'-14'							
					26					
			-with calcareous powder pockets 10'-12'							
					17	111.5				
12							92	55	17	38
					19					
			-reddish tan 14'-18', with silt partings 14'-16'							
					22					
16			-with ferrous stains 16'-18'							
					27	100.4				
			-tan and light gray, with silt partings 18'-20'					56	19	37
20					22					
			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY/DN**

PROJECT NO. G126-21 **PLATE A-8**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-7**

DATE **6/9/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	SHEAR STRENGTH, TSF (△ Confined Compression, ● Unconfined Compression, ○ Pocket Penetrometer, □ Torvane; 0.5 1 1.5 2)	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 5" asphalt								
			Base: 12" stabilized sand and gravel		6						
			Fill: hard, brown and dark gray Sandy Lean Clay (CL), with gravel		14			52			
			Fill: very stiff, dark brown Fat Clay (CH), with gravel and lean clay seams		23				61	20	41
4			Stiff to hard, dark gray Fat Clay (CH), with slickensides -with ferrous nodules 4'-6'		30	91.9					
					29						
8			-gray 8'-10', with ferrous nodules 8'-12'		30			96	71	21	50
			-tan 10'-12', with calcareous nodules 10'-14'		24	99.7					
12			-reddish tan 12'-16'		20						
					24				62	23	39
16			-tan and gray 16'-20', with calcareous nodules 16'-18'		25	102.8					
			-with silt partings 18'-20'		22						
20			Termination Depth = 20 feet								
24											
28											

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY/DN**

PROJECT NO. G126-21 **PLATE A-9**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-8**

DATE **6/9/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 4" asphalt							
			Base: 14.5" stabilized sand							
			Fill: stiff to very stiff, dark gray Fat Clay (CH), with gravel and sand pockets		28		97	76	24	52
			Stiff to hard, dark gray Fat Clay (CH), with slickensides		36	86.2				
4			-with ferrous nodules 2'-4'		31					
					32		97	85	24	61
8			-gray 8'-10', with calcareous nodules 8'-12'		32	90.7				
			-reddish tan and light brown 10'-12'		30					
12			-tan 12'-14'		24			61	20	41
			-tan and light gray, with calcareous powder pockets 14'-16'		22	103.6				
16			-reddish tan and gray, with silt seams 16'-18'		24					
			-tan and gray, with sandy silt seams 18'-20'	26	20		97			
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY/DN**

PROJECT NO. G126-21 **PLATE A-10**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-9**

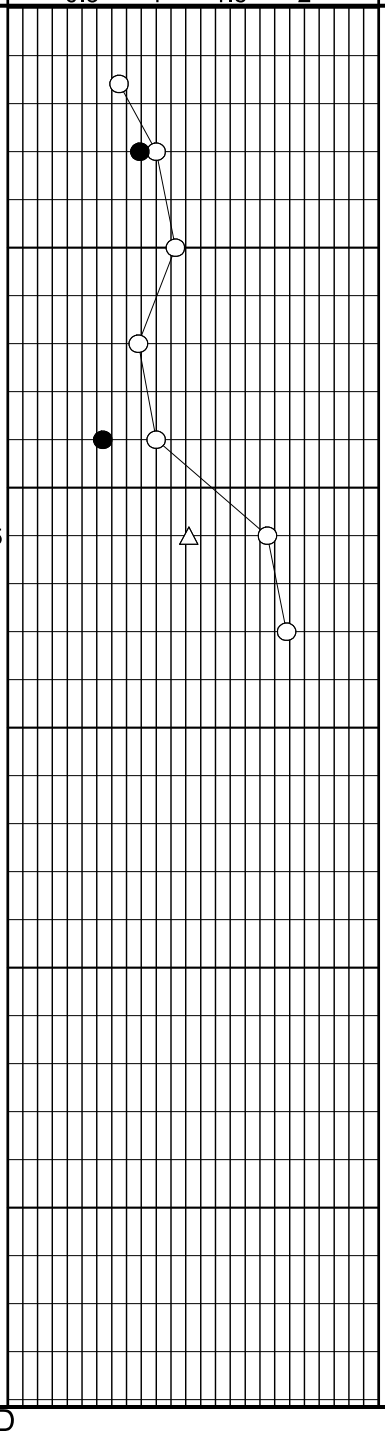
DATE **6/8/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 4" asphalt		6					
			Base: 10" stabilized sand and gravel		32		96	63	26	37
			Fill: stiff, dark brown Fat Clay (CH), with gravel and lean clay pockets		34	85.9				
4			Stiff to very stiff, dark gray Fat Clay (CH), with slickensides		33					
			-with ferrous nodules 6'-12'		32			90	25	65
8			-tan and gray, with calcareous nodules 8'-10'		31	91.1				
			-tan 10'-12'		22	103.5				
12			Very stiff, tan Lean Clay (CL), with sandy silt partings		15		89	31	14	17
			Medium dense to dense, tan Sandy Silt (ML)	35	7					
16			-with cemented sand nodules 16'-18'	31	9					
			-with lean clay seams 18'-20'	28	10		60			
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY**

PROJECT NO. G126-21 **PLATE A-11**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-10**

DATE **6/8/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 4" asphalt		5					
			Base: 8" stabilized sand and gravel		7		21	33	17	16
			Fill: dark brown Clayey Sand (SC), with gravel -gray 2'-3'							
4			Stiff to hard, dark gray Fat Clay (CH), with slickensides -with ferrous nodules 4'-12'		39	84.6				
					39					
					36		96	83	26	57
8			-tan and gray, with calcareous nodules 8'-10'		36	85.9				
			-tan 10'-14'		28					
12					26			65	27	38
			-tan and light gray 14'-20'		29	98.4				
16					28					
					24			60	26	34
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2

GRID Coordinates (US Survey ft):
Texas State Plane Zone: 4204
Easting: 2980400.76
Northing: 13751072.08
Elevation: 96.26

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽
WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼
DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY**

PROJECT NO. G126-21 **PLATE A-12**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-11**

DATE **6/8/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

GRID Coordinates (US Survey ft):
Texas State Plane Zone: 4204
Easting: 2980828.65
Northing: 13750890.73
Elevation: 96.32

DEPTH IN FEET	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0	Pavement: 3.5" asphalt							
	Base: 5.5" stabilized sand and gravel		4					
	Subbase: 10" sand and gravel		26		46	61	23	38
	Fill: dark brown Clayey Sand (SC), with gravel		35	85.4				
	Stiff to hard, dark brownish gray Fat Clay (CH), with slickensides							
4	-with ferrous nodules 2'-6'					81	24	57
	-dark gray 4'-8'		34					
			35					
8	-dark gray and tannish gray 8'-10', with ferrous stains 8'-12'		34	90.9				
	-reddish tan 10'-14', with calcareous nodules 10'-12'		30			75	24	51
12			26					
	-tan and reddish brown, with ferrous stains and silt partings 14'-16'		24	105.3				
16	-tan and light gray 16'-18'		30		100	66	21	45
	Dense, tan and light gray Sandy Silt (ML), with lean clay pockets and siltstone nodules	43	15					
20	Termination Depth = 20 feet							
24								
28								

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING
WATER LEVEL AT **N/A** FEET AFTER **COMPLETE**
DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY**

PROJECT NO. G126-21 **PLATE A-13**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-12**

DATE **6/8/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 4" asphalt		10					
			Base: 8" stabilized sand and gravel		33		96	67	23	44
			Fill: stiff to very stiff, dark gray Fat Clay (CH), with sandy lean clay seams and gravel							
			Stiff to hard, dark gray Fat Clay (CH), with slickensides		36	83.7				
4					37					
			-dark gray and browinsh gray 6'-8', with ferrous nodules 6'-16'		33			81	24	57
8			-reddish tan 8'-10'		31	91.7				
			-tan and light gray 10'-12'		27					
12			-reddish tan and light gray 12'-14'		26			68	22	46
			-tan and light gray, with silt seams 14'-16'		24	102.2				
16			Dense to very dense, tan and light gray Sandy Silt (ML)				52			
			-with calcareous nodules 16'-18'	62	11					
			-tan, with silty clay pockets and siltstone nodules 18'-20'	37	9					
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY**

PROJECT NO. G126-21 **PLATE A-14**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-13**

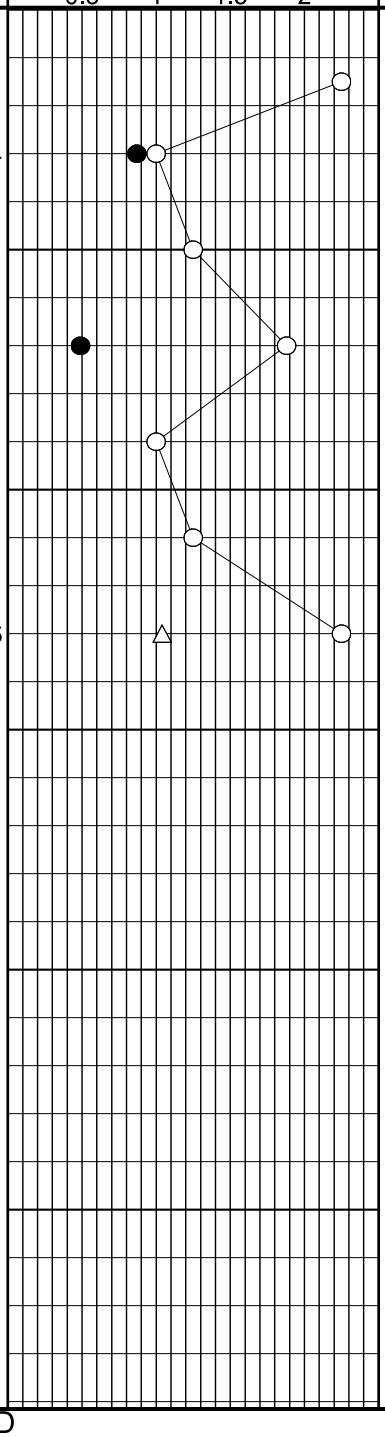
DATE **6/8/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 4" asphalt		11					
			Base: 8" stabilized sand and gravel		10		17	31	13	18
			Fill: dark brown Clayey Sand (SC), with gravel -with fat clay pockets 1'-2' -brown, with fat clay seams 2'-4'		16	104.4				
4			Firm to hard, dark gray Fat Clay (CH), with slickensides		33			78	27	51
			-with calcareous nodules 6'-10'		32	90.4				
8			-tan and gray 8'-10', with ferrous stains 8'- 12'		29					
			-tan 10'-12'		28		98	69	24	45
12			-tan and light gray, with calcareous nodules, and lean clay and calcareous powder pockets 12'-14'		18	108.5				
			Very dense, light tan Sandy Silt (ML), with siltstone nodules	77	5					
16			-tan 16'-20'	61	7		51			
			-with sandy lean clay pockets 18'-20'	50/5"	8					
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY**

PROJECT NO. G126-21 **PLATE A-15**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-14**

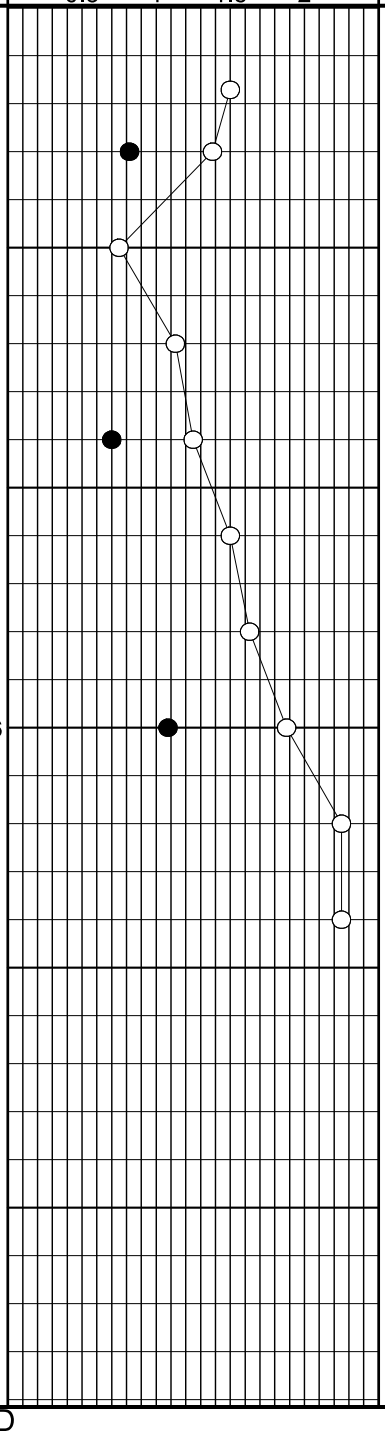
DATE **6/7/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 3.5" asphalt							
			Base: 13.5" sand and gravel							
			Stiff to hard, dark gray Fat Clay (CH), with slickensides		33		96	78	28	50
					33	86.6				
4					34					
			-tannish gray and dark gray 6'-8', with calcareous nodules 6'-10'		32			87	24	63
8			-reddish tan 8'-14'		30	91.7				
					27					
12					27			69	24	45
			-tan and light gray 14'-16'		25	101.6				
16			-reddish tan and light gray, with silt seams 16'-18'		20					
			-tan and light gray, with silt pockets 18'-20'		25		100	56	21	35
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY**

PROJECT NO. G126-21 **PLATE A-16**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-15**

DATE **6/7/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 4" asphalt							
			Base: 14" sand and gravel							
			Stiff to very stiff, dark gray Fat Clay (CH), with slickensides		32		96	80	27	53
			-with ferrous nodules 2'-6'		36	83.3				
4					36					
			-brown and gray 6'-8'		32			86	23	63
8			-tan and gray 8'-10', with calcareous and ferrous nodules 8'-12'		30	91.9				
			-reddish tan 10'-12'		25					
12			Stiff to hard, light reddish tan and gray Lean Clay (CL), with sandy silt seams		28	90.9	91	31	15	16
			Dense to very dense, tan Silt with Sand (ML)	37	15					
16			-with fat clay seams and silty clay pockeys 16'-18'	70	19					
			-light tan 18'-20'	50/5"	8		77			
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY**

PROJECT NO. G126-21 **PLATE A-17**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-16**

DATE **6/7/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 3.5" asphalt							
			Base: 12.5" sand and gravel							
			Fill: very stiff, dark gray Fat Clay (CH), with gravel, sandy lean clay seams, and asphalt pieces		27		95	72	25	47
					30	90.8				
4			Stiff to very stiff, dark gray Fat Clay (CH), with slickensides -with ferrous nodules 2'-6' -dark brownish gray 4'-6'		29					
			-tan and gray 6'-8'					73	23	50
					29	94.7				
8			-tan and dark gray, with ferrous stains 8'-10', and calcareous nodules 8'-12'							
					27					
			-red and tan, with silt pockets and seams 10'-12'							
					22					
12			Stiff to very stiff, tan and gray Lean Clay (CL), with calcareous nodules and silt partings				98	29	18	11
					21					
			Medium dense, tan Silt with Sand (ML) -with siltstone seams 14'-16'	20	20					
16										
				20	18		79			
			-with silty clay pockets 18'-20'							
				21	15					
20			Termnation Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY**

PROJECT NO. G126-21 **PLATE A-18**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-17**

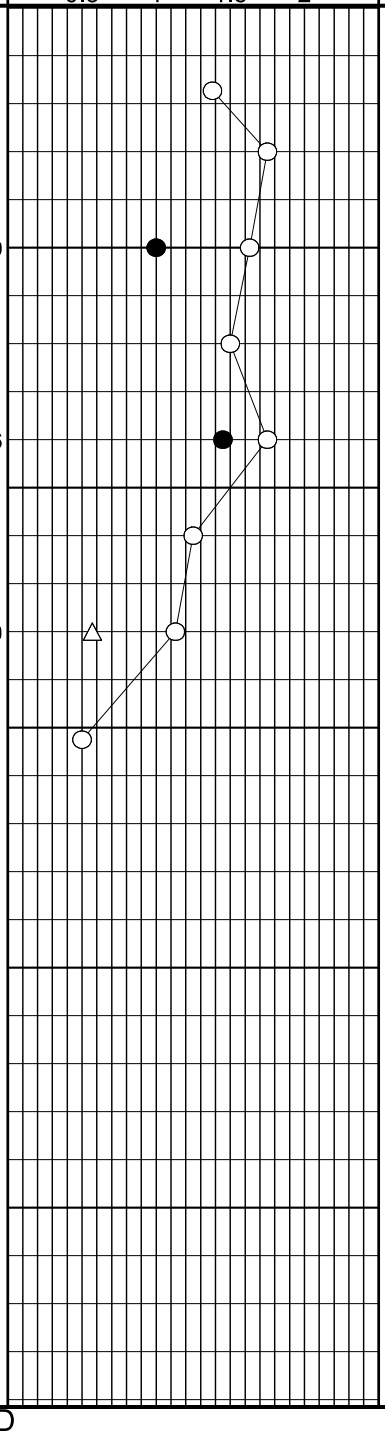
DATE **6/7/2021** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			Pavement: 3.25" asphalt							
			Base: 14.25" sand and gravel							
			Fill: very stiff, dark gray Sandy Fat Clay (CH), with gravel seams and shell fragments		22		63	50	17	33
			Stiff to very stiff, gray and dark gray Fat Clay (CH), with slickensides		23					
4			-with ferrous nodules 2'-6'							
			-tan and gray, with calcareous nodules 4'-6'		25	100.9				
			-reddish tan, with lean clay pockets 6'-8' and calcareous powder pockets 6'-10'		21			67	20	47
8			-reddish brown, with silt pockets 8'-10'							
					19	109.6				
			Reddish tan Silt with Sand (ML)		16					
12			Stiff to very stiff, tan and light gray Lean Clay (CL), with silt seams		18	109.0	93	32	15	17
			Medium dense, tan Silt with Sand (ML)							
			-with silty clay pockets 14'-16'	16	21					
16			-boring cave-in at 16' after completion of drilling							
					19		81			
				24	17					
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **YY** LOGGED BY **YY**

PROJECT NO. G126-21 **PLATE A-19**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-18**

DATE **3/25/2022** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			*GRID Coordinates (US Survey ft):* *Texas State Plane Zone: 4204* *Easting: 2979443.158* *Northing: 13750595.24* *Elevation: 93.80* Firm to hard, gray Fat Clay (CH), with slickensides -with roots 0'-2' -dark gray 2'-6', with ferrous nodules 2'-18'		29		96	67	20	47
					36	85.5				
4					32					
			-tan 6'-12'				97	68	20	48
					22					
8			-with calcareous nodules 8'-10'		22	106.3				
					21					
12			-tan and gray 12'-18'							
					23					
					24	103.0				
16			-with silty sand seams and partings 16'-20'				99	51	18	33
					18					
			-tan 18'-20'							
					20					
20			Termination Depth = 20 feet							
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Son** DRAFTED BY **SA** LOGGED BY **AZ**

PROJECT NO. G126-21 **PLATE A-20**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-19**

DATE **3/25/2022** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	SHEAR STRENGTH, TSF (△ Confined Compression, ● Unconfined Compression, ○ Pocket Penetrometer, □ Torvane; 0.5 1 1.5 2)	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			*GRID Coordinates (US Survey ft):* *Texas State Plane Zone: 4204* *Easting: 2980368.432* *Northing: 13750882.72* *Elevation: 94.19* Stiff to hard, dark gray Fat Clay (CH), with slickensides -with roots 0'-4'		42			96	79	25	54
					37						
4			-gray and tan 4'-6', with ferrous nodules 4'-8'		35	87.9					
			-reddish tan 6'-8', with calcareous nodules 6'-10'		23						
8			-tan and tannish gray 8'-10'		28	96.4		98	68	22	46
			-gray and reddish tan 10'-12'		29						
12			-tan and light gray, with calcareous nodules 12'-14'		22	105.7					
			Stiff, tan and light gray Lean Clay (CL), with silt partings and siltstone nodules		12				32	15	17
16			Very dense, tan Silty Sand (SM), with cemented sand nodules	54	5			37			
			-with clayey sand pockets 18'-20'	61	7						
20			Termination Depth = 20 feet								
24											
28											

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **SA** LOGGED BY **AZ**

PROJECT NO. G126-21 **PLATE A-21**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-20**

DATE **5/12/2022** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	SHEAR STRENGTH, TSF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			*GRID Coordinates (US Survey ft):* *Texas State Plane Zone: 4204* *Easting: 2980993.076* *Northing: 13751108.265* *Elevation: 98**				△ Confined Compression ● Unconfined Compression ○ Pocket Penetrometer □ Torvane 0.5 1 1.5 2				
			Fill: hard, black and gray Fat Clay (CH), with silty sand pockets and gravel -with roots and calcareous nodules 0'-2' -with ferrous nodules 2'-4'		23 32			87	77	24	53
4			Stiff to hard, dark gray Fat Clay (CH), with slickensides -with ferrous nodules 4'-6'		33	87.8					
					28						
8			-tan and tannish gray, with calcareous nodules 8'-10', and ferrous nodules 8'-14'		23				79	25	54
			-tan 10'-12'		23	104.5					
12			-tan and gray, with calcareous nodules 12'-14'		24						
			Hard, tan and gray Lean Clay (CL), with slickensides and ferrous nodules		17				49	18	31
16			Termination Depth = 15 feet *: boring not surveyed; coordinates and elevation are estimated.								
20											
24											
28											

BORING DRILLED TO **15** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **LW** LOGGED BY **BA**

PROJECT NO. G126-21 **PLATE A-22**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-21**

DATE **5/12/2022** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			*GRID Coordinates (US Survey ft):* *Texas State Plane Zone: 4204* *Easting: 2981100.064* *Northing: 13750814.117* *Elevation: 97**							
			Fill: hard, black and reddish tan Fat Clay (CH), with calcareous nodules and roots		22					
			Fill: dark brown Clayey Sand (SC), with gravel and asphalt pieces		9		17	47	16	31
4			Stiff to hard, gray Fat Clay (CH), with slickensides and ferrous nodules		31	90.9				
			-olive gray and brown, with calcareous nodules 6'-8'		29	95.5	95	98	29	69
8			-tan 8'-10'		26					
			-tan and gray 10'-12'		24	102				
12			-tan 12'-14'		24			66	24	42
			-tan and gray 14'-15'		24					
16			Termination Depth = 15 feet *: boring not surveyed; coordinates and elevation are estimated.							
20										
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2

BORING DRILLED TO **15** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING
WATER LEVEL AT **N/A** FEET AFTER **COMPLETE**
DRILLED BY **Van and Sons** DRAFTED BY **LW** LOGGED BY **BA**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-22**

DATE **5/12/2022** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	SHEAR STRENGTH, TSF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			*GRID Coordinates (US Survey ft):* *Texas State Plane Zone: 4204* *Easting: 2979703.639* *Northing: 13750851.892* *Elevation: 95**				△ Confined Compression ● Unconfined Compression ○ Pocket Penetrometer □ Torvane 0.5 1 1.5 2				
			Very stiff to hard, dark gray Fat Clay (CH), with slickensides and ferrous nodules -with roots 0'-4'		27						
					26	96.4					
4			-tan and gray 4'-6'					96	82	25	57
					32						
			-tan 6'-8'								
					22						
8			-reddish tan and gray 8'-10', with calcareous nodules and pockets 8'-14'								
					24	102.7					
			-tan and gray 10'-14', with silt partings 10'-12'					100	67	24	43
12					22						
					18						
			Very dense, tan Silt (ML), with sandy lean clay pockets	59	6			93			
16			Termination Depth = 16 feet *: boring not surveyed; coordinates and elevation are estimated.								
20											
24											
28											

BORING DRILLED TO **15** FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽

WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼

DRILLED BY **Van and Sons** DRAFTED BY **LW** LOGGED BY **BA**

PROJECT NO. G126-21 **PLATE A-24**

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Stella Road Improvements** BORING **B-23**

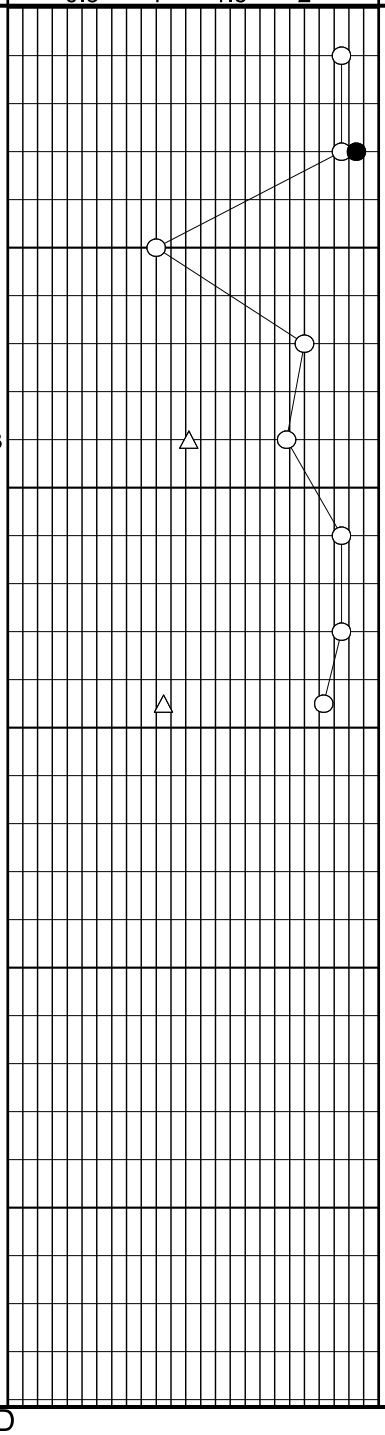
DATE **5/12/2022** TYPE **4" Dry Auger** LOCATION **See Boring Location Plan**

DEPTH IN FEET	SYMBOL	SAMPLE INTERVAL	DESCRIPTION	S.P.T. BLOWS / FT.	MOISTURE CONTENT, %	DRY DENSITY, PCF	-200 MESH	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0			*GRID Coordinates (US Survey ft):* *Texas State Plane Zone: 4204* *Easting: 2979319.157* *Northing: 13750724.229* *Elevation: 95**							
			Stiff to hard, dark gray Fat Clay (CH), with slickensides and ferrous nodules		25					
			-with roots 2'-4'		25	99.7				
4			-gray and reddish brown 4'-6'		29	92.1	97	76	23	53
			-tan 6'-8'		24					
8			-tan and gray 8'-12', with calcareous nodules 8'-10'		25	102.3				
					24		100	63	22	41
12			-reddish tan 12'-14'		24					
			-tan and gray 14'-15'		25	99.0				
16			Termination Depth = 15 feet *: boring not surveyed; coordinates and elevation are estimated.							
20										
24										
28										

SHEAR STRENGTH, TSF

△ Confined Compression
● Unconfined Compression
○ Pocket Penetrometer
□ Torvane

0.5 1 1.5 2



BORING DRILLED TO **15** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **N/A** FEET WHILE DRILLING ▽
WATER LEVEL AT **N/A** FEET AFTER **COMPLETE** ▼
DRILLED BY **Van and Sons** DRAFTED BY **LW** LOGGED BY **BA**

PROJECT NO. G126-21 **PLATE A-25**

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Paving
	Fill
	High plasticity clay
	Low plasticity clay
	Silty sand
	Silty low plasticity clay
	Silt
Misc. Symbols	
□	Torvane
○	Pocket Penetrometer
●	Unconfined Compression
△	Confined Compression
Soil Samplers	
	Rock core
	Undisturbed thin wall Shelby tube
	Standard penetration test

Symbol	Description
	Auger

AYLES ENGINEERING CORP.

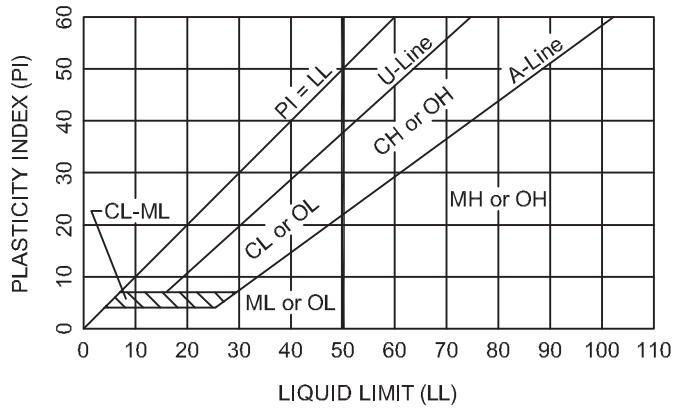
CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation D-2487

MAJOR DIVISIONS				GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (Less than 50% of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No. 200 sieve)		GW	Well-graded gravel, well-graded gravel with sand
				GP	Poorly-graded gravel, poorly-graded gravel with sand
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart	GM	Silty gravel, silty gravel with sand
			Limits plot above "A" line & hatched zone on plasticity chart	GC	Clayey gravel, clayey gravel with sand
	SANDS (50% or more of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 sieve)		SW	Well-graded sand, well-graded sand with gravel
				SP	Poorly-graded sand, poorly-graded sand with gravel
		SANDS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart	SM	Silty sand, silty sand with gravel
			Limits plot above "A" line & hatched zone on plasticity chart	SC	Clayey sand, clayey sand with gravel
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)		SILTS AND CLAYS (Liquid Limit Less Than 50%)		ML	Silt, silt with sand, silt with gravel, sandy silt, gravelly silt
				CL	Lean clay, lean clay with sand, lean clay with gravel, sandy lean clay, gravelly lean clay
				OL	Organic clay, organic clay with sand, sandy organic clay, organic silt, sandy organic silt
		SILTS AND CLAYS (Liquid Limit 50% or More)		MH	Elastic silt, elastic silt with sand, sandy elastic silt, gravelly elastic silt
				CH	Fat clay, fat clay with sand, fat clay with gravel, sandy fat clay, gravelly fat clay
				OH	Organic clay, organic clay with sand, sandy organic clay, organic silt, sandy organic silt

NOTE: Coarse soils between 5% and 12% passing the No. 200 sieve and fine-grained soils with limits plotting in the hatched zone of the plasticity chart are to have dual symbols.

PLASTICITY CHART



Equation of A-Line: Horizontal at PI=4 to LL=25.5, then PI=0.73(LL-20)

Equation of U-Line: Vertical at LL=16 to PI=7, then PI=0.9(LL-8)

DEGREE OF PLASTICITY OF COHESIVE SOILS

Degree of Plasticity	Plasticity Index
None	0 - 4
Slight	5 - 10
Medium	11 - 20
High	21 - 40
Very High	>40

SOIL SYMBOLS

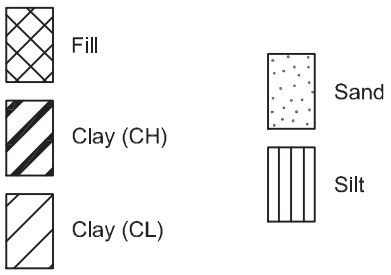


PLATE A-27

AYLES ENGINEERING CORP.

TERMS USED ON BORING LOGS

SOIL GRAIN SIZE

U.S. STANDARD SIEVE

6"	3"	3/4"	#4	#10	#40	#200		
BOULDERS	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		
152	76.2	19.1	4.76	2.00	0.420	0.074	0.002	

SOIL GRAIN SIZE IN MILLIMETERS

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength, Kips per Sq. ft.	SPT Blowcount
Very Soft	less than 0.25	< 2 bpf
Soft	0.25 to 0.50	2-4 bpf
Firm	0.50 to 1.00	4-8 bpf
Stiff	1.00 to 2.00	8-16 bpf
Very Stiff	2.00 to 4.00	16-32 bpf
Hard	greater than 4.00	>32 bpf

RELATIVE DENSITY OF COHESIONLESS SOILS FROM STANDARD PENETRATION TEST

Very Loose	<4 bpf
Loose	5-10 bpf
Medium Dense	11-30 bpf
Dense	31-50 bpf
Very Dense	>50 bpf

SPLIT-BARREL SAMPLER DRIVING RECORD

Blows per Foot	Description
25	25 blows driving sampler 12 inches, after initial 6 inches of seating.
50/7"	50 blows driving sampler 7 inches, after initial 6 inches of seating.
Ref/3"	50 blows driving sampler 3 inches, during initial 6-inches seating interval.

NOTE: To avoid change to sampling tools, driving is limited to 50 blows during or after seating interval.

DRY STRENGTH ASTM D2488

None	Dry specimen crumbles into powder with mere pressure of handling
Low	Dry specimen crumbles into powder with some finger pressure
Medium	Dry specimen breaks into pieces or crumbles with considerable pressure
High	Dry specimen cannot be broken with finger pressure, it can be broken between thumb and hard surface
Very High	Dry specimen cannot be broken between thumb and hard surface

MOISTURE CONDITION ASTM D2488

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water

SOIL STRUCTURE

Slickensided	Having planes of weakness that appear slick and glossy. The degree of slickensidedness depends upon the spacing of slickensides and the easiness of breaking along these planes.
Fissured	Containing shrinkage or relief cracks, often filled with fine sand or silt; usually more or less vertical.
Friable	Crumbly, can be easily crushed with light pressure.
Blocky	Clays that have a block-like or polyhedral structure.
Pocket	Inclusion of material of different texture that is smaller than the diameter of the sample.
Parting	Inclusion less than 1/8 inch thick extending through the sample.
Seam	Inclusion 1/8 inch to 3 inches thick extending through the sample.
Layer	Inclusion greater than 3 inches thick extending through the sample.
Laminated	Soil sample composed of alternating partings or seams of different soil types.
Interlayered	Soil sample composed of alternating layers of different soil types.
Intermixed	Soil sample composed of pockets of different soil types and layered or laminated structure is not evident.
Calcareous	Having appreciable quantities of calcium material.

AVILES
ENGINEERING CORP.

ASTM & TXDOT DESIGNATION FOR SOIL LABORATORY TESTS

SOIL TEST	ASTM TEST DESIGNATION	TXDOT TEST DESIGNATION
Unified Soil Classification System	D 2487	Tex-142-E
Moisture Content	D 2216	Tex-103-E
Specific Gravity	D 854	Tex-108-E
Sieve Analysis	D 6913	Tex-110-E (Part 1)
Hydrometer Analysis	D 7928	Tex-110-E (Part 2)
Minus No. 200 Sieve	D 1140	Tex-111-E
Liquid Limit	D 4318	Tex-104-E
Plastic Limit	D 4318	Tex-105-E
Standard Proctor Compaction	D 698	Tex-114-E
Modified Proctor Compaction	D 1557	Tex-113-E
California Bearing Ratio	D 1883	-
Swell	D 4546	-
Consolidation	D 2435	-
Unconfined Compression	D 2166	-
Unconsolidated-Undrained Triaxial	D 2850	Tex-118-E
Consolidated-Undrained Triaxial	D 4767	Tex-131-E
Permeability (constant head)	D 5084	-
Pinhole	D 4647	-
Crumb	D 6572	-
Double Hydrometer	D 4221	-
pH of Soil	D 4972	Tex-128-E
Soil Suction	D 5298	-
Soil Sulfate	C 1580	Tex-145-E
Organics	D 2974	Tex-148-E

AVILES ENGINEERING CORPORATION

Consulting Engineers - Geotechnical, Construction Materials Testing, Environmental

RESULTS OF CRUMB TESTS (ASTM D 6572)

Project Name: Stella Road Reconstruction from Cottonwood School to Band Road, Fort Bend County, Texas
Project No.: G126-21 Test Date: 5/26/22

Boring Number	Depth, feet	2 Minutes		1 Hour		6 Hours	
		Grade	C (deg)	Grade	C (deg)	Grade	C (deg)
B-20	0-2	1	22.2	1	22.2	1	22.3
B-20	6-8	1	22.2	1	22.2	1	22.3
B-21	0-2	1	22.2	1	22.2	1	22.3
B-21	8-10	1	22.2	1	22.2	1	22.3
B-22	2-4	1	22.2	1	22.2	1	22.3
B-22	6-8	1	22.2	1	22.2	1	22.3
B-23	0-2	1	22.2	1	22.2	1	22.3
B-23	6-8	1	22.2	1	22.2	1	22.3

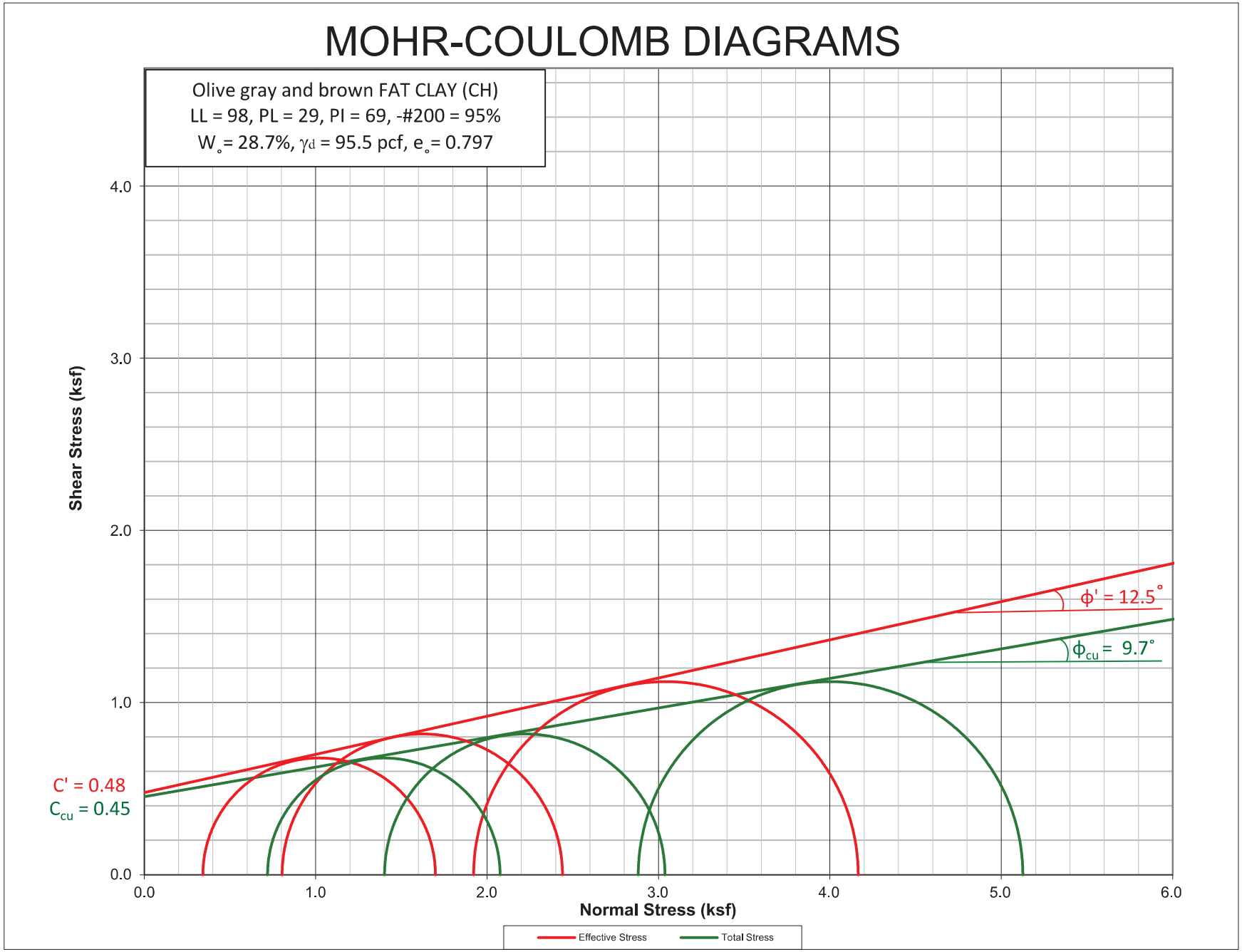
Grade Classification:

Grade 1 Non-dispersive; No reaction
Grade 2 Intermediate; Slight reaction
Grade 3 Dispersive; Moderate reaction
Grade 4 Highly Dispersive; Strong reaction

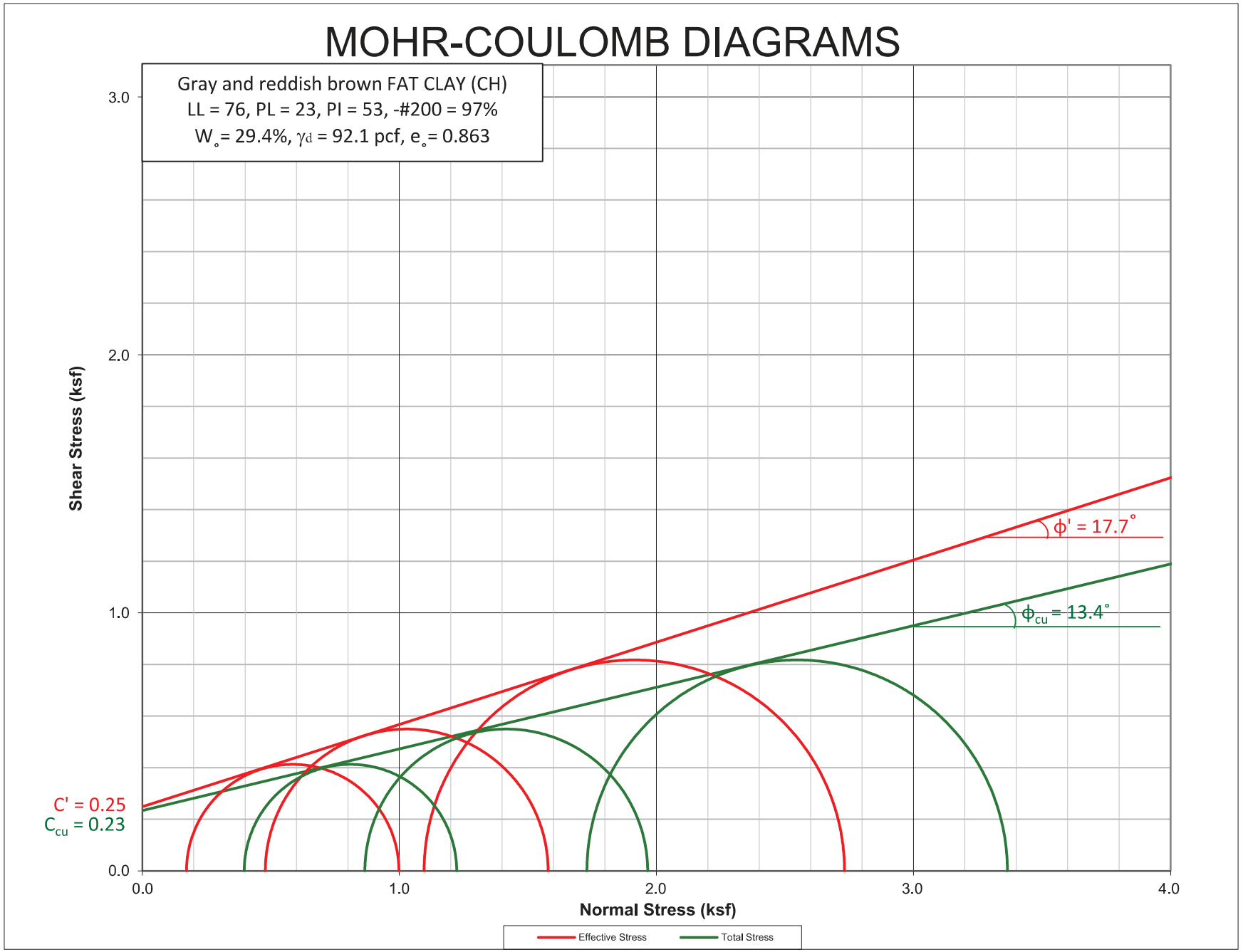
Interpretation:

Under normal conditions, use the 1 hour reading to determine dispersive grade.
However, if the dispersive grade changes from 2 to 3 or from 3 to 4 between the 1 and 6 hour readings, use the 6 hour reading instead.

MOHR-COULOMB DIAGRAMS



MOHR-COULOMB DIAGRAMS



AVLES
ENGINEERING CORP.

APPENDIX B

Plates B-1a to B-1c Generalized Soil Profiles

STATIONS ALONG STELLA ROAD BASELINE

4+00 6+00 8+00 10+00 12+00 14+00 16+00 18+00 20+00 22+00 24+00 26+00 28+00 30+00

ELEVATION IN FEET

100 96 92 88 84 80 76 72 68 64

B-1

- Pavement: 5.5" asphalt
- Base: 6" gravel
- Subbase: 7.75" stabilized sand
- Soft to very stiff, dark gray Fat Clay (CH), with slickensides -with ferrous nodules 2'-12'
- -tannish gray 4'-6', with calcareous nodules 4'-12'
- -dark brown and gray 6'-8'
- -tannish gray 8'-10'
- -tan, with calcareous powder pockets 10'-12'
- Soft to very stiff, tan and gray Lean Clay (CL), with calcareous nodules -with calcareous powder pockets 12'-14' -with silty clay pockets and and silt seams 14'-16'
- Loose to medium dense, tan Silty Sand (SM), wet
- -tan and light gray, with fat clay seams 18'- 20'

Termination Depth = 20 feet

B-2

- Pavement: 3.5" asphalt
- Base: 8.5" stabilized sand and gravel
- Fill: brown Clayey Sand (SC), with gravel -with fat clay seams 1.5'-2'
- Stiff to very stiff, gray Fat Clay (CH), with ferrous nodules
- -tan and gray, with calcareous nodules 6'-8'
- Very stiff, tan and gray Lean Clay (CL), with fat clay and calcareous powder pockets, and calcareous and ferrous nodules
- Very stiff, tan Silty Clay (CL-ML), with lean clay pockets, calcareous nodules, and ferrous stains
- Very stiff, tan Sandy Lean Clay (CL), with sandy silt partings, silty clay pockets, calcareous nodules, and ferrous stains
- Tan Sandy Silt (ML), with lean clay pockets, calcareous nodules, and ferrous stains
- Firm to very stiff, tan Lean Clay (CL), with silt and calcareous powder pockets, and calcareous nodules
- Stiff to very stiff, reddish tan Fat Clay (CH), with slickensides, silt pockets, and calcareous nodules

Termination Depth = 20 feet

B-3

- Pavement: 4.5" asphalt
- Base: 14" stabilized sand with gravel
- Fill: dark gray Clayey Sand (SC), with gravel
- Fill: stiff to very stiff, dark gray Fat Clay (CH), with gravel
- -with sand seams 4'-6'
- Very stiff, gray Fat Clay (CH), with slickensides -with ferrous nodules 6'-10'
- -grayish tan, with calcareous nodules 8'-10'
- Very stiff to hard, reddish brown Lean Clay (CL), with calcareous nodules, pockets, and seams
- -with silt pockets and ferrous stains 12'-14'
- Stiff to hard, reddish tan Fat Clay (CH), with slickensides -with silt seams 14'-16'
- -with calcareous nodules 16'-20'

Termination Depth = 20 feet

B-4

- Pavement: 3.5" asphalt
- Base: 6" sand and gravel
- Pavement: 2.5" asphalt
- Subbase: 7.5" sand and gravel
- Very stiff to hard, dark gray Fat Clay (CH) -with sandy lean clay partings 1.6'-2' and ferrous nodules 1.6'-10' -gray, with calcareous nodules 2'-4'
- -tan and grayish tan 6'-8', with calcareous nodules 6'-12'
- -brown and gray 8'-10', with calcareous powder pockets 8'-12'
- -tan 10'-12'
- Very stiff, reddish tan Silty Clay (CL-ML), with ferrous and calcareous nodules, and fat clay pockets
- Very stiff, tan and light gray Lean Clay (CL), with calcareous nodules and powder pockets
- Very stiff to hard, tan and light gray Fat Clay (CH), with slickensides -with calcareous nodules 16'-18' -with calcareous powder pockets 18'-20'

Termination Depth = 20 feet

B-5

- Pavement: 4.5" asphalt
- Base: 15" stabilized sand with gravel
- Fill: gray Silty Clayey Sand (SC-SM), with gravel -with fat clay seams and lime pockets 2'-4'
- Stiff to hard, gray and dark gray Fat Clay (CH) -with ferrous nodules 4'-6'
- -gray, with calcareous nodules 6'-8'
- -light grayish tan 8'-10'
- -tan and grayish tan, with calcareous and ferrous nodules, and lean clay pockets 10'-12'
- Hard, tan Lean Clay (CL), with calcareous nodules and powder pockets
- Very stiff to hard, tan Fat Clay (CH), with slickensides -with calcareous nodules and ferrous stains 14'-18' -tan and gray 16'-20'

Termination Depth = 20 feet

B-6

- Pavement: 7" asphalt
- Base: 5" stabilized sand and gravel
- Fill: stiff to very stiff, dark brown Lean Clay (CL), with gravel -with ferrous nodules 1'-2' -with fat clay seams 2'- 4'
- Stiff to hard, gray and dark gray Fat Clay (CH), with slickensides -with ferrous nodules 4'-14'
- -tannish gray 6'-8', with calcareous nodules 6'-16'
- -tan 8'-14'
- -with calcareous powder pockets 10'-12'
- -reddish tan 14'-18', with silt partings 14'-16'
- -with ferrous stains 16'-18'
- -tan and light gray, with silt partings 18'-20'

Termination Depth = 20 feet

ELEVATION IN FEET

LEGEND:

Paving	High plasticity clay	Silty clayey sand	Low plasticity clay	Silty sand
Fill	Silt	Clayey sand	Silty low plasticity clay	Poorly graded silty clayey sand

Depth of water encountered during drilling

Depth of water 15 min. after initial encounter

NOTES:

1) See Plate A–2 in Appendix A for approximate location of borings.
2) Data concerning subsurface conditions have been obtained at boring locations only. Actual conditions between borings may differ from profile shown here.
3) See logs of boring for detailed description of soil encountered in each borehole.
4) Ground surface elevation at each boring location was based on survey data provided by others.
5) Soil stratigraphy and secondary soil structure (such as seams, layers, or pockets of sands, silts, slickensides, fissures, and siltstones/claystones) that are different from what were identified in the actual borings may exist away from these borings.

AVILES ENGINEERING CORPORATION

GENERALIZED SOIL PROFILE

STELLA ROAD IMPROVEMENTS
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
FORT BEND COUNTY, TEXAS

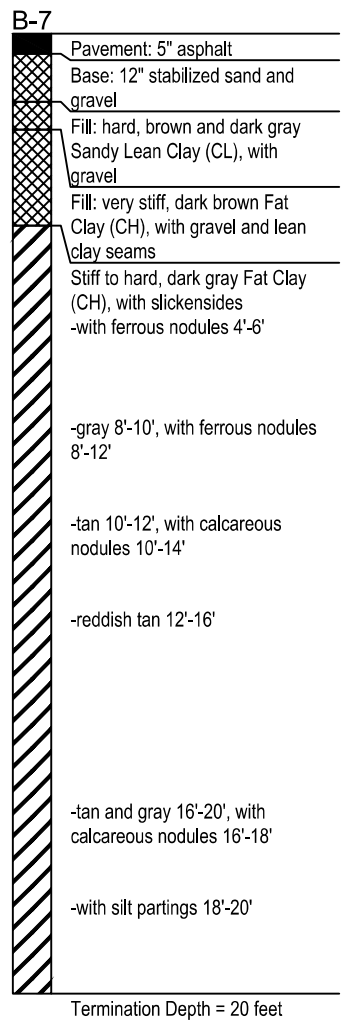
AEC PROJECT NO. : G126-21	DATE : 7-28-21	SOURCE DRAWING PROVIDED BY: AVILES ENGINEERING CORP.
VERTICAL SCALE : 1" = 4' HORIZONTAL SCALE : 1" = 200'	DRAFTED BY : BpJ	PLATE NO.: PLATE B-1a

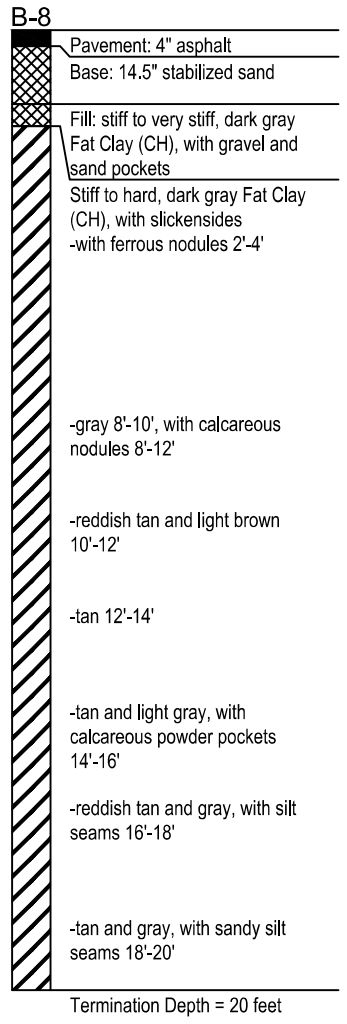
STATIONS ALONG STELLA ROAD BASELINE

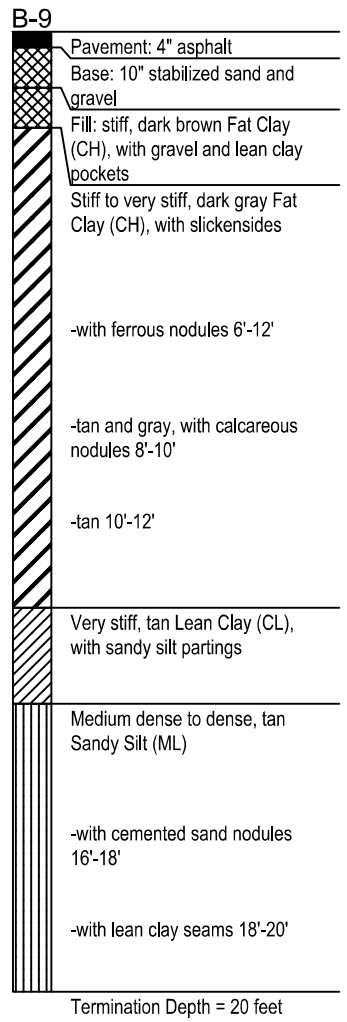
34+00 36+00 38+00 40+00 42+00 44+00 46+00 48+00 50+00 52+00 54+00 56+00 58+00 60+00

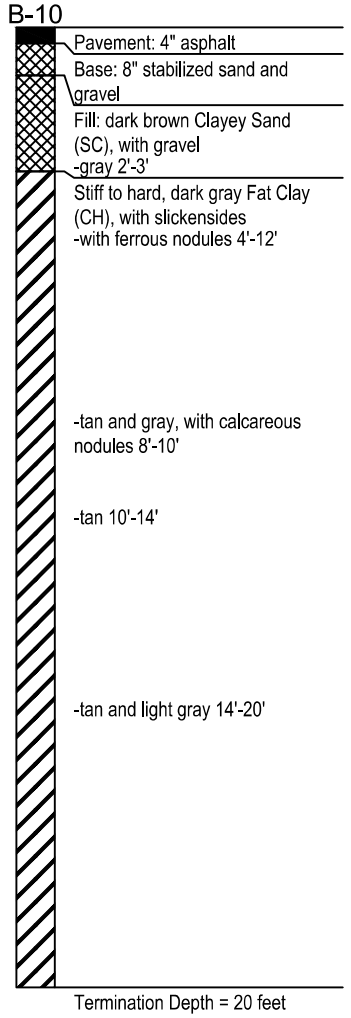
ELEVATION IN FEET

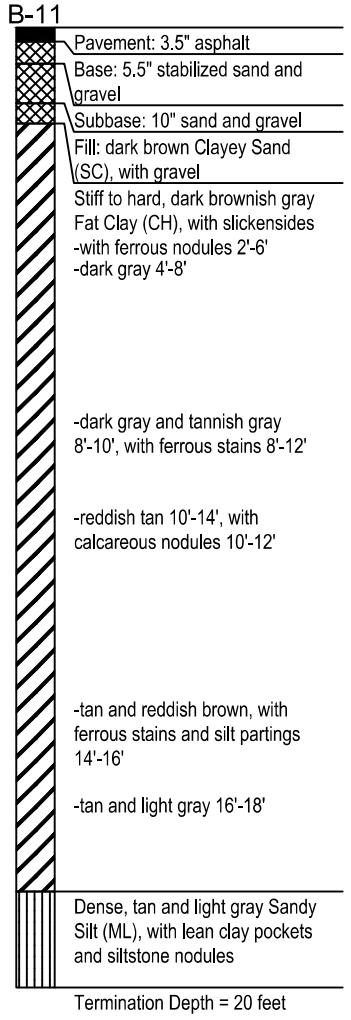
100 96 92 88 84 80 76 72 68 64

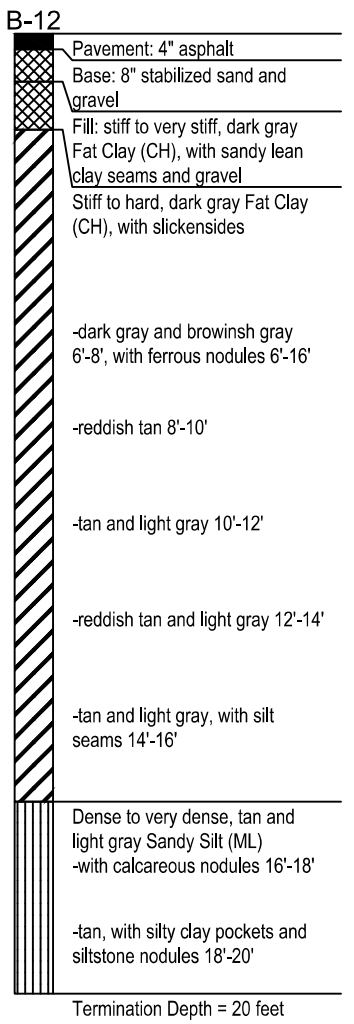












ELEVATION IN FEET

LEGEND:

Paving	High plasticity clay	Silty clayey sand	Low plasticity clay	Silty sand
Fill	Silt	Clayey sand	Silty low plasticity clay	Poorly graded silty clayey sand

Depth of water encountered during drilling

Depth of water 15 min. after initial encounter

NOTES:

1) See Plate A–2 in Appendix A for approximate location of borings.
2) Data concerning subsurface conditions have been obtained at boring locations only. Actual conditions between borings may differ from profile shown here.
3) See logs of boring for detailed description of soil encountered in each borehole.
4) Ground surface elevation at each boring location was based on survey data provided by others.
5) Soil stratigraphy and secondary soil structure (such as seams, layers, or pockets of sands, silts, slickensides, fissures, and siltstones/claystones) that are different from what were identified in the actual borings may exist away from these borings.

AVILES ENGINEERING CORPORATION

GENERALIZED SOIL PROFILE

STELLA ROAD IMPROVEMENTS
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
FORT BEND COUNTY, TEXAS

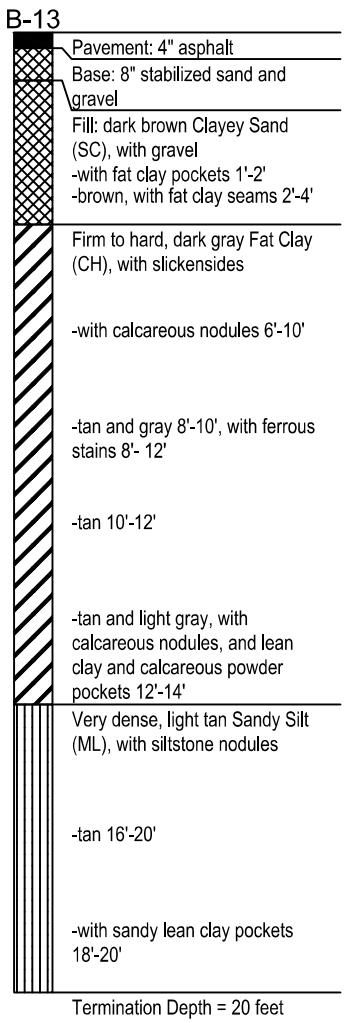
AEC PROJECT NO.: G126-21	DATE: 7-28-21	SOURCE DRAWING PROVIDED BY: AVILES ENGINEERING CORP.
VERTICAL SCALE: 1" = 4' HORIZONTAL SCALE: 1" = 200'	DRAFTED BY: BpJ	PLATE NO.: PLATE B-1b

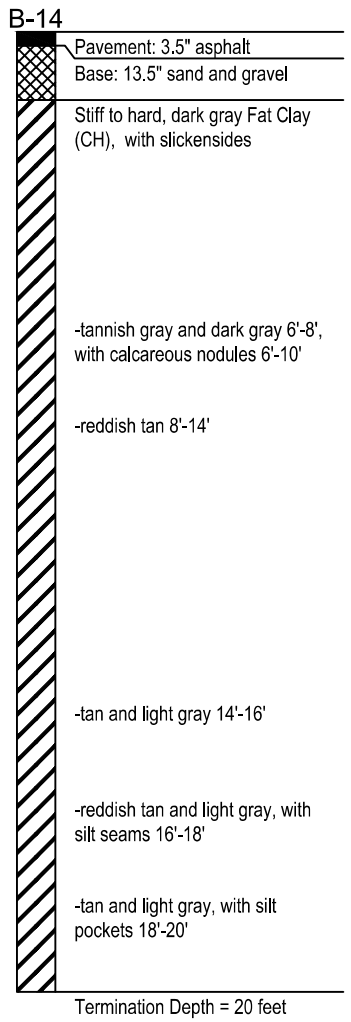
STATIONS ALONG STELLA ROAD BASELINE

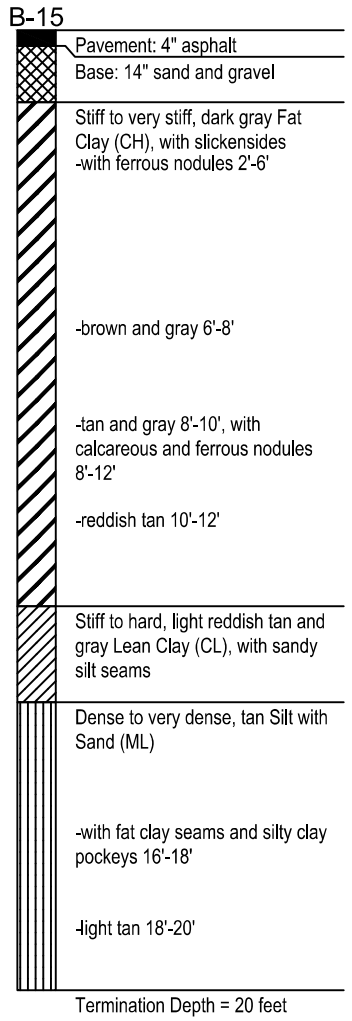
62+00 64+00 66+00 68+00 70+00 72+00 74+00 76+00 78+00 80+00 82+00

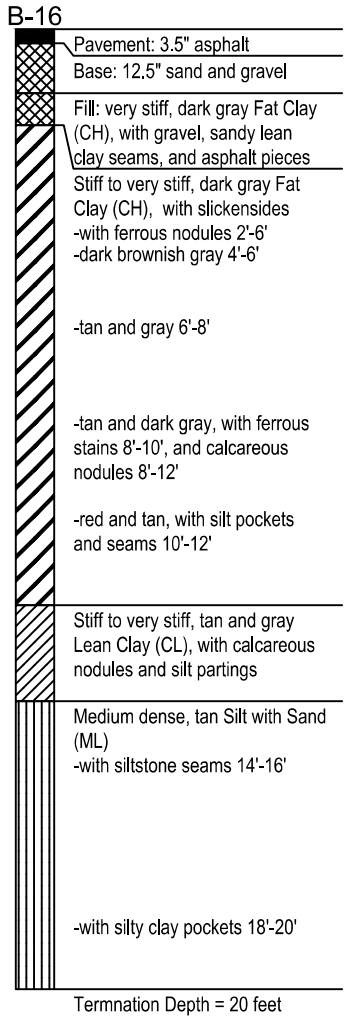
ELEVATION IN FEET

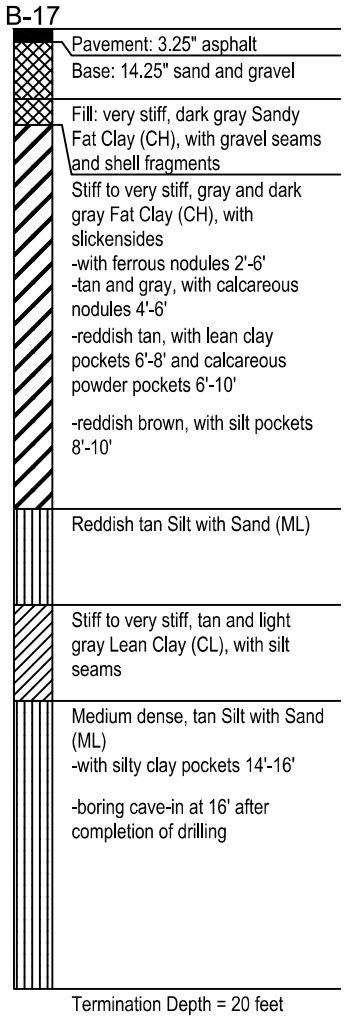
100 96 92 88 84 80 76 72 68 64











LEGEND:

- Paving
- Fill
- High plasticity clay
- Silt
- Silty clayey sand
- Clayey sand
- Low plasticity clay
- Silty low plasticity clay
- Silty sand
- Poorly graded silty clayey sand
- Depth of water encountered during drilling
- Depth of water 15 min. after initial encounter

NOTES:

1) See Plate A–2 in Appendix A for approximate location of borings.
2) Data concerning subsurface conditions have been obtained at boring locations only. Actual conditions between borings may differ from profile shown here.
3) See logs of boring for detailed description of soil encountered in each borehole.
4) Ground surface elevation at each boring location was based on survey data provided by others.
5) Soil stratigraphy and secondary soil structure (such as seams, layers, or pockets of sands, silts, slickensides, fissures, and siltstones/claystones) that are different from what were identified in the actual borings may exist away from these borings.

AVILES ENGINEERING CORPORATION

GENERALIZED SOIL PROFILE

STELLA ROAD IMPROVEMENTS
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
FORT BEND COUNTY, TEXAS

AEC PROJECT NO. : G126-21	DATE : 7-28-21	SOURCE DRAWING PROVIDED BY: AVILES ENGINEERING CORP.
VERTICAL SCALE : 1" = 4' / HORIZONTAL SCALE : 1" = 200'	DRAFTED BY : BpJ	PLATE NO. : PLATE B-1c

AVLES
ENGINEERING CORP.

APPENDIX C

Plates C-1 to C-3 DARWin v3.0 Outputs for Asphalt Pavement Design

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product

AVILES

Flexible Structural Design Module

Stella Road Reconstruction ESALs Calculation with FBC's Minumun Thickness Requirements

Flexible Structural Design

Structural Number	4.92 in
Initial Serviceability	4.2
Terminal Serviceability	2.5
Reliability Level	90 %
Overall Standard Deviation	0.45
Roadbed Soil Resilient Modulus	1,500 psi
Stage Construction	1
18-kip ESALs Over Initial Performance Period	226,282

Effective Roadbed Soil Resilient Modulus

Period	Description	Roadbed Resilient Modulus (psi)
1	1	1,500

Calculated Effective Modulus 1,500 psi

Specified Layer Design

Layer	Material Description	Struct Coef. (Ai)	Drain Coef. (Mi)	Thickness (Di)(in)	Width (ft)	Calculated SN (in)
1	Asphalt	0.44	1	3	-	1.32
2	Black Base	0.34	1	8	-	2.72
3	Stabilized Subgrade	0.11	1	8	-	0.88
Total	-	-	-	19.00	-	4.92

PLATE C-1

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product

AVILES

Flexible Structural Design Module

Stella Road Reconstruction Structural Number Calculation to Meet Estimated Design Life ESALs

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	678,526
Initial Serviceability	4.2
Terminal Serviceability	2.5
Reliability Level	90 %
Overall Standard Deviation	0.45
Roadbed Soil Resilient Modulus	1,500 psi
Stage Construction	1
Calculated Design Structural Number	5.73 in

Effective Roadbed Soil Resilient Modulus

Period	Description	Roadbed Resilient Modulus (psi)
1	1	1,500

Calculated Effective Modulus 1,500 psi

PLATE C-2

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product

AVILES

Flexible Structural Design Module

Stella Road Reconstruction ESALs Calculation with Recommended Pavement Design

Flexible Structural Design

Structural Number	5.82 in
Initial Serviceability	4.2
Terminal Serviceability	2.5
Reliability Level	90 %
Overall Standard Deviation	0.45
Roadbed Soil Resilient Modulus	1,500 psi
Stage Construction	1
18-kip ESALs Over Initial Performance Period	760,267

Effective Roadbed Soil Resilient Modulus

Period	Description	Roadbed Resilient Modulus (psi)
1	1	1,500

Calculated Effective Modulus 1,500 psi

Specified Layer Design

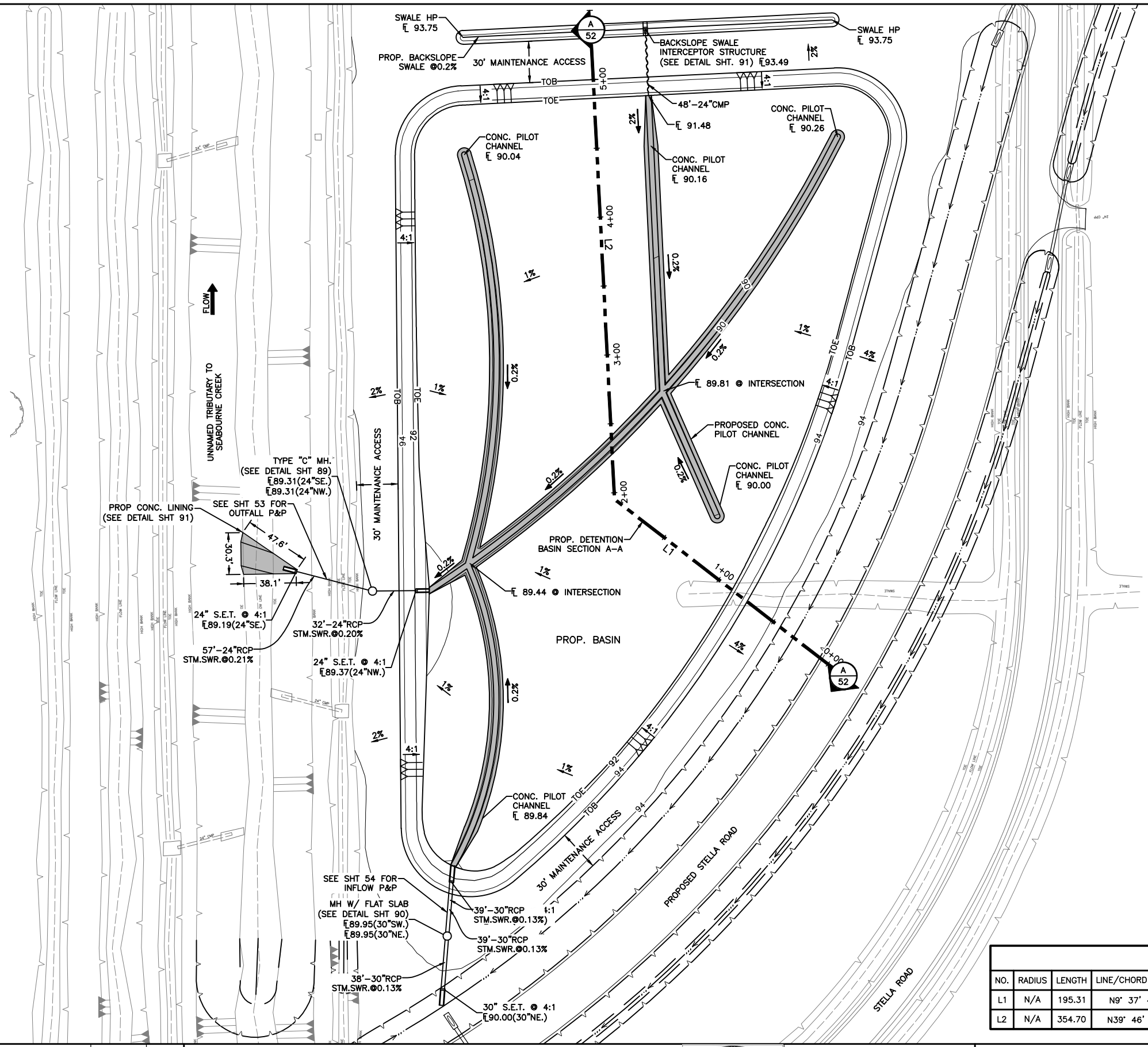
Layer	Material Description	Struct Coef. (Ai)	Drain Coef. (Mi)	Thickness (Di)(in)	Width (ft)	Calculated SN (in)
1	Asphalt	0.44	1	3.5	-	1.54
2	Black Base	0.34	1	10	-	3.40
3	Stabilized Subgrade	0.11	1	8	-	0.88
Total	-	-	-	21.50	-	5.82

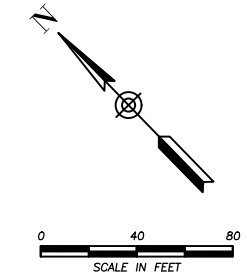
PLATE C-3

AVLES
ENGINEERING CORP.

APPENDIX D

Plates D-1 and D-2	r.g. Miller Engineers drawings, Detention Basin Layout and Cross Sections, dated June 28, 2022
Plate D-3	Design Soil Parameters for Slope Stability Analyses
Plates D-4 to D-9	Detention Basin Slope Stability Analyses





LEGEND

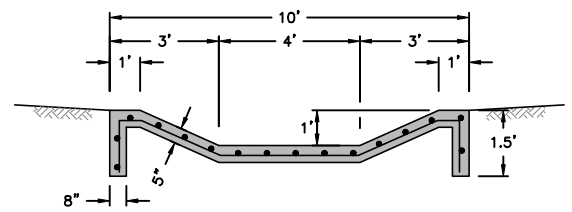
PROP. CONCRETE PILOT CHANNEL

ABBRIVIATIONS

TOB TOP OF BANK

Project:	Stella Road From Cottonwood School Road to Band Road				
Basin Description:	Proposed Basin				
Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (ac.ft)
89.5	589.69	N/A	N/A	0	N/A
90	6,828.21	0.5	1854.5	1854.5	0.0
90.5	16,652.89	0.5	5870.3	7724.8	0.2
91	71,369.66	0.5	22005.6	29730.4	0.7
91.5	132,861.19	0.5	51057.7	80788.1	1.9
92	140,672.85	0.5	68383.5	149171.6	3.4
92.5	143,839.36	0.5	71128.1	220299.7	5.1
93	147,030.39	0.5	72717.4	293017.1	6.7
93.5	150,245.84	0.5	74319.1	367336.2	8.4
93.85	152,511.23	0.35	52982.5	420318.6	9.6
94	153,485.79	0.15	22949.8	443268.4	10.2
94.5	156,750.27	0.5	77559.0	520827.4	12.0
94.85	159,098.90	0.35	55273.6	576101.0	13.2

Stella Rd Detention Basin Summary			
Detention Volume Required	9.5 acre-feet		
Detention Volume Provided with 1' Free Board	9.6 acre-feet		
Detention Rate Provided	0.72 acre-feet/acre		
Annual Exceedance Probability	20%	10%	1%
Peak WSE (NAVD 88, 01) (ft)	93.4	93.9	94.2



TYPICAL CONC. PILOT CHANNEL SECTION
N.T.S.

PROP. BASIN SECTION A–A

NO.	RADIUS	LENGTH	LINE/CHORD DIRECTION	START POINT	END POINT	START STA.	END STA.
L1	N/A	195.31	N9° 37' 40.81"W	13752442.61, 2979978.50	13752635.17, 2979945.83	0+00.00	1+95.31
L2	N/A	354.70	N39° 46' 36.67"E	13752635.17, 2979945.83	13752907.77, 2980172.77	1+95.31	5+50.00

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY ENGINEERING DEPARTMENT

r.g.miller engineers
16340 Park Ten Place
Suite 350
Houston, Texas 77084
(713) 461-9600
TEXAS FIRM REGISTRATION NO. F-487

INTERIM REVIEW ONLY
DOCUMENT INCOMPLETE: Not Intended for permit, or construction.
Engineer: Mengyang Jiang
P.E. License No. 138195
DATE: June, 2022

PROJECT TITLE: STELLA ROAD
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD
SHEET DESCRIPTION: PROPOSED DETENTION BASIN LAYOUT
DRAWN BY: NS
DATE: 6/28/22
CK'D BY: MJ
SCALE: 1" = 80'
SHEET NO: 51/100

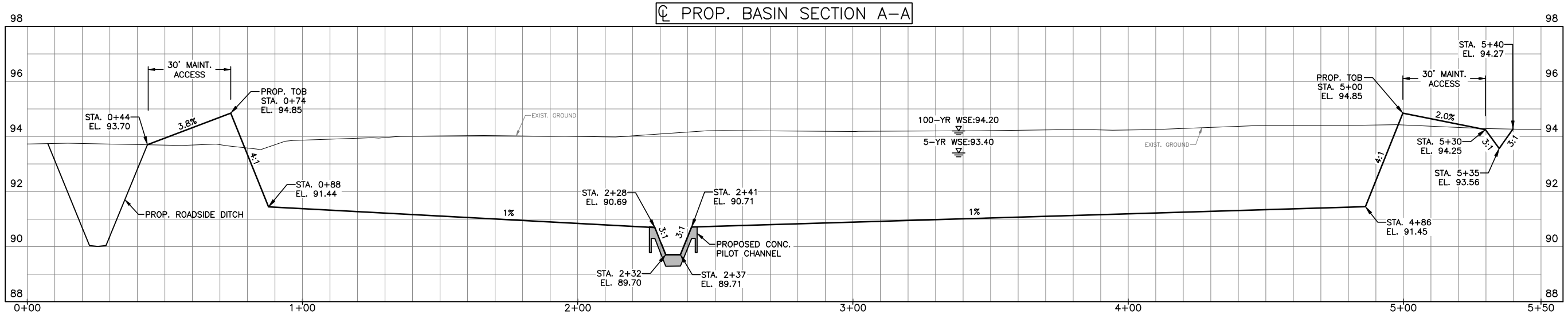
M:\04755.000 20116 stella road\CAD\DWG\02- 04755 - Basins.dwg

PLATE D-1

LEGEND

PROP. CONCRETE PILOT CHANNEL

℄ PROP. BASIN SECTION A–A



0 20 40

SCALE IN FEET

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY ENGINEERING DEPARTMENT

r.g.miller engineers
16340 Park Ten Place
Suite 350
Houston, Texas 77084
(713) 461-9600
TEXAS FIRM REGISTRATION NO. F-487

INTERIM REVIEW ONLY
DOCUMENT INCOMPLETE: Not Intended for permit, or construction.
Engineer: Mengyang Jiang
P.E. License No. 138195
DATE: June, 2022

PROJECT TITLE: STELLA ROAD		
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION: PROPOSED DETENTION BASIN SECTION		
DRAWN BY: NS		DATE: 6/28/22
CK'D BY: MJ	SCALE: 1" = 40'	SHEET NO: 52/100

M:\04755.000 20116 stella road\CAD\DWG\02- 04755 - Basins.dwg

AVILES
ENGINEERING CORP.

Design Soil Parameters for Slope Stability Analyses
Detention Basin (Based on Boring B-23)

Elevation (ft)	Soil Type	γ_m (pcf)	Short-Term/Undrained Parameters		Effective Stress Parameters		Total Stress Parameters	
			C_u (psf)	ϕ_u (deg)	C' (psf)	ϕ' (deg)	C_{cu} (psf)	ϕ_{cu} (deg)
94 to 90	Hard CH	125	2500	0	160 (C_r = 55)	16 (ϕ_r = 15)	150 (C_r = 55)	15 (ϕ_r = 15)
90 to 88	Stiff CH	119	1750	0	120 (C_r = 55)	16 (ϕ_r = 15)	110 (C_r = 55)	15 (ϕ_r = 15)
88 to 79	Very stiff to hard CH	124	2,100	0	140 (C_r = 55)	16 (ϕ_r = 15)	120 (C_r = 55)	15 (ϕ_r = 15)

Notes: (1) γ_m = moist unit weight of soil.
(2) C_u =undrained cohesion, ϕ_u = angle of internal friction, under short term conditions. UU = strength parameters that were determined from Unconsolidated-Undrained (UU)triaxial tests.
(3) C' =effective cohesion, ϕ' =effective friction angle, effective stress parameters that were determined from Consolidated-Undrained (CU) triaxial tests with pore water pressure measurements.
(4) C_{cu} = cohesion, ϕ_{cu} = friction angle, total stress parameters that were developed from CU triaxial tests.
(5) C_r = cohesion for desiccated fat clay, ϕ_r = friction angle for desiccated fat clay.
(6) CH = Fat Clay

G126-21 STELLA ROAD RECONSTRUCTION FROM COTTONWOOD SCHOOL TO BAND ROAD
STABILITY ANALYSIS FOR SOUTHEAST BANK DETENTION BASIN 1
SHORT TERM CONDITION, GLOBAL SLIDE, BASED ON BORING B-23

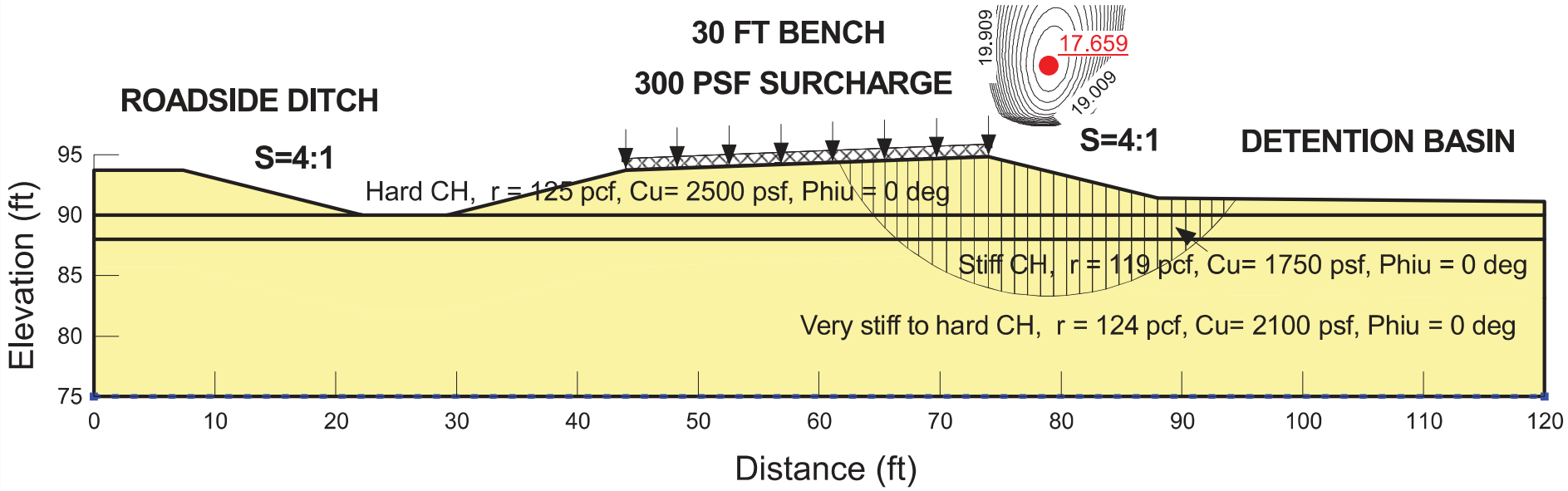


PLATE D-4

G126-21 STELLA ROAD RECONSTRUCTION FROM COTTONWOOD SCHOOL TO BAND ROAD
STABILITY ANALYSIS FOR SOUTHEAST BANK DETENTION BASIN 1
SHORT TERM CONDITION, LOCAL SLIDE, BASED ON BORING B-23

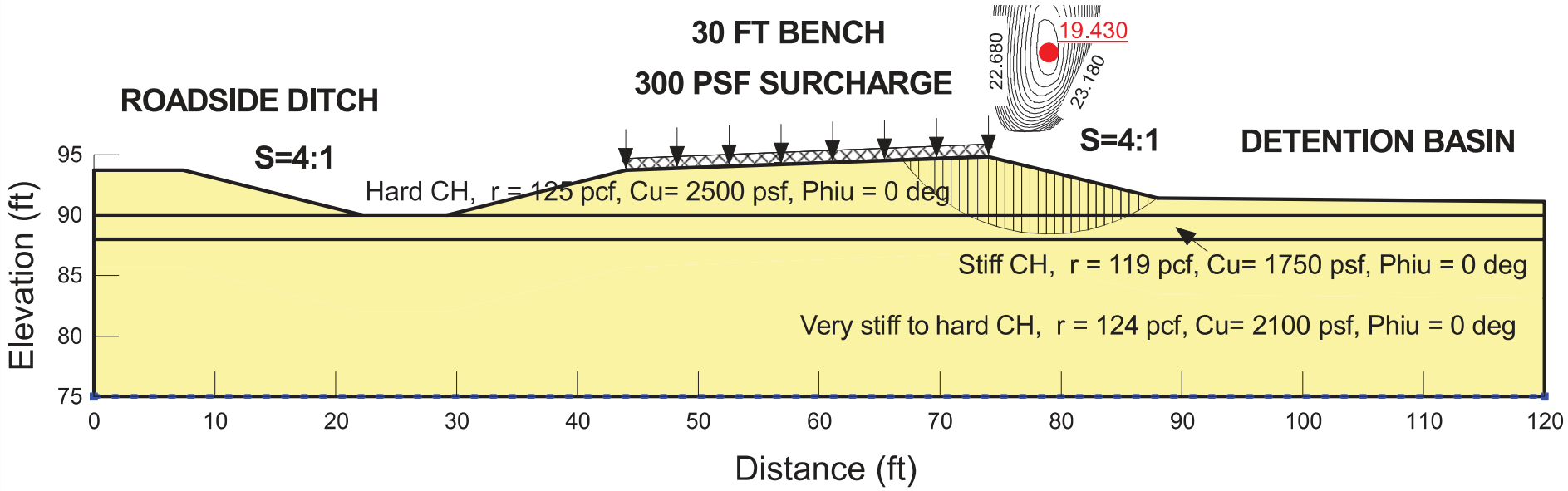


PLATE D-5

G126-21 STELLA ROAD RECONSTRUCTION FROM COTTONWOOD SCHOOL TO BAND ROAD
STABILITY ANALYSIS FOR SOUTHEAST BANK DETENTION BASIN 1
LONG TERM CONDITION, GLOBAL SLIDE, BASED ON BORING B-23

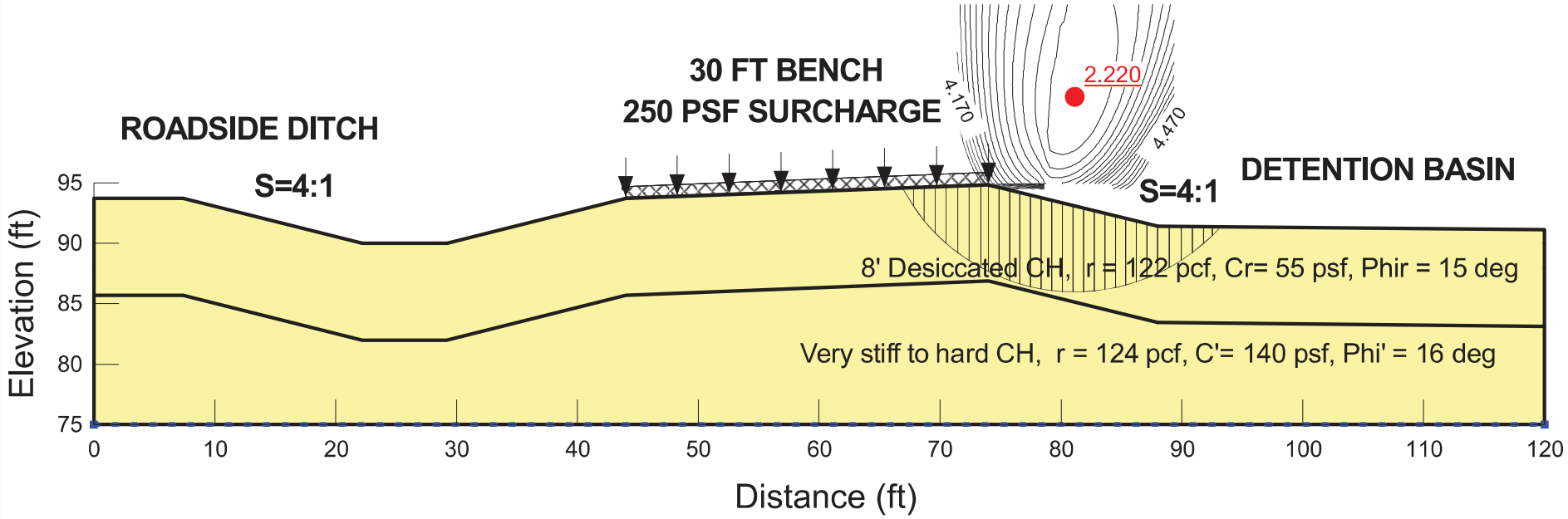


PLATE D-6

G126-21 STELLA ROAD RECONSTRUCTION FROM COTTONWOOD SCHOOL TO BAND ROAD
STABILITY ANALYSIS FOR SOUTHEAST BANK DETENTION BASIN 1
LONG TERM CONDITION, LOCAL SLIDE, BASED ON BORING B-23

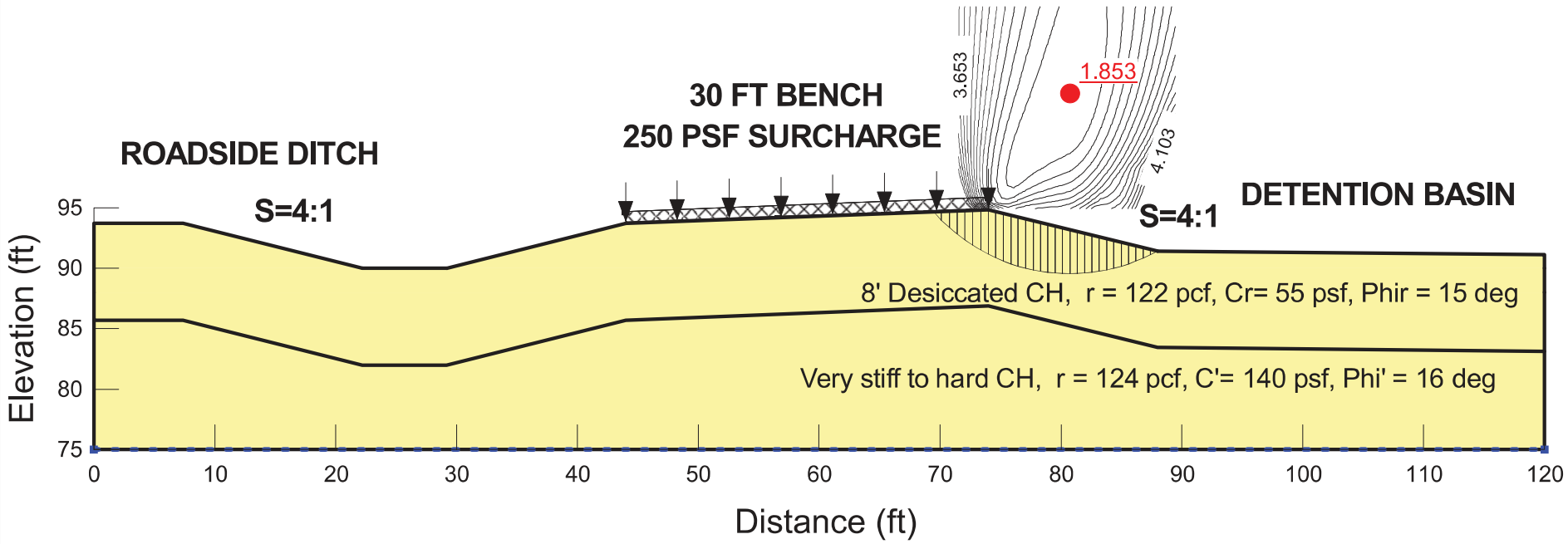


PLATE D-7

G126-21 STELLA ROAD RECONSTRUCTION FROM COTTONWOOD SCHOOL TO BAND ROAD
STABILITY ANALYSIS FOR SOUTHEAST BANK DETENTION BASIN 1
RAPID DRAWDOWN CONDITION, GLOBAL SLIDE, USING TOTAL STRESS PARAMETERS
BASED ON BORING B-23

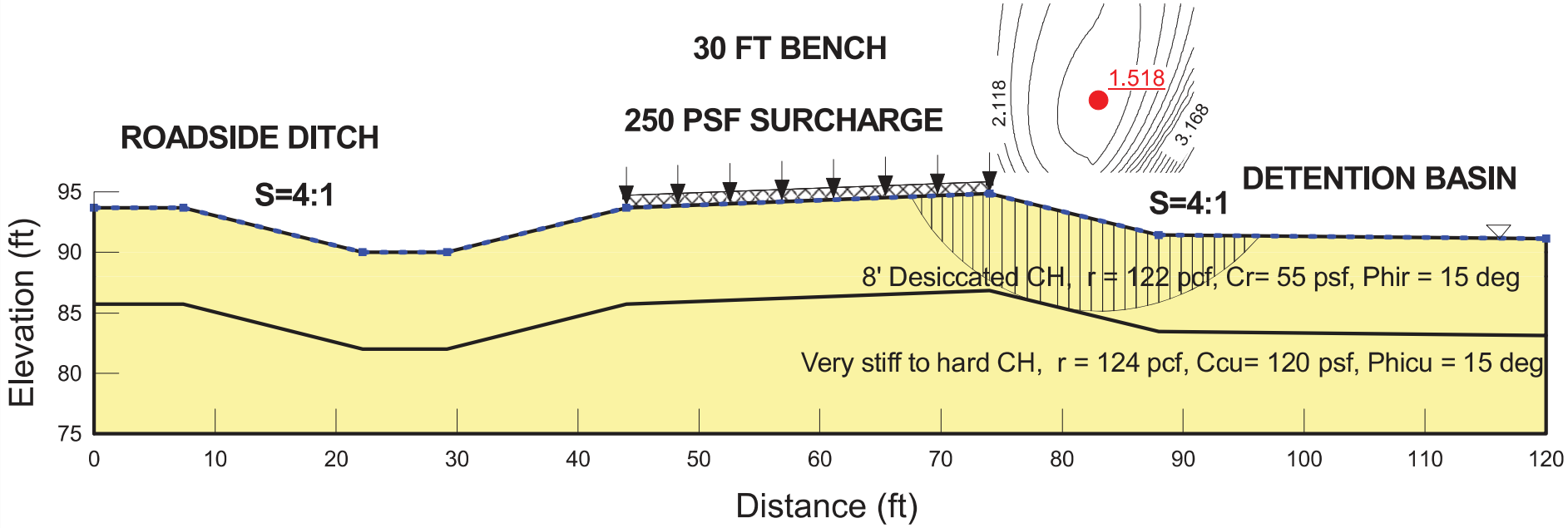


PLATE D-8

G126-21 STELLA ROAD RECONSTRUCTION FROM COTTONWOOD SCHOOL TO BAND ROAD
STABILITY ANALYSIS FOR SOUTHEAST BANK DETENTION BASIN 1
RAPID DRAWDOWN CONDITION, LOCAL SLIDE, USING TOTAL STRESS PARAMETERS
BASED ON BORING B-23

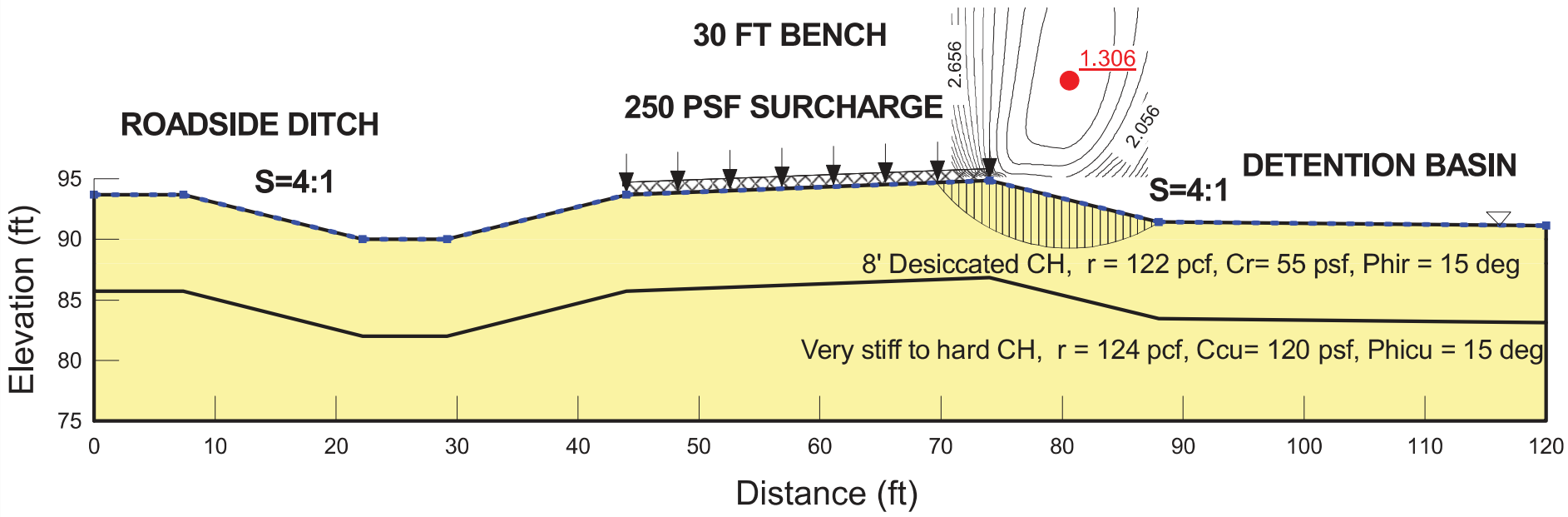


PLATE D-9

FORT BEND COUNTY ENGINEERING DEPARTMENT

STELLA ROAD
FROM COTTONWOOD SCHOOL RD TO W FAIRGROUNDS RD

FORT BEND COUNTY MOBILITY BOND PROJECT #20116
PRECINCT 1

VINCENT MORALES, JR.
COMMISSIONER PRECINCT 1

GRADY PRESTAGE
COMMISSIONER PRECINCT 2

KP GEORGE
COUNTY JUDGE

ANDY MEYERS
COMMISSIONER PRECINCT 3

DEXTER McCOY
COMMISSIONER PRECINCT 4

Rigoberto Calzoncin
Digitally signed by Rigoberto Calzoncin
Reason: I am approving this document
Date: 2024.07.12 08:02:36-05'00'

RIGO CALZONCIN, DATE
EXECUTIVE DIRECTOR OF PUBLIC SERVICES

Charles A. Kalkomey
Digitally signed by Charles A. Kalkomey
DN: C=US, E=ckalkomey@rosenbergtx.gov, CN=Charles A. Kalkomey
Reason: I am approving this document
Date: 2024.07.11 12:14:18-05'00'

CHARLES A. KALKOMEY, P.E., CITY ENGINEER DATE

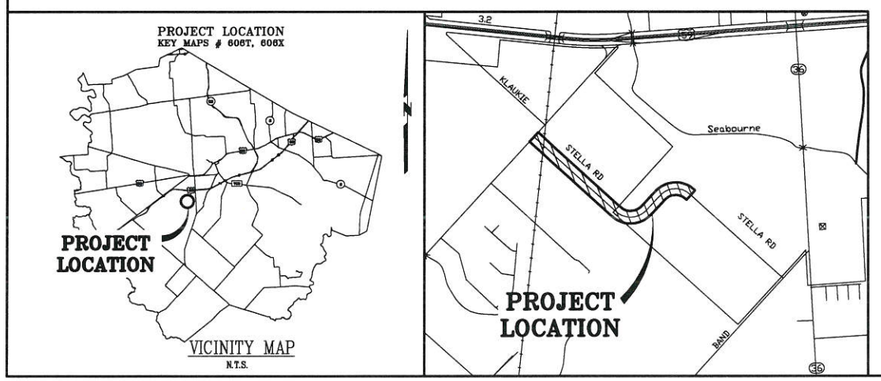
THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN ONE (1) YEAR FROM DATE OF APPROVALS.

THE STATE OF TEXAS
FORT BEND COUNTY

July 2024
PRECINCT 1
Fort Bend County, Texas

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/2/2024

County Engineer
J. STACY SLAWINSKI, P.E.
7/15/24
Date



x:\engineering\2021\21060 - stella road\1 cover sheet.dwg

GENERAL

1	COVER SHEET
2	INDEX SHEET
3	LEGEND
4	GENERAL NOTES
5	CONSTRUCTION NOTES
6-7	TYPICAL PAVEMENT SECTIONS
8	PROJECT LAYOUT

RIGHT-OF-WAY LAYOUT

9-36	TOPOGRAPHIC AND ROW SURVEY
37	HORIZONTAL ALIGNMENT DATA SHEET

REMOVAL PLAN

38-44	REMOVAL PLAN

PLAN AND PROFILE

45-56	PLAN AND PROFILE
57	DRIVEWAY SUMMARY TABLE
58	PROPOSED LATERAL CROSS SECTIONS

DRAINAGE

59	PROPOSED OVERALL DRAINAGE LAYOUT
60	PROPOSED DETENTION BASIN LAYOUT
61	PROPOSED DETENTION BASIN SECTION
62	PROPOSED DETENTION BASIN OUTFALL P&P
63	PROPOSED DETENTION BASIN INFLOW P&P
64	PROPOSED DETENTION BASIN GEOMETRIC LAYOUT
65	GEOMETRIC LAYOUT POINT DATA
66-67	EXISTING DRAINAGE MAP
68-69	PROPOSED DRAINAGE MAP
70	EXISTING DRAINAGE CALCULATIONS
71	PROPOSED DRAINAGE CALCULATIONS
72	PROPOSED CULVERT INPUT DATA
73	EXISTING CULVERT INPUT DATA
74	PROPOSED CULVERT NODE RESULTS
75	PROPOSED CULVERT LINK RESULTS

TRAFFIC CONTROL PLAN

76-77	TCP TYPICAL SECTIONS
78-79	OVERALL TCP PHASING
80-84	TRAFFIC CONTROL PLAN PHASE 1
85-90	TRAFFIC CONTROL PLAN PHASE 2
91	STELLA ROAD DETOUR PLAN

SIGNING AND PAVEMENT MARKING

92-96	SIGNING AND PAVEMENT MARKING PLAN

SWPPP

97-100	SWPPP SHEETS
101	PROPOSED DETENTION BASIN SWPPP

CONSTRUCTION DETAILS

102	FBCED TYPICAL PAVEMENT SECTIONS FOR DEVELOPMENT PROJ.
103	FBCED ASPHALT DRIVEWAY DETAILS
104	FBCED DRIVEWAY DETAILS FOR MAJOR ROADWAY CONSTRUCTION
105	FBCED STORM SEWER CONSTRUCTION DETAILS
106	FBCED PRECAST CONCRETE STORM SEWER MANHOLE DETAILS
107	FBCED JUNCTION BOX AND MANHOLE DETAILS
108	TXDOT PRECAST S.E.T.-TYII-PARALLEL DRAINAGE (PSET-SP)
109	TXDOT PRECAST S.E.T.-TYII-CROSS DRAINAGE (PSET-SC)
110	INTERCEPTOR STRUCTURE DETAILS
111	URBAN INTERCEPTOR STRUCTURE DETAILS
112	STORM SEWER AND RIPRAP DETAILS
113	CONCRETE HEADWALL DETAIL
114	CONCRETE CHANNEL LINING DETAIL
115	SWPPP DETAILS
116	SINGLE BOX CULVERT DETAIL
117-118	FBCED PAVEMENT MARKING DETAILS
119	FBCED TYPE III BARRICADE DETAILS
120	FBCED TYPICAL GROUND SIGN INSTALLATION
121	FBCED STREET SIGN NAME DETAILS
122	FBCED SWPPP DETAILS
123-124	FBCED PROJECT SIGN DETAILS

CROSS SECTIONS

125-133	CROSS SECTIONS

X:\Engineering\2021\21060 - Stella Road\2 INDEX SHEET.dwg Charlie Valenzuela

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: INDEX SHEET
SCALE:	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 2 / 133

LEGEND

SURVEY

- GUY ANCHOR
- POWER POLE
- TELE. PEDESTAL
- WATER SPIGOT
- LIGHT POLE
- MAILBOX
- STREET SIGN
- FLUSH VALVE
- WATER VALVE
- BLOW OFF VALVE
- WATER METER
- OVERHEAD UTILITY LINE
- BARBWIRE FENCE
- WOOD FENCE
- HOGWIRE FENCE
- "S" - SET 5/8" IR W/CAP

P.R.F.B.C.T. - PLAT RECORDS, FORT BEND CO.
D.R.F.B.C.T. - DEED RECORDS, FORT BEND CO.
O.R.F.B.C.T. - OFFICIAL RECORDS, FORT BEND CO.
O.P.R.F.B.C.T. - OFFICIAL PUBLIC RECORDS, FORT BEND CO.

PROPOSED

SOUTH/WEST ROW
NORTH/EAST ROW
SWALE
STORM SEWER
SANITARY SEWER
WATERLINE (WL)
CURB
PHONE DUCTS
GAS LINE
OVERHEAD POWER
SAWCUT
TRAFFIC SIGN
BARRICADE
F.H. W/ VALVE
GATE VALVE
GUY WIRE
PIPELINE MARKER
TYPE "BB" INLET
TYPE "C" INLET
TYPE "A" INLET
STORM MANHOLE
SANITARY MANHOLE
TOP OF CURB
TC
FLOW LINE
FL
CENTER LINE
CL
PAVEMENT
PVMT.
STREET LIGHT
PROFILE GRADE LINE
PGL
HYDRAULIC GRADE LINE
HGL
VERTICAL POINT OF INTERSECTION
VPI
POINT OF TANGENCY
PT
POINT OF COMMENCEMENT
PC
LINEAR FEET
LF
WATER SURFACE ELEVATION
WSEL
INVERT
INV
DIRECTION OF FLOW
DRAINAGE BOUNDARY
CUMULATIVE ACREAGE — 10.13
DRAINAGE AREA ACREAGE — 1.13
SLOPE

EXISTING

SOUTH/WEST ROW
NORTH/EAST ROW
SWALE
STORM SEWER
SANITARY SEWER
WATERLINE (WL)
CURB
PHONE DUCTS
GAS LINE
OVERHEAD POWER
ESMT. LINE
TRAFFIC SIGN
BARRICADE
F.H. W/ VALVE
GATE VALVE
GUY WIRE
PIPELINE MARKER
TYPE "BB" INLET
TYPE "H-2" INLET
TYPE "A" INLET
STORM MANHOLE
SANITARY MANHOLE
TOP OF CURB
TC
FLOW LINE
FL
CENTER LINE
CL
PAVEMENT
PVMT.
STREET LIGHT
BUSINESS SINGN
POWER POLE
PHONE MH
EBOX
WATER SURFACE ELEVATION
WSEL
DIRECTION OF FLOW
GRAVEL
REMOVE CONCRETE
SLOPE

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: LEGEND
SCALE:	
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 3 / 133

X:\Engineering\2021\21060 - Stella Road\3 LEGEND.dwg Charlie Valenzuela

GENERAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS BEFORE BEGINNING CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SECURITY TO PROTECT THE PROJECT SITE, CONTRACTOR PROPERTY, EQUIPMENT, AND WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING STREETS OF CONSTRUCTION DIRT AND DEBRIS AT CLOSE OF EACH WORK DAY.
4. THE CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF THE JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR, ALONG WITH CONCURRENCE FROM THE FIELD ENGINEER, SHALL DETERMINE HIS/HER LAY-DOWN AND/OR STAGING AREA LOCATIONS.
6. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF 24 HOURS PRIOR TO BLOCKING DRIVEWAYS OR ENTERING UTILITY EASEMENTS.
7. TRAFFIC INGRESS AND EGRESS FOR DRIVEWAYS AND PEDESTRIAN ACCESS FACILITIES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
8. THE CONTRACTOR SHALL REMOVE ANY FENCES, POSTS, MAILBOXES, PLANTERS, PERMANENT TRASH CONTAINERS, CULVERTS, ETC. OR SECTIONS THEREOF, THAT ENCROACH WITHIN THE COUNTY'S RIGHT-OF-WAY. NOTE: PRIOR TO CONSTRUCTION, THE PROPERTY OWNER WAS PAID TO RELOCATE OR REPLACE THESE ITEMS OUTSIDE OF THE COUNTY'S RIGHT-OF-WAY. IF THE OWNER HAS FAILED TO DO SO, THE CONTRACTOR WILL REPLACE THEM WITH THE MINIMUM LEVEL OF QUALITY NEEDED TO SECURE THE PROPERTY AND/OR MAINTAIN MAIL DELIVERY. IN THAT CASE, PAYMENT FOR THESE INSTALLATIONS WILL BE INCLUDED AS EXTRA WORK ITEMS OR AS OVERRUNS TO EXISTING PAY ITEMS.

   ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS LOCATED OUTSIDE OF THE COUNTY'S RIGHT-OF-WAY, SHALL BE REPLACED WITH LIKE-KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   ALSO, IF THESE ITEMS ARE LOCATED WITHIN THE PROJECT RIGHT-OF-WAY AND ARE DESIGNATED TO REMAIN, ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS, SHALL BE REPLACED WITH LIKE-KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   TREES, BUSHES, SHRUBBERY AND OTHER DAMAGED PLANTINGS DESIGNATED TO REMAIN SHALL BE REPLACED WITHIN 72 HOURS OF REMOVAL AND ARE TO BE THOROUGHLY WATERED-IN. NO SEPARATE PAY.
9. PAVED SURFACES, PAVEMENT MARKERS AND MARKINGS SHALL BE PROTECTED FROM DAMAGE BY TRACKED EQUIPMENT.
10. IRON RODS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED BY A REGISTERED PROFESSIONAL LAND SURVEYOR FOR THE ORIGINAL PROPERTY OWNER AT NO SEPARATE PAY.
11. CONSTRUCTION STAKING WILL BE PROVIDED BY THE CONTRACTOR. TWO COPIES OF STAKING NOTES TO BE PROVIDED TO THE ENGINEER PRIOR TO CONSTRUCTION.
12. THE COUNTY OR THE COUNTY'S SURVEYOR SHALL PROVIDE A BENCHMARK OR TEMPORARY BENCHMARK AND SURVEY CONTROLS.
13. THE CONTRACTOR SHALL MAINTAIN UPDATED RED-LINED RECORD DRAWINGS ON SITE FOR INSPECTION BY THE ENGINEER.
14. MOWING, MAINTENANCE, AND CLEAN-UP OF THE PROJECT SHALL MEET THE REQUIREMENT OF SPECIFICATION ITEM 560 (NO SEPARATE PAY). MOWING, MAINTENANCE, AND CLEAN-UP IS REQUIRED FOR THE PROJECT LIMITS AND DURATION, REGARDLESS OF THE CONTRACTOR'S SCOPE OF ACTIVITIES WITHIN THE PROJECT LIMITS.
15. THE REMOVAL OF ANY ABANDONED UTILITIES REQUIRED TO COMPLETE THE WORK SHALL BE INCIDENTAL AND NO SEPARATE PAYMENT SHALL BE MADE.
16. IT IS THE CONTRACTOR'S RESPONSIBILITY TO STOCKPILE NECESSARY MATERIAL ON-SITE OR AT A SECURED OFF-SITE LOCATION AT NO ADDITIONAL EXPENSE TO FORT BEND COUNTY. ANY SUITABLE EXCAVATED MATERIAL ON THE PROJECT WHICH IS AVAILABLE AT THE TIME OF NEED; WHETHER FROM STORM SEWER, ROADWAY, AND/OR CHANNEL EXCAVATION, SHALL BE USED BEFORE BORROW IS BROUGHT ON-SITE.
17. MANHOLES, JUNCTION BOXES, INLETS, AND RISERS ARE TO BE PRE-CAST OR CAST IN PLACE.
18. THE FOLLOWING DETAILS ARE MINIMUM REQUIREMENTS AND MAY BE SUPERSEDED BY GEOTECHNICAL ENGINEER RECOMMENDATIONS OR MORE STRINGENT REQUIREMENTS FROM THE CITY'S ETJ PROJECT IS WITHIN.
19. POP UP DRAINS ARE NOT ALLOWED IN FORT BEND COUNTY RIGHT OF WAY.
20. CONTRACTOR IS RESPONSIBLE FOR HIS OWN HORIZONTAL AND VERTICAL CONTROL, REFERENCE POINTS AND CONSTRUCTION STAKING AS INCIDENTAL TO THE PROJECT.
21. CONTRACTOR TO FIELD VERIFY ALL BOUNDARY AND TOPOGRAPHIC INFORMATION PRIOR TO BEGINNING WORK.
22. EXISTING UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR TO FIELD VERIFY LOCATION OF ANY EXISTING UTILITIES AND OTHER FACILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL EXISTING FACILITIES.
23. THE LENGTH OF PROPOSED UNDERGROUND UTILITY LINES SHOWN ARE APPROXIMATE ONLY. LENGTHS OF LINES MAY VARY DUE TO FIELD CONDITIONS ENCOUNTERED AT THE TIME OF CONSTRUCTION. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS NECESSARY FOR UTILITY LINES TO SERVE THEIR INTENDED PURPOSE AND SHALL BE RESPONSIBLE FOR THE REROUTING OF LINES OCCASIONED BY CONFLICTS WITH OTHER UTILITIES AND SITE FEATURES.
24. WATER METERS, UTILITY LINES AND APPURTENANCES, DRIVEWAYS, AND ALL OTHER ITEMS TO BE LOCATED WITHIN THE STREET RIGHT-OF-WAY OR A PUBLIC EASEMENT, ARE TO BE CONSTRUCTED IN STRICT ACCORDANCE WITH CURRENT GOVERNING CITY, COUNTY AND STATE STANDARDS.
25. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY BUILDING PERMITS AND FOR NOTIFICATION OF ALL AUTHORIZED INSPECTORS, SUPERINTENDENTS OR PERSONS IN CHARGE OF PRIVATE OR PUBLIC UTILITIES AFFECTED BY HIS OPERATIONS PRIOR TO COMMENCEMENT OF WORK.
26. CONTRACTOR SHALL NOTIFY UTILITY COORDINATING COMMITTEE BY TELEPHONE AT LEAST TWO FULL WORKING DAYS BEFORE STARTING WORK IN ANY STREET RIGHT-OF-WAY OR PUBLIC EASEMENT.

GENERAL NOTES CONT.

27. CONTRACTOR TO BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL BARRICADES,WARNING SIGNS, FLASHING LIGHTS AND TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", (TEXAS M.U.T.C.D. MOST RECENT EDITION AS REVISED) DURING CONSTRUCTION.
28. IF CONTRACTOR OPTS TO USE OPEN CUT METHOD OF CONSTRUCTION, TRENCH BEDDING AND BACKFILL SHALL MEET CITY OF STAFFORD REQUIREMENTS AND ALL OPEN EXCAVATIONS IN VEHICULAR TRAFFIC AREAS SHALL BE COVERED WITH ANCHORED STEEL PLATES CAPABLE OF SUPPORTING HS 20 LOADING AT END OF EACH DAYS WORK OR WHEN NOT IN USE.

TRAFFIC CONTROL

1. THE CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE MOST RECENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE APPROVED TRAFFIC CONTROL PLAN.
2. THE CONTRACTOR SHALL MAINTAIN AT LEAST ONE LANE OF TRAFFIC IN EACH DIRECTION DURING WORKING HOURS EXCEPT DURING FLAGGING OPERATION OR PROVIDE DETOURS AROUND THE CONSTRUCTION SITE AND PROVIDE PUBLIC NOTIFICATION.
3. LANE CLOSURES SHALL BE DURING OFF-PEAK HOURS ONLY (MONDAY THROUGH FRIDAY 9 A.M. TO 4 P.M.) UNIFORMED PEACE OFFICERS OR FLAGGERS IN RADIO CONTACT ARE REQUIRED TO DIRECT TRAFFIC DURING LANE CLOSURES.
4. DETOURS REQUIRE PRIOR APPROVAL OF THE FIELD ENGINEER AND PRECINCT. DETOUR PLANS, IF ALLOWED, MUST INCLUDE APPROPRIATE DETOUR SIGNAGE, PUBLIC NOTICE VIA SIGNAGE TWO WEEKS IN ADVANCE STATING THE DATES OF THE AGREED UPON DATE OF CLOSURE AND DATE THE ROAD WILL RE-OPEN TO TRAFFIC. CONTRACTOR TO USE (WITH PRIOR APPROVAL OF THE FIELD ENGINEER) HIGH EARLY STRENGTH CONCRETE AND OTHER RELATED CONSTRUCTION METHODS TO MINIMIZE THE DURATION OF THE DETOUR AND TO ENSURE THAT THE ROADWAY IS OPEN ON, OR PRIOR TO, THE AGREED UPON DATE.
5. ONE DAY PRIOR TO THE IMPLEMENTATION OF A TRAFFIC CONTROL PLAN PHASE OR STEP, OR THE IMPLEMENTATION OF AN ADDITIONAL, REVISED, OR NEW TRAFFIC CONTROL ELEMENT, THE CONTRACTOR SHALL MEET WITH THE ENGINEER TO GIVE A DETAILED DESCRIPTION OF THE CONTRACTOR'S PLAN AND PREPARATIONS. THE CONTRACTOR SHALL OBTAIN WRITTEN CONCURRENCE FROM THE ENGINEER THAT ADEQUATE PROJECT PROGRESS HAS BEEN ACHIEVED AND THAT ADEQUATE PREPARATIONS ARE IN PLACE PRIOR TO SWITCHING TRAFFIC. IF, IN THE OPINION OF THE ENGINEER, REQUIRED PROGRESS AND ADEQUATE PREPARATIONS ARE NOT COMPLETE, THE CONTRACTOR SHALL NOT IMPLEMENT THE NEXT PHASE, STEP, OR ELEMENT OF TRAFFIC CONTROL UNTIL INCOMPLETE CONSTRUCTION ITEMS OR PREPARATIONS ARE COMPLETED. TIME EXTENSIONS WILL NOT BE GRANTED FOR DELAYS CAUSED BY THE INCOMPLETE CONSTRUCTION ITEMS OR INADEQUATE CONTRACTOR PREPARATIONS REQUIRED TO IMPLEMENT TRAFFIC CONTROL.
6. TRAFFIC CONTROL PER THE CONTRACT IS REQUIRED FOR THE ENTIRE DURATION OF THE PROJECT, INCLUDING THE PUNCHLIST PERIOD. PAYMENT FOR TRAFFIC CONTROL THAT IS PROPERLY INSTALLED FOR LESS THAN A FULL MONTH SHALL BE BASED ON A PERCENTAGE BASIS OF THE TIME INSTALLED. TRAFFIC CONTROL PAYMENTS TO THE CONTRACTOR SHALL END 10 DAYS AFTER SUBSTANTIAL COMPLETION, ALTHOUGH PROPER TRAFFIC CONTROL MUST BE MAINTAINED UNTIL PUNCHLIST COMPLETION.
7. THE PURPOSE OF THE CONSTRUCTION SEQUENCE AND TRAFFIC HANDLING OUTLINED HEREIN IS TO DOCUMENT A VIABLE TCP THAT CAN BE UTILIZED TO CONSTRUCT THE PROJECT. IT IS THE BASIS OF ESTIMATION FOR THE TRAFFIC CONTROL BID ITEMS, AND IS TO BE UTILIZED AND IMPLEMENTED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

   IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT TCP, HE/SHE SHALL PREPARE AND SUBMIT THE ALTERNATIVE TCP TO THE COUNTY FOR APPROVAL NO LESS THAN 10 WORKING DAYS PRIOR TO THE PROPOSED IMPLEMENTATION DATE. THE TCP SHALL BE DRAWN TO SCALE AND SIGNED & SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS. UPON APPROVAL BY FORT BEND COUNTY, THE ALTERNATIVE PLAN SHALL BECOME THE BASIS FOR A "CHANGE IN CONTRACT" TO REVISE THE TRAFFIC CONTROL BID ITEMS ACCORDINGLY AND BECOME PART OF THE CONTRACT DOCUMENTS.
8. ALL TEMPORARY PAVEMENT MARKINGS ON PERMANENT PAVEMENT SHOULD BE RPMS OR TABS.
9. TRAFFIC PATTERN CHANGES REQUIRE CHANGEABLE MESSAGE BOARDS PLACED AT LEAST 2 WEEKS IN ADVANCE OF PROPOSED CHANGE. QUANTITY, PLACEMENT AND WORDING TBD BY FBC.

STORM SEWER CONSTRUCTION NOTES

1. STORM SEWER PIPE TO BE POLYVINYL CHLORIDE PIPE (PVC) CONFORMING TO ASTM D3034, SDR 35 (PIPE SIZE 12"), AND REINFORCED CONCRETE PIPE (RCP) CONFORMING TO ASTM C-76, CLASS III, EXCEPT AS OTHERWISE NOTED ON THE PLANS.
2. ALL STORM SEWERS TO RECEIVE BEDDING AND BACKFILL IN ACCORDANCE WITH THE DETAILS CONTAINED IN THE PLANS. STORM SEWERS WITHIN PUBLIC STREET RIGHTS-OF-WAY OR EASEMENTS TO RECEIVE BEDDING AND BACKFILL IN ACCORDANCE WITH FORT BEND COUNTY W.C.I.D. NO.2 SPECIFICATIONS FOR SEWER CONSTRUCTION, LATEST PRINTING AND AMENDMENTS THERETO.
3. WHERE MANHOLES, GRATE INLETS, OR JUNCTION BOXES ARE LOCATED WITHIN PAVED AREAS, CONTRACTOR SHALL SET RIM ELEVATIONS TO MATCH TOP OF PAVEMENT ELEVATIONS.
4. CONTRACTOR TO ALLOW A MINIMUM OF 6-INCH VERTICAL CLEARANCE BETWEEN STORM SEWER AND OTHER EXISTING OR PROPOSED UTILITIES.

AT&T TEXAS/SWBT FACILITIES

1. THE LOCATIONS OF AT&T TEXAS/SWBT FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.
2. THE CONTRACTOR SHALL CALL 1-800-344-8377 (TEXAS 811) A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.
3. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF AT&T TEXAS/SWBT FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL EXPOSE THE AT&T TEXAS/SWBT FACILITIES.
4. WHEN AT&T TEXAS/SWBT FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.
5. THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES OR BURIED CABLE FACILITIES SHOWN ON THESE PLANS DOES NOT MEAN THAT THERE ARE NO DIRECT BURIED CABLES OR OTHER CABLES IN CONDUIT IN THE AREA.
6. PLEASE CONTACT THE AT&T TEXAS DAMAGE PREVENTION MANAGER MR. ROOSEVELT LEE JR. AT (713) 567-4552 OR EMAIL HIM AT RL7259@ATT.COM, IF THERE ARE QUESTIONS ABOUT BORING OR EXCAVATING NEAR OUR AT&T TEXAS/SWBT FACILITIES.

CAUTION: UNDERGROUND GAS FACILITIES

THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITEE AT 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

*WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 945-8036 OR (713) 945-8037 (7:00 A.M. TO 4:30P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

*WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.

*WHEN CENTERPOINT ENERGY GAS FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.

* FOR EMERGENCIES REGARDING GAS LINES CALL (713) 659-3552 OR (713) 207-4200

THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

WARNING: OVERHEAD ELECTRICAL LINES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:

- ANY ACTIVITY WHERE PERSON OR THINGS MAY COME WITHIN SIX(6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
- OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES.

PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS, ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT (713) 207-2222

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY
NO APPROVAL TO USE, CROSS OR OCCUPY CENTERPOINT FEE OR EASEMENT PROPERTY IS GIVEN. IF YOU NEED TO USE CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING & RIGHT OF WAY DIVISION AT (713) 207-6348 OR (713) 207-5769.

STORM WATER QUALITY

1. SWQMP: THIS PROJECT DOES NOT REQUIRE A STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) BECAUSE IT DOES NOT MEET THE DEFINITION OF NEW DEVELOPMENT OR SIGNIFICANT REDEVELOPMENT UNDER THE FORT BEND COUNTY REGULATIONS.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER · 7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: GENERAL NOTES
SCALE:	
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 4 / 133

X:\Engineering\2021\21060 - Stella Road\4 GENERAL NOTES.dwg Charlie Valenzuela

CONSTRUCTION

1. FORT BEND COUNTY MUST BE INVITED TO THE PRE-CONSTRUCTION MEETING.

2. CONTRACTOR SHALL NOTIFY FORT BEND COUNTY ENGINEERING DEPARTMENT 48 HOURS PRIOR TO COMMENCING CONSTRUCTION AND 48 HOUR NOTICE TO ANY CONSTRUCTION ACTIVITY WITHIN THE LIMITS OF THE PAVING AT CONSTRUCTION@FBCTX.GOV.

3. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FROM FORT BEND COUNTY PRIOR TO COMMENCING CONSTRUCTION OF ANY IMPROVEMENTS WITHIN COUNTY ROAD RIGHT OF WAYS.

4. ALL PAVING IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH FORT BEND COUNTY "RULES, REGULATIONS AND REQUIREMENTS" RELATING TO THE APPROVAL AND ACCEPTANCE OF IMPROVEMENTS IN SUBDIVISIONS AS CURRENTLY AMENDED.

5. ALL ROAD WIDTHS, CURB RADII AND CURB ALIGNMENT SHOWN INDICATES BACK OF CURB.

6. A CONTINUOUS LONGITUDINAL REINFORCING BAR SHALL BE USED IN THE CURBS.

7. ALL CONCRETE PAVEMENT SHALL BE 5½ SACK CEMENT WITH A MINIMUM COMPRESSIVE STRENGTH OF 3500 PSI AT 28 DAYS. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT EACH CURB RETURN AND AT A MAXIMUM SPACING OF 60 FEET.

8. ALL WEATHER ACCESS TO ALL EXISTING STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.

9. 4" X 12" REINFORCED CONCRETE CURB SHALL BE PLACED IN FRONT OF SINGLE FAMILY LOTS ONLY. ALL OTHER AREAS SHALL BE 6" REINFORCED CONCRETE CURB.

10. CURB HEADERS ARE REQUIRED AT CURB CONNECTIONS TO HANDICAP RAMPS, WITH NO CONSTRUCTION JOINT WITHIN 5' OF RAMPS.

11. GUIDELINES ARE SET FORTH IN THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED, SHALL BE OBSERVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE FLAGMEN, SIGNING, STRIPING AND WARNING DEVICES, ETC., DURING CONSTRUCTION – BOTH DAY AND NIGHT.

12. ALL R1-1 STOP SIGNS SHALL BE A MINIMUM OF 36"X36" WITH DIAMOND GRADE SHEETING PER TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

13. STREET NAME SIGNAGE SHALL BE ON A 9" HIGH SIGN FLAT BLADE W/REFLECTIVE GREEN BACKGROUND. STREET NAMES SHALL BE UPPER AND LOWERCASE LETTERING WITH UPPERCASE LETTERS OF 6" MINIMUM AND LOWERCASE LETTERS OF 4.5" MINIMUM. THE LETTERS SHALL BE REFLECTIVE WHITE. STREET NAME SIGNS SHALL BE MOUNTED ON STOP SIGN POST.

14. A BLUE DOUBLE REFLECTORIZED BUTTON SHALL BE PLACED AT ALL FIRE HYDRANT LOCATIONS. THE BUTTON SHALL BE PLACED 12 INCHES OFF OF THE CENTERLINE OF THE STREET ON THE SAME SIDE AS THE HYDRANT.

15. THE PROJECT AND ALL PARTS THEREOF SHALL BE SUBJECT TO INSPECTION FROM TIME TO TIME BY INSPECTORS DESIGNATED BY FORT BEND COUNTY. NO SUCH INSPECTIONS SHALL RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER. NEITHER FAILURE TO INSPECT NOR FAILURE TO DISCOVER OR REJECT ANY OF THE WORK AS NOT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS, REQUIREMENTS AND SPECIFICATIONS OF FORT BEND COUNTY OR ANY PROVISION OF THIS PROJECT SHALL BE CONSTRUED TO IMPLY AN ACCEPTANCE OF SUCH WORK OR TO RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER.

16. STABILIZED SUBGRADE: DETERMINE THE THICKNESS OF THE STABILIZED SUBGRADE AFTER CURING AND COMPACTION. IF THE SUBGRADE DEPTH IS GREATER THAN THE PROPOSED THICKNESS BY 20% OR MORE, THE CMT LAB MUST PROVIDE VERIFICATION THE PERCENTAGE OF MATERIAL BEING USED TO STABILIZE THE SUBGRADE MEETS OR EXCEEDS PROJECT REQUIREMENTS. TEST RESULTS REQUIRED.

17. CONTRACTOR TO PROVIDE MONTHLY SCHEDULE UPDATES AND WEEKLY LOOK AHEAD

NOTE: FORT BEND COUNTY NOTES SUPERSEDE ANY CONFLICTING NOTES.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS
2	ADDED NOTE 17	3-1-23	RJS
3			
4			
5			

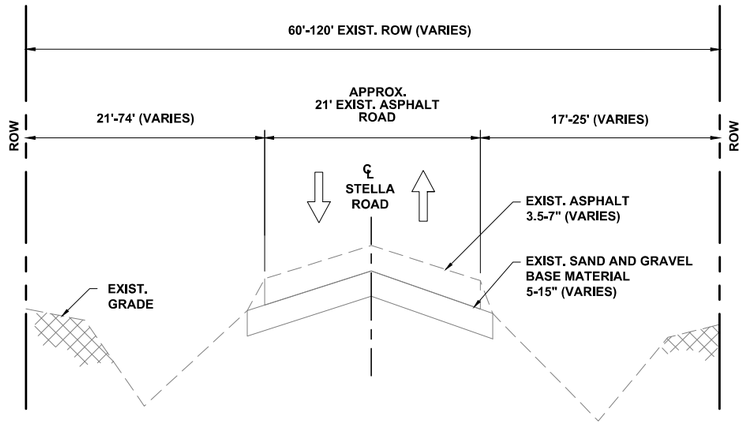
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103500
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

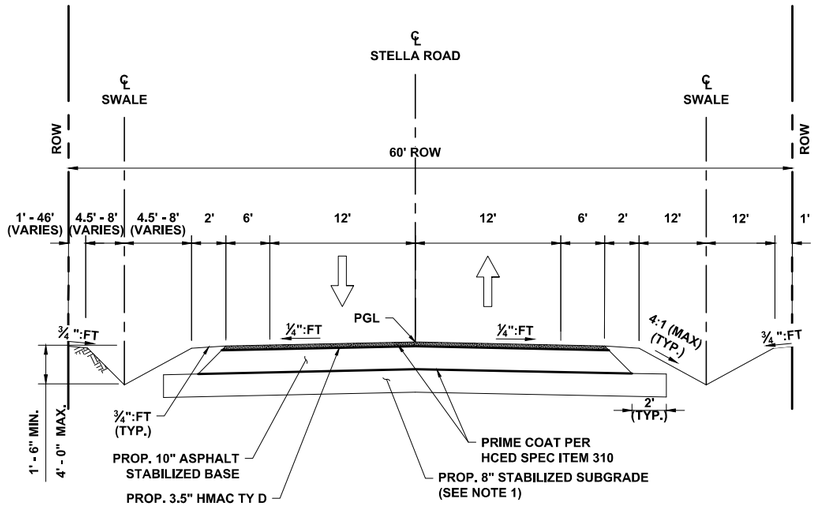
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: CONSTRUCTION NOTES
SCALE:	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 5 / 133

X:\Engineering\2021\21060 – Stella Road\5 CONSTRUCTION NOTES.dwg Charlie Valenzuela

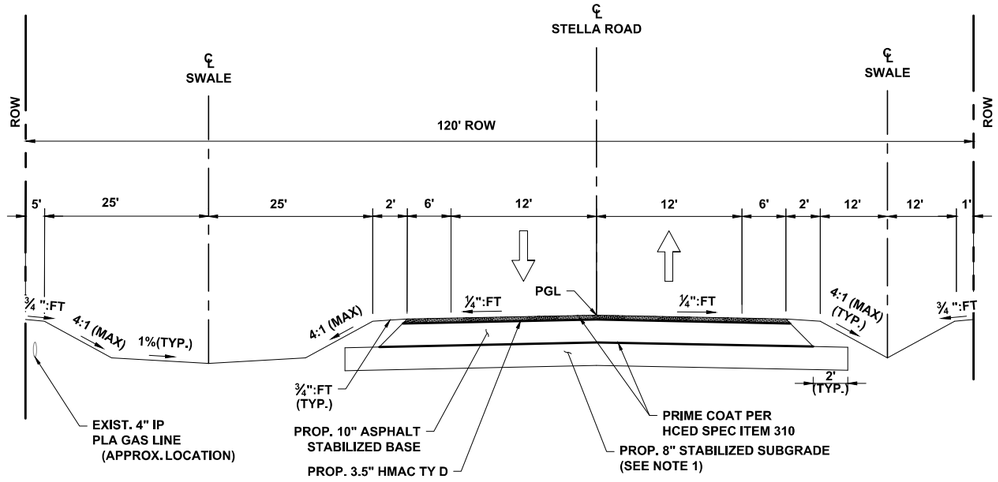


EXISTING TYPICAL SECTION
STELLA ROAD
N.T.S.

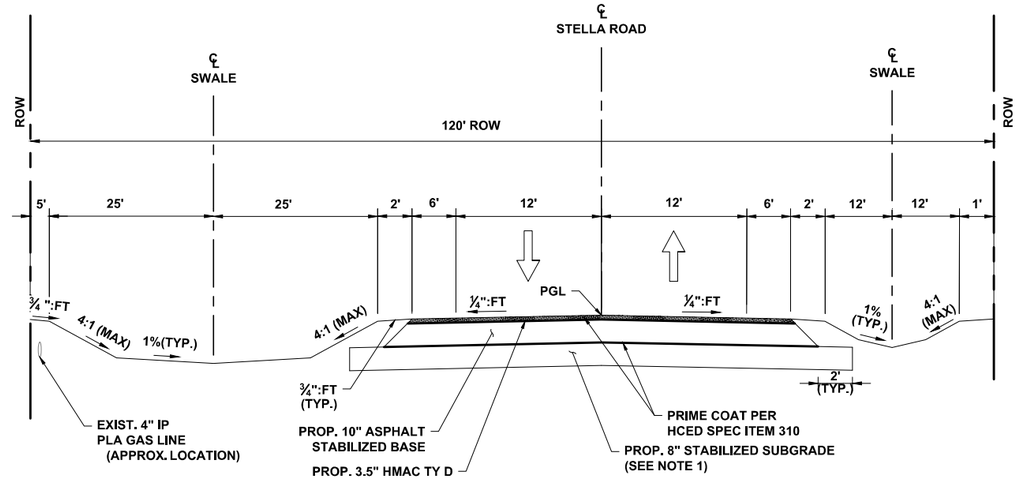


NOTES:
1. PER GEOTECHNICAL INVESTIGATION FOR STELLA ROAD IMPROVEMENTS FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD REPORT NO. G126-21 DATED JULY 2021, SUBGRADE WITHIN HIGHLY EXPANSIVE FAT CLAY (CH) SOIL SHALL BE STABILIZED WITH A MIN. OF 7% LIME. WHERE SANDY SOILS ARE EXPOSED AT GROUND SURFACE, SUBGRADE SHOULD BE STABILIZED WITH A MIN 3% LIME AND 7% FLY ASH.

PROPOSED TYPICAL SECTION
STELLA ROAD
N.T.S.
STA 1+61.85 - 5+20.00



PROPOSED TYPICAL SECTION
STELLA ROAD
N.T.S.
STA 5+20.00 - 12+74.00
STA 19+21.07 - 25+50.00



PROPOSED TYPICAL SECTION
STELLA ROAD
N.T.S.
STA 12+74.00 - 19+21.07

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

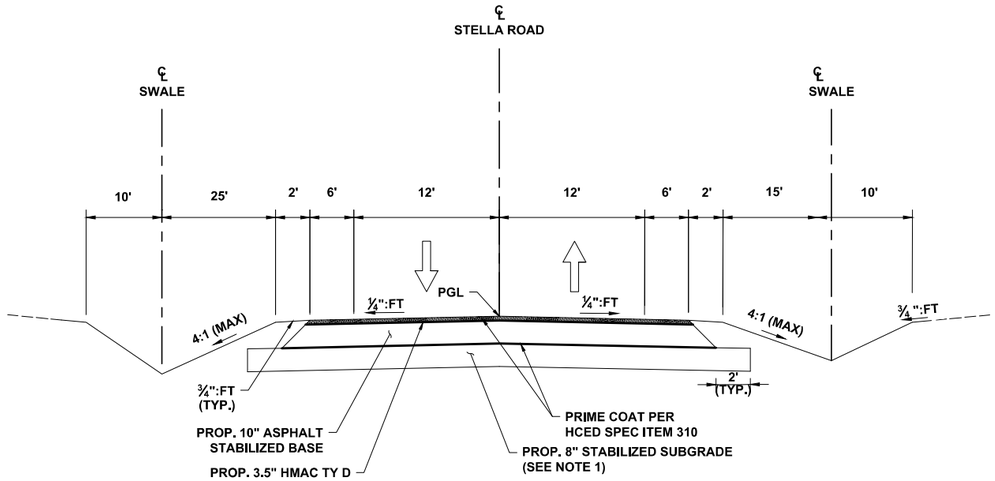
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

AUSTIN P. MCLEAN 132535 LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TYPICAL PAVEMENT SECTIONS
SCALE:	
DATE: 1/16/2023	APPROVED BY:

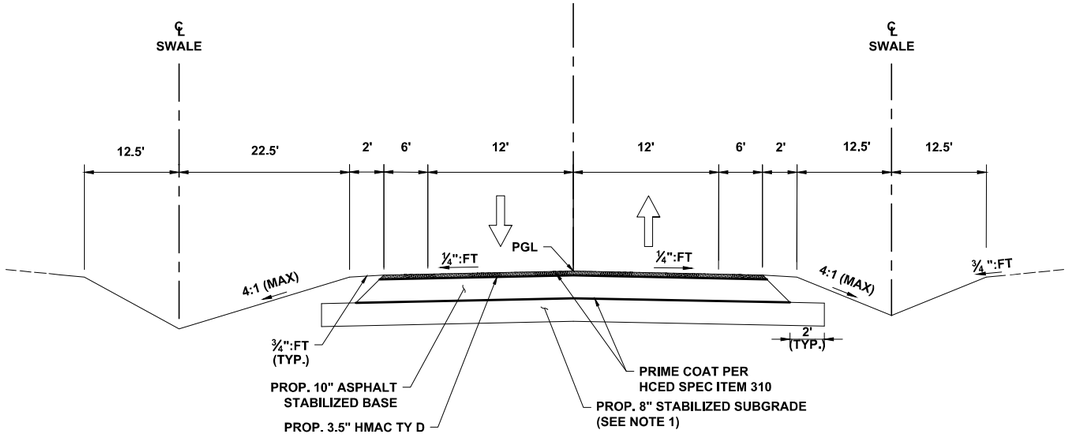
SHEET NO: 6 / 133

X:\Engineering\2021\21060 - Stella Road\6 TYPICAL PAVEMENT SECTIONS.dwg Charlie Valenzuela

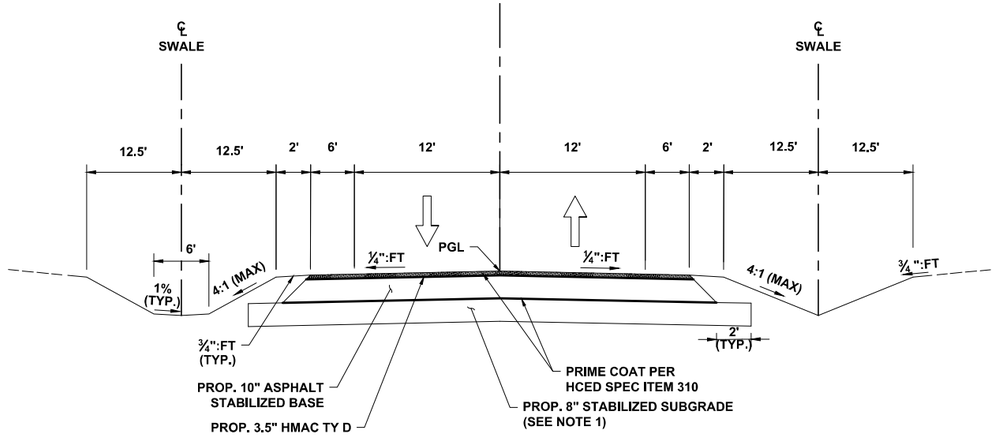


PROPOSED TYPICAL SECTION
STELLA ROAD
N.T.S.
STA. 25+50.00 - 37+66.69

NOTES:
1. PER GEOTECHNICAL INVESTIGATION FOR STELLA ROAD IMPROVEMENTS FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD REPORT NO. G126-21 DATED JULY 2021, SUBGRADE WITHIN HIGHLY EXPANSIVE FAT CLAY (CH) SOIL SHALL BE STABILIZED WITH A MIN. OF 7% LIME. WHERE SANDY SOILS ARE EXPOSED AT GROUND SURFACE, SUBGRADE SHOULD BE STABILIZED WITH A MIN 3% LIME AND 7% FLY ASH.



PROPOSED TYPICAL SECTION
STELLA ROAD
N.T.S.
STA. 37+66.69 - 47+00.00



PROPOSED TYPICAL SECTION
STELLA ROAD
N.T.S.
STA. 47+00.00 - END

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

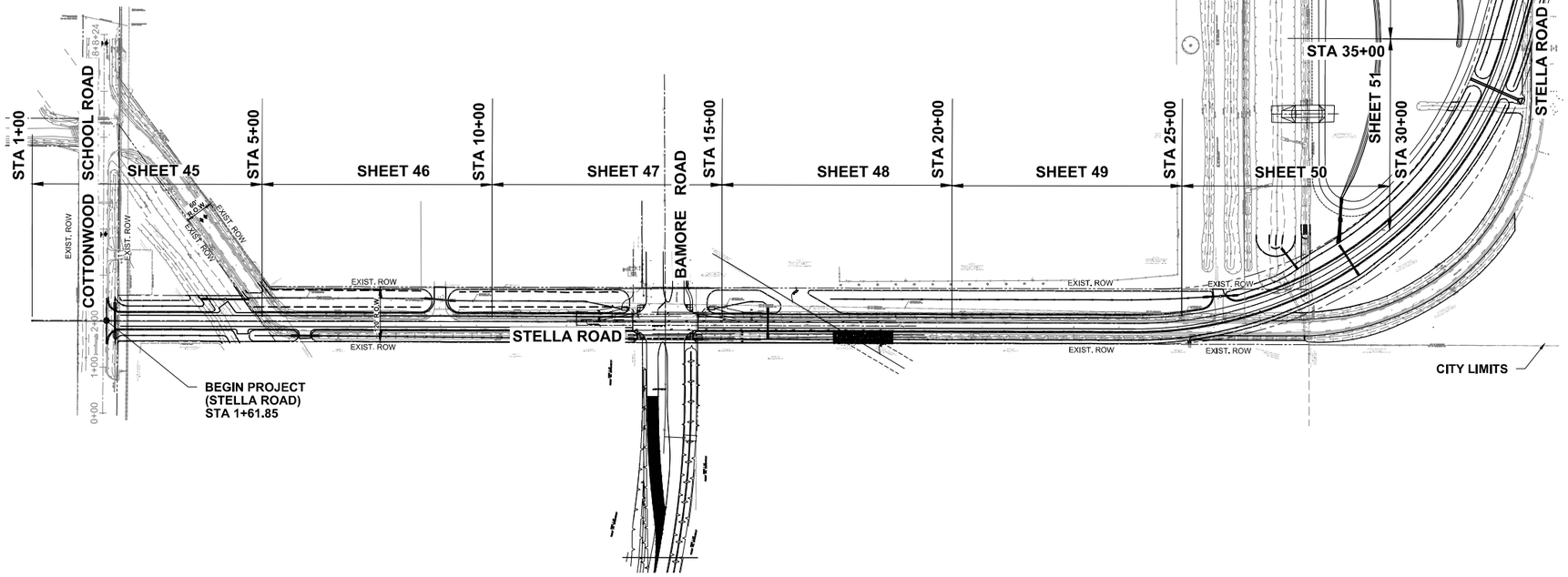
McDONOUGH
CVM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TYPICAL PAVEMENT SECTIONS
SCALE:	
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 7 / 133

X:\Engineering\2021\21060 – Stella Road\7 TYPICAL PAVEMENT SECTIONS.dwg Charlie Valenzuela



NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

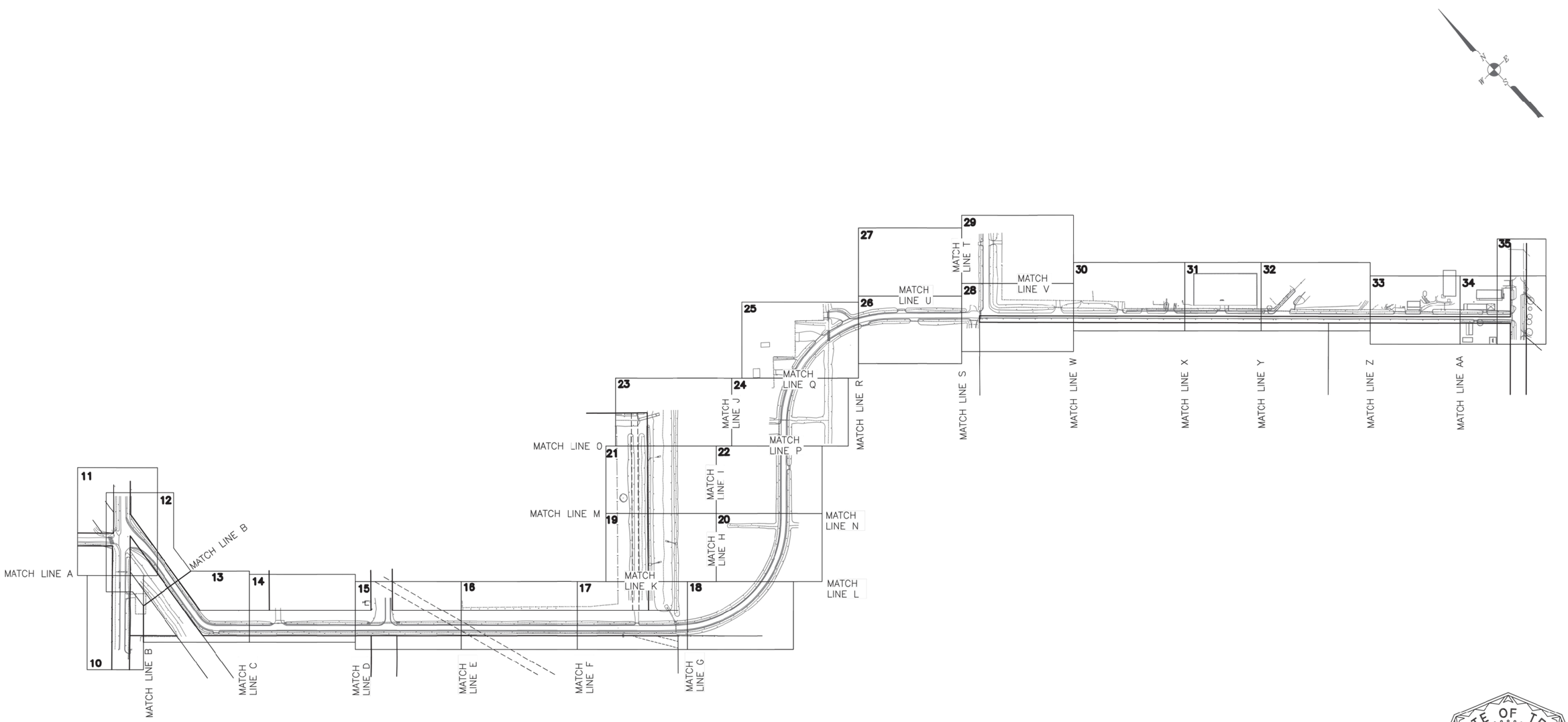
FORT BEND COUNTY TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD	
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.	
CK'D BY: AM	SHEET DESCRIPTION: PROJECT LAYOUT	
SCALE: 1"=150'		SHEET NO: 8 / 133
DATE: 1/16/2023	APPROVED BY:	

X: \Engineering \2021 \21060 – Stella Road \8 PROJECT LAYOUT.dwg Charlie Valenzuela



PAUL P. KWAN
4313
PROFESSIONAL LAND SURVEYOR
STATE OF TEXAS REGISTERED

07/26/2022

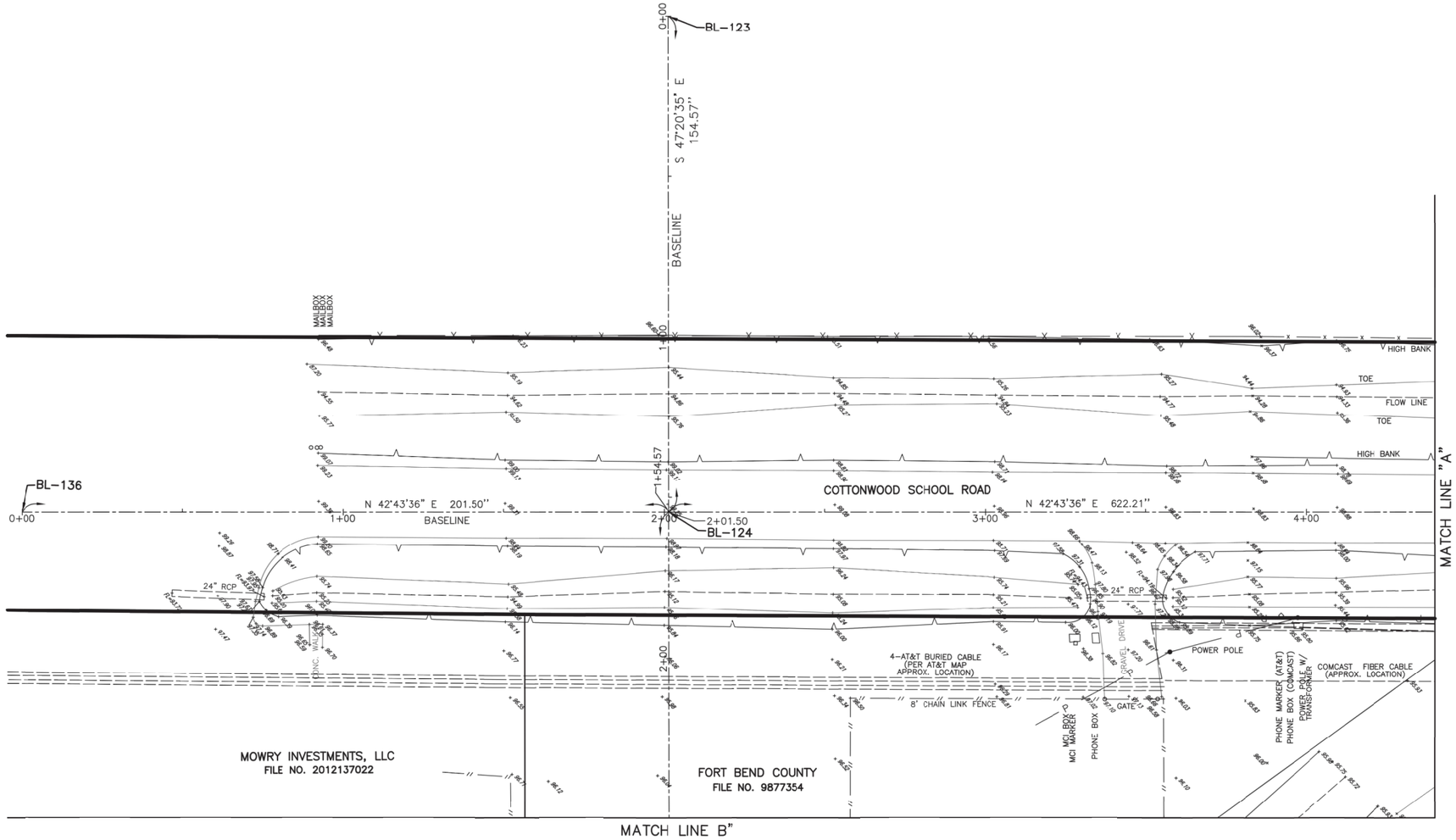
NO.	REVISIONS	DATE	NAME
1	ADDED BH–12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

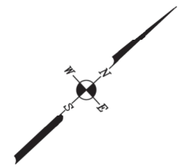
FORT BEND COUNTY ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY
DRAWN BY:
DATE:
CK'D BY:
SCALE: AS SHOWN
SHEET NO: 9 / 133

S:\2021\212006\StellaRoad\CADD\Stella Road Index Sheet.dwg





0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL-123	0+00.00	13,754,244.13	2,977,397.57	STELLA 0+00
BL-124	1+54.57	13,754,139.39	2,977,511.24	STELLA ROAD INTERSECTION
BL-136	0+00.00	13,753,991.37	2,977,374.52	COTTONWOOD SCHOOL 0+00

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY ENGINEERING DEPARTMENT

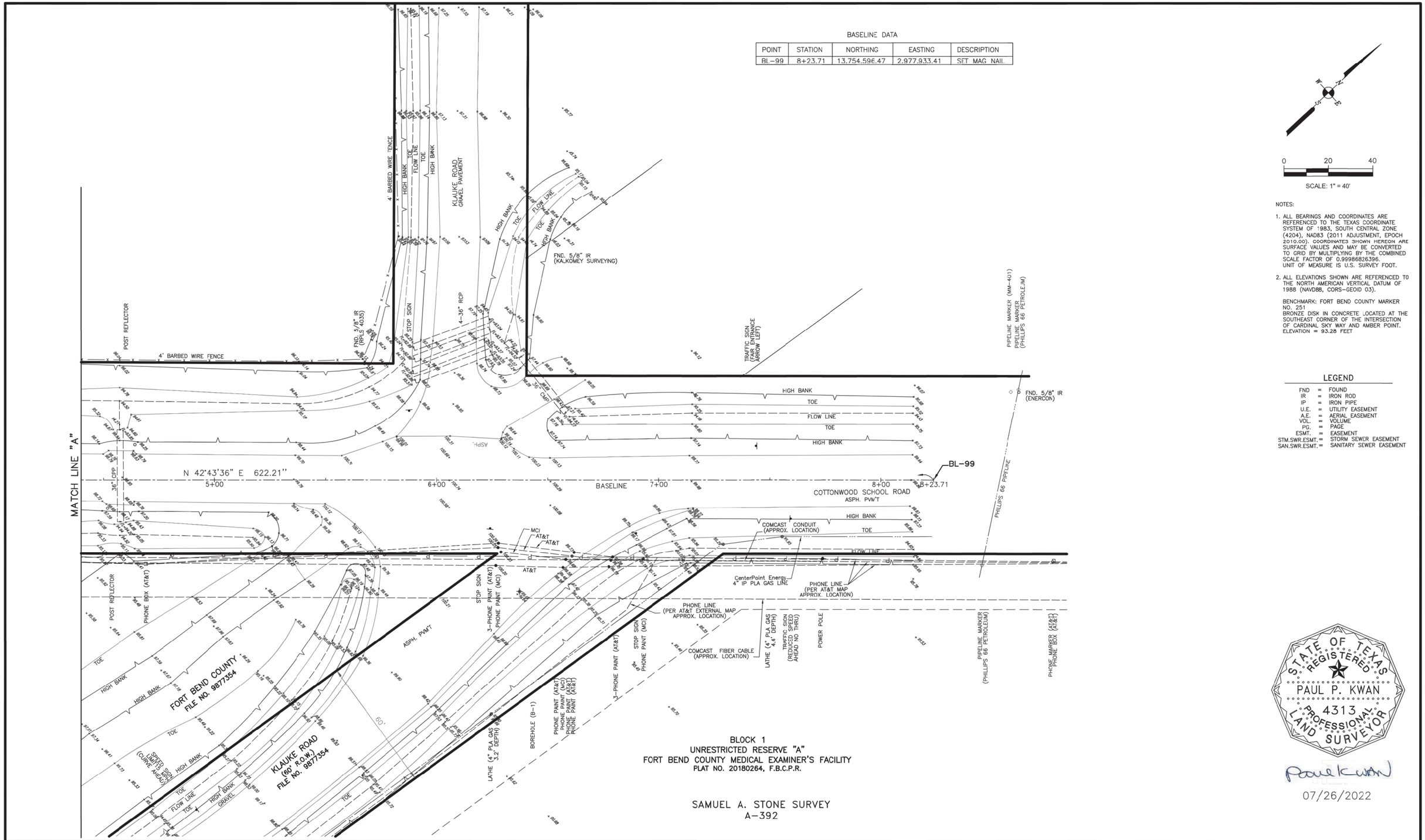
LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 10 / 133

S:\2021\212006SStellaRoad\CADD\Stella Road Topo.dwg

BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL–99	8+23.71	13,754,596.47	2,977,933.41	SET MAG NAIL



BLOCK 1
UNRESTRICTED RESERVE "A"
FORT BEND COUNTY MEDICAL EXAMINER'S FACILITY
PLAT NO. 20180264, F.B.C.P.R.

SAMUEL A. STONE SURVEY
A–392

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS–GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

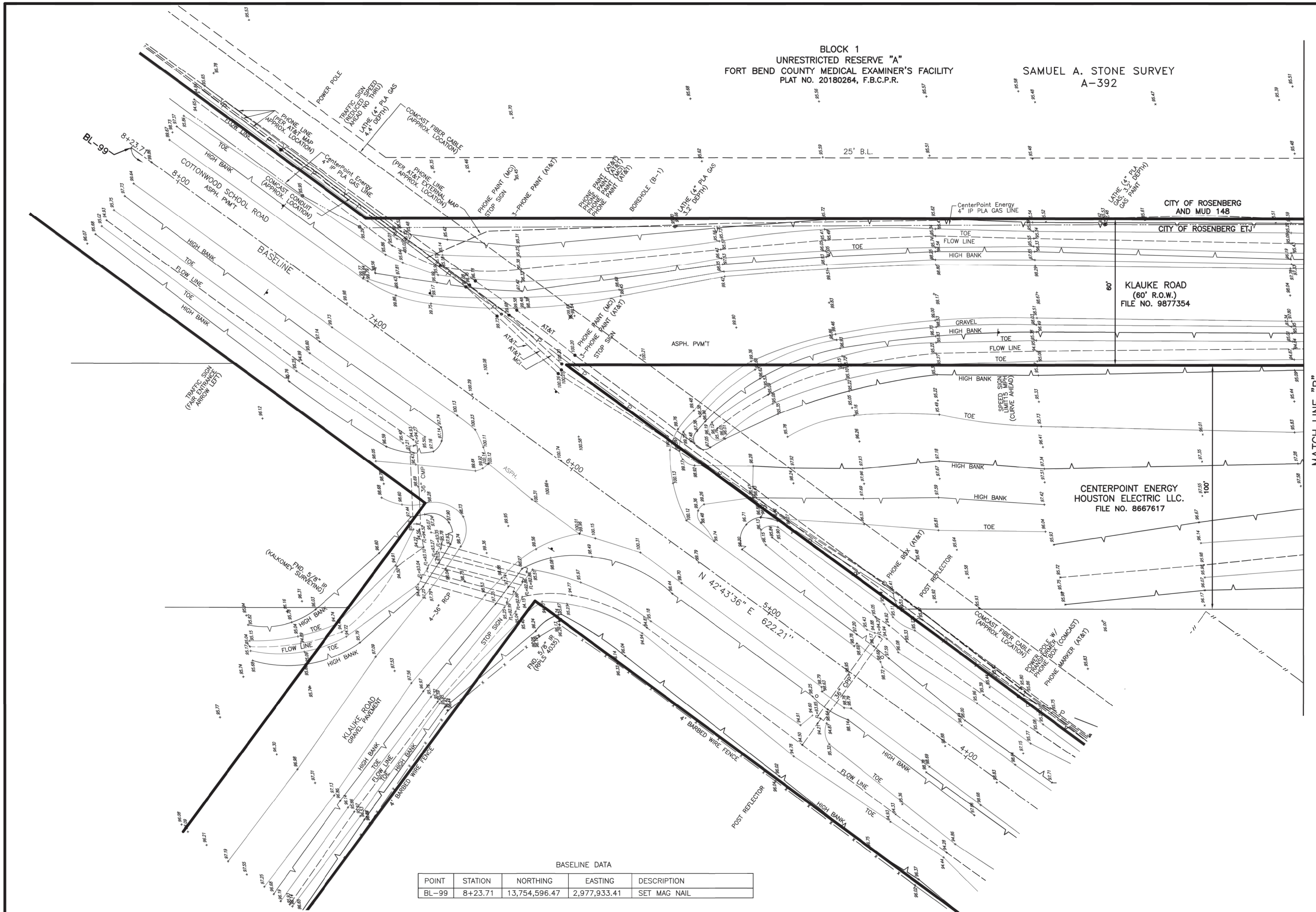
NO.	REVISIONS	DATE	NAME
1	ADDED BH–12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD			
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD			CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY			
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 11 / 133

S:\2021\212006SStellaRoad\CADD\Stella Road Topo.dwg



NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.
2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

BENCHMARK: FORT BEND COUNTY MARKER NO. 251
BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS REGISTERED PAUL P. KWAN 4313 PROFESSIONAL LAND SURVEYOR

Paul Kwan
07/26/2022

BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL-99	8+23.71	13,754,596.47	2,977,933.41	SET MAG NAIL

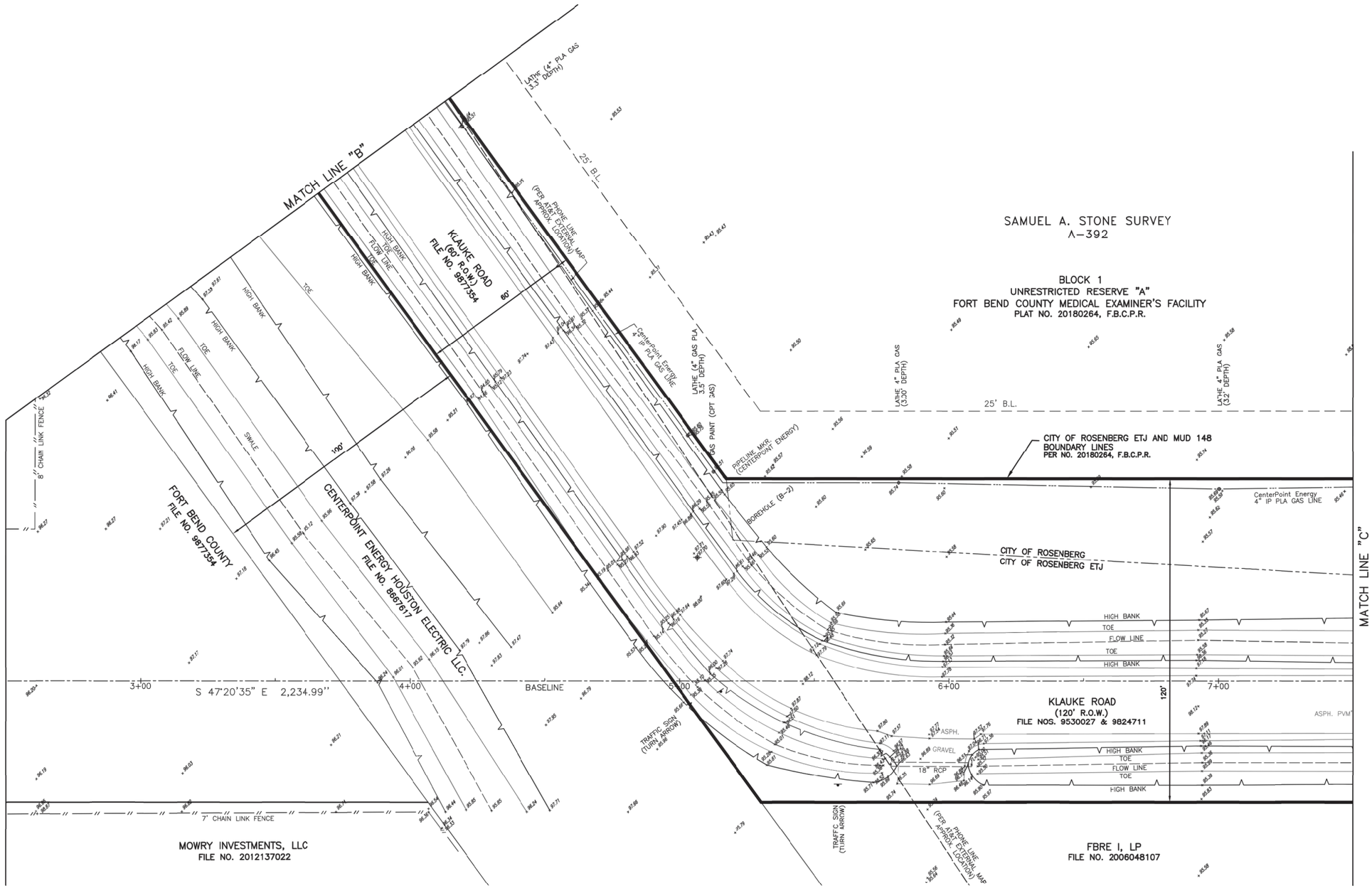
NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY
DRAWN BY:
DATE:
CK'D BY:
SCALE: AS SHOWN
SHEET NO: 12 / 133

S:\2021\2120065StellaRoad\CADD\Stella Road Topo.dwg



0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.
2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

07/26/2022

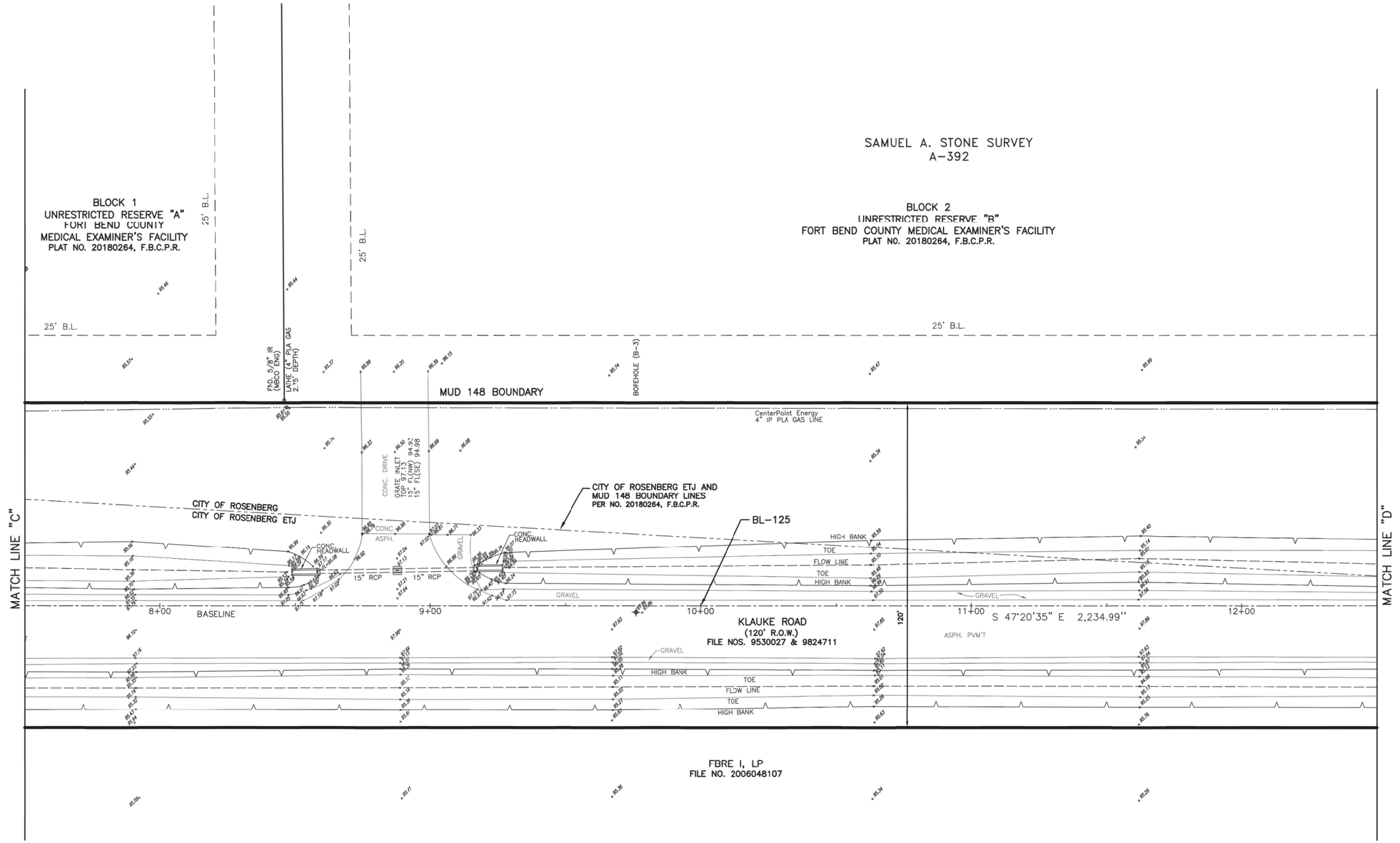
NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL
5			

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 13 / 133

S:\2021\212006\StellaRoad\CADD\Stella Road Topo.dwg



BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL-125	10+00.00	13,753,566.52	2,978,132.99	STELLA ROAD 10+00

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

07/26/2022

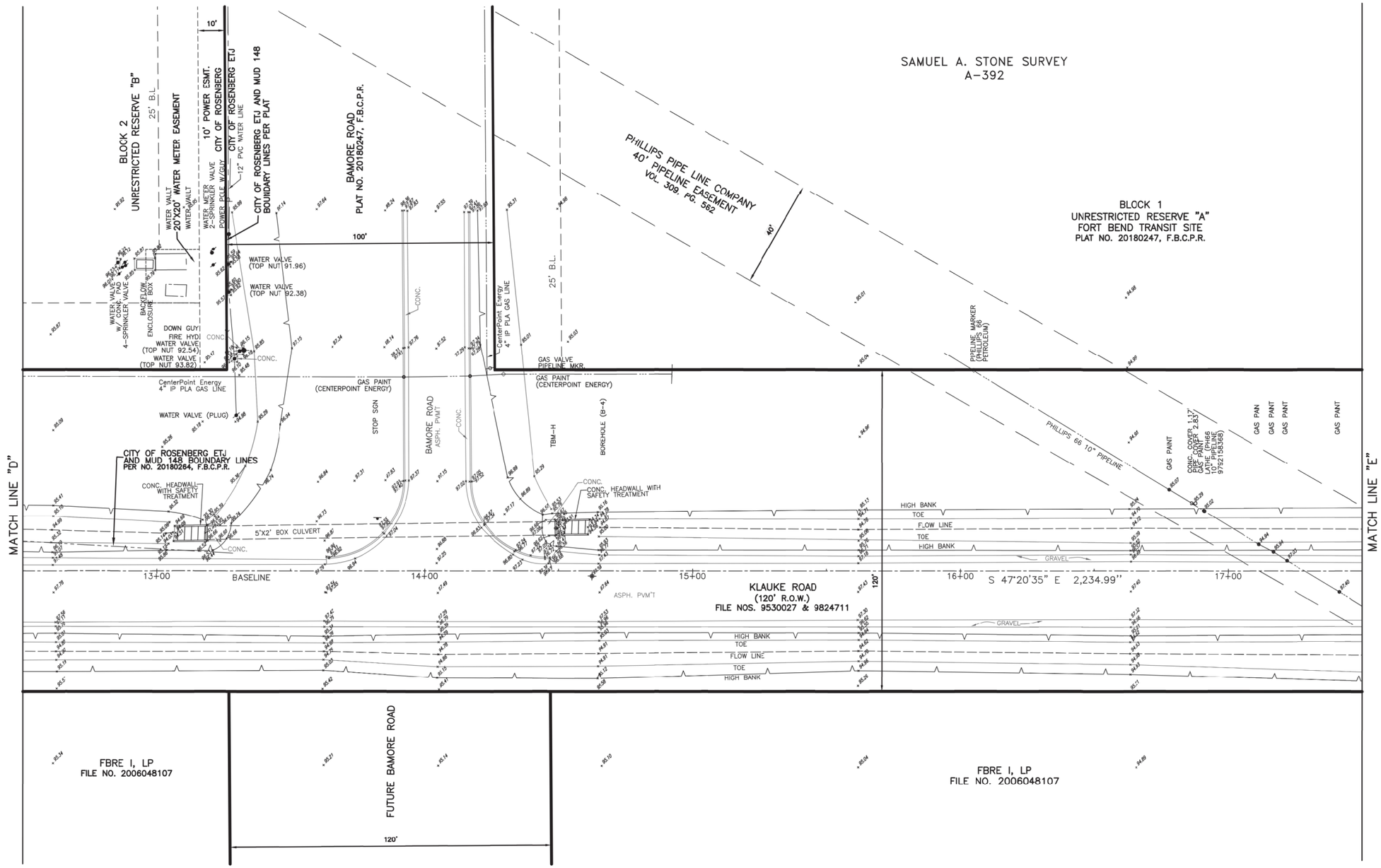
NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:		DATE:	
CK'D BY:	SCALE: AS SHOWN	SHEET NO:	14 / 133

S:\2021_21200655tellaRoad\CADD\Stella Road Topo.dwg



N

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL
5			

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD	
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD	CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY	
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 15 / 133

S:\2021\212006\StellaRoad\CADD\Stella Road Topo.dwg

BASELINE DATA

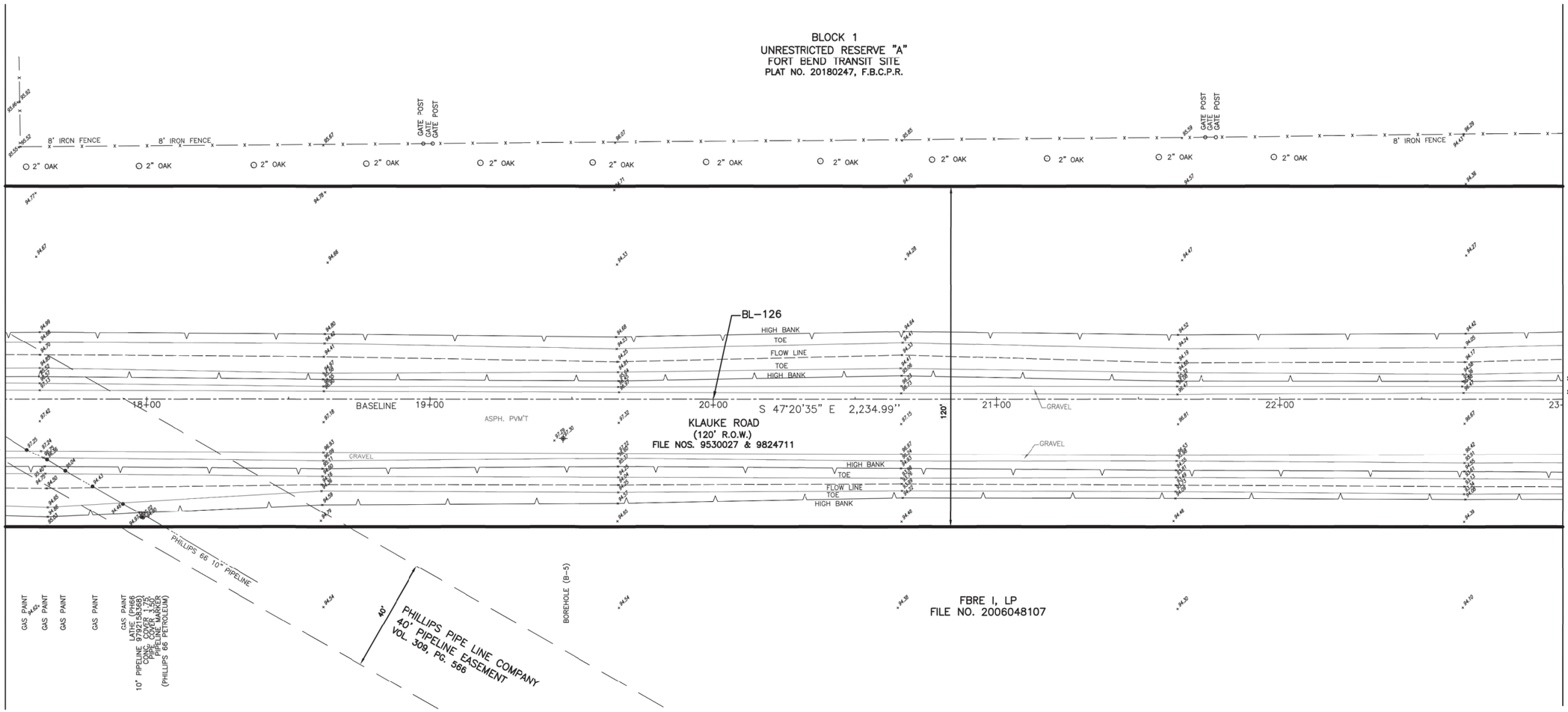
POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL–126	20+00.00	13,752,888.92	2,978,868.41	STELLA ROAD 20+00

0 20 40

SCALE: 1" = 40'

SAMUEL A. STONE SURVEY
A–392

BLOCK 1
UNRESTRICTED RESERVE "A"
FORT BEND TRANSIT SITE
PLAT NO. 20180247, F.B.C.P.R.



NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS–GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH–12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY
DRAWN BY:	
CK'D BY:	
SCALE:	AS SHOWN

CIVIL STANDARD

DATE:

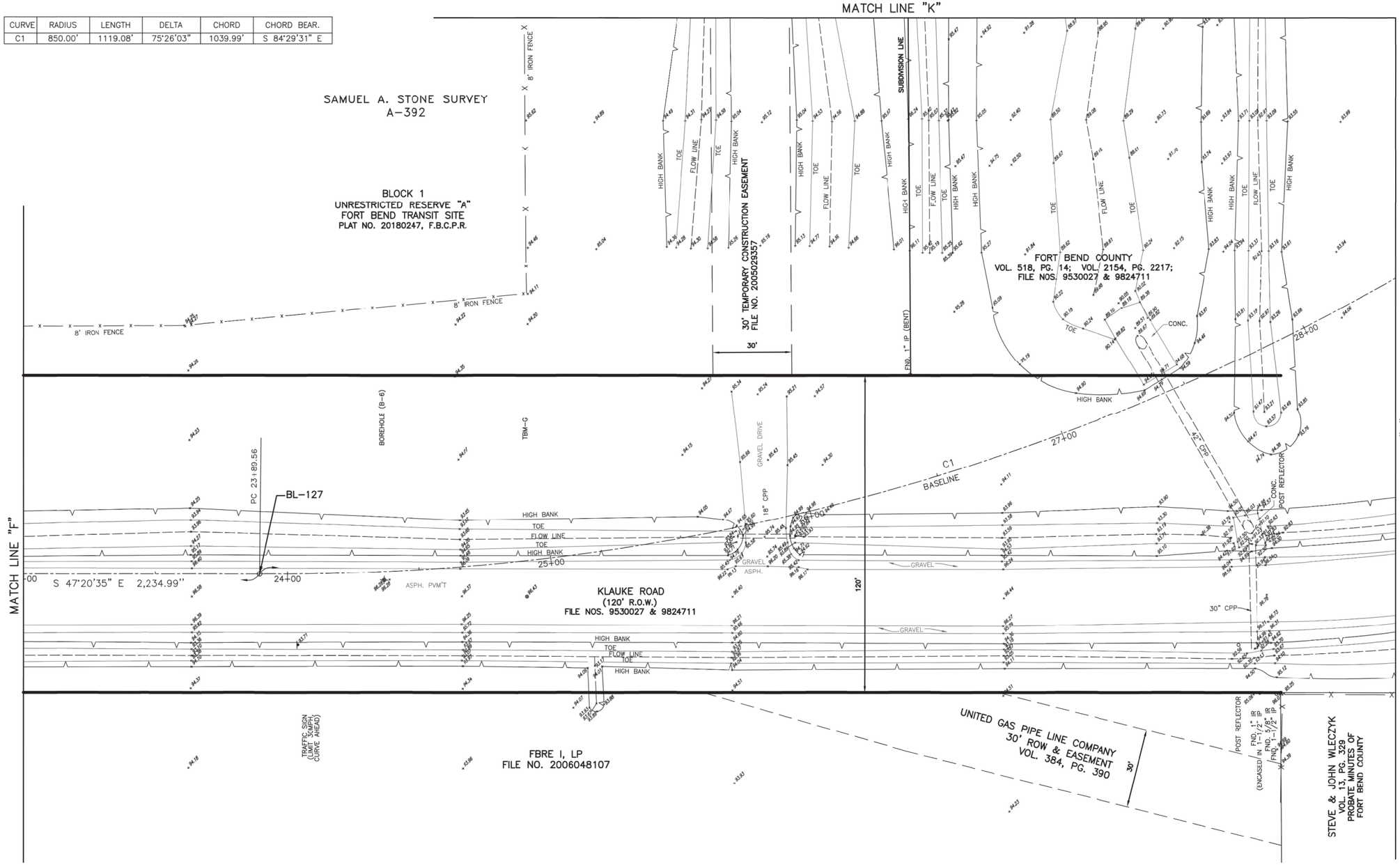
SHEET NO: 16 / 133

S:\2021\212006SStellaRoad\CADD\Stella Road Topo.dwg

BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL–127	23+89.56	13,752,624.95	2,979,154.90	STELLA ROAD PC

CURVE	RADIUS	LENGTH	DELTA	CHORD	CHORD BEAR.
C1	850.00'	1119.08'	75°26'03"	1039.99'	S 84°29'31" E



0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.
2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS–GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND
SURVEYOR

07/26/2022

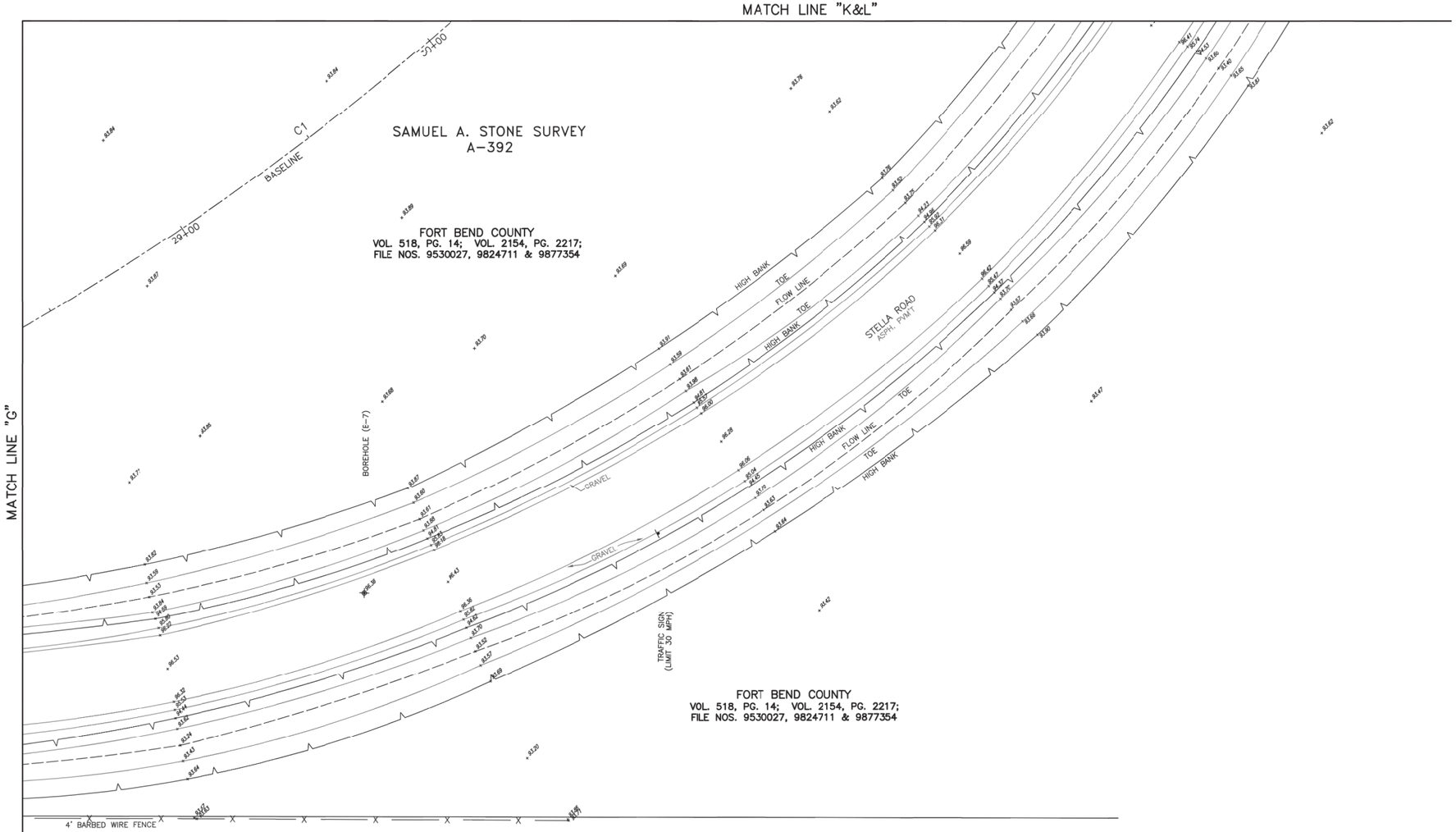
NO.	REVISIONS	DATE	NAME
1	ADDED BH–12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD		
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 17 / 133

S:\2021\212006S\StellaRoad\CADD\Stella Road Topo.dwg



0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

CURVE	RADIUS	LENGTH	DELTA	CHORD	CHORD BEAR.
C1	850.00'	1119.08'	75°26'03"	1039.99'	S 84°29'31" E

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL
5			

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 18 / 133

S:\2021\212006StellaRoad\CADD\Stella Road Topo.dwg

MATCH LINE "M"

BLOCK 1
UNRESTRICTED RESERVE "A"
FORT BEND TRANSIT SITE
PLAT NO. 20180247, F.B.C.P.R.

30' TEMPORARY CONSTRUCTION EASEMENT
FILE NO. 2005C29357

SUBDIVISION LINE

SAMUEL A. STONE SURVEY
A-392

FORT BEND COUNTY
VOL. 518, PG. 14; VOL. 2154, PG. 2217;
FILE NOS. 9530027, 9824711 & 9877354

MATCH LINE "H"

MATCH LINE "K"

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

07/26/2022

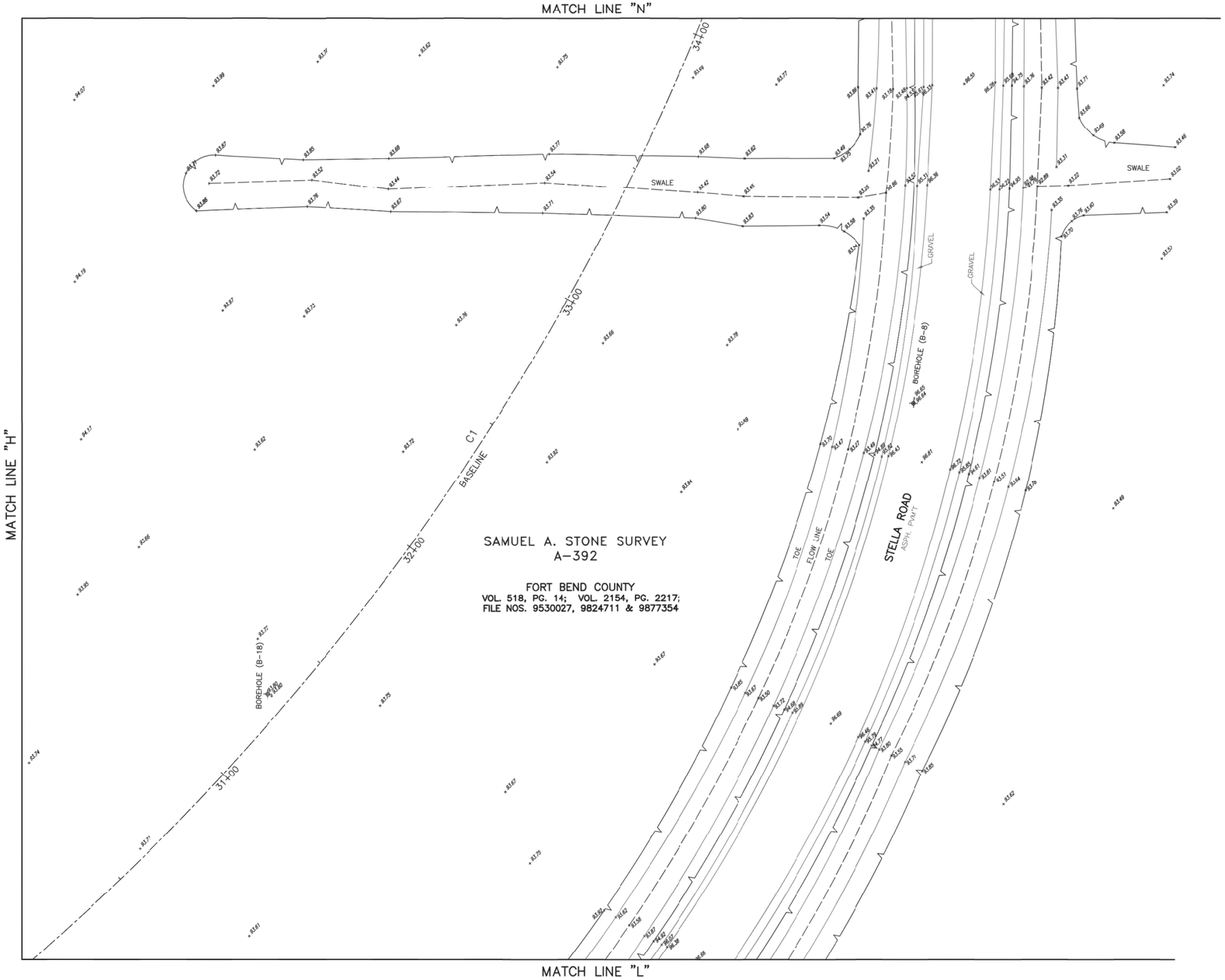
NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD	
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD	CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY	
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 19 / 133

S:\2021_2120065StellaRoad\CADD\Stella Road Topo.dwg



0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

CURVE	RADIUS	LENGTH	DELTA	CHORD	CHORD BEAR.
C1	850.00'	1119.08'	75°26'03"	1039.99'	S 84°29'31" E

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 20 / 133

S:\2021\2120065StellaRoad\CADD\Stella Road Topo.dwg

MATCH LINE "O"

BLOCK 1
UNRESTRICTED RESERVE "A"
FORT BEND TRANSIT SITE
PLAT NO. 20180247, F.B.C.P.R.

8' IRON FENCE

30' TEMPORARY CONSTRUCTION EASEMENT
FILE NO. 2005029357

SUBDIVISION LINE

HIGH BANK
TOE
FLOW LINE

24" CMP
CONC.

PHONE BOX

6-10" MESQUITE CLUSTER
TREES CANOPY

30'

SAMUEL A. STONE SURVEY
A-392

FORT BEND COUNTY
VOL. 518, PG. 14; VOL. 2154, PG. 2217;
FILE NOS. 9530027, 9824711 & 9877354

MATCH LINE "N"

MATCH LINE "M"

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

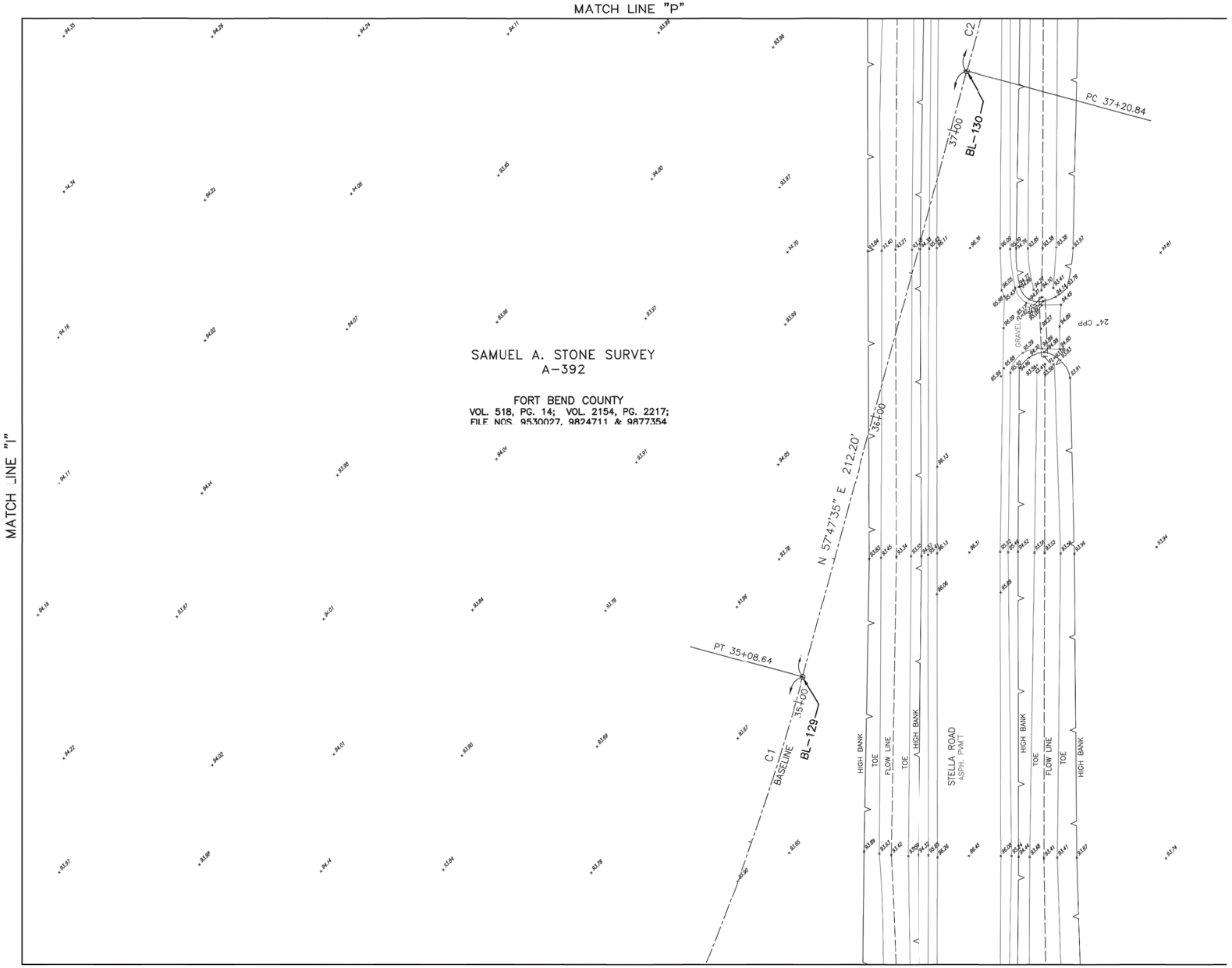
FORT BEND COUNTY
ENGINEERING DEPARTMENT

THE STATE OF TEXAS
FORT BEND COUNTY

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD	
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD	CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY	
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 21 / 133

S:\2021\212006\StellaRoad\CADD\Stella Road Topo.dwg



0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

CURVE	RADIUS	LENGTH	DELTA	CHORD	CHORD BEAR.
C1	850.00'	1119.08'	75°26'03"	1039.99'	S 84°29'31" E
C2	850.00'	1115.61'	75°12'00"	1037.25'	S 84°50'34" E

BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL-129	35+08.64	13,752,525.13	2,980,190.09	STELLA ROAD PT
BL-130	37+20.84	13,752,638.23	2,980,369.64	STELLA ROAD PC

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

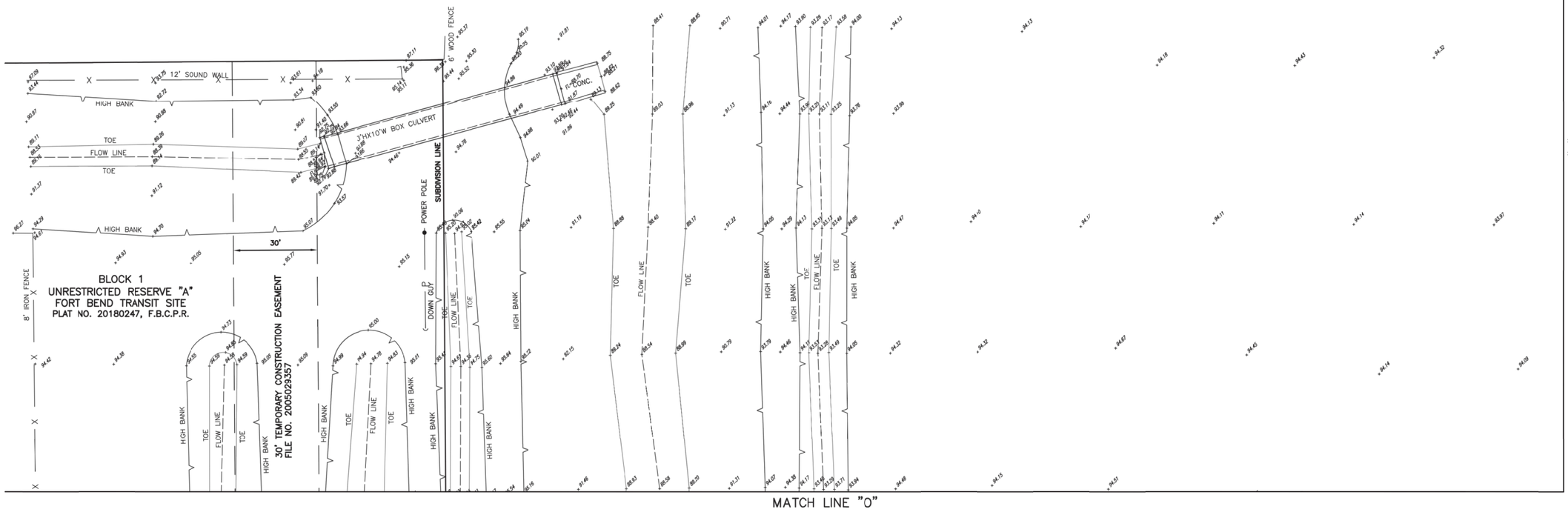
FORT BEND COUNTY
ENGINEERING DEPARTMENT

THE STATE OF TEXAS
FORT BEND COUNTY

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD	
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD	CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY	
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 22 / 133

S:\2021\2120065StellaRoad\CADD\Stella Road Topo.dwg



MATCH LINE "J"

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS–GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH–12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY
ENGINEERING DEPARTMENT

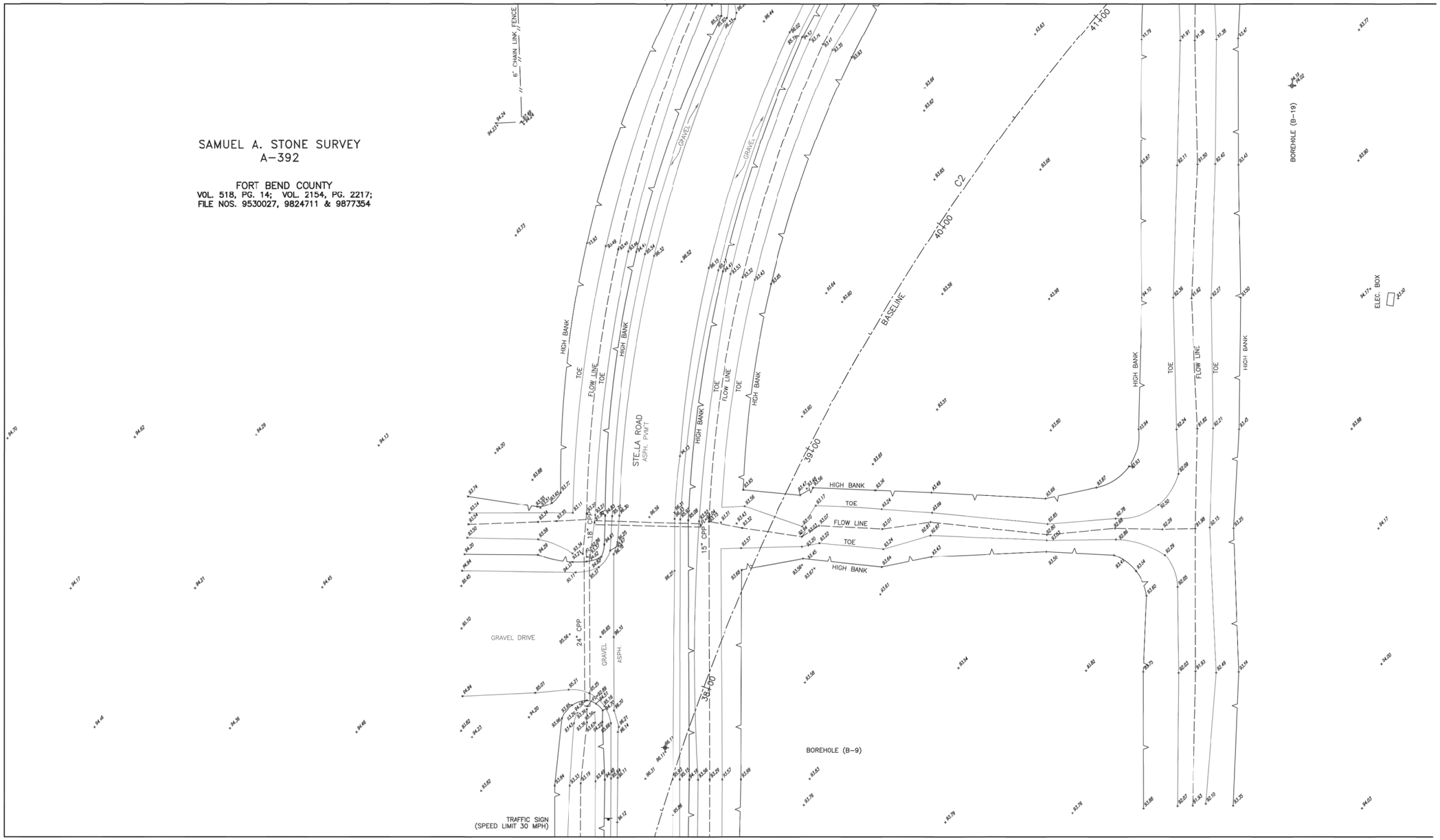
LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD	
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD	CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY	
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 23 / 133

S:\2021_2120065StellaRoad\CADD\Stella Road Topo.dwg

MATCH LINE "Q"

MATCH LINE "J"



MATCH LINE "P"

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

CURVE	RADIUS	LENGTH	DELTA	CHORD	CHORD BEAR.
C2	850.00'	1115.61'	75°12'00"	1037.25'	S 84°50'34" E

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

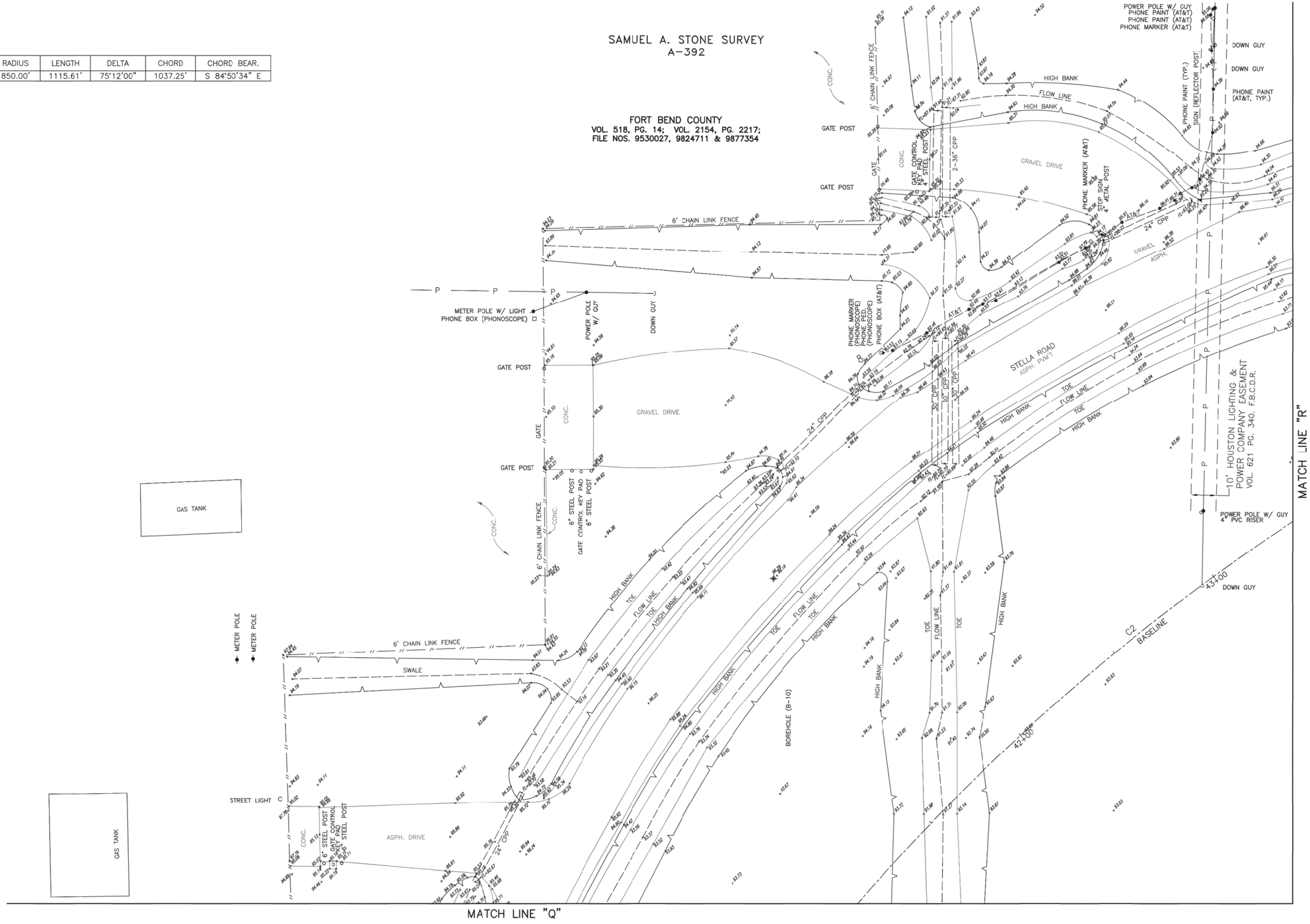
PROJECT TITLE:	STELLA ROAD	
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD	CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY	
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 24 / 133

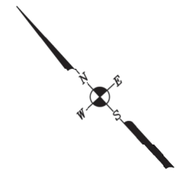
S:\2021_212006SStellaRoad\CADD\Stella Road Topo.dwg

CURVE	RADIUS	LENGTH	DELTA	CHORD	CHORD BEAR.
C2	850.00'	1115.61'	75°12'00"	1037.25'	S 84°50'34" E

SAMUEL A. STONE SURVEY
A-392

FORT BEND COUNTY
VOL. 518, PG. 14; VOL. 2154, PG. 2217;
FILE NOS. 9530027, 9824711 & 9877354





0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

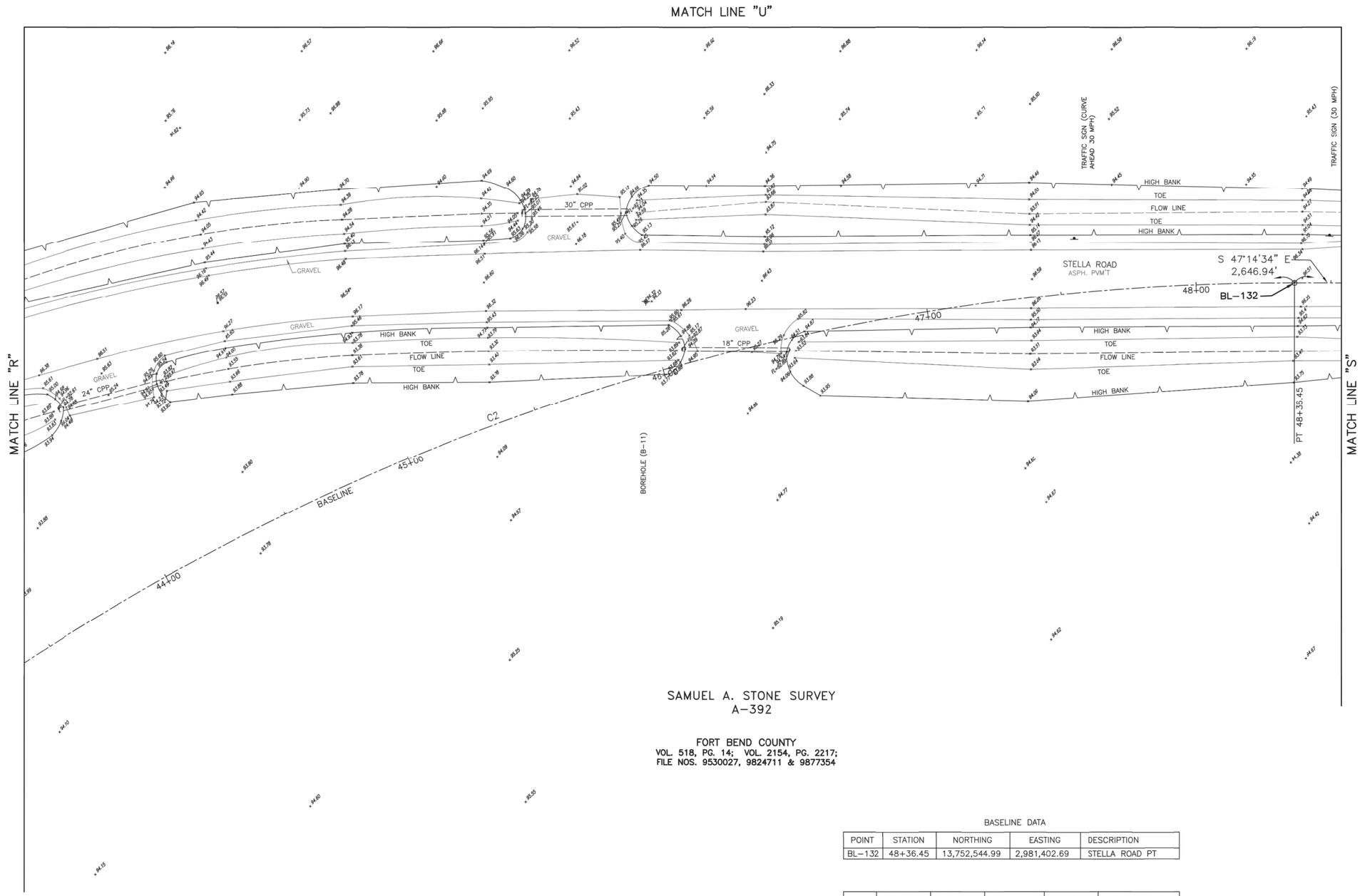
FORT BEND COUNTY ENGINEERING DEPARTMENT

THE STATE OF TEXAS
FORT BEND COUNTY

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD			
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD			CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY			
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 25 / 133

S:\2021\212065StellaRoad\CADD\Stella Road Topo.dwg



SAMUEL A. STONE SURVEY
A-392

FORT BEND COUNTY
VOL. 518, PG. 14; VOL. 2154, PG. 2217;
FILE NOS. 9530027, 9824711 & 9877354

BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL-132	48+36.45	13,752,544.99	2,981,402.69	STELLA ROAD PT

CURVE	RADIUS	LENGTH	DELTA	CHORD	CHORD BEAR.
C2	850.00'	1115.61'	75°12'00"	1037.25'	S 84°50'34" E

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY ENGINEERING DEPARTMENT

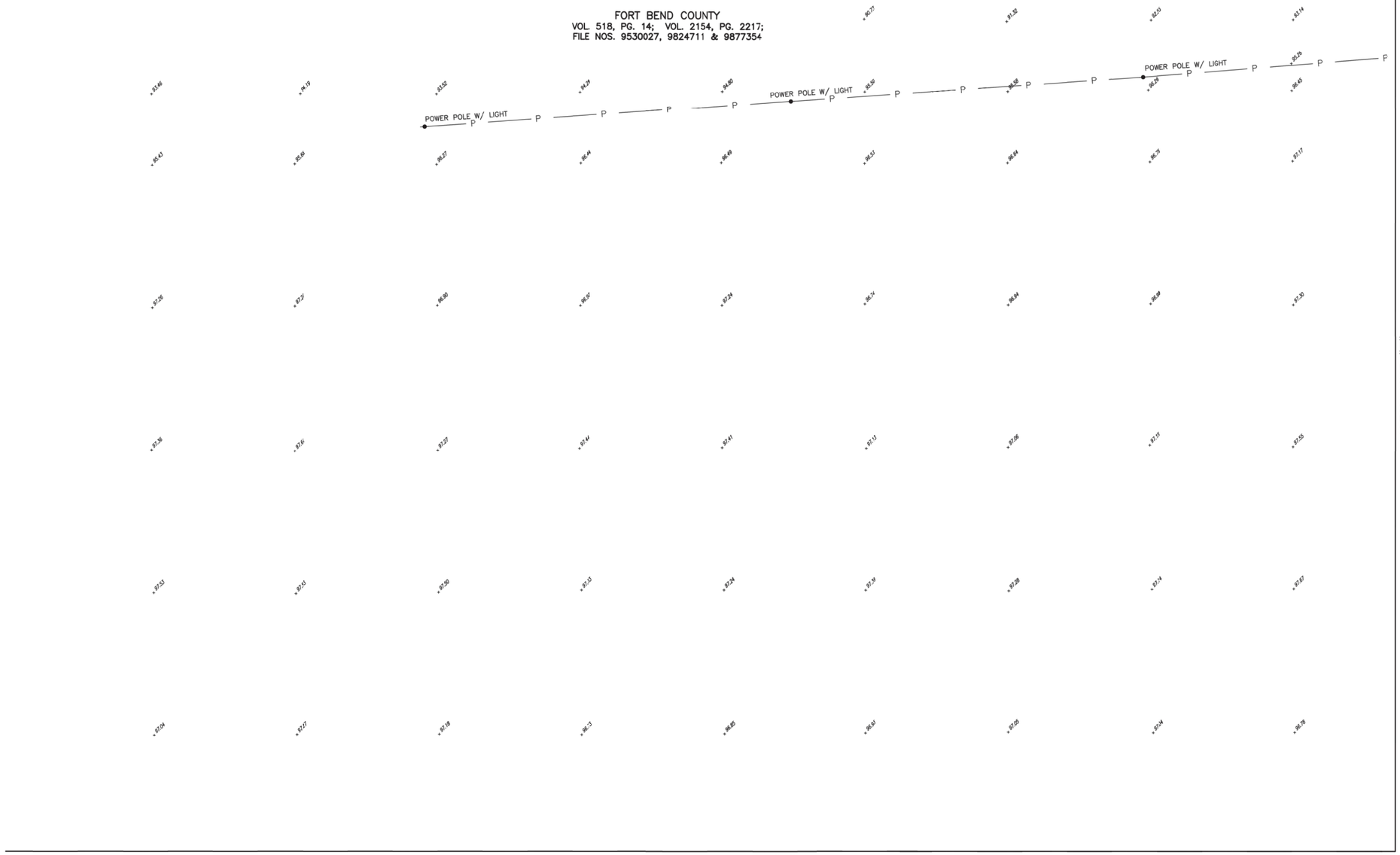
LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 26 / 133

S:\2021\212065StellaRoad\CADD\Stella Road Topo.dwg

SAMUEL A. STONE SURVEY
A-392

FORT BEND COUNTY
VOL. 518, PG. 14; VOL. 2154, PG. 2217;
FILE NOS. 9530027, 9824711 & 9877354



MATCH LINE "U"

MATCH LINE "T"

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

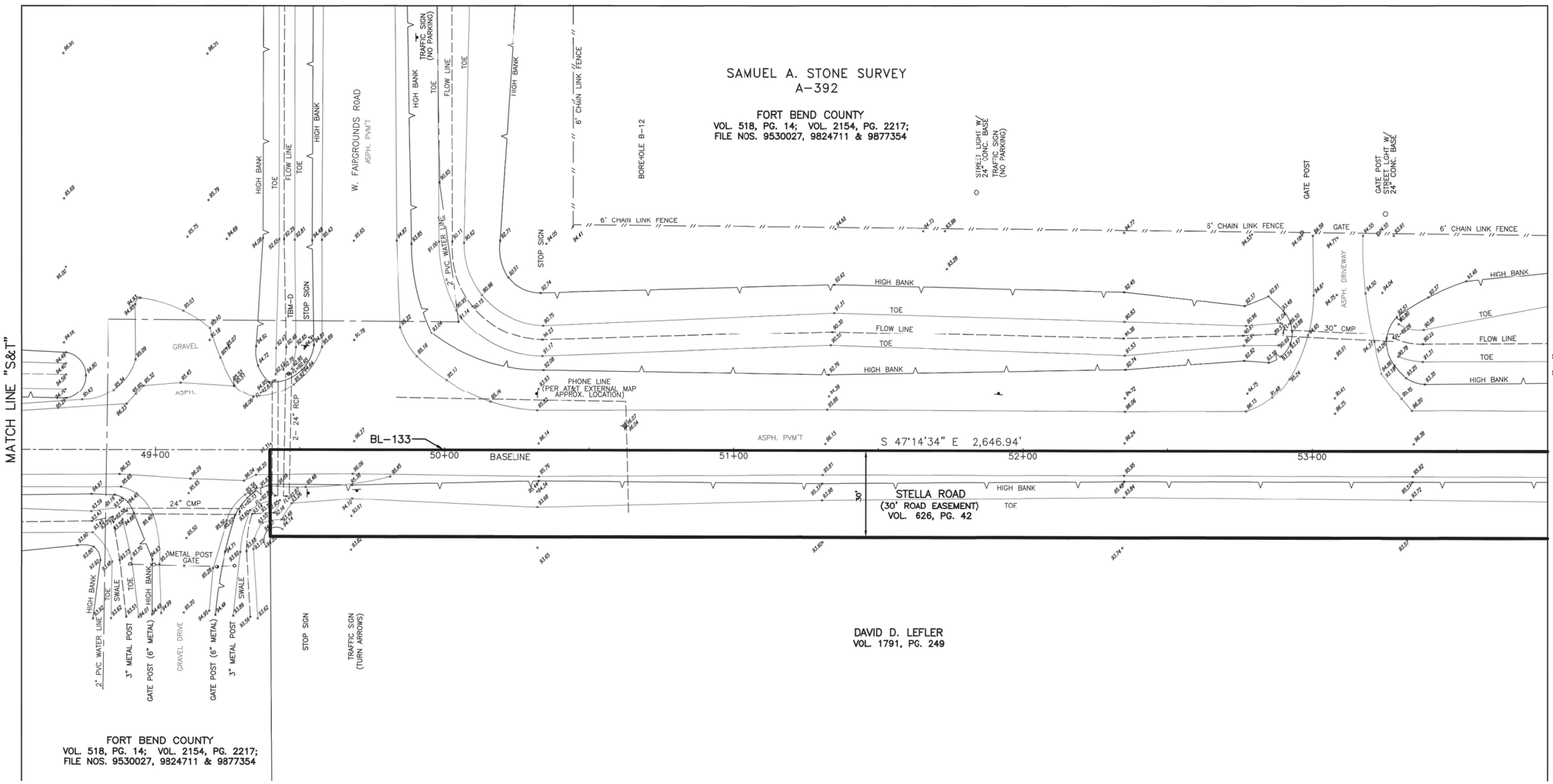
NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD		
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 27 / 133

S:\2021\2120065StellaRoad\CADD\Stella Road Topo.dwg



BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL-133	50+00.00	13,752,433.96	2,981,522.77	STELLA ROAD 50+00

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

07/26/2022

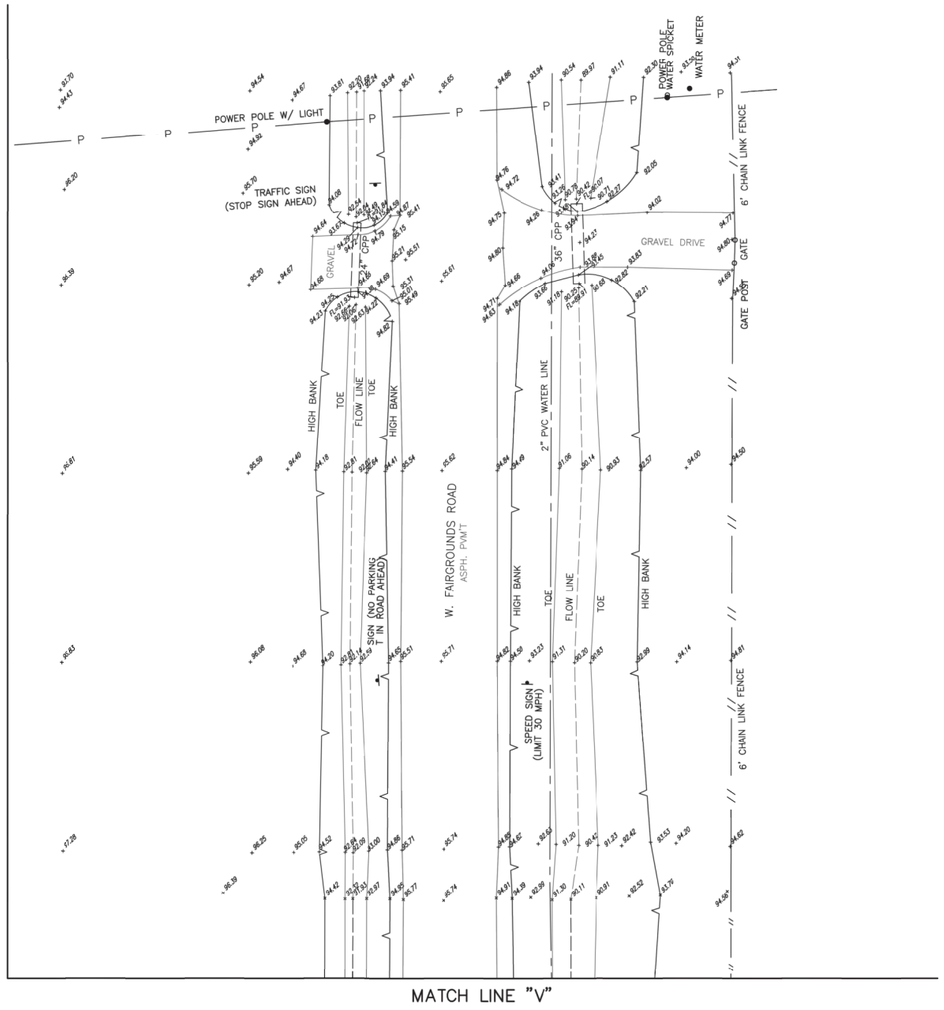
NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 28 / 133

S:\2021_2120065StellaRoad\CADD\Stella Road Topo.dwg



SAMUEL A. STONE SURVEY
A 392

FORT BEND COUNTY
VOL. 518, PG. 14; VOL. 2154, PG. 2217;
FILE NOS. 9530027, 9824711 & 9877354

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS–GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

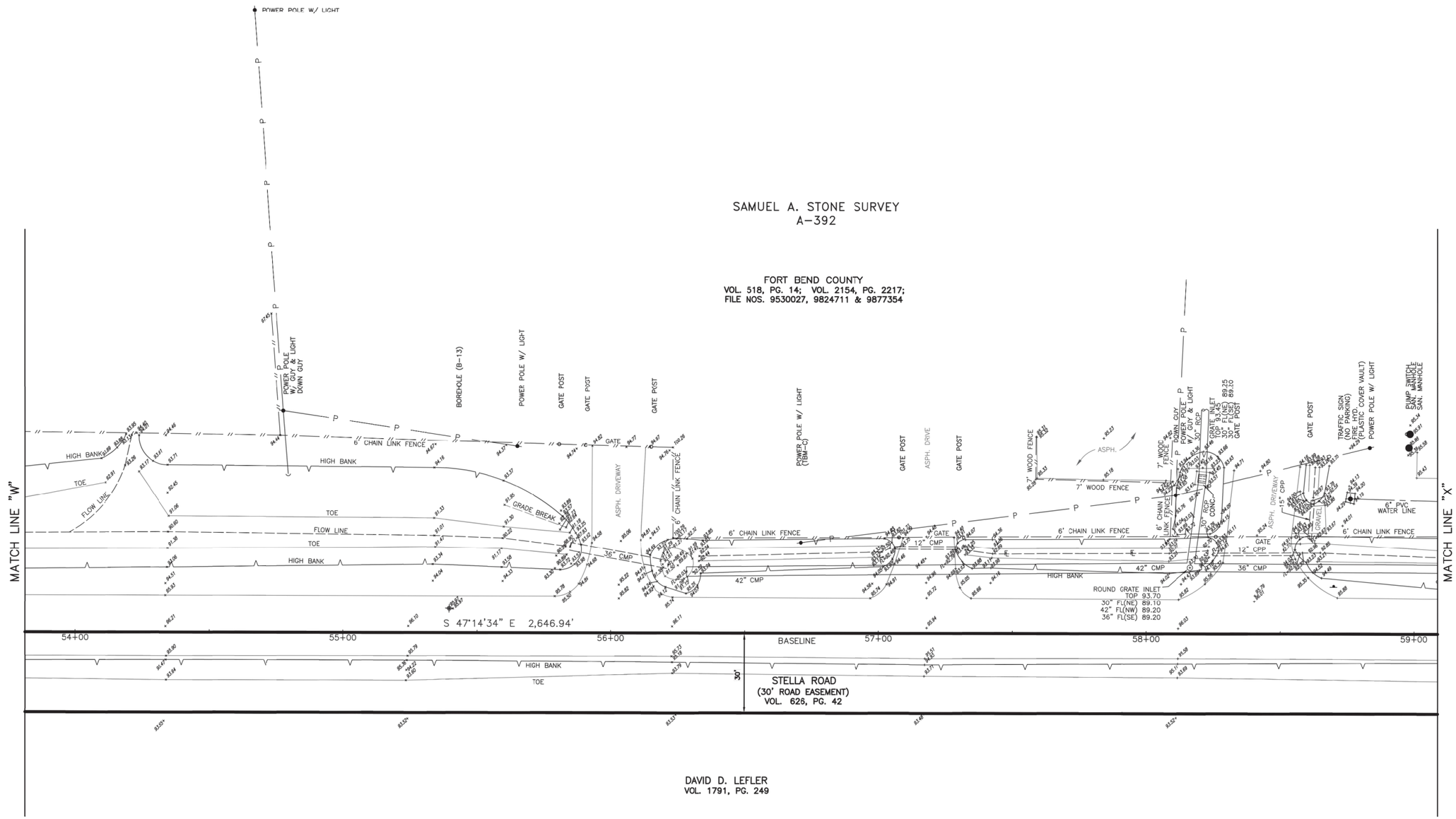
NO.	REVISIONS	DATE	NAME
1	ADDED BH–12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD	
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD	CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY	
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 29 / 133

S:\2021\212006SStellaRoad\CADD\Stella Road Topo.dwg



SAMUEL A. STONE SURVEY
A-392

FORT BEND COUNTY
VOL. 518, PG. 14; VOL. 2154, PG. 2217;
FILE NOS. 9530027, 9824711 & 9877354

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL
5			

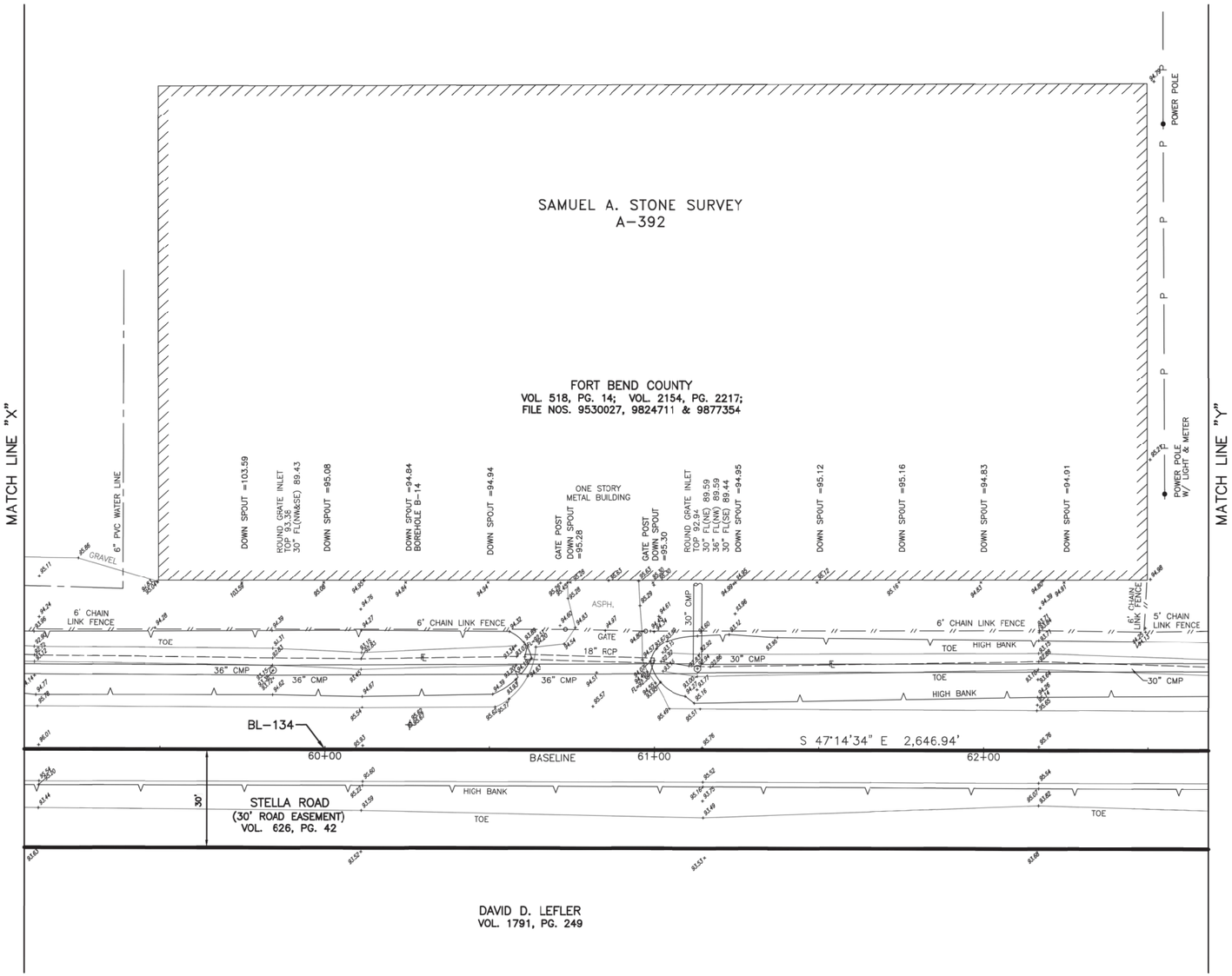
FORT BEND COUNTY ENGINEERING DEPARTMENT

THE STATE OF TEXAS FORT BEND COUNTY

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD		
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:		DATE:
CK'D BY:	SCALE: AS SHOWN	SHEET NO: 30 / 133

S:\2021_2120065StellaRoad\CADD\Stella Road Topo.dwg



BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL-134	60+00.00	13,751,755.07	2,982,257.01	STELLA ROAD 60+00

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

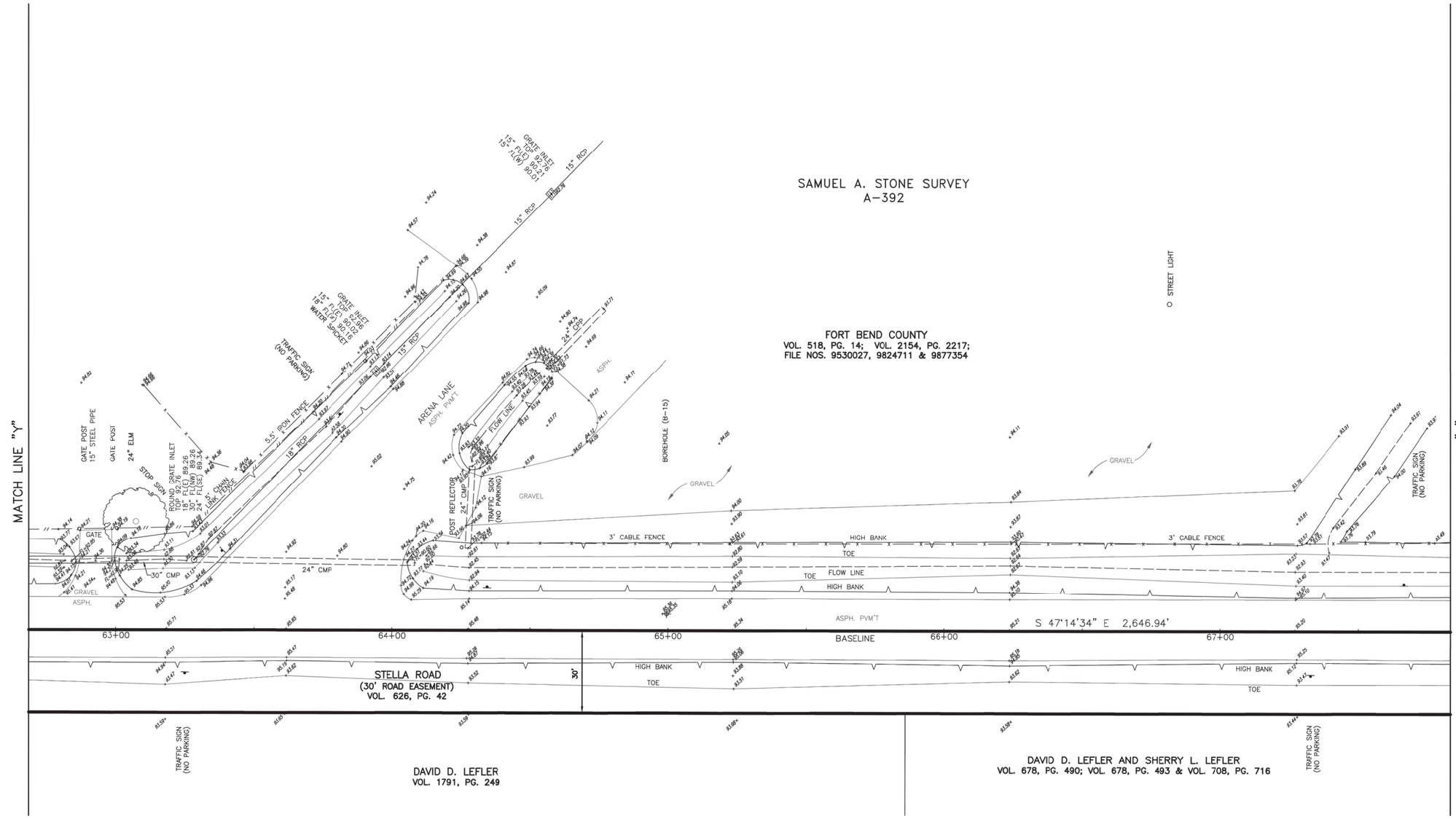
NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD			
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD			CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY			
DRAWN BY:		DATE:	
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 31 / 133

S:\2021\2120065StellaRoad\CADD\Stella Road Topo.dwg



0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

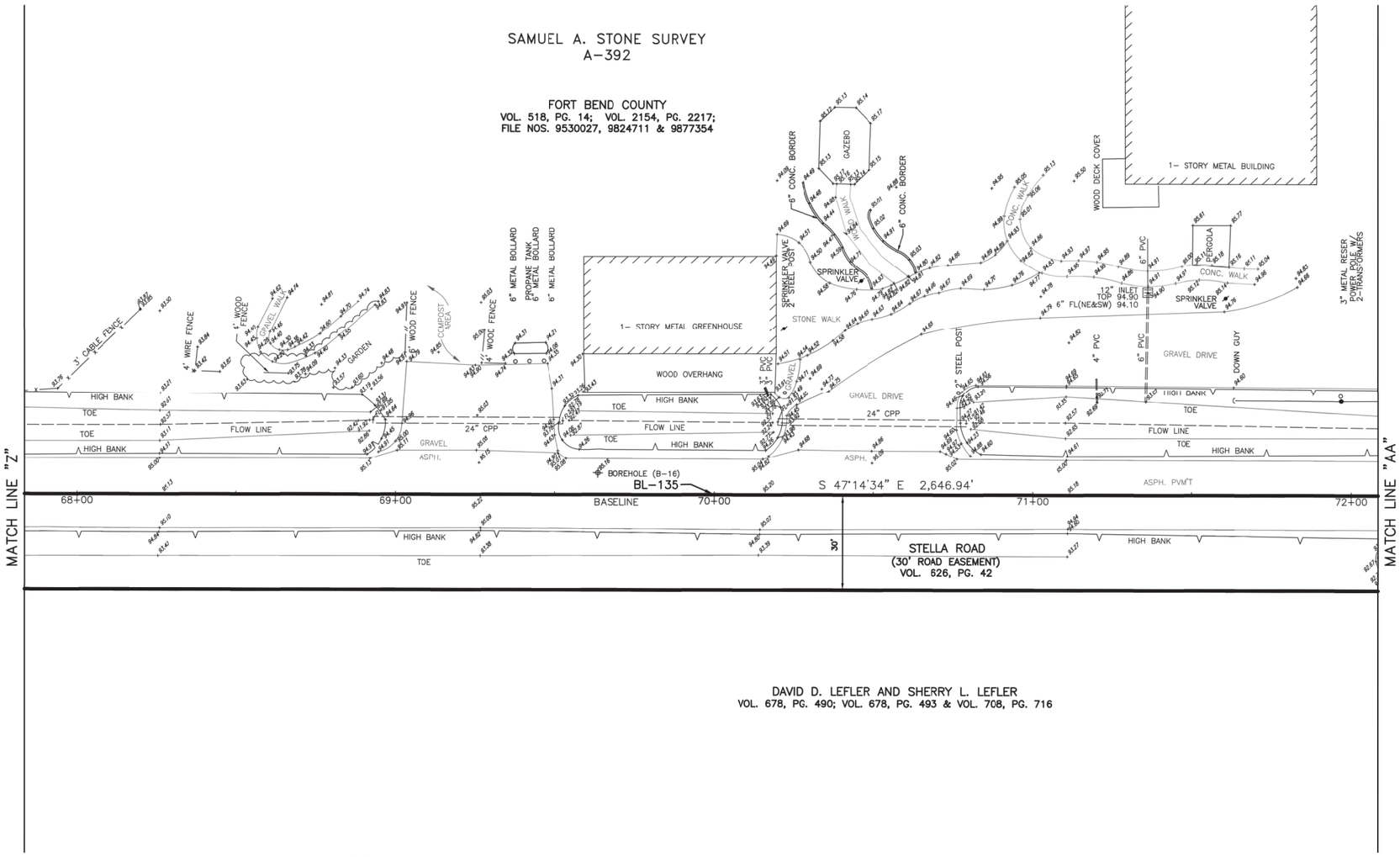
NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL
5			

FORT BEND COUNTY
ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:		DATE:	
CK'D BY:	SCALE: AS SHOWN	SHEET NO:	32 / 133

S:\2021\212006\StellaRoad\CADD\Stella Road Topo.dwg



BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL-135	70+00.00	13,751,076.17	2,982,991.24	STELLA ROAD 70+00

0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.
2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

Paul Kwan

07/26/2022

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL
5			

FORT BEND COUNTY ENGINEERING DEPARTMENT

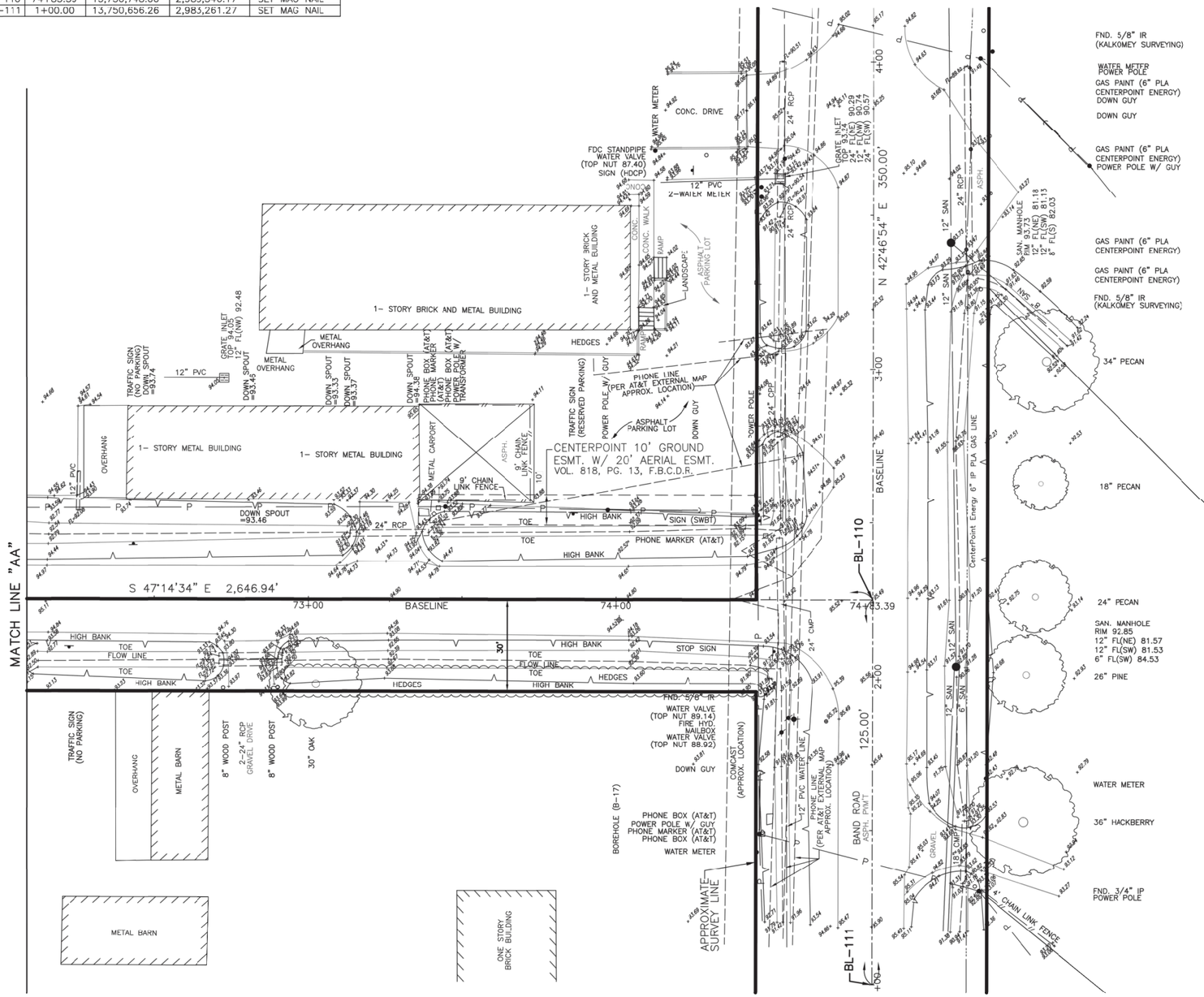
LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY
DRAWN BY:
DATE:
CK'D BY:
SCALE: AS SHOWN
SHEET NO: 33 / 133

S:\2021\212065StellaRoad\CADD\Stella Road Topo.dwg

BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL–110	74+83.39	13,750,748.00	2,983,346.17	SET MAG NAIL
BL–111	1+00.00	13,750,656.26	2,983,261.27	SET MAG NAIL



0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS–GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

07/26/2022

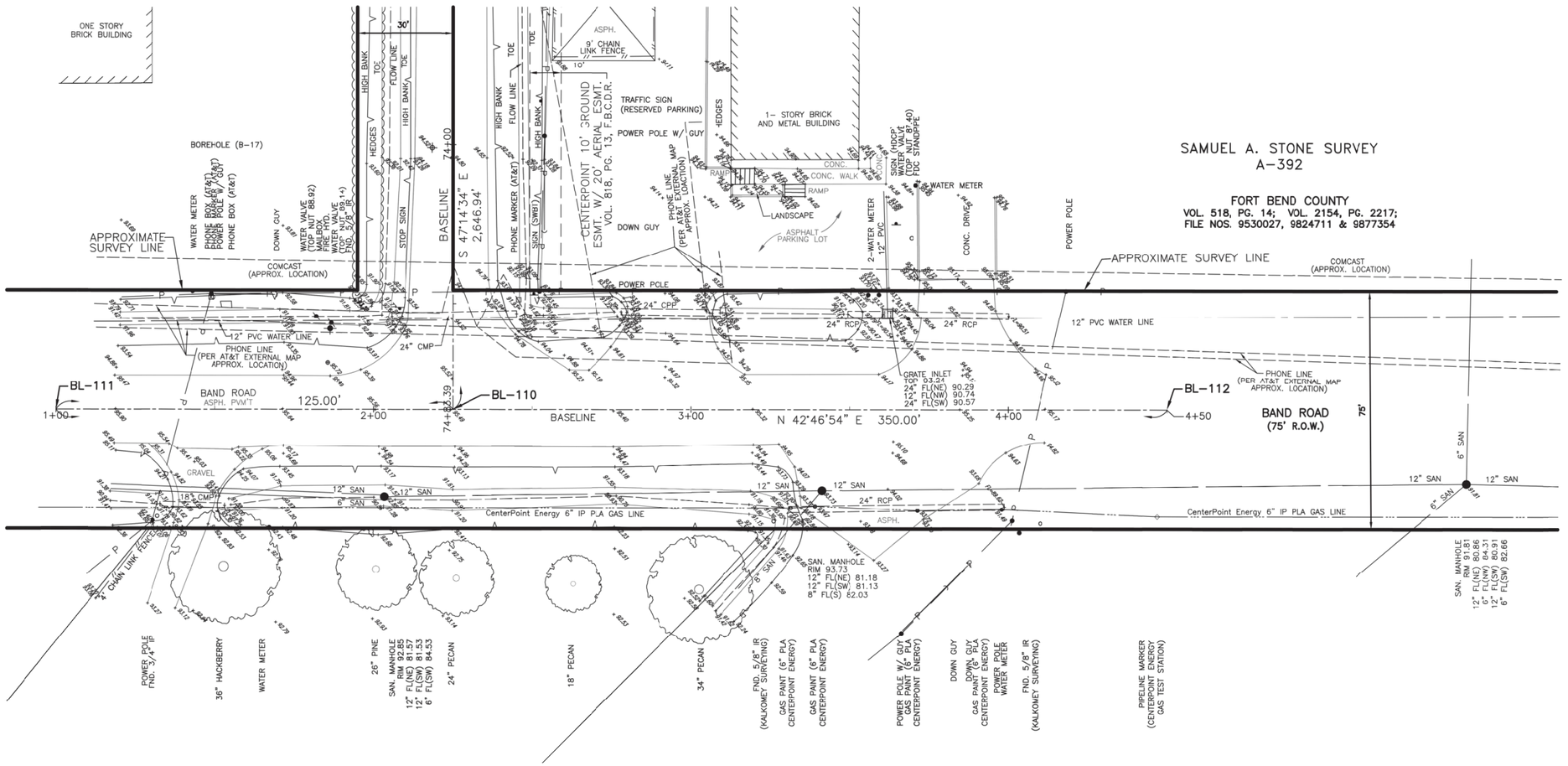
NO.	REVISIONS	DATE	NAME
1	ADDED BH–12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL

FORT BEND COUNTY ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 34 / 133

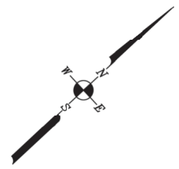
S:\2021_2120065StellaRoad\CADD\Stella Road Topo.dwg



FORT BEND COUNTY
FILE NO. 9877354

SAMUEL A. STONE SURVEY
A-392

FORT BEND COUNTY
VOL. 518, PG. 14; VOL. 2154, PG. 2217;
FILE NOS. 9530027, 9824711 & 9877354



0 20 40

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.
2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

BASELINE DATA

POINT	STATION	NORTHING	EASTING	DESCRIPTION
BL-110	74+83.39	13,750,748.00	2,983,346.17	SET MAG NAIL
BL-111	1+00.00	13,750,656.26	2,983,261.27	SET MAG NAIL
BL-112	4+50.00	13,750,913.14	2,983,498.99	SET MAG NAIL

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL LAND SURVEYOR

Paul Kwan

07/26/2022

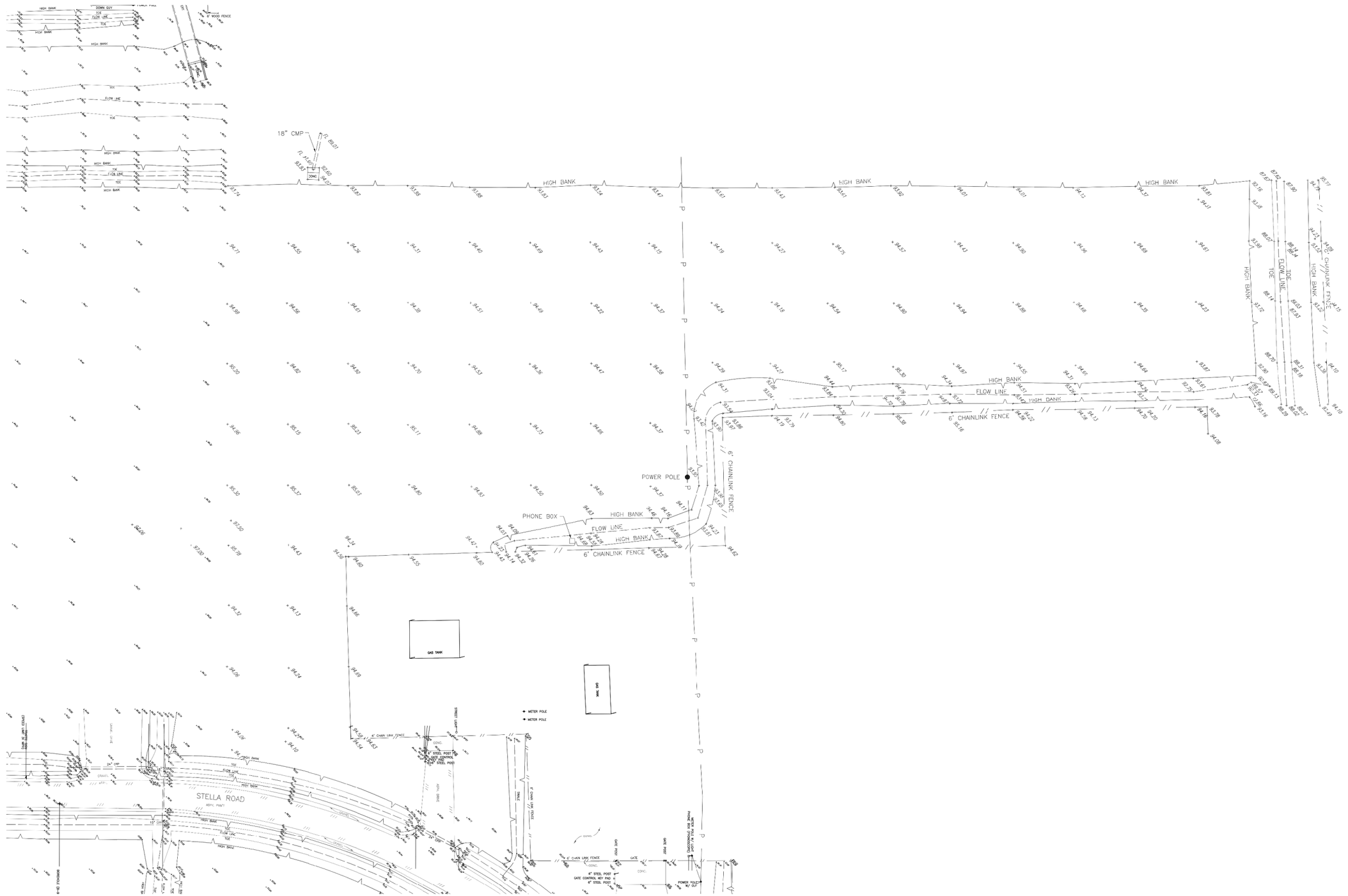
NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	07/26/22	YL
5			

FORT BEND COUNTY ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE: STELLA ROAD
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD
SHEET DESCRIPTION: TOPOGRAPHIC AND RIGHT OF WAY SURVEY
DRAWN BY:
DATE:
CK'D BY:
SCALE: AS SHOWN
SHEET NO: 35 / 133

S:\2021_2120065StellaRoad\CADD\Stella Road Topo.dwg



0 40 80

SCALE: 1" = 40'

NOTES:

1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983, SOUTH CENTRAL ZONE (4204), NAD83 (2011 ADJUSTMENT, EPOCH 2010.00). COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99986826396. UNIT OF MEASURE IS U.S. SURVEY FOOT.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, CORS-GEOID 03).

   BENCHMARK: FORT BEND COUNTY MARKER NO. 251
   BRONZE DISK IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CARDINAL SKY WAY AND AMBER POINT.
   ELEVATION = 93.28 FEET

LEGEND

FND	=	FOUND
IR	=	IRON ROD
IP	=	IRON PIPE
U.E.	=	UTILITY EASEMENT
A.E.	=	AERIAL EASEMENT
VOL.	=	VOLUME
PG.	=	PAGE
ESMT.	=	EASEMENT
STM.SWR.ESMT.	=	STORM SEWER EASEMENT
SAN.SWR.ESMT.	=	SANITARY SEWER EASEMENT

STATE OF TEXAS
REGISTERED
PAUL P. KWAN
4313
PROFESSIONAL
LAND SURVEYOR

NO.	REVISIONS	DATE	NAME
1	ADDED BH-12&14, REVISED & SET BASELINE	08/06/21	YL
2	ADDED SHEET DESCRIPTION TITLE	09/20/21	YL
3	UPDATED TOPOGRAPHIC & BASELINE	05/06/22	YL
4	UPDATED SHEET NUMBERS	04/29/24	ZD
#	REVISION_TEXT	DATE	INIT

FORT BEND COUNTY ENGINEERING DEPARTMENT

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4131
TBPELS Registration No. 10019100

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	TOPOGRAPHIC AND RIGHT OF WAY SURVEY		
DRAWN BY:			DATE:
CK'D BY:	SCALE: AS SHOWN		SHEET NO: 36 / 133

S:\2024\2420009\CADD\FBCSO_Trng.Facility.topo.dwg

Horizontal Alignment Report

****

Alignment Name: Stella Rd
Station Range: Start: 0+00.00, End: 49+99.95
Description:

****

Begin Stella Rd
N 13,754,244.1303 E 2,977,397.5658 0+00.00

Line (1)
S47° 20' 34.99"E 2,397.992'
N 13,752,619.2334 E 2,979,161.1068 23+97.99
Line (1)

Curve (2)
BC N 13,752,619.2334 E 2,979,161.1068 23+97.99
CTR N 13,753,244.3437 E 2,979,737.0730
PI N 13,752,178.3639 E 2,979,639.5934

Direction Back S47° 20' 34.99"E
Radius 850.000'
Delta 74°51'50"(LT)
Length 1,110.630'
Tangent 650.627'
Chord Direction S84° 46' 30.22"E Distance 1,033.293'
Direction Ahead N57° 47' 34.54"E

EC N 13,752,525.1355 E 2,980,190.1066 35+08.62
Curve (2)

Line (3)
N57° 47' 34.54"E 215.685'
N 13,752,640.0913 E 2,980,372.6034 37+24.31
Line (3)

Curve (4)
BC N 13,752,640.0913 E 2,980,372.6034 37+24.31
CTR N 13,751,920.8830 E 2,980,825.6370
PI N 13,752,987.4921 E 2,980,924.1155

Direction Back N57° 47' 34.54"E
Radius 850.000'
Delta 74°57'52"(RT)
Length 1,112.118'
Tangent 651.808'
Chord Direction S84° 43' 29.69"E Distance 1,034.474'
Direction Ahead S47° 14' 33.92"E

EC N 13,752,544.9842 E 2,981,402.6965 48+36.43
Curve (4)

Line (5)
S47° 14' 33.92"E 163.527'
N 13,752,433.9667 E 2,981,522.7641 49+99.95
Line (5)

N 13,752,433.9667 E 2,981,522.7641 49+99.95
End Stella Rd

****

Alignment Length: 4,999.952'
****

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

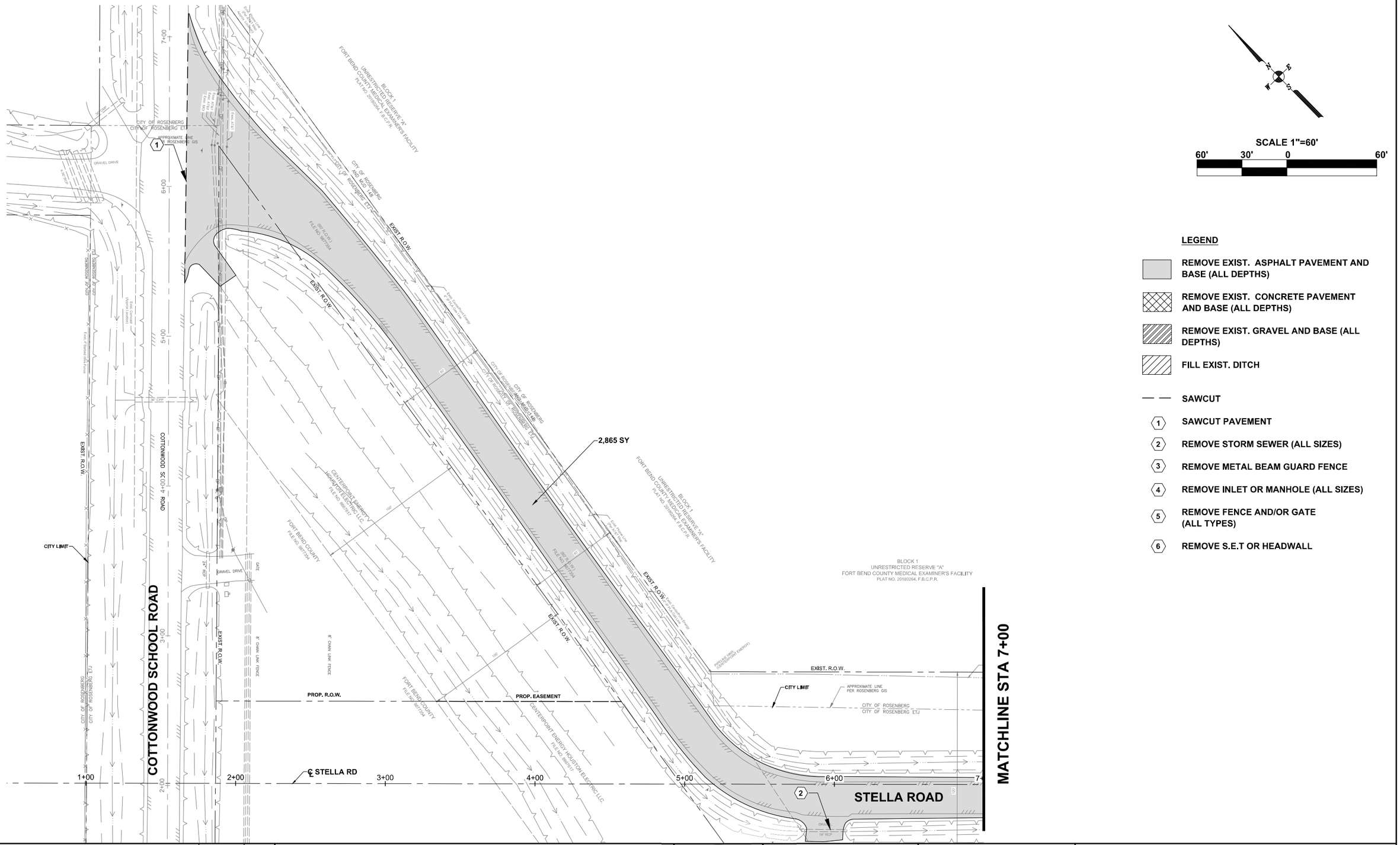
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: HORIZONTAL ALIGNMENT
SCALE:	DATA SHEET
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 37 / 133



NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY TEXAS

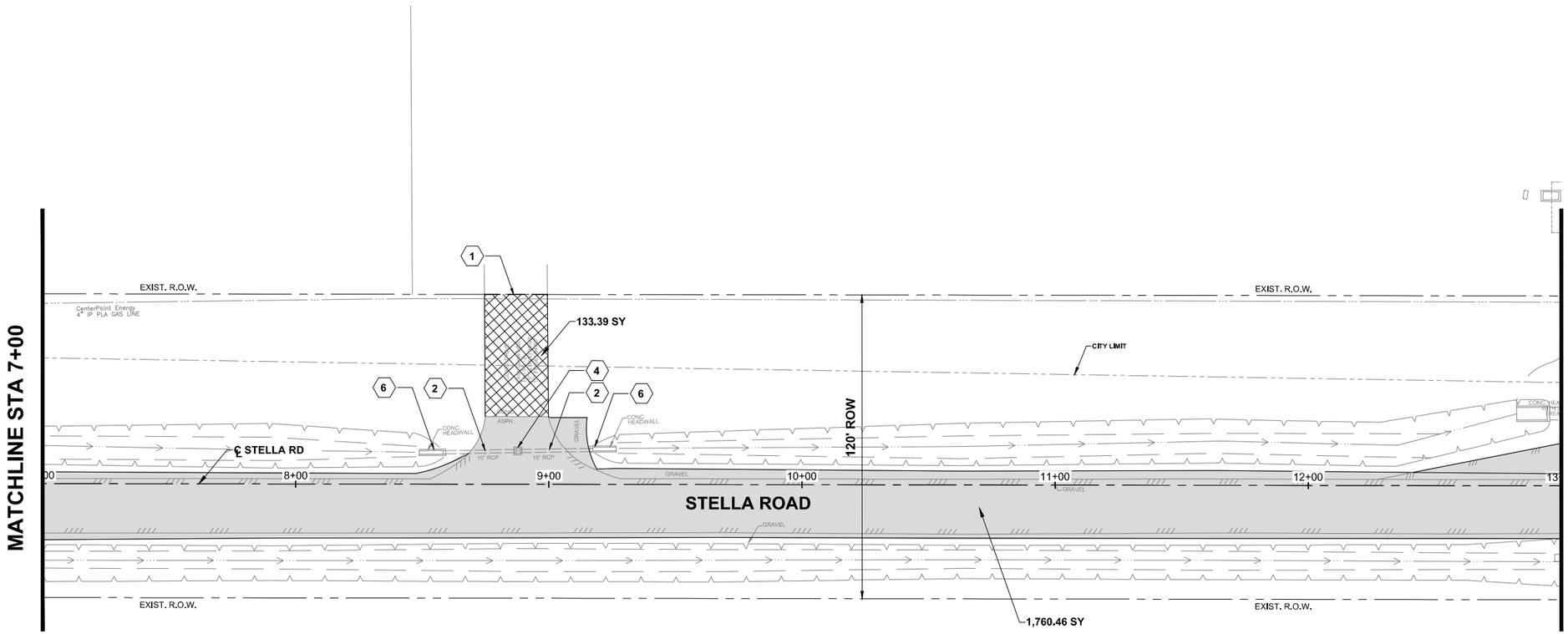
THE STATE OF TEXAS FORT BEND COUNTY

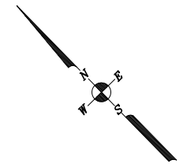
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: REMOVAL PLAN
SCALE: 1" = 60'	STA. 0+00 TO STA. 7+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 38 / 133

X:\Engineering\2021\21060 - Stella Road\38 REMOVAL PLAN.dwg Charlie Valenzuela





SCALE 1"=60'

60' 30' 0 60'

LEGEND

- REMOVE EXIST. ASPHALT PAVEMENT AND BASE (ALL DEPTHS)
- REMOVE EXIST. CONCRETE PAVEMENT AND BASE (ALL DEPTHS)
- REMOVE EXIST. GRAVEL AND BASE (ALL DEPTHS)
- FILL EXIST. DITCH
- SAWCUT
- (1) SAWCUT PAVEMENT
- (2) REMOVE STORM SEWER (ALL SIZES)
- (3) REMOVE METAL BEAM GUARD FENCE
- (4) REMOVE INLET OR MANHOLE (ALL SIZES)
- (5) REMOVE FENCE AND/OR GATE (ALL TYPES)
- (6) REMOVE S.E.T OR HEADWALL

FBRE, L.P.
FBCCF NO. 2006048107

X:\Engineering\2021\21060 – Stella Road\39 REMOVAL PLAN.dwg Charlie Valenzuela

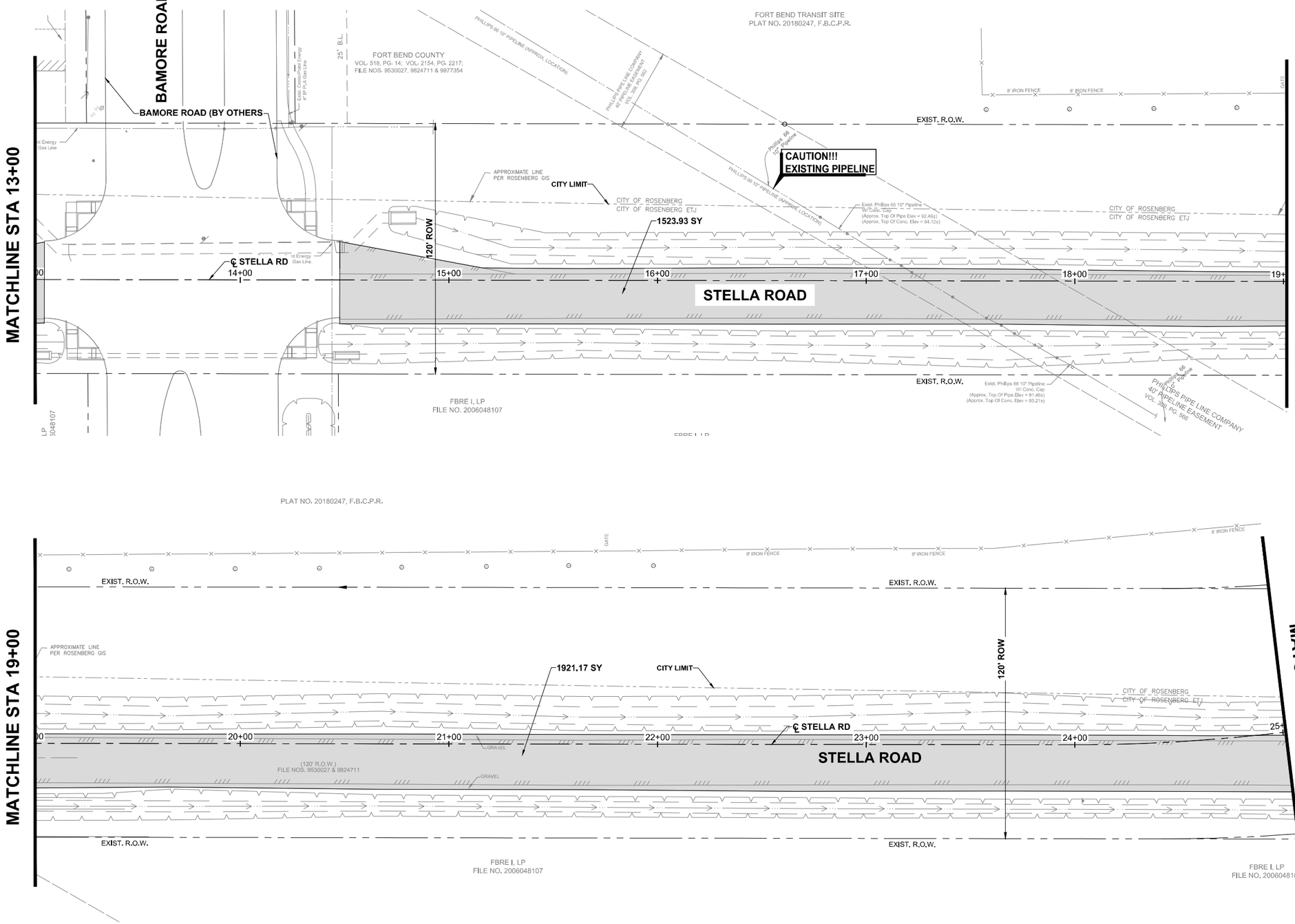
NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD	
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.	
CK'D BY: AM	SHEET DESCRIPTION: REMOVAL PLAN	
SCALE: 1" = 60'	STA. 0+00 TO STA. 7+00	SHEET NO: 39 / 133
DATE: 1/16/2023	APPROVED BY:	



SCALE 1"=50'

50' 25' 0 50'

LEGEND

- REMOVE EXIST. ASPHALT PAVEMENT AND BASE (ALL DEPTHS)
- REMOVE EXIST. CONCRETE PAVEMENT AND BASE (ALL DEPTHS)
- REMOVE EXIST. GRAVEL AND BASE (ALL DEPTHS)
- FILL EXIST. DITCH
- SAWCUT
- (1) SAWCUT PAVEMENT
- (2) REMOVE STORM SEWER (ALL SIZES)
- (3) REMOVE METAL BEAM GUARD FENCE
- (4) REMOVE INLET OR MANHOLE (ALL SIZES)
- (5) REMOVE FENCE AND/OR GATE (ALL TYPES)
- (6) REMOVE S.E.T OR HEADWALL

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

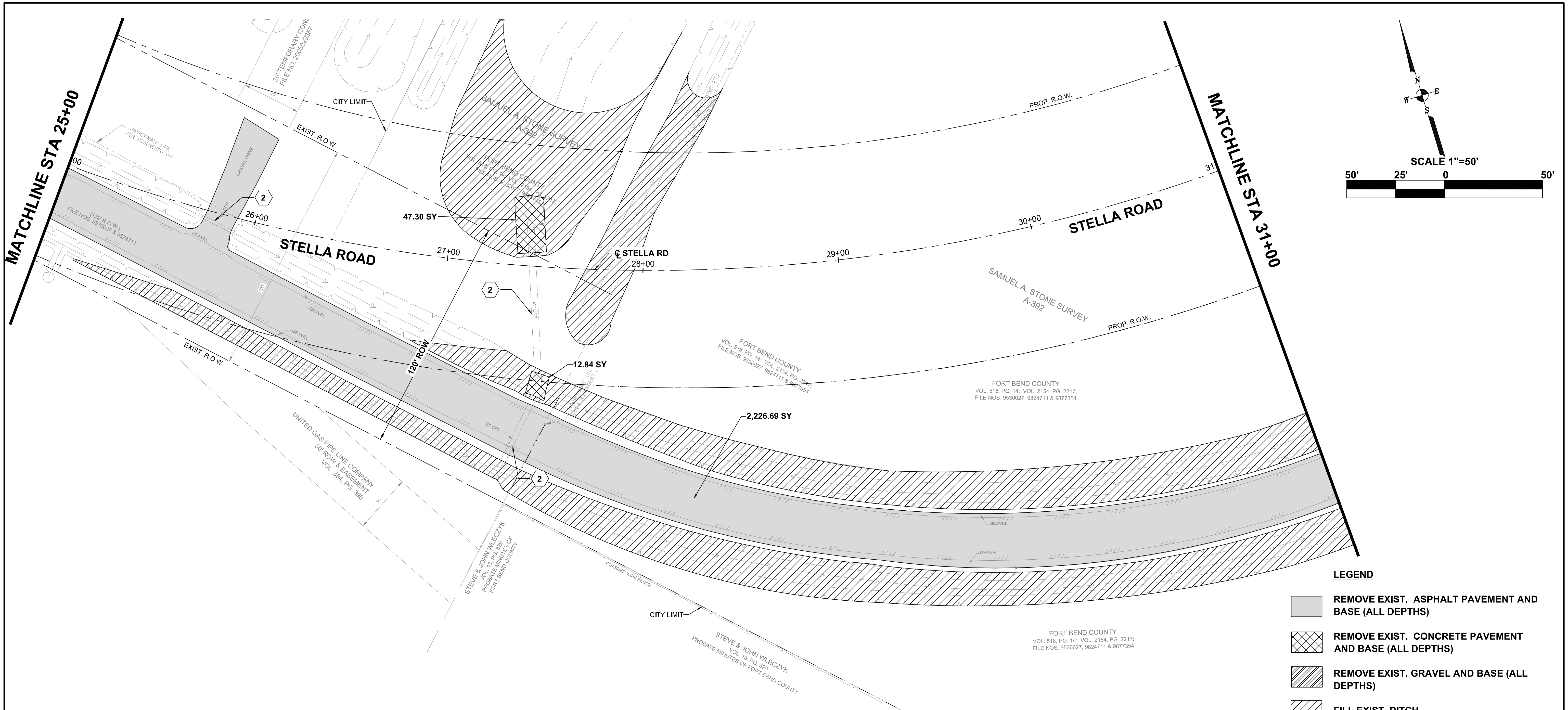
FORT BEND COUNTY TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: REMOVAL PLAN
SCALE: 1" = 50'	STA. 13+00 TO STA. 25+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 40 / 133

X:\Engineering\2021\21060 - Stella Road\40 REMOVAL PLAN.dwg Charlie Valenzuela



LEGEND

REMOVE EXIST. ASPHALT PAVEMENT AND BASE (ALL DEPTHS)

REMOVE EXIST. CONCRETE PAVEMENT AND BASE (ALL DEPTHS)

REMOVE EXIST. GRAVEL AND BASE (ALL DEPTHS)

FILL EXIST. DITCH

SAWCUT

1. SAWCUT PAVEMENT
2. REMOVE STORM SEWER (ALL SIZES)
3. REMOVE METAL BEAM GUARD FENCE
4. REMOVE INLET OR MANHOLE (ALL SIZES)
5. REMOVE FENCE AND/OR GATE (ALL TYPES)
6. REMOVE S.E.T OR HEADWALL

NO.	REVISIONS	DATE	NAME

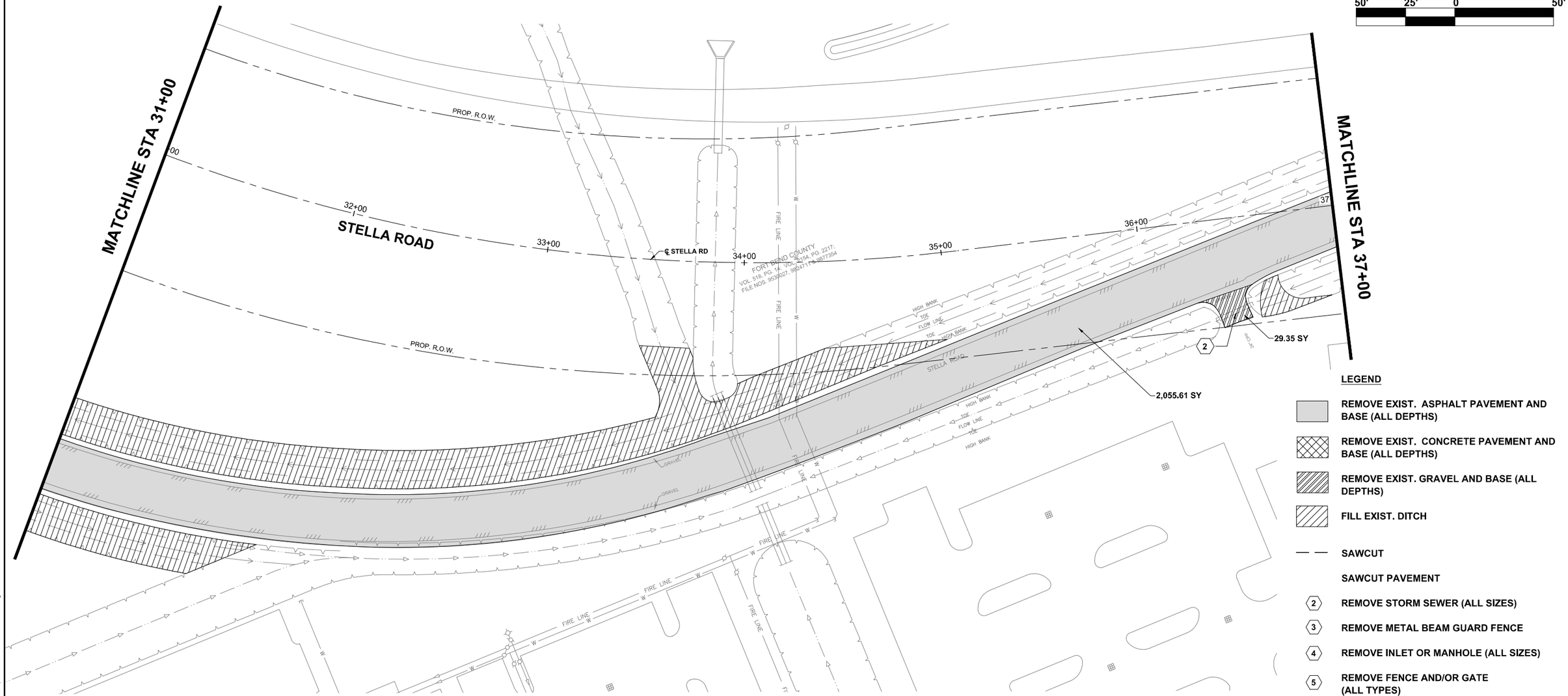
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS — AUSTIN P. MCLEAN — 132535 — LICENSED PROFESSIONAL ENGINEER — 7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: REMOVAL PLAN
SCALE: 1" = 50'	STA. 25+00 TO STA. 31+00
DATE: 1/16/2023	APPROVED BY:
SHEET NO:	41 / 133

X:\Engineering\2021\21060 – Stella Road\41 REMOVAL PLAN.dwg Charlie Valenzuela



LEGEND

- REMOVE EXIST. ASPHALT PAVEMENT AND BASE (ALL DEPTHS)
- REMOVE EXIST. CONCRETE PAVEMENT AND BASE (ALL DEPTHS)
- REMOVE EXIST. GRAVEL AND BASE (ALL DEPTHS)
- FILL EXIST. DITCH
- SAWCUT
- SAWCUT PAVEMENT
- (2) REMOVE STORM SEWER (ALL SIZES)
- (3) REMOVE METAL BEAM GUARD FENCE
- (4) REMOVE INLET OR MANHOLE (ALL SIZES)
- (5) REMOVE FENCE AND/OR GATE (ALL TYPES)
- (6) REMOVE S.E.T OR HEADWALL

X:\Engineering\2021\21060 – Stella Road\42 REMOVAL PLAN.dwg Charlie Valenzuela

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

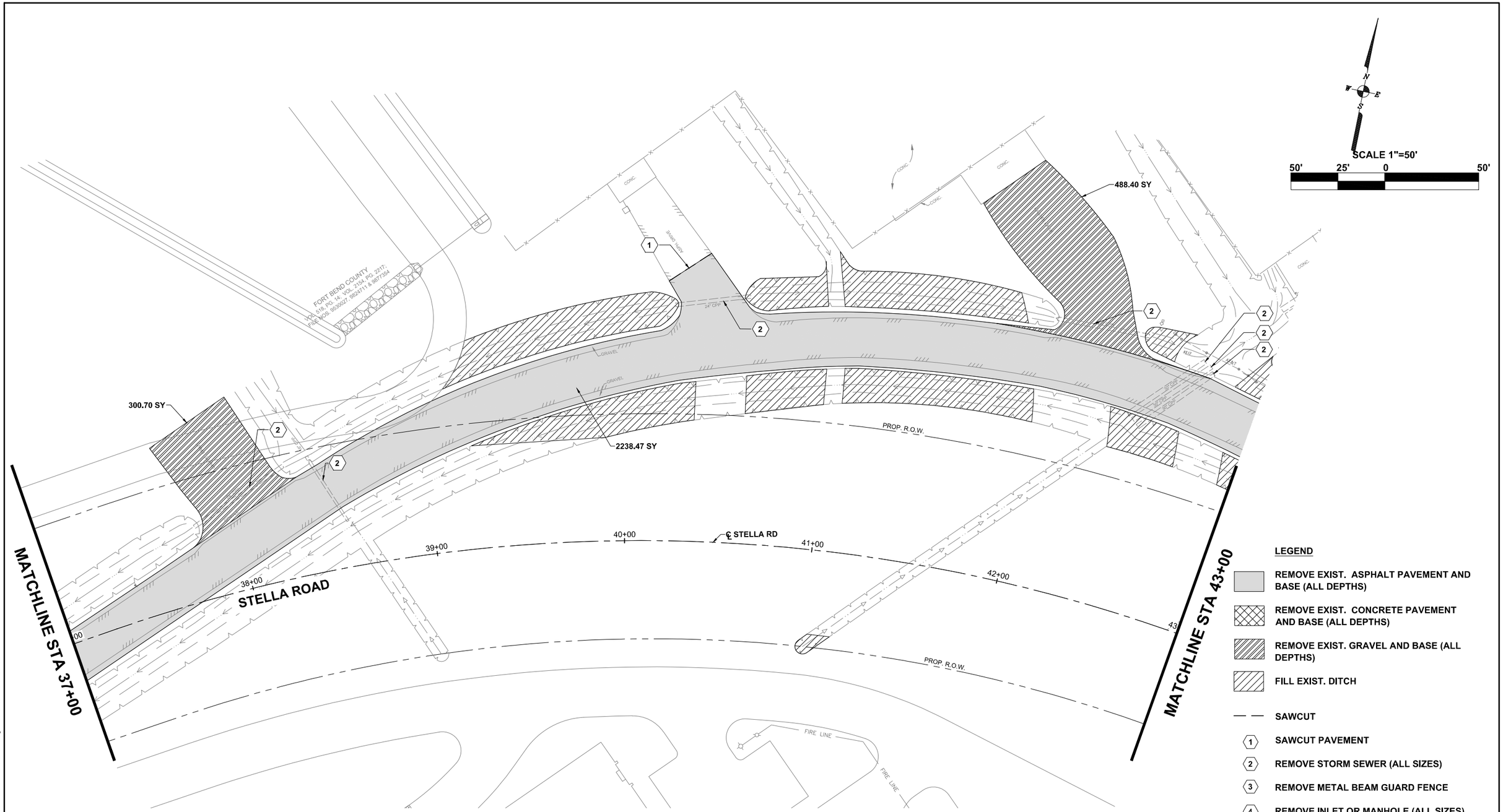
FORT BEND COUNTY TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: REMOVAL PLAN
SCALE: 1" = 50'	STA. 31+00 TO STA. 37+00
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 42 / 133



NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

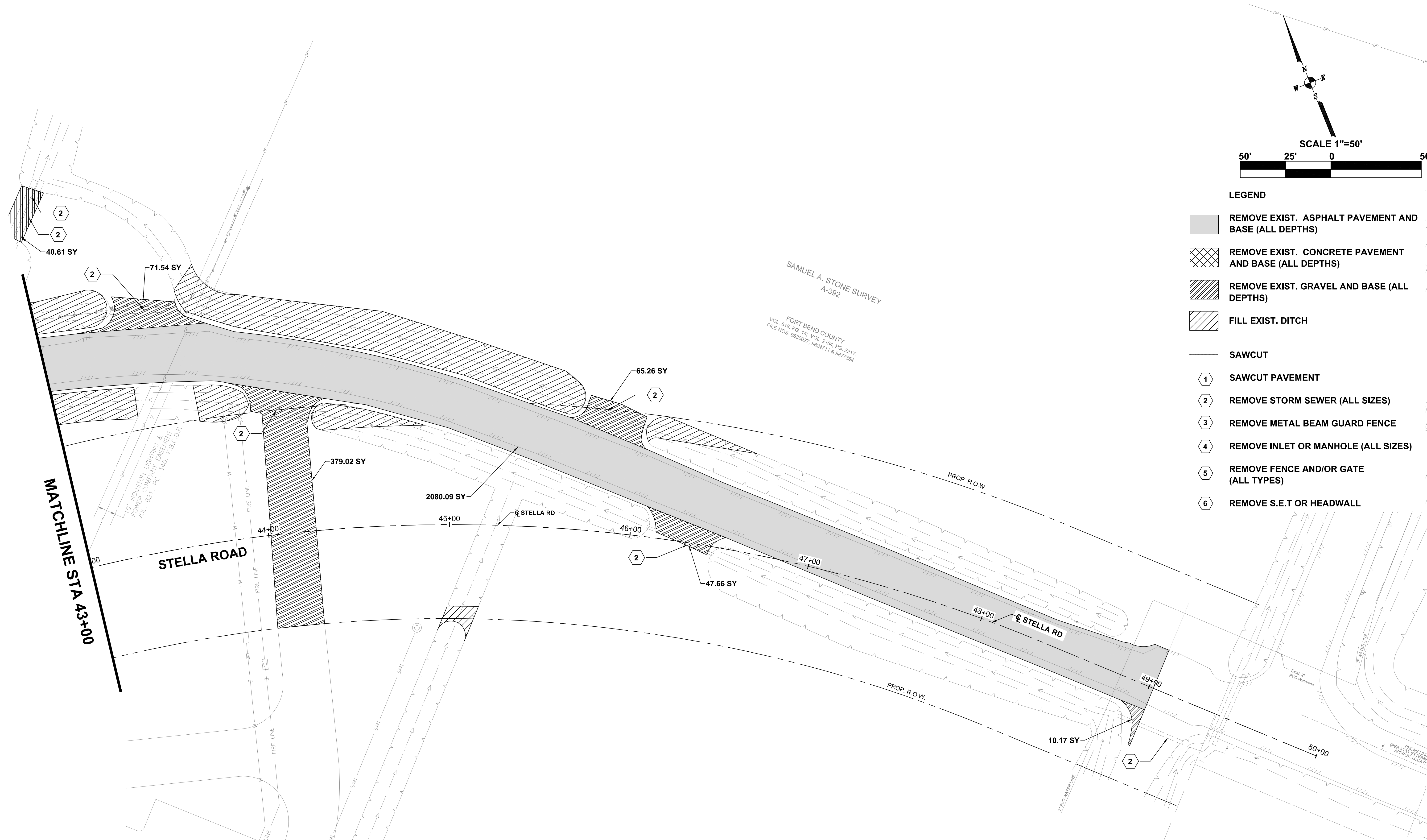
THE STATE OF TEXAS FORT BEND COUNTY

McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: REMOVAL PLAN
SCALE: 1" = 50'	STA. 37+00 TO STA. 43+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 43 / 133

X:\Engineering\2021\21060 – Stella Road\43 REMOVAL PLAN.dwg Charlie Valenzuela



LEGEND

▨	REMOVE EXIST. ASPHALT PAVEMENT AND BASE (ALL DEPTHS)
▩	REMOVE EXIST. CONCRETE PAVEMENT AND BASE (ALL DEPTHS)
▧	REMOVE EXIST. GRAVEL AND BASE (ALL DEPTHS)
▨	FILL EXIST. DITCH
—	SAWCUT
1	SAWCUT PAVEMENT
2	REMOVE STORM SEWER (ALL SIZES)
3	REMOVE METAL BEAM GUARD FENCE
4	REMOVE INLET OR MANHOLE (ALL SIZES)
5	REMOVE FENCE AND/OR GATE (ALL TYPES)
6	REMOVE S.E.T OR HEADWALL

NO.	REVISIONS	DATE	NAME
△			
△			
△			
△			
△			

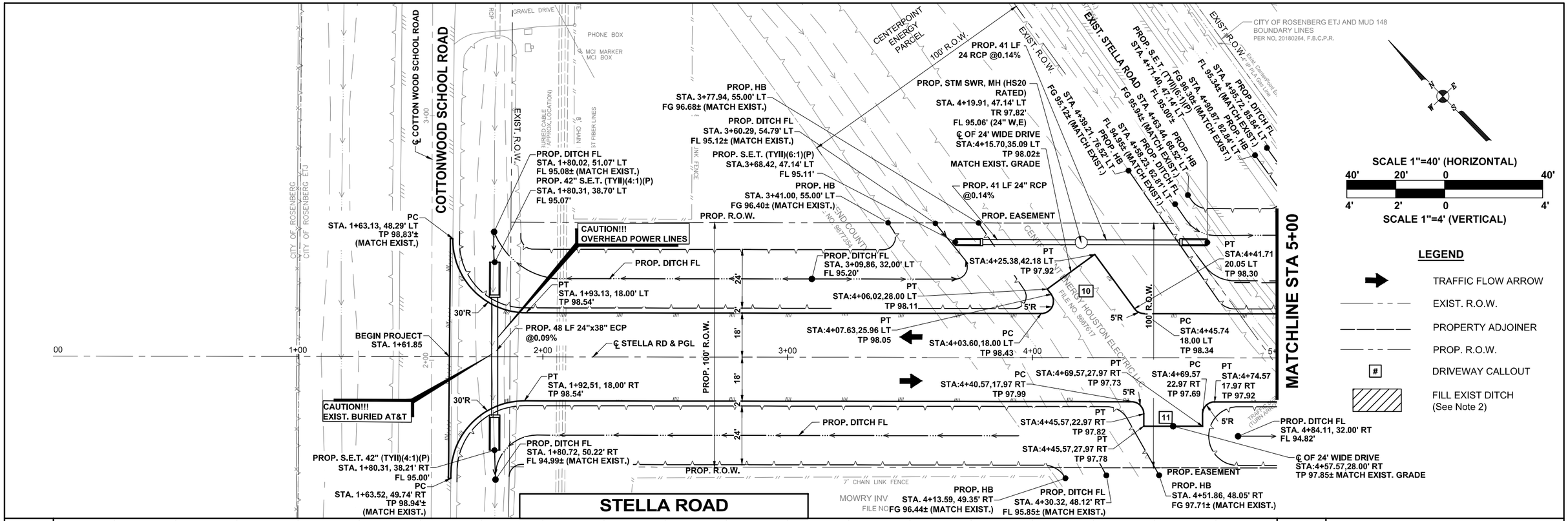
FORT BEND COUNTY
TEXAS

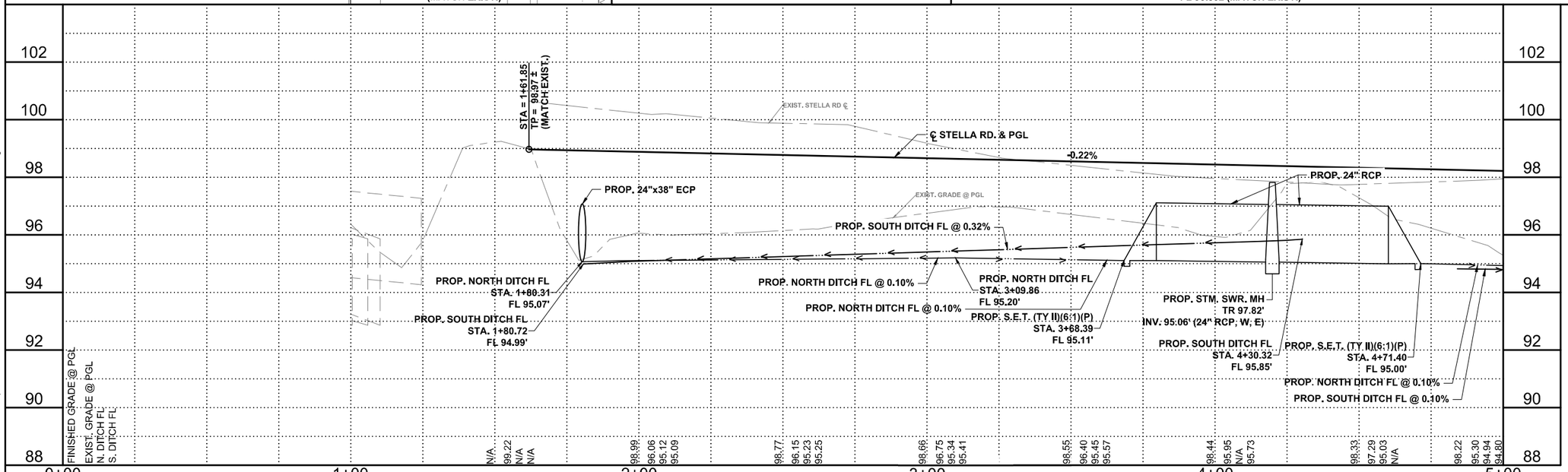
THE STATE OF TEXAS · FORT BEND COUNTY

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
[illegible]
7/2/2024

PROJECT TITLE:	STELLA ROAD	
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.	
CK'D BY: AM	SHEET DESCRIPTION: REMOVAL PLAN	
SCALE: 1" = 50'	STA. 43+00 TO END	SHEET NO:
DATE: 1/16/2023	APPROVED BY:	44 / 133





NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.

2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

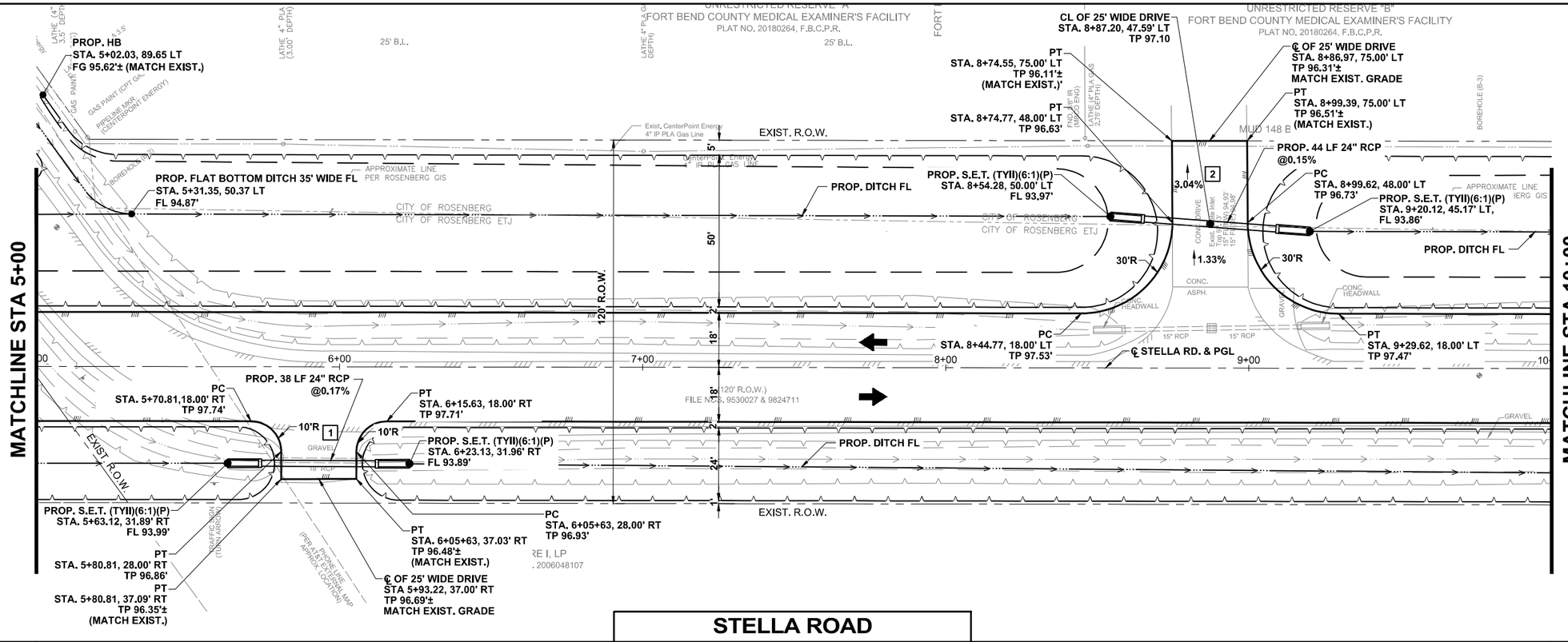
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

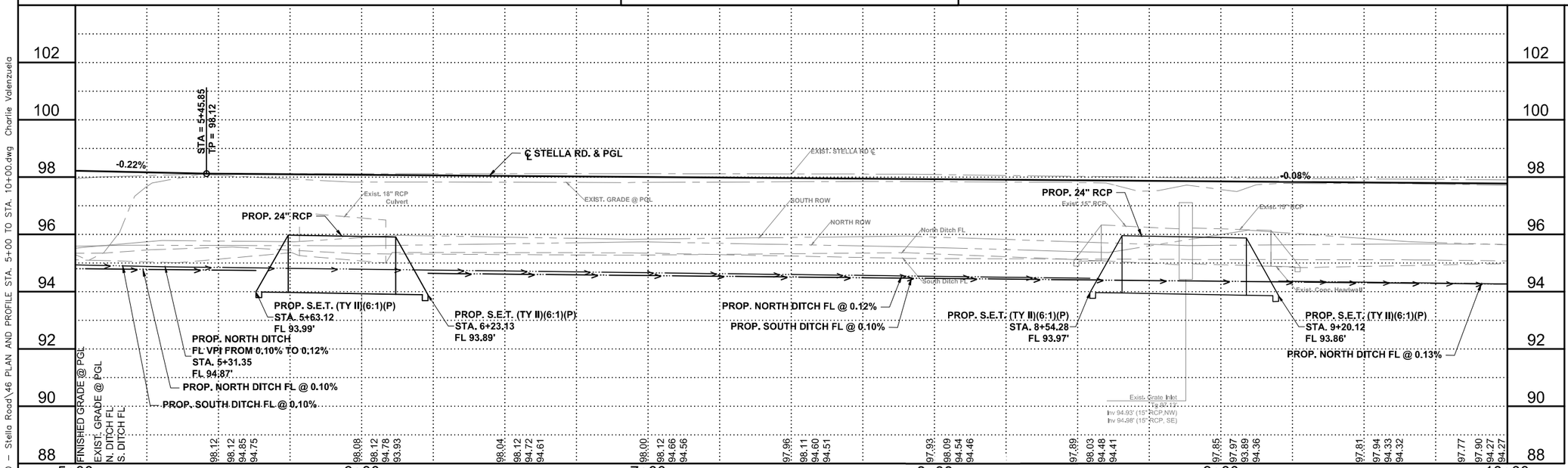
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 0+00 TO STA. 5+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 45 / 133

X:\Engineering\2021\21060 – Stella Road\45 PLAN AND PROFILE STA. 0+00 TO STA. 5+00.dwg Charlie Valenzuela



STELLA ROAD



NOTES:
1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.
2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

NO.	REVISIONS	DATE	NAME

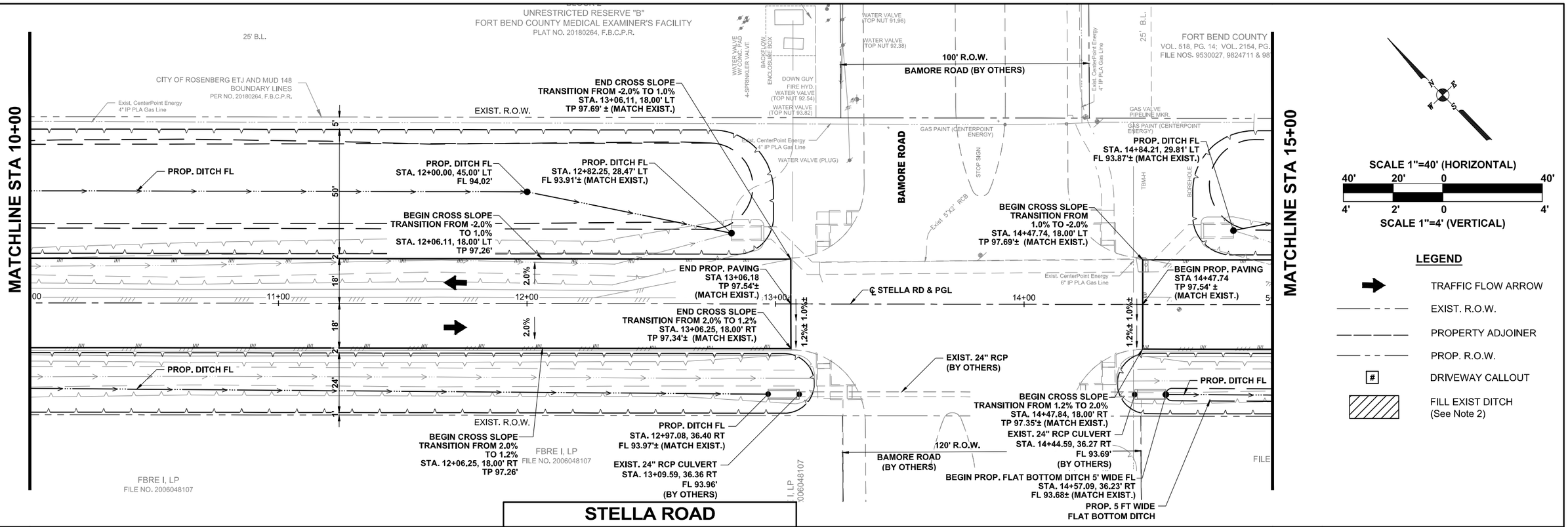
FORT BEND COUNTY
TEXAS

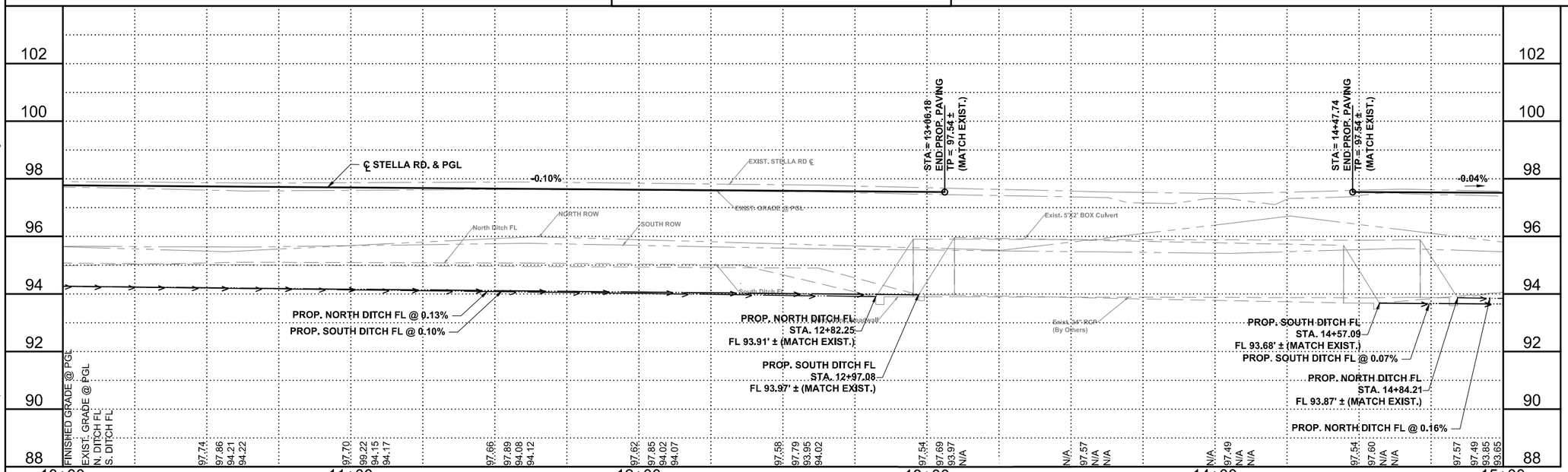
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 5+00 TO STA. 10+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 46 / 133

X:\Engineering\2021\21060 – Stella Road\46 PLAN AND PROFILE STA. 5+00 TO STA. 10+00.dwg Charlie Valenzuela





NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.

2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

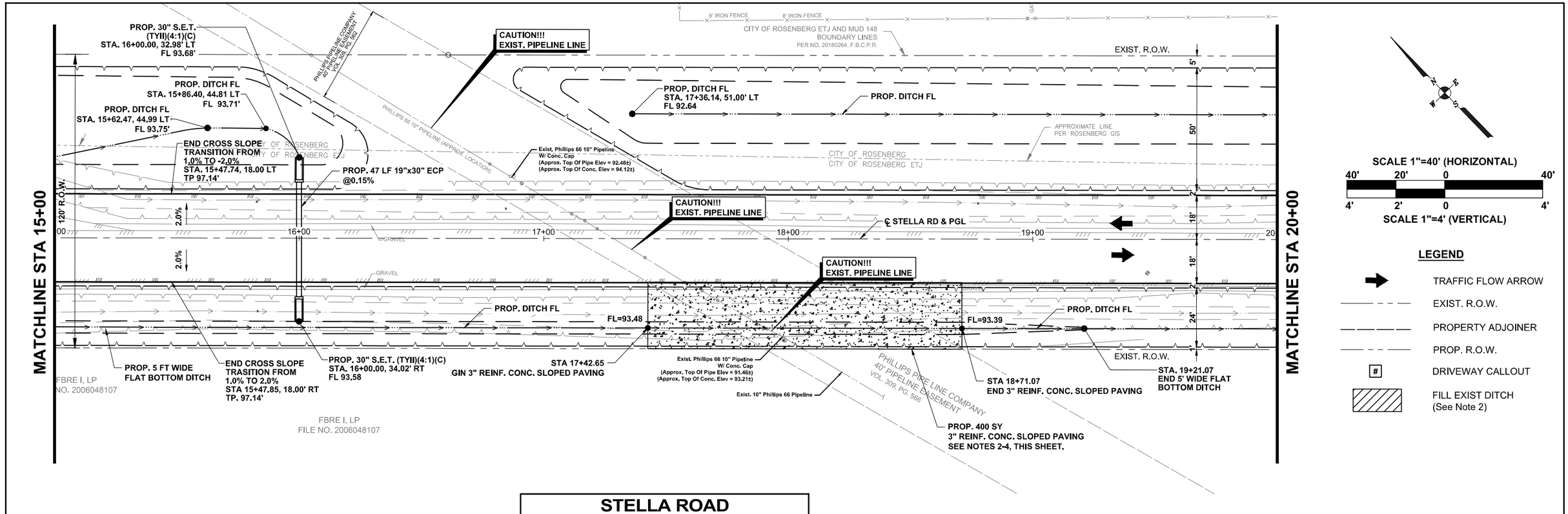
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 10+00 TO STA. 15+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 47 / 133

X:\Engineering\2021\21060 – Stella Road\47 PLAN AND PROFILE STA. 10+00 TO STA. 15+00.dwg Charlie Valenzuela



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

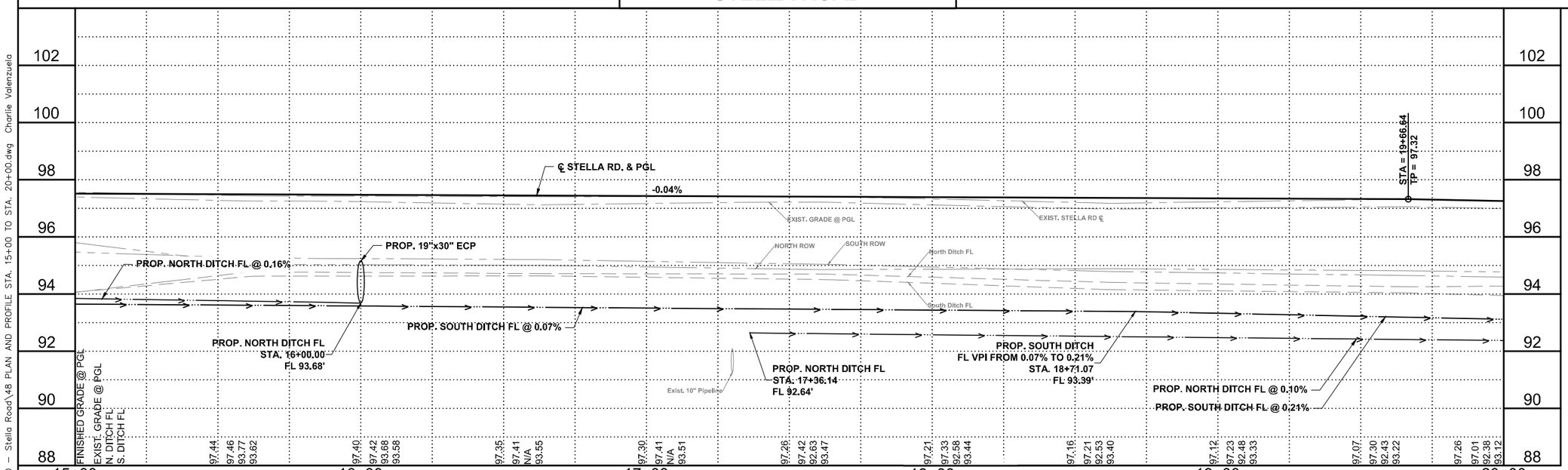
4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

- TRAFFIC FLOW ARROW
- EXIST. R.O.W.
- PROPERTY ADJOINER
- PROP. R.O.W.
- [#] DRIVEWAY CALLOUT
- FILL EXIST DITCH (See Note 2)

STELLA ROAD



NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.
2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP. ROADSIDE SWALES.
3) PHILLIPS 66 PERSONNEL SHALL BE ONSITE PRIOR TO ANY EXCAVATION WITHIN PHILLIPS 66 EASEMENT.
4) MECHANICAL EXCAVATION SHALL CEASE, AND ONLY HAND EXCAVATION SHALL BE PERMITTED, WITHIN 24-INCHES OF PHILLIPS 66 PIPELINE. THIS CAN BE ACCOMPLISHED BY SWITCHING BUCKETS OR ADDING A BAR TO CUTTING TEETH FEET OF THE PIPE.
5) PRIOR TO COMMENCING ANY ACTIVITY ON THE PHILLIPS 66 EASEMENT, CONTRACTOR TO SUBMIT A LIST & SPECS OF ALL EQUIPMENT ANTICIPATED TO CROSS PHILLIPS 66 EASEMENT FOR PHILLIPS 66 APPROVAL.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

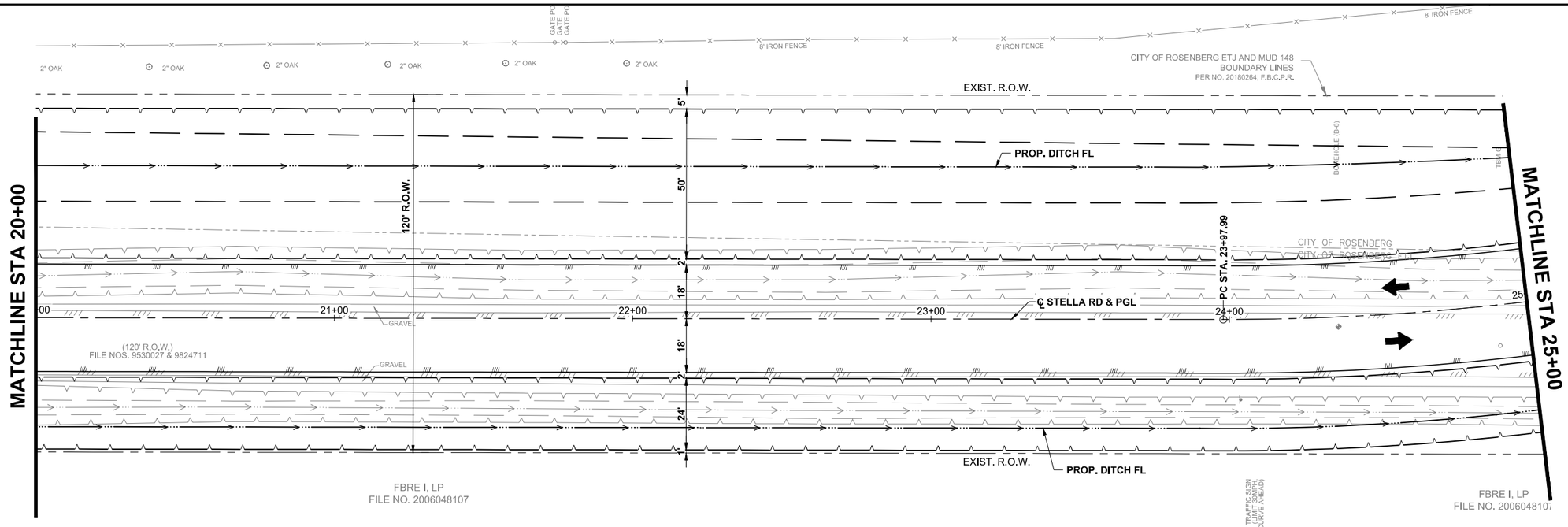
FORT BEND COUNTY
TEXAS

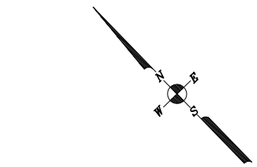
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER · 7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 15+00 TO STA. 20+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 48 / 133

X:\Engineering\2021\21060 – Stella Road\48 PLAN AND PROFILE STA. 15+00 TO STA. 20+00.dwg Charlie Valenzuela

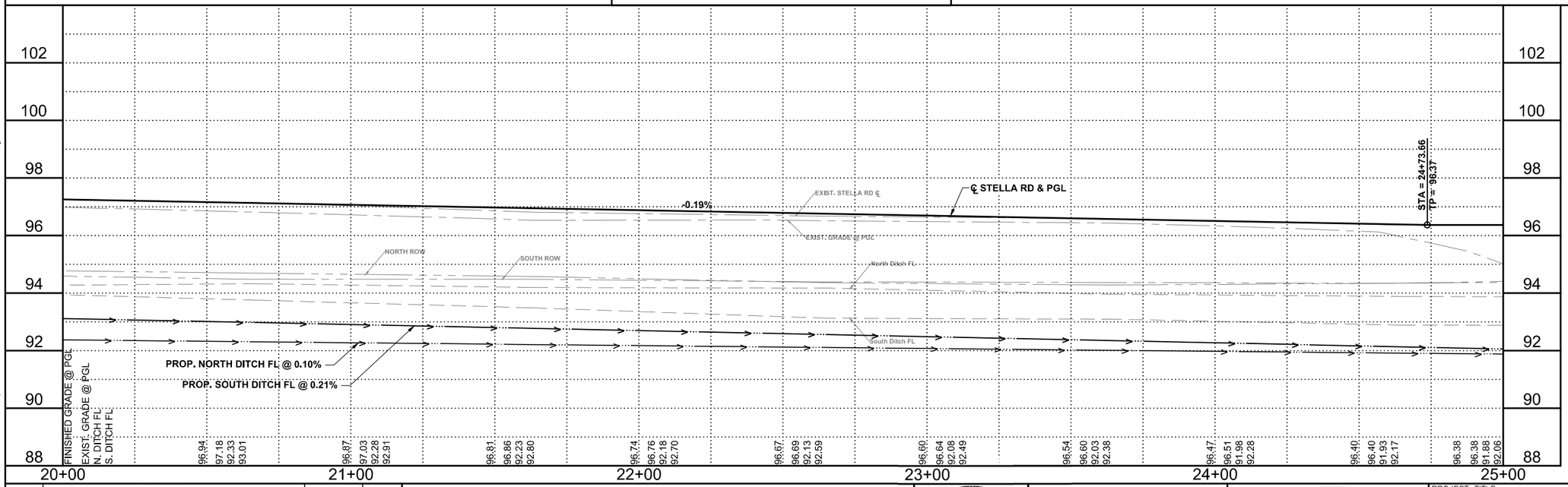




LEGEND

- TRAFFIC FLOW ARROW
- EXIST. R.O.W.
- PROPERTY ADJOINER
- PROP. R.O.W.
- [#] DRIVEWAY CALLOUT
- FILL EXIST DITCH (See Note 2)

STELLA ROAD



NOTES:

1) **ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.**

2) **REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.**

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

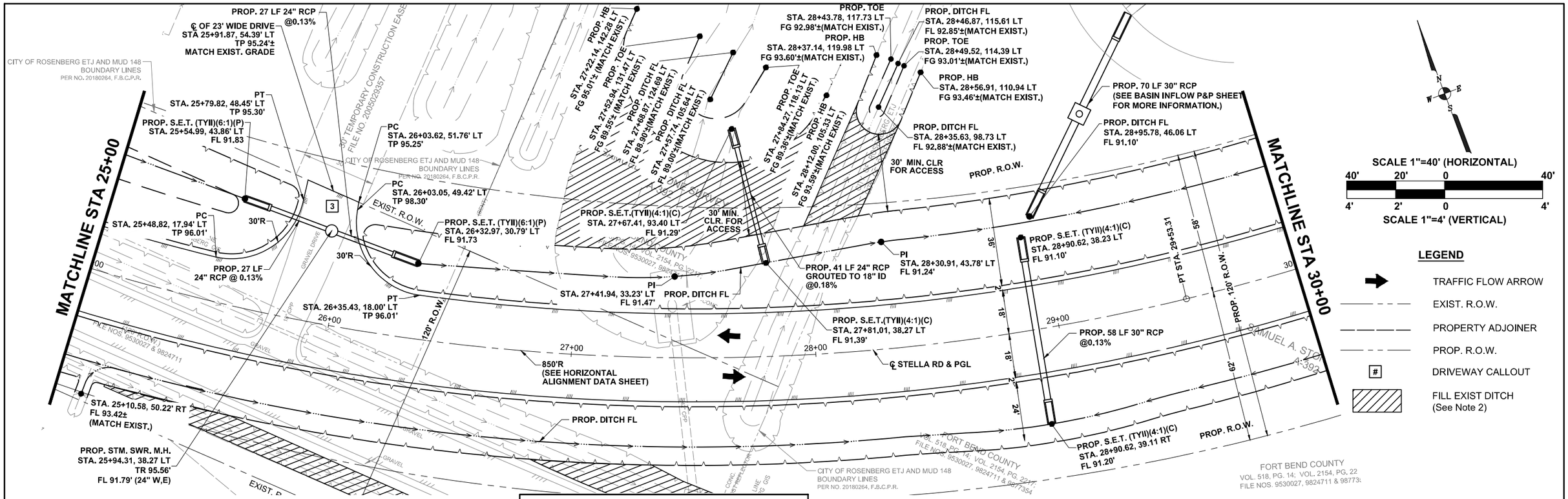
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER
7/2/2024

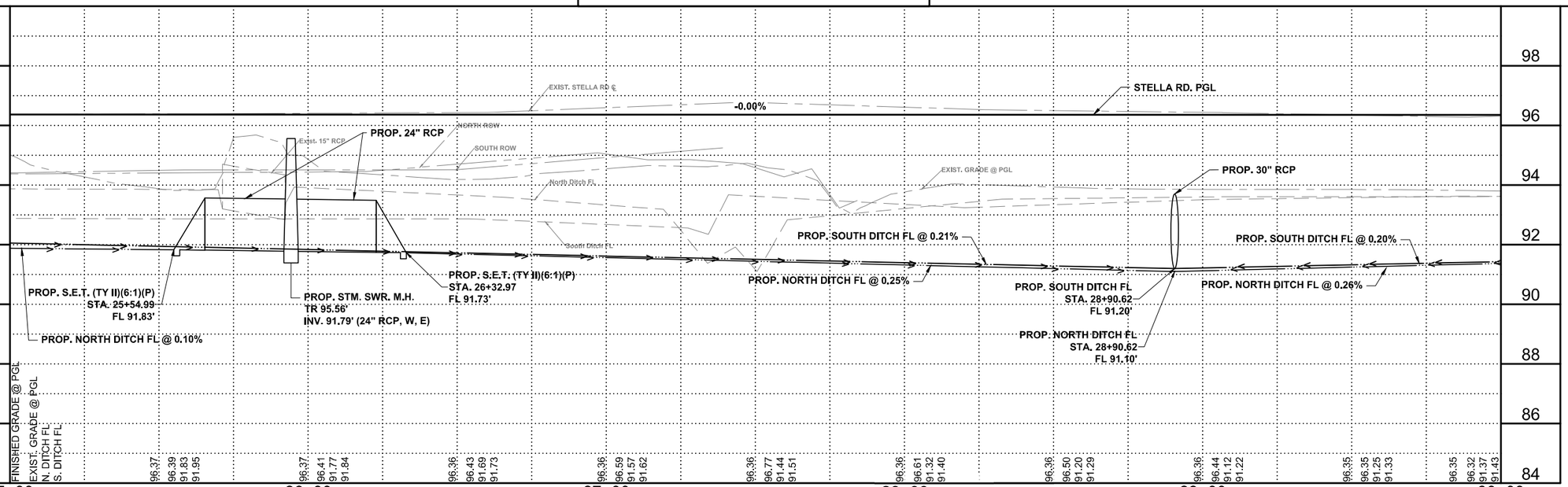
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 20+00 TO STA. 25+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 49 / 133

X:\Engineering\2021\21060 – Stella Road\49 PLAN AND PROFILE STA. 20+00 TO STA. 25+00.dwg Charlie Valenzuela



STELLA ROAD



NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.
2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

NO.	REVISIONS	DATE	NAME

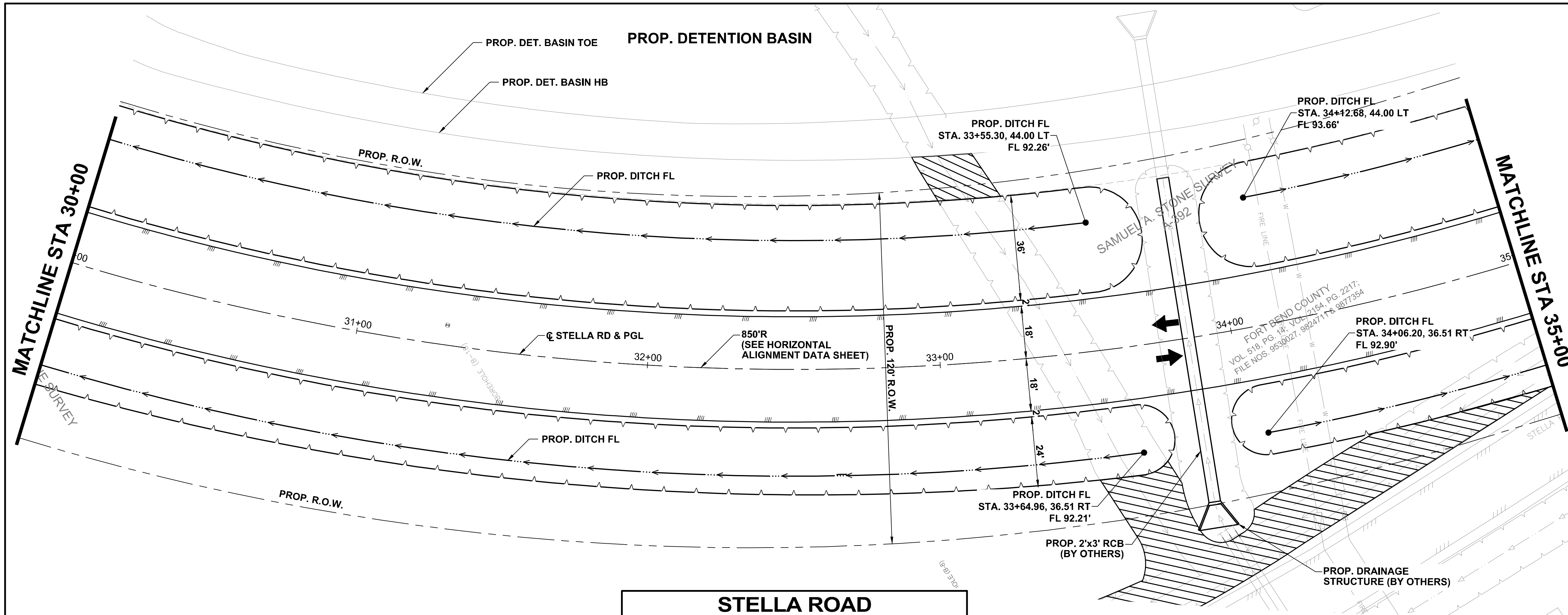
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane, Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

AUSTIN P. MCLEAN 132535 LICENSED PROFESSIONAL ENGINEER 7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 25+00 TO STA. 30+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 50 / 133

X:\Engineering\2021\21060 – Stella Road\50 PLAN AND PROFILE STA. 25+00 TO STA. 30+00.dwg Charlie Valenzuela



SCALE 1"=40' (HORIZONTAL)

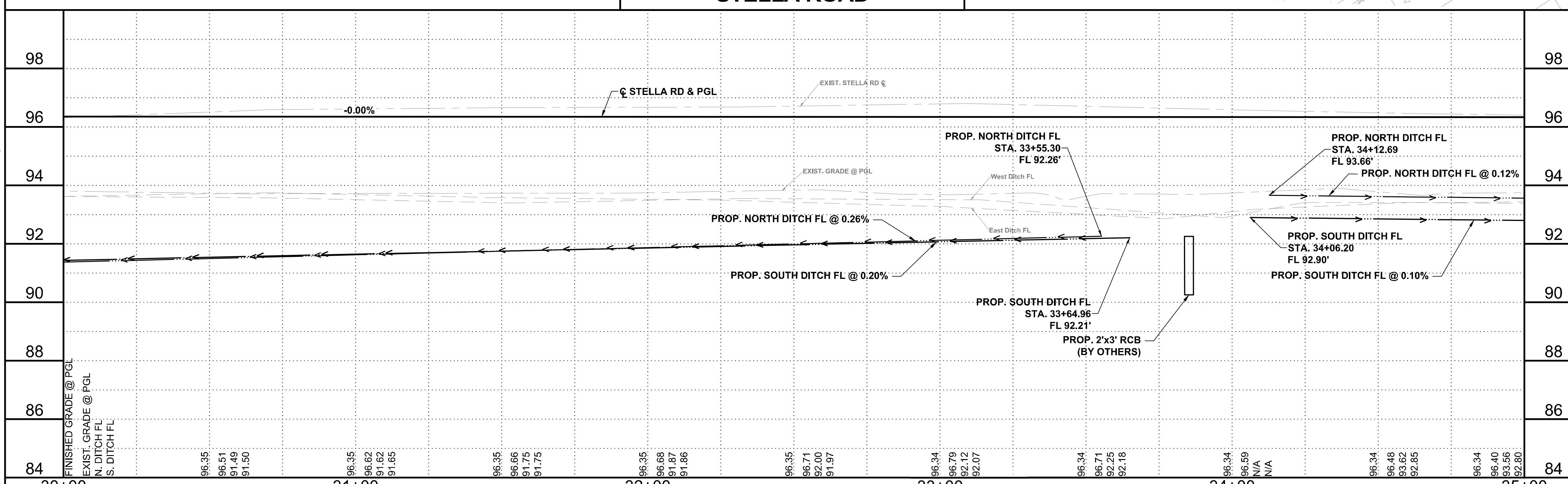
40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

- TRAFFIC FLOW ARROW
- EXIST. R.O.W.
- PROPERTY ADJOINER
- PROP. R.O.W.
- # DRIVEWAY CALLOUT
- FILL EXIST DITCH (See Note 2)



	30+25	30+75	31+25	31+75	32+25	32+75	33+25	33+75	34+25	34+75
FINISHED GRADE @ PGL	96.35	96.35	96.35	96.35	96.35	96.34	96.34	96.34	96.34	96.34
EXIST. GRADE @ PGL	96.51	96.62	96.66	96.68	96.71	96.79	96.71	96.59	96.48	96.40
N. DITCH FL	91.49	91.62	91.75	91.87	92.00	92.12	92.25	N/A	93.62	93.56
S. DITCH FL	91.50	91.65	91.75	91.86	91.97	92.07	92.18	N/A	92.85	92.80

NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.

2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

X:\Engineering\2021\21060 – Stella Road\51 PLAN AND PROFILE STA. 30+00 TO STA. 35+00.dwg Charlie Valenzuela

NO.	REVISIONS	DATE	NAME
△			
△			
△			
△			
△			

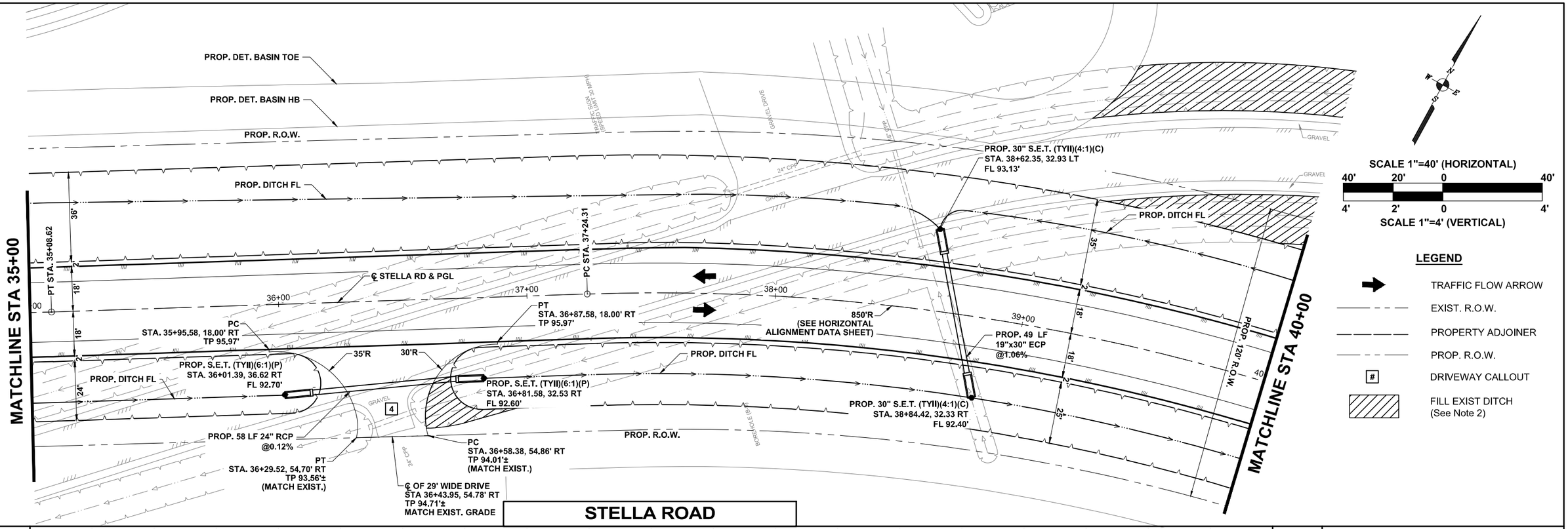
FORT BEND COUNTY
TEXAS

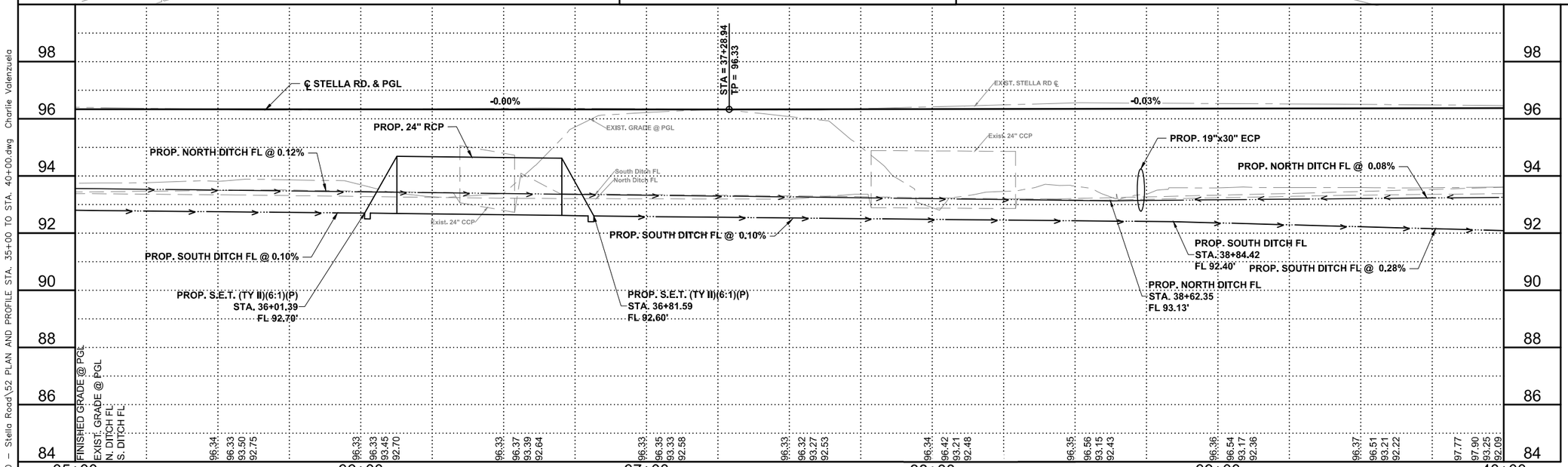
THE STATE OF TEXAS – FORT BEND COUNTY

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS – AUSTIN P. MCLEAN – 132535 – LICENSED PROFESSIONAL ENGINEER – 7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 30+00 TO STA. 35+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
SHEET NO:	51 / 133





NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.

2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

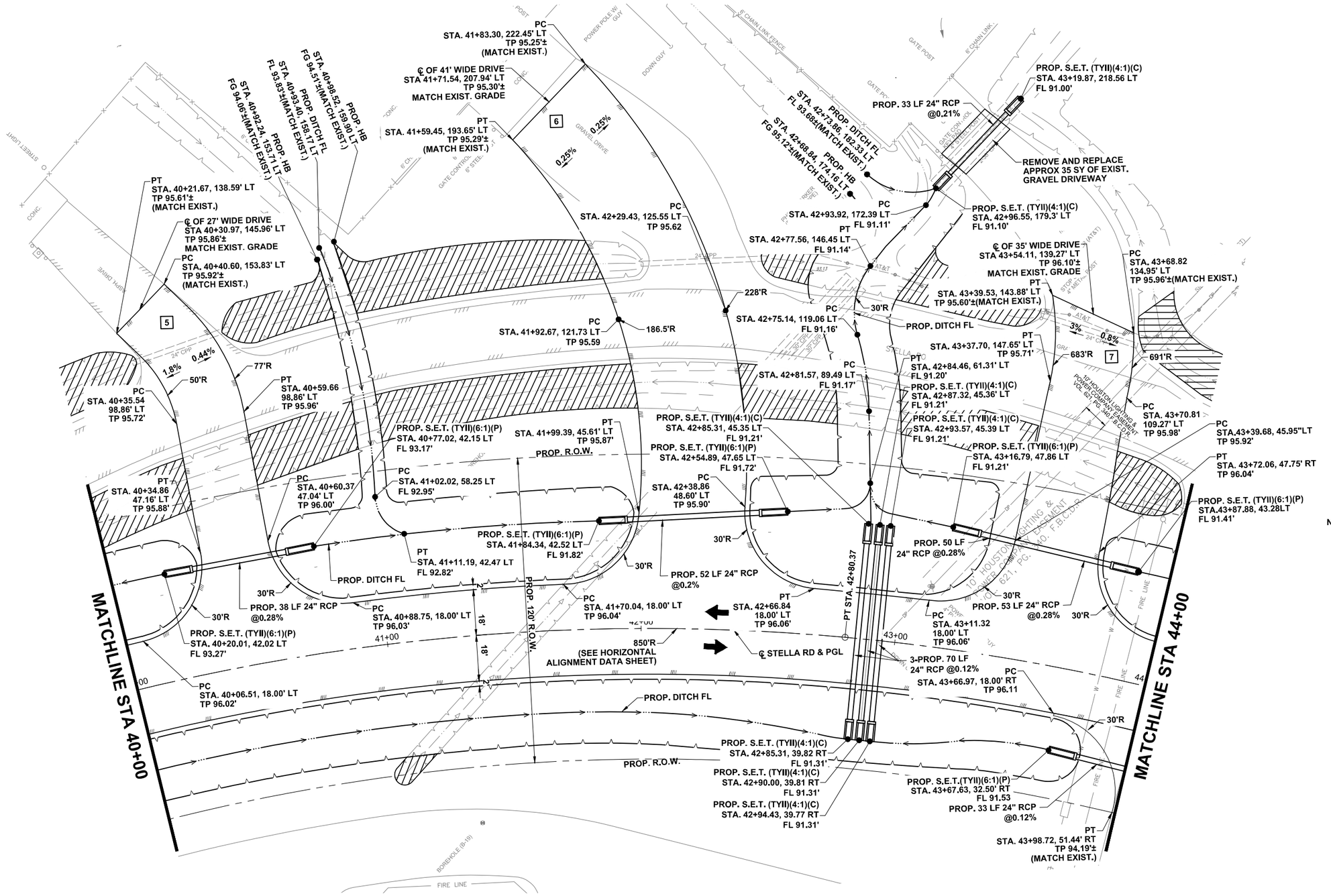
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

AUSTIN P. MCLEAN 132535 LICENSED PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 35+00 TO STA. 40+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 52 / 133

X:\Engineering\2021\21060 – Stella Road\52 PLAN AND PROFILE STA. 35+00 TO STA. 40+00.dwg Charlie Valenzuela



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

- TRAFFIC FLOW ARROW
- EXIST. R.O.W.
- PROPERTY ADJOINER
- PROP. R.O.W.
- [#] DRIVEWAY CALLOUT
- FILL EXIST DITCH (See Note 2)

NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.

2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

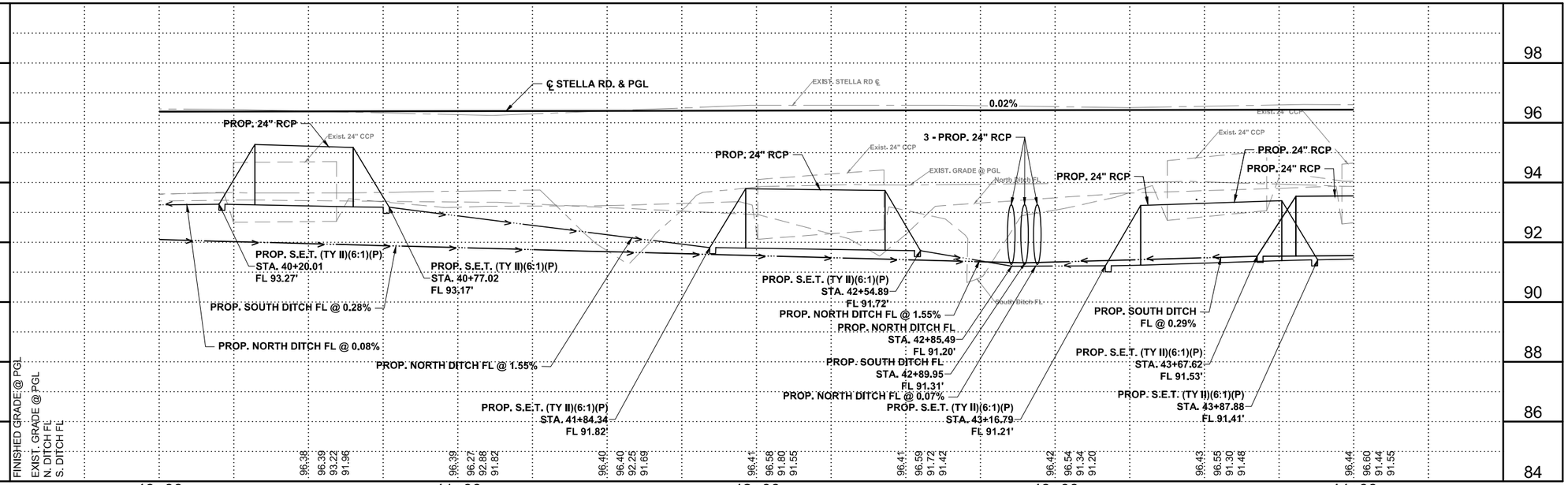
FORT BEND COUNTY TEXAS

McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN STA. 40+00 TO STA. 44+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 53 / 133

X:\Engineering\2021\21060 – Stella Road\53 PLAN STA. 40+00 TO STA. 44+00.dwg Charlie Valenzuela



NOTES:

1) **ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.**

2) **REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.**

SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

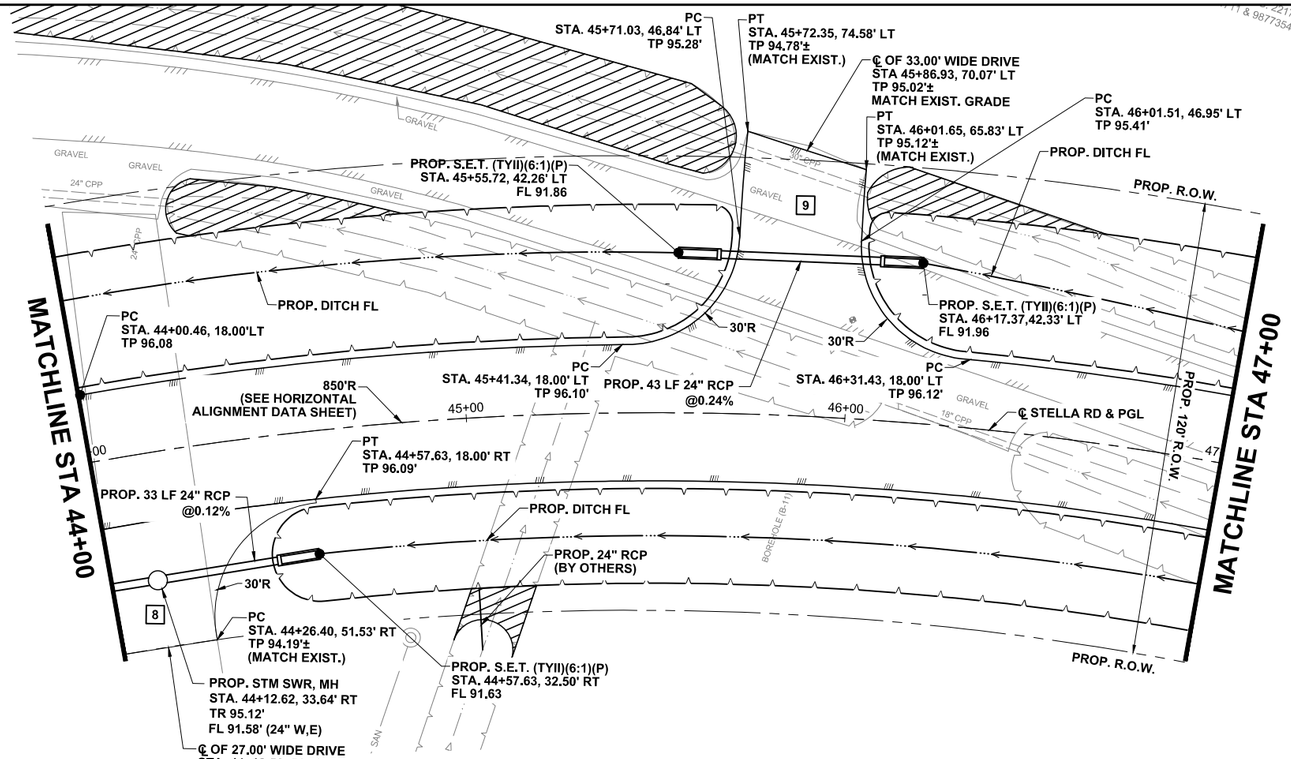
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

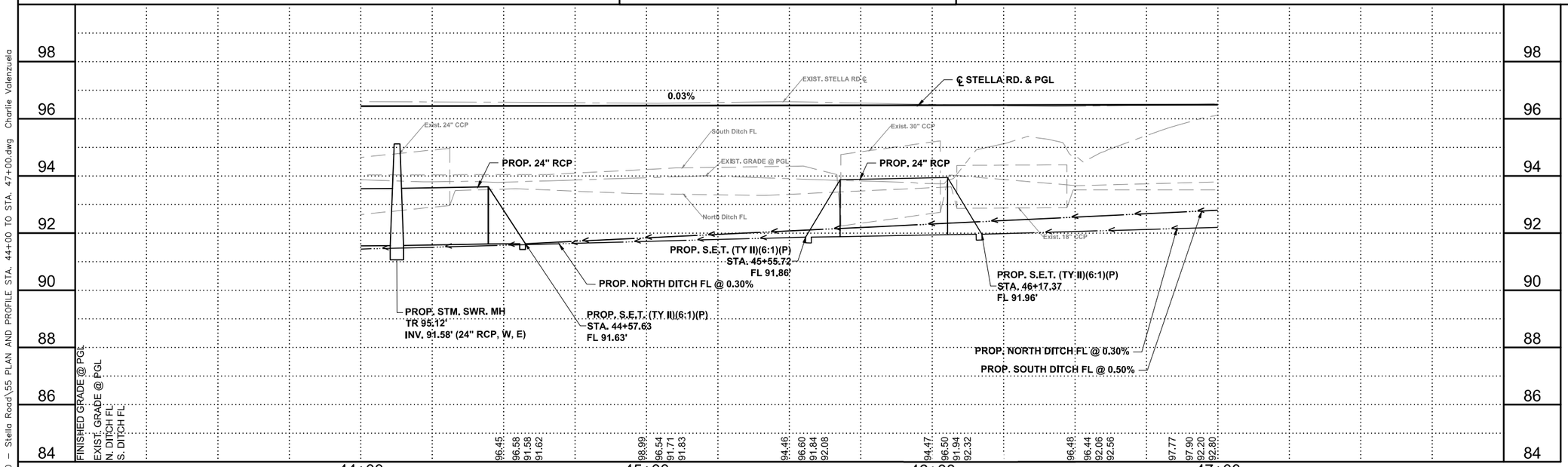
STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PROFILE STA. 40+00 TO STA. 44+00
SCALE: 1" = 40'	
DATE: 12/9/2022	APPROVED BY:
	SHEET NO: 54 / 133

X:\Engineering\2021\21060 – Stella Road\54 PROFILE STA. 40+00 TO STA. 44+00.dwg Charlie Valenzuela



STELLA ROAD



LEGEND

- TRAFFIC FLOW ARROW
- EXIST. R.O.W.
- PROPERTY ADJOINER
- PROP. R.O.W.
- [#] DRIVEWAY CALLOUT
- FILL EXIST DITCH (See Note 2)

NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.
2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

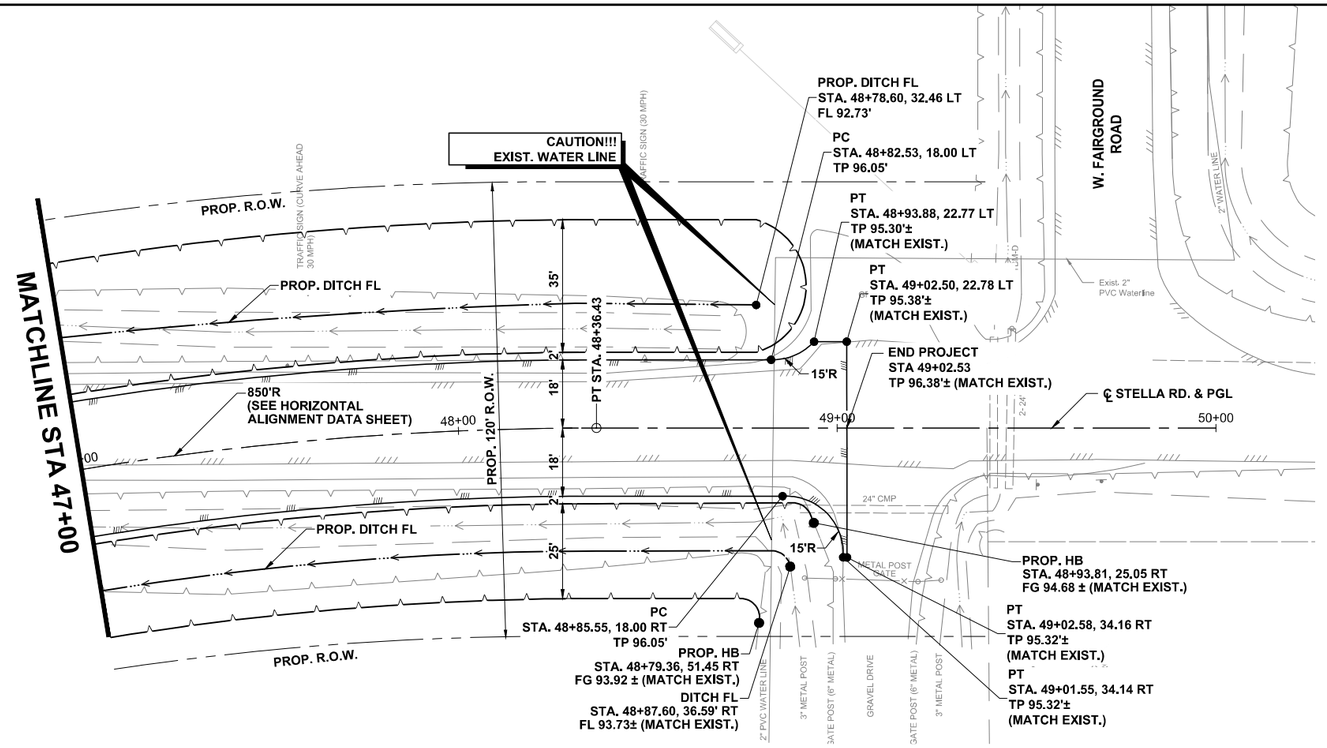
FORT BEND COUNTY
TEXAS

McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 44+00 TO STA. 47+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 55 / 133

X:\Engineering\2021\21060 – Stella Road\55 PLAN AND PROFILE STA. 44+00 TO STA. 47+00.dwg Charlie Valenzuela



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

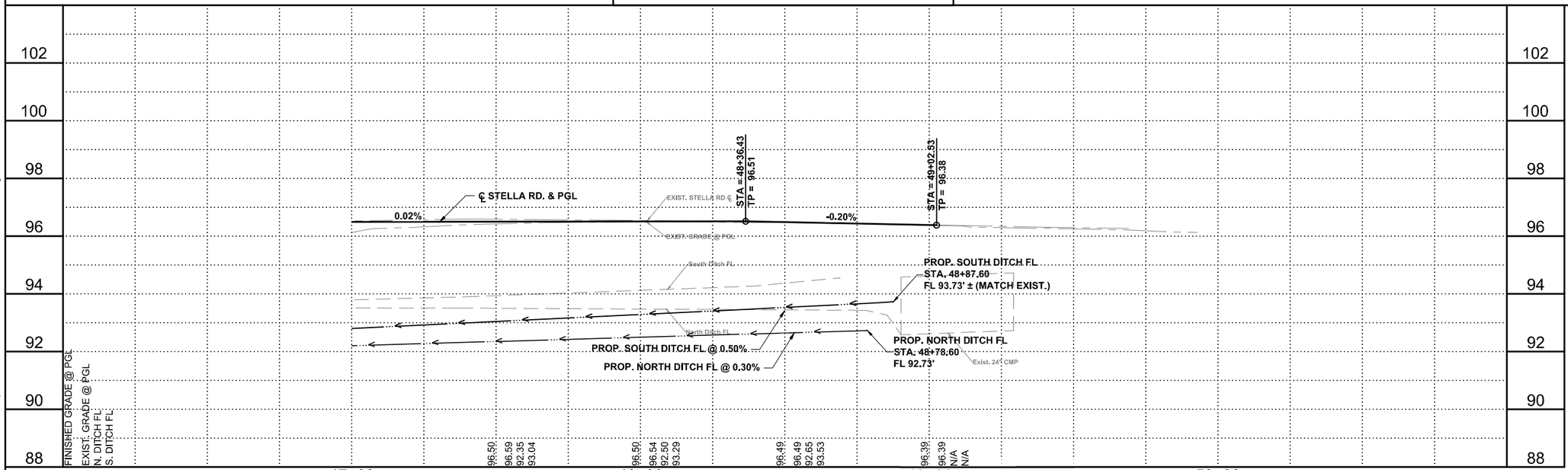
SCALE 1"=4' (VERTICAL)

4' 2' 0 4'

LEGEND

- TRAFFIC FLOW ARROW
- EXIST. R.O.W.
- PROPERTY ADJOINER
- PROP. R.O.W.
- [#] DRIVEWAY CALLOUT
- FILL EXIST DITCH (See Note 2)

STELLA ROAD



NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.
2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

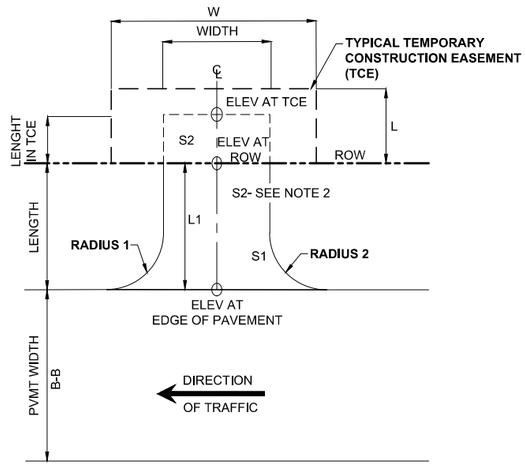
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

AUSTIN P. MCLEAN 132535 LICENSED PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PLAN AND PROFILE STA. 47+00 TO END
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 56 / 133

X:\Engineering\2021\21060 - Stella Road\56 PLAN AND PROFILE STA. 47+00 TO END.dwg Charlie Valenzuela



DRIVEWAY DETAIL

NTS

NOTES:
1. CONTRACTOR TO FIELD VERIFY EXIST. PAVING ELEVATION AND NOTIFY ENGINEER IF IT DOES NOT MATCH ELEV. SHOWN IN PLANS.
2. GRADE S2 ONLY NEEDED FOR DRIVEWAY NO. 2.

DRIVEWAY NO.	SHEET NO	CL STATION	PROP. WIDTH (FT)	PROP. LENGTH (FT)	PROP. LENGTH IN TCE (FT)	RADIUS 1 (FT)	RADIUS 2 (FT)	EL. AT EOP	EXIST. PAVING EL. @ TIE IN	LENGTH L1 (FT)	GRADE S1(%)	TCE (LxW)	GRADE S2(%)
1	45	STA 5+93.22, 37.00' RT	25	19	N/A	10	10	97.73	96.69 +/-	19	5.47	N/A	
2	45	STA 8+86.97, 75.00' LT	25	57	N/A	30	30	97.50	96.31 +/-	57	1.35	N/A	2.88
3	49	STA 25+92.16,54.37' LT	23	36.4	N/A	30	30	96.01	95.24 +/-	36.4	2.12	N/A	
4	51	STA 36+43.95, 54.78' RT	29	36.8	N/A	35	30	95.97	94.71 +/-	36.8	3.42	N/A	
5	52	STA 40+30.97, 145.96' LT	27	132.8	N/A	30	30	96.03	95.86 +/-	132.8	0.13	N/A	
6	52	STA 41+71.54, 207.94' LT	41	204.1	N/A	30	30	96.05	95.30 +/-	204.1	0.37	N/A	
7	52	STA 43+54.11, 139.27' LT	35	121.3	N/A	30	30	96.07	96.10 +/-	121.1	-0.02	N/A	
8	54	STA 44+12.56, 51.59' RT	27	33.6	N/A	30	30	96.10	94.17 +/-	33.6	5.74	N/A	
9	54	STA 45+86.93, 70.07' RT	33	52.1	N/A	30	30	96.11	95.02 +/-	52.1	2.09	N/A	
10	44	STA 4+15.70, 35.09' LT	24	21.2	N/A	5	5	98.38	98.02 +/-	21.2	1.70	N/A	
11	44	STA 4+57.57, 28.00' RT	24	10	N/A	5	5	97.96	97.85 +/-	10	1.10	N/A	

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

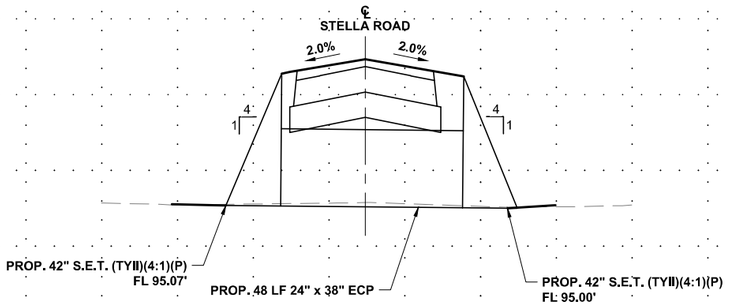
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

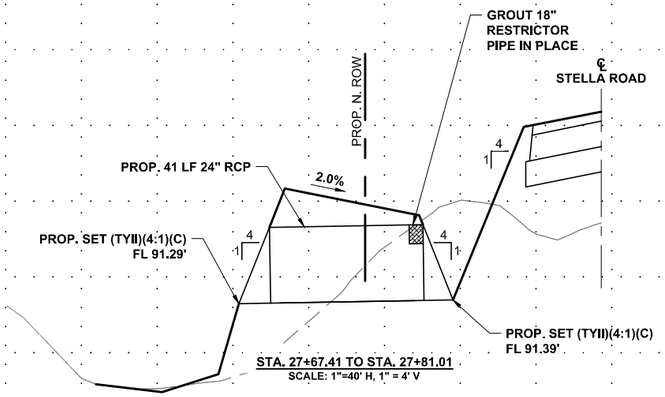
STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER · 7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: DRIVEWAY SUMMARY TABLE
SCALE:	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 57 / 133

X:\Engineering\2021\21060 - Stella Road\57 DRIVEWAY SUMMARY TABLE.dwg Charlie Valenzuela



STA. 1+80.30
SCALE: 1"=40' H, 1" = 4' V



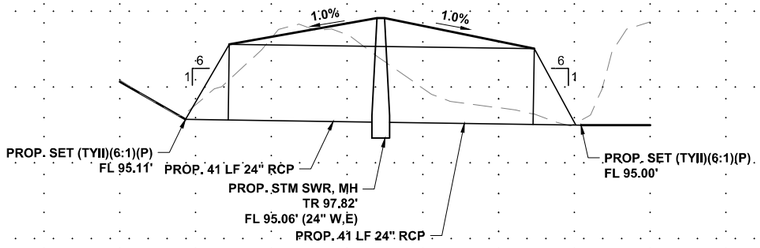
STA. 27+67.41 TO STA. 27+81.01
SCALE: 1"=40' H, 1" = 4' V

SCALE 1"=40' (HORIZONTAL)

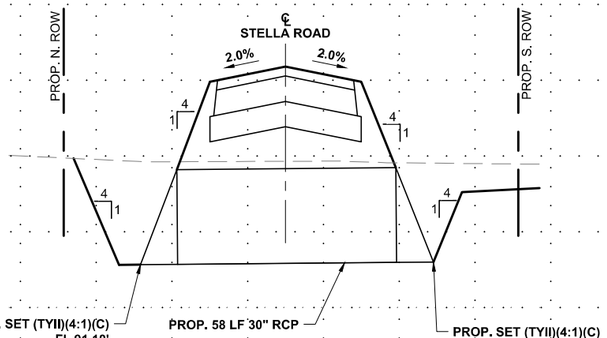
40' 20' 0 40'

4' 2' 0 4'

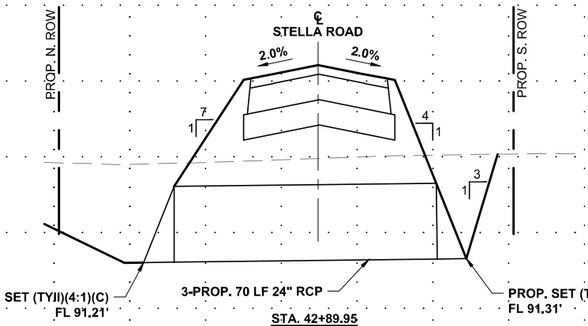
SCALE 1"=4' (VERTICAL)



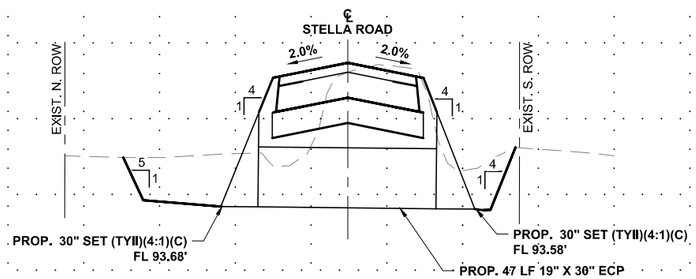
STA. 3+68.42 TO STA. 4+71.40, 47.14 LT
SCALE: 1"=40' H, 1" = 4' V



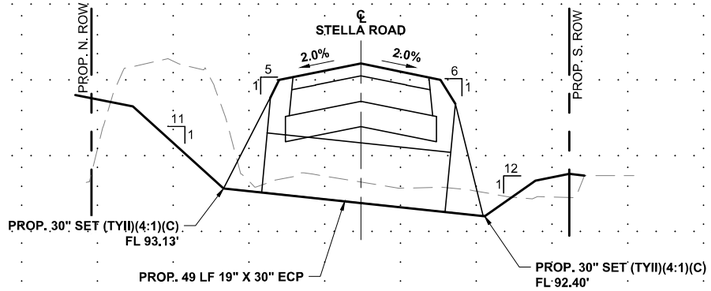
STA. 28+90.62
SCALE: 1"=40' H, 1" = 4' V



STA. 42+89.95
SCALE: 1"=40' H, 1" = 4' V



STA. 16+00.00
SCALE: 1"=40' H, 1" = 4' V



STA. 38+73.01
SCALE: 1"=40' H, 1" = 4' V

-70 -50 -30 -10 0 10 30 50 70

X:\Engineering\2021\21060 – Stella Road\58 PROPOSED LATERALS CROSS SECTIONS.dwg Charlie Valenzuela

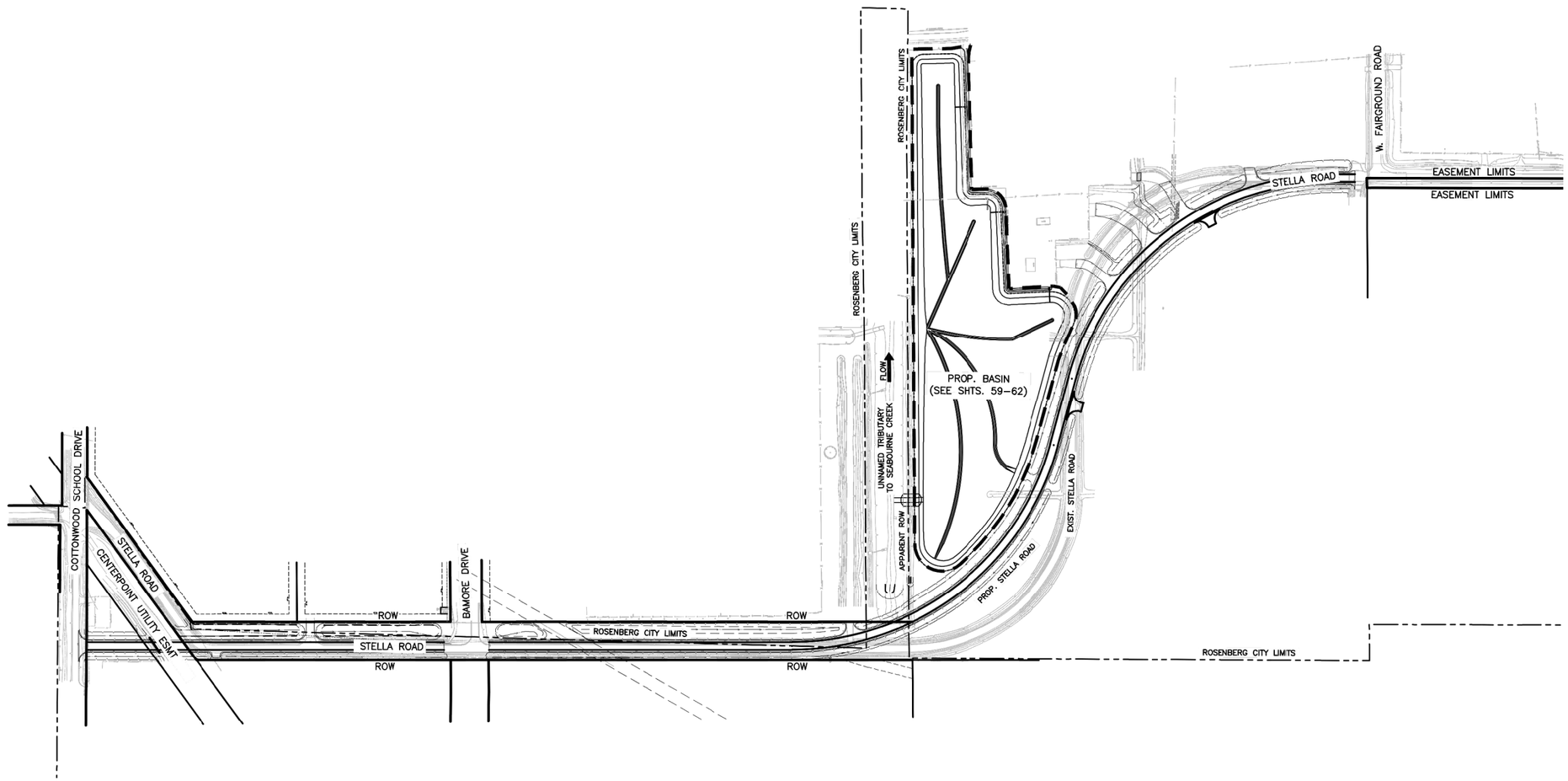
NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: PROPOSED LATERALS CROSS SECTIONS
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 58 / 133



M:\04755.000 20116 Stella Road\CAD\DWG\01- 04755 - Overall Layout.dwg

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

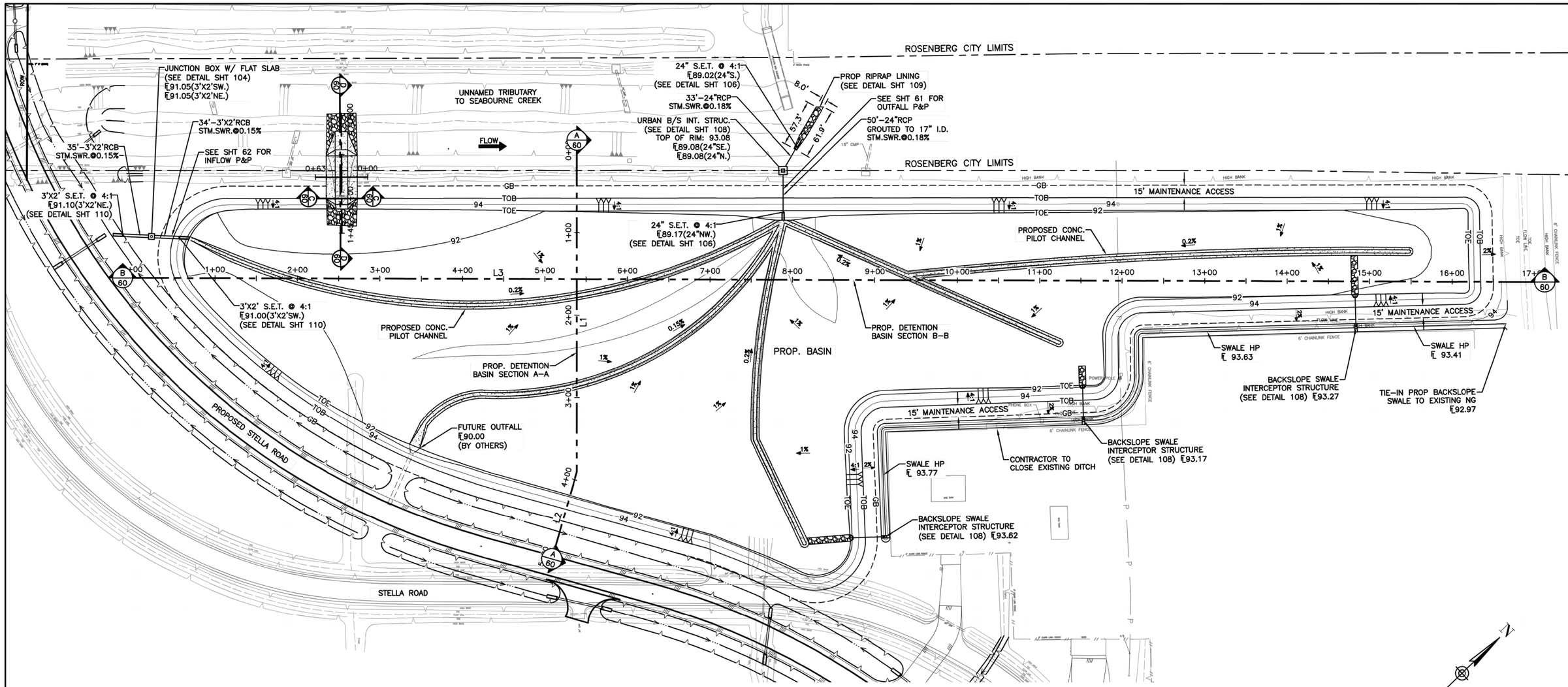
THE STATE OF TEXAS · FORT BEND COUNTY

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS · MENGYANG JIANG · 138195 · LICENSED PROFESSIONAL ENGINEER

06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	PROPOSED OVERALL DRAINAGE LAYOUT
DRAWN BY:	NS
CK'D BY:	MJ
SCALE:	1" = 400'
DATE:	6/18/24
SHEET NO:	59 / 133
CIVIL STANDARD	



Stella Rd Detention Basin Summary			
Detention Volume Required at 100-yr WSE	31.6 acre-feet		
Detention Volume Provided with 1' Free Board	33.68 acre-feet		
Detention Rate Provided	0.73 acre-feet/acre		
Annual Exceedance Probability	20%	10%	1%
Peak WSE (NAVD 88, 01) (ft)	93.08	93.57	94.68

Project:	Stella Road From Cottonwood School Road to Band Road				
Basin Description:		Proposed Basin			
Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (cu. ft)	Cumulative Volume Avg. End (ac.ft)
89.50	4,264.71	N/A	N/A	0.00	N/A
90.00	25,533.07	0.50	7449.45	7449.45	0.17
90.50	78,674.76	0.50	26051.96	33501.40	0.77
91.00	180,371.55	0.50	64761.58	98262.98	2.26
91.50	272,081.58	0.50	113113.28	211376.26	4.85
92.00	329,512.53	0.50	150398.53	361774.79	8.31
92.50	364,567.05	0.50	173519.90	535294.69	12.29
93.00	378,799.94	0.50	185841.75	721136.43	16.56
93.50	386,041.27	0.50	191210.30	912346.74	20.94
94.00	393,306.31	0.50	194836.90	1107183.63	25.42
94.50	400,713.93	0.50	198505.06	1305688.69	29.97
94.90	406,567.06	0.40	161456.20	1467144.89	33.68
95.00	408,032.36	0.10	40729.97	1507874.86	34.62
95.50	415,370.34	0.50	205850.68	1713725.53	39.34
95.90	423,144.54	0.40	167702.98	1881428.51	43.19

LEGEND

PROP. CONCRETE PILOT CHANNEL

ABBREVIATIONS

TOB TOP OF BANK

GB GRADE BREAK

0 60 120

SCALE IN FEET

PROP. BASIN SECTION A-A							
NO.	RADIUS	LENGTH	LINE/CHORD DIRECTION	START POINT	END POINT	START STA.	END STA.
L1	N/A	389.96	S47° 35' 58.53"E	13752934.93, 2979913.48	13752671.98, 2980201.45	0+00.00	3+89.96
L2	N/A	110.04	S31° 31' 46.94"E	13752671.98, 2980201.45	13752578.18, 2980258.99	3+89.96	5+00.00

PROP. BASIN SECTION B-B							
NO.	RADIUS	LENGTH	LINE/CHORD DIRECTION	START POINT	END POINT	START STA.	END STA.
L3	N/A	1700.00	N42° 34' 00.53"E	13752432.83, 2979664.40	13753684.86, 2980814.37	0+00.00	17+00.00

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

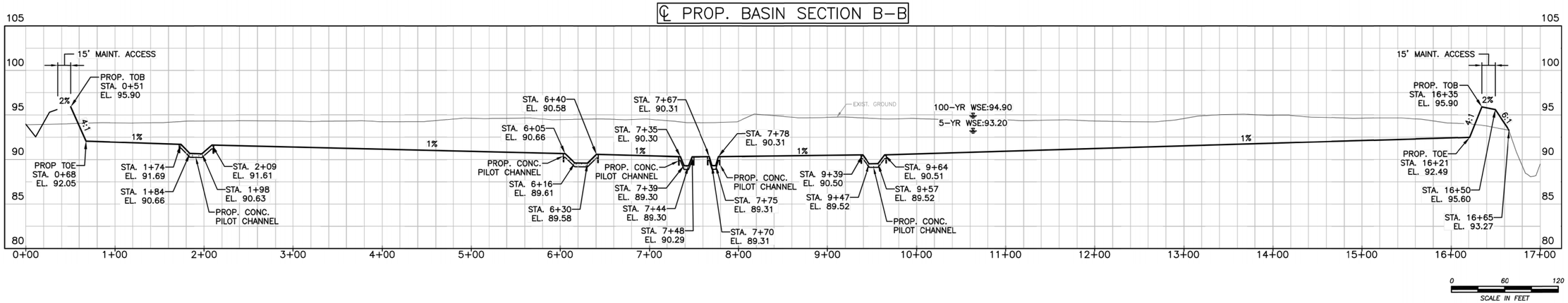
r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

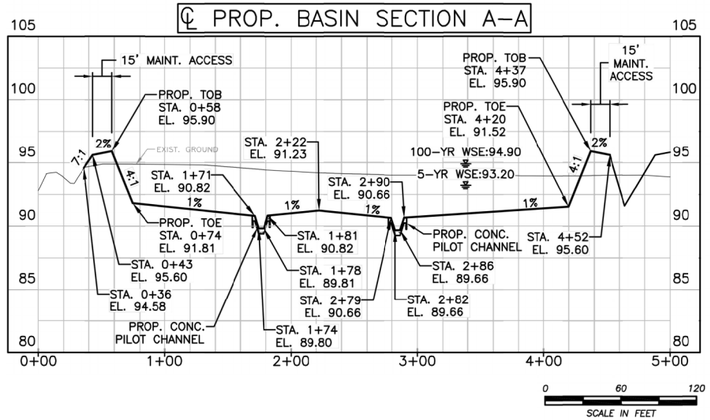
PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	PROPOSED DETENTION BASIN LAYOUT
DRAWN BY:	NS
CK'D BY:	MJ
SCALE:	1" = 60'
CIVIL STANDARD	
DATE:	6/18/24
SHEET NO:	60 / 133

M:\04755.000 20116 Stella Road\CAD\DWG\02- 04755 - Basins.dwg

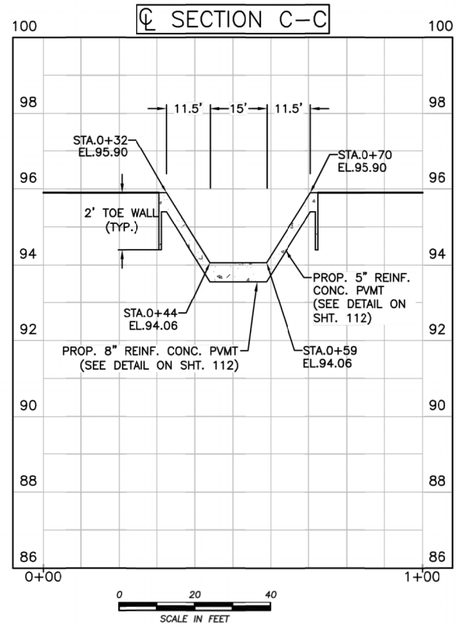
℄ PROP. BASIN SECTION B–B



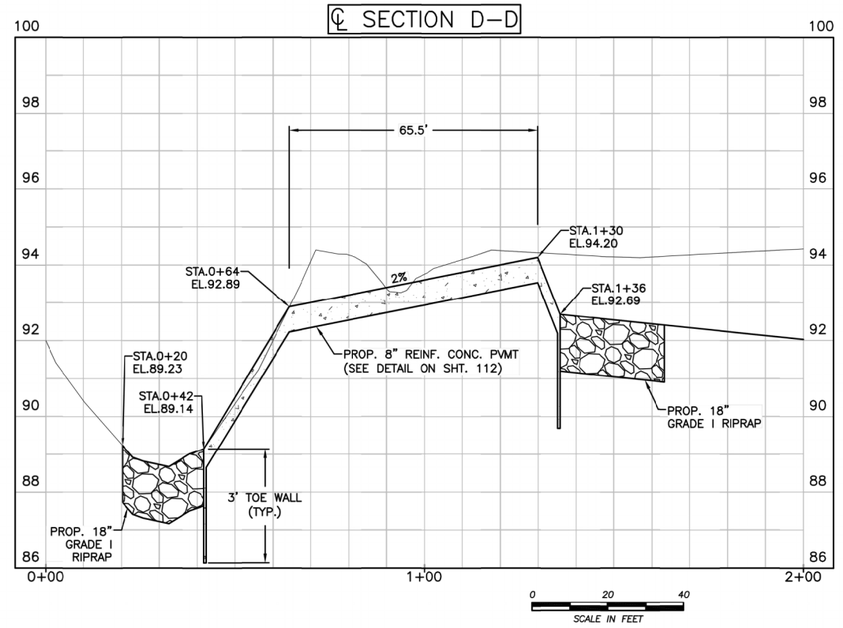
℄ PROP. BASIN SECTION A–A



℄ SECTION C–C



℄ SECTION D–D



NO.	REVISIONS	DATE	NAME

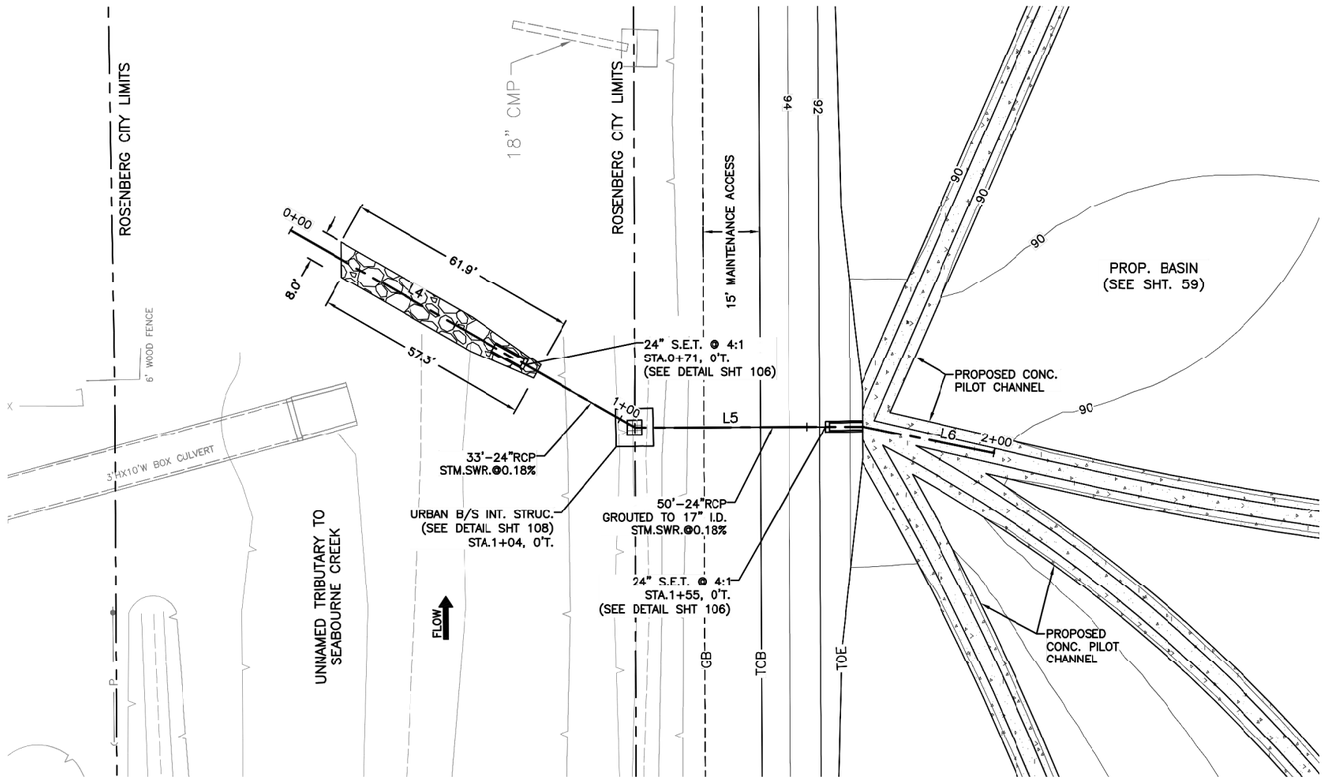
FORT BEND COUNTY ENGINEERING DEPARTMENT

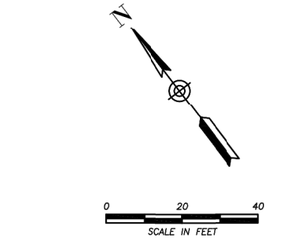
r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED PROFESSIONAL ENGINEER
06/18/24

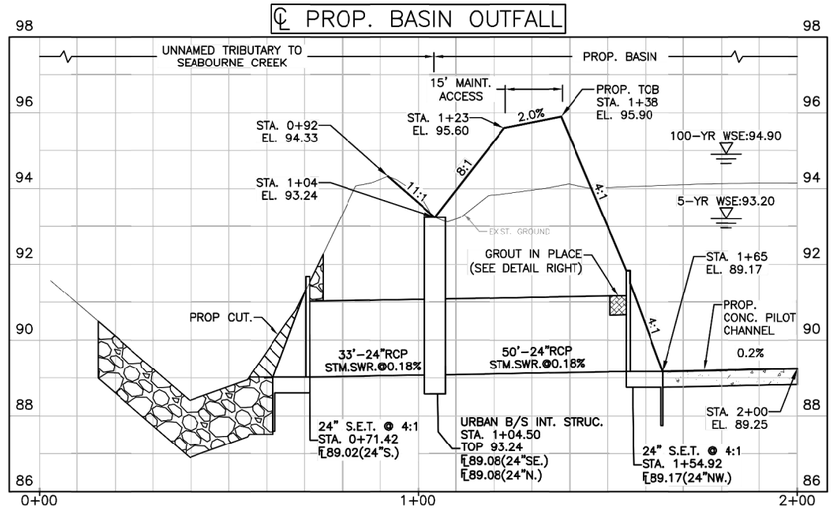
PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD	
SHEET DESCRIPTION:	PROPOSED DETENTION BASIN SECTION
DRAWN BY:	NS
DATE:	6/18/24
CK'D BY:	MJ
SCALE:	N/A
SHEET NO:	61 / 133

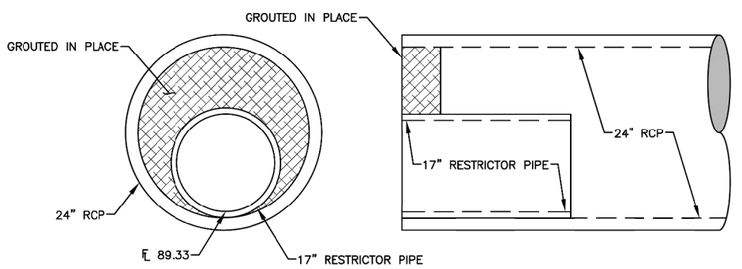
M:\04755.000 20116 Stella Road\CAD\DWG\02- 04755 - Basins.dwg





℄ PROP. BASIN OUTFALL





24" DISCHARGE PIPE WITH 17" RESTRICTOR

N.T.S.

PROP. BASIN OUTFALL

NO.	RADIUS	LENGTH	LINE/CHORD DIRECTION	START POINT	END POINT	START STA.	END STA.
L4	N/A	104.50	S17° 38' 23.86"E	13753202.51, 2980068.53	13753102.93, 2980100.19	0+00.00	1+04.50
L5	N/A	60.39	S47° 38' 00.41"E	13753102.93, 2980100.19	13753062.23, 2980144.82	1+04.50	1+64.89
L6	N/A	35.11	S35° 55' 09.20"E	13753062.23, 2980144.82	13753033.79, 2980165.41	1+64.89	2+00.00

NO.	REVISIONS	DATE	NAME

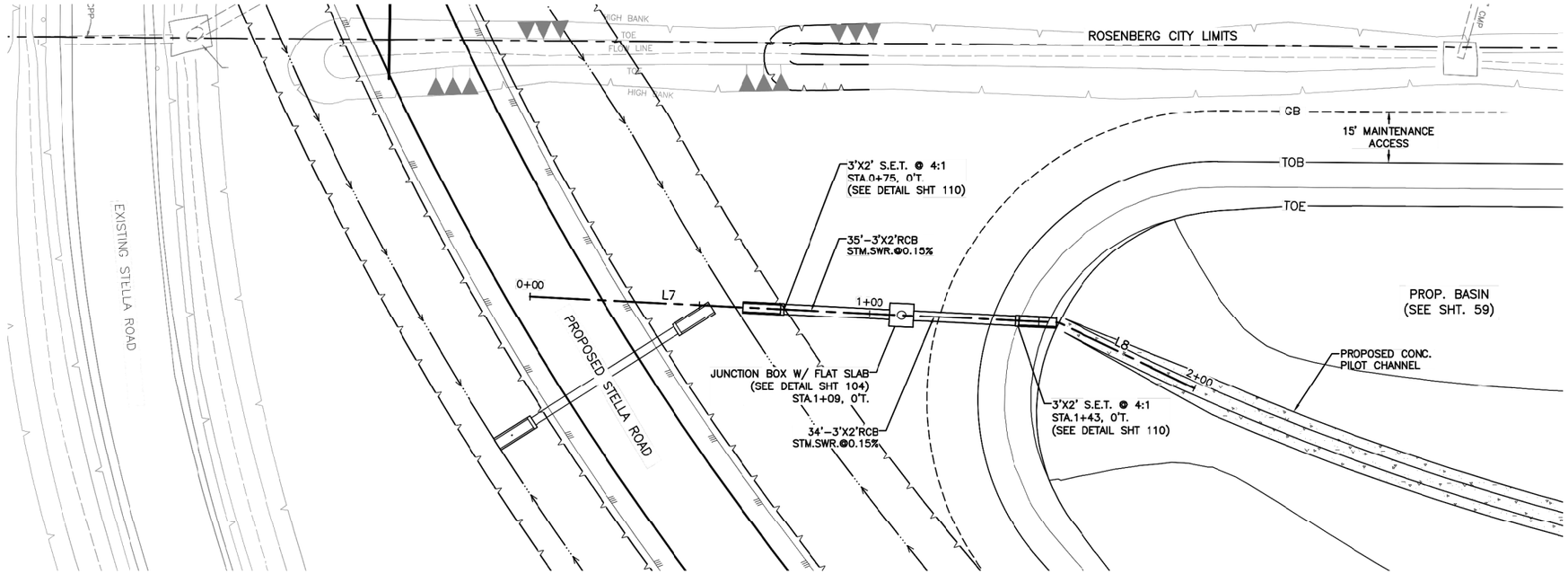
FORT BEND COUNTY
ENGINEERING DEPARTMENT

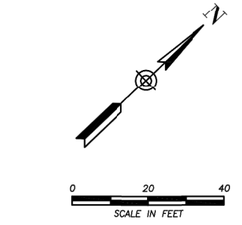
r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	PROPOSED DETENTION BASIN OUTFALL P&P
DRAWN BY:	NS
CK'D BY:	MJ
SCALE:	1" = 40'
CIVIL STANDARD	
DATE:	6/18/24
SHEET NO:	62 / 133

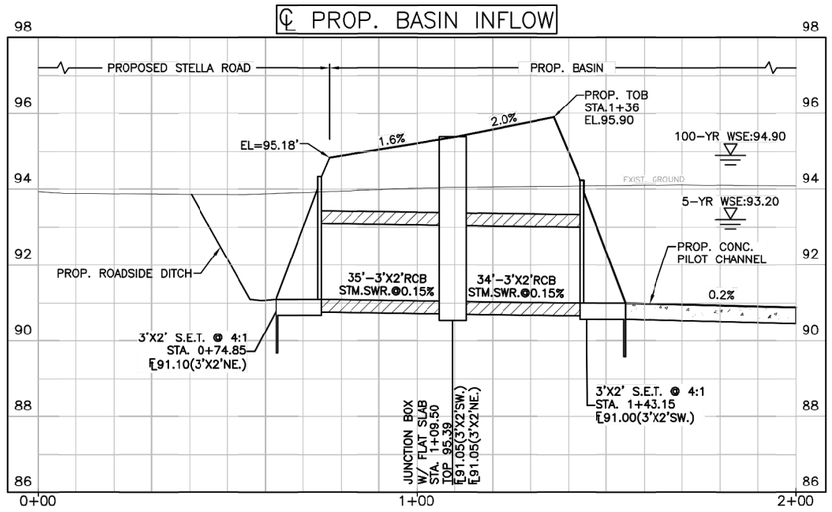
M:\04755.000 20116 Stella Road\CAD\DWG\02- 04755 - Basins.dwg





LEGEND

PROP. CONCRETE PILOT CHANNEL



PROP. BASIN INFLOW

NO.	LENGTH	LINE/CHORD DIRECTION	START POINT	END POINT	START STA.	END STA.
L7	155.82	N44° 49' 50.65"E	13752405.93,2979565.55	13752516.44, 2979675.40	0+00.00	1+55.82
L8	44.18	N67° 34' 59.50"E	13752516.44,2979675.40	13752533.28, 2979716.25	1+55.82	2+00.00

NO.	REVISIONS	DATE	NAME

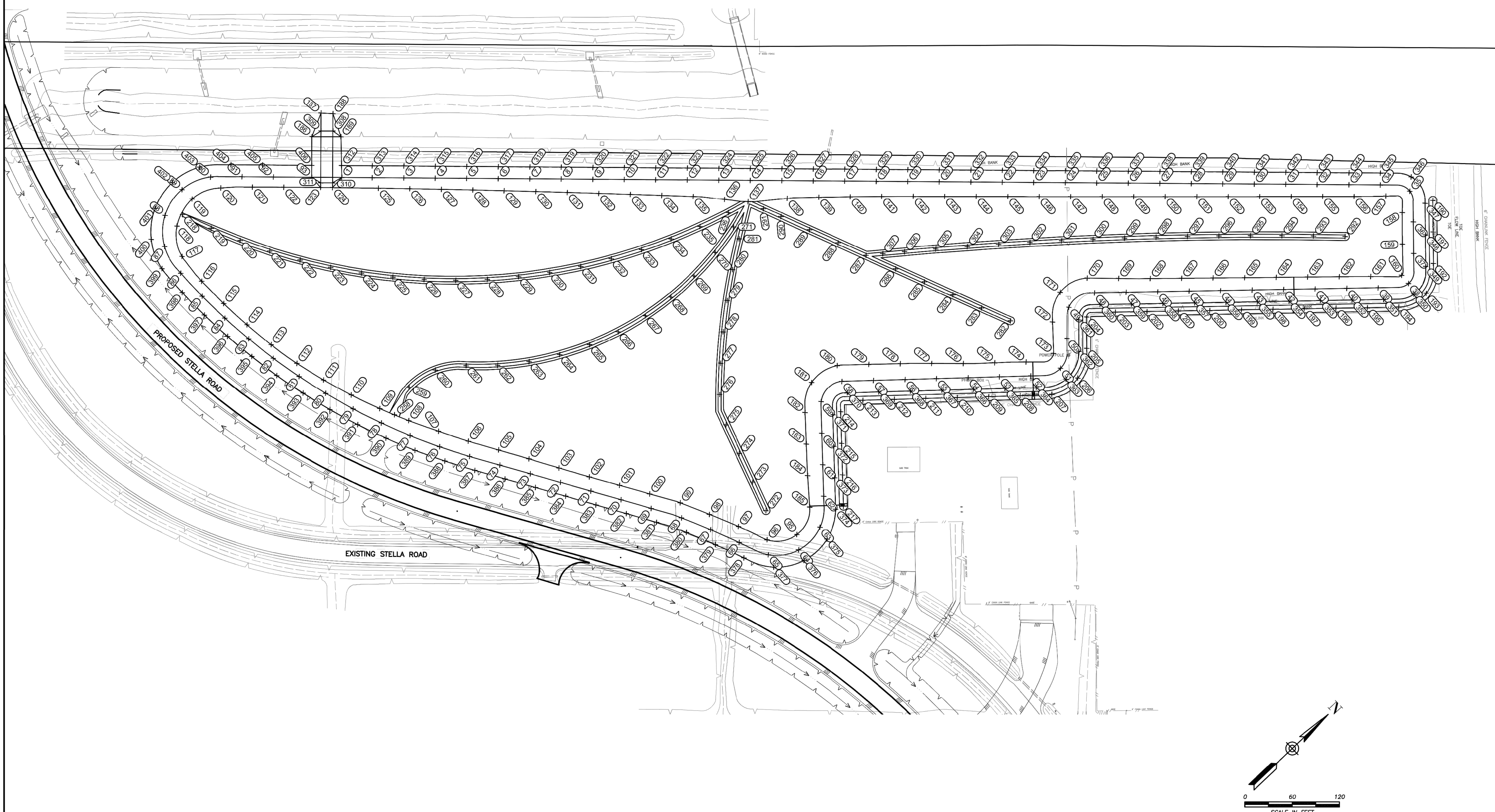
FORT BEND COUNTY ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	PROPOSED DETENTION BASIN INFLOW P&P
DRAWN BY:	NS
CK'D BY:	MJ
SCALE:	1" = 40'
CIVIL STANDARD	
DATE:	6/18/24
SHEET NO:	63 / 133

M:\04755.000 20116 Stella Road\CAD\DWG\02- 04755 - Basins.dwg



NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

r.g. miller
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE: STELLA ROAD
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD
SHEET DESCRIPTION: GEOMETRIC LAYOUT
DRAWN BY: NS
DATE: 6/18/24
CK'D BY: MJ
SCALE: 1" = 60'
SHEET NO: 64 / 133

M:\04755.000 20116 Stella Road\CAD\DWG\08- 04755 - Geometric Layout.dwg

POINT TABLE				
POINT NO.	ELEV.	NORTHING	EASTING	DESC.
1	95.90	13752698.93	2979777.03	WEIR
2	95.90	13752727.56	2979803.11	TOB
3	95.90	13752757.13	2979830.05	TOB
4	95.90	13752786.69	2979856.99	TOB
5	95.90	13752816.26	2979883.93	TOB
6	95.90	13752845.83	2979910.87	TOB
7	95.90	13752875.40	2979937.81	TOB
8	95.90	13752904.97	2979964.75	TOB
9	95.90	13752934.53	2979991.69	TOB
10	95.90	13752964.10	2980018.63	TOB
11	95.90	13752993.67	2980045.57	TOB
12	95.90	13753023.24	2980072.50	TOB
13	95.90	13753052.81	2980099.44	TOB
14	95.90	13753082.38	2980126.38	TOB
15	95.90	13753111.94	2980153.32	TOB
16	95.90	13753141.51	2980180.26	TOB
17	95.90	13753171.08	2980207.20	TOB
18	95.90	13753200.65	2980234.14	TOB
19	95.90	13753230.22	2980261.08	TOB
20	95.90	13753259.79	2980288.02	TOB
21	95.90	13753289.35	2980314.96	TOB
22	95.90	13753318.92	2980341.90	TOB
23	95.90	13753348.49	2980368.84	TOB
24	95.90	13753378.06	2980395.77	TOB
25	95.90	13753407.63	2980422.71	TOB
26	95.90	13753437.20	2980449.65	TOB
27	95.90	13753466.76	2980476.59	TOB
28	95.90	13753496.33	2980503.53	TOB
29	95.90	13753525.90	2980530.47	TOB
30	95.90	13753555.47	2980557.41	TOB
31	95.90	13753585.04	2980584.35	TOB
32	95.90	13753614.60	2980611.29	TOB
33	95.90	13753644.17	2980638.23	TOB
34	95.90	13753673.74	2980665.17	TOB
35	95.90	13753696.44	2980696.14	TOB
36	95.90	13753673.67	2980728.19	TOB
37	95.90	13753647.23	2980758.20	TOB
38	95.90	13753616.99	2980782.23	TOB
39	95.90	13753584.46	2980760.48	TOB
40	95.90	13753554.23	2980734.29	TOB
41	95.90	13753523.99	2980708.10	TOB
42	95.90	13753493.76	2980681.91	TOB
43	95.90	13753463.52	2980655.72	TOB
44	95.90	13753433.29	2980629.53	TOB
45	95.90	13753403.06	2980603.34	TOB
46	95.90	13753372.82	2980577.15	TOB
47	95.90	13753342.59	2980550.96	TOB
48	95.90	13753312.36	2980524.77	TOB
49	95.88	13753275.89	2980516.58	TOB
50	95.90	13753247.55	2980544.45	TOB
51	95.90	13753216.05	2980567.01	TOB
52	95.90	13753181.71	2980549.20	TOB
53	95.90	13753151.20	2980523.33	TOB
54	95.90	13753120.70	2980497.46	TOB
55	95.90	13753090.19	2980471.58	TOB
56	95.90	13753059.69	2980445.71	TOB
57	95.90	13753029.18	2980419.83	TOB
58	95.89	13752998.62	2980394.03	TOB
59	95.90	13752961.55	2980395.52	TOB
60	95.90	13752935.43	2980425.80	TOB
61	95.90	13752909.60	2980456.34	TOB
62	95.90	13752883.77	2980486.88	TOB
63	95.90	13752854.04	2980512.98	TOB
64	95.90	13752814.94	2980516.53	TOB
65	95.90	13752782.02	2980495.14	TOB

POINT TABLE				
POINT NO.	ELEV.	NORTHING	EASTING	DESC.
66	95.88	13752764.97	2980459.11	TOB
67	95.89	13752748.81	2980422.53	TOB
68	95.88	13752731.21	2980386.61	TOB
69	95.90	13752710.77	2980352.26	TOB
70	95.90	13752689.50	2980318.38	TOB
71	95.90	13752668.23	2980284.50	TOB
72	95.90	13752646.96	2980250.63	TOB
73	95.90	13752625.70	2980216.75	TOB
74	95.90	13752604.43	2980182.87	TOB
75	95.90	13752583.17	2980148.99	TOB
76	95.90	13752563.00	2980114.45	TOB
77	95.90	13752544.62	2980078.93	TOB
78	95.90	13752528.06	2980042.52	TOB
79	95.90	13752513.38	2980005.32	TOB
80	95.90	13752500.61	2979967.41	TOB
81	95.90	13752489.79	2979928.91	TOB
82	95.90	13752480.94	2979889.91	TOB
83	95.90	13752474.08	2979850.50	TOB
84	95.90	13752469.24	2979810.80	TOB
85	95.90	13752466.42	2979770.91	TOB
86	95.90	13752465.63	2979730.92	TOB
87	95.90	13752472.97	2979692.03	TOB
88	95.90	13752499.71	2979663.02	TOB
89	95.90	13752537.89	2979653.07	TOB
90	95.90	13752575.39	2979665.36	TOB
91	95.90	13752605.37	2979691.79	TOB
92	95.90	13752634.94	2979718.73	TOB
93	95.90	13752670.85	2979751.45	WEIR
94	91.42	13752861.51	2980485.47	TOE
95	91.47	13752826.19	2980500.46	TOE
96	91.36	13752793.60	2980479.96	TOE
97	91.39	13752777.81	2980443.23	TOE
98	91.59	13752760.59	2980407.13	TOE
99	91.59	13752742.70	2980371.36	TOE
100	91.62	13752721.64	2980337.37	TOE
101	91.65	13752700.25	2980303.57	TOE
102	91.69	13752678.86	2980269.77	TOE
103	91.59	13752657.93	2980235.68	TOE
104	91.47	13752637.07	2980201.55	TOE
105	91.39	13752616.08	2980167.50	TOE
106	91.36	13752595.00	2980133.50	TOE
107	91.36	13752575.16	2980098.78	TOE
108	91.67	13752556.05	2980063.64	TOE
109	92.00	13752538.77	2980027.57	TOE
110	92.30	13752523.42	2979990.64	TOE
111	92.59	13752510.11	2979952.93	TOE
112	92.85	13752498.84	2979914.55	TOE
113	92.90	13752490.40	2979875.47	TOE
114	92.84	13752484.42	2979835.92	TOE
115	92.77	13752480.54	2979796.12	TOE
116	92.69	13752478.72	2979756.16	TOE
117	92.16	13752481.10	2979716.30	TOE
118	91.41	13752502.10	2979683.31	TOE
119	91.57	13752539.33	2979670.49	TOE
120	92.33	13752575.96	2979684.32	TOE
121	92.68	13752606.44	2979710.18	TOE
122	92.71	13752636.08	2979737.05	TOE
123	92.69	13752670.75	2979768.68	WEIR
124	92.69	13752681.80	2979778.80	WEIR
125	92.60	13752724.51	2979818.16	TOE
126	92.52	13752753.83	2979845.36	TOE
127	92.40	13752783.09	2979872.64	TOE
128	92.26	13752812.28	2979899.99	TOE
129	92.10	13752841.41	2979927.40	TOE
130	91.90	13752870.44	2979954.92	TOE

POINT TABLE				
POINT NO.	ELEV.	NORTHING	EASTING	DESC.
131	91.70	13752899.45	2979982.46	TOE
132	91.47	13752928.36	2980010.08	TOE
133	91.21	13752957.27	2980037.75	TOE
134	90.95	13752986.11	2980065.46	TOE
135	90.67	13753014.91	2980093.22	TOE
136	89.79	13753041.98	2980122.63	TOE
137	89.17	13753062.23	2980144.82	TOE
138	90.29	13753102.17	2980174.77	TOE
139	90.70	13753132.80	2980200.45	TOE
140	90.95	13753163.02	2980226.66	TOE
141	91.10	13753193.01	2980253.14	TOE
142	91.20	13753222.84	2980279.78	TOE
143	91.25	13753252.55	2980306.56	TOE
144	91.31	13753282.27	2980333.34	TOE
145	91.37	13753311.99	2980360.10	TOE
146	91.43	13753341.73	2980386.86	TOE
147	91.49	13753371.47	2980413.61	TOE
148	91.56	13753401.22	2980440.35	TOE
149	91.63	13753430.97	2980467.08	TOE
150	91.70	13753460.73	2980493.81	TOE
151	91.78	13753490.50	2980520.52	TOE
152	91.86	13753520.28	2980547.23	TOE
153	91.94	13753550.07	2980573.93	TOE
154	92.02	13753579.86	2980600.61	TOE
155	92.11	13753609.67	2980627.30	TOE
156	92.19	13753639.45	2980654.00	TOE
157	92.40	13753669.57	2980680.32	TOE
158	92.46	13753671.23	2980710.13	TOE
159	92.40	13753644.63	2980740.00	TOE
160	92.54	13753617.51	2980768.76	TOE
161	92.27	13753587.09	2980743.55	TOE
162	92.17	13753557.14	2980717.05	TOE
163	92.09	13753527.10	2980690.63	TOE
164	92.01	13753497.07	2980664.21	TOE
165	91.94	13753467.04	2980637.79	TOE
166	91.85	13753437.03	2980611.34	TOE
167	91.77	13753407.02	2980584.89	TOE
168	91.68	13753377.02	2980558.44	TOE
169	91.44	13753347.41	2980531.55	TOE
170	91.13	13753317.91	2980504.53	TOE
171	91.02	13753280.29	2980494.99	TOE
172	91.27	13753247.78	2980516.52	TOE
173	91.62	13753221.95	2980547.05	TOE
174	91.44	13753189.11	2980532.11	TOE
175	91.42	13753158.65	2980506.18	TOE
176	91.39	13753128.25	2980480.20	TOE
177	91.07	13753098.57	2980453.38	TOE
178	90.84	13753068.67	2980426.81	TOE
179	90.80	13753038.28	2980400.81	TOE
180	90.77	13753007.50	2980375.30	TOE
181	90.78	13752969.02	2980369.31	TOE
182	90.85	13752937.32	2980392.29	TOE
183	90.93	13752911.73	2980423.03	TOE
184	91.06	13752886.30	2980453.90	TOE
185	91.42	13752861.60	2980485.36	TOE
186	95.82	13752705.50	2979713.25	WEIR
187	92.88	13752734.06	2979698.84	WEIR
188	92.82	13752744.72	2979709.42	WEIR
189	95.93	13752732.78	2979737.78	WEIR
190	95.00	13753710.26	2980724.48	SWALE
191	95.00	13753683.82	2980754.49	SWALE
192	95.00	13753657.38	2980784.51	SWALE
193	95.00	13753625.13	2980806.50	SWALE
194	95.00	13753587.77	2980796.42	SWALE
195	95.00	13753557.53	2980770.23	SWALE

POINT TABLE				
POINT NO.	ELEV.	NORTHING	EASTING	DESC.
196	95.00	13753527.30	2980744.04	SWALE
197	95.00	13753497.07	2980717.85	SWALE
198	95.90	13753466.83	2980691.66	SWALE
199	95.90	13753436.60	2980665.47	SWALE
200	95.90	13753406.36	2980639.28	SWALE
201	95.90	13753376.13	2980613.09	SWALE
202	95.90	13753345.90	2980586.90	SWALE
203	95.90	13753315.66	2980560.71	SWALE
204	95.90	13753284.36	2980540.93	SWALE
205	95.90	13753257.60	2980570.66	SWALE
206	95.00	13753224.18	2980591.11	SWALE
207	95.00	13753185.64	2980584.34	SWALE
208	95.00	13753154.68	2980559.07	SWALE
209	95.90	13753124.18	2980533.19	SWALE
210	95.90	13753093.67	2980507.32	SWALE
211	95.90	13753063.17	2980481.44	SWALE
212	95.90	13753032.67	2980455.57	SWALE
213	95.90	13753002.16	2980429.70	SWALE
214	95.90	13752971.61	2980421.73	SWALE
215	95.90	13752945.78	2980452.27	SWALE
216	95.90	13752919.95	2980482.81	SWALE
217	95.90	13752894.27	2980513.18	SWALE
218	91.24	13752517.15	2979677.26	PILOT CHANNEL
219	91.15	13752532.38	2979714.24	PILOT CHANNEL
220	91.03	13752549.56	2979750.36	PILOT CHANNEL
221	90.93	13752568.64	2979785.51	PILOT CHANNEL
222	90.80	13752589.55	2979819.60	PILOT CHANNEL
223	90.70	13752612.25	2979852.54	PILOT CHANNEL
224	90.59	13752636.67	2979884.21	PILOT CHANNEL
225	90.47	13752662.73	2979914.55	PILOT CHANNEL
226	90.37	13752690.37	2979943.45	PILOT CHANNEL
227	90.26	13752719.51	2979970.85	PILOT CHANNEL
228	90.15	13752750.06	2979996.66	PILOT CHANNEL
229	90.04	13752781.94	2980020.81	PILOT CHANNEL
230	89.92	13752815.06	2980043.23	PILOT CHANNEL
231	89.82	13752849.33	2980063.86	PILOT CHANNEL
232	89.71	13752884.64	2980082.64	PILOT CHANNEL
233	89.58	13752920.90	2980099.52	PILOT CHANNEL
234	89.49	13752958.01	2980114.44	PILOT CHANNEL
235	89.37	13752995.86	2980127.37	PILOT CHANNEL
236	89.25	13753034.34	2980138.27	PILOT CHANNEL
258	91.83	13752547.44	2980045.85	PILOT CHANNEL
259	91.24	13752584.75	2980032.39	PILOT CHANNEL
260	90.59	13752623.99	2980038.31	PILOT CHANNEL
261	90.28	13752656.82	2980060.52	PILOT CHANNEL
262	90.26	13752686.93	2980086.84	PILOT CHANNEL
263	90.23	13752719.58	2980109.90	PILOT CHANNEL
264	90.19	13752754.45	2980129.47	PILOT CHANNEL
265	90.13	13752791.15	2980145.34	PILOT CHANNEL
266	90.06	13752829.29	2980157.33	PILOT CHANNEL
267	89.98	13752868.47	2980165.31	PILOT CHANNEL
268	89.90	13752908.26	2980169.21	PILOT CHANNEL
269	89.80	13752948.24	2980168.97	PILOT CHANNEL
270	89.69	13752987.99	2980164.61	PILOT CHANNEL
271	89.53	13753027.07	2980156.17	PILOT CHANNEL
272	90.04	13752817.23	2980451.54	PILOT CHANNEL
273	89.96	13752828.90	2980413.28	PILOT CHANNEL
274	89.88	13752840.56	2980375.02	PILOT CHANNEL
275	89.80	13752852.22	2980336.76	PILOT CHANNEL
276	90.72	13752871.69	2980302.87	PILOT CHANNEL
277	90.79	13752899.39	2980274.02	PILOT CHANNEL
278	90.71	13752928.39	2980246.48	PILOT CHANNEL
279	90.56	13752958.63	2980220.30	PILOT CHANNEL
280	90.36	13752990.04	2980195.53	PILOT CHANNEL
281	89.28	13753022.55	2980172.23	PILOT CHANNEL

POINT TABLE				
POINT NO.	ELEV.	NORTHING	EASTING	DESC.
282	89.90	13753208.97	2980479.72	PILOT CHANNEL
283	89.82	13753192.92	2980443.09	PILOT CHANNEL
284	89.74	13753176.87	2980406.45	PILOT CHANNEL
285	89.66	13753160.81	2980369.81	PILOT CHANNEL
286	89.58	13753144.76	2980333.17	PILOT CHANNEL
287	89.50	13753128.19	2980295.36	PILOT CHANNEL
288	89.42	13753112.65	2980259.90	PILOT CHANNEL
289	89.34	13753096.60	2980223.26	PILOT CHANNEL
290	89.26	13753080.55	2980186.62	PILOT CHANNEL
291	89.21	13753070.78	2980164.33	PILOT CHANNEL
292	90.72	13753596.68	2980683.97	PILOT CHANNEL
293	90.64	13753567.36	2980656.77	PILOT CHANNEL
294	90.57	13753537.83	2980629.70	PILOT CHANNEL
295	90.50	13753508.08	2980603.04	PILOT CHANNEL
296	90.40	13753478.13	2980576.53	PILOT CHANNEL
297	90.34	13753447.98	2980550.25	PILOT CHANNEL
298	90.25	13753417.62	2980524.20	PILOT CHANNEL
299	90.17	13753387.05	2980498.40	PILOT CHANNEL
300	90.10	13753356.29	2980472.83	PILOT CHANNEL
301	90.00	13753325.33	2980447.51	PILOT CHANNEL
302	89.93	13753294.17	2980422.43	PILOT CHANNEL
303	89.86	13753262.81	2980397.59	PILOT CHANNEL
304	89.76	13753231.26	2980373.00	PILOT CHANNEL
305	89.70	13753199.52	2980348.66	PILOT CHANNEL
306	89.61	13753167.60	2980324.56	PILOT CHANNEL
307	89.56	13753145.55	2980308.15	PILOT CHANNEL
308	92.80	13752730.12	2979725.55	WEIR
309	92.84	13752718.95	2979715.55	WEIR
310	92.70	13752685.82	2979774.37	WEIR
311	92.70	13752674.71	2979764.31	WEIR
312	95.93	13752708.73	2979765.67	GB
313	95.60	13752737.66	2979792.02	GB
314	95.60	13752767.23	2979818.96	GB
315	95.60	13752796.80	2979845.90	GB
316	95.60	13752826.36	2979872.84	GB
317	95.60	13752855.93	2979899.78	GB
318	95.60	13752885.50	2979926.72	GB
319	95.60	13752915.07	2979953.66	GB
320	95.60	13752944.64	2979980.60	GB
321	95.60	13752974.21	2980007.54	GB
322	95.60	13753003.77	2980034.48	GB
323	95.60	13753033.34	2980061.42	GB
324	95.60	13753062.91	2980088.36	GB
325	95.60	13753092.48	2980115.29	GB
326	95.60	13753122.05	2980142.23	GB
327	95.60	13753151.61	2980169.17	GB
328	95.60	13753181.18	2980196.11	GB
329	95.60	13753210.75	2980223.05	GB
330	95.60	13753240.32	2980249.99	GB
331	95.60	13753269.89	2980276.93	GB
332	95.60	13753299.46	2980303.87	GB
333	95.60	13753329.02	2980330.81	GB
334	95.60	13753358.59	2980357.75	GB
335	95.60	13753388.16	2980384.69	GB
336	95.60	13753417.73	2980411.63	GB
337	95.60	13753447.30	2980438.56	GB
338	95.60	13753476.87	2980465.50	GB
339	95.60	13753506.43	2980492.44	GB
340	95.60	13753536.00	2980519.38	GB
341	95.60	13753565.57	2980546.32	GB
342	95.60	13753595.14	2980573.26	GB
343	95.60	13753624.71	2980600.20	GB
344	95.60	13753654.28	2980627.14	GB
345	95.60	13753683.84	2980654.08	GB
346	95.60	13753709.76	2980683.85	GB

POINT TABLE				
POINT NO.	ELEV.	NORTHING	EASTING	DESC.
347	95.60	13753700.34	2980720.61	GB
348	95.60	13753673.90	2980750.63	GB
349	95.60	13753647.45	2980780.64	GB
350	95.60	13753613.04	2980797.00	GB
351	95.60	13753579.74	2980776.23	GB
352	95.60	13753549.50	2980750.04	GB
353	95.90	13753519.27	2980723.85	GB
354	95.90	13753489.04	2980697.66	GB
355	95.90	13753458.80	2980671.47	GB
356	95.90	13753428.57	2980645.28	GB
357	95.90	13753398.34	2980619.09	GB
358	95.90	13753368.10	2980592.90	GB
359	95.90	13753337.87	2980566.71	GB
360	95.90	13753307.64	2980540.52	GB
361	95.90	13753274.41	2980537.04	GB
362	95.90	13753247.64	2980566.77	GB
363	95.60	13753212.10	2980582.06	GB
364	95.60	13753177.03	2980564.91	GB
365	95.90	13753146.53	2980539.03	GB
366	95.90	13753116.02	2980513.16	GB
367	95.90	13753085.52	2980487.29	GB
368	95.90	13753055.01	2980461.41	GB
369	95.90	13753024.51	2980435.54	GB
370	95.90	13752994.00	2980409.66	GB
371	95.90	13752961.75	2980417.91	GB
372	95.90	13752935.91	2980448.46	GB
373	95.90	13752910.08	2980479.00	GB
374	95.90	13752884.19	2980509.48	GB
375	95.60	13752850.55	2980530.24	GB
376	95.60	13752811.03	2980531.01	GB
377	95.60	13752776.60	2980511.59	GB
378	95.60	13752756.32	2980477.54	GB
379	95.60	13752740.65	2980440.74	GB
380	95.60	13752723.51	2980404.60	GB
381	95.60	13752704.02	2980369.71	GB
382	95.60	13752682.75	2980335.84	GB
383	95.60	13752661.48	2980301.96	GB
384	95.60	13752640.21	2980268.08	GB
385	95.60	13752618.94	2980234.20	GB
386	95.60	13752597.67	2980200.33	GB
387	95.60	13752576.41	2980166.45	GB
388	95.60	13752555.75	2980132.20	GB
389	95.60	13752536.82	2980096.97	GB
390	95.60	13752519.67	2980060.84	GB
391	95.60	13752504.34	2980023.89	GB
392	95.60	13752490.88	2979986.23	GB
393	95.60	13752479.31	2979947.95	GB
394	95.60	13752469.67	2979909.13	GB
395	95.60	13752461.97	2979869.88	GB
396	95.60	13752456.25	2979830.30	GB
397	95.60	13752452.51	2979790.48	GB
398	95.60	13752450.76	2979750.52	GB
399	95.60	13752451.65	2979710.57	GB
400	95.60	13752466.44	2979673.80	GB
401	95.60	13752496.30	2979647.73	GB
402	95.60	13752534.73	2979638.04	GB
403	95.60	13752573.37	2979646.83	GB
404	95.60	13752604.94	2979671.11	GB
405	95.60	13752634.51	2979698.05	GB
406	95.93	13752680.93	2979740.34	GB

M:\04755.000 20116 Stella Road\CAD\DWG\08- 04755 - Geometric Layout.dwg

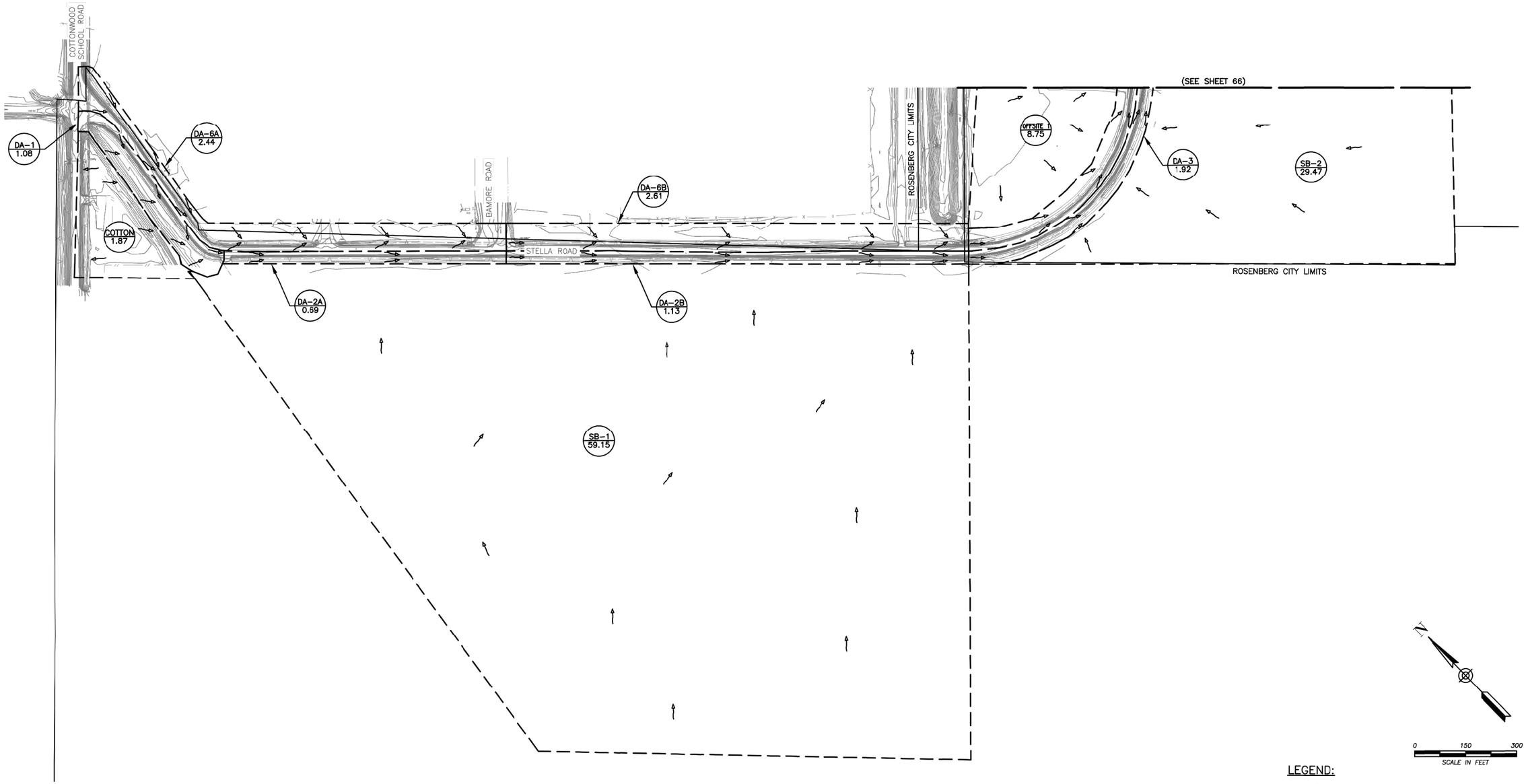
NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD	
SHEET DESCRIPTION:	GEOMETRIC LAYOUT POINT DATA
DRAWN BY:	NS
DATE:	6/18/24
CK'D BY:	MJ
SCALE:	N/A
SHEET NO:	65 / 133



0 150 300
SCALE IN FEET

LEGEND:

XX00 / X.XX —DRAINAGE AREA DESIGNATION INLET NUMBER
—DRAINAGE AREA (ACRE)

—OVERLAND FLOW DIRECTION

— — — —DRAINAGE AREA BOUNDARY

NO.	REVISIONS	DATE	NAME

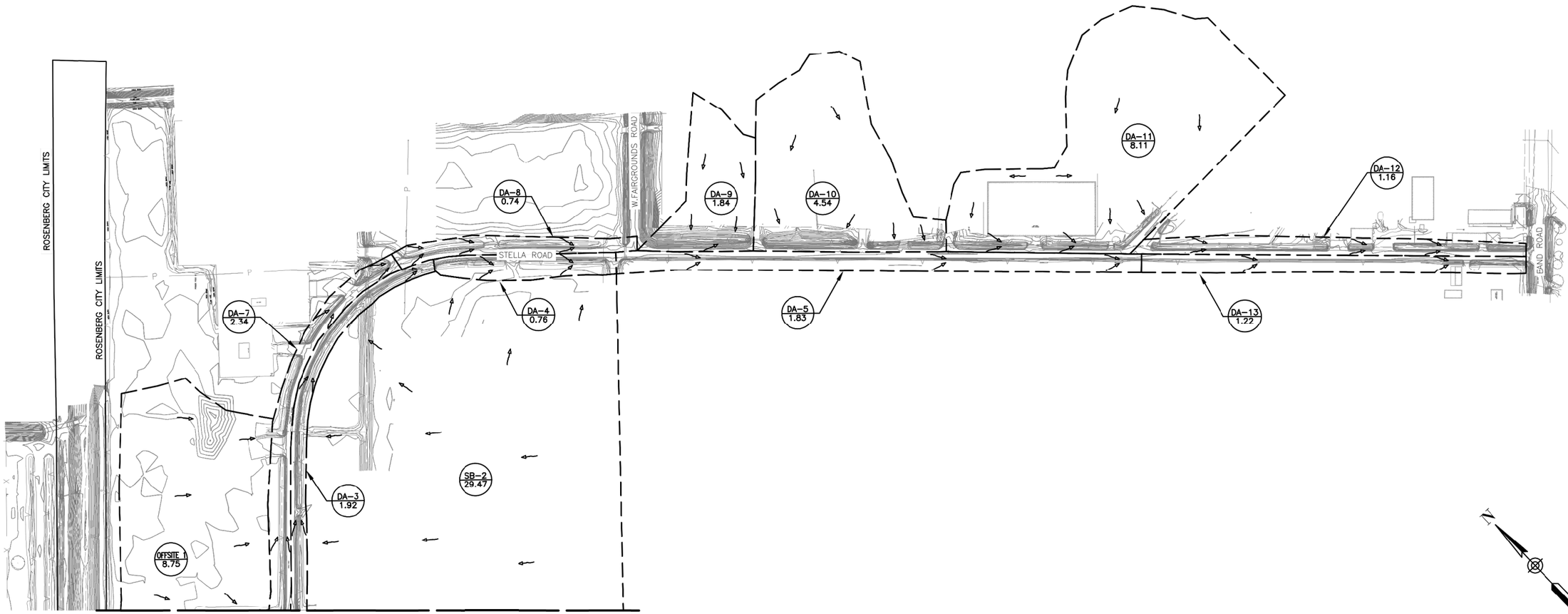
FORT BEND COUNTY
ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	EXISTING DRAINAGE MAP (1 OF 2)
DRAWN BY: NS	DATE: 6/18/24
CK'D BY: MJ	SCALE: 1" = 300'
CIVIL STANDARD	SHEET NO: 66 / 133

M:\04755.000 20116 Stella Road\CAD\DWG\05- 04755 - Drainage Area Maps.dwg



0 150 300
SCALE IN FEET

LEGEND:

XX00 / X.XX — –DRAINAGE AREA DESIGNATION INLET NUMBER / –DRAINAGE AREA (ACRE)

–OVERLAND FLOW DIRECTION

– – – –DRAINAGE AREA BOUNDARY

NO.	REVISIONS	DATE	NAME

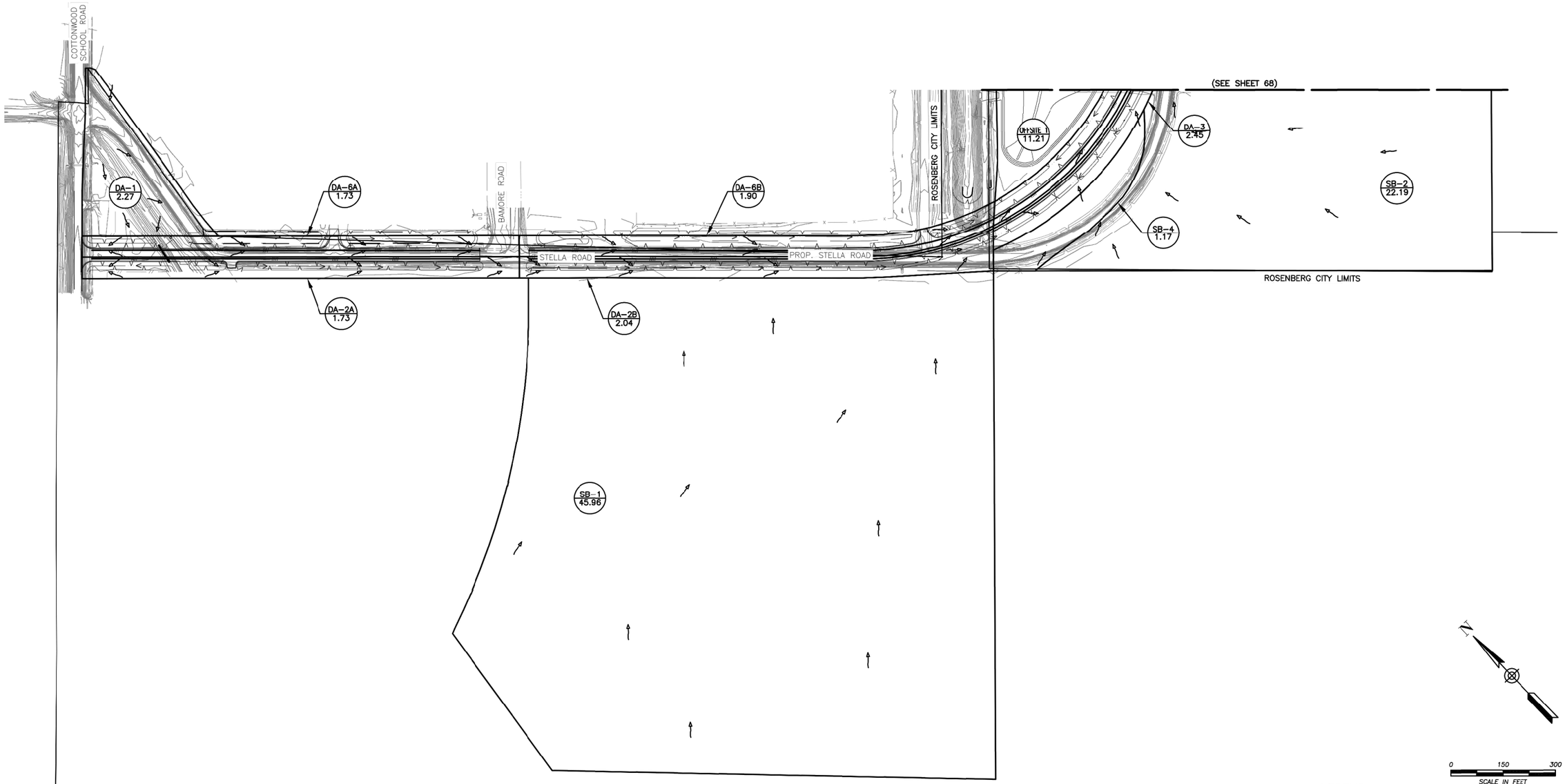
FORT BEND COUNTY
ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE: STELLA ROAD		
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION: EXISTING DRAINAGE MAP (2 OF 2)		
DRAWN BY: NS		DATE: 6/18/24
CK'D BY: MJ	SCALE: 1" = 300'	SHEET NO: 67 / 133

M:\04755.000 20116 Stella Road\CAD\DWG\05- 04755 - Drainage Area Maps.dwg



0 150 300
SCALE IN FEET

LEGEND:

XX00 / X.XX — –DRAINAGE AREA DESIGNATION INLET NUMBER / –DRAINAGE AREA (ACRE)

–OVERLAND FLOW DIRECTION

–DRAINAGE AREA BOUNDARY

NO.	REVISIONS	DATE	NAME

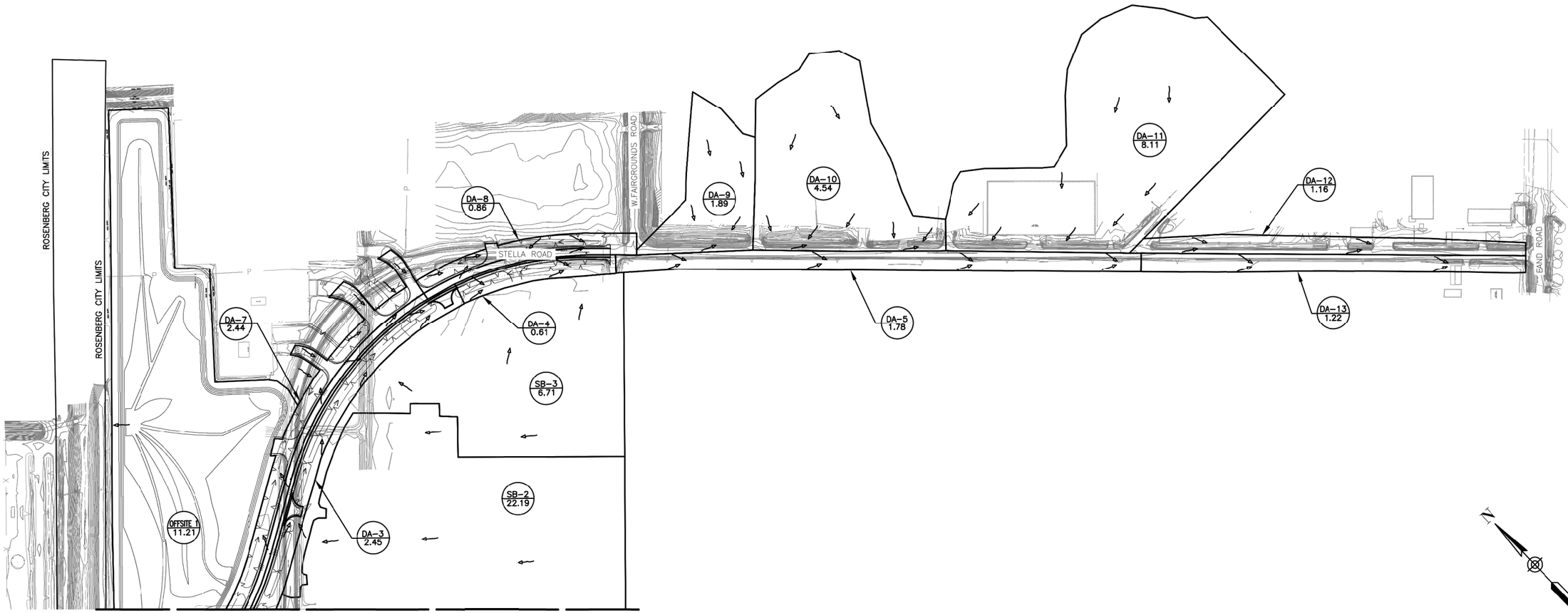
FORT BEND COUNTY ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD	CIVIL STANDARD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD	
SHEET DESCRIPTION:	PROPOSED DRAINAGE MAP (1 OF 2)	
DRAWN BY: NS		DATE: 6/18/24
CK'D BY: MJ	SCALE: 1" = 300'	SHEET NO: 68 / 133

M:\04755.000 20116 Stella Road\CAD\DWG\05- 04755 - Drainage Area Maps.dwg



N

0 150 300
SCALE IN FEET

LEGEND:

XX00 / X.XX — –DRAINAGE AREA DESIGNATION INLET NUMBER / –DRAINAGE AREA (ACRE)

–OVERLAND FLOW DIRECTION

–DRAINAGE AREA BOUNDARY

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE: STELLA ROAD		
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION: PROPOSED DRAINAGE MAP (2 OF 2)		
DRAWN BY: NS		DATE: 6/18/24
CK'D BY: MJ	SCALE: 1" = 300'	SHEET NO: 69 / 133

M:\04755.000 20116 Stella Road\CAD\DWG\05- 04755 - Drainage Area Maps.dwg

Rational Method & TC&R Parameters
Existing Condition - Atlas 14

Sub-Basin	Area		Impervious	C	Tc	Tc	I_{100}	Q_{100}	Storage
	acre	mi^2	%		min	hr	in/hr	cfs	hr
DA_1	1.08	0.0017	44.4%	0.54	12.65	0.21	10.80	6.4	0.37
DA_2A	0.69	0.0011	76.4%	0.72	11.38	0.19	11.37	5.6	0.12
DA_2B	1.13	0.0018	76.7%	0.72	17.38	0.29	9.24	7.5	0.25
DA_3	1.92	0.0030	79.7%	0.74	19.78	0.33	8.66	12.3	0.26
DA_4	0.76	0.0012	57.9%	0.62	10.70	0.18	11.71	5.5	0.18
DA_5	1.83	0.0029	44.3%	0.54	16.53	0.28	9.47	9.4	0.49
DA_6A	2.44	0.0038	41.6%	0.49	18.58	0.31	8.94	10.8	0.69
DA_6B	2.61	0.0041	33.3%	0.48	18.91	0.32	8.86	11.2	0.76
DA_7	2.34	0.0037	65.8%	0.66	13.95	0.23	10.29	15.9	0.24
DA_8	0.74	0.0012	79.7%	0.74	10.99	0.18	11.56	6.3	0.11
DA_9	1.84	0.0029	88.8%	0.78	12.86	0.21	10.71	15.3	0.09
DA_10	4.54	0.0071	76.0%	0.64	17.62	0.29	9.17	26.5	0.33
DA_11	8.11	0.0127	86.4%	0.79	21.90	0.36	8.23	52.6	0.24
DA_12	1.16	0.0018	78.4%	0.73	11.44	0.19	11.33	9.5	0.10
DA_13	1.22	0.0019	44.7%	0.55	11.77	0.20	11.18	7.4	0.34
Cotton	1.87	0.0029	11.4%	0.36	11.32	0.19	11.40	7.7	0.83
Offsite_1	8.75	0.0137	0.0%	0.30	65.02	1.08	4.71	12.4	5.21
SB-1	59.15	0.0924	0.0%	0.30	166.15	2.77	2.89	51.3	10.297
SB-2	29.47	0.0460	30.2%	0.43	182.79	3.05	2.75	34.9	6.770

TIME OF CONCENTRATION CALCULATIONS USING THE SCS UPLAND METHOD
Stella Road & Sheriff's Training Facility

Sub-Area				DA_1	DA_2A	DA_2B	DA_3	DA_4	DA_5	DA_6A	DA_6B	DA_7	DA_8	DA_9	DA_10	DA_11	DA_12	DA_13	SB-1	SB-2	Cotton	Offsite_1
Basin Drainage Area																						
	acres			1.08	0.69	1.13	1.92	0.76	1.83	2.44	2.61	2.34	0.74	1.84	4.54	8.11	1.16	1.22	59.15	29.47	1.87	8.75
Drainage Area	sq. mi.			0.002	0.001	0.002	0.003	0.001	0.003	0.004	0.004	0.004	0.001	0.003	0.007	0.013	0.002	0.002	0.092	0.046	0.003	0.014
Impervious Cover																						
Description		*C*	*I*	*Area of Land (acres) Belonging to Each Development Category*																		
Road/Lake	*W*	*0.85*	100%	0.48	0.53	0.87	1.53	0.44	0.81	0.86	0.87	1.54	0.59	0.46	0.65	0.80	0.74	0.52	0.00	1.04	0.00	0.00
Commercial	*C*	*0.75*	85%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38	0.00	7.30	0.20	0.03	0.00	0.00	0.25	0.00
Industrial	*I*	*0.6*	72%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.89	0.00	0.00	0.00	0.00	10.90	0.00	0.00
Single-Family	*SF*	*0.5*	66%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential larger Lot	*LR*	*0.3*	25%	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Space/Undeveloped	*OS*	*0.3*	0%	0.60	0.16	0.26	0.40	0.33	1.02	0.96	1.74	0.80	0.15	0.00	0.00	0.80	0.21	0.67	59.15	17.53	1.62	8.75
Runoff Coefficient				0.54	0.72	0.72	0.74	0.62	0.54	0.49	0.48	0.66	0.74	0.78	0.64	0.79	0.73	0.55	0.3	0.4	0.4	0.30
Impervious Area	acres			0.5	0.5	0.9	1.5	0.4	0.8	1.0	0.9	1.5	0.6	1.6	3.5	7.0	0.9	0.5	0.0	8.9	0.2	0.0
Impervious Cover	%			44.4%	76.4%	76.7%	79.7%	57.9%	44.3%	41.6%	33.3%	65.8%	79.7%	88.8%	76.0%	85.4%	78.4%	44.7%	0.0%	30.2%	11.4%	0.0%
Time of Concentration																						
SCS Uplands Method Curve C - Overland Flow in Grassy Areas																						
Distance	feet			50.0	30.0	30.0	0.0	50.0	0.0	40.0	65.0	20.0	30.0	0.0	0.0	0.0	0.0	0.0	300.0	300.0	77.8	300.0
Slope	percent			0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.07	0.01	0.05	0.05
Velocity	ft/sec			0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.18	0.08	0.16	0.16
Travel Time	minutes			3.78	2.27	2.27	0.00	3.78	0.00	3.02	4.91	1.51	2.27	0.00	0.00	0.00	0.00	0.00	27.09	59.63	8.32	32.06
SCS Uplands Method Curve F - Shallow Concentrated Flow in Grassed Waterway																						
Distance	feet			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2776.0	1222.0	0.0	653.0
Slope	percent			0.00	0.11	0.11	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01	0.07	0.05
Velocity	ft/sec			0.00	0.49	0.49	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.18	0.39	0.33
Travel Time	minutes			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	118.19	115.24	0.00	32.95
SCS Uplands Method Curve G - Paved Areas (Sheet Flow) and Upland Gullies																						
Distance	feet			50	0.0	0.0	10.0	25.0	0.0	0.0	0.0	25.0	25.0	341.0	370.0	233.0	0.0	0.0	0.0	0.0	0.0	0.0
Slope	percent			0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Velocity	ft/sec			0.69	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Travel Time	minutes			1.22	0.00	0.00	0.32	0.81	0.00	0.00	0.00	0.81	0.81	11.06	12.00	7.56	0.00	0.00	0.00	0.00	0.00	0.00
Flow in Storm Sewer/Roadside Ditch																						
Distance	feet			0.0	0.0	0.0	46.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Velocity	ft/sec			3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Travel Time	minutes			0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flow in Roadside Ditch																						
Distance	feet			689.0	820.0	1360.0	1728.0	550.0	1488.0	1400.0	1260.0	1047.0	712.0	162.0	506.0	1291.0	1030.0	1059.0	1879.0	712.0	270.0	0.0
Velocity	ft/sec			1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Travel Time	minutes			7.66	9.11	15.11	19.20	6.11	16.53	15.56	14.00	11.63	7.91	1.80	5.62	14.34	11.44	11.77	20.88	7.91	3.00	0.00
Flow in Channel/Ditch																						
Distance	feet			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Velocity	ft/sec			1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Travel Time	minutes			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TC			minutes	12.65	11.38	17.38	19.78	10.70	16.53	18.58	18.91	13.95	10.99	12.86	17.62	21.90	11.44	11.77	166.15	182.79	11.32	65.02
TC			hours	**0.21**	**0.19**	**0.29**	**0.33**	**0.18**	**0.28**	**0.31**	**0.32**	**0.23**	**0.18**	**0.21**	**0.29**	**0.36**	**0.19**	**0.20**	**2.77**	**3.05**	**0.19**	**1.08**

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	EXISTING DRAINAGE CALCULATIONS
DRAWN BY:	NS
CK'D BY:	MJ
SCALE:	N/A
DATE:	6/18/24
SHEET NO:	70 / 133

CIVIL STANDARD

Rational Method & TC&R Parameters

Proposed Condition - Atlas 14

Sub-Basin	Area		Impervious	C	Tc	Tc	I_{100}	Q_{100}	Storage
	acre	mi^2	%		min	hr	in/hr	cfs	hr
DA_1	2.27	0.0035	7.9%	0.34	43.48	0.72	5.80	4.5	3.000
DA_2A	1.73	0.0027	69.9%	0.68	18.45	0.31	8.97	10.6	0.303
DA_2B	2.04	0.0032	63.7%	0.65	19.63	0.33	8.69	11.5	0.373
DA_3	2.45	0.0038	65.7%	0.66	24.38	0.41	7.80	12.6	0.460
DA_4	0.61	0.0010	70.5%	0.69	9.49	0.16	12.40	5.2	0.118
DA_5	1.78	0.0028	45.5%	0.55	16.53	0.28	9.47	9.3	0.490
DA_6A	1.73	0.0027	84.4%	0.76	18.45	0.31	8.97	11.9	0.208
DA_6B	1.90	0.0030	100.0%	0.85	19.63	0.33	8.69	14.0	0.165
DA_7	2.44	0.0038	71.3%	0.69	21.90	0.36	8.23	13.9	0.343
DA_8	0.86	0.0013	67.4%	0.67	11.50	0.19	11.31	6.5	0.120
DA_9	1.89	0.0030	86.4%	0.76	12.86	0.21	10.71	15.4	0.097
DA_10	4.54	0.0071	76.0%	0.64	17.62	0.29	9.17	26.5	0.33
DA_11	8.11	0.0127	86.4%	0.79	21.90	0.36	8.23	52.6	0.24
DA_12	1.16	0.0018	78.4%	0.73	11.44	0.19	11.33	9.5	0.10
DA_13	1.22	0.0019	44.7%	0.55	11.77	0.20	11.18	7.4	0.34
Offsite_1	11.21	0.0175	86.3%	0.77	32.63	0.54	6.72	58.4	0.500
SB-1	45.95	0.0718	0.0%	0.30	121.77	2.03	3.40	46.9	8.270
SB-2	22.19	0.0347	85.0%	0.75	37.60	0.63	6.25	104.1	0.540
SB-3	6.71	0.0105	63.7%	0.57	32.72	0.55	6.71	25.5	0.940
SB-4	1.17	0.0018	0.0%	0.30	14.00	0.23	10.28	3.6	1.400

TIME OF CONCENTRATION CALCULATIONS USING THE SCS UPLAND METHOD

Stella Road & Sheriff's Training Facility

Sub-Area				DA_1	DA_2A	DA_2B	DA_3	DA_4	DA_5	DA_6A	DA_6B	DA_7	DA_8	DA_9	DA_10	DA_11	DA_12	DA_13	Offsite_1	SB-1	SB-2	SB-3	SB-4
Basin Drainage Area																							
	acres			2.27	1.73	2.04	2.45	0.61	1.78	1.73	1.90	2.44	0.86	1.89	4.54	8.11	1.16	1.22	11.21	45.95	22.19	6.71	1.17
Drainage Area	sq. mi.			0.004	0.003	0.003	0.004	0.001	0.003	0.003	0.003	0.004	0.001	0.003	0.007	0.013	0.002	0.002	0.018	0.072	0.035	0.010	0.002
Impervious Cover																							
Description		***C***	***I***	***Area of Land (acres) Belonging to Each Development Category***																			
Road/Lake	*W*	*0.85*	100%	0.00	1.21	1.30	1.61	0.43	0.81	1.46	1.90	1.74	0.58	0.46	0.65	0.80	0.74	0.52	9.67	0.00	0.00	0.00	0.00
Commercial	*C*	*0.75*	85%	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38	0.00	7.30	0.20	0.03	0.00	0.00	22.19	0.00	0.00
Industrial	*I*	*0.6*	72%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.89	0.00	0.00	0.00	0.00	0.00	0.00	5.94	0.00
Single-Family	*SF*	*0.5*	66%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential larger Lot	*LR*	*0.3*	25%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Space/Undeveloped	*OS*	*0.3*	0%	2.06	0.52	0.74	0.84	0.18	0.97	0.27	0.00	0.70	0.28	0.05	0.00	0.80	0.21	0.67	1.54	45.95	0.00	0.77	1.17
Runoff Coefficient				0.3	0.7	0.7	0.7	0.7	0.6	0.8	0.9	0.7	0.7	0.8	0.6	0.8	0.7	0.5	0.8	0.3	0.8	0.6	0.3
Impervious Area	acres			0.2	1.2	1.3	1.6	0.4	0.8	1.5	1.9	1.7	0.6	1.6	3.5	7.0	0.9	0.5	9.7	0.0	18.9	4.3	0.0
Impervious Cover	%			7.9%	69.9%	63.7%	65.7%	70.5%	45.5%	84.4%	100.0%	71.3%	67.4%	86.4%	76.0%	86.4%	78.4%	44.7%	86.3%	0.0%	85.0%	63.7%	0.0%
Time of Concentration																							
SCS Uplands Method Curve C - Overland Flow in Grassy Areas																							
Distance	feet			77.8	60.0	60.0	60.0	60.0	0.0	60.0	60.0	60.0	60.0			0.0	0.0	0.0	300.0	300.0	60.0	300.0	100.0
Slope	percent			0.05	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.07	0.10	0.10	0.10
Velocity	ft/sec			0.16	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.18	0.22	0.22	0.22
Travel Time	minutes			8.32	4.53	4.53	4.53	4.53	0.00	4.53	4.53	4.53	4.53	0.00	0.00	0.00	0.00	0.00	22.65	27.09	4.53	22.65	7.55
SCS Uplands Method Curve F - Shallow Concentrated Flow in Grassed Waterway																							
Distance	feet			521.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	140.0	2224.0	0.0	0.0	0.0
Slope	percent			0.05	0.11	0.11	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.07	0.00	0.00	0.00
Velocity	ft/sec			0.33	0.49	0.49	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.39	0.00	0.00	0.00
Travel Time	minutes			26.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.98	94.69	0.00	0.00	0.00
SCS Uplands Method Curve G - Paved Areas (Sheet Flow) and Upland Gullies																							
Distance	feet			50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	341.0	370.0	233.0	0.0	0.0	0.0	0.0	300.0	0.0	0.0
Slope	percent			0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Velocity	ft/sec			0.69	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Travel Time	minutes			1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.06	12.00	7.56	0.00	0.00	0.00	0.00	9.73	0.00	0.00
Flow in Storm Sewer/Roadside Ditch																							
Distance	feet			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	738.0	0.0	0.0
Velocity	ft/sec			3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Travel Time	minutes			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.10	0.00	0.00
Flow in Roadside Ditch																							
Distance	feet			689.0	1253.0	1359.0	1786.0	446.0	1488.0	1253.0	1359.0	1563.0	627.0	162.0	506.0	1291.0	1030.0	1059.0	450.0	0.0	1732.0	906.0	500.0
Velocity	ft/sec			1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Travel Time	minutes			7.66	13.92	15.10	19.84	4.96	16.53	13.92	15.10	17.37	6.97	1.80	5.62	14.34	11.44	11.77	5.00	0.00	19.24	10.07	5.56
Flow in Channel/Ditch																							
Distance	feet			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.0
Velocity	ft/sec			1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Travel Time	minutes			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89
TC			minutes	43.48	18.45	19.63	24.38	9.49	16.53	18.45	19.63	21.90	11.50	12.86	17.62	21.90	11.44	11.77	32.63	121.77	37.60	32.72	14.00
TC			hours	**0.72**	**0.31**	**0.33**	**0.41**	**0.16**	**0.28**	**0.31**	**0.33**	**0.36**	**0.19**	**0.21**	**0.29**	**0.36**	**0.19**	**0.20**	**0.54**	**2.03**	**0.63**	**0.55**	**0.23**

M:\04755.000 20116 Stella Road\CAD\DWG\05- 04755 - Drainage Area Maps.dwg

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	PROPOSED DRAINAGE CALCULATIONS
DRAWN BY:	NS
CK'D BY:	MJ
SCALE:	N/A
CIVIL STANDARD	
DATE:	6/18/24
SHEET NO:	71 / 133

PROPOSED CULVERT NODE INPUT DATA

Name	Scenario	Node Inputs				
Name		Node Name 0	Elevation (Spill Crest) ft	Invert Elevation ft	User Inflow Hydrograph	Ponding Type
D1_US	100-Year Storm	D1_US	98.33	94.82	0.25	Allowed
D1_DS	100-Year Storm	D1_DS	98.11	93.99	0.25	Allowed
D2_US	100-Year Storm	D2_US	98.11	93.89	0.17	Allowed
D2_DS	100-Year Storm	D2_DS	96.8	91.2	0	Allowed
D13.1_US	100-Year Storm	D13.1_US	96.8	91.1		Allowed
Out_1	100-Year Storm	Out_1	95.269	89.274		Allowed
D3_DS	100-Year Storm	D3_DS	96.4	92.7	0.17	Allowed
D4_US	100-Year Storm	D4_US	96.3	92.6		Allowed
D4.1_US	100-Year Storm	D4.1_US	96.6	92.4		Allowed
D4.1_DS	100-Year Storm	D4.1_DS	96.7	91.31		Allowed
D4_DS	100-Year Storm	D4_DS	96.7	91.53		Allowed
D5_US	100-Year Storm	D5_US	96.7	91.63		Allowed
D5_DS	100-Year Storm	D5_DS	96.6	91.99	0.17	Allowed
D6_US	100-Year Storm	D6_US	96.5	92.09		Allowed
D6_DS	100-Year Storm	D6_DS	96.5	92.58		Allowed
D7_US	100-Year Storm	D7_US	96.32	92.73	0.17	Allowed
D16.1_US	100-Year Storm	D16.1_US	96.6	91.2		Allowed
D16.2_DS	100-Year Storm	D16.2_DS	95.39	91.1		Allowed
Out_2	100-Year Storm	Out_2	95.28	87.31		Allowed
D10_US	100-Year Storm	D10_US	98.23	95	0.17	Allowed
D10_DS	100-Year Storm	D10_DS	98.1	93.81		Allowed
D11_US	100-Year Storm	D11_US	98	93.86		Allowed
D11_DS	100-Year Storm	D11_DS	97.9	93.91		Allowed
D12_US	100-Year Storm	D12_US	97.54	93.87	0.17	Allowed
D12_DS	100-Year Storm	D12_DS	96.3	91.83		Allowed
D13_US	100-Year Storm	D13_US	96.4	91.73		Allowed
D13_DS	100-Year Storm	D13_DS	96.8	93.3	0.25	Allowed
D14_US	100-Year Storm	D14_US	96.64	93.13		Allowed
D15_US	100-Year Storm	D15_US	96.68	93.17		Allowed
D16_US	100-Year Storm	D16_US	96.7	91.72		Allowed
D16_DS	100-Year Storm	D16_DS	96.517	91.21		Allowed
D17_US	100-Year Storm	D17_US	96.7	91.41		Allowed
D17_DS	100-Year Storm	D17_DS	96.6	91.86		Allowed
D18_US	100-Year Storm	D18_US	96.5	91.96		Allowed
D18_DS	100-Year Storm	D18_DS	96.6	92.73	0.17	Allowed
D19_US	100-Year Storm	D19_US	96.31	92.594		Allowed
Out3.1	100-Year Storm	Out3.1	95.407	91.93		Allowed
Out_3	100-Year Storm	Out_3	96.381	90.113		Allowed
D14_DS	100-Year Storm	D14_DS	96.78	93.27	0.17	Allowed
D15_DS	100-Year Storm	D15_DS	96.7	91.82		Allowed
D13_US.1	100-Year Storm	D13_US.1	96.7	91.47		Allowed
D2_US.1	100-Year Storm	D2_US.1	96.5	91.37	0.25	Allowed
D4.1_US.1	100-Year Storm	D4.1_US.1	96.6	91.41	0.17	Allowed
Basin1_Opt2	100-Year Storm	Basin1_Opt2	96	89.2	0.17	Allowed
Out_1.1	100-Year Storm	Out_1.1	99	88.95		Allowed
Out_1.2	100-Year Storm	Out_1.2	95.146	89.15		Allowed
D7.1_US	100-Year Storm	D7.1_US	95.725	92.5		Allowed
D7_DS	100-Year Storm	D7_DS	96	91.67		Allowed
D8_US	100-Year Storm	D8_US	96	91.52		Allowed
D8_DS	100-Year Storm	D8_DS	95.949	90.85		Allowed
Out_4	100-Year Storm	Out_4	95.838	91.39		Allowed
D26_US	100-Year Storm	D26_US	95.09	94.114		Allowed
D26.1_US	100-Year Storm	D26.1_US	95.911	89.26		Allowed
D26_DS	100-Year Storm	D26_DS	95.911	92.99		Allowed
D25_US	100-Year Storm	D25_US	95.71	92.811		Allowed
D25_DS	100-Year Storm	D25_DS	95.91	92.38		Allowed
D24_US	100-Year Storm	D24_US	95.769	92.51		Allowed
D24_DS	100-Year Storm	D24_DS	96.01	92.01		Allowed
D23_US	100-Year Storm	D23_US	96.03	89.2	0.17	Allowed
D23_DS	100-Year Storm	D23_DS	96.496	92.79		Allowed
D22_US	100-Year Storm	D22_US	95.94	92.46		Allowed
D22_DS	100-Year Storm	D22_DS	96.11	88.49		Allowed
D21_US	100-Year Storm	D21_US	97.803	87.73		Allowed
D21_DS	100-Year Storm	D21_DS	96.59	89.26		Allowed
D20_US	100-Year Storm	D20_US	96.24	89.5	0	Allowed
D27_US	100-Year Storm	D27_US	95.09	93.435		Allowed
D27_DS	100-Year Storm	D27_DS	95	92.4		Allowed
D28.1_US	100-Year Storm	D28.1_US	95.971	92.437	0.17	Allowed
D28_DS	100-Year Storm	D28_DS	95.22	91.05		Allowed
D29_US	100-Year Storm	D29_US	95.213	91.019		Allowed
D29_DS	100-Year Storm	D29_DS	95.2	91.51		Allowed
D30_US	100-Year Storm	D30_US	95.187	91.42		Allowed
D30_DS	100-Year Storm	D30_DS	94.939	91.46		Allowed
D31_US	100-Year Storm	D31_US	94.9	91.52		Allowed
D31_DS	100-Year Storm	D31_DS	95.52	91.16		Allowed
D28_US	100-Year Storm	D28_US	95.691	90.6		Allowed
Node650	100-Year Storm	Node650	93.45	89.2		Allowed
Node651	100-Year Storm	Node651	96.03	89.1		Allowed
Node652	100-Year Storm	Node652	93.38	89.43		Allowed
Node653	100-Year Storm	Node653	92.94	89.44	0.17	Allowed
D7_US.1	100-Year Storm	D7_US.1	95.929	92.579	0.17	Allowed
DW2N_US	100-Year Storm	DW2N_US	98.81	95.3	0.17	None
DW1N_Out	100-Year Storm	DW1N_Out	100.5	95.07		None
DW2S_DS	100-Year Storm	DW2S_DS	99.36	95.24	0	None
DW1S_Out	100-Year Storm	DW1S_Out	100.5	94.99		None
D2_US.2	100-Year Storm	D2_US.2	97.7	93.97	0.25	Allowed
D2B_US	100-Year Storm	D2B_US	97.54	93.68	0.17	Allowed
D_Co_Out	100-Year Storm	D_Co_Out	100.5	94.89		None
Out_2.2	100-Year Storm	Out_2.2	95.28	87.21		None
DW2N_US.1	100-Year Storm	DW2N_US.1	99.36	95.45	0.17	None
D12_US.1	100-Year Storm	D12_US.1	97.48	93.68	0	Allowed
D2B_US.1	100-Year Storm	D2B_US.1	97.48	93.58		Allowed
D12_US.1.1	100-Year Storm	D12_US.1.1	97.47	92.64	0	Allowed
Sheriff_Outfall	100-Year Storm	Sheriff_Outfall	96.511	90.3	0	None
D3_DS.1	100-Year Storm	D3_DS.1	96.511	92.21	0	Allowed
D3_US	100-Year Storm	D3_US	96.511	92.9		None
D13_DS.1	100-Year Storm	D13_DS.1	96.664	92.258	0.25	Allowed
D13_DS.2	100-Year Storm	D13_DS.2	97.16	93.66		None

PROPOSED CULVERT LINK INPUT DATA

Name	Link Name 0	Conduit Design Option 0	Diameter (Height) ft	Length ft	Roughness 0	Shape 0	Upstream Invert Elevation ft	Downstream Invert Elevation ft	Natural Section Shape GLDB Reference 0	Initial Water Surface Slope 0	Vertical Shift ft	Horizontal Distortion Factor ft	Cross-section Identification Number 0	Left Channel Length ft	Right Channel Length ft	User-defined Conduit using GLDB	Roughness
1311.1	D1_D2_Cul	Circular	2	60	0.013	Circular	93.99	93.89		0.001	0	0	0	0	0	0	0.013
1317.1	D13_Out_Cul	Circular	1.5	81	0.013	Circular	91.1	85.67		0.001	0	0	0	0	0	0	0.013
1322.1	D3_D4_Cul	Circular	2	80.2	0.013	Circular	92.7	92.6		0.001	0	0	0	0	0	0	0.013
1330.1	D4_D5_Cul	Circular	2	90	0.013	Circular	91.63	91.53		0.001	0	0	0	0	0	0	0.013
1334.1	D5_D6_Cul	Circular	2	91.5	0.013	Circular	92.09	91.99		0.001	0	0	0	0	0	0	0.013
1344.1	D7_D8_Cul	Circular	2	45	0.013	Circular	91.84	91.52		0.001	0	0	0	0	0	0	0.013
1344.2	D7_D8_Cul	Circular	2	45	0.013	Circular	91.67	91.57		0.001	0	0	0	0	0	0	0.013
1350.1	Rd_Cross3	Circular	2	42	0.013	Circular	91.31	91.21		0.001	0	0	0	0	0	0	0.013
1350.2	Rd_Cross3	Circular	2	42	0.013	Circular	91.31	91.21		0.001	0	0	0	0	0	0	0.013
1350.3	Rd_Cross3	Circular	2	42	0.013	Circular	91.31	91.21		0.001	0	0	0	0	0	0	0.013
1354.1	D16.2_Out-2	Circular	1.67	51	0.013	Circular	91.1	91		0.001	0	0	0	0	0	0	0.013
1359.1	D10_D11_Cul	Circular	2	65.8	0.013	Circular	93.97	93.86		0.001	0	0	0	0	0	0	0.013
1367.1	D12_D13_Cul	Circular	2	78	0.013	Circular	91.83	91.73		0.001	0	0	0	0	0	0	0.013
1372.1	D13_D14_Cul	Circular	2	79.1	0.013	Circular	93.3	93.13		0.001	0	0	0	0	0	0	0.013
1381.1	D16_D17_Cul	Circular	2	71.1	0.013	Circular	91.41	91.21		0.001	0	0	0	0	0	0	0.013
1385.1	D17_D18_Cul	Circular	2	61.7	0.013	Circular	91.96	91.86		0.001	0	0	0	0	0	0	0.013
1389.1	Rd_Cross4	Circular	2	83	0.013	Circular	92.89	92.83		0.001	0	0	0	0	0	0	0.013
1389.2	Rd_Cross4	Circular	2	83	0.013	Circular	92.87	92.65		0.001	0	0	0	0	0	0	0.013
1410.1	D22_D23_Cul	Circular	1	24	0.024	Circular	92.79	92.46		0.001	0	0	0	0	0	0	0.024
1414.1	D21_D22_Cul	Circular	3	81	0.024	Circular	88.49	87.83		0.001	0	0	0	0	0	0	0.024
1442.1	D14_D15_Cul	Circular	3	67	0.013	Circular	93.27	93.17		0.001	0	0	0	0	0	0	0.013
1444.1	D15_D16_Cul	Circular	2	70.6	0.013	Circular	91.82	91.72		0.001	0	0	0	0	0	0	0.013
1445.1	Rd_Cross2	Circular	2.5	44	0.013	Special	93.13	92.4		0.001	0	0	0	0	0	0	0.013
1487.1	Link633	Circular	2.5	100	0.013	Circular	91.1	91		0.001	0	0	0	0	0	0	0.013
1488.1	Link634	Circular	1.417	70	0.013	Circular	89.2	85.15		0.001	0	0	0	0	0	0	0.013
Coss_Cul	D10_D11_Cul																
Cross_Cul	D14_D15_Cul																
Cross_Cul1	D12_D13_Cul																
Cross_Cul2.1	D13_D14_Cul																
Cross_Cul3	D15_D16_Cul																
Cross_Cul4	D16_D17_Cul																
CrossCul	CrossCul	Circular	2.5	64.7	0.014	Special	93.68	93.58		0.001	0	0	0	0	0	0	0.014
Cul_Cross	D1_D2_Cul																
Cul_Cross2	D3_D4_Cul																
Cul_Cross3	D17_D18_Cul																
Cul_Cross4	D5_D6_Cul																
Cul_Cross5	D4_D5_Cul																
D1	D1	Circular	0	80	0.014	Natural	94.82	93.99	Stella_A_S_XS_O2_.40	0.001	0	0	0	80	80	0	0.014
D10	D10	Circular	0	382.88	0.014	Natural	95	93.97	Stella_A_N_XS_O2_.60'	0.001	0	0	0	382.88	382.88	0	0.014
D11	D11	Circular	0	362.1	0.014	Natural	93.86	93.91	Stella_N_50RD	0.001	0	0	0	362.1	362.1	0	0.014
D:1_D12_Cul	D11_D12_Cul	Circular	2	200	0.015	ectangul	93.91	93.87		0.001	0	0	0	0	0	0	0.015
D12.1	D12.1	Circular	0	115.8	0.014	Natural	93.87	93.68	Stella_N_50RD	0.001	0	0	0	115.8	115.8	0	0.014
D12.1.1.1	D12.1.1.1	Circular	0	818.9	0.014	Natural	92.64	91.83	Stella_N_50RD	0.001	0	0	0	818.9	818.9	0	0.014
D13	D13	Circular	0	109	0.014	Natural	91.73	91.47	Stella_A_N_XS_O2_.40'	0.001	0	0	0	109	109	0	0.014
D13.1	D13.1	Circular	0	358.59	0.014	Natural	93.66	93.3	Stella_N_36_3ft	0.001	0	0	0	876.2	876.2	0	0.014
D13.1.1	D13.1.1	Circular	0	517.61	0.014	Natural	92.258	91.1	Stella_N_36_3ft	0.001	0	0	0	876.2	876.2	0	0.014
D13.2	D13.2	Circular	0	148.5	0.014	Natural	91.47	91.1	Stella_N_36	0.001	0	0	0	148.5	148.5	0	0.014
D14	D14	Circular	0	174.2	0.014	Natural	93.27	93.13	Stella_N_36_3ft	0.001	0	0	0	174.2	174.2	0	0.014
D15	D15	Circular	0	107.3	0.014	Natural	93.17	91.82	Stella_N_36_3ft	0.001	0	0	0	107.3	107.3	0	0.014
D16	D16	Circular	0	29.6	0.014	Natural	91.72	91.2	Stella_N_36	0.001	0	0	0	29.6	29.6	0	0.014
D16.1	D16.1	Circular	0	32.3	0.014	Natural	91.21	91.2	Stella_N_36	0.001	0	0	0	32.3	32.3	0	0.014
D16.2	D16.2	Circular	0	118	0.014	Natural	91.2	91.1	D16.2_XS	0.001	0	0	0	118	118	0	0.014
D17	D17	Circular	0	167.8	0.014	Natural	91.86	91.41	Stella_N_36	0.001	0	0	0	157.8	167.8	0	0.014
D17_Out-2	D17_Out-2	Circular	0	115	0.014	Natural	93.06	92.8	D17_Oct-2_XS	0.001	0	0	0	115	115	0	0.014
D18	D18	Circular	0	261.2	0.014	Natural	92.73	91.96	Stella_N_36_3ft	0.001	0	0	0	251.2	261.2	0	0.014
D19	D19	Circular	0	129	0.014	Natural	92.594	91.93	D19_XS	0.001	0	0	0	129	129	0	0.014
D2	D2	Circular	0	674	0.014	Natural	93.89	93.97	Stella_A_S_XS_O2_.40	0.001	0	0	0	674	674	0	0.014
D2.1	D2.1	Circular	0	80	0.014	Natural	91.37	91.2	Stella_A_S_XS_O2_.40	0.001	0	0	0	80	80	0	0.014
D2.2	D2.2	Circular	2	160	0.013	Circular	93.97	93.68	Stella_A_S_XS_O2_.34'	0.001	0	0	0	79.123	79.123	0	0.013
D2.2.1	D2.2.1	Circular	0	142.9	0.014	Natural	93.68	93.58	Stella_A_S_XS_O2_.40	0.001	0	0	0	142.9	142.9	0	0.014
D2.2.1.1	D2.2.1.1	Circular	0	1210.6	0.014	Natural	93.58	91.37	Stella_A_S_XS_O2_.40	0.001	0	0	0	1210.6	1210.6	0	0.014
D20	D20	Circular	0	400	0.014	Natural	89.956	90.113	D20_XS	0.001	0	0	0	400	400	0	0.014
D20_D21_Cul	D20_D21_Cul	Circular	2.5	81	0.024	Circular	89.26	89.5		0.001	0	0	0	0	0	0	0.024
D21	D21	Circular	0	251	0.014	Natural	91.024	89.811	D21_XS	0.001	0	0	0	251	251	0	0.014
D22	D22	Circular	0	78	0.014	Natural	93.12	89.034	D22_XS	0.001	0	0	0	78	78	0	0.014
D23	D23	Circular	0	89	0.014	Natural	92.599	93.235	D23_XS	0.001	0	0	0	89	89	0	0.014
D23_D24_Cul	D23_D24_Cul	Circular	1	67	0.009	Circular	92.01	91.12		0.001	0	0	0	0	0	0	0.009
D24	D24	Circular	0	199	0.014	Natural	93.06	92.591	D24_XS	0.001	0	0	0	199	199	0	0.014
D24_D25_Cul	D24_D25_Cul	Circular	1.5	80	0.013	Circular	92.38	92.51		0.001	0	0	0	0	0	0	0.013
D25	D25	Circular	0	179	0.014	Natural	92.811	93.038	D25_XS	0.001	0	0	0	179	179	0	0.014
D25_D26_Cul	D25_D26_Cul	Circular	1.25	37	0.012	Circular	92.99	92.85		0.001	0	0	0	0	0	0	0.012
D26	D26	Circular	0	132.5	0.014	Natural	94.114	92.814	D26_XS	0.001	0	0	0	0	0	0	0.014
D26.1	D26.1	Circular	0	25	0.014	Natural	92.782	93.082	D26.1_XS	0.001	0	0	0	25	25	0	0.014
D26.1_D28_Cul	D26.1_D28_Cul	Circular	2	82	0.024	Circular	90.6	85.34		0.001	0	0	0	0	0	0	0.024
D27	D27	Circular	0	36	0.014	Natural	93.435	92.97	D27_XS	0.001	0	0	0	0	0	0	0.014
D27_D28.1_Cul	D27_D28.1_Cul	Circular	2	63	0.024	Circular	92.4	92.44		0.001	0	0	0	0	0	0	0.024
D28	D28	Circular	0	15	0.014	Natural	92.157	92.437	D28_XS	0.001	0	0	0	15	15	0	0.014
D28.1	D28.1	Circular	0	463	0.014	Natural	92.437	92.092	D28.1_XS	0.001	0	0	0	463	463	0	0.014
D28_D29_Cul	D28_D29_Cul	Circular	2	123	0.009	Circular	91.05	91.019		0.001	0	0	0	0	0	0	0.009
D29	D29	Circular	0	62	0.014	Natural	92.47	92.253	D29_XS	0.001	0	0	0	62	62	0	0.014
D29_D30_Cul	D29_D30_Cul	Circular	2	122	0.009	Circular	91.51	91.42		0.001	0	0	0	0	0	0	0.009
D3	D3	Circular	0	197.91	0.014	Natural	92.9	92.7	Stella_A_S_XS_O2_.40	0.001	0	0	0	710.8	710.8	0	0.014
D3.1	D3.1	Circular	0	512.89	0.014	Natural	92.21	91.2	Stella_A_S_XS_O2_.40	0.001	0	0	0	710.8	710.8	0	0.014
D30	D30	Circular	0	232	0.014	Natural	92.458	92.21	D30_XS	0.001	0	0	0	232	232	0	0.014

PROPOSED CULVERT LINK INPUT DATA

Link Name 0	Conduit Design Option 0	Diameter (Height) ft	Length ft	Roughness 0	Shape 0	Upstream Invert Elevation ft	Downstream Invert Elevation ft	Natural Section Shape GLDB Reference 0	Initial Water Surface Slope 0	Vertical Shift ft	Horizontal Distortion Factor ft	Cross-section Identification Number 0	Left Channel Length ft	Right Channel Length ft	User-defined Conduit using GLDB	Roughness	Roughness
D30_D31_Cul	D30_D31_Cul	Circular	2	55	0.013	Circular	91.46	91.52		0.001	0	0	0	0	0	0	0.013
D31	D31	Circular	0	113	0.014	Natural	92.14	91.886	D31_XS	0.001	0	0	0	113	113	0	0.014
D4	D4	Circular	0	202.8	0.014	Natural	92.5	92.4	Stella_A_S_XS_O2_.40	0.001	0	0	0	202.8	202.8	0	0.014
D4.1	D4.1	Circular	0	257.4	0.014	Natural	92.1	91.41	Stella_A_S_XS_O2_.40	0.001	0	0	0	257.4	257.4	0	0.014
D4.1.1	D4.1.1	Circular	0	148.2	0.014	Natural	91.41	91.31	Stella_A_S_XS_O2_.40	0.001	0	0	0	148.2	148.2	0	0.014
D4.2	D4.2	Circular	0	77.7	0.014	Natural	91.53	91.31	Stella_A_S_XS_O2_.40	0.001	0	0	0	77.7	77.7	0	0.014
D5	D5	Circular	0	125.5	0.014	Natural	91.99	91.63	Stella_A_S_XS_O2_.40	0.001	0	0	0	125.5	125.5	0	0.014
D6	D6	Circular	0	213	0.014	Natural	92.09	92.09	Stella_A_S_XS_O2_.40	0.001	0	0	0	213	213	0	0.014
D6_D7_Cul	D6_D7_Cul	Circular	0.03	82	0.013	Circular	92.58	92.73		0.001	0	0	0	0	0	0	0.013
D7	D7	Circular	0	1496.3	0.014	Natural	92.73	92.703	D7_XS	0.001	0	0	0	1496.31	1496.31	0	0.014
D7.1	D7.1	Circular	0	60	0.014	Natural	92.5	92.354	D7.1_XS	0.001	0	0	0	60	60	0	0.014
D7.2	D7.2	Circular	0	772.7	0.014	Natural	92.703	92.5	D7_XS	0.001	0	0	0	772.695	772.695	0	0.014
D8	D8	Circular	0	160	0.014	Natural	92.14	91.503	D8_XS	0.001	0	0	0	160	160	0	0.014
D9	D9	Circular	0	74	0.014	Natural	91.533	91.392	D9_XS	0.001	0	0	0	74	74	0	0.014
D_Co_OutL	D_Co_OutL	Circular	0	33	0.014	Natural	94.99	94.89	Cotton	0.001	0	0	0	33	33	0	0.014
D_CoWo	D_CoWo	Circular	3.167	50	0.015	Special	95.07	95		0.001	0	0	0	0	0	0	0.015
D_Out1.1	D_Out1.1	Circular	0	37.995	0.014	Natural	89.274	89.15	Out_1.1_XS	0.001	0	0	0	37.995	37.995	0	0.014
D_Out1.1.1	D_Out1.1.1	Circular	0	62.005	0.014	Natural	89.151	88.95	Out_1.1_XS	0.001	0	0	0	0	0	0	0.014
DW1_N	DW1_N	Circular	0	32.83	0.014	Natural	95.45	95.3	Stella_A_N_XS_O2_40'	0.001	0	0	0	32.83	32.83	0	0.014
DW1_N.1	DW1_N.1	Circular	0	170.42	0.014	Natural	95.45	95.07	Stella_A_N_XS_O2_40'	0.001	0	0	0	170.42	170.42	0	0.014
DW1_S	DW1_S	Circular	0	249.6	0.014	Natural	95.85	94.99	Stella_A_S_XS_O2_.40	0.001	0	0	0	249.6	249.6	0	0.014
DW2_N	DW2_N	Circular	2	103	0.013	Circular	95.3	95	Stella_A_N_XS_O2_35'	0.001	0	0	0	102	102	0	0.013
DW2_S	DW2_S	Circular	0.3	53.8	0.04	rapezoida	98.16	98		0.001	0	0	0	0	0	0	0.04
L_Sheriff_Out	L_Sheriff_Out	Circular	1.5	177	0.015	ectangula	90.3	90		0.001	0	0	0	0	0	0	0.015
Link615	Link615	Circular	2.5	33	0.013	Circular	89.2	89.1		0.001	0	0	0	0	0	0	0.013
Link616	Link616	Circular	2.5	168	0.024	Circular	89.43	89.2		0.001	0	0	0	0	0	0	0.024
Link617	Link617	Circular	2.5	129	0.024	Circular	89.44	89.43		0.001	0	0	0	0	0	0	0.024
Link618	Link618	Circular	2.5	214	0.024	Circular	89.44	89.26		0.001	0	0	0	0	0	0	0.024
Out2.2RdCR	D16.2_Out-2																
Out_2.2L	Out_2.2L	Circular	0	33	0.014	Natural	87.51	87.28	D_Out_2.2	0.001	0	0	0	33	33	0	0.014
Overflow	Link711																
Overflow Weir	Link634																
Rd_Cross1	Rd_Cross1	Circular	2.5	46	0.013	Circular	91.2	91.1		0.001	0	0	0	0	0	0	0.013
Rd_Cross5	Rd_Cross5	Circular	2	41	0.024	Circular	91.16	90.85		0.001	0	0	0	0	0	0	0.024
RoadCross	D21_D22_Cul																
RoadCross2.1	D22_D23_Cul																

NOTE:

NODES LOCATION CAN BE FOUND IN THE DRAINAGE REPORT TITLED "DRAINAGE IMPACT ANALYSIS FOR STELLA ROAD EXPANSION WITHIN SEABOURNE CREEK WATERSHED FORT BEND, TEXAS", EXHIBIT 8A.

M:\04755.000 20116 Stella Road\CAD\DWG\05 - 04755 - Drainage Area Maps.dwg

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS MENGYANG JIANG 138195 LICENSED PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	PROPOSED CULVERT INPUT DATA
CIVIL STANDARD	
DRAWN BY: NS	DATE: 6/18/24
CK'D BY: MJ	SCALE: N/A
SHEET NO:	72 / 133

EXISTING CULVERT NODE INPUT DATA

Name	Node Name 0	Ground Elevation (Spill Crest) ft	Invert Elevation ft	User Inflow Hydrograph	Ponding Type
Node653	Node653	92.94	89.44	0.17	Allowed
Node652	Node652	93.38	89.43	0.17	Allowed
Node650	Node650	93.45	89.2		Allowed
D31_US	D31_US	94.9	91.52	0.17	Allowed
D30_DS	D30_DS	94.939	91.46	0.17	Allowed
D27_DS	D27_DS	95	92.4		Allowed
Out_1.1	Out_1.1	95	88.95		Allowed
D26_US	D26_US	95.09	94.114		Allowed
D27_US	D27_US	95.09	93.435	0.17	Allowed
D30_US	D30_US	95.187	91.42		Allowed
D29_DS	D29_DS	95.2	91.51		Allowed
D29_US	D29_US	95.213	91.019	0.17	Allowed
D28_DS	D28_DS	95.22	91.05		Allowed
Out_1	Out_1	95.269	89.274		Allowed
Out_2	Out_2	95.28	87.31	0.17	Allowed
Out_2.2	Out_2.2	95.28	87.21		None
D16.2_DS	D16.2_DS	95.39	87.33		Allowed
Out3.1	Out3.1	95.407	91.93	0.17	Allowed
D31_DS	D31_DS	95.52	91.16	0.17	Allowed
D28_US	D28_US	95.691	90.6		Allowed
D25_US	D25_US	95.71	92.811		Allowed
D7.1_US	D7.1_US	95.725	92.5		Allowed
D24_US	D24_US	95.769	92.51		Allowed
Out_4	Out_4	95.838	91.39		Allowed
D25_DS	D25_DS	95.91	92.38		Allowed
D26.1_US	D26.1_US	95.911	89.26		Allowed
D26_DS	D26_DS	95.911	92.99	0.17	Allowed
D7_US.1	D7_US.1	95.928	92.578		Allowed
D22_US	D22_US	95.94	92.46		Allowed
D8_DS	D8_DS	95.949	90.85		Allowed
D28.1_US	D28.1_US	95.971	92.437	0.17	Allowed
D7_DS	D7_DS	96	91.67		Allowed
D8_US	D8_US	96	91.52		Allowed
D24_DS	D24_DS	96.01	92.01		Allowed
D23_US	D23_US	96.03	89.2		Allowed
Node651	Node651	96.03	89.1		Allowed
D22_DS	D22_DS	96.11	88.49		Allowed
D20_US	D20_US	96.24	89.5		Allowed
D19_US	D19_US	96.31	92.594		Allowed
D7_US	D7_US	96.32	92.73		Allowed
D13_US	D13_US	96.366	92.84	0.17	Allowed
D18_US	D18_US	96.37	92.73		Allowed
Out_3	Out_3	96.381	90.113		Allowed
D6_DS	D6_DS	96.419	92.58		Allowed
D6_US	D6_US	96.43	92.89		Allowed
D15_US	D15_US	96.44	92.7		Allowed
D18_DS	D18_DS	96.451	94.389		Allowed
D23_DS	D23_DS	96.496	92.79		Allowed
D16_DS	D16_DS	96.517	92.73		Allowed
D3_DS	D3_DS	96.524	93.06		Allowed
D14_US	D14_US	96.56	91.9	0.17	Allowed
D5_US	D5_US	96.566	92.97		Allowed
D4.1_DS	D4.1_DS	96.58	90.7		Allowed
D16.1_US	D16.1_US	96.587	90.65		Allowed
D16_US	D16_US	96.587	92.42		Allowed
D21_DS	D21_DS	96.59	89.26		Allowed
D15_DS	D15_DS	96.59	92.1	0.17	Allowed
D17_US	D17_US	96.645	93.06		Allowed
D17_DS	D17_DS	96.645	92.25		Allowed
D5_DS	D5_DS	96.682	92.87		Allowed
D2_DS	D2_DS	96.756	91.45	0.17	Allowed
D3_US	D3_US	96.767	93.66		Allowed
D13.1_US	D13.1_US	96.78	91.1		Allowed
D14_DS	D14_DS	97.078	92.67		Allowed
D12_DS	D12_DS	97.098	93.2		Allowed
D11_DS	D11_DS	97.134	93.95		Allowed
D13_DS	D13_DS	97.435	92.89		Allowed
D4.1_US	D4.1_US	97.519	92.04		Allowed
D12_US	D12_US	97.625	93.91	0.17	Allowed
D4_US	D4_US	97.745	92.73		Allowed
D21_US	D21_US	97.803	87.73		Allowed
D11_US	D11_US	97.98	94.848		Allowed
D2B_US	D2B_US	98.785	93.671		Allowed
D4_DS	D4_DS	98.816	92.61		Allowed
D1_DS	D1_DS	100	95.26	0.17	Allowed
D2_US	D2_US	100	95	0.17	Allowed
D1_US	D1_US	100.113	95.748		Allowed
D10_DS	D10_DS	100.229	95.08	0.17	Allowed
D10_US	D10_US	100.278	95.18		Allowed

EXISTING CULVERT LINK INPUT DATA

Link Name 0	Conduit Design Option 0	Diameter (Height) ft	Length ft	Roughness 0	Shape 0	Upstream Invert Elevation ft	Downstream Invert Elevation ft	Natural Section Shape GLDB Reference 0	Initial Water Surface Slope 0	Vertical Shift ft	Horizontal Distortion Factor ft	Cross-section Identification Number 0	Left Channel Length ft	Right Channel Length ft	User-defined Conduit using GLDB	Roughness
D7_D8_Cul	Circular	2	45	0.013	Circular	91.84	91.52		0.001	0	0	0	0	0	0	0.013
D7_D8_Cul	Circular	2	45	0.013	Circular	91.67	91.57		0.001	0	0	0	0	0	0	0.013
Rd_Cross3	Circular	2.5	104	0.009	Circular	90.7	90.65		0.001	0	0	0	0	0	0	0.009
Rd_Cross3	Circular	2.5	104	0.009	Circular	90.75	90.77		0.001	0	0	0	0	0	0	0.009
Rd_Cross3	Circular	2.5	104	0.009	Circular	90.89	90.86		0.001	0	0	0	0	0	0	0.009
D16.2_Out-2	Circular	2	99	0.009	Circular	87.35	87.44		0.001	0	0	0	0	0	0	0.009
D16.2_Out-2	Circular	3	99	0.009	Circular	87.33	87.31		0.001	0	0	0	0	0	0	0.009
Rd_Cross4	Circular	2	83	0.013	Circular	92.89	92.83		0.001	0	0	0	0	0	0	0.013
Rd_Cross4	Circular	2	83	0.013	Circular	92.87	92.65		0.001	0	0	0	0	0	0	0.013
D22_D23_Cul	Circular	1	24	0.024	Circular	92.79	92.46		0.001	0	0	0	0	0	0	0.024
D21_D22_Cul	Circular	3	81	0.024	Circular	88.49	87.83		0.001	0	0	0	0	0	0	0.024
D1	Circular	0	550	0.014	Natural	95.748	95.33	D1_XS	0.001	0	0	0	550	550	0	0.014
D10	Circular	0	906	0.014	Natural	95.18	95.131	D10_XS	0.001	0	0	0	906	906	0	0.014
D10_D11_Cul	Circular	1.25	60	0.013	Circular	95.08	94.89		0.001	0	0	0	0	0	0	0.013
D11	Circular	0	383	0.014	Natural	94.848	94.03	D11_XS	0.001	0	0	0	383	383	0	0.014
D11_D12_Cul	Circular	2	131	0.015	Rectangular	93.95	93.91		0.001	0	0	0	0	0	0	0.015
D12	Circular	0	1106	0.014	Natural	94.356	93.829	D12_XS	0.001	0	0	0	1106	1106	0	0.014
D12_D13_Cul	Circular	1.5	46	0.009	Circular	93.2	92.84		0.001	0	0	0	0	0	0	0.009
D13	Circular	0	170	0.014	Natural	93.675	91.296	D13_XS	0.001	0	0	0	170	170	0	0.014
D13.1	Circular	0	1174	0.014	Natural	92.601	93.268	D13.1_XS	0.001	0	0	0	1174	1174	0	0.014
D13_D14_Cul	Circular	2	110	0.009	Circular	92.09	92.06		0.001	0	0	0	0	0	0	0.009
D13_Out_Cul	Circular	3.5	81	0.009	Circular	91.1	89.67		0.001	0	0	0	0	0	0	0.009
D14	Circular	0	214	0.014	Natural	93.128	93.657	D14_XS	0.001	0	0	0	214	214	0	0.014
D14_D15_Cul	Circular	2	84	0.009	Circular	92.67	92.7		0.001	0	0	0	0	0	0	0.009
D15	Circular	0	158	0.014	Natural	93.458	93.301	D15_XS	0.001	0	0	0	158	158	0	0.014
D15_D16_Cul	Circular	2	103	0.009	Circular	92.1	92.42		0.001	0	0	0	0	0	0	0.009
D16	Circular	0	37	0.014	Natural	93.185	91.898	D16_XS	0.001	0	0	0	37	37	0	0.014
D16.1	Circular	0	68	0.014	Natural	93.62	91.898	D16.1_XS	0.001	0	0	0	68	68	0	0.014
D16.2	Circular	0	43	0.014	Natural	91.626	91.024	D16.2_XS	0.001	0	0	0	43	43	0	0.014
D16_D17_Cul	Circular	2	82	0.009	Circular	93.06	92.73		0.001	0	0	0	0	0	0	0.009
D17	Circular	0	218	0.014	Natural	94.236	94.284	D17_XS	0.001	0	0	0	218	218	0	0.014
D17_D18_Cul	Circular	2.5	83	0.009	Circular	92.73	92.25		0.001	0	0	0	0	0	0	0.009
D17_Out-2	Circular	0	115	0.014	Natural	94.463	92.8	D17_Out-2_XS	0.001	0	0	0	115	115	0	0.014
D18	Circular	0	278	0.014	Natural	94.389	94.028	D18_XS	0.001	0	0	0	278	278	0	0.014
D19	Circular	0	129	0.014	Natural	92.594	91.93	D19_XS	0.001	0	0	0	129	129	0	0.014
D1_D2_Cul	Circular	1.5	63.19	0.013	Circular	95.26	95		0.001	0	0	0	0	0	0	0.013
D2	Circular	0	806.98	0.014	Natural	95	94.259	D2_XS	0.001	0	0	0	806.98	806.98	0	0.014
D20	Circular	0	400	0.014	Natural	89.956	90.113	D20_XS	0.001	0	0	0	400	400	0	0.014
D20_D21_Cul	Circular	2.5	81	0.024	Circular	89.26	89.5		0.001	0	0	0	0	0	0	0.024
D21	Circular	0	251	0.014	Natural	91.024	89.811	D21_XS	0.001	0	0	0	251	251	0	0.014
D22	Circular	0	78	0.014	Natural	93.12	89.034	D22_XS	0.001	0	0	0	78	78	0	0.014
D23	Circular	0	89	0.014	Natural	92.599	93.235	D23_XS	0.001	0	0	0	89	89	0	0.014
D23_D24_Cul	Circular	1	67	0.009	Circular	92.01	91.12		0.001	0	0	0	0	0	0	0.009
D24	Circular	0	199	0.014	Natural	93.06	92.591	D24_XS	0.001	0	0	0	199	199	0	0.014
D24_D25_Cul	Circular	1.5	80	0.013	Circular	92.38	92.51		0.001	0	0	0	0	0	0	0.013
D25	Circular	0	179	0.014	Natural	92.811	93.038	D25_XS	0.001	0	0	0	179	179	0	0.014
D25_D26_Cul	Circular	1.25	37	0.012	Circular	92.99	92.85		0.001	0	0	0	0	0	0	0.012
D26	Circular	0	132.5	0.014	Natural	94.114	92.814	D26_XS	0.001	0	0	0	132.5	132.5	0	0.014
D26.1	Circular	0	25	0.014	Natural	92.782	93.082	D26.1_XS	0.001	0	0	0	25	25	0	0.014
D26.1_D28_Cul	Circular	2	82	0.024	Circular	90.6	89.34		0.001	0	0	0	0	0	0	0.024
D27	Circular	0	36	0.014	Natural	93.435	92.97	D27_XS	0.001	0	0	0	36	36	0	0.014
D27_D28.1_Cul	Circular	2	63	0.024	Circular	92.4	92.44		0.001	0	0	0	0	0	0	0.024
D28	Circular	0	15	0.014	Natural	92.157	92.437	D28_XS	0.001	0	0	0	15	15	0	0.014
D28.1	Circular	0	463	0.014	Natural	92.437	92.092	D28.1_XS	0.001	0	0	0	463	463	0	0.014
D28_D29_Cul	Circular	2	123	0.009	Circular	91.05	91.019		0.001	0	0	0	0	0	0	0.009
D29	Circular	0	62	0.014	Natural	92.47	92.253	D29_XS	0.001	0	0	0	62	62	0	0.014
D29_D30_Cul	Circular	2	122	0.009	Circular	91.51	91.42		0.001	0	0	0	0	0	0	0.009
D2B	Circular	0	1348.02	0.014	Natural	94.259	91.45	D2_XS	0.001	0	0	0	1348.02	1348.02	0	0.014
D3	Circular	0	1055	0.014	Natural	93.66	93.417	D3_XS	0.001	0	0	0	1055	1055	0	0.014
D30	Circular	0	232	0.014	Natural	92.458	92.21	D30_XS	0.001	0	0	0	232	232	0	0.014
D30_D31_Cul	Circular	2	55	0.013	Circular	91.46	91.52		0.001	0	0	0	0	0	0	0.013
D31	Circular	0	113	0.014	Natural	92.14	91.886	D31_XS	0.001	0	0	0	113	113	0	0.014
D3_D4_Cul	Circular	2	33	0.009	Circular	93.06	92.73		0.001	0	0	0	0	0	0	0.009
D4	Circular	0	213	0.014	Natural	93.38	93.154	D4_XS	0.001	0	0	0	213	213	0	0.014
D4.1	Circular	0	425	0.014	Natural	93.154	91.545	D4.1_XS	0.001	0	0	0	425	425	0	0.014
D4.2	Circular	0	173	0.014	Natural	91.545	93.781	D4.2_XS	0.001	0	0	0	173	173	0	0.014
D4_D5_Cul	Circular	2	82	0.009	Circular	92.61	92.97		0.001	0	0	0	0	0	0	0.009
D5	Circular	0	192	0.014	Natural	93.492	93.608	D5_XS	0.001	0	0	0	192	192	0	0.014
D5_D6_Cul	Circular	1.5	82	0.009	Circular	92.87	92.89		0.001	0	0	0	0	0	0	0.009
D6	Circular	0	238	0.014	Natural	93.515	92.918	D6_XS	0.001	0	0	0	238	238	0	0.014
D6_D7_Cul	Circular	2	82	0.024	Circular	92.58	92.73		0.001	0	0	0	0	0	0	0.024
D7	Circular	0	1496.305	0.014	Natural	92.73	92.703	D7_XS	0.001	0	0	0	1496.305	1496.305	0	0.014
D7.1	Circular	0	60	0.014	Natural	92.5	92.354	D7.1_XS	0.001	0	0	0	60	60	0	0.014
D7.2	Circular	0	772.695	0.014	Natural	92.703	92.5	D7_XS	0.001	0	0	0	772.695	772.695	0	0.014
D8	Circular	0	160	0.014	Natural	92.14	91.503	D8_XS	0.001	0	0	0	160	160	0	0.014
D9	Circular	0	74	0.014	Natural	91.503	91.392	D9_XS	0.001	0	0	0	74	74	0	0.014
D_Out1.1	Circular	0	100	0.014	Natural	89.274	88.95	D_Out1.1_XS	0.001	0	0	0	0	0	0	0.014
Link615	Circular	2.5	33	0.013	Circular	89.2	89.1		0.001	0	0	0	0	0	0	0.013
Link616	Circular	2.5	168	0.024	Circular	89.43	89.2		0.001	0	0	0	0	0	0	0.024
Link617	Circular	2.5	129	0.024	Circular	89.44	89.43		0.001	0	0	0	0	0	0	0.024
Link618	Circular	2.5	214	0.024	Circular	89.44	89.26		0.001	0	0	0	0	0	0	0.024
Out_2.2L	Circular	0	33	0.014	Natural	87.31	87.28	D_Out_2.2	0.001	0	0	0	33	33	0	0.014
Rd_Cross1	Circular	2.5	84	0.009	Circular	91.45	91.23		0.001	0	0	0	0	0	0	0.009
Rd_Cross2	Circular	1.5	84	0.009	Circular	92.04	91.9		0.001	0	0	0	0	0	0	0.009
Rd_Cross5	Circular	2	41	0.024	Circular	91.16	90.85		0.001	0	0	0	0	0	0	0.024
D21_D22_Cul																
D22_D23_Cul																

NOTE:

NODES LOCATION CAN BE FOUND IN THE DRAINAGE REPORT TITLED "DRAINAGE IMPACT ANALYSIS FOR STELLA ROAD EXPANSION WITHIN SEABOURNE CREEK WATERSHED FORT BEND, TEXAS", EXHIBIT 8A.

M:\04755.000 20116 Stella Road\CAD\DWG\05- 04755 - Drainage Area Maps.dwg

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	EXISTING CULVERT INPUT DATA
DRAWN BY:	NS
CK'D BY:	MJ
SCALE:	N/A
CIVIL STANDARD	
DATE:	6/18/24
SHEET NO:	73 / 133

PROPOSED CULVERT NODE 100-YR RESULT

Name	Scenario	Node Name 0	Max Water Elevation ft	Max Volume ft^3	Node Inflow ft^3
Basin1_Opt2	100-Year Storm	Basin1_Opt2	94.825	1381275.708	656456.154
D10_DS	100-Year Storm	D10_DS	96.711	36.456	0
D10_US	100-Year Storm	D10_US	96.711	21.501	100815.313
D11_DS	100-Year Storm	D11_DS	96.731	35.451	0
D11_US	100-Year Storm	D11_US	96.731	36.078	0
D12_DS	100-Year Storm	D12_DS	95.214	42.529	0
D12_US	100-Year Storm	D12_US	96.734	35.99	114980.557
D12_US.1	100-Year Storm	D12_US.1	96.734	38.377	0
D12_US.1.1	100-Year Storm	D12_US.1.1	95.215	32.351	0
D13.1_US	100-Year Storm	D13.1_US	95.214	51.698	0
D13_DS	100-Year Storm	D13_DS	96.086	35.004	0
D13_DS.1	100-Year Storm	D13_DS.1	95.214	37.147	0
D13_DS.2	100-Year Storm	D13_DS.2	96.086	30.481	0
D13_US	100-Year Storm	D13_US	95.214	43.782	0
D13_US.1	100-Year Storm	D13_US.1	95.214	47.049	0
D14_DS	100-Year Storm	D14_DS	96.084	35.365	138723.595
D14_US	100-Year Storm	D14_US	96.085	37.139	0
D15_DS	100-Year Storm	D15_DS	95.967	52.117	0
D15_US	100-Year Storm	D15_US	95.968	35.158	0
D16.1_US	100-Year Storm	D16.1_US	95.768	57.399	0
D16.2_DS	100-Year Storm	D16.2_DS	95.766	2338.4	0
D16_DS	100-Year Storm	D16_DS	95.768	57.274	0
D16_US	100-Year Storm	D16_US	95.768	50.865	0
D17_DS	100-Year Storm	D17_DS	95.77	49.136	0
D17_US	100-Year Storm	D17_US	95.77	54.791	0
D18_DS	100-Year Storm	D18_DS	95.771	38.215	47104.329
D18_US	100-Year Storm	D18_US	95.771	47.89	0
D19_US	100-Year Storm	D19_US	93.39	10.006	0
D1_DS	100-Year Storm	D1_DS	97.141	39.594	0
D1_US	100-Year Storm	D1_US	97.141	29.166	0
D20_US	100-Year Storm	D20_US	92.192	33.832	107948.85
D21_DS	100-Year Storm	D21_DS	93.901	59.078	0
D21_US	100-Year Storm	D21_US	94.124	80.417	0
D22_DS	100-Year Storm	D22_DS	94.93	83.779	0
D22_US	100-Year Storm	D22_US	95.245	34.997	0
D23_DS	100-Year Storm	D23_DS	95.265	31.176	0
D23_US	100-Year Storm	D23_US	95.285	76.736	261742.407
D24_DS	100-Year Storm	D24_DS	95.211	40.225	0
D24_US	100-Year Storm	D24_US	95.211	33.956	0
D25_DS	100-Year Storm	D25_DS	95.218	35.657	0
D25_US	100-Year Storm	D25_US	95.218	30.245	0
D26.1_US	100-Year Storm	D26.1_US	95.288	75.752	0
D26_DS	100-Year Storm	D26_DS	95.288	28.88	0
D26_US	100-Year Storm	D26_US	95.288	1108.697	0
D27_DS	100-Year Storm	D27_DS	94.739	29.393	0
D27_US	100-Year Storm	D27_US	94.739	16.387	0
D28.1_US	100-Year Storm	D28.1_US	94.738	28.918	66906.339
D28_DS	100-Year Storm	D28_DS	94.725	46.186	0
D28_US	100-Year Storm	D28_US	94.74	52.024	0
D29_DS	100-Year Storm	D29_DS	94.347	35.646	0
D29_US	100-Year Storm	D29_US	94.353	41.896	0
D2_DS	100-Year Storm	D2_DS	96.718	69.344	2221285.356
D2_US	100-Year Storm	D2_US	97.14	40.842	98049.784
D2_US.1	100-Year Storm	D2_US.1	96.718	1285.002	0
D2_US.2	100-Year Storm	D2_US.2	97.137	39.8	107282.869
D2B_US	100-Year Storm	D2B_US	96.737	38.413	115393.415
D2B_US.1	100-Year Storm	D2B_US.1	96.734	39.636	115393.415
D30_DS	100-Year Storm	D30_DS	93.885	30.477	0
D30_US	100-Year Storm	D30_US	93.973	32.087	0
D31_DS	100-Year Storm	D31_DS	93.342	27.413	0
D31_US	100-Year Storm	D31_US	93.536	25.335	0
D3_DS	100-Year Storm	D3_DS	96.259	44.717	137463.164
D3_DS.1	100-Year Storm	D3_DS.1	96.716	1191.691	57717.88
D3_US	100-Year Storm	D3_US	96.277	42.439	0
D4.1_DS	100-Year Storm	D4.1_DS	96.1	60.185	0
D4.1_US	100-Year Storm	D4.1_US	96.109	46.608	0
D4.1_US.1	100-Year Storm	D4.1_US.1	96.102	58.964	379091.294
D4_DS	100-Year Storm	D4_DS	96.1	57.421	0
D4_US	100-Year Storm	D4_US	96.129	44.347	0
D5_DS	100-Year Storm	D5_DS	96.1	51.649	36543.347
D5_US	100-Year Storm	D5_US	96.1	56.172	0
D6_DS	100-Year Storm	D6_DS	96.1	44.237	0
D6_US	100-Year Storm	D6_US	96.1	50.394	0
D7.1_US	100-Year Storm	D7.1_US	93.303	10.095	0
D7_DS	100-Year Storm	D7_DS	93.124	18.272	0
D7_US	100-Year Storm	D7_US	93.848	14.05	101348.761
D7_US.1	100-Year Storm	D7_US.1	93.846	15.92	66303.446
D8_DS	100-Year Storm	D8_DS	92.833	24.914	0
D8_US	100-Year Storm	D8_US	93.097	19.813	0
D_Co_Out	100-Year Storm	D_Co_Out	95.556	8.37	0
DW1N_Out	100-Year Storm	DW1N_Out	96.03	12.068	0
DW1S_Out	100-Year Storm	DW1S_Out	95.915	11.628	0
DW2N_US	100-Year Storm	DW2N_US	96.663	17.132	0
DW2N_US.1	100-Year Storm	DW2N_US.1	96.647	15.038	113943.611
DW2S_DS	100-Year Storm	DW2S_DS	95.915	8.487	0
Node650	100-Year Storm	Node650	89.2	0	0
Node651	100-Year Storm	Node651	89.1	0	0
Node652	100-Year Storm	Node652	95.449	34623.146	0
Node653	100-Year Storm	Node653	95.853	87123.784	476578.977
Out3.1	100-Year Storm	Out3.1	92.426	6.233	0
Out_1	100-Year Storm	Out_1	90.374	13.827	0
Out_1.1	100-Year Storm	Out_1.1	89.757	10.138	0.041
Out_1.2	100-Year Storm	Out_1.2	90.349	15.069	0
Out_2	100-Year Storm	Out_2	88.679	17.206	0
Out_2.2	100-Year Storm	Out_2.2	88.211	12.582	0
Out_3	100-Year Storm	Out_3	91.257	14.399	0.021
Out_4	100-Year Storm	Out_4	92.279	11.173	0.004
Sheriff_Outfall	100-Year Storm	Sheriff_Outfall	96.279	75.132	1298560.367

PROPOSED CULVERT NODE 10-YR RESULT

Name	Scenario	Node Name 0	Max Water Elevation ft	Max Volume ft^3	Node Inflow ft^3
Basin1_Opt2	10-Year Storm	Basin1_Opt2	93.648	912239.284	334337.348
D10_DS	10-Year Storm	D10_DS	95.974	27.195	0
D10_US	10-Year Storm	D10_US	95.979	12.302	51371.947
D11_DS	10-Year Storm	D11_DS	95.921	25.264	0
D11_US	10-Year Storm	D11_US	95.921	25.901	0
D12_DS	10-Year Storm	D12_DS	93.899	26.002	0
D12_US	10-Year Storm	D12_US	95.912	25.659	59597.205
D12_US.1	10-Year Storm	D12_US.1	95.912	28.042	0
D12_US.1.1	10-Year Storm	D12_US.1.1	93.899	15.824	0
D13.1_US	10-Year Storm	D13.1_US	93.899	35.173	0
D13_DS	10-Year Storm	D13_DS	94.658	20.076	0
D13_DS.1	10-Year Storm	D13_DS.1	93.899	20.622	0
D13_DS.2	10-Year Storm	D13_DS.2	94.658	12.537	0
D13_US	10-Year Storm	D13_US	93.899	27.257	0
D13_US.1	10-Year Storm	D13_US.1	93.899	30.524	0
D14_DS	10-Year Storm	D14_DS	94.657	17.424	69840.797
D14_US	10-Year Storm	D14_US	94.657	19.194	0
D15_DS	10-Year Storm	D15_DS	94.613	35.084	0
D15_US	10-Year Storm	D15_US	94.614	18.15	0
D16.1_US	10-Year Storm	D16.1_US	94.585	42.532	0
D16.2_DS	10-Year Storm	D16.2_DS	94.583	43.771	0
D16_DS	10-Year Storm	D16_DS	94.585	42.408	0
D16_US	10-Year Storm	D16_US	94.585	36	0
D17_DS	10-Year Storm	D17_DS	94.586	34.254	0
D17_US	10-Year Storm	D17_US	94.586	39.908	0
D18_DS	10-Year Storm	D18_DS	94.587	23.334	24905.078
D18_US	10-Year Storm	D18_US	94.587	33.008	0
D19_US	10-Year Storm	D19_US	93.246	8.192	0
D1_DS	10-Year Storm	D1_DS	96.494	31.468	0
D1_US	10-Year Storm	D1_US	96.494	21.057	0
D20_US	10-Year Storm	D20_US	91.824	29.201	55417.52
D21_DS	10-Year Storm	D21_DS	92.485	40.531	0
D21_US	10-Year Storm	D21_US	93.012	66.372	0
D22_DS	10-Year Storm	D22_DS	93.291	60.327	0
D22_US	10-Year Storm	D22_US	93.752	16.234	0
D23_DS	10-Year Storm	D23_DS	94.849	25.873	0
D23_US	10-Year Storm	D23_US	94.87	71.252	131418.505
D24_DS	10-Year Storm	D24_DS	94.832	35.467	0
D24_US	10-Year Storm	D24_US	94.833	29.189	0
D25_DS	10-Year Storm	D25_DS	94.834	30.837	0
D25_US	10-Year Storm	D25_US	94.834	25.422	0
D26.1_US	10-Year Storm	D26.1_US	94.835	70.051	0
D26_DS	10-Year Storm	D26_DS	94.835	23.185	0
D26_US	10-Year Storm	D26_US	94.835	9.056	0
D27_DS	10-Year Storm	D27_DS	94.313	24.039	0
D27_US	10-Year Storm	D27_US	94.313	11.034	0
D28.1_US	10-Year Storm	D28.1_US	94.312	23.565	33585.764
D28_DS	10-Year Storm	D28_DS	94.282	40.613	0
D28_US	10-Year Storm	D28_US	94.316	46.695	0
D29_DS	10-Year Storm	D29_DS	94.003	31.329	0
D29_US	10-Year Storm	D29_US	94.014	37.64	0
D2_DS	10-Year Storm	D2_DS	95.419	53.019	990486.574
D2_US	10-Year Storm	D2_US	96.493	32.709	48665.824
D2_US.1	10-Year Storm	D2_US.1	95.42	50.896	0
D2_US.2	10-Year Storm	D2_US.2	96.489	31.657	107284.182
D2B_US	10-Year Storm	D2B_US	95.907	27.98	56584.135
D2B_US.1	10-Year Storm	D2B_US.1	95.858	28.63	115395.149
D30_DS	10-Year Storm	D30_DS	93.624	27.189	0
D30_US	10-Year Storm	D30_US	93.755	29.336	0
D31_DS	10-Year Storm	D31_DS	93.062	23.906	0
D31_US	10-Year Storm	D31_US	93.374	23.3	0
D3_DS	10-Year Storm	D3_DS	94.735	25.572	68524.407
D3_DS.1	10-Year Storm	D3_DS.1	95.419	40.327	25563.083
D3_US	10-Year Storm	D3_US	94.739	23.109	0
D4.1_DS	10-Year Storm	D4.1_DS	94.648	41.944	0
D4.1_US	10-Year Storm	D4.1_US	94.658	28.373	0
D4.1_US.1	10-Year Storm	D4.1_US.1	94.655	40.774	187624.549
D4_DS	10-Year Storm	D4_DS	94.648	39.181	0
D4_US	10-Year Storm	D4_US	94.666	25.961	0
D5_DS	10-Year Storm	D5_DS	94.649	33.412	17763.76
D5_US	10-Year Storm	D5_US	94.649	37.935	0
D6_DS	10-Year Storm	D6_DS	94.649	25.999	0
D6_US	10-Year Storm	D6_US	94.649	32.156	0
D7.1_US	10-Year Storm	D7.1_US	93.106	7.612	0
D7_DS	10-Year Storm	D7_DS	92.886	15.282	0
D7_US	10-Year Storm	D7_US	93.63	11.31	49266.88
D7_US.1	10-Year Storm	D7_US.1	93.632	13.23	32824.989
D8_DS	10-Year Storm	D8_DS	92.692	23.147	0
D8_US	10-Year Storm	D8_US	92.874	17.018	0
D_Co_Out	10-Year Storm	D_Co_Out	95.207	3.984	0
DW1N_Out	10-Year Storm	DW1N_Out	95.536	5.86	0
DW1S_Out	10-Year Storm	DW1S_Out	95.487	6.245	0
DW2N_US	10-Year Storm	DW2N_US	96	8.797	0
DW2N_US.1	10-Year Storm	DW2N_US.1	96.072	7.821	51122.415
DW2S_DS	10-Year Storm	DW2S_DS	95.24	0	0
Node650	10-Year Storm	Node650	89.2	0	0
Node651	10-Year Storm	Node651	89.1	0	0
Node652	10-Year Storm	Node652	95.032	21145.097	0
Node653	10-Year Storm	Node653	95.221	43967.968	242745.684
Out3.1	10-Year Storm	Out3.1	92.335	5.088	0
Out_1	10-Year Storm	Out_1	90.102	10.4	0
Out_1.1	10-Year Storm	Out_1.1	89.502	6.948	0
Out_1.2	10-Year Storm	Out_1.2	90.04	11.189	0
Out_2	10-Year Storm	Out_2	88.295	12.372	0
Out_2.2	10-Year Storm	Out_2.2	87.893	8.582	0
Out_3	10-Year Storm	Out_3	91.005	11.207	0.044
Out_4	10-Year Storm	Out_4	92.175	9.87	0
Sheriff_Outfall	10-Year Storm	Sheriff_Outfall	96.511	78.047	660688.37

PROPOSED CULVERT NODE 5-YR RESULT

Name	Scenario	Node Name 0	Max Water Elevation ft	Max Volume ft^3	Node Inflow ft^3
Basin1_Opt2	5-Year Storm	Basin1_Opt2	93.134	714598.167	264979.813
D10_DS	5-Year Storm	D10_DS	95.844	25.562	0
D10_US	5-Year Storm	D10_US	95.85	10.681	40327.028
D11_DS	5-Year Storm	D11_DS	95.804	23.806	0
D11_US	5-Year Storm	D11_US	95.805	24.44	0
D12_DS	5-Year Storm	D12_DS	93.555	21.674	0
D12_US	5-Year Storm	D12_US	95.798	24.228	47774.674
D12_US.1	5-Year Storm	D12_US.1	95.798	26.612	0
D12_US.1.1	5-Year Storm	D12_US.1.1	93.555	11.497	0
D13.1_US	5-Year Storm	D13.1_US	93.554	30.84	0
D13_DS	5-Year Storm	D13_DS	94.329	15.941	0
D13_DS.1	5-Year Storm	D13_DS.1	93.554	16.289	0
D13_DS.2	5-Year Storm	D13_DS.2	94.329	8.405	0
D13_US	5-Year Storm	D13_US	93.554	22.926	0
D13_US.1	5-Year Storm	D13_US.1	93.554	26.191	0
D14_DS	5-Year Storm	D14_DS	94.328	13.29	54121.439
D14_US	5-Year Storm	D14_US	94.328	15.055	0
D15_DS	5-Year Storm	D15_DS	94.273	30.828	0
D15_US	5-Year Storm	D15_US	94.277	13.91	0
D16.1_US	5-Year Storm	D16.1_US	94.256	38.407	0
D16.2_DS	5-Year Storm	D16.2_DS	94.255	39.641	0
D16_DS	5-Year Storm	D16_DS	94.257	38.283	0
D16_US	5-Year Storm	D16_US	94.256	31.875	0
D17_DS	5-Year Storm	D17_DS	94.258	30.135	0
D17_US	5-Year Storm	D17_US	94.258	35.785	0
D18_DS	5-Year Storm	D18_DS	94.259	19.212	21002.807
D18_US	5-Year Storm	D18_US	94.259	28.886	0
D19_US	5-Year Storm	D19_US	93.201	7.63	0
D1_DS	5-Year Storm	D1_DS	96.36	29.782	0
D1_US	5-Year Storm	D1_US	96.36	19.351	0
D20_US	5-Year Storm	D20_US	91.686	27.473	43206.374
D21_DS	5-Year Storm	D21_DS	92.085	35.499	0
D21_US	5-Year Storm	D21_US	92.782	63.49	0
D22_DS	5-Year Storm	D22_DS	92.963	56.206	0
D22_US	5-Year Storm	D22_US	93.687	15.42	0
D23_DS	5-Year Storm	D23_DS	94.784	25.057	0
D23_US	5-Year Storm	D23_US	94.8	70.369	103999.185
D24_DS	5-Year Storm	D24_DS	94.719	34.047	0
D24_US	5-Year Storm	D24_US	94.719	27.764	0
D25_DS	5-Year Storm	D25_DS	94.718	29.384	0
D25_US	5-Year Storm	D25_US	94.718	22.066	0
D26.1_US	5-Year Storm	D26.1_US	94.707	68.448	0
D26_DS	5-Year Storm	D26_DS	94.707	21.577	0
D26_US	5-Year Storm	D26_US	94.707	7.453	0
D27_DS	5-Year Storm	D27_DS	94.218	22.849	0
D27_US	5-Year Storm	D27_US	94.219	9.853	0
D28.1_US	5-Year Storm	D28.1_US	94.215	22.349	27303.384
D28_DS	5-Year Storm	D28_DS	94.177	39.298	0
D28_US	5-Year Storm	D28_US	94.22	45.488	0
D29_DS	5-Year Storm	D29_DS	93.925	30.349	0
D29_US	5-Year Storm	D29_US	93.938	36.681	0
D2_DS	5-Year Storm	D2_DS	95.042	48.276	735952.327
D2_US	5-Year Storm	D2_US	96.359	31.022	38528.949
D2_US.1	5-Year Storm	D2_US.1	95.045	46.175	0
D2_US.2	5-Year Storm	D2_US.2	96.355	29.967	107284.325
D2B_US	5-Year Storm	D2B_US	95.813	26.801	44644.8
D2B_US.1	5-Year Storm	D2B_US.1	95.759	27.378	115396.078
D30_DS	5-Year Storm	D30_DS	93.567	26.473	0
D30_US	5-Year Storm	D30_US	93.706	28.73	0
D31_DS	5-Year Storm	D31_DS	92.991	23.011	0
D31_US	5-Year Storm	D31_US	93.339	22.858	0
D3_DS	5-Year Storm	D3_DS	94.382	21.14	53040.641
D3_DS.1	5-Year Storm	D3_DS.1	95.042	35.586	19019.565
D3_US	5-Year Storm	D3_US	94.382	18.628	0
D4.1_DS	5-Year Storm	D4.1_DS	94.314	37.754	0
D4.1_US	5-Year Storm	D4.1_US	94.328	24.229	0
D4.1_US.1	5-Year Storm	D4.1_US.1	94.323	36.608	146708.465
D4_DS	5-Year Storm	D4_DS	94.315	34.991	0
D4_US	5-Year Storm	D4_US	94.338	21.84	0
D5_DS	5-Year Storm	D5_DS	94.316	29.224	13681.371
D5_US	5-Year Storm	D5_US	94.316	33.748	0
D6_DS	5-Year Storm	D6_DS	94.316	21.814	0
D6_US	5-Year Storm	D6_US	94.316	27.97	0
D7.1_US	5-Year Storm	D7.1_US	93.054	6.965	0
D7_DS	5-Year Storm	D7_DS	92.82	14.452	0
D7_US	5-Year Storm	D7_US	93.566	10.507	38583.613
D7_US.1	5-Year Storm	D7_US.1	93.567	12.415	24185.091
D8_DS	5-Year Storm	D8_DS	92.654	22.668	0
D8_US	5-Year Storm	D8_US	92.812	16.229	0
D_Co_Out	5-Year Storm	D_Co_Out	95.156	3.341	0
DW1N_Out	5-Year Storm	DW1N_Out	95.473	5.063	0
DW1S_Out	5-Year Storm	DW1S_Out	95.429	5.511	0
DW2N_US	5-Year Storm	DW2N_US	95.884	7.344	0
DW2N_US.1	5-Year Storm	DW2N_US.1	96.004	6.957	38101.185
DW2S_DS	5-Year Storm	DW2S_DS	95.85	0	0
Node650	5-Year Storm	Node650	89.2	0	0
Node651	5-Year Storm	Node651	89.1	0	0
Node652	5-Year Storm	Node652	94.91	18151.529	0
Node653	5-Year Storm	Node653	95.035	35657.035	192104.64
Out3.1	5-Year Storm	Out3.1	92.3	4.647	0
Out_1	5-Year Storm	Out_1	90.07	10.003	0
Out_1.1	5-Year Storm	Out_1.1	89.483	6.701	0
Out_1.2	5-Year Storm	Out_1.2	90.008	10.779	0
Out_2	5-Year Storm	Out_2	88.267	12.022	0
Out_2.2	5-Year Storm	Out_2.2	87.872	8.316	0
Out_3	5-Year Storm	Out_3	90.918	10.112	0.06
Out_4	5-Year Storm	Out_4	92.147	9.516	0.001
Sheriff_Outfall	5-Year Storm	Sheriff_Outfall	93.502	44.286	523052.2

NOTE:

NODES LOCATION CAN BE FOUND IN THE DRAINAGE REPORT TITLED "DRAINAGE IMPACT ANALYSIS FOR STELLA ROAD EXPANSION WITHIN SEABOURNE CREEK WATERSHED FORT BEND, TEXAS", EXHIBIT 8A.

M:\04755.000 20116 Stella Road\CAD\DWG\05- 04755 - Drainage Area Maps.dwg

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE: STELLA ROAD		
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION: PROPOSED CULVERT NODE RESULTS		
DRAWN BY: NS		DATE: 6/18/24
CK'D BY: MJ	SCALE: N/A	SHEET NO: 74 / 133

PROPOSED CULVERT LINK 100-YR RESULT

Name	Scenario	Link Name 0	Upstream Node Name 0	Downstream Node Name 0	Max Flow cfs	Max X-Sectional Area ft^2	Max Velocity ft/s	Maximum Water Elevation (US) ft	Maximum Water Elevation (DS) ft
1311.1	100-Year Storm	D1_D2_Cul	D1_DS	D2_US	-0.994	3.291	-0.316	97.141	97.14
1317.1	100-Year Storm	D13_Out_CUl	D13.1_US	Out_1	16.813	1.796	9.434	95.214	91.106
1322.1	100-Year Storm	D3_D4_Cul	D3_DS	D4_US	11.23	3.291	3.563	96.259	96.129
1330.1	100-Year Storm	D4_D5_Cul	D5_US	D4_DS	-1.6	3.291	0.683	96.1	96.1
1334.1	100-Year Storm	D5_D6_Cul	D6_US	D5_DS	-2.617	3.291	-0.831	96.1	96.1
1344.1	100-Year Storm	D7_D8_Cul	D7_DS	D8_US	2.507	2.183	1.149	93.124	93.097
1344.2	100-Year Storm	D7_D8_Cul	D7_DS	D8_US	2.438	2.459	0.992	93.124	93.097
1350.1	100-Year Storm	Rd_Cross3	D4.1_DS	D16.1_US	10.414	3.293	3.286	96.1	95.768
1350.2	100-Year Storm	Rd_Cross3	D4.1_DS	D16.1_US	10.414	3.293	3.286	96.1	95.768
1350.3	100-Year Storm	Rd_Cross3	D4.1_DS	D16.1_US	10.414	3.293	3.286	96.1	95.768
1354.1	100-Year Storm	D16.2_Out-2	D16.2_DS	Out_2	20.775	2.232	9.409	95.766	92.578
1359.1	100-Year Storm	D10_D11_Cul	D10_DS	D11_US	5.438	3.293	1.702	96.711	96.731
1367.1	100-Year Storm	D12_D13_CUl	D12_DS	D13_US	-10.087	3.291	-3.185	95.214	95.214
1372.1	100-Year Storm	D13_D14_Cul	D13_DS	D14_US	-3.861	3.286	-1.34	96.086	96.085
1381.1	100-Year Storm	D16_D17_Cul	D17_US	D16_DS	-4.401	3.285	-1.392	95.77	95.768
1385.1	100-Year Storm	D17_D18_Cul	D18_US	D17_DS	2.137	3.291	0.892	95.771	95.77
1389.1	100-Year Storm	Rd_Cross4	D7_US	D19_US	3.419	1.426	2.398	93.848	93.476
1389.2	100-Year Storm	Rd_Cross4	D7_US	D19_US	4.219	1.48	2.851	93.848	93.39
1410.1	100-Year Storm	D22_D23_Cul	D23_DS	D22_US	3.091	0.816	3.899	95.271	95.245
1414.1	100-Year Storm	D21_D22_Cul	D22_DS	D21_US	31.226	7.378	4.387	95.159	94.13
1442.1	100-Year Storm	D14_D15_Cul	D14_DS	D15_US	6.897	3.293	2.436	96.084	95.968
1444.1	100-Year Storm	D15_D16_Cul	D15_DS	D16_US	7.397	3.292	2.339	95.967	95.768
1445.1	100-Year Storm	Rd_Cross2	D14_US	D4.1_US	5.988	3.326	2.974	96.085	96.109
1487.1	100-Year Storm	Link633	D13.1_US	Basin1_Opt2	16.449	5.145	3.338	95.214	94.825
1488.1	100-Year Storm	Link634	Basin1_Opt2	Out_1.2	15.704	1.588	9.887	94.825	90.349
Coss_Cul	100-Year Storm	D10_D11_Cul	D10_DS	D11_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul	100-Year Storm	D14_D15_Cul	D14_DS	D15_US	2.631	0	0	-9.00E+99	-9.00E+99
Cross_Cul1	100-Year Storm	D12_D13_CUl	D12_DS	D13_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul2.1	100-Year Storm	D13_D14_Cul	D13_DS	D14_US	-1.515	0	0	-9.00E+99	-9.00E+99
Cross_Cul3	100-Year Storm	D15_D16_Cul	D15_DS	D16_US	1.051	0	0	-9.00E+99	-9.00E+99
Cross_Cul4	100-Year Storm	D16_D17_Cul	D17_US	D16_DS	0	0	0	-9.00E+99	-9.00E+99
CrossCul	100-Year Storm	CrossCul	D12_US.1	D2B_US.1	9.458	3.32	2.854	96.734	96.734
Cul_Cross	100-Year Storm	D1_D2_Cul	D1_DS	D2_US	-0.117	0	0	-9.00E+99	-9.00E+99
Cul_Cross2	100-Year Storm	D3_D4_Cul	D3_DS	D4_US	17.435	0	0	-9.00E+99	-9.00E+99
Cul_Cross3	100-Year Storm	D17_D18_Cul	D18_US	D17_DS	-0.447	0	0	-9.00E+99	-9.00E+99
Cul_Cross4	100-Year Storm	D5_D6_Cul	D6_US	D5_DS	-1.596	0	0	-9.00E+99	-9.00E+99
Cul_Cross5	100-Year Storm	D4_D5_Cul	D5_US	D4_DS	-2.008	0	0	-9.00E+99	-9.00E+99
D1	100-Year Storm	D1	D1_US	D1_DS	-1.238	38.177	-0.057	97.141	97.141
D10	100-Year Storm	D10	D10_US	D10_DS	10.173	98.523	0.375	96.711	96.711
D11	100-Year Storm	D11	D11_US	D11_DS	3.675	102.445	0.066	96.731	96.731
D11_D12_Cul	100-Year Storm	D11_D12_Cul	D11_DS	D12_US	-3.257	10.087	0.351	96.731	96.734
D12.1	100-Year Storm	D12.1	D12_US	D12_US.1	10.154	112.895	0.297	96.734	96.734
D12.1.1.1	100-Year Storm	D12.1.1.1	D12_US.1.1	D12_DS	-4.846	129.795	-0.093	95.215	95.214
D13	100-Year Storm	D13	D13_US	D13_US.1	-10.45	62.541	-0.462	95.214	95.214
D13.1	100-Year Storm	D13.1	D13_DS.2	D13_DS	-1.905	44.184	0.186	96.086	96.086
D13.1.1	100-Year Storm	D13.1.1	D13_DS.1	D13.1_US	-2.197	102.324	0.064	95.214	95.214
D13.2	100-Year Storm	D13.2	D13_US.1	D13.1_US	-11.423	72.855	-0.339	95.214	95.214
D14	100-Year Storm	D14	D14_DS	D14_US	7.316	50.491	0.741	96.084	96.085
D15	100-Year Storm	D15	D15_US	D15_DS	8.436	52.085	3.964	95.968	95.967
D16	100-Year Storm	D16	D16_US	D16.1_US	8.42	74.128	4.034	95.768	95.768
D16.1	100-Year Storm	D16.1	D16_DS	D16.1_US	-4.591	94.984	-0.186	95.768	95.768
D16.2	100-Year Storm	D16.2	D16.1_US	D16.2_DS	39.905	156.397	0.437	95.768	95.766
D17	100-Year Storm	D17	D17_DS	D17_US	-1.809	79.672	0.435	95.77	95.77
D17_Out-2	100-Year Storm	D17_Out-2	D17_US	Out_2	0	98.967	0	95.77	92.8
D18	100-Year Storm	D18	D18_DS	D18_US	4.56	57.719	0.596	95.771	95.771
D19	100-Year Storm	D19	D19_US	Out3.1	7.637	4.661	1.639	93.39	92.426
D2	100-Year Storm	D2	D2_US	D2_US.2	5.895	42.799	0.261	97.14	97.137
D2.1	100-Year Storm	D2.1	D2_US.1	D2_DS	16.426	136.662	1.734	96.718	96.718
D2.2	100-Year Storm	D2.2	D2_US.2	D2B_US	10.48	3.293	3.325	97.137	96.737
D2.2.1	100-Year Storm	D2.2.1	D2B_US	D2B_US.1	19.265	37.719	0.81	96.737	96.734
D2.2.1.1	100-Year Storm	D2.2.1.1	D2B_US.1	D2_US.1	33.947	49.706	1.102	96.734	96.718
D20	100-Year Storm	D20	D20_US	Out_3	28.391	18.483	1.538	92.192	91.259
D20_D21_Cul	100-Year Storm	D20_D21_Cul	D21_DS	D20_US	25.978	5.102	5.251	93.961	92.192
D21	100-Year Storm	D21	D21_US	D21_DS	36.215	23.373	1.753	94.13	93.961
D22	100-Year Storm	D22	D22_US	D22_DS	68.435	112.389	3.143	95.245	95.157
D23	100-Year Storm	D23	D23_US	D23_DS	29.436	42.262	0.783	95.307	95.271
D23_D24_Cul	100-Year Storm	D23_D24_Cul	D24_DS	D23_US	2.017	0.82	2.532	95.211	95.307
D24	100-Year Storm	D24	D24_US	D24_DS	2.002	44.551	0.754	95.212	95.211
D24_D25_Cul	100-Year Storm	D24_D25_Cul	D25_DS	D24_US	1.858	1.848	1.045	95.218	95.212
D25	100-Year Storm	D25	D25_US	D25_DS	1.854	34.776	-0.258	95.218	95.218
D25_D26_Cul	100-Year Storm	D25_D26_Cul	D26_DS	D25_US	1.798	1.282	1.457	95.288	95.218
D26	100-Year Storm	D26	D26_US	D26.1_US	-1.473	76.207	0.031	95.288	95.288
D26.1	100-Year Storm	D26.1	D26.1_US	D26_DS	-3.356	64.772	-2.194	95.288	95.288
D26.1_D28_Cu	100-Year Storm	D26.1_D28_Cul	D28_US	D26.1_US	-8.457	3.28	9.72	94.74	95.288
D27	100-Year Storm	D27	D27_US	D27_DS	-0.52	40.442	0.057	94.739	94.739
D27_D28.1_Cu	100-Year Storm	D27_D28.1_Cul	D27_DS	D28.1_US	-0.477	3.293	-0.245	94.739	94.738
D28	100-Year Storm	D28	D28_US	D28.1_US	8.456	30.57	-11.219	94.74	94.738
D28.1	100-Year Storm	D28.1	D28.1_US	D28_DS	12.756	43.507	3.303	94.738	94.725
D28_D29_Cul	100-Year Storm	D28_D29_Cul	D28_DS	D29_US	10.449	3.293	3.31	94.725	94.353
D29	100-Year Storm	D29	D29_US	D29_DS	10.378	22.345	0.7	94.353	94.347
D29_D30_Cul	100-Year Storm	D29_D30_Cul	D29_DS	D30_US	10.347	3.292	3.285	94.347	93.973
D3	100-Year Storm	D3	D3_US	D3_DS	20.357	48.384	0.62	96.277	96.259
D3.1	100-Year Storm	D3.1	D3_DS.1	D2_DS	-18.449	138.99	0.246	96.716	96.718
D30	100-Year Storm	D30	D30_US	D30_DS	10.357	14.893	0.783	93.973	93.885
D30_D31_Cul	100-Year Storm	D30_D31_Cul	D30_DS	D31_US	10.375	3.275	3.211	93.885	93.536
D31	100-Year Storm	D31	D31_US	D31_DS	10.383	8.691	1.351	93.536	93.342
D4	100-Year Storm	D4	D4_US	D4.1_US	23.231	54.839	0.696	96.129	96.109
D4.1	100-Year Storm	D4.1	D4.1_US	D4.1_US.1	18.901	66.551	0.807	96.109	96.102
D4.1.1	100-Year Storm	D4.1.1	D4.1_US.1	D4.1_DS	32.114	106.813	0.824	96.102	96.1
D4.2	100-Year Storm	D4.2	D4_DS	D4.1_DS	-3.744	108.929	1.191	96.1	96.1
D5	100-Year Storm	D5	D5_DS	D5_US	-1.833	92.828	0.476	96.1	96.1
D6	100-Year Storm	D6	D6_DS	D6_US	-1.528	72.004	0.183	96.1	96.1
D6_D7_Cul	100-Year Storm	D6_D7_Cul	D6_DS	D7_US	0.001	0.001	0.727	96.1	93.848
D7	100-Year Storm	D7	D7_US	D7_US.1	0.602	10.545	0.06	93.848	93.846
D7.1	100-Year Storm	D7.1	D7.1_US	D7_DS	4.954	5.351	1.029	93.303	93.124
D7.2	100-Year Storm	D7.2	D7_US.1	D7.1_US	5.16	10.347	0.501	93.846	93.303
D8	100-Year Storm	D8	D8_US	D8_DS	4.938	4.455	1.109	93.097	92.833
D9	100-Year Storm	D9	D8_DS	Out_4	15.067	8.137	1.852	92.833	92.281
D_Co_OutL	100-Year Storm	D_Co_OutL	DW1S_Out	D_Co_Out	7.431	4.068	1.827	95.915	95.556
D_CoWo	100-Year Storm	D_CoWo	DW1N_Out	DW1S_Out	7.431	2.43	3.058	96.03	95.915
D_Out1.1	100-Year Storm	D_Out1.1	Out_1	Out_1.2	16.816	21.997	1.006	90.374	90.349
D_Out1.1.1	100-Year Storm	D_Out1.1.1	Out_1.2	Out_1.1	54.685	23.684	2.309	90.349	89.757
DW1_N	100-Year Storm	DW1_N	DW2N_US.1	DW2N_US	-4.129	7.28	1.367	9.66E+01	9.67E+01
DW1_N.1	100-Year Storm	DW1_N.1	DW2N_US.1	DW1N_Out	7.432	5.543	1.341	96.647	96.03
DW1_S	100-Year Storm	DW1_S	DW2S_DS	DW1S_Out	-0.029	3.103	-0.045	9.59E+01	9.59E+01
DW2_N	100-Year Storm	DW2_N	DW2N_US	D10_US	-4.126	2.802	3.135	9.67E+01	9.67E+01
DW2_S	100-Year Storm	DW2_S	DW2S_DS	D1_US	0	0	0	-9.00E+99	-9.00E+99
L_Sheriff_Out	100-Year Storm	L_Sheriff_Out	Sheriff_Outfall	Basin1_Opt2	104.024	7.606	6.838	96.279	94.825
Link615	100-Year Storm	Link615	Node650	Node651	0	0	0	-9.00E+99	-9.00E+99
Link616	100-Year Storm	Link616	Node652	D23_US	10.7	5.134	2.161	9.54E+01	9.53E+01
Link617	100-Year Storm	Link617	Node653	Node652	11.658	5.137	2.352	95.853	95.449
Link618	100-Year Storm	Link618	Node653	D26.1_US	10.843	5.13	2.188	9.59E+01	9.53E+01
Out2.2Cr	100-Year Storm	D16.2_Out-2	D16.2_DS	Out_2	19.314	0	0	-9.00E+99	-9.00E+99
Out_2.2L	100-Year Storm	Out_2.2L	Out_2	Out_2.2	39.88	14.587	2.734	88.679	88.281
Overflow	100-Year Storm	Link711	D3_US	D3_DS.1	-20.286	0	0	-9.00E+99	-9.00E+99
Overflow Weir	100-Year Storm	Link634	Basin1_Opt2	Out_1.2	23.815	0	0	-9.00E+99	-9.00E+99
Rd_Cross1	100-Year Storm	Rd_Cross1	D2_DS	D13.1_US	42.003	5.145	8.474	96.718	95.214
Rd_Cross5	100-Year Storm	Rd_Cross5	D31_DS	D8_DS	10.4	3.252	3.217	93.342	92.833
RoadCross	100-Year Storm	D21_D22_Cul	D22_DS	D21_US	12.838	0	0	-9.00E+99	-9.00E+99
RoadCross2.1	100-Year Storm	D22_D23_Cul	D23_DS	D22_US	26.619	0	0	-9.00E+99	-9.00E+99

PROPOSED CULVERT LINK 10-YR RESULT

Name	Scenario	Link Name 0	Upstream Node Name 0	Downstream Node Name 0	Max Flow cfs	Max X-Sectional Area ft^2	Max Velocity ft/s	Maximum Water Elevation (US) ft	Maximum Water Elevation (DS) ft
1311.1	10-Year Storm	D1_D2_Cul	D1_DS	D2_US	-0.567	3.291	-0.233	96.494	96.493
1317.1	10-Year Storm	D13_Out_CUl	D13.1_US	Out_1	13.936	1.796	7.945	93.899	90.899
1322.1	10-Year Storm	D3_D4_Cul	D3_DS	D4_US	7.274	3.171	2.561	94.735	94.666
1330.1	10-Year Storm	D4_D5_Cul	D5_US	D4_DS	1.125	3.291	0.591	94.649	94.648
1334.1	10-Year Storm	D5_D6_Cul	D6_US	D5_DS	-1.924	3.291	-0.631	94.649	94.649
1344.1	10-Year Storm	D7_D8_Cul	D7_DS	D8_US	1.41	1.723	0.819	92.886	92.874
1344.2	10-Year Storm	D7_D8_Cul	D7_DS	D8_US	1.337	2.016	0.664	92.886	92.874
1350.1	10-Year Storm	Rd_Cross3	D4.1_DS	D16.1_US	6.107	3.293	1.938	94.648	94.585
1350.2	10-Year Storm	Rd_Cross3	D4.1_DS	D16.1_US	6.107	3.293	1.938	94.648	94.585
1350.3	10-Year Storm	Rd_Cross3	D4.1_DS	D16.1_US	6.107	3.293	1.938	94.648	94.585
1354.1	10-Year Storm	D16.2_Out-2	D16.2_DS	Out_2	16.615	2.232	7.583	94.583	92.49
1359.1	10-Year Storm	D10_D11_Cul	D10_DS	D11_US	4.043	3.149	1.29	95.974	95.921
1367.1	10-Year Storm	D12_D13_CUl	D12_DS	D13_US	-6.052	3.253	-2.399	93.899	93.899
1372.1	10-Year Storm	D13_D14_Cul	D13_DS	D14_US	-1.552	2.544	-1.168	94.658	94.657
1381.1	10-Year Storm	D16_D17_Cul	D17_US	D16_DS	-3.442	3.285	-1.093	94.586	94.585
1385.1	10-Year Storm	D17_D18_Cul	D18_US	D17_DS	2.066	3.291	0.921	94.587	94.586
1389.1	10-Year Storm	Rd_Cross4	D7_US	D19_US	2.065	1.013	2.039	93.63	93.328
1389.2	10-Year Storm	Rd_Cross4	D7_US	D19_US	2.684	1.065	2.52	93.63	93.246
1410.1	10-Year Storm	D22_D23_Cul	D23_DS	D22_US	3.155	0.816	4.007	94.849	93.752
1414.1	10-Year Storm	D21_D22_Cul	D22_DS	D21_US	16.273	7.378	2.293	93.291	93.012
1442.1	10-Year Storm	D14_D15_Cul	D14_DS	D15_US	4.177	2.334	2.782	94.657	94.614
1444.1	10-Year Storm	D15_D16_Cul	D15_DS	D16_US	3.186	3.292	1.246	94.613	94.585
1445.1	10-Year Storm	Rd_Cross2	D14_US	D4.1_US	6.88	3.303	2.446	94.657	94.658
1487.1	10-Year Storm	Link633	D13.1_US	Basin1_Opt2	19.121	5.114	3.825	93.899	93.648
1488.1	10-Year Storm	Link634	Basin1_Opt2	Out_1.2	12.629	1.547	8.187	93.648	90.04
Coss_Cul	10-Year Storm	D10_D11_Cul	D10_DS	D11_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul	10-Year Storm	D14_D15_Cul	D14_DS	D15_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul1	10-Year Storm	D12_D13_CUl	D12_DS	D13_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul2.1	10-Year Storm	D13_D14_Cul	D13_DS	D14_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul3	10-Year Storm	D15_D16_Cul	D15_DS	D16_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul4	10-Year Storm	D16_D17_Cul	D17_US	D16_DS	0	0	0	-9.00E+99	-9.00E+99
CrossCul	10-Year Storm	CrossCul	D12_US.1	D2B_US.1	6.307	3.308	1.906	95.912	95.858
Cul_Cross	10-Year Storm	D1_D2_Cul	D1_DS	D2_US	0	0	0	-9.00E+99	-9.00E+99
Cul_Cross2	10-Year Storm	D3_D4_Cul	D3_DS	D4_US	0	0	0	-9.00E+99	-9.00E+99
Cul_Cross3	10-Year Storm	D17_D18_Cul	D18_US	D17_DS	0	0	0	-9.00E+99	-9.00E+99
Cul_Cross4	10-Year Storm	D5_D6_Cul	D6_US	D5_DS	0	0	0	-9.00E+99	-9.00E+99
Cul_Cross5	10-Year Storm	D4_D5_Cul	D5_US	D4_DS	0	0	0	-9.00E+99	-9.00E+99
D1	10-Year Storm	D1	D1_US	D1_DS	-0.73	23.671	-0.077	96.494	96.494
D10	10-Year Storm	D10	D10_US	D10_DS	6.69	29.54	0.407	95.979	95.974
D11	10-Year Storm	D11	D11_US	D11_DS	3.902	67.534	0.059	95.921	95.921
D11_D12_Cul	10-Year Storm	D11_D12_Cul	D11_DS	D12_US	-4.323	10.047	-0.558	95.921	95.912
D12.1	10-Year Storm	D12.1	D12_US	D12_US.1	6.383	67.75	0.144	95.912	95.912
D12.1.1.1	10-Year Storm	D12.1.1.1	D12_US.1.1	D12_DS	-2.896	64.936	-0.1	93.899	93.899
D13	10-Year Storm	D13	D13_US	D13_US.1	-6.177	23.142	-0.502	93.899	93.899
D13.1	10-Year Storm	D13.1	D13_DS.2	D13_DS	-0.721	10.28	-0.194	94.658	94.658
D13.1.1	10-Year Storm	D13.1.1	D13_DS.1	D13.1_US	-0.95	42.707	0.058	93.899	93.899
D13.2	10-Year Storm	D13.2	D13_US.1	D13.1_US	-6.479	33.466	-0.326	93.899	93.899
D14	10-Year Storm	D14	D14_DS	D14_US	5.03	13.379	0.977	94.657	94.657
D15	10-Year Storm	D15	D15_US	D15_DS	3.927	15.525	3.964	94.614	94.613
D16	10-Year Storm	D16	D16_US	D16.1_US	2.964	37.337	5.692	94.585	94.585
D16.1	10-Year Storm	D16.1	D16_DS	D16.1_US	-3.615	49.883	0.226	94.585	94.585
D16.2	10-Year Storm	D16.2	D16.1_US	D16.2_DS	16.717	92.177	0.441	94.585	94.583
D17	10-Year Storm	D17	D17_DS	D17_US	1.598	41.806	0.432	94.586	94.586
D17_Out-2	10-Year Storm	D17_Out-2	D17_US	Out_2	0	43.753	0	94.586	92.8
D18	10-Year Storm	D18	D18_DS	D18_US	3.673	22.149	0.64	94.587	94.587
D19	10-Year Storm	D19	D19_US	Out3.1	4.749	3.44	1.38	93.246	92.335
D2	10-Year Storm	D2	D2_US	D2_US.2	3.743	26.947	0.246	96.493	96.489
D2.1	10-Year Storm	D2.1	D2_US.1	D2_DS	19.764	78.243	0.957	95.42	95.419
D2.2	10-Year Storm	D2.2	D2_US.2	D2B_US	10.643	3.29	3.368	96.489	95.907
D2.2.1	10-Year Storm	D2.2.1	D2B_US	D2B_US.1	15.171	19.932	0.882	95.907	95.858
D2.2.1.1	10-Year Storm	D2.2.1.1	D2B_US.1	D2_US.1	28.821	25.512	1.376	95.858	95.42
D20	10-Year Storm	D20	D20_US	Out_3	17.022	13.24	1.286	91.824	91.005
D20_D21_Cul	10-Year Storm	D20_D21_Cul	D21_DS	D20_US	15.991	5.09	3.263	92.485	91.824
D21	10-Year Storm	D21	D21_US	D21_DS	16.119	9.492	1.85	93.012	92.485
D22	10-Year Storm	D22	D22_US	D22_DS	16.505	11.397	1.486	93.752	93.291
D23	10-Year Storm	D23	D23_US	D23_DS	16.51	32.112	0.514	94.87	94.849
D23_D24_Cul	10-Year Storm	D23_D24_Cul	D24_DS	D23_US	-2.551	0.82	-3.201	94.832	94.87
D24	10-Year Storm	D24	D24_US	D24_DS	-1.648	35.763	0.669	94.833	94.832
D24_D25_Cul	10-Year Storm	D24_D25_Cul	D25_DS	D24_US	-1.12	1.848	-0.632	94.834	94.833
D25	10-Year Storm	D25	D25_US	D25_DS	-1.264	25.922	-0.221	94.834	94.834
D25_D26_Cul	10-Year Storm	D25_D26_Cul	D26_DS	D25_US	-1.413	1.282	-1.144	94.835	94.834
D26	10-Year Storm	D26	D26_US	D26.1_US	-0.665	56.356	0.03	94.835	94.835
D26.1	10-Year Storm	D26.1	D26.1_US	D26_DS	-1.455	46.549	-0.137	94.835	94.835
D26.1_D28_Cul	10-Year Storm	D26.1_D28_Cul	D28_US	D26.1_US	-8.353	3.28	-2.631	94.316	94.835
D27	10-Year Storm	D27	D27_US	D27_DS	-0.544	23.266	0.084	94.313	94.313
D27_D28.1_Cul	10-Year Storm	D27_D28.1_Cul	D27_DS	D28.1_US	-0.322	3.088	-0.231	94.313	94.312
D28	10-Year Storm	D28	D28_US	D28.1_US	8.343	20.199	0.601	94.316	94.312
D28.1	10-Year Storm	D28.1	D28.1_US	D28_DS	9.788	29.92	0.467	94.312	94.282
D28_D29_Cul	10-Year Storm	D28_D29_Cul	D28_DS	D29_US	8.767	3.293	2.78	94.282	94.014
D29	10-Year Storm	D29	D29_US	D29_DS	8.762	16.558	0.599	94.014	94.003
D29_D30_Cul	10-Year Storm	D29_D30_Cul	D29_DS	D30_US	8.759	3.292	2.763	94.003	93.755
D3	10-Year Storm	D3	D3_US	D3_DS	2.871	15.512	0.237	94.739	94.735
D3.1	10-Year Storm	D3.1	D3_DS.1	D2_DS	-1.929	80.744	0.24	9.54E+01	9.54E+01
D30	10-Year Storm	D30	D30_US	D30_DS	8.754	11.529	0.79	9.38E+01	9.36E+01
D30_D31_Cul	10-Year Storm	D30_D31_Cul	D30_DS	D31_US	8.756	3.234	2.707	9.36E+01	9.34E+01
D31	10-Year Storm	D31	D31_US	D31_DS	8.758	6.636	1.344	9.34E+01	9.31E+01
D4	10-Year Storm	D4	D4_US	D4.1_US	6.724	17.418	0.804	9.47E+01	9.47E+01
D4.1	10-Year Storm	D4.1	D4.1_US	D4.1_US.1	8.463	22.647	0.934	9.47E+01	9.47E+01
D4.1.1	10-Year Storm	D4.1.1	D4.1_US.1	D4.1_DS	20.43	43.19	0.929	94.655	94.648
D4.2	10-Year Storm	D4.2	D4_DS	D4.1_DS	1.316	43.946	0.313	9.46E+01	9.46E+01
D5	10-Year Storm	D5	D5_DS	D5_US	1.099	33.165	0.493	9.46E+01	9.46E+01
D6	10-Year Storm	D6	D6_DS	D6_US	-0.785	24.69	0.163	9.46E+01	9.46E+01
D6_D7_Cul	10-Year Storm	D6_D7_Cul	D6_DS	D7_US	0.001	0.001	0.511	9.46E+01	9.36E+01
D7	10-Year Storm	D7	D7_US	D7_US.1	0.337	7.524	0.067	9.36E+01	9.36E+01
D7.1	10-Year Storm	D7.1	D7.1_US	D7_DS	2.751	2.74	1.005	93.106	92.886
D7.2	10-Year Storm	D7.2	D7_US.1	D7.1_US	2.886	7.154	0.404	93.632	93.106
D8	10-Year Storm	D8	D8_US	D8_DS	2.742	3.191	0.86	92.874	92.692
D9	10-Year Storm	D9	D8_DS	Out_4	11.27	6.519	1.729	92.692	92.177
D_Co_OutL	10-Year Storm	D_Co_OutL	DW1S_Out	D_Co_Out	1.186	1.168	1.016	95.487	95.207
D_CoWo	10-Year Storm	D_CoWo	DW1N_Out	DW1S_Out	1.187	0.816	1.455	95.536	95.487
D_Out1.1	10-Year Storm	D_Out1.1	Out_1	Out_1.2	13.936	13.999	1.001	90.102	90.04
D_Out1.1.1	10-Year Storm	D_Out1.1.1	Out_1.2	Out_1.1	26.385	14.601	1.807	90.04	89.503
DW1_N	10-Year Storm	DW1_N	DW2N_US.1	DW2N_US	1.372	1.608	1.095	9.61E+01	9.60E+01
DW1_N.1	10-Year Storm	DW1_N.1	DW2N_US.1	DW1N_Out	1.188	1.501	0.791	96.072	95.536
DW1_S	10-Year Storm	DW1_S	DW2S_DS	DW1S_Out	0	0.101	0	-9.00E+99	-9.00E+99
DW2_N	10-Year Storm	DW2_N	DW2N_US	D10_US	1.357	1.035	2.199	9.60E+01	9.60E+01
DW2_S	10-Year Storm	DW2_S	DW2S_DS	D1_US	0	0	0	-9.00E+99	-9.00E+99
L_Sheriff_Out	10-Year Storm	L_Sheriff_Out	Sheriff_Outfall	Basin1_Opt2	67.443	7.595	4.474	96.511	93.648
Link615	10-Year Storm	Link615	Node650	Node651	0	0	0	-9.00E+99	-9.00E+99
Link616	10-Year Storm	Link616	Node652	D23_US	7.046	5.136	1.424	9.50E+01	9.49E+01
Link617	10-Year Storm	Link617	Node653	Node652	7.856	5.143	1.587	95.221	95.032
Link618	10-Year Storm	Link618	Node653	D26.1_US	9.631	5.137	1.946	9.52E+01	9.48E+01
Out2.2RdCR	10-Year Storm	D16.2_Out-2	D16.2_DS	Out_2	0	0	0	-9.00E+99	-9.00E+99
Out_2.2L	10-Year Storm	Out_2.2L	Out_2	Out_2.2	16.615	8.385	1.982	88.295	87.963
Overflow	10-Year Storm	Link711	D3_US	D3_DS.1	0	0	0	0.00E+00	0.00E+00
Overflow Weir	10-Year Storm	Link634	Basin1_Opt2	Out_1.2	0	0	0	-9.00E+99	-9.00E+99
Rd_Cross1	10-Year Storm	Rd_Cross1	D2_DS	D13.1_US	38.67	5.13	7.859	95.419	93.899
Rd_Cross5	10-Year Storm	Rd_Cross5	D31_DS	D8_DS	8.768	3.077	2.858	93.062	92.692
RoadCross	10-Year Storm	D21_D22_Cul	D22_DS	D21_US	0	0	0	-9.00E+99	-9.00E+99
RoadCross2.1	10-Year Storm	D22_D23_Cul	D23_DS	D22_US	13.447	0	0	-9.00E+99	-9.00E+99

PROPOSED CULVERT LINK 5-YR RESULT

Name	Scenario	Link Name 0	Upstream Node Name 0	Downstream Node Name 0	Max Flow cfs	Max X-Sectional Area ft^2	Max Velocity ft/s	Maximum Water Elevation (US) ft	Maximum Water Elevation (DS) ft
1311.1	5-Year Storm	D1_D2_Cul	D1_DS	D2_US	-0.583	3.291	-0.216	96.36	96.359
1317.1	5-Year Storm	D13_Out_CUl	D13.1_US	Out_1	13.078	1.796	7.505	93.554	90.823
1322.1	5-Year Storm	D3_D4_Cul	D3_DS	D4_US	6.496	2.827	2.467	94.382	94.338
1330.1	5-Year Storm	D4_D5_Cul	D5_US	D4_DS	1.135	3.291	0.608	94.316	94.315
1334.1	5-Year Storm	D5_D6_Cul	D6_US	D5_DS	-1.538	3.291	-0.586	94.316	94.316
1344.1	5-Year Storm	D7_D8_Cul	D7_DS	D8_US	1.141	1.592	0.717	92.82	92.812
1344.2	5-Year Storm	D7_D8_Cul	D7_DS	D8_US	1.069	1.888	0.567	92.82	92.812
1350.1	5-Year Storm	Rd_Cross3	D4.1_DS	D16.1_US	5.558	3.292	1.765	94.314	94.256
1350.2	5-Year Storm	Rd_Cross3	D4.1_DS	D16.1_US	5.558	3.292	1.765	94.314	94.256
1350.3	5-Year Storm	Rd_Cross3	D4.1_DS	D16.1_US	5.558	3.292	1.765	94.314	94.256
1354.1	5-Year Storm	D16.2_Out-2	D16.2_DS	Out_2	15.326	2.232	7.017	94.255	92.448
1359.1	5-Year Storm	D10_D11_Cul	D10_DS	D11_US	3.536	3.062	1.16	95.844	95.805
1367.1	5-Year Storm	D12_D13_CUl	D12_DS	D13_US	-5.201	2.993	-2.265	93.555	93.554
1372.1	5-Year Storm	D13_D14_Cul	D13_DS	D14_US	-1.171	1.93	-1.137	94.329	94.328
1381.1	5-Year Storm	D16_D17_Cul	D17_US	D16_DS	-2.856	3.284	-0.907	94.258	94.257
1385.1	5-Year Storm	D17_D18_Cul	D18_US	D17_DS	1.83	3.291	0.93	94.259	94.258
1389.1	5-Year Storm	Rd_Cross4	D7_US	D19_US	1.724	0.895	1.926	93.566	93.283
1389.2	5-Year Storm	Rd_Cross4	D7_US	D19_US	2.287	0.946	2.417	93.566	93.201
1410.1	5-Year Storm	D22_D23_Cul	D23_DS	D22_US	3.124	0.816	3.967	94.784	93.687
1414.1	5-Year Storm	D21_D22_Cul	D22_DS	D21_US	12.989	7.378	1.832	92.963	92.782
1442.1	5-Year Storm	D14_D15_Cul	D14_DS	D15_US	3.693	1.695	2.689	94.328	94.277
1444.1	5-Year Storm	D15_D16_Cul	D15_DS	D16_US	2.88	3.292	1.262	94.273	94.257
1445.1	5-Year Storm	Rd_Cross2	D14_US	D4.1_US	6.652	2.8	2.394	94.328	94.328
1487.1	5-Year Storm	Link633	D13.1_US	Basin1_Opt2	19.128	4.799	4.045	93.554	93.134
1488.1	5-Year Storm	Link634	Basin1_Opt2	Out_1.2	11.511	1.549	7.504	93.134	90.008
Coss_Cul	5-Year Storm	D10_D11_Cul	D10_DS	D11_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul	5-Year Storm	D14_D15_Cul	D14_DS	D15_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul1	5-Year Storm	D12_D13_CUl	D12_DS	D13_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul2.1	5-Year Storm	D13_D14_Cul	D13_DS	D14_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul3	5-Year Storm	D15_D16_Cul	D15_DS	D16_US	0	0	0	-9.00E+99	-9.00E+99
Cross_Cul4	5-Year Storm	D16_D17_Cul	D17_US	D16_DS	0	0	0	-9.00E+99	-9.00E+99
CrossCul	5-Year Storm	CrossCul	D12_US.1	D2B_US.1	5.422	3.307	1.64	95.798	95.759
Cul_Cross	5-Year Storm	D1_D2_Cul	D1_DS	D2_US	0	0	0	-9.00E+99	-9.00E+99
Cul_Cross2	5-Year Storm	D3_D4_Cul	D3_DS	D4_US	0	0	0	-9.00E+99	-9.00E+99
Cul_Cross3	5-Year Storm	D17_D18_Cul	D18_US	D17_DS	0	0	0	-9.00E+99	-9.00E+99
Cul_Cross4	5-Year Storm	D5_D6_Cul	D6_US	D5_DS	0	0	0	-9.00E+99	-9.00E+99
Cul_Cross5	5-Year Storm	D4_D5_Cul	D5_US	D4_DS	0	0	0	-9.00E+99	-9.00E+99
D1	5-Year Storm	D1	D1_US	D1_DS	-0.742	21.136	0.089	96.36	96.36
D10	5-Year Storm	D10	D10_US	D10_DS	5.95	25.367	0.752	95.85	95.844
D11	5-Year Storm	D11	D11_US	D11_DS	3.432	62.686	0.068	95.805	95.804
D11_D12_Cul	5-Year Storm	D11_D12_Cul	D11_DS	D12_US	-4.358	9.489	-0.605	95.804	95.798
D12.1	5-Year Storm	D12.1	D12_US	D12_US.1	5.544	62.998	0.114	95.798	95.798
D12.1.1.1	5-Year Storm	D12.1.1.1	D12_US.1.1	D12_DS	-2.492	51.12	-0.095	93.555	93.555
D13	5-Year Storm	D13	D13_US	D13_US.1	-5.299	16.978	-0.491	93.554	93.554
D13.1	5-Year Storm	D13.1	D13_DS.2	D13_DS	-0.43	5.84	-0.168	94.329	94.329
D13.1.1	5-Year Storm	D13.1.1	D13_DS.1	D13.1_US	-0.828	32.629	-0.054	93.554	93.554
D13.2	5-Year Storm	D13.2	D13_US.1	D13.1_US	-5.539	25.65	-0.312	93.554	93.554
D14	5-Year Storm	D14	D14_DS	D14_US	4.333	8.201	0.947	94.328	94.328
D15	5-Year Storm	D15	D15_US	D15_DS	3.529	9.955	4.818	94.277	94.273
D16	5-Year Storm	D16	D16_US	D16.1_US	2.67	29.429	3.024	94.257	94.256
D16.1	5-Year Storm	D16.1	D16_DS	D16.1_US	-2.995	40.685	0.256	94.257	94.256
D16.2	5-Year Storm	D16.2	D16.1_US	D16.2_DS	15.437	75.916	0.441	94.256	94.255
D17	5-Year Storm	D17	D17_DS	D17_US	1.48	33.893	0.508	94.258	94.258
D17_Out-2	5-Year Storm	D17_Out-2	D17_US	Out_2	0	31.93	0	94.258	92.8
D18	5-Year Storm	D18	D18_DS	D18_US	3.3	15.364	0.731	94.259	94.259
D19	5-Year Storm	D19	D19_US	Out3.1	4.01	3.085	1.3	93.201	92.3
D2	5-Year Storm	D2	D2_US	D2_US.2	3.108	24.231	0.225	96.359	96.355
D2.1	5-Year Storm	D2.1	D2_US.1	D2_DS	19.887	61.327	0.991	95.045	95.042
D2.2	5-Year Storm	D2.2	D2_US.2	D2B_US	10.372	3.287	3.178	96.355	95.813
D2.2.1	5-Year Storm	D2.2.1	D2B_US	D2B_US.1	13.957	18.289	0.862	95.813	95.759
D2.2.1.1	5-Year Storm	D2.2.1.1	D2B_US.1	D2_US.1	26.972	22.158	1.39	95.759	95.045
D20	5-Year Storm	D20	D20_US	Out_3	13.626	11.472	1.188	91.686	90.918
D20_D21_Cul	5-Year Storm	D20_D21_Cul	D21_DS	D20_US	12.846	5.083	2.527	92.085	91.686
D21	5-Year Storm	D21	D21_US	D21_DS	12.937	7.299	1.835	92.782	92.085
D22	5-Year Storm	D22	D22_US	D22_DS	13.127	9.993	1.332	93.687	92.963
D23	5-Year Storm	D23	D23_US	D23_DS	13.132	30.457	0.431	94.8	94.784
D23_D24_Cul	5-Year Storm	D23_D24_Cul	D24_DS	D23_US	-2.566	0.82	-3.22	94.719	94.8
D24	5-Year Storm	D24	D24_US	D24_DS	-1.623	32.72	0.49	94.719	94.719
D24_D25_Cul	5-Year Storm	D24_D25_Cul	D25_DS	D24_US	-1.126	1.848	-0.636	94.718	94.719
D25	5-Year Storm	D25	D25_US	D25_DS	-1.28	19.478	-0.221	94.718	94.718
D25_D26_Cul	5-Year Storm	D25_D26_Cul	D26_DS	D25_US	-1.441	1.281	1.578	94.707	94.718
D26	5-Year Storm	D26	D26_US	D26.1_US	-0.738	50.979	0.031	94.707	94.707
D26.1	5-Year Storm	D26.1	D26.1_US	D26_DS	-1.486	38.363	-5.798	94.707	94.707
D26.1_D28_Cul	5-Year Storm	D26.1_D28_Cul	D28_US	D26.1_US	-8.145	3.28	-2.567	94.22	94.707
D27	5-Year Storm	D27	D27_US	D27_DS	-0.392	19.784	0.08	94.219	94.218
D27_D28.1_Cul	5-Year Storm	D27_D28.1_Cul	D27_DS	D28.1_US	-0.377	2.991	-0.404	94.218	94.216
D28	5-Year Storm	D28	D28_US	D28.1_US	8.137	18.457	1.378	94.22	94.216
D28.1	5-Year Storm	D28.1	D28.1_US	D28_DS	9.125	26.893	0.472	94.216	94.177
D28_D29_Cul	5-Year Storm	D28_D29_Cul	D28_DS	D29_US	8.288	3.293	2.629	94.177	93.938
D29	5-Year Storm	D29	D29_US	D29_DS	8.283	15.309	0.605	93.938	93.925
D29_D30_Cul	5-Year Storm	D29_D30_Cul	D29_DS	D30_US	8.28	3.292	2.547	93.925	93.706
D3	5-Year Storm	D3	D3_US	D3_DS	-0.514	11.071	0.105	94.382	94.382
D3.1	5-Year Storm	D3.1	D3_DS.1	D2_DS	1.276	53.252	0.201	95.042	95.042
D30	5-Year Storm	D30	D30_US	D30_DS	8.273	10.838	0.787	93.706	93.567
D30_D31_Cul	5-Year Storm	D30_D31_Cul	D30_DS	D31_US	8.272	3.199	2.586	93.567	93.339
D31	5-Year Storm	D31	D31_US	D31_DS	8.273	6.212	1.34	93.339	92.991
D4	5-Year Storm	D4	D4_US	D4.1_US	6.237	12.379	0.832	94.338	94.328
D4.1	5-Year Storm	D4.1	D4.1_US	D4.1_US.1	8.298	16.791	0.994	94.328	94.323
D4.1.1	5-Year Storm	D4.1.1	D4.1_US.1	D4.1_DS	18.585	34.18	0.983	94.323	94.314
D4.2	5-Year Storm	D4.2	D4_DS	D4.1_DS	1.303	34.819	0.314	94.315	94.314
D5	5-Year Storm	D5	D5_DS	D5_US	1.236	25.697	0.512	94.316	94.316
D6	5-Year Storm	D6	D6_DS	D6_US	-0.642	18.547	0.251	94.316	94.316
D6_D7_Cul	5-Year Storm	D6_D7_Cul	D6_DS	D7_US	0	0.001	0.429	94.316	93.566
D7	5-Year Storm	D7	D7_US	D7_US.1	0.293	6.57	0.071	93.566	93.567
D7.1	5-Year Storm	D7.1	D7.1_US	D7_DS	2.214	2.337	0.948	93.054	92.82
D7.2	5-Year Storm	D7.2	D7_US.1	D7.1_US	2.321	6.232	0.373	93.567	93.054
D8	5-Year Storm	D8	D8_US	D8_DS	2.205	2.873	0.769	92.812	92.654
D9	5-Year Storm	D9	D8_DS	Out_4	10.241	6.128	1.671	92.654	92.149
D_Co_OutL	5-Year Storm	D_Co_OutL	DW1S_Out	D_Co_Out	0.843	0.919	0.917	95.429	95.156
D_CoWo	5-Year Storm	D_CoWo	DW1N_Out	DW1S_Out	0.843	0.675	1.25	95.473	95.429
D_Out1.1	5-Year Storm	D_Out1.1	Out_1	Out_1.2	13.078	13.207	0.994	90.07	90.008
D_Out1.1.1	5-Year Storm	D_Out1.1.1	Out_1.2	Out_1.1	24.303	13.826	1.758	90.008	89.483
DW1_N	5-Year Storm	DW1_N	DW2N_US.1	DW2N_US	1.243	1.24	1.095	9.60E+01	9.59E+01
DW1_N.1	5-Year Storm	DW1_N.1	DW2N_US.1	DW1N_Out	0.845	1.172	0.721	96.004	95.473
DW1_S	5-Year Storm	DW1_S	DW2S_DS	DW1S_Out	0	0.078	0	-9.00E+99	-9.00E+99
DW2_N	5-Year Storm	DW2_N	DW2N_US	D10_US	1.229	0.816	2.292	9.59E+01	9.59E+01
DW2_S	5-Year Storm	DW2_S	DW2S_DS	D1_US	0	0	0	-9.00E+99	-9.00E+99
Emergency Overflow	5-Year Storm	Link634	Basin1_Opt2	Out_1.2	0	0	0	-9.00E+99	-9.00E+99
L_Sheriff_Out	5-Year Storm	L_Sheriff_Out	Sheriff_Outfall	Basin1_Opt2	57.745	7.567	3.839	93.877	93.134
Link615	5-Year Storm	Link615	Node650	Node651	0	0	0	-9.00E+99	-9.00E+99
Link616	5-Year Storm	Link616	Node652	D23_US	5.923	5.135	1.198	9.49E+01	9.48E+01
Link617	5-Year Storm	Link617	Node653	Node652	6.337	5.139	1.281	95.035	94.91
Link618	5-Year Storm	Link618	Node653	D26.1_US	9.135	5.136	1.847	95.035	94.707
Out2.2RdCR	5-Year Storm	D16.2_Out-2	D16.2_DS	Out_2	0	0	0	-9.00E+99	-9.00E+99
Out_2.2L	5-Year Storm	Out_2.2L	Out_2	Out_2.2	15.326	7.976	1.922	8.83E+01	8.79E+01
Overflow	5-Year Storm	Link711	D3_US	D3_DS.1	0	0	0	0.00E+00	0.00E+00
Rd_Cross1	5-Year Storm	Rd_Cross1	D2_DS	D13.1_US	36.6	5.102	7.479	95.042	93.554
Rd_Cross5	5-Year Storm	Rd_Cross5	D31_DS	D8_DS	8.28	3.01	2.756	92.991	92.654
RoadCross	5-Year Storm	D21_D22_Cul	D22_DS	D21_US	0	0	0	-9.00E+99	-9.00E+99
RoadCross2.1	5-Year Storm	D22_D23_Cul	D23_DS	D22_US	10.057	0	0	-9.00E+99	-9.00E+99

NOTE:

NODES LOCATION CAN BE FOUND IN THE DRAINAGE REPORT TITLED "DRAINAGE IMPACT ANALYSIS FOR STELLA ROAD EXPANSION WITHIN SEABOURNE CREEK WATERSHED FORT BEND, TEXAS", EXHIBIT 8A.

NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

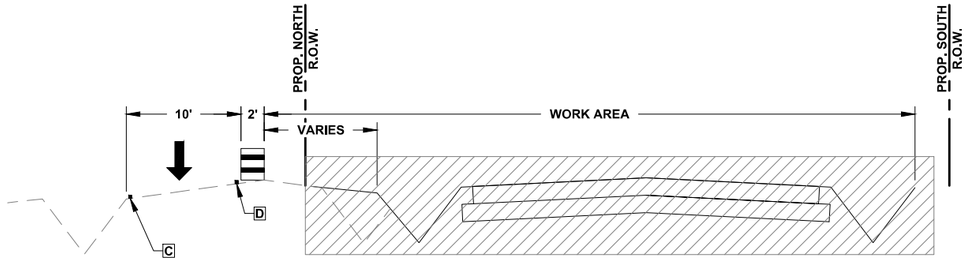
THE STATE OF TEXAS · FORT BEND COUNTY

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

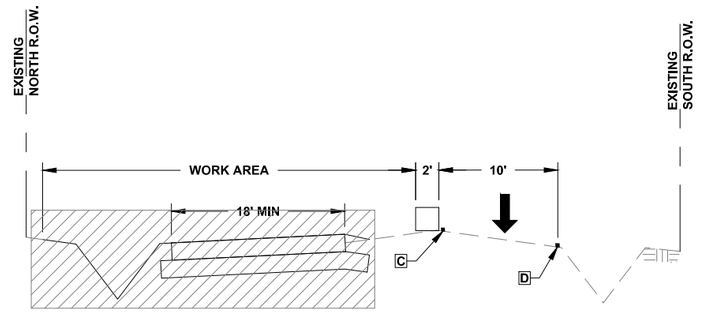
STATE OF TEXAS · MENGYANG JIANG · 138195 · LICENSED PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE: STELLA ROAD
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD
SHEET DESCRIPTION: PROPOSED CULVERT LINK RESULTS
DRAWN BY: NS
DATE: 6/18/24
CK'D BY: MJ
SCALE: N/A
SHEET NO: 75 / 133

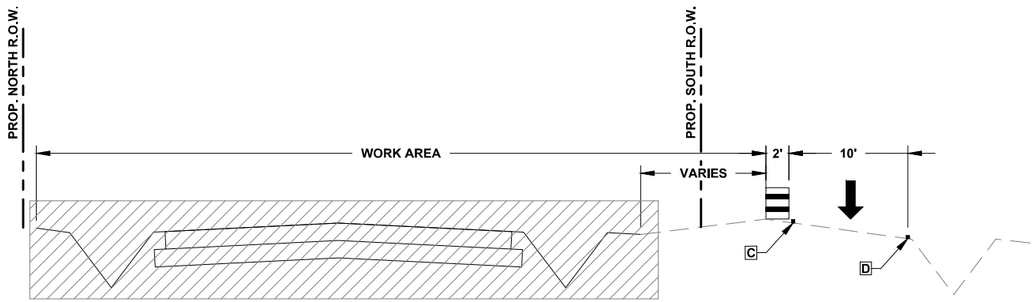
M:\04755.000 20116 Stella Road\CAD\DWG\05- 04755 - Drainage Area Maps.dwg



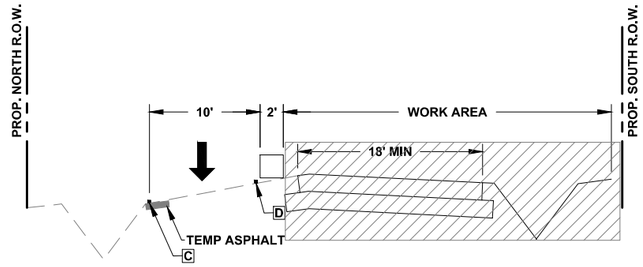
PHASE 1 STEP 1
STA. 38+70 TO STA. 45+50



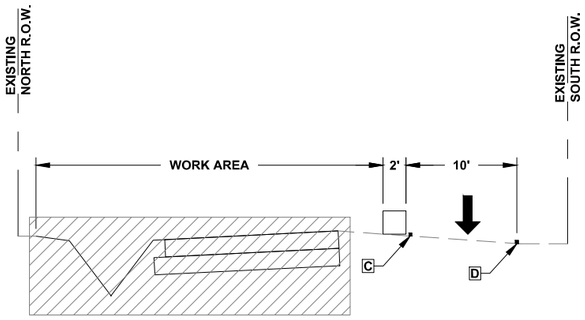
PHASE 1 STEP 1
STA. 6+30 TO STA. 26+00



PHASE 1 STEP 1
STA. 26+00 TO STA. 35+60



PHASE 1 STEP 1
STA. 46+75 TO END



PHASE 1 STEP 2
STA. 4+70 TO STA. 6+30

LEGEND

- EXIST. R.O.W.
- PROP. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- [A] 4" WHITE SOLID REMOVABLE
- [B] 4" YELLOW SOLID REMOVABLE
- [C] 4" WHITE SOLID NON-REMOVABLE
- [D] 4" YELLOW SOLID NON-REMOVABLE
- [E] 24" WHITE SOLID

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

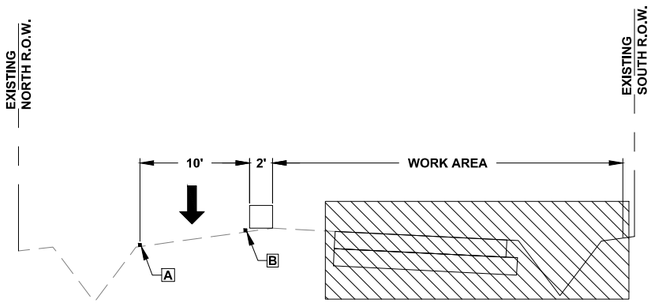
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

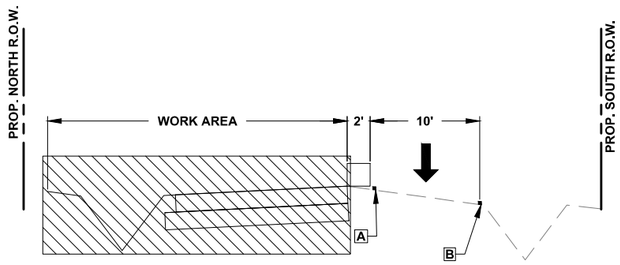
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TCP TYPICAL SECTION PHASE 1
SCALE: N.T.S.	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 76 / 133

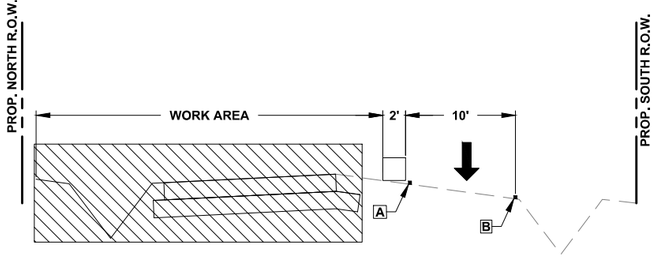
X:\Engineering\2021\21060 - Stella Road\76 TCP TYPICAL SECTION PHASE 1.dwg Charlie Valenzuela



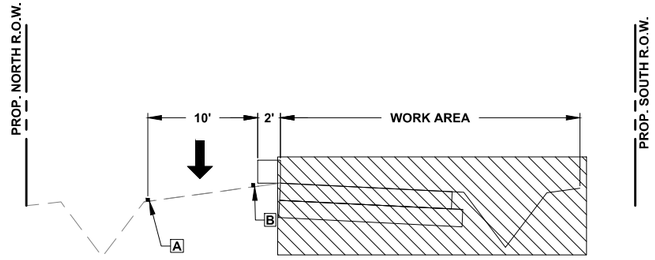
PHASE 2 STEP 1
STA. 4+70 TO STA. 13+08
STA. 14+48 TO STA. 26+00



PHASE 2 STEP 1
STA. 46+75 TO END



PHASE 2 STEP 1
STA. 36+50 TO STA. 38+70



PHASE 2 STEP 2
STA. 35+60 TO STA. 38+14

LEGEND

- EXIST. R.O.W.
- PROP. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- A — 4" WHITE SOLID REMOVABLE
- B — 4" YELLOW SOLID REMOVABLE
- C — 4" WHITE SOLID NON-REMOVABLE
- D — 4" YELLOW SOLID NON-REMOVABLE
- E — 24" WHITE SOLID

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mcctx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TCP TYPICAL SECTION PHASE 2
SCALE: N.T.S.	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 77 / 133

X:\Engineering\2021\21060 - Stella Road\77 TCP TYPICAL SECTION PHASE 2.dwg Charlie Valenzuela

TRAFFIC CONTROL PLAN NARRATIVE:

PHASE 1, STEP 1:

1) SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2) CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FROM STA 0+00 TO 4+70 (ROW TO ROW), AND 6+00 TO END (PROPOSED ROADWAY).
3) CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.

PHASE 1, STEP 2:

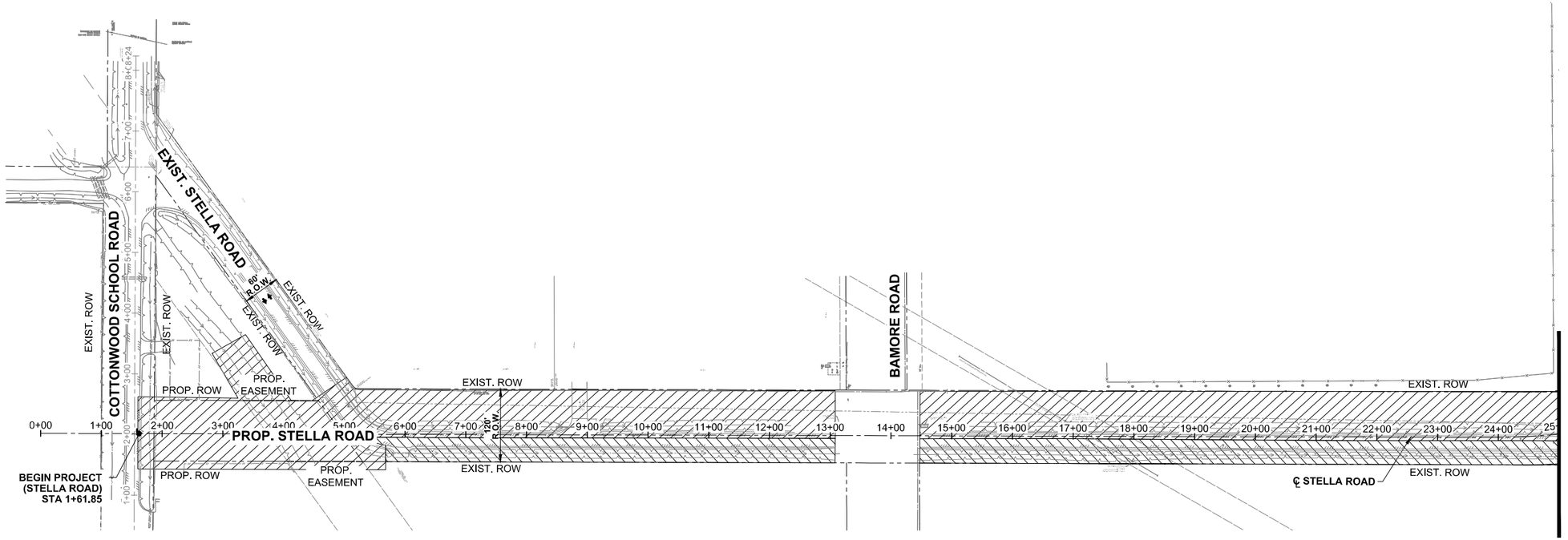
1) SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2) CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FROM STA 4+70 TO 6+00 (ROW TO ROW).

PHASE 2, STEP 1:

1) SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2) CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FROM STA 6+00 TO END (EXISTING ROADWAY).
3) CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.

PHASE 2, STEP 2:

1) SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2) CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FROM STA 35+60 TO 38+20 (SOUTH SIDE OF PROPOSED ROADWAY).



SCALE 1"=200'

200' 100' 0 200'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2

GENERAL NOTES:

1) MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
2) CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
3) SEE SHEET 85 FOR EASTBOUND TRAFFIC DETOUR.

X:\Engineering\2021\21060 - Stella Road\78 OVERALL TCP PHASING (1 OF 2).dwg Charlie Valenzuela

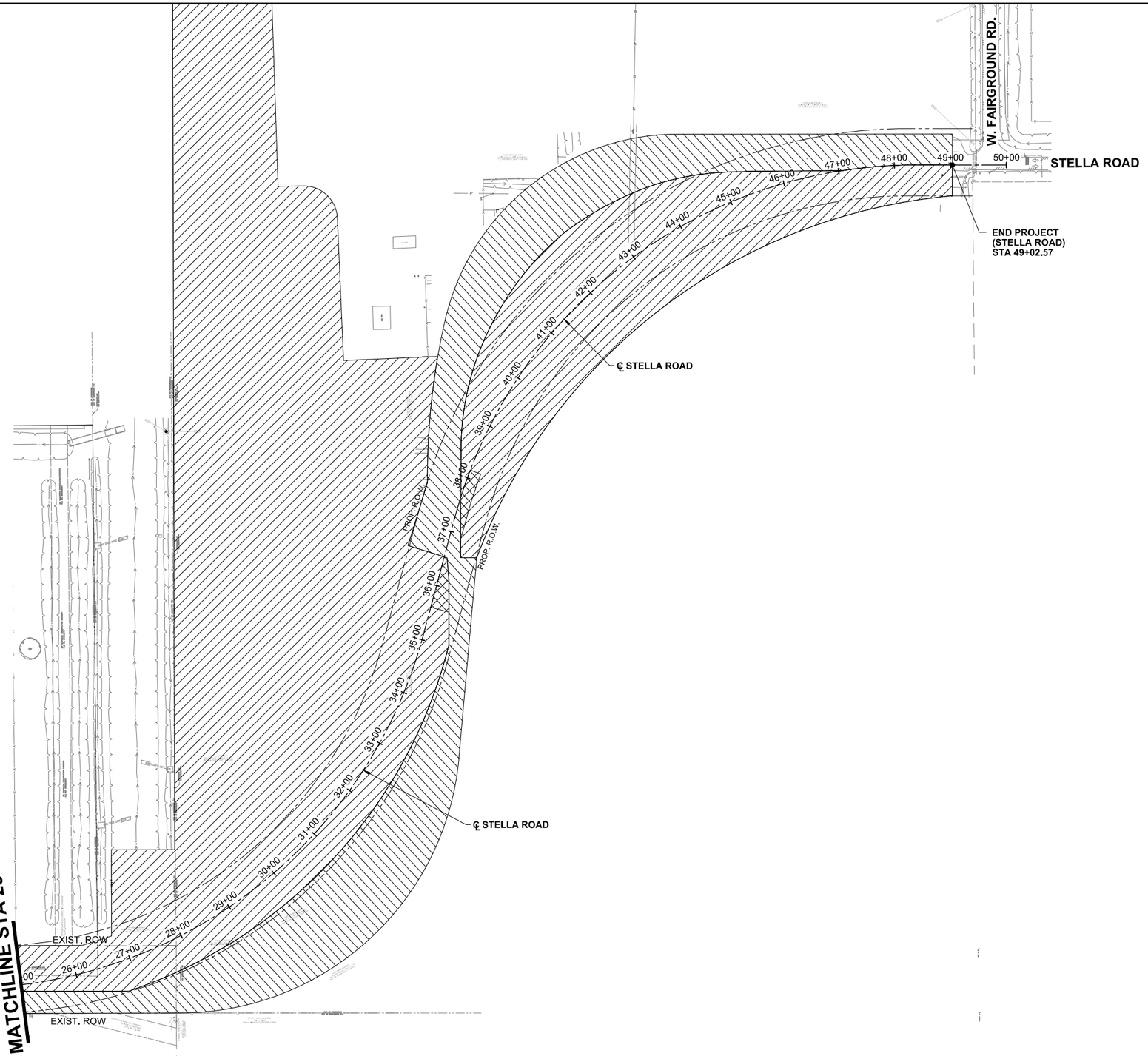
NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

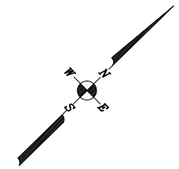
FORT BEND COUNTY
TEXAS

McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: OVERALL TCP PHASING (1 OF 2)
SCALE: 1" = 200'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 78 / 133





SCALE 1"=200'

200' 100' 0 200'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

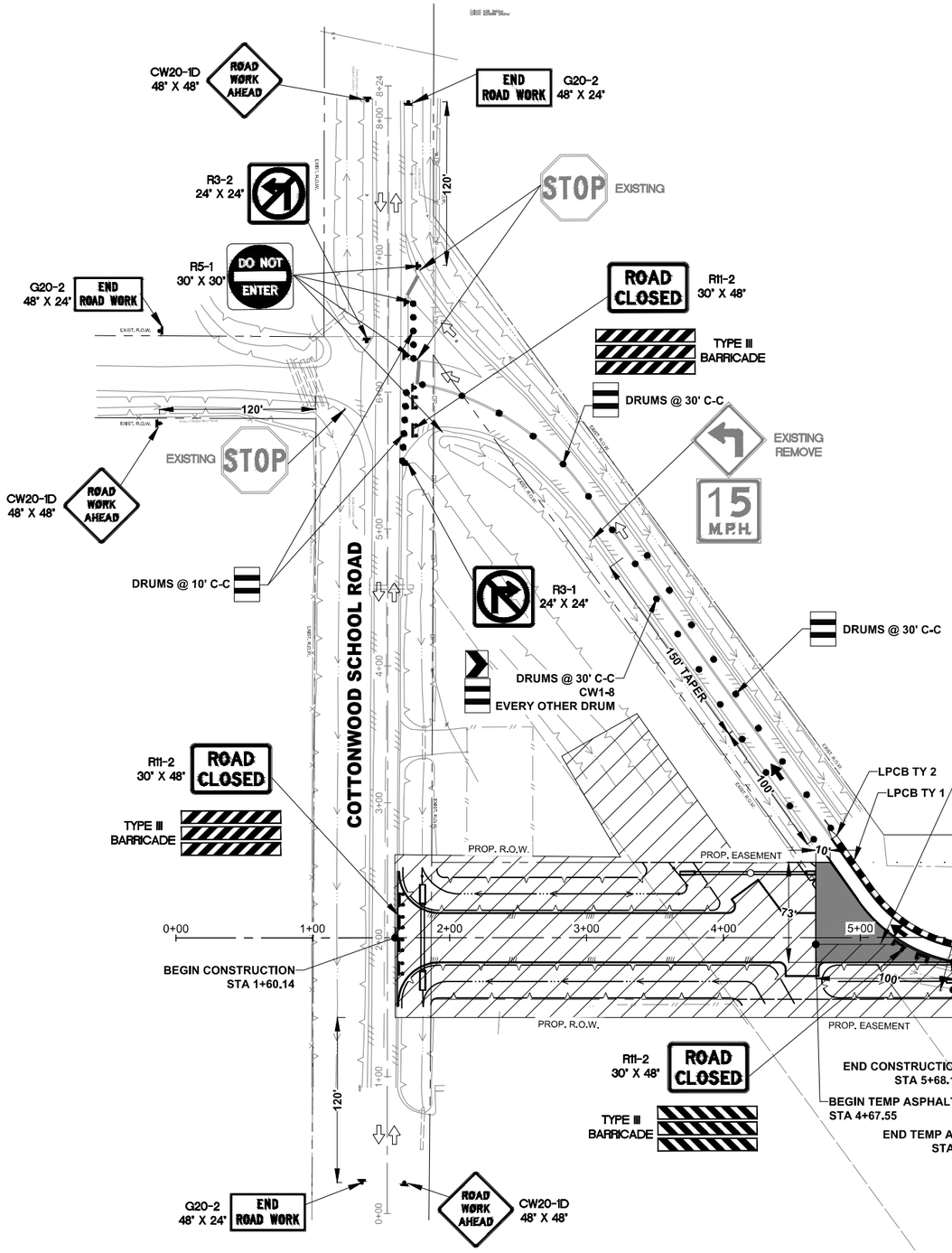
FORT BEND COUNTY
TEXAS

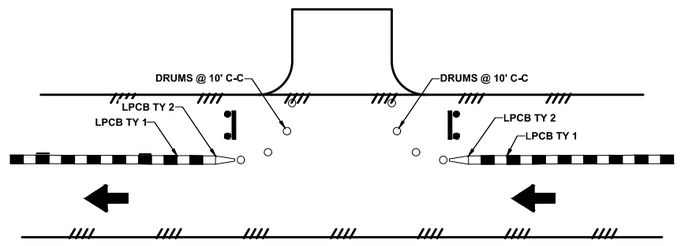
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

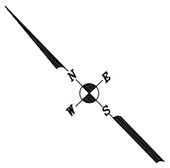
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: OVERALL TCP PHASING (2 OF 2)
SCALE: 1" = 200'	SHEET NO: 79 / 133
DATE: 1/16/2023	APPROVED BY:

X:\Engineering\2021\21060 - Stella Road\79 OVERALL TCP PHASING (2 OF 2).dwg Charlie Valenzuela





Ⓐ TYP. DRIVEWAY ACCESS
N.T.S.



SCALE 1"=100'

100' 50' 0 100'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- A 4" WHITE SOLID REMOVABLE
- B 4" YELLOW SOLID REMOVABLE
- C 4" WHITE SOLID NON-REMOVABLE
- D 4" YELLOW SOLID NON-REMOVABLE
- E 24" WHITE SOLID

NOTES:

PHASE 1

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

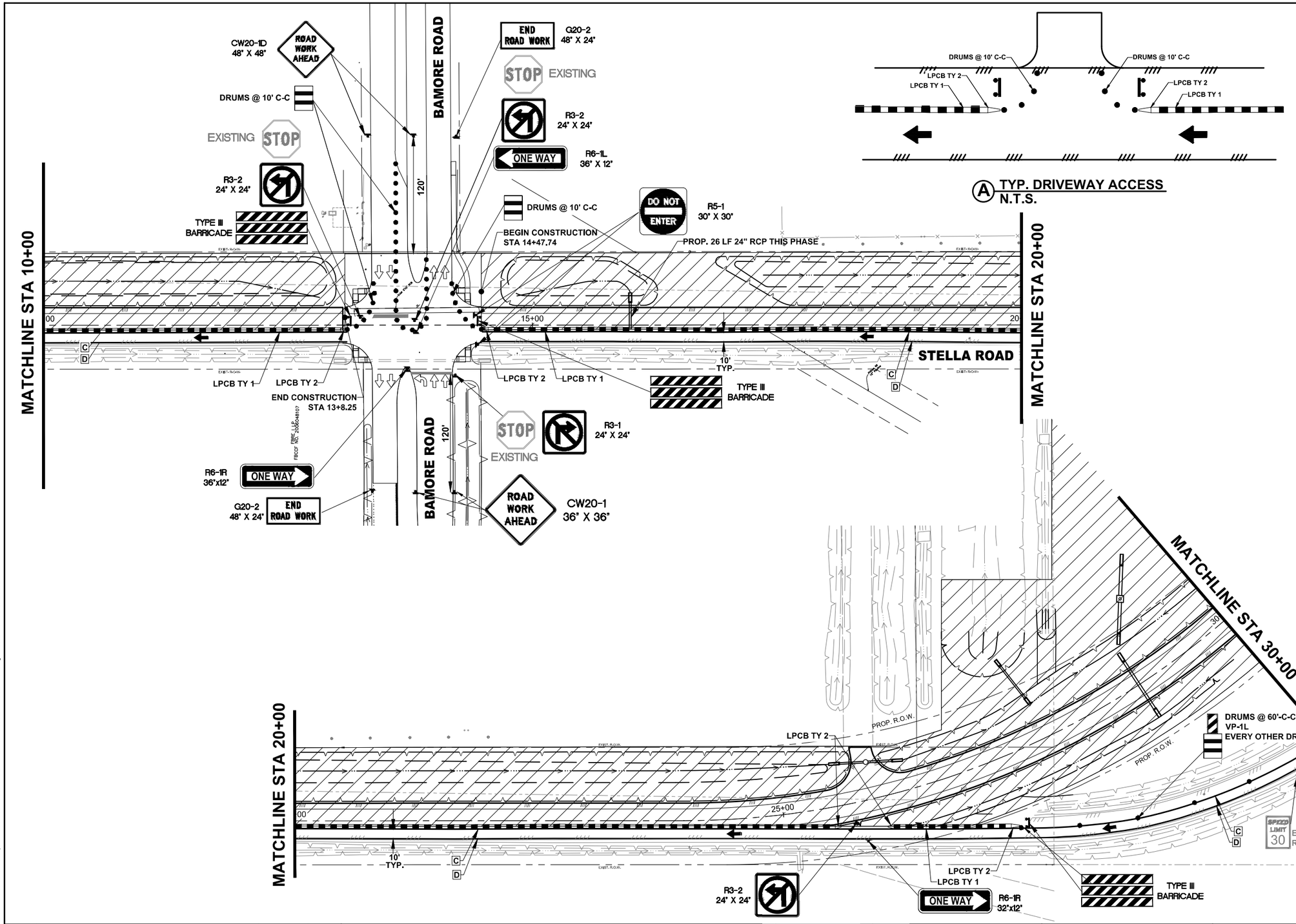
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 1 STEP 1
SCALE: 1" = 40'	STA. 0+00 TO STA. 10+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 80 / 133

X:\Engineering\2021\21060 - Stella Road\80 TRAFFIC CONTROL PLAN PHASE 1 STEP 1.dwg Charlie Valenzuela



NOTES:

PHASE 1

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

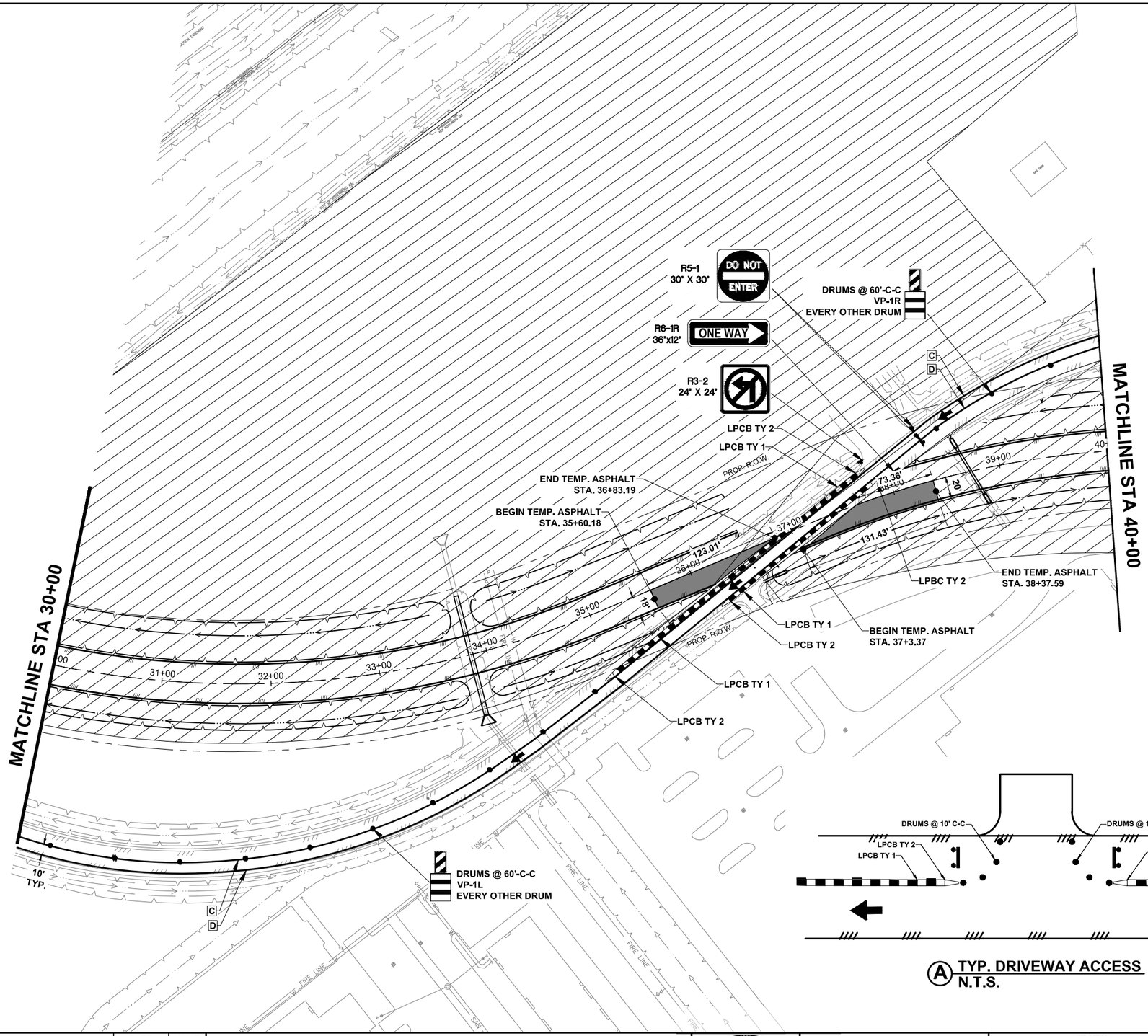
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

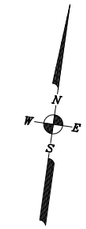
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 1 STEP 1
SCALE: 1" = 40'	STA. 10+00 TO STA. 30+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 81 / 133

X:\Engineering\2021\21060 – Stella Road\81 TRAFFIC CONTROL PLAN PHASE 1 STEP 1.dwg Charlie Valenzuela



Ⓐ **TYP. DRIVEWAY ACCESS**
N.T.S.



SCALE 1"=100'

100' 50' 0 100'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- [A] 4" WHITE SOLID REMOVABLE
- [B] 4" YELLOW SOLID REMOVABLE
- [C] 4" WHITE SOLID NON-REMOVABLE
- [D] 4" YELLOW SOLID NON-REMOVABLE
- [E] 24" WHITE SOLID

NOTES:

PHASE 1

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

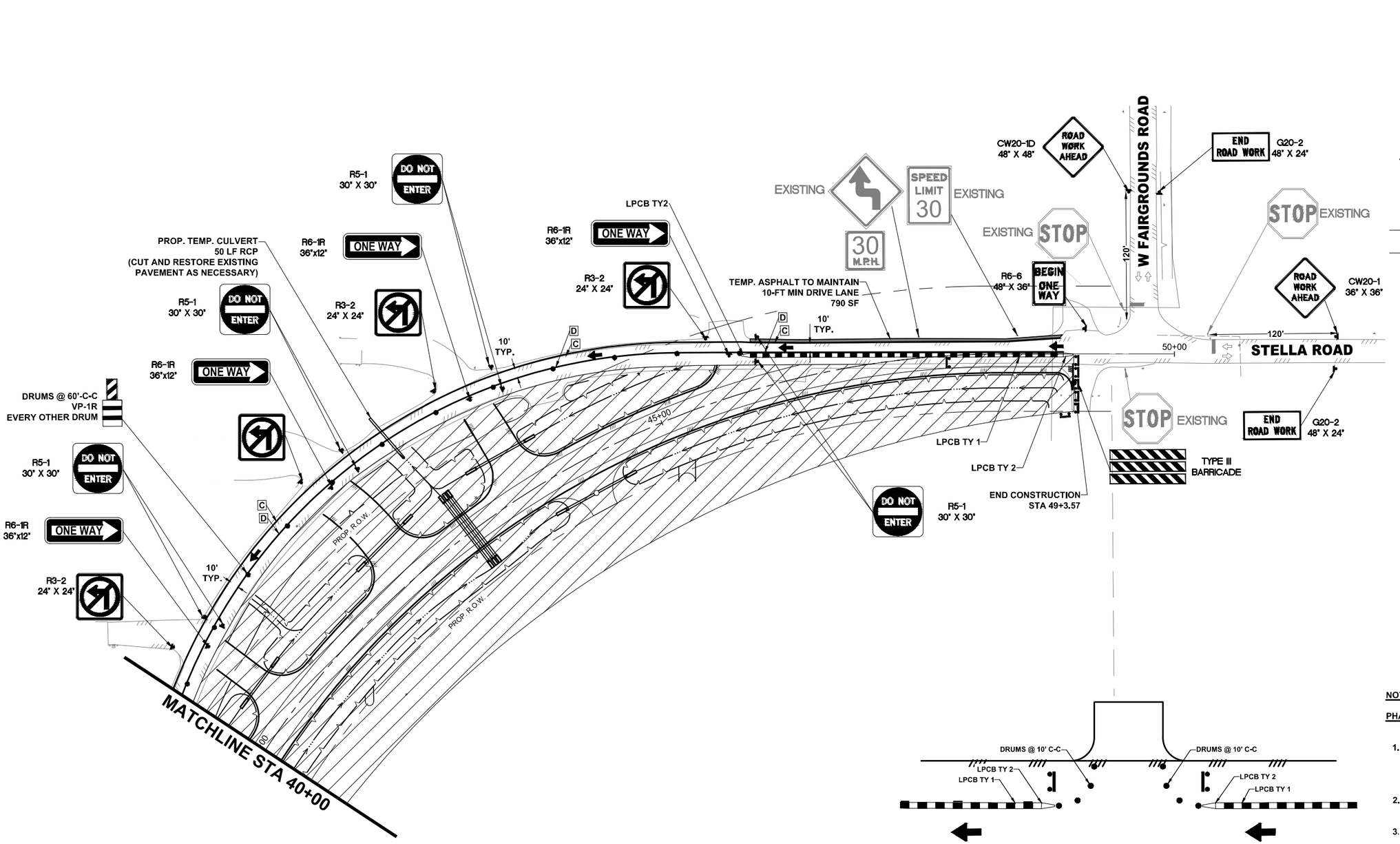
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 1 STEP 1
SCALE: 1" = 40'	STA. 30+00 TO STA. 40+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 82 / 133

X:\Engineering\2021\21060 – Stella Road\82 TRAFFIC CONTROL PLAN PHASE 1 STEP 1.dwg Charlie Valenzuela



SCALE 1"=100'

100' 50' 0 100'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- [A] 4" WHITE SOLID REMOVABLE
- [B] 4" YELLOW SOLID REMOVABLE
- [C] 4" WHITE SOLID NON-REMOVABLE
- [D] 4" YELLOW SOLID NON-REMOVABLE
- [E] 24" WHITE SOLID

Ⓐ TYP. DRIVEWAY ACCESS
N.T.S.

NOTES:

PHASE 1

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

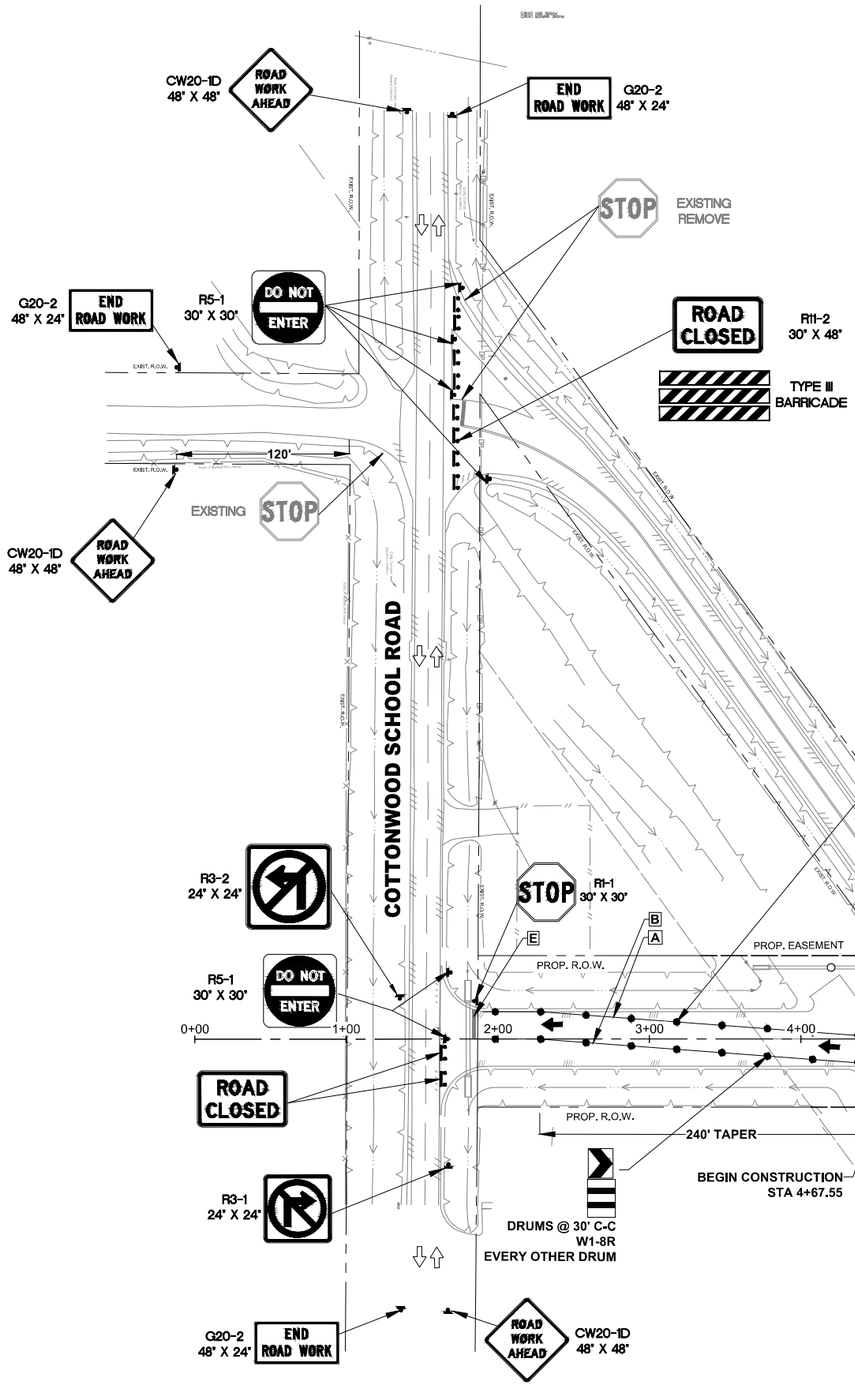
FORT BEND COUNTY
TEXAS

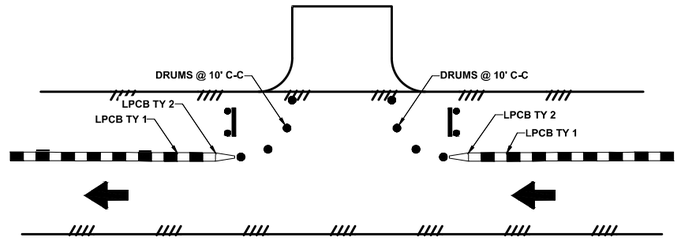
McDONOUGH
CVil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

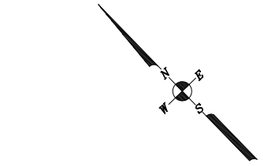
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 1 STEP 1
SCALE: 1" = 40'	STA. 40+00 TO END
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 83 / 133

X:\Engineering\2021\21060 – Stella Road\83 TRAFFIC CONTROL PLAN PHASE 1 STEP 1.dwg Charlie Valenzuela





Ⓐ TYP. DRIVEWAY ACCESS
N.T.S.



LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- [A] 4" WHITE SOLID REMOVABLE
- [B] 4" YELLOW SOLID REMOVABLE
- [C] 4" WHITE SOLID NON-REMOVABLE
- [D] 4" YELLOW SOLID NON-REMOVABLE
- [E] 24" WHITE SOLID

NOTES:

PHASE 1

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

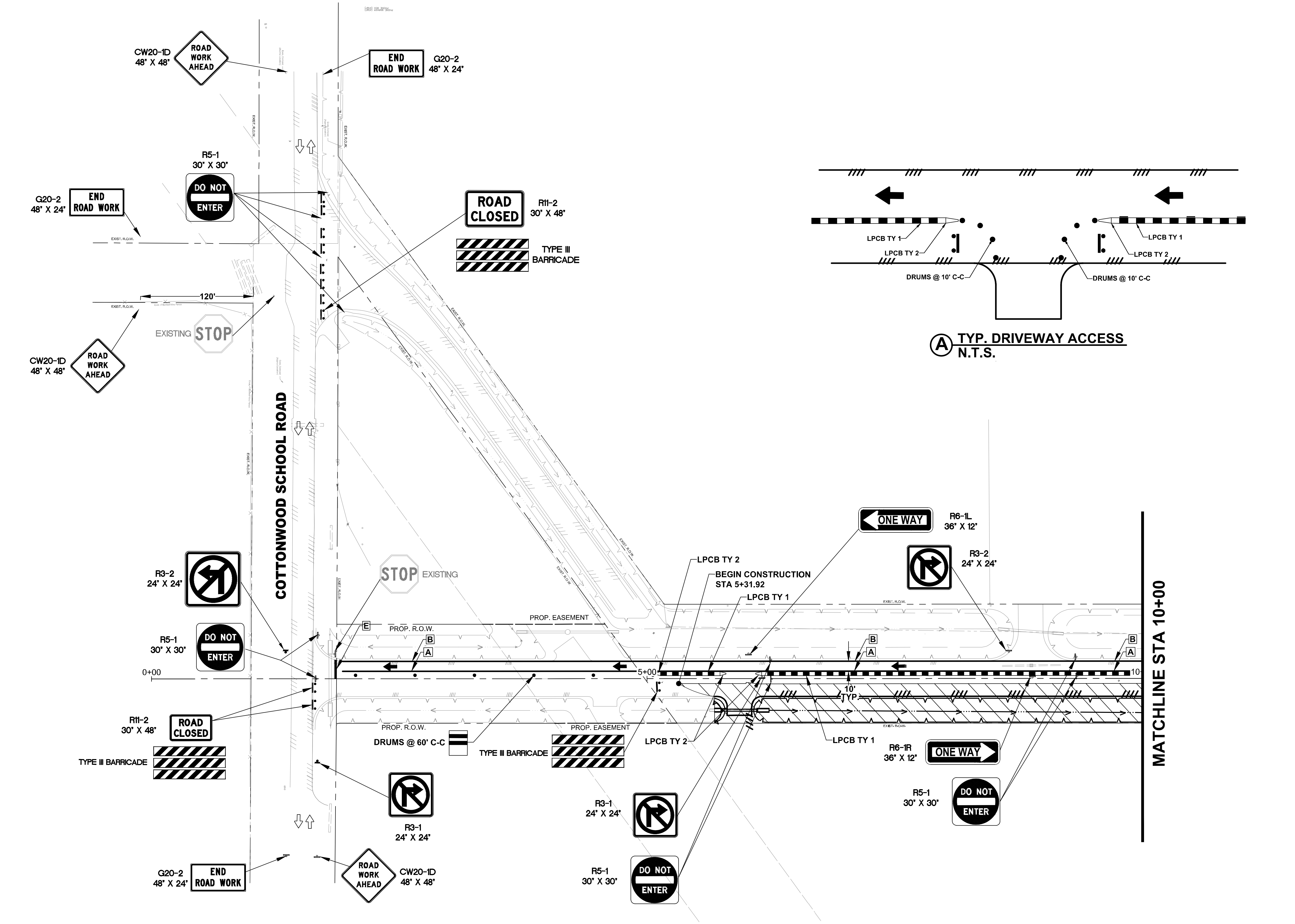
FORT BEND COUNTY TEXAS

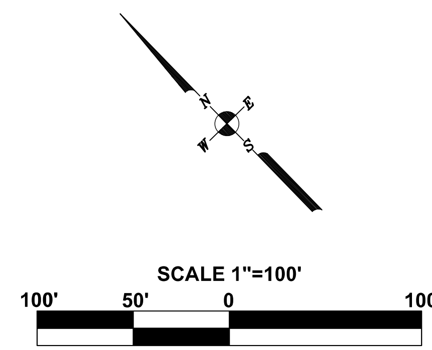
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 1 STEP 2
SCALE: 1" = 40'	STA. 0+00 TO STA. 10+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 84 / 133

X:\Engineering\2021\21060 – Stella Road\84 TRAFFIC CONTROL PLAN PHASE 1 STEP 2.dwg Charlie Valenzuela





LEGEND

— — —	PROP. R.O.W.
— — —	EXIST. R.O.W.
➡	PROP. TRAFFIC FLOW
⇨	EXIST. TRAFFIC FLOW
▨	CONSTRUCTION PHASE 1
▧	CONSTRUCTION PHASE 2
▬	PORT CTB LOW PROFILE (LPCB) TY 1
▭	PORT CTB LOW PROFILE (LPCB) TY 2
⁞	TYPE III BARRICADE
●	CHANNELIZING DEVICE
■	TEMP ASPHALT
A	4" WHITE SOLID REMOVABLE
B	4" YELLOW SOLID REMOVABLE
C	4" WHITE SOLID NON-REMOVABLE
D	4" YELLOW SOLID NON-REMOVABLE
E	24" WHITE SOLID

NOTES:

PHASE 2

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

X:\Engineering\2021\21060 – Stella Road\85 TRAFFIC CONTROL PLAN PHASE 2 STEP 1.dwg Charlie Valenzuela

NO.	REVISIONS	DATE	NAME
△			
△			
△			
△			
△			

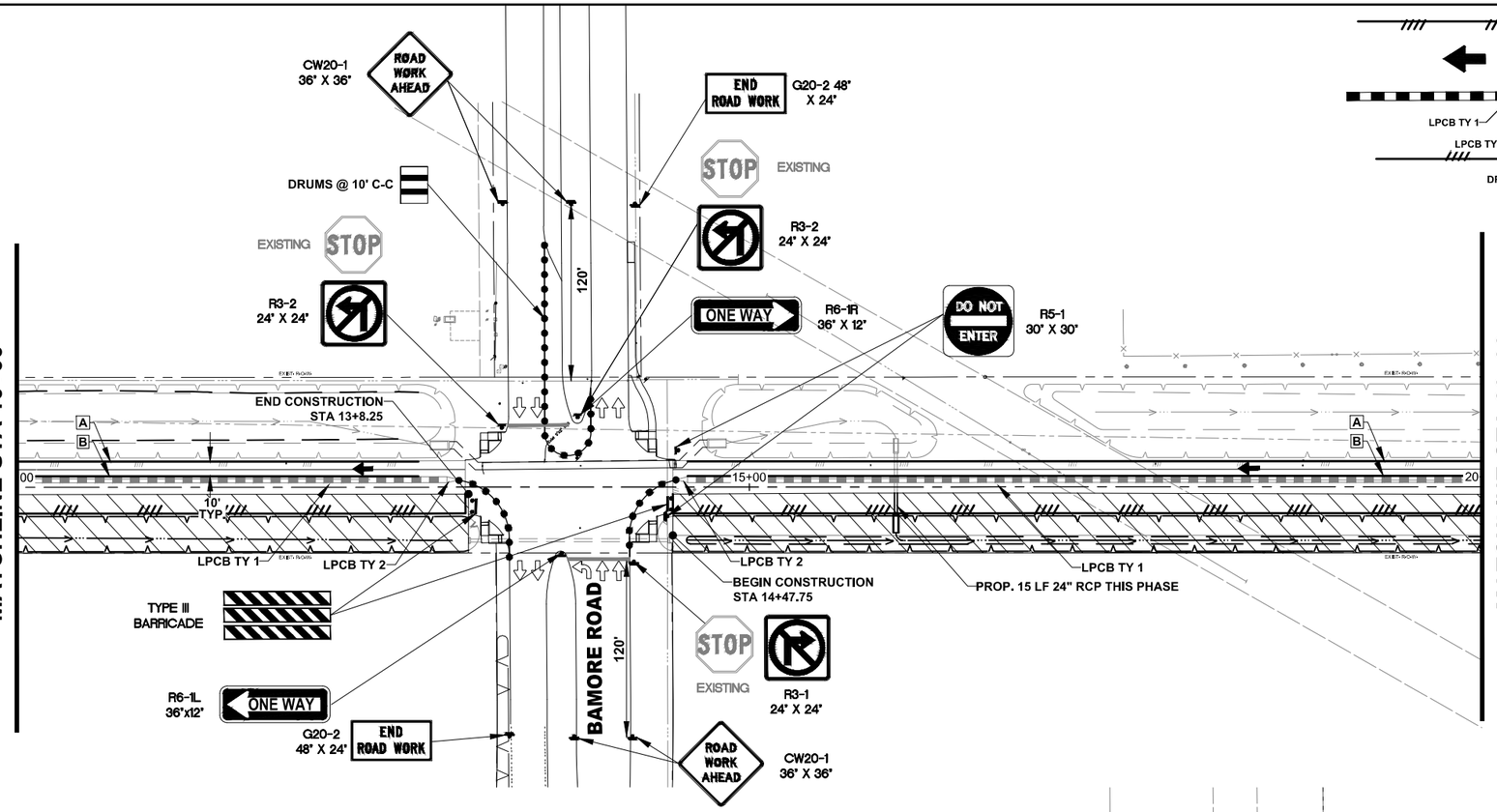
FORT BEND COUNTY
TEXAS

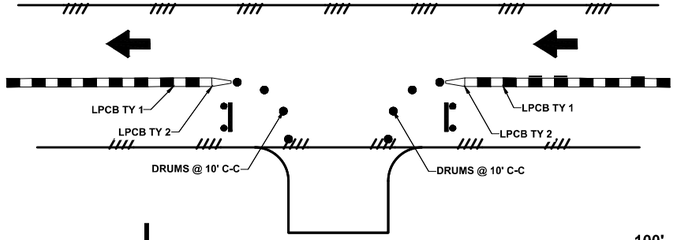
THE STATE OF TEXAS FORT BEND COUNTY

MᶜDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
[illegible]
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 2 STEP 1
SCALE: 1" = 40'	STA. 0+00 TO STA. 10+00
DATE: 1/16/2023	APPROVED BY:
SHEET NO:	85 / 133





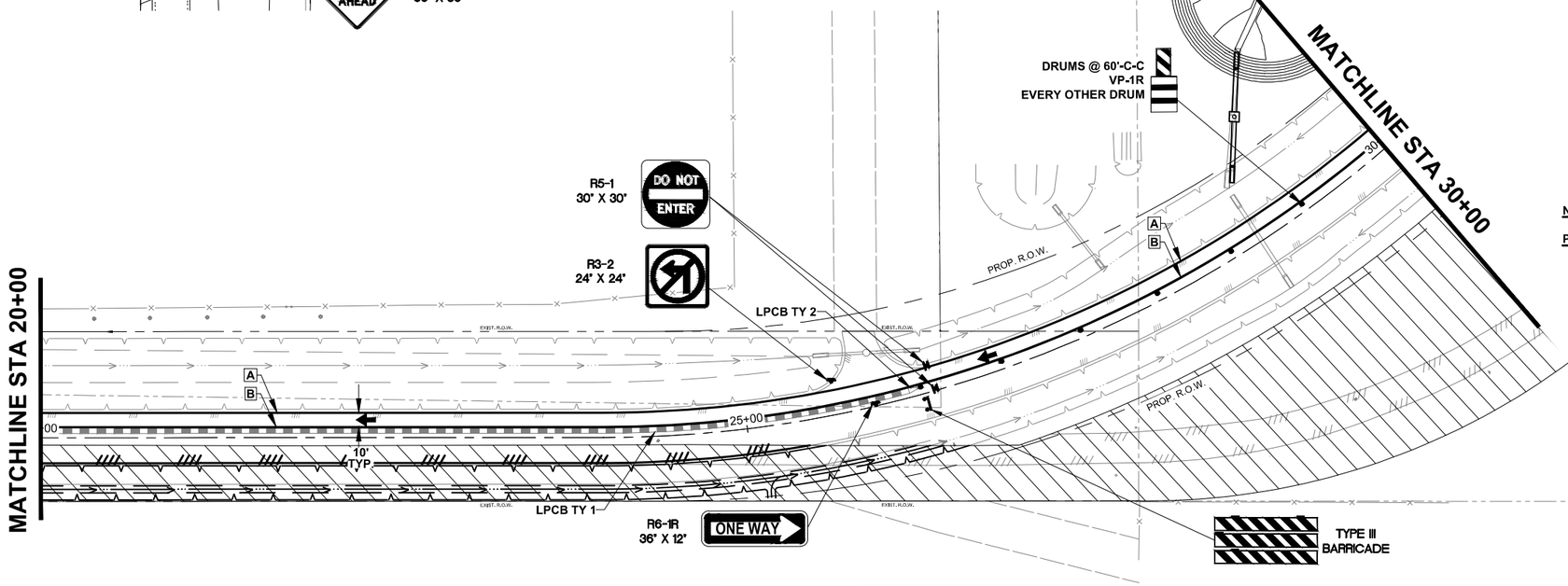
A TYP. DRIVEWAY ACCESS
N.T.S.

SCALE 1"=100'

100' 50' 0 100'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- [A] 4" WHITE SOLID REMOVABLE
- [B] 4" YELLOW SOLID REMOVABLE
- [C] 4" WHITE SOLID NON-REMOVABLE
- [D] 4" YELLOW SOLID NON-REMOVABLE
- [E] 24" WHITE SOLID



NOTES:

PHASE 2

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

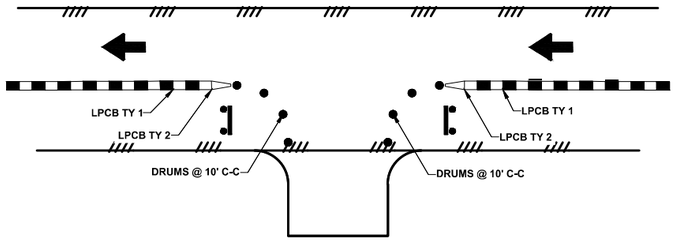
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

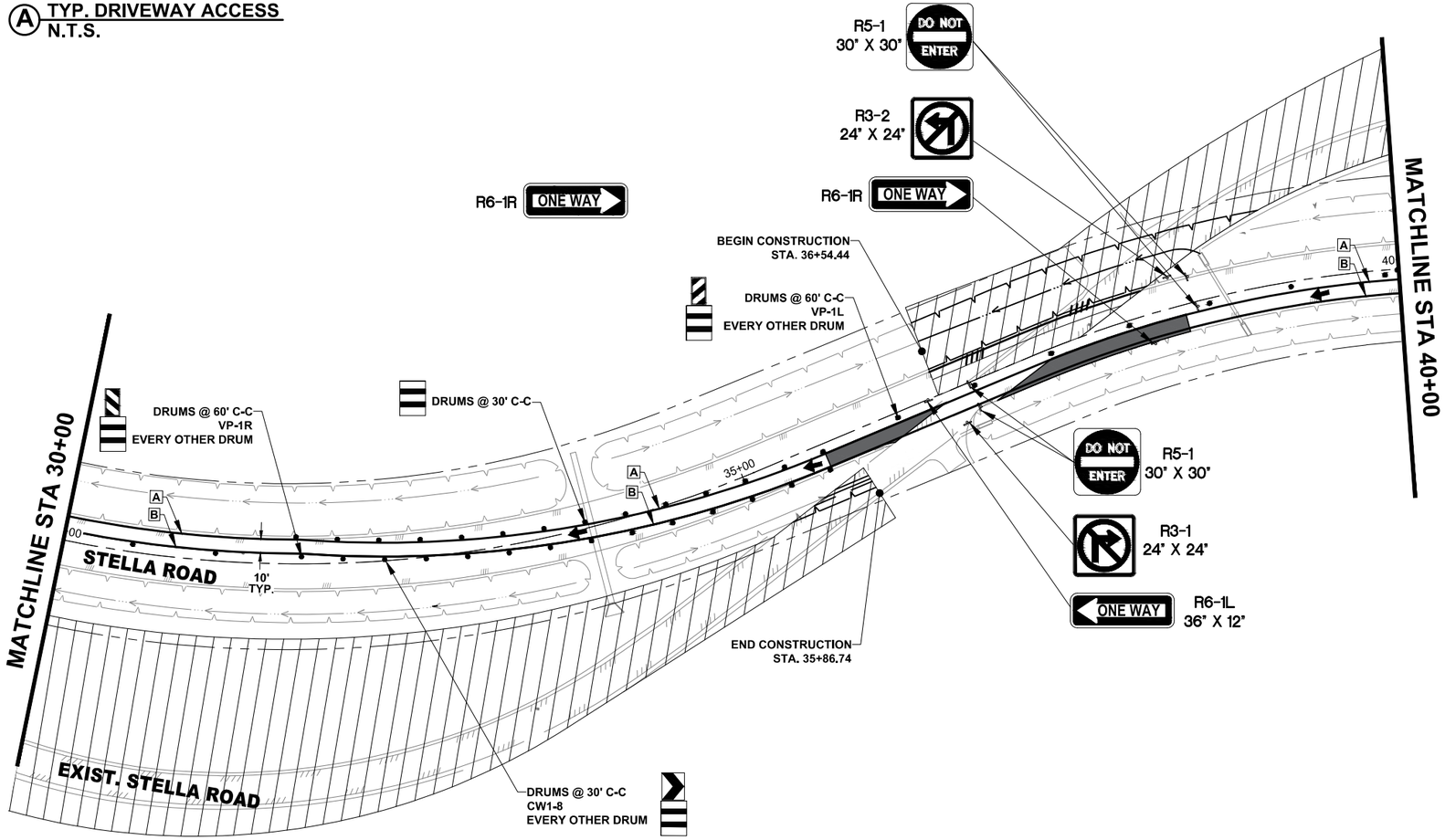
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 2 STEP 1
SCALE: 1" = 40'	STA. 10+00 TO STA. 30+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 86 / 133

X:\Engineering\2021\21060 – Stella Road\86 TRAFFIC CONTROL PLAN PHASE 2 STEP 1.dwg Charlie Valenzuela



Ⓐ TYP. DRIVEWAY ACCESS
N.T.S.



SCALE 1"=100'

100' 50' 0 100'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- A — 4" WHITE SOLID REMOVABLE
- B — 4" YELLOW SOLID REMOVABLE
- C — 4" WHITE SOLID NON-REMOVABLE
- D — 4" YELLOW SOLID NON-REMOVABLE
- E — 24" WHITE SOLID

NOTES:

PHASE 2

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

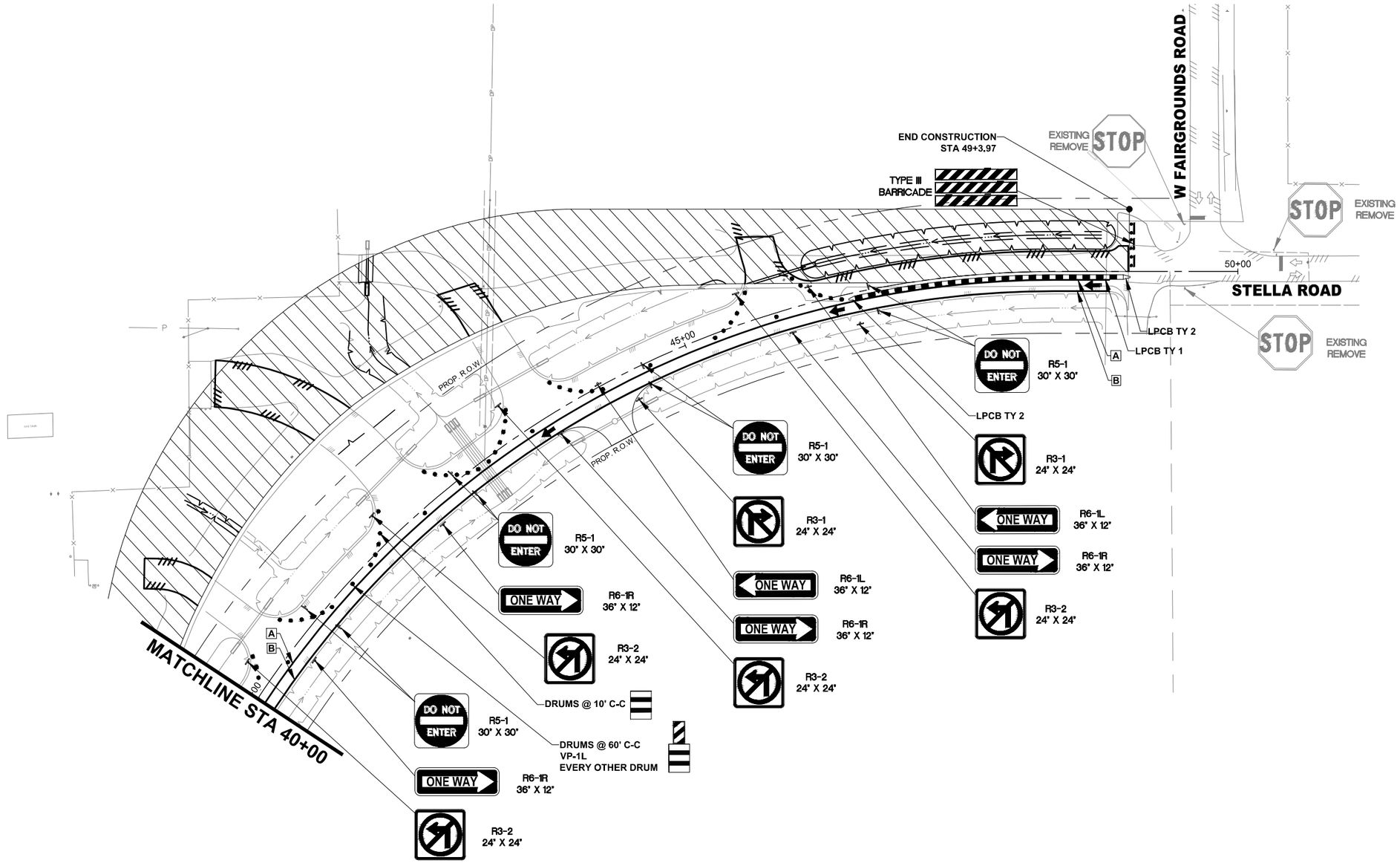
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 2 STEP 1
SCALE: 1" = 40'	STA. 30+00 TO STA. 40+00
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 87 / 133

X:\Engineering\2021\21060 – Stella Road\87 TRAFFIC CONTROL PLAN PHASE 2 STEP 1.dwg Charlie Valenzuela



SCALE 1"=100'

100' 50' 0 100'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- [A] 4" WHITE SOLID REMOVABLE
- [B] 4" YELLOW SOLID REMOVABLE
- [C] 4" WHITE SOLID NON-REMOVABLE
- [D] 4" YELLOW SOLID NON-REMOVABLE
- [E] 24" WHITE SOLID

NOTES:

PHASE 2

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

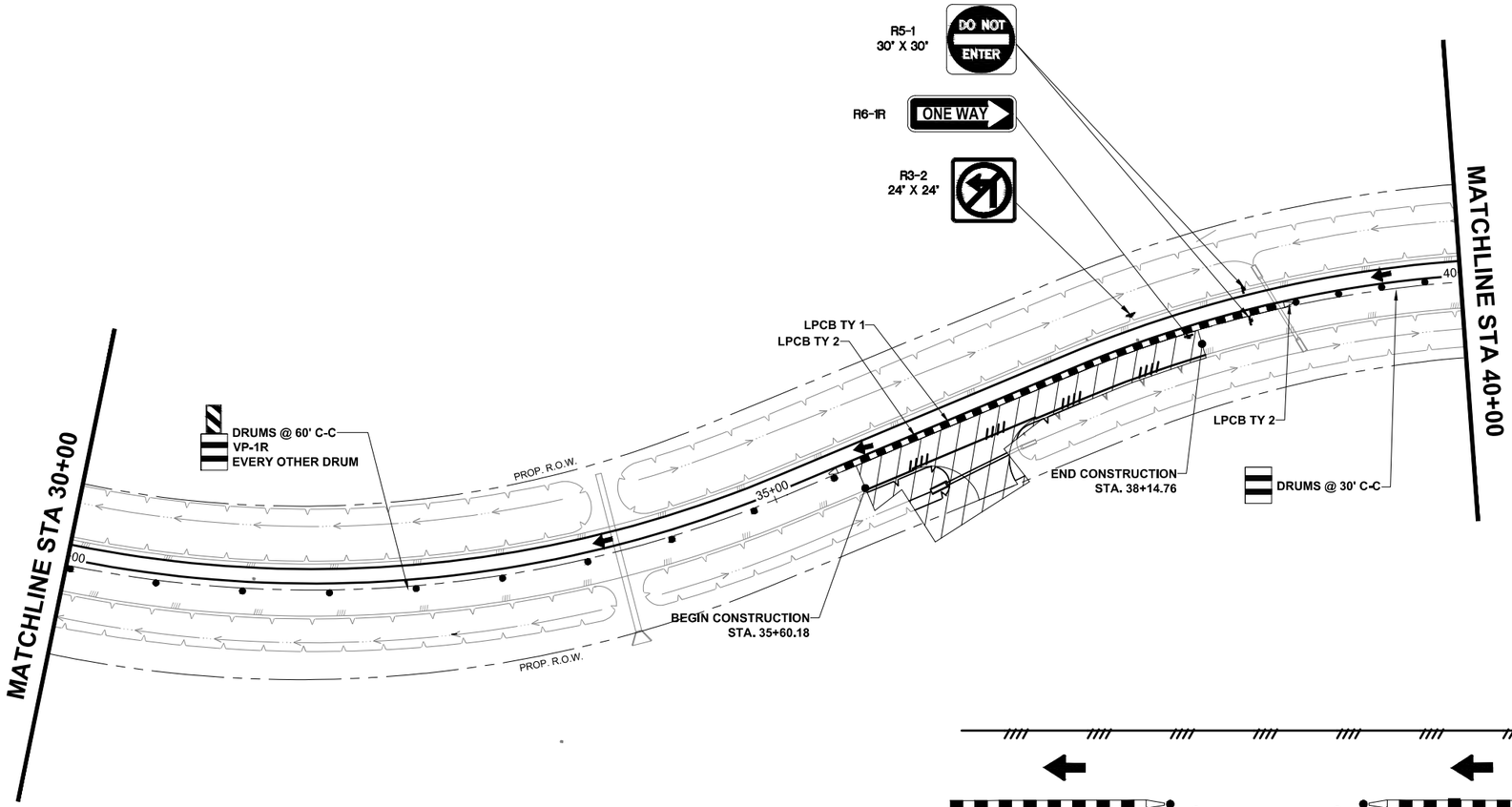
FORT BEND COUNTY
TEXAS

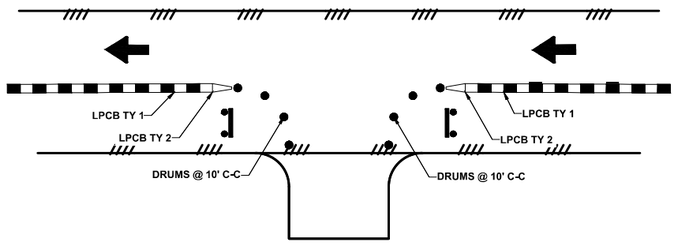
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

AUSTIN P. MCLEAN 132535 LICENSED PROFESSIONAL ENGINEER
7/3/2024

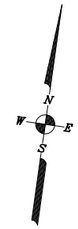
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 2 STEP 1
SCALE: 1" = 40'	STA. 40+00 TO END
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 88 / 133

X:\Engineering\2021\21060 - Stella Road\88 TRAFFIC CONTROL PLAN PHASE 2 STEP 1.dwg Charlie Valenzuela





Ⓐ TYP. DRIVEWAY ACCESS
N.T.S.



SCALE 1"=100'

100' 50' 0 100'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- [A] 4" WHITE SOLID REMOVABLE
- [B] 4" YELLOW SOLID REMOVABLE
- [C] 4" WHITE SOLID NON-REMOVABLE
- [D] 4" YELLOW SOLID NON-REMOVABLE
- [E] 24" WHITE SOLID

NOTES:

PHASE 2

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

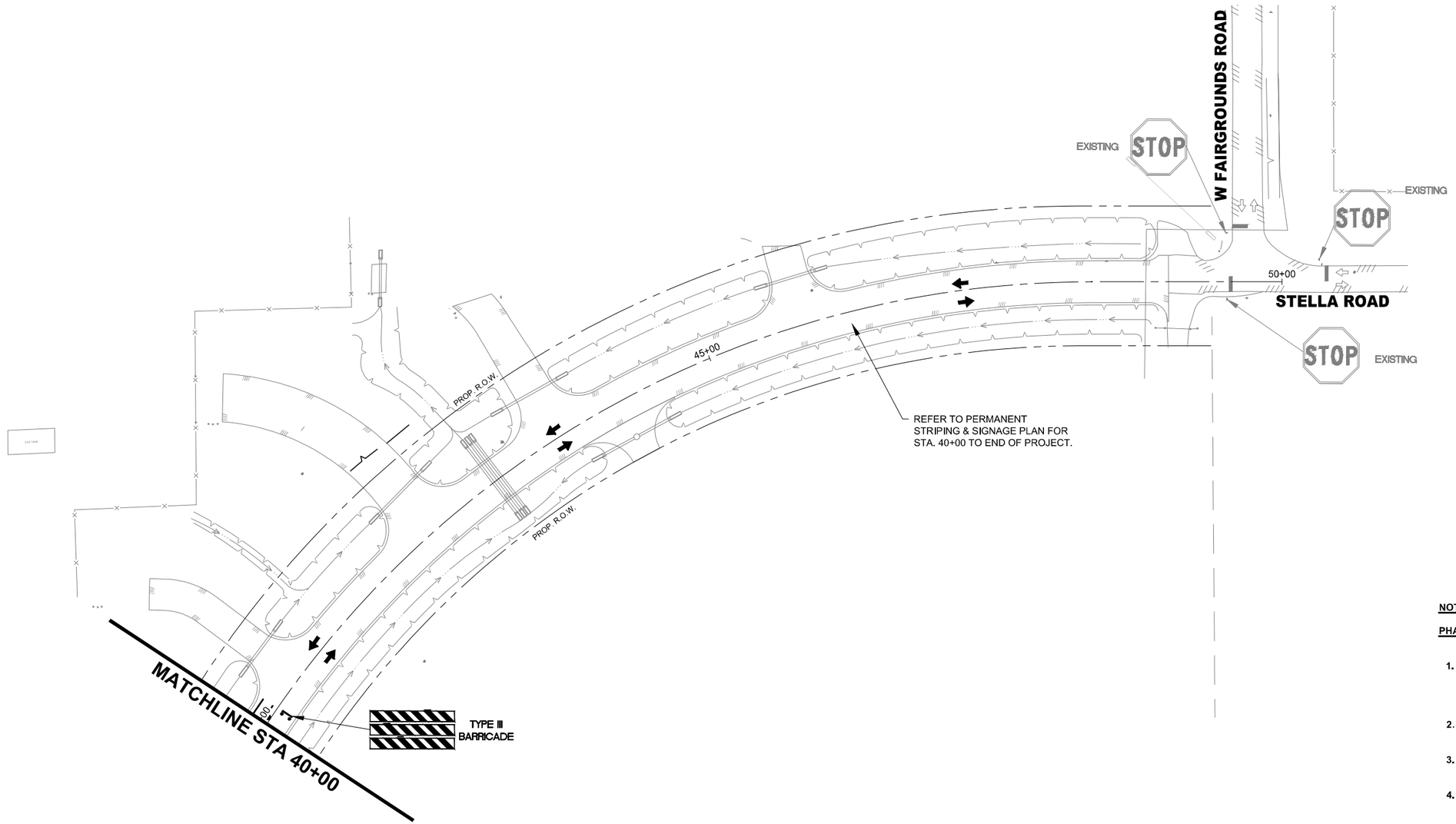
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 2 STEP 2
SCALE: 1" = 40'	STA. 30+00 TO STA. 40+00
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 89 / 133

X:\Engineering\2021\21060 - Stella Road\89 TRAFFIC CONTROL PLAN PHASE 2 STEP 2.dwg Charlie Valenzuela



SCALE 1"=100'

100' 50' 0 100'

LEGEND

- PROP. R.O.W.
- EXIST. R.O.W.
- PROP. TRAFFIC FLOW
- EXIST. TRAFFIC FLOW
- CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- PORT CTB LOW PROFILE (LPCB) TY 1
- PORT CTB LOW PROFILE (LPCB) TY 2
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TEMP ASPHALT
- [A] 4" WHITE SOLID REMOVABLE
- [B] 4" YELLOW SOLID REMOVABLE
- [C] 4" WHITE SOLID NON-REMOVABLE
- [D] 4" YELLOW SOLID NON-REMOVABLE
- [E] 24" WHITE SOLID

NOTES:

PHASE 2

1. SET LOW PROFILE CONCRETE BARRIER AND INSTALL TEMPORARY PAVEMENT MARKINGS, CONSTRUCTION SIGNS, AND BARRICADES AS SHOWN IN THE TRAFFIC CONTROL PLAN.
2. CONSTRUCT PAVEMENT, STORM SEWER AND DITCHES FOR THIS PHASE.
3. CONSTRUCT TEMPORARY ASPHALT PAVEMENT AT THE LOCATION SHOWN.
4. MAINTAIN ACCESS WITH CRUSHED LIMESTONE TO ALL RESIDENTS AND BUSINESSES DURING THIS PHASE. SEE TYPICAL DRIVEWAY ACCESS DETAIL.
5. CONTRACTOR TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.
6. INSTALL PERMANENT STRIPING AND SIGNAGE FROM STA. 40+00 TO END OF PROJECT. REFER TO SHEET 96 FOR PERMANENT STRIPING AND SIGNAGE PLAN.
7. SEE SHEET 91 FOR EASTBOUND TRAFFIC DETOUR

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

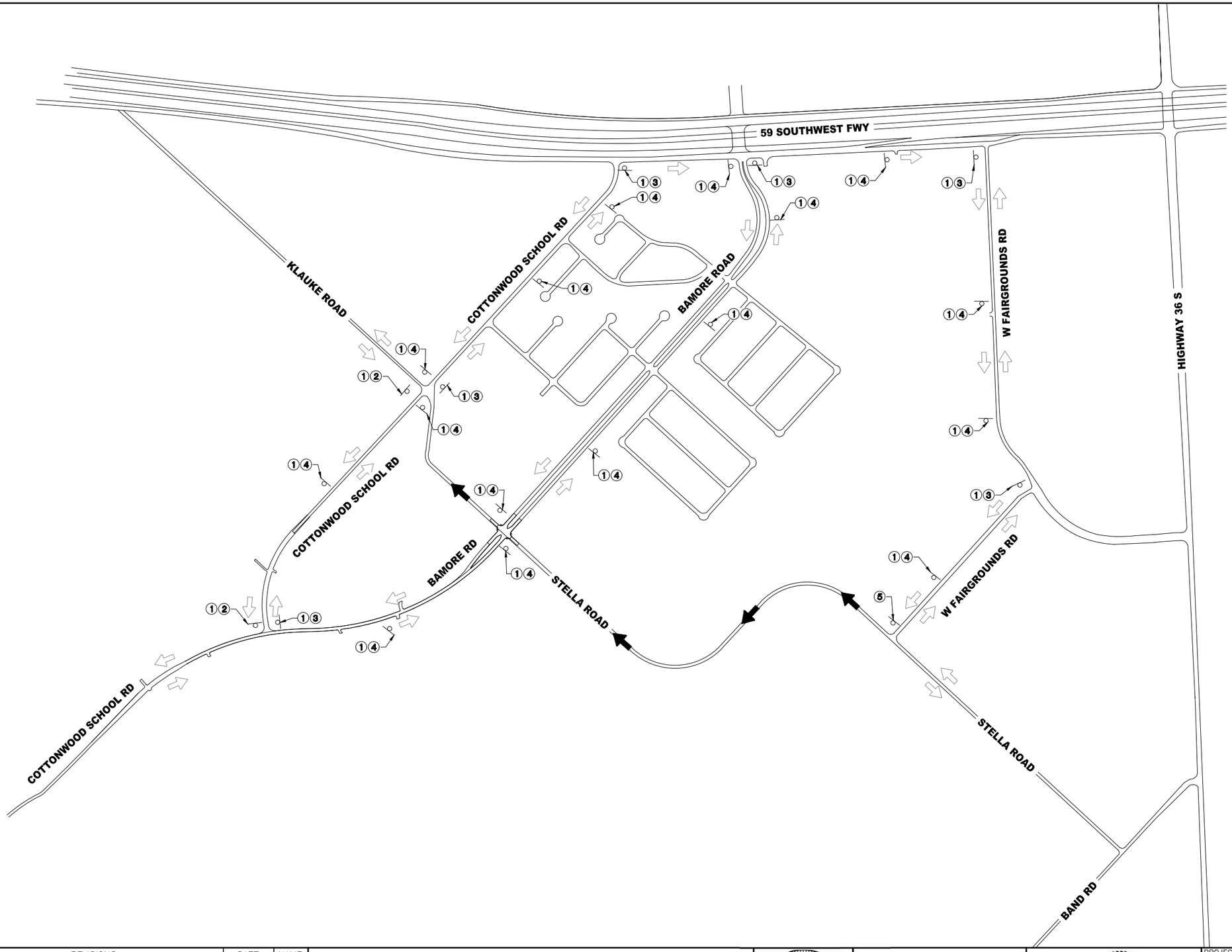
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TRAFFIC CONTROL PLAN PHASE 2 STEP 2
SCALE: 1" = 40'	STA. 40+00 TO END
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 90 / 133

X:\Engineering\2021\21060 - Stella Road\90 TRAFFIC CONTROL PLAN PHASE 2 STEP 2.dwg Charlie Valenzuela



N.T.S.

LEGEND

- PROP. TRAFFIC FLOW
- BARRELS OR DRUMS
- EXIST. TRAFFIC FLOW

① EASTBOUND STELLA ROAD — M4-12T

② DETOUR — M4-9, ALT-L 30" X 36"

③ DETOUR — M4-9, ALT-R 30" X 36"

④ DETOUR — M4-9, ALT-S 30" X 36"

⑤ END DETOUR — M4-8a 24" X 18"

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

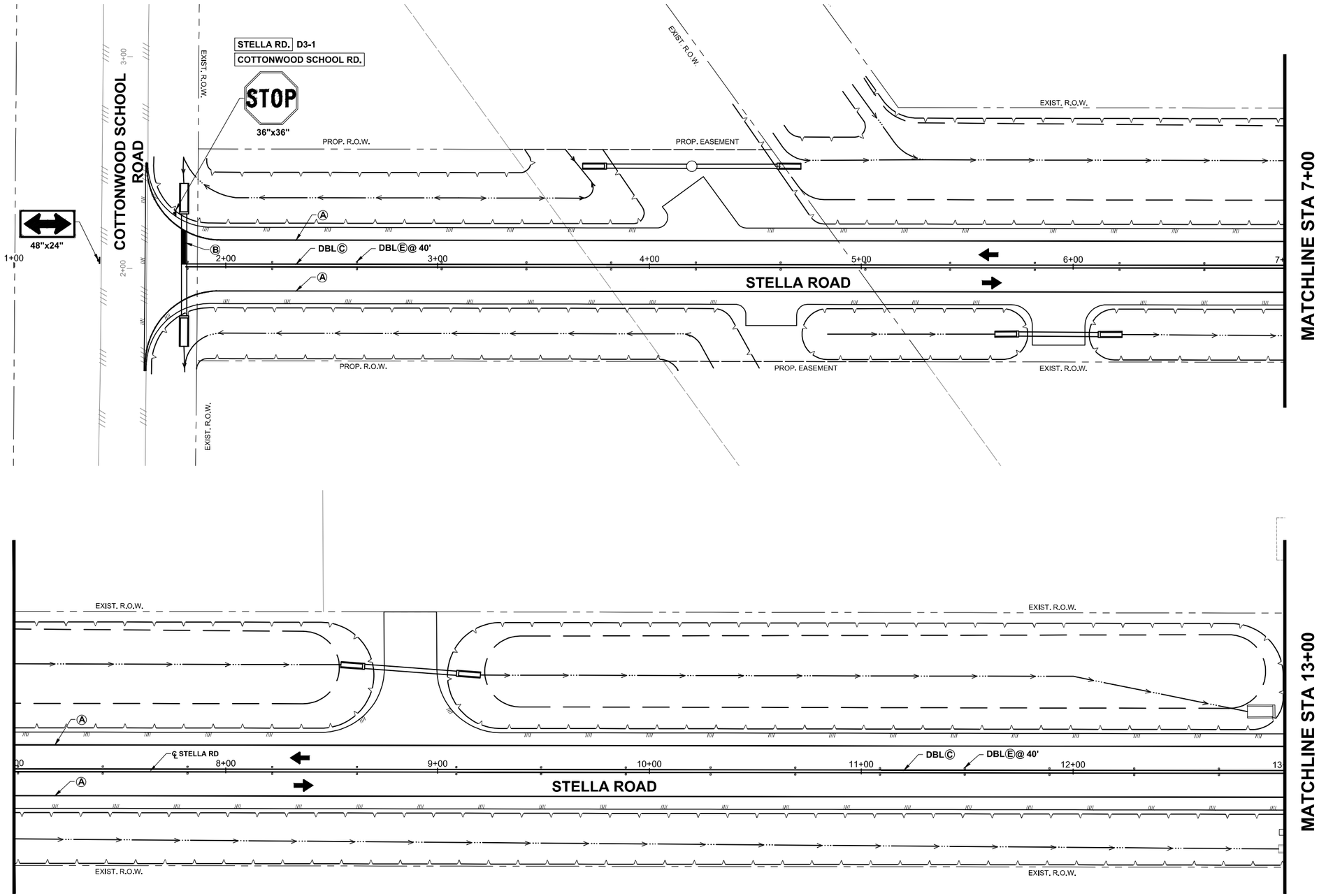
FORT BEND COUNTY TEXAS

McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS — AUSTIN P. MCLEAN — 132535 — LICENSED PROFESSIONAL ENGINEER — 7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: STELLA ROAD
SCALE: 1" = 40'	DETOUR PLAN
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 91 / 133

X:\Engineering\2021\21060 – Stella Road\91 STELLA ROAD DETOUR PLAN.dwg Charlie Valenzuela



SCALE 1"=50'

50' 25' 0 50'

LEGEND

- PROPOSED SIGN
- PROPOSED TRAVEL LANE

KEY NOTES

- (A) PROP. REFL PAV MRK TY I (W)(4")(SLD)
- (B) PROP. REFL PAV MRK TY I (W)(24")(SLD)
- (C) PROP. REFL PAV MRK TY I (Y)(4")(SLD)
- (D) PROP. REFL PAV MRK TY I (Y)(4")(BRK)
- (E) PROP. RAIS REFL PAV MRK TY II A-A
- (F) EXIST. SIGN TO REMAIN
- (G) EXIST. STRIPE TO REMAIN

NOTES

1. ALL PAVEMENT MARKING SHALL BE REFLECTORIZED TYPE I THERMOPLASTIC.
2. REFER TO PAVEMENT MARKING DETAILS FOR RAISED PAVEMENT MARKER PLACEMENT.
3. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL MEET THE REQUIREMENTS OF THE TEXAS M.U.T.C.D. FOR STREETS AND HIGHWAYS INCLUDING THERMOPLASTIC AND RAISED PAVEMENT MARKINGS AS REQUIRED BY FORT BEND COUNTY.
4. THE LOCATION OF SIGNS IS APPROXIMATE. IF THERE IS ANY CONFLICT WITH UTILITIES, DRAINAGE ELEMENTS, OR ANY OTHER PHYSICAL FEATURES, THE NEW SIGN LOCATION WITH BE DIRECTED BY THE ENGINEER.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

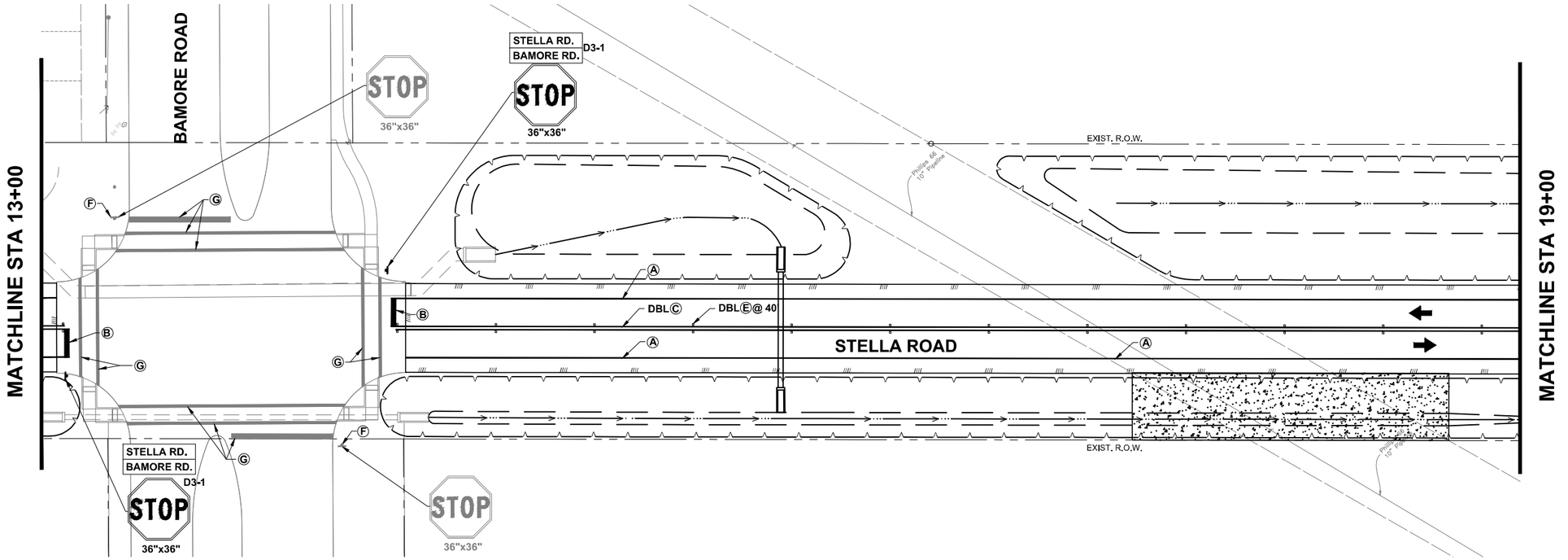
FORT BEND COUNTY
TEXAS

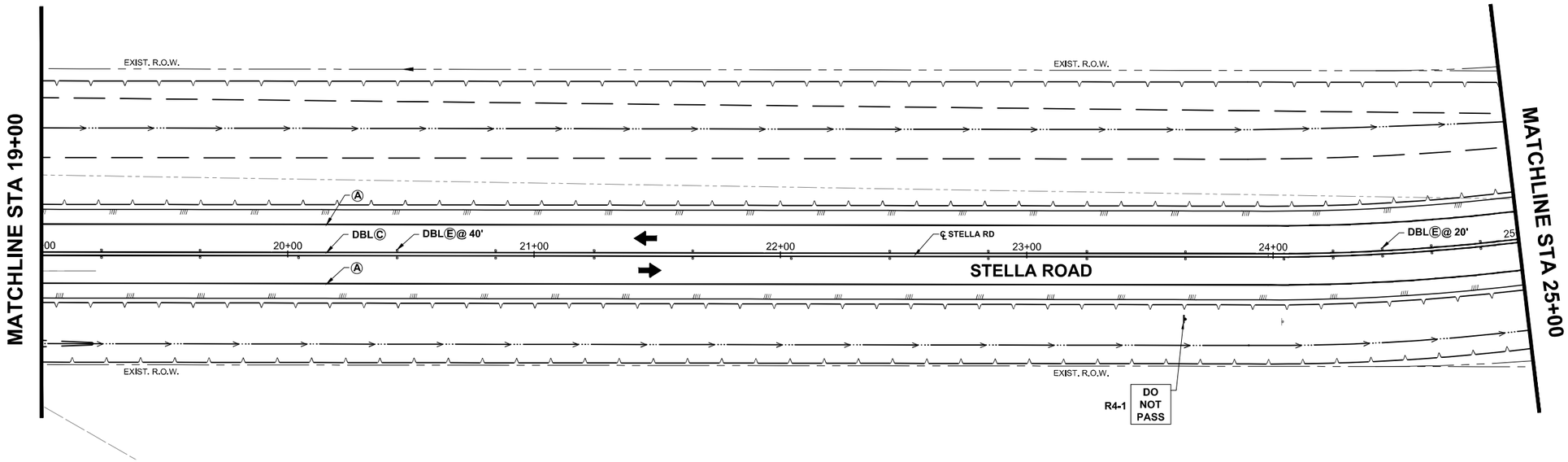
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

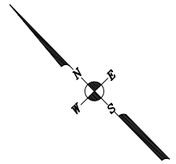
STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER · 7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: SIGNING AND PAVEMENT MARKING PLAN
SCALE: 1" = 50'	STA. 1+00 TO STA. 13+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 92 / 133

X:\Engineering\2021\21060 – Stella Road\92 SIGNING AND PAVEMENT MARKING PLAN STA. 1+00 TO STA. 13+00.dwg Charlie Valenzuela







SCALE 1"=50'

50' 25' 0 50'

LEGEND

PROPOSED SIGN

PROPOSED TRAVEL LANE

KEY NOTES

Ⓐ PROP. REFL PAV MRK TY I (W)(4")(SLD)

Ⓑ PROP. REFL PAV MRK TY I (W)(24")(SLD)

Ⓒ PROP. REFL PAV MRK TY I (Y)(4")(SLD)

Ⓓ PROP. REFL PAV MRK TY I (Y)(4")(BRK)

Ⓔ PROP. RAIS REFL PAV MRK TY II A-A

Ⓕ EXIST. SIGN TO REMAIN

Ⓖ EXIST. STRIPE TO REMAIN

NOTES

1. ALL PAVEMENT MARKING SHALL BE REFLECTORIZED TYPE I THERMOPLASTIC.
2. REFER TO PAVEMENT MARKING DETAILS FOR RAISED PAVEMENT MARKER PLACEMENT.
3. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL MEET THE REQUIREMENTS OF THE TEXAS M.U.T.C.D. FOR STREETS AND HIGHWAYS INCLUDING THERMOPLASTIC AND RAISED PAVEMENT MARKINGS AS REQUIRED BY FORT BEND COUNTY.
4. THE LOCATION OF SIGNS IS APPROXIMATE. IF THERE IS ANY CONFLICT WITH UTILITIES, DRAINAGE ELEMENTS, OR ANY OTHER PHYSICAL FEATURES, THE NEW SIGN LOCATION WITH BE DIRECTED BY THE ENGINEER.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

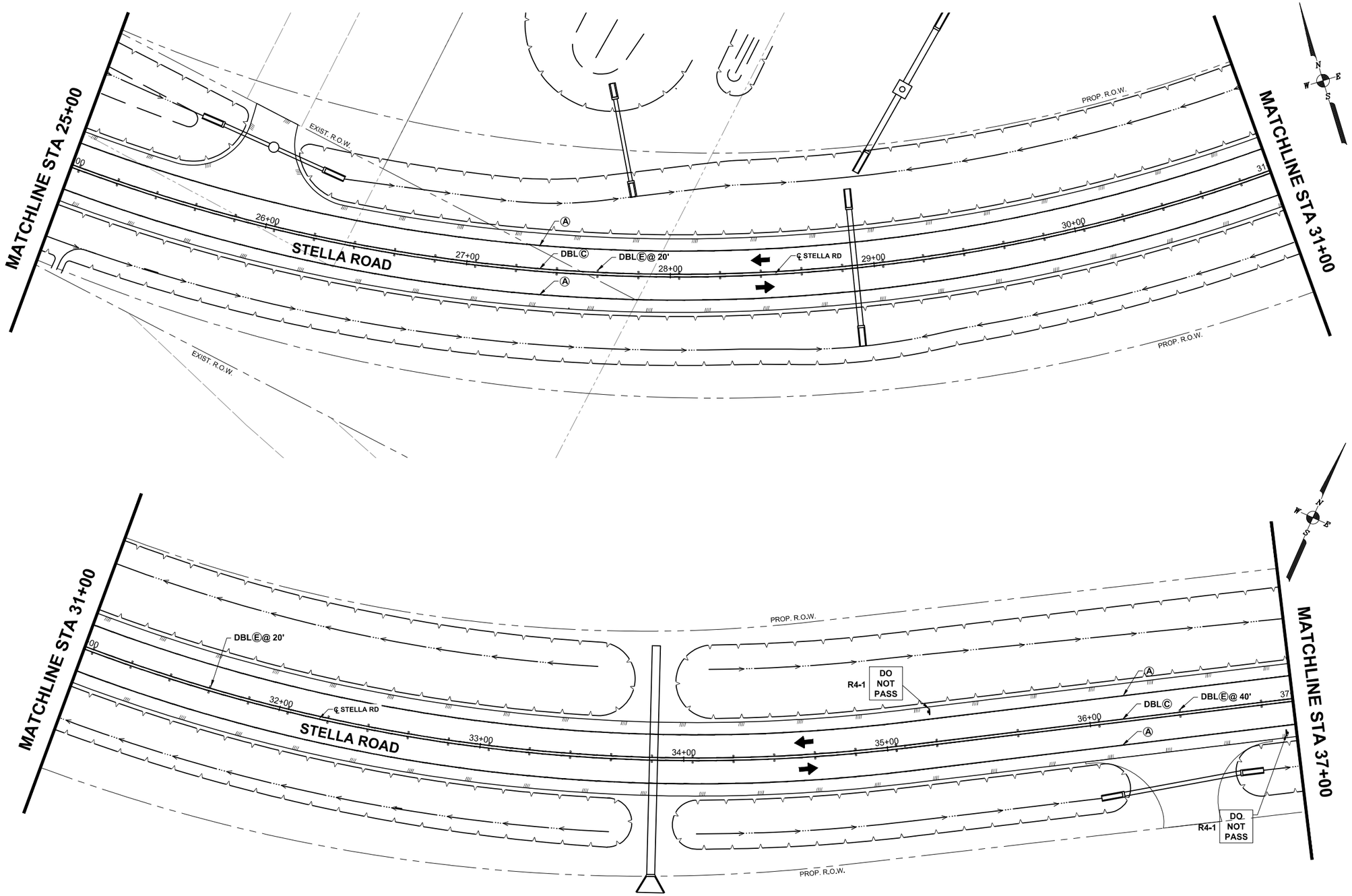
FORT BEND COUNTY
TEXAS

McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: SIGNING AND PAVEMENT MARKING PLAN
SCALE: 1" = 50'	STA. 13+00 TO STA. 25+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 93 / 133

X:\Engineering\2021\21060 – Stella Road\93 SIGNING AND PAVEMENT MARKING PLAN STA. 13+00 TO STA. 25+00.dwg Charlie Valenzuela



SCALE 1"=50'

50' 25' 0 50'

LEGEND

- PROPOSED SIGN
- PROPOSED TRAVEL LANE

KEY NOTES

- Ⓐ PROP. REFL PAV MRK TY I (W)(4")(SLD)
- Ⓑ PROP. REFL PAV MRK TY I (W)(24")(SLD)
- Ⓒ PROP. REFL PAV MRK TY I (Y)(4")(SLD)
- Ⓓ PROP. REFL PAV MRK TY I (Y)(4")(BRK)
- Ⓔ PROP. RAIS REFL PAV MRK TY II A-A
- Ⓕ EXIST. SIGN TO REMAIN
- Ⓖ EXIST. STRIPE TO REMAIN

NOTES

1. ALL PAVEMENT MARKING SHALL BE REFLECTORIZED TYPE I THERMOPLASTIC.
2. REFER TO PAVEMENT MARKING DETAILS FOR RAISED PAVEMENT MARKER PLACEMENT.
3. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL MEET THE REQUIREMENTS OF THE TEXAS M.U.T.C.D. FOR STREETS AND HIGHWAYS INCLUDING THERMOPLASTIC AND RAISED PAVEMENT MARKINGS AS REQUIRED BY FORT BEND COUNTY.
4. THE LOCATION OF SIGNS IS APPROXIMATE. IF THERE IS ANY CONFLICT WITH UTILITIES, DRAINAGE ELEMENTS, OR ANY OTHER PHYSICAL FEATURES, THE NEW SIGN LOCATION WITH BE DIRECTED BY THE ENGINEER.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

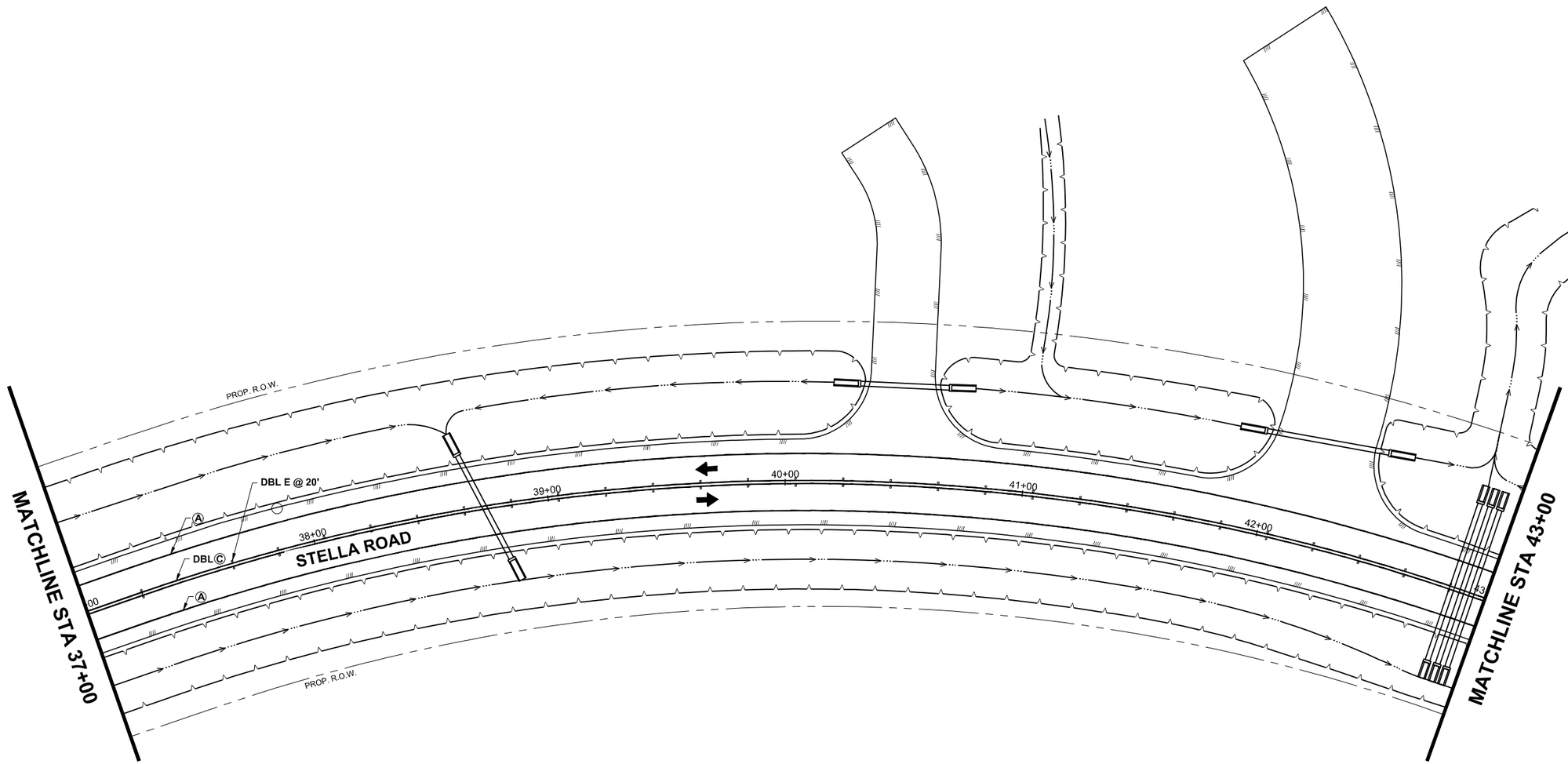
FORT BEND COUNTY TEXAS

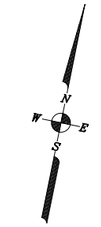
McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS — AUSTIN P. MCLEAN — 132535 — LICENSED PROFESSIONAL ENGINEER — 7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: SIGNING AND PAVEMENT MARKING PLAN
SCALE: 1" = 50'	STA. 25+00 TO STA. 37+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 94 / 133

X:\Engineering\2021\21060 – Stella Road\94 SIGNING AND PAVEMENT MARKING PLAN STA. 25+00 TO STA. 37+00.dwg Charlie Valenzuela





SCALE 1"=50'

50' 25' 0 50'

LEGEND

PROPOSED SIGN

PROPOSED TRAVEL LANE

KEY NOTES

Ⓐ PROP. REFL PAV MRK TY I (W)(4")(SLD)

Ⓑ PROP. REFL PAV MRK TY I (W)(24")(SLD)

Ⓒ PROP. REFL PAV MRK TY I (Y)(4")(SLD)

Ⓓ PROP. REFL PAV MRK TY I (Y)(4")(BRK)

Ⓔ PROP. RAIS REFL PAV MRK TY II A-A

Ⓕ EXIST. SIGN TO REMAIN

Ⓖ EXIST. STRIPE TO REMAIN

NOTES

1. ALL PAVEMENT MARKING SHALL BE REFLECTORIZED TYPE I THERMOPLASTIC.
2. REFER TO PAVEMENT MARKING DETAILS FOR RAISED PAVEMENT MARKER PLACEMENT.
3. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL MEET THE REQUIREMENTS OF THE TEXAS M.U.T.C.D. FOR STREETS AND HIGHWAYS INCLUDING THERMOPLASTIC AND RAISED PAVEMENT MARKINGS AS REQUIRED BY FORT BEND COUNTY.
4. THE LOCATION OF SIGNS IS APPROXIMATE. IF THERE IS ANY CONFLICT WITH UTILITIES, DRAINAGE ELEMENTS, OR ANY OTHER PHYSICAL FEATURES, THE NEW SIGN LOCATION WITH BE DIRECTED BY THE ENGINEER.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

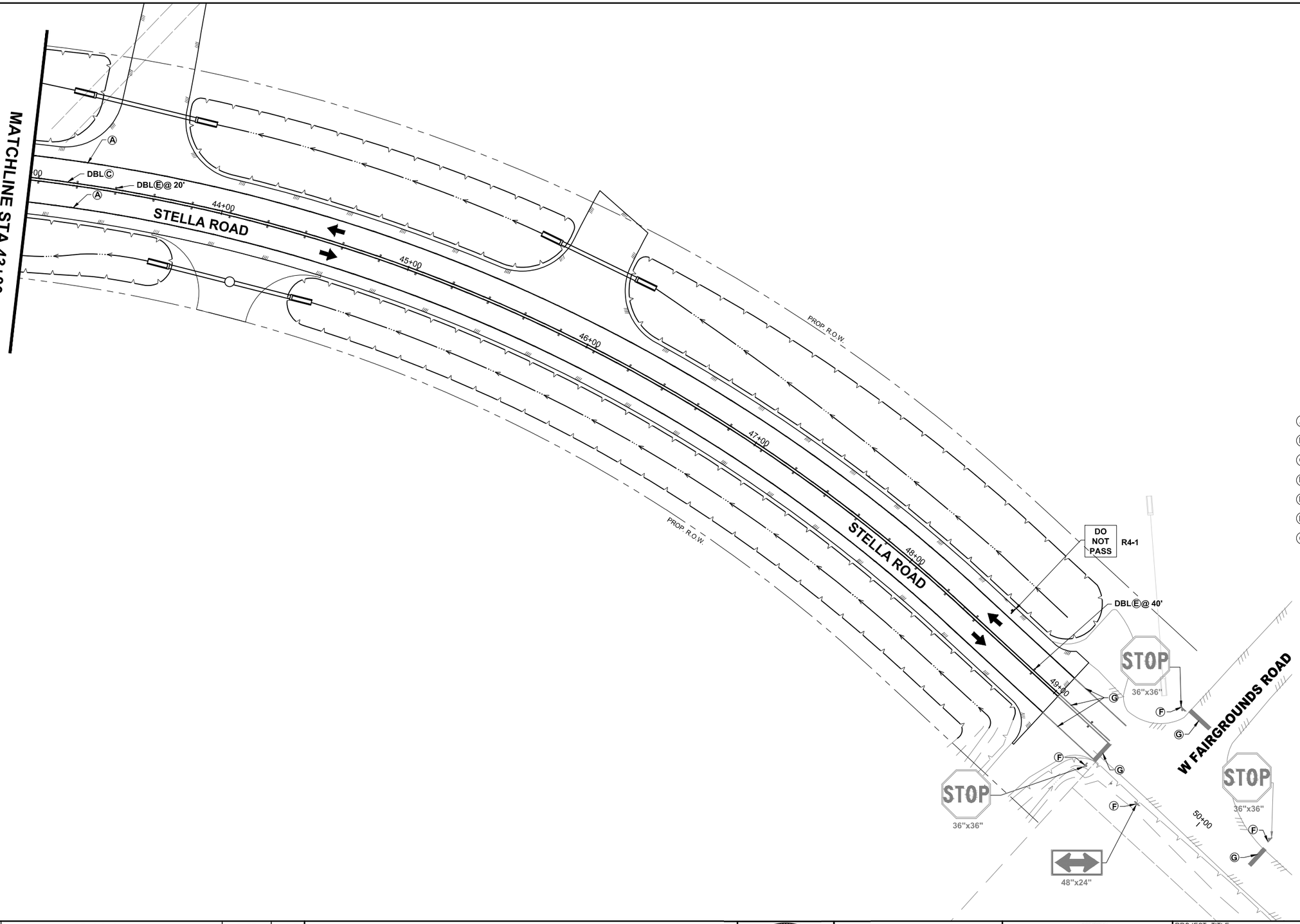
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: SIGNING AND PAVEMENT MARKING PLAN
SCALE: 1" = 50'	STA. 37+00 TO STA. 43+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 95 / 133

X:\Engineering\2021\21060 - Stella Road\95 SIGNING AND PAVEMENT MARKING PLAN STA. 37+00 TO STA. 43+00.dwg Charlie Valenzuela



N
W E
S

SCALE 1"=50'

50' 25' 0 50'

LEGEND

PROPOSED SIGN

PROPOSED TRAVEL LANE

KEY NOTES

Ⓐ PROP. REFL PAV MRK TY I (W)(4")(SLD)

Ⓑ PROP. REFL PAV MRK TY I (W)(24")(SLD)

Ⓒ PROP. REFL PAV MRK TY I (Y)(4")(SLD)

Ⓓ PROP. REFL PAV MRK TY I (Y)(4")(BRK)

Ⓔ PROP. RAIS REFL PAV MRK TY II A-A

Ⓕ EXIST. SIGN TO REMAIN

Ⓖ EXIST. STRIPE TO REMAIN

NOTES

1. ALL PAVEMENT MARKING SHALL BE REFLECTORIZED TYPE I THERMOPLASTIC.
2. REFER TO PAVEMENT MARKING DETAILS FOR RAISED PAVEMENT MARKER PLACEMENT.
3. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL MEET THE REQUIREMENTS OF THE TEXAS M.U.T.C.D. FOR STREETS AND HIGHWAYS INCLUDING THERMOPLASTIC AND RAISED PAVEMENT MARKINGS AS REQUIRED BY FORT BEND COUNTY.
4. THE LOCATION OF SIGNS IS APPROXIMATE. IF THERE IS ANY CONFLICT WITH UTILITIES, DRAINAGE ELEMENTS, OR ANY OTHER PHYSICAL FEATURES, THE NEW SIGN LOCATION WITH BE DIRECTED BY THE ENGINEER.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

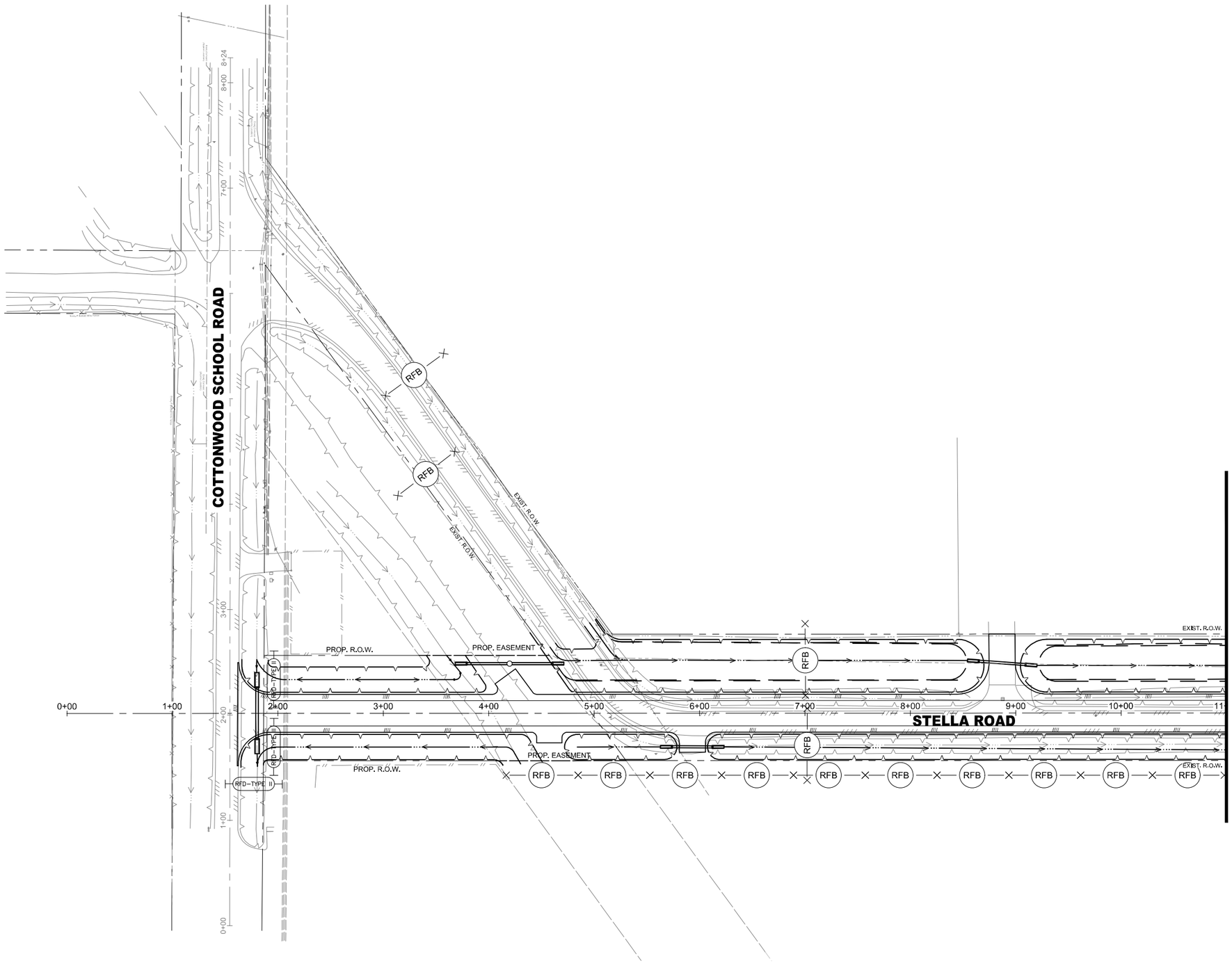
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

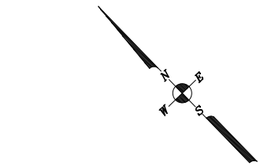
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: SIGNING AND PAVEMENT MARKING PLAN
SCALE: 1" = 50'	STA. 43+00 TO STA. 52+00
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 96 / 133

X:\Engineering\2021\21060 – Stella Road\96 SIGNING AND PAVEMENT MARKING PLAN STA. 43+00 TO STA. 52+00.dwg Charlie Valenzuela





SCALE 1"=100'

100' 50' 0 100'

STANDARD SWPPP PLAN SHEET NOTES:

1. THE PLACEMENT OF HYDRO-MULCH SEEDING AND BLOCK SOD FOR FINAL STABILIZATION CAN BE FOUND ON THE ROADWAY TYPICAL SECTION.
2. THE LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES INCLUDING MATERIALS, WASTE, BORROW, FILL AND EQUIPMENT STORAGE AREA WILL BE SHOWN ON THE PLANS ONCE ESTABLISHED BY THE CONTRACTOR. THIS SITE WILL BE INCLUDED IN THE INSPECTION REPORT.
3. THE LOCATION OF VEHICLE WASH AREA INCLUDING CONCRETE WASHOUTS WILL BE SHOWN ON THE PLANS ONCE ESTABLISHED BY THE CONTRACTOR. THIS SITE WILL BE INCLUDED IN THE INSPECTION REPORT.
4. THE FOLLOWING RECORDS WILL BE MAINTAINED BY THE CONTRACTOR AND WILL BE MADE READILY AVAILABLE UPON REQUEST TO PARTIES LISTED IN PART III. D.1 OF THE TPDES GENERAL PERMIT TXR150000:
   - A. DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;
   - B. ALL DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE.
   - C. THE DATES WHEN STABILIZATION (BOTH TEMPORARY AND/OR PERMANENT) MEASURE ARE INITIATED.
   - D. CHECK LIST TO BE ON ALL SWPPP SHEETS.

LEGEND

- FLOW DIRECTION
- RFB — REINFORCED FILTER FABRIC FENCE AT PERIMETER
- INLET PROTECTION (STAGE I & II IPB)
- EXISTING INLET
- SC — STABILIZED CONSTRUCTION ACCESS (ESTABLISHED BY THE CONTRACTOR)
- RFD–TYPE II — REINFORCED FILTER DAM (TYPE II)

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

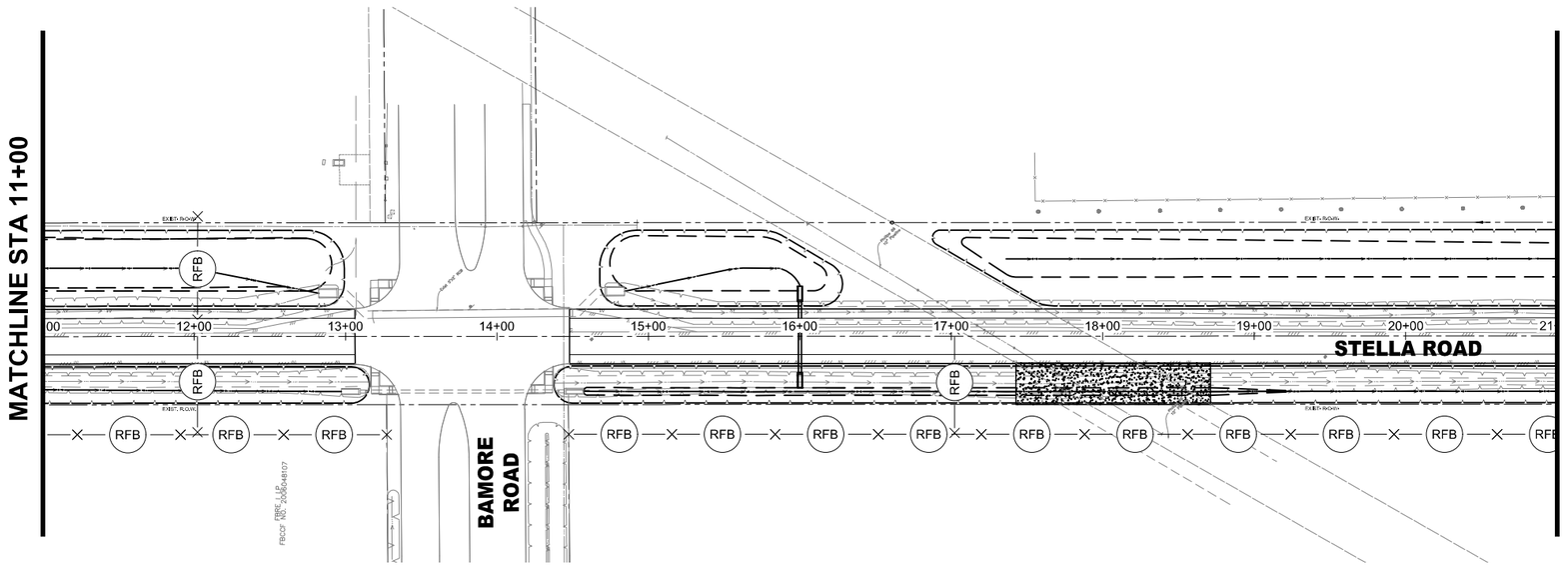
FORT BEND COUNTY
TEXAS

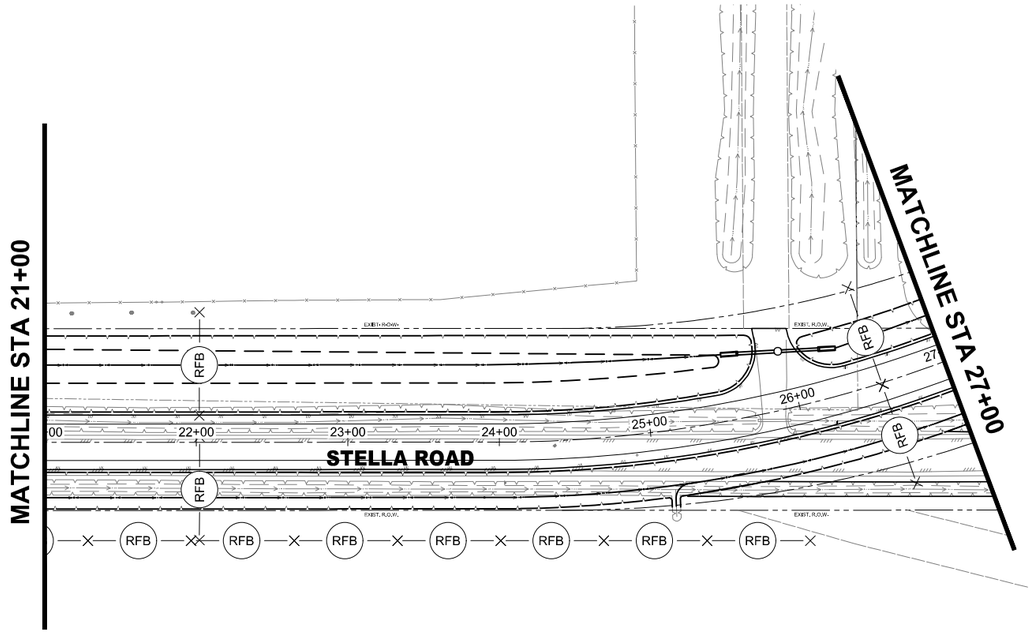
McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

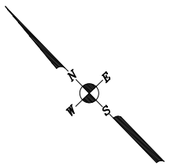
STATE OF TEXAS — AUSTIN P. MCLEAN — 132535 — LICENSED PROFESSIONAL ENGINEER — 7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: SWPPP STA 0+00 TO STA. 11+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 97 / 133

X:\Engineering\2021\21060 – Stella Road\97 SWPPP STA 0+00 TO STA. 11+00.dwg Charlie Valenzuela







SCALE 1"=100'

100' 50' 0 100'

STANDARD SWPPP PLAN SHEET NOTES:

1. THE PLACEMENT OF HYDRO-MULCH SEEDING AND BLOCK SOD FOR FINAL STABILIZATION CAN BE FOUND ON THE ROADWAY TYPICAL SECTION.
2. THE LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES INCLUDING MATERIALS, WASTE, BORROW, FILL AND EQUIPMENT STORAGE AREA WILL BE SHOWN ON THE PLANS ONCE ESTABLISHED BY THE CONTRACTOR. THIS SITE WILL BE INCLUDED IN THE INSPECTION REPORT.
3. THE LOCATION OF VEHICLE WASH AREA INCLUDING CONCRETE WASHOUTS WILL BE SHOWN ON THE PLANS ONCE ESTABLISHED BY THE CONTRACTOR. THIS SITE WILL BE INCLUDED IN THE INSPECTION REPORT.
4. THE FOLLOWING RECORDS WILL BE MAINTAINED BY THE CONTRACTOR AND WILL BE MADE READILY AVAILABLE UPON REQUEST TO PARTIES LISTED IN PART III. D.1 OF THE TPDES GENERAL PERMIT TXR150000:
   - A. DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;
   - B. ALL DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE.
   - C. THE DATES WHEN STABILIZATION (BOTH TEMPORARY AND/OR PERMANENT) MEASURE ARE INITIATED.
   - D. CHECK LIST TO BE ON ALL SWPPP SHEETS.

LEGEND

- FLOW DIRECTION
- RFB — REINFORCED FILTER FABRIC FENCE AT PERIMETER
- INLET PROTECTION (STAGE I & II IPB)
- EXISTING INLET
- SC — STABILIZED CONSTRUCTION ACCESS (ESTABLISHED BY THE CONTRACTOR)
- RFD–TYPE II — REINFORCED FILTER DAM (TYPE II)

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

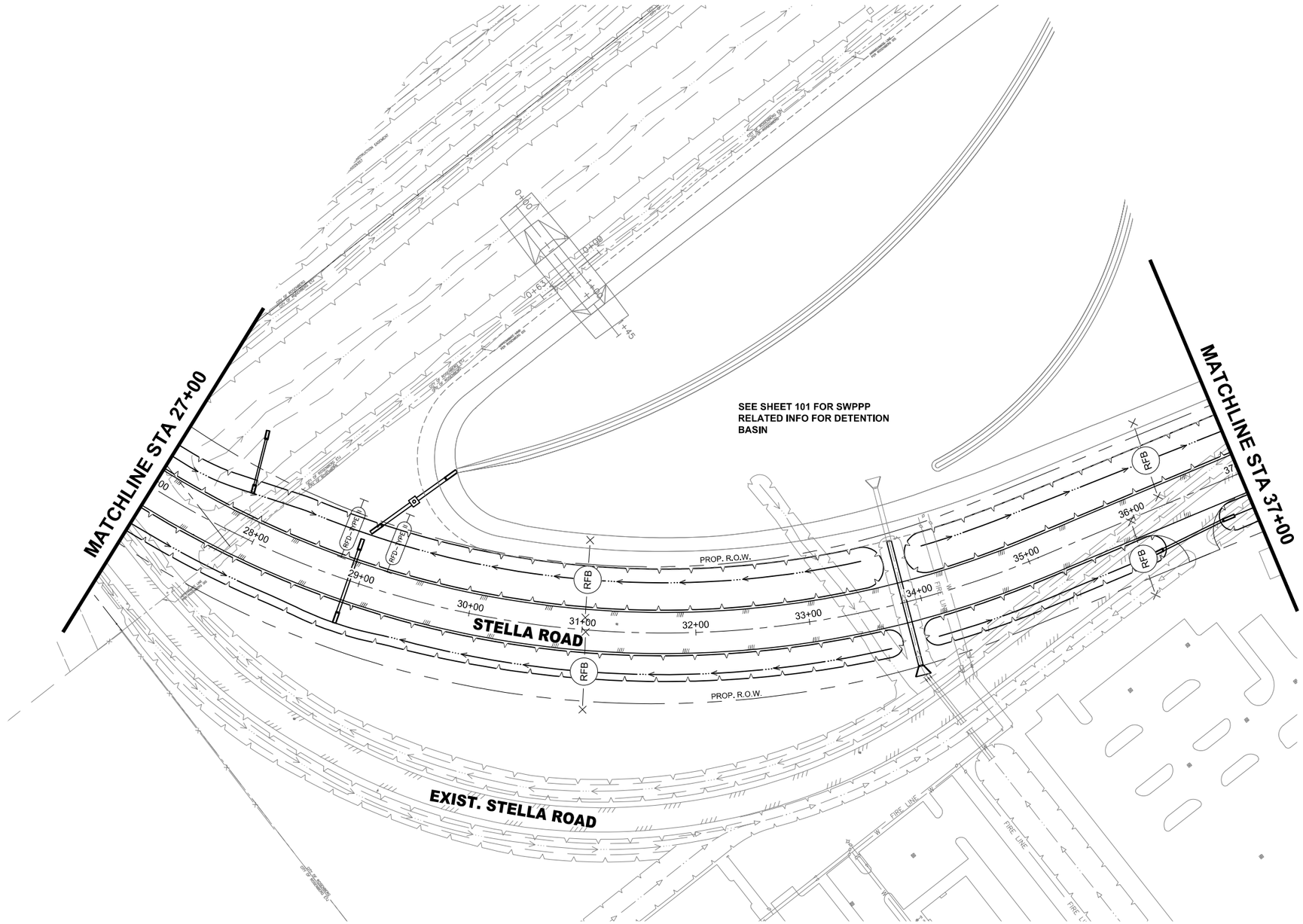
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: SWPPP STA 11+00 TO STA. 27+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 98 / 133

X:\Engineering\2021\21060 – Stella Road\98 SWPPP STA 11+00 TO STA. 27+00.dwg Charlie Valenzuela



SEE SHEET 101 FOR SWPPP RELATED INFO FOR DETENTION BASIN

SCALE 1"=100'

100' 50' 0 100'

STANDARD SWPPP PLAN SHEET NOTES:

1. THE PLACEMENT OF HYDRO-MULCH SEEDING AND BLOCK SOD FOR FINAL STABILIZATION CAN BE FOUND ON THE ROADWAY TYPICAL SECTION.
2. THE LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES INCLUDING MATERIALS, WASTE, BORROW, FILL AND EQUIPMENT STORAGE AREA WILL BE SHOWN ON THE PLANS ONCE ESTABLISHED BY THE CONTRACTOR. THIS SITE WILL BE INCLUDED IN THE INSPECTION REPORT.
3. THE LOCATION OF VEHICLE WASH AREA INCLUDING CONCRETE WASHOUTS WILL BE SHOWN ON THE PLANS ONCE ESTABLISHED BY THE CONTRACTOR. THIS SITE WILL BE INCLUDED IN THE INSPECTION REPORT.
4. THE FOLLOWING RECORDS WILL BE MAINTAINED BY THE CONTRACTOR AND WILL BE MADE READILY AVAILABLE UPON REQUEST TO PARTIES LISTED IN PART III. D.1 OF THE TPDES GENERAL PERMIT TXR150000:
   - A. DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;
   - B. ALL DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE.
   - C. THE DATES WHEN STABILIZATION (BOTH TEMPORARY AND/OR PERMANENT) MEASURE ARE INITIATED.
   - D. CHECK LIST TO BE ON ALL SWPPP SHEETS.

LEGEND

- FLOW DIRECTION
- RFB — REINFORCED FILTER FABRIC FENCE AT PERIMETER
- INLET PROTECTION (STAGE I & II IPB)
- EXISTING INLET
- SC — STABILIZED CONSTRUCTION ACCESS (ESTABLISHED BY THE CONTRACTOR)
- RFD–TYPE II — REINFORCED FILTER DAM (TYPE II)

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

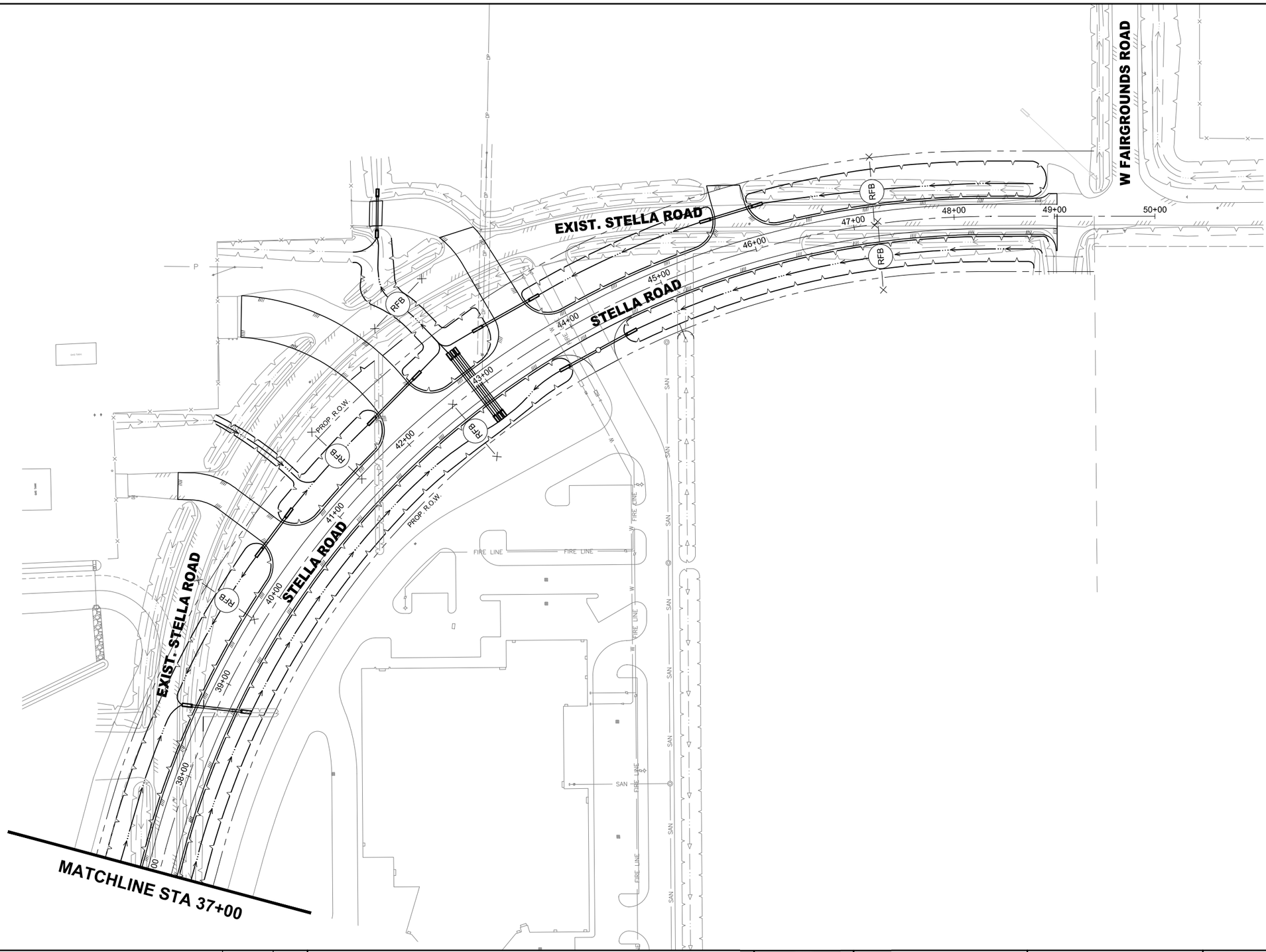
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: SWPPP STA 27+00 TO STA. 37+00
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 99 / 133

X:\Engineering\2021\21060 – Stella Road\99 SWPPP STA 27+00 TO STA. 37+00.dwg Charlie Valenzuela



SCALE 1"=100'

100' 50' 0 100'

STANDARD SWPPP PLAN SHEET NOTES:

1. THE PLACEMENT OF HYDRO-MULCH SEEDING AND BLOCK SOD FOR FINAL STABILIZATION CAN BE FOUND ON THE ROADWAY TYPICAL SECTION.
2. THE LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES INCLUDING MATERIALS, WASTE, BORROW, FILL AND EQUIPMENT STORAGE AREA WILL BE SHOWN ON THE PLANS ONCE ESTABLISHED BY THE CONTRACTOR. THIS SITE WILL BE INCLUDED IN THE INSPECTION REPORT.
3. THE LOCATION OF VEHICLE WASH AREA INCLUDING CONCRETE WASHOUTS WILL BE SHOWN ON THE PLANS ONCE ESTABLISHED BY THE CONTRACTOR. THIS SITE WILL BE INCLUDED IN THE INSPECTION REPORT.
4. THE FOLLOWING RECORDS WILL BE MAINTAINED BY THE CONTRACTOR AND WILL BE MADE READILY AVAILABLE UPON REQUEST TO PARTIES LISTED IN PART III. D.1 OF THE TPDES GENERAL PERMIT TXR150000:
   - A. DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;
   - B. ALL DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE.
   - C. THE DATES WHEN STABILIZATION (BOTH TEMPORARY AND/OR PERMANENT) MEASURE ARE INITIATED.
   - D. CHECK LIST TO BE ON ALL SWPPP SHEETS.

LEGEND

- FLOW DIRECTION
- RFB — REINFORCED FILTER FABRIC FENCE AT PERIMETER
- INLET PROTECTION (STAGE I & II IPB)
- EXISTING INLET
- SC — STABILIZED CONSTRUCTION ACCESS (ESTABLISHED BY THE CONTRACTOR)
- RFD–TYPE II — REINFORCED FILTER DAM (TYPE II)

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

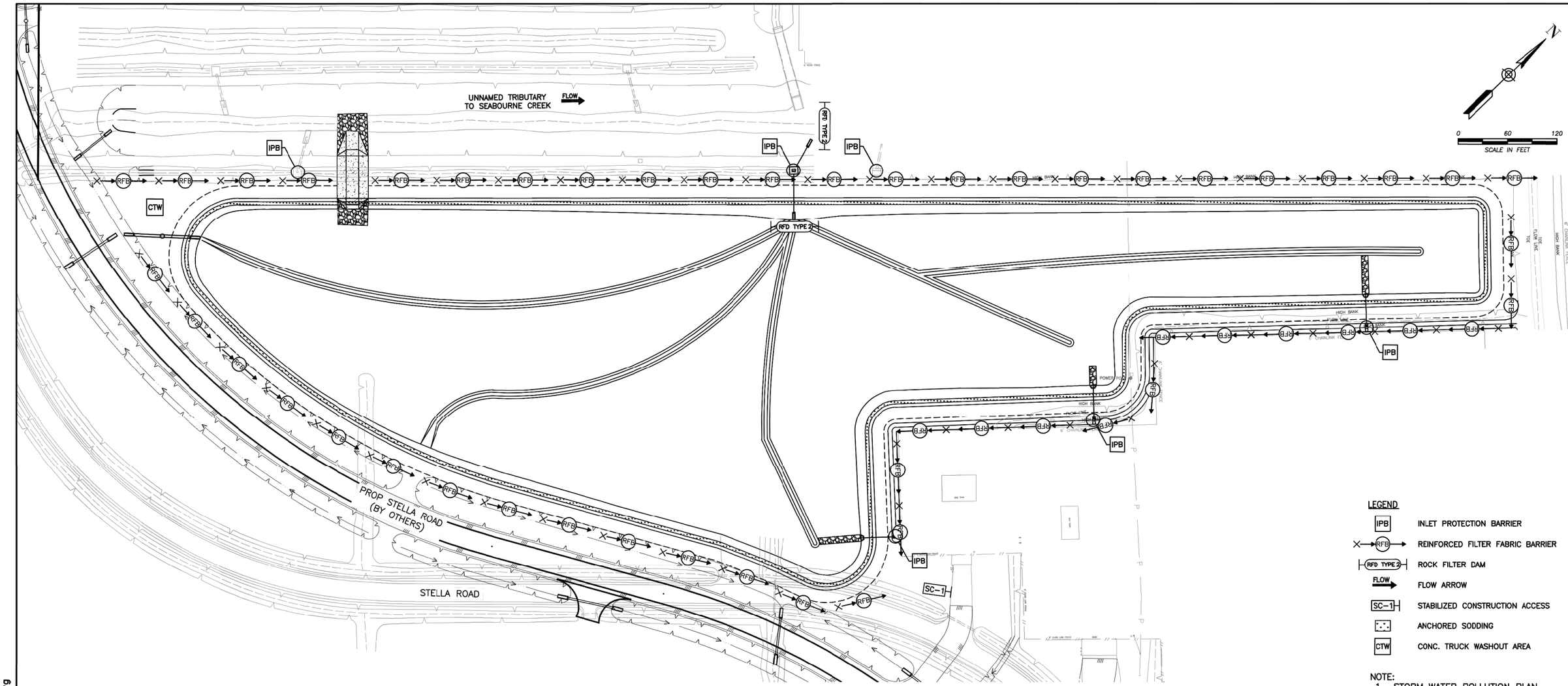
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. McLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: SWPPP STA 37+00 TO END
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 100 / 133

X:\Engineering\2021\21060 – Stella Road\100 SWPPP STA 37+00 TO END.dwg Charlie Valenzuela



LEGEND

IPB	INLET PROTECTION BARRIER
RFB	REINFORCED FILTER FABRIC BARRIER
RFD TYPE 2	ROCK FILTER DAM
FLOW	FLOW ARROW
SC-1	STABILIZED CONSTRUCTION ACCESS
	ANCHORED SODDING
CTW	CONC. TRUCK WASHOUT AREA

NOTE:

1. STORM WATER POLLUTION PLAN SHALL BE ACCORDANCE WITH SPECIFICATIONS AND DRAWINGS.
2. WHERE OUTFALL PIPE IS TO BE INSTALLED OUTSIDE OF THE BOUNDARY, THE DISTURBED AREAS ARE TO BE SODDED IMMEDIATELY AFTER INSTALLATION IS COMPLETE.
3. USE SOD STRIPS AS STABILIZED METHOD FOR ALL DISTURBANCES. ANCHORED SOD TO BE USED ON SLOPE DISTURBANCES, AND SOLID SOD TO BE USED FOR OTHER DISTURBANCES UNLESS OTHERWISE SPECIFIED IN THE DETAIL AND/OR SPECIFICATIONS.
4. FILTER DAMS MUST BE REMOVED POST CONSTRUCTION AND EXISTING CHANNEL AND ROADSIDE DITCH RETURNED/ RESTORE TO ORIGINAL OR BETTER CONDITIONS.

NO.	REVISIONS	DATE	NAME

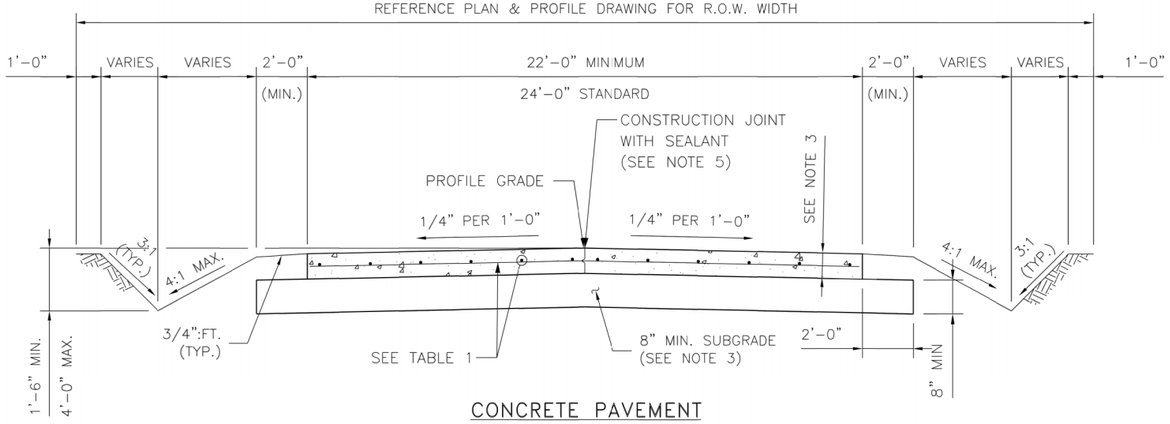
FORT BEND COUNTY ENGINEERING DEPARTMENT

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

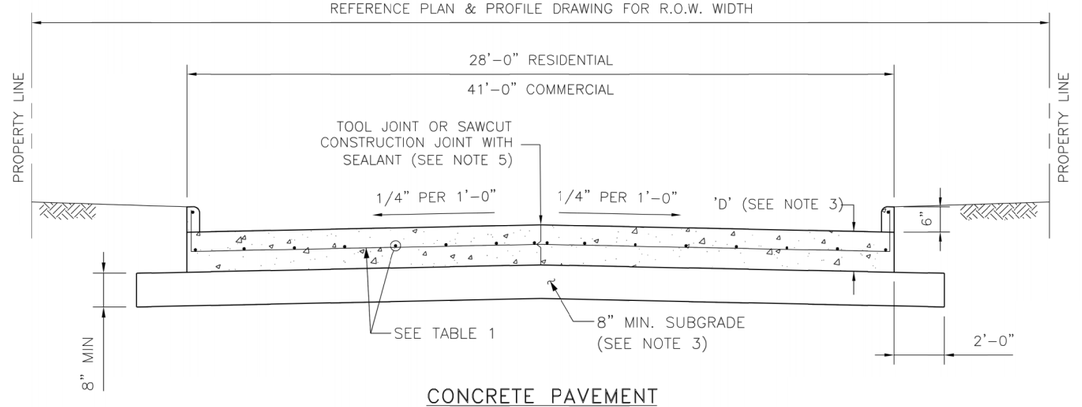
STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	PROPOSED DETENTION BASIN SWPPP
DRAWN BY: NS	DATE: 6/18/24
CK'D BY: MJ	SCALE: 1" = 60'
CIVIL STANDARD	SHEET NO: 101/ 132

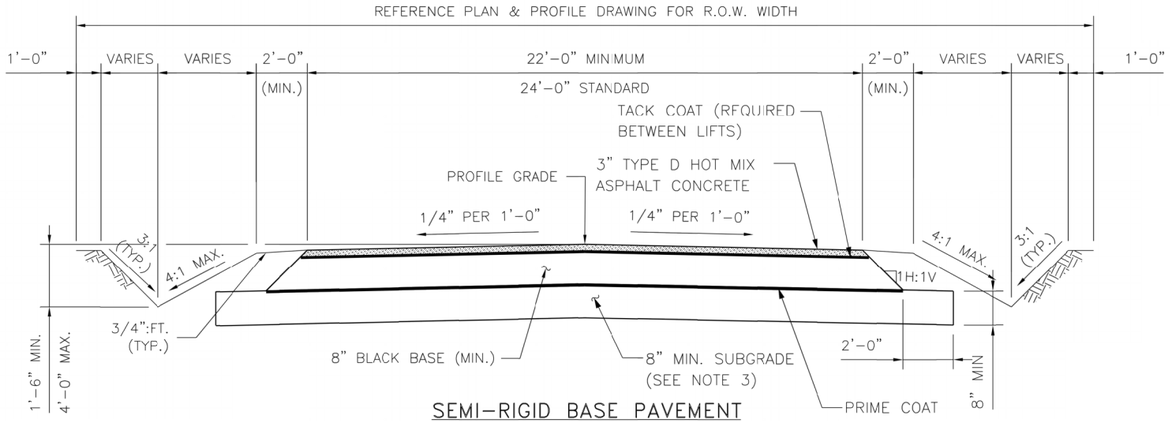
M:\04755.000 20116 Stella Road\CAD\DWG\06- 04755 - SWPPP.dwg



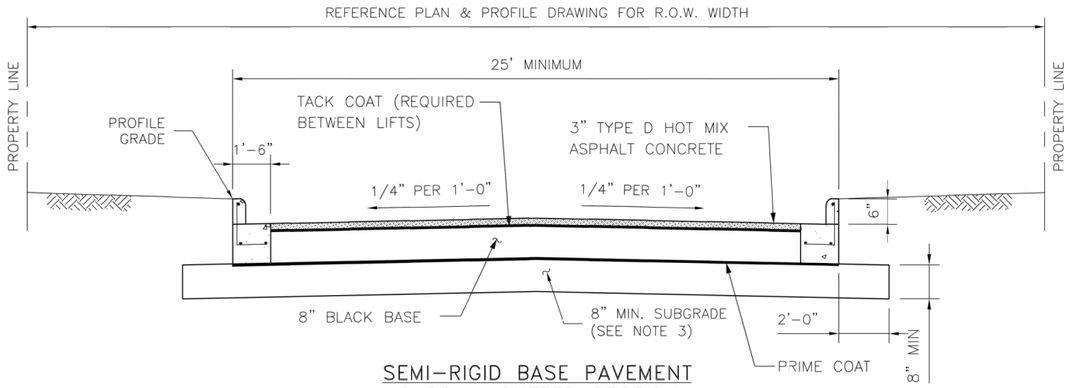
CONCRETE PAVEMENT
DITCH SECTION



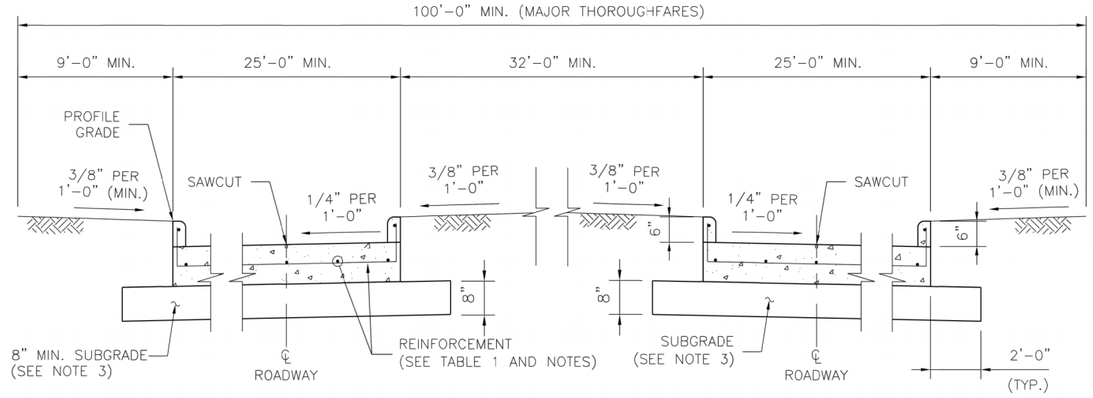
CONCRETE PAVEMENT
CURB & GUTTER SECTION
(PARABOLIC CROWN IS AN ACCEPTABLE OPTION)



SEMI-RIGID BASE PAVEMENT
DITCH SECTION



SEMI-RIGID BASE PAVEMENT
CURB & GUTTER SECTION



TYPICAL SECTIONS FOR
MAJOR THOROUGHFARES

TABLE 1
(CONSTRUCTION JOINT DOWELS)

DOWEL SIZE	PAVEMENT DEPTH
#4 BAR	< 6"
#5 BAR	6" ≤ D < 9"
#6 BAR	≥ 9"
DOWEL SHALL BE DRILLED INTO EXISTING PAVEMENT (MIN. 10", MAX. 12") AND EPOXIED. (SEE ITEM 361.3)	

NOTES:

1. PAVEMENT SECTIONS SHOWN ARE INTENDED FOR DEVELOPMENT PROJECTS AND NOT FOR PUBLIC PROJECTS, WHERE WIDTH OF R.O.W. MAY VARY.
2. PAVEMENT SECTIONS SHALL BE LOCATED IN CENTER OF R.O.W.
3. SUBGRADE TREATMENT AND PAVEMENT THICKNESS AS DESIGNATED IN PLANS
4. REFERENCE CONSTRUCTION JOINT DETAIL ON THE STANDARD CIVIL DRAWING "CONCRETE PAVEMENT DETAILS – SHEET 1 OF 2" FOR JOINT AND SEALANT REQUIREMENTS.
5. NO TRAFFIC ON CONCRETE PAVEMENT FOR 7 DAYS AND COMPRESSIVE STRENGTH OF 3,500 psi HAS BEEN REACHED.
6. ALL CONSTRUCTION JOINTS SHALL BE SEALED

HORIZONTAL SCALE: 1"=3'-0"
VERTICAL SCALE: 1"=1'-6"

SLAB AND REBAR NOTES:

1. TYPICAL SLAB THICKNESS D=8"
2. TYPICAL REBAR SIZE AND SPACING ARE:
   a. #4 BAR @ 18" C-C LONGITUDINAL
   b. #4 BAR @ 18" C-C TRANSVERSE
3. REBAR SIZE FOR PAVEMENT LESS THAN 8" THICK
   a. #4 BAR @ 24" C-C LONGITUDINAL
   b. #4 BAR @ 24" C-C TRANSVERSE
4. REBAR SHALL NOT BE PLACED WITHIN 3" FROM THE EDGE OF PAVEMENT.
5. TYPICAL STABILIZED SUBGRADE THICKNESS IS 8 INCHES.
6. FOR HEAVY INDUSTRIAL TRAFFIC, SLAB THICKNESS AND REBAR SIZE AND SPACING WILL BE AS PER GEOTECHNICAL RECOMMENDATION.
7. ALL BENT BARS SHALL BE GRADE 40 STEEL, ALL OTHER SHALL BE GRADE 60.
8. MINIMUM LAP SPLICE 16".
9. LAP SPLICES SHOULD BE ON ALTERNATING BARS, ADJACENT LAP SPLICES ARE NOT ACCEPTABLE.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

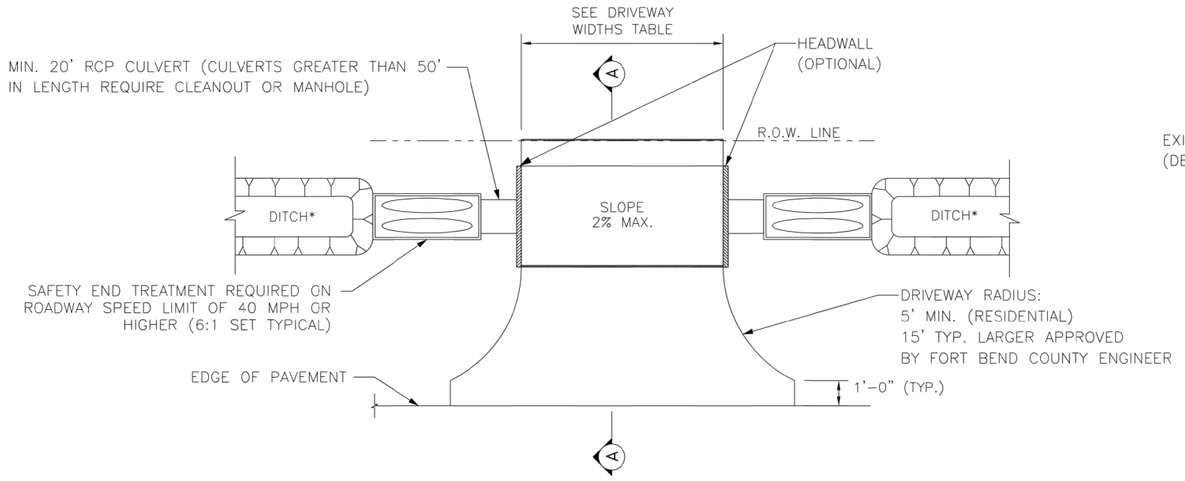
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. McLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

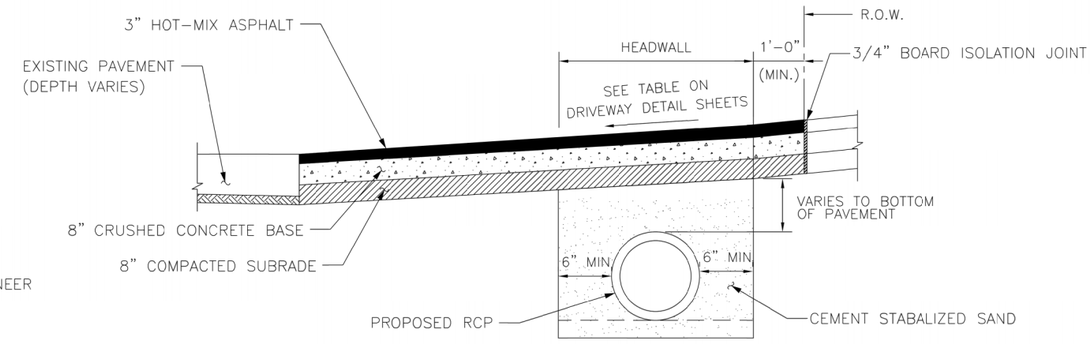
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED TYPICAL PAVEMENT SECTIONS
SCALE: 1" = 40'	FOR DEVELOPMENT PROJ.
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 102 / 133

X:\Engineering\2021\21060 - Stella Road\102 FBCED TYPICAL PAVEMENT SECTIONS FOR DEVELOPMENT PROJ.dwg Charlie Valenzuela



OPEN DITCH DRIVEWAY

*DITCH IS TO HAVE 4:1 SLOPE



SECTION A-A FOR RESIDENTIAL DRIVEWAYS

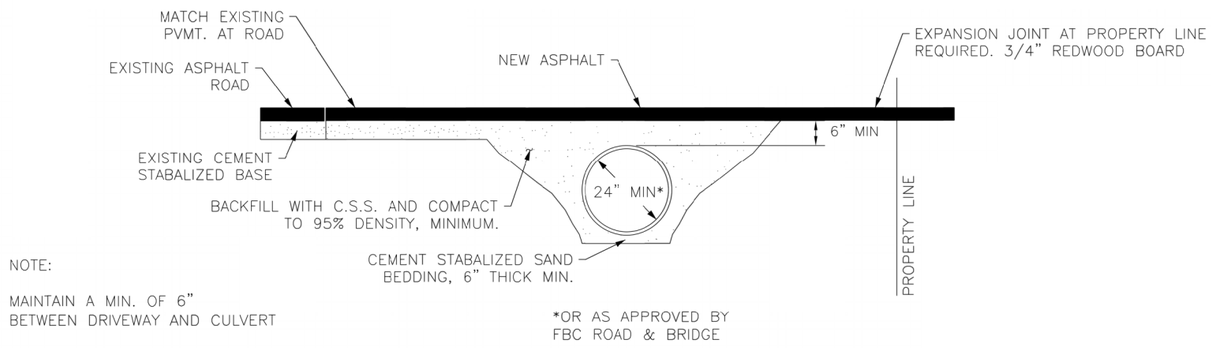
MINIMUM RADII REQUIREMENTS – DRIVEWAYS

	LOCAL	COLLECTOR	MAJOR
RESIDENTIAL	5'	5'	–
COMMERCIAL	10'	10'	25'

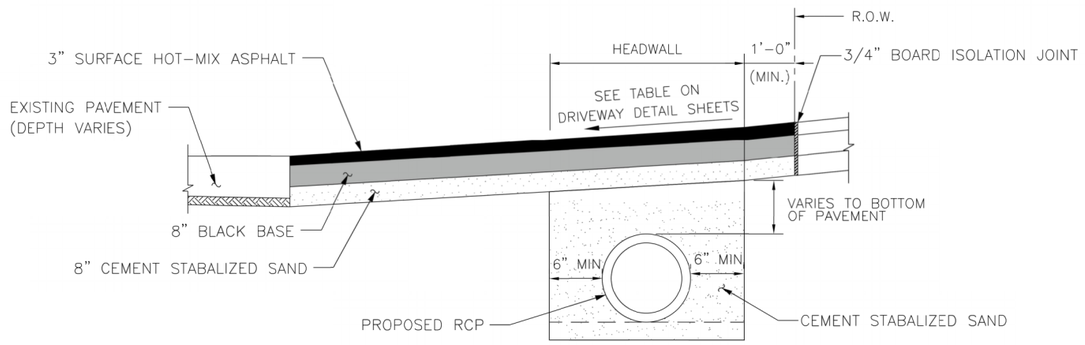
DRIVEWAY WIDTHS*

	MINIMUM	MAXIMUM
RESIDENTIAL	10'	25'
COMMERCIAL	20'	40'

*DRIVEWAY WIDTHS ARE MEASURED AT THE ROW LINE



ASPHALT APRON DETAIL – DRIVEWAY PROFILE FOR CULVERT DRAINAGE



SECTION A-A FOR COMMERCIAL DRIVEWAYS

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

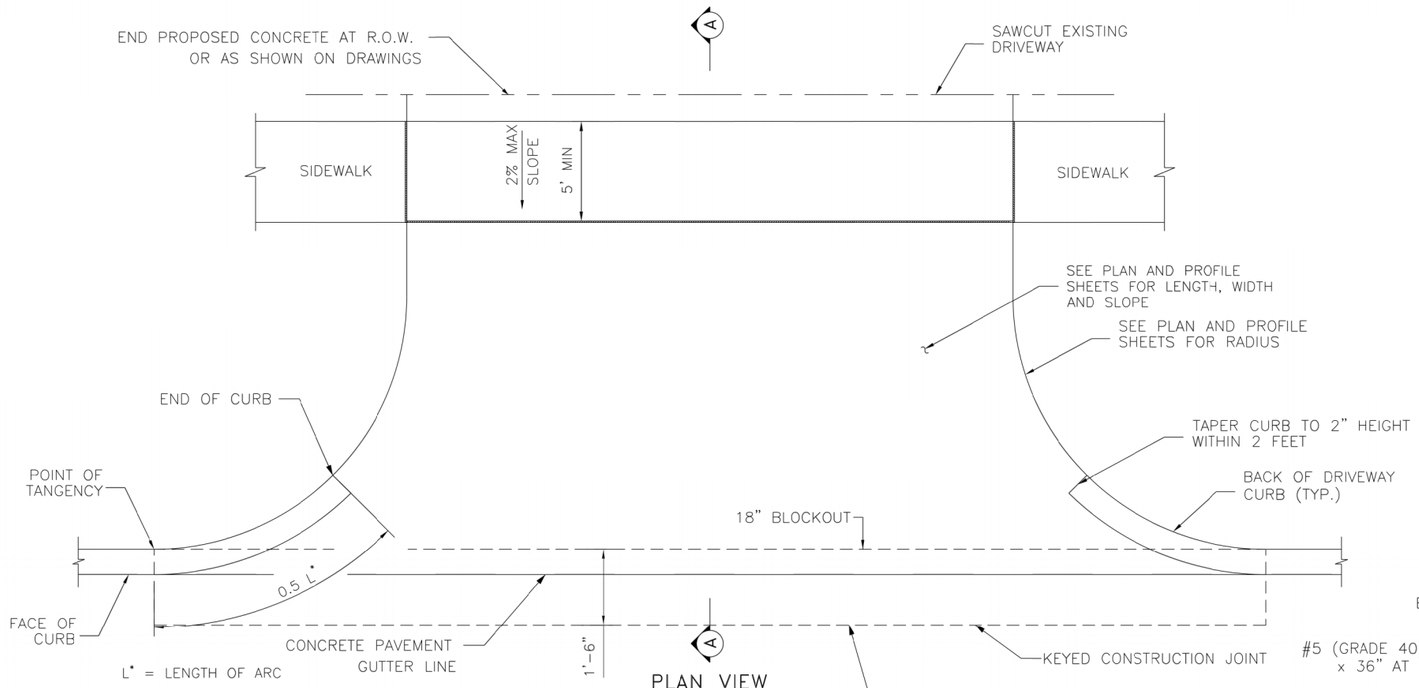
FORT BEND COUNTY TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103500
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

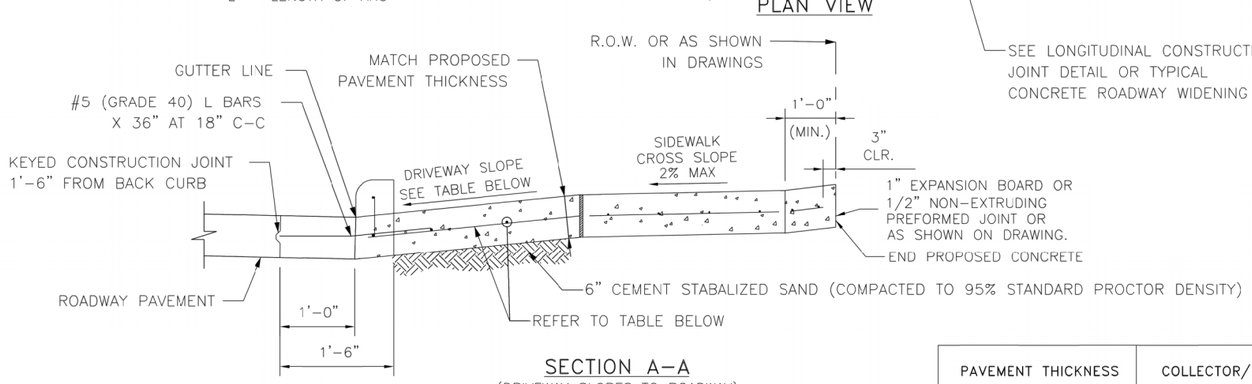
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED ASPHALT DRIVEWAY DETAILS
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 103 / 133

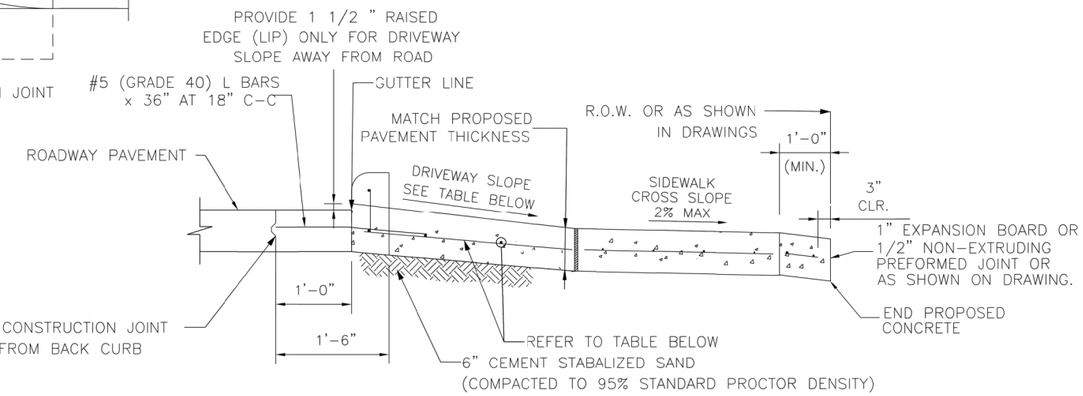
X:\Engineering\2021\21060 - Stella Road\103 FBCED ASPHALT DRIVEWAY DETAILS.dwg Charlie Valenzuela



PLAN VIEW



SECTION A–A
(DRIVEWAY SLOPES TO ROADWAY)



SECTION A–A
(DRIVEWAY SLOPES AWAY FROM ROADWAY)

NOTES:

1. SAWCUT EXISTING DRIVEWAY AT R.O.W. LINE OR AS SHOWN ON DRAWING AND REMOVE EXISTING DRIVEWAY TO SAWCUT LINE.
2. IF THERE IS EXISTING CURB ON DRIVEWAY, CONNECT PROPOSED CURB TO EXISTING CURB; OTHERWISE TAPER CURB HEIGHT AS SHOWN.
3. SEE PAVEMENT DETAIL SHEET FOR CONCRETE CURB REINFORCEMENT.
4. THIS DRIVEWAY INSTALLATION IS GOVERNED BY HARRIS COUNTY ITEM 360 AND 433.
5. DRIVEWAY WIDTHS ARE MEASURED AT THE ROW LINE
6. CULVERTS GREATER THAN 50' IN LENGTH REQUIRE CLEANOUT OR MANHOLE

MINIMUM RADII REQUIREMENTS – DRIVEWAYS

	LOCAL	COLLECTOR	MAJOR
RESIDENTIAL	5'	5'	–
COMMERCIAL	10'	10'	25'

DRIVEWAY WIDTHS

	MINIMUM	MAXIMUM
RESIDENTIAL	10'	25'
COMMERCIAL	20'	40'

	PAVEMENT THICKNESS	COLLECTOR/MAJOR	RESIDENTIAL (MAJOR THOROUGHFARE)	RESIDENTIAL (COLLECTORS AND LOCAL STREETS)
REINFORCEMENT	6"	#4 @ 24" O.C.E.W.	N/A	#4 @ 24" O.C.E.W.
	7"	#4 @ 24" O.C.E.W.	#4 @ 24" O.C.E.W.	#4 @ 24" O.C.E.W.
	8"	#4 @ 18" O.C.E.W.	#4 @ 18" O.C.E.W.	#4 @ 18" O.C.E.W.
	9"–10"	#5 @ 18" O.C.E.W.	#5 @ 18" O.C.E.W.	#5 @ 18" O.C.E.W.
EXPANSION DOWEL JOINT	6"	3/4" DIA. SMOOTH BAR	3/4" DIA. SMOOTH BAR	3/4" DIA. SMOOTH BAR
	7"	1" DIA. SMOOTH BAR	1" DIA. SMOOTH BAR	1" DIA. SMOOTH BAR
	8"	1" DIA. SMOOTH BAR	1" DIA. SMOOTH BAR	1" DIA. SMOOTH BAR
	9"–10"	1 1/4" DIA. SMOOTH BAR	1 1/4" DIA. SMOOTH BAR	1 1/4" DIA. SMOOTH BAR
CONSTRUCTION JOINT DOWEL	ALL	#5 REBAR	#5 REBAR	#5 REBAR
SUBGRADE	ALL	6" CEMENT–STABALIZED SAND	2" BANK SAND	2" BANK SAND
DRIVEWAY SLOPE	ALL	2% TO 4%	2% TO 6%	2% TO 10%*

*10% ALLOWABLE ON PRIVATELY CONSTRUCTED PROJECTS
6% MAX ON PUBLIC PROJECTS

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS
2	ADDED NOTE 6 & REVISED NOTE 4	3-1-23	RJS

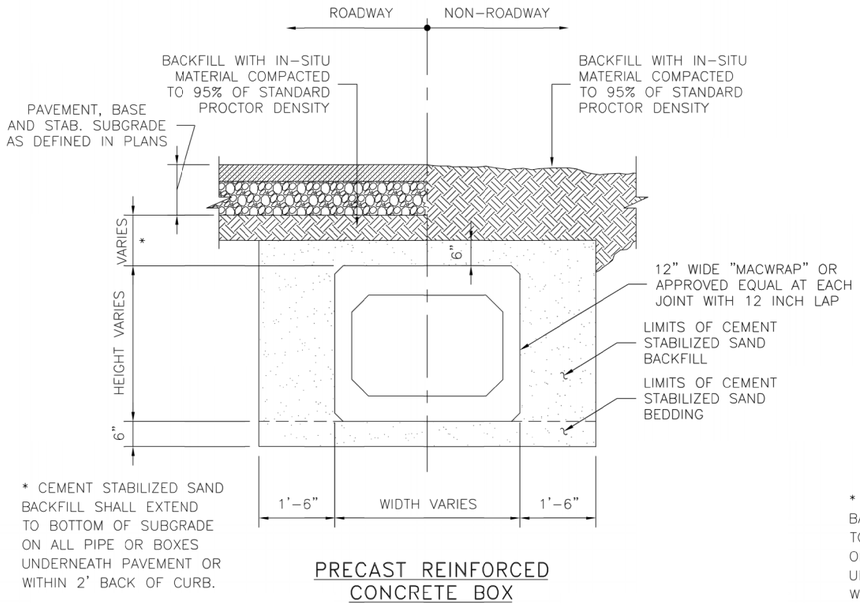
FORT BEND COUNTY TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

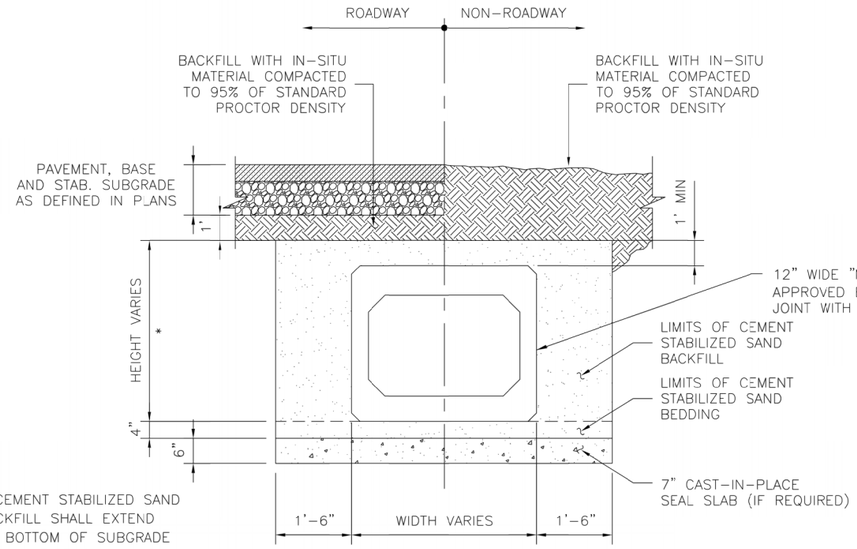
STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER · 7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED DRIVEWAY DETAILS FOR MAJOR
SCALE: 1" = 40'	ROADWAY CONSTRUCTION
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 104 / 133

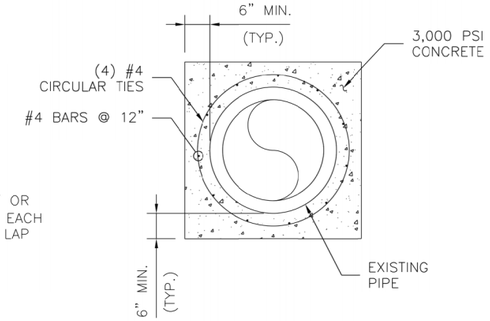
X:\Engineering\2021\21060 - Stella Road\104 FBCED DRIVEWAY DETAILS FOR MAJOR ROADWAY CONSTRUCTION.dwg Charlie Valenzuela



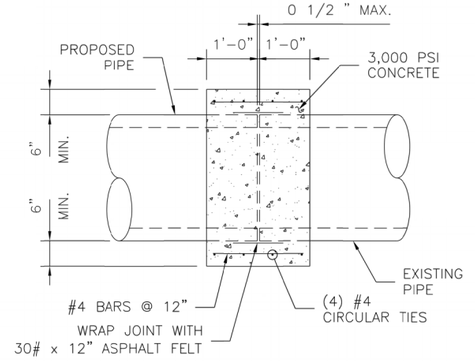
PRECAST REINFORCED CONCRETE BOX



PRECAST REINFORCED CONCRETE BOX WITH SEAL SLAB

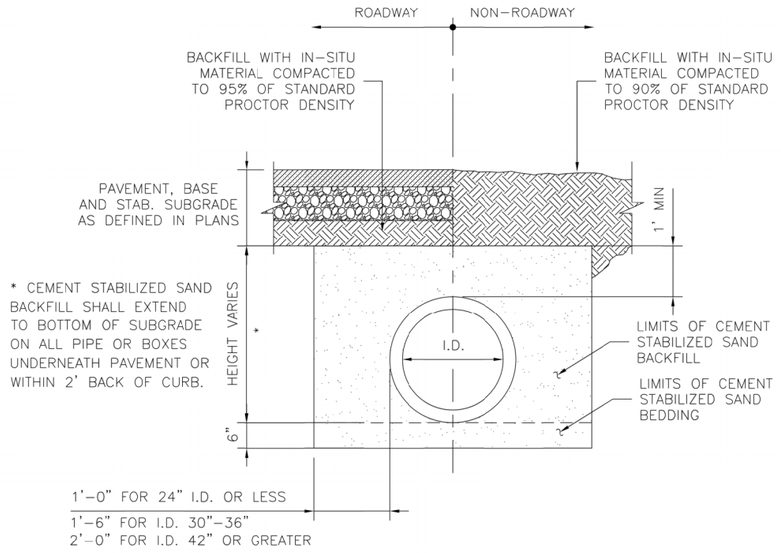


SECTION VIEW

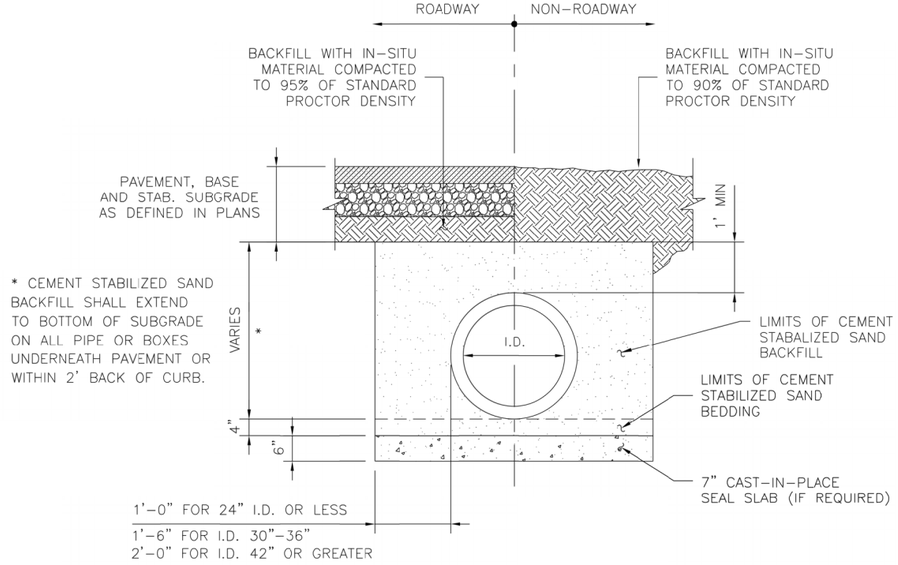


ELEVATION VIEW

TYPICAL CONCRETE COLLAR FOR 36" & SMALLER RCP



REINFORCED CONCRETE PIPE



REINFORCED CONCRETE PIPE WITH SEAL SLAB

GENERAL NOTES:

1. FOR RCP LARGER THAN 36" DIAMETER, CONCRETE COLLARS MUST BE DESIGNED BY THE ENGINEER OF RECORD.
2. ALL TRENCHES IN ROW SHALL BE BACKFILLED WITH 1.5 SACK CEMENT STABILIZED SAND TO WITHIN 1' OF SUBGRADE. COMPACTED TO 95% STANDARD PROCTOR DENSITY

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

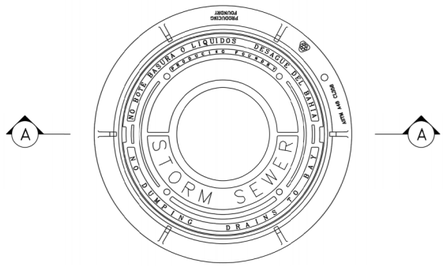
FORT BEND COUNTY TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. McLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/2/2024

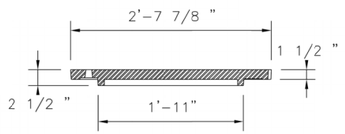
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED STORM SEWER CONSTRUCTION DETAILS
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 105 / 133

X:\Engineering\2021\21060 - Stella Road\105 FBCED STORM SEWER CONSTRUCTION DETAILS.dwg Charlie Valenzuela

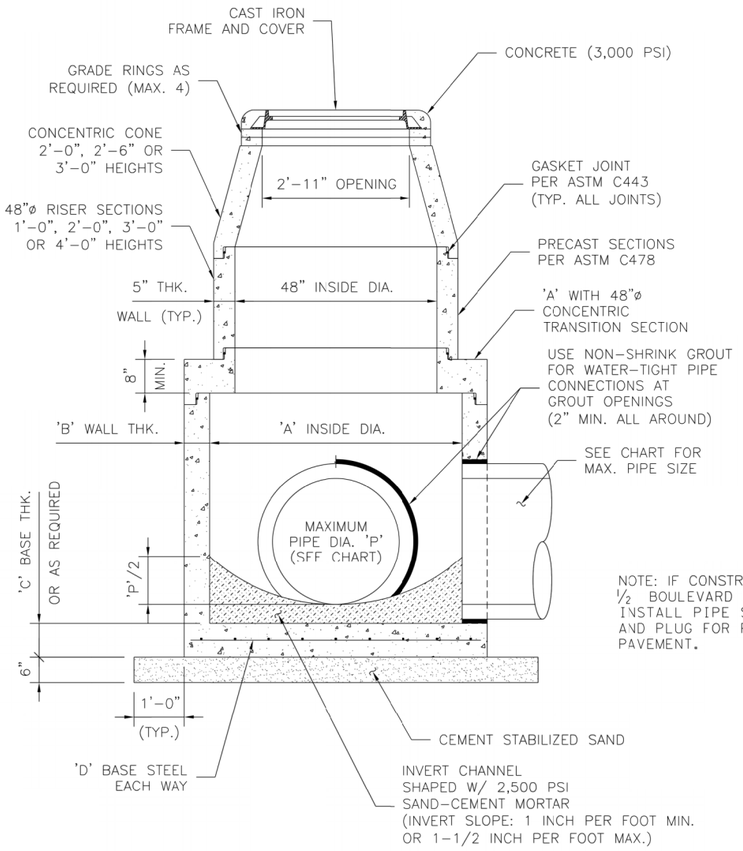


PLAN VIEW
FRAME AND COVER
SCALE: 1" = 1'-0"

NOTE: IF PROJECT IS WITHIN A CITY ETJ OR CITY LIMITS, USE CITY'S STD MANHOLE COVER

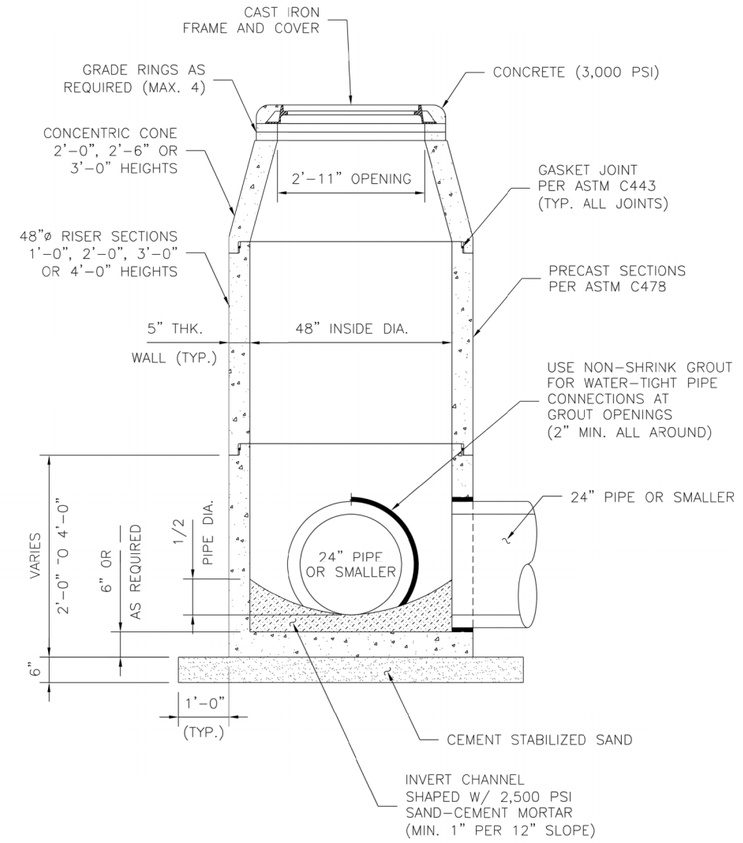


COVER SECTION A-A
SCALE: 1" = 1'-0"

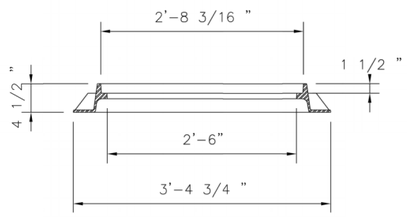


NOTE: IF CONSTRUCT IN ½ BOULEVARD PAVEMENT INSTALL PIPE STUB-OUT AND PLUG FOR FUTURE PAVEMENT.

PRECAST CONCENTRIC MANHOLE
FOR PIPE SIZES GREATER THAN 24"
SCALE: 1" = 1'-6"



48"ø PRECAST CONCENTRIC MANHOLE
FOR PIPE SIZES 24" OR SMALLER
SCALE: 1" = 1'-6"



FRAME SECTION A-A
SCALE: 1" = 1'-0"

MAXIMUM PIPE DIA. 'P'	INSIDE DIA. 'A'	WALL THICKNESS 'B'	BASE THICKNESS 'C'	BASE STEEL 'D'
30"	5'-0"	6"	8"	#5 @ 8"
42"	6'-0"	7"	8"	#5 @ 8"
54"	7'-0"	8"	10"	#6 @ 12" (2 LAYERS)
60"	8'-0"	9"	10"	#6 @ 12" (2 LAYERS)

GENERAL NOTES:

1. CONSTRUCTION AND MATERIALS SHALL MEET REQUIREMENTS OF ITEM 471 "PRECAST CONCRETE MANHOLES".
2. CONCRETE FOR MANHOLE: MINIMUM 4,000 PSI IN 28 DAYS
3. HS-20 LOADING; MANHOLE DESIGN SHALL MEET OR EXCEED ASTM C478 REQUIREMENTS.
4. GASKET JOINT: PER ASTM C443
5. FRAME AND COVER SHALL BE EAST JORDAN IRON WORKS MODEL V-1420 OR APPROVED EQUAL.
5. SHOP DRAWINGS WITH MANUFACTURER'S CERTIFICATION SHALL BE SUBMITTED FOR ENGINEER'S APPROVAL.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

FORT BEND COUNTY TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103500
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

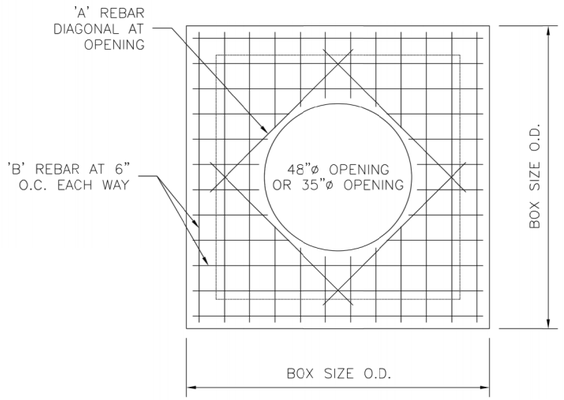
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED PRECAST CONCRETE STORM
SCALE: 1" = 40'	SEWER MANHOLE DETAILS
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 106 / 133

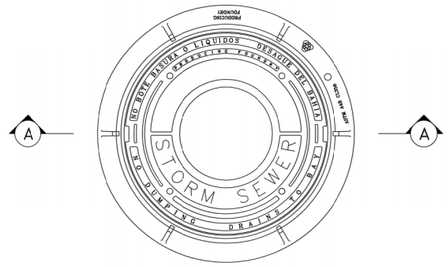
X:\Engineering\2021\21060 - Stella Road\106 FBCED PRECAST CONCRETE STORM SEWER MANHOLE DETAILS.dwg Charlie Valenzuela

BOX SIZE I.D.	MAX. OPENING SIZE	FLAT SLAB THK.	WALL THK.	BASE THK.	BAR 'A'	BAR 'B'	BAR 'C'	*BAR 'D'
4'X4'	48"	8"	6"	6"	#4	#4	#4	#4
5'X5'	60"	10"	6"	8"	#5	#5	#4	#4
6'X6'	72"	10"	8"	8"	#5	#5	#5	#5
7'X7'	84"	10"	8"	8"	#5	#5	#5	#5
8'X8'	96"	10"	8"	8"	#5	#5	#5	#5

* FOR 7'X7' AND 8'X8' BOX SIZE: TWO LAYERS OF STEEL REQUIRED. (FOR DEPTHS GREATER THAN 15')

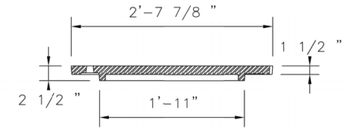


PLAN VIEW
FLAT SLAB WITH OPENING
SCALE: 1"=1'-6"

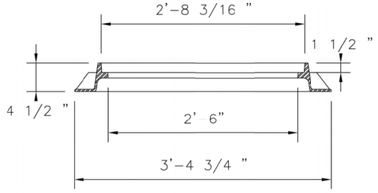


PLAN VIEW
FRAME AND COVER
SCALE: 1"=1'-0"

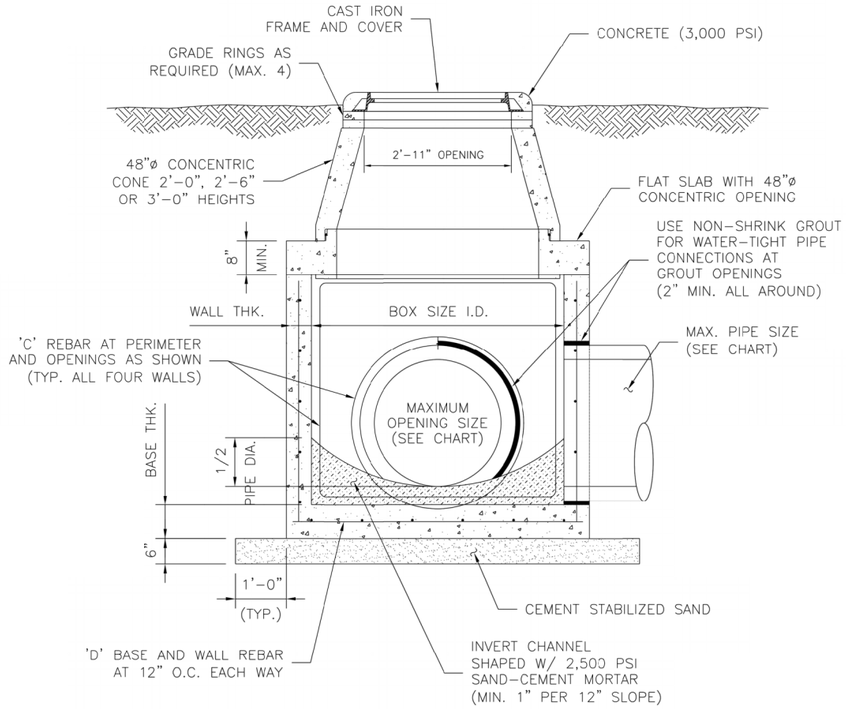
NOTE: IF PROJECT IS WITHIN A CITY ETJ USE CITY'S STD MANHOLE COVER



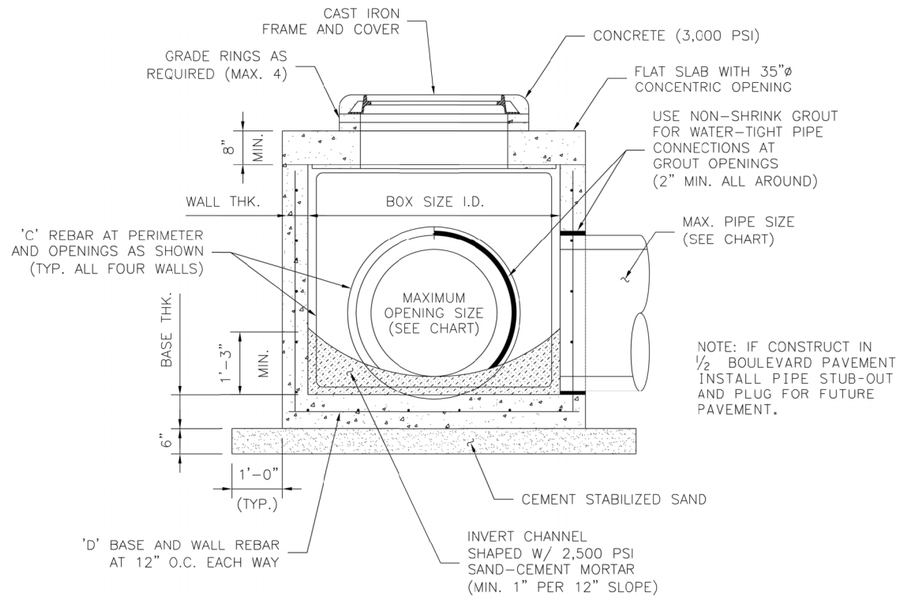
COVER SECTION A-A
SCALE: 1"=1'-0"



FRAME SECTION A-A
SCALE: 1"=1'-0"



JUNCTION BOX/MANHOLE
WITH CONCENTRIC CONE
SCALE: 1"=1'-6"



JUNCTION BOX/MANHOLE
WITH FLAT SLAB
SCALE: 1"=1'-6"

GENERAL NOTES:

1. CONSTRUCTION AND MATERIALS SHALL MEET REQUIREMENTS OF ITEM 471 "PRECAST CONCRETE MANHOLES".
2. CONCRETE FOR JUNCTION BOX: MINIMUM 4,000 PSI IN 28 DAYS
3. HS-20 LOADING; MANHOLE DESIGN SHALL MEET OR EXCEED ASTM C478 AND ASTM C913 REQUIREMENTS.
4. JOINT SEALANT: RAM-NEK GASKET MATERIAL
5. FRAME AND COVER SHALL BE EAST JORDAN IRON WORKS MODEL V-1420 OR APPROVED EQUAL.
6. SHOP DRAWINGS WITH MANUFACTURER'S CERTIFICATION SHALL BE SUBMITTED FOR ENGINEER'S APPROVAL.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

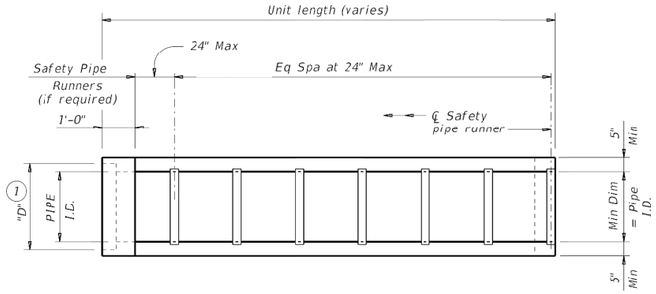
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

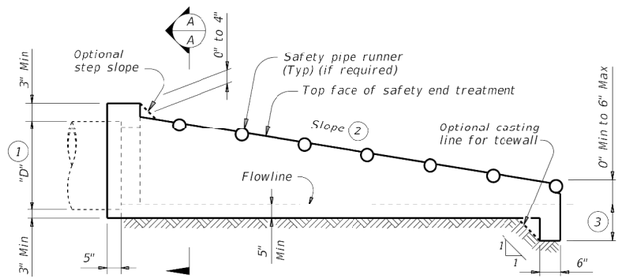
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED JUNCTION BOX AND MANHOLE DETAILS
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 107 / 133

X:\Engineering\2021\21060 - Stella Road\107 FBCED JUNCTION BOX AND MANHOLE DETAILS.dwg Charlie Valenzuela



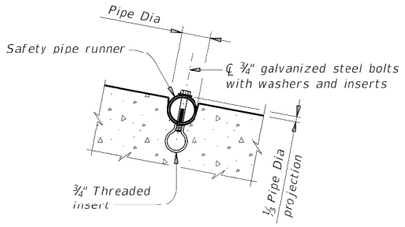
PLAN

(Showing bell end connection.)



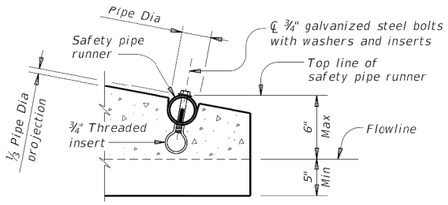
LONGITUDINAL ELEVATION

(Showing bell end connection.)

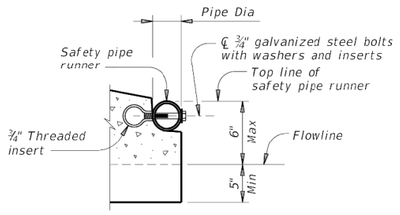


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



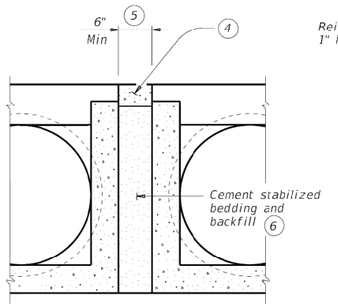
OPTION A



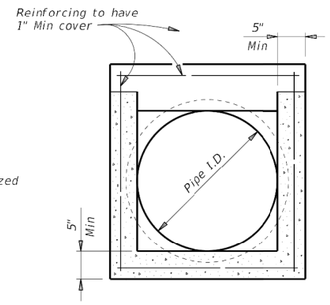
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

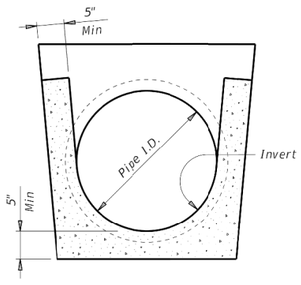
(If required)



MULTIPLE PIPE INSTALLATION

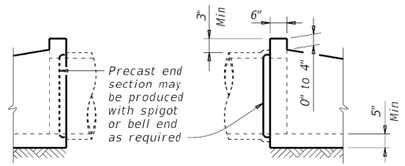


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Min Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' – 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 ¼"	1.30"	20.50"	6:1	6' – 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	1.60"	24.00"	6:1	8' – 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' – 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	2.65"	38.50"	6:1	14' – 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' – 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	2.7"	52.50"	6:1	21' – 2"	Yes	Yes	4" STD	4.500"	4.026"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(7) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below :

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" – D12 x D12 or 5"x5" – D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'_c = 3,600 psi).

At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation — Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

FILE: psetspss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	DIST	COUNTY		SHEET NO.

NO.	REVISIONS	DATE	NAME
1	TXDOT REVISED STANDARD ISSUE	12/21	RLW
2			
3			
4			
5			

FORT BEND COUNTY TEXAS

THE STATE OF TEXAS — FORT BEND COUNTY

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS — AUSTIN P. MCLEAN — 132535 — LICENSED PROFESSIONAL ENGINEER — 7/3/2024

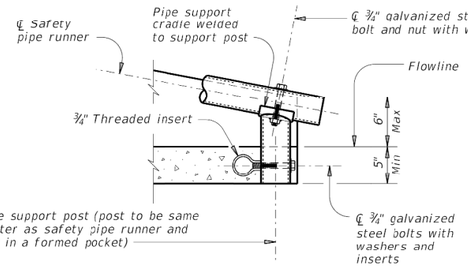
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TXDOT PRECAST S.E.T.-TYII-PARALLEL
SCALE: 1" = 40'	DRAINAGE (PSET-SP)
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 108 / 133

X:\Engineering\2021\21060 – Stella Road\108 TXDOT PRECAST S.E.T.-TYII-PARALLEL DRAINAGE (PSET-SP).dwg Charlie Valenzuela

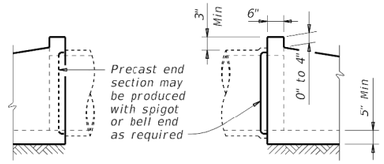
REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (8)	"D" (1)	Slope	Min Length of Unit	Single Pipe		Multiple Pipes	
						Skew	Pipe Runners Required	Skew	Pipe Runners Required
12"	2"	1.15"	17.00"	3:1	2' – 11"	≤ 45°	No	≤ 45°	No
				4:1	3' – 6"				
				6:1	4' – 9"				
15"	2 ¼"	1.30"	20.50"	3:1	3' – 0"	≤ 45°	No	≤ 45°	No
				4:1	4' – 7"				
				6:1	6' – 5"				
18"	2 ½"	1.60"	24.00"	3:1	4' – 6"	≤ 45°	No	≤ 45°	No
				4:1	5' – 8"				
				6:1	8' – 0"				
24"	3"	1.95"	31.00"	3:1	6' – 2"	≤ 45°	No	= 30°	No
				4:1	7' – 10"				
				6:1	11' – 3"			> 30°	Yes
30"	3 ½"	2.65"	38.50"	3:1	7' – 10"	= 15°	No	= 15°	No
				4:1	10' – 1"	> 15°	Yes	> 15°	Yes
				6:1	14' – 8"				
36"	4"	2.75"	45.50"	3:1	9' – 5"	= 0°	No	≥ 0°	Yes
				4:1	12' – 3"	> 0°	Yes		
				6:1	17' – 11"				
42"	4 ½"	2.7"	52.50"	3:1	11' – 1"	≥ 0°	Yes	≥ 0°	Yes
				4:1	14' – 5"				
				6:1	21' – 2"				



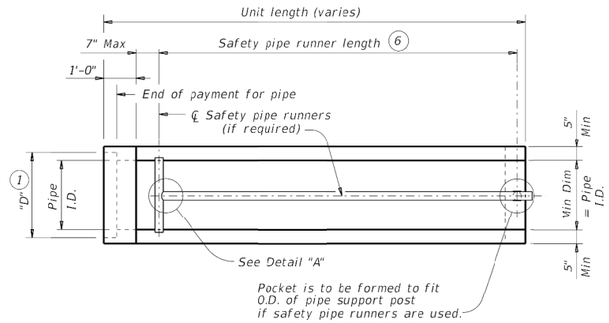
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)



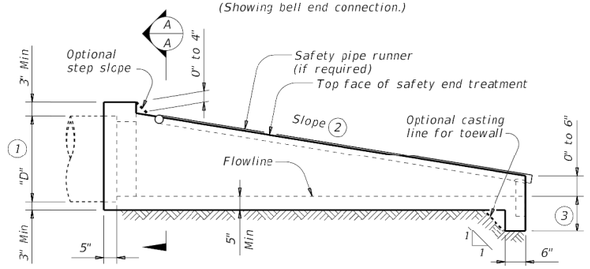
OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment)



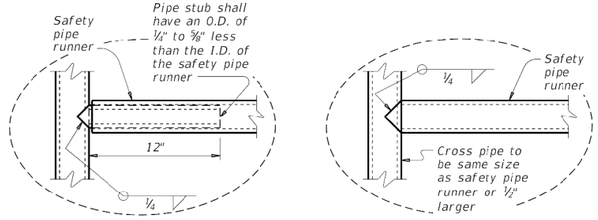
PLAN

(Showing bell end connection.)



LONGITUDINAL ELEVATION

(Showing bell end connection.)

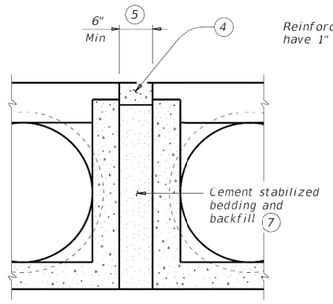


OPTION A

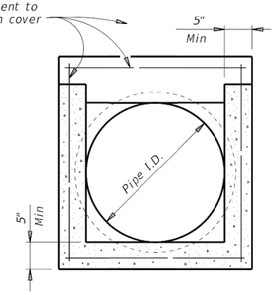
DETAIL A

(If required)

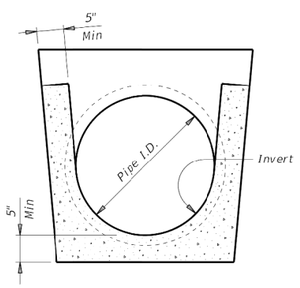
OPTION B



MULTIPLE PIPE INSTALLATION

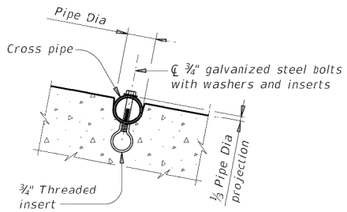


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

SAFETY PIPE RUNNER DIMENSIONS

Max Safety Pipe Runner Length	Required Pipe Runner Size		
	Pipe Size	Pipe O.D.	Pipe I.D.
11' – 2"	3" STD	3.500"	3.068"
15' – 6"	3 ½" STD	4.000"	3.548"
20' – 10"	4" STD	4.500"	4.026"
35' – 4"	5" STD	5.563"	5.047"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in plans. Slope of 3:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Measured along slope.

(7) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(8) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below :

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

At the option and expense of the Contractor, the next larger size of safety end treatment may be furnished as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 1,800 Lbs at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Provide safety pipe runners, cross pipes, pipe support posts, and pipe stubs meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464 "Reinforced Concrete Pipe". Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation — Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ CROSS DRAINAGE

PSET-SC

FILE: psetscss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	DIST	COUNTY		SHEET NO.

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

DATE:
FILE:

X:\Engineering\2021\21060 – Stella Road\109 TXDOT PRECAST S.E.T.-TYII-CROSS DRAINAGE (PSET-SC).dwg Charlie Valenzuela

NO.	REVISIONS	DATE	NAME
1	TXDOT REVISED STANDARD ISSUE	12/21	RLW
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

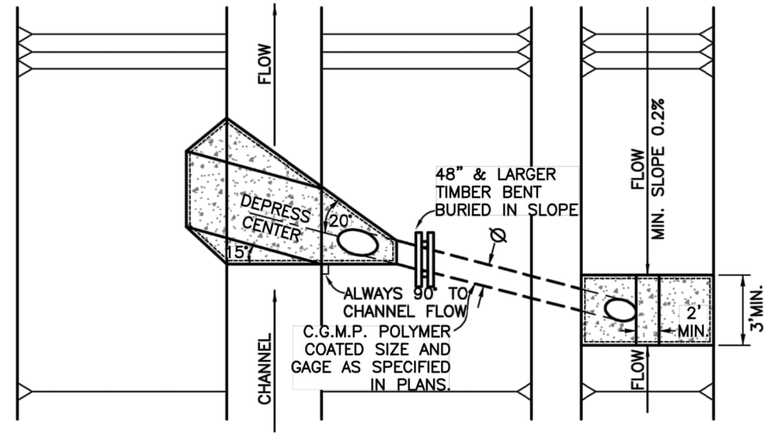
THE STATE OF TEXAS — FORT BEND COUNTY

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane, Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

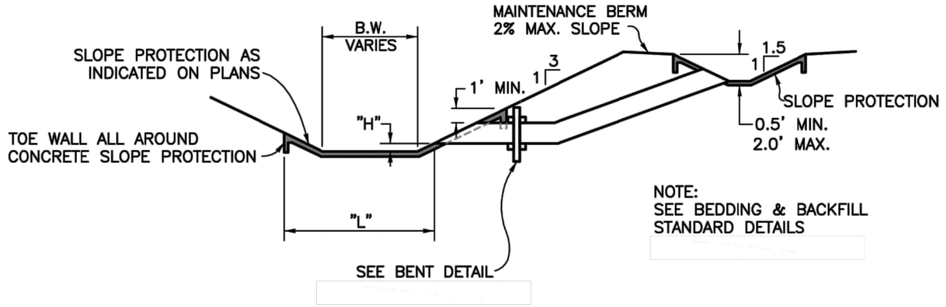
STATE OF TEXAS — AUSTIN P. MCLEAN — 132535 — LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: TXDOT PRECAST S.E.T.-TYII-CROSS
SCALE: 1" = 40'	DRAINAGE (PSET-SC)
DATE: 1/16/2023	APPROVED BY:

SHEET NO: 109 / 133



PLAN VIEW



PROFILE

PIPE DIA.	SLOPE	VELOCITY
24"	0.6%	3.25 f.p.s.
36"	0.3%	3.00 f.p.s.
42"	0.2%	2.75 f.p.s.
48"	0.2%	3.00 f.p.s.
54"	0.2%	3.25 f.p.s.

"H" : FOR PIPE SIZES UP TO 42" H = 3 FT. MAX. AND 1 FT. MIN.
FOR PIPE SIZES OVER 48" H = 1 FT. MAX. AND MIN.

"L" : $\frac{\text{B.W.}}{\text{PIPE SIZE}} \leq 7'-6"$ → "L" WILL EXTEND ONE PIPE Ø ABOVE FL ON OPPOSITE BANK (MIN.)

$\frac{\text{B.W.}}{\text{PIPE SIZE}} > 7'-6"$ → "L" = 6 Ø OR MIN. 1'-6" INTO B.W. WHICHEVER IS GREATER

NOTE: MAX. BACKSLOPE DRAIN SPACING SHALL BE 800 FT. OR 400 FT. TO THE SWALE HIGH POINT.

NOTES:

1. THE MINIMUM THICKNESS OF CONCRETE SLOPE PAVING USED SHALL BE (5") FIVE INCHES.

THE CITY OF ROSENBERG, FORT BEND COUNTY, TEXAS
DEPARTMENT OF PUBLIC WORKS

TYPICAL BACKSLOPE DRAIN

DESIGN:	CAD:	SCALE:	DATE:	DRAWING:
CAK	STAFF	NTS	11/10	D-110

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

FORT BEND COUNTY
ENGINEERING DEPARTMENT

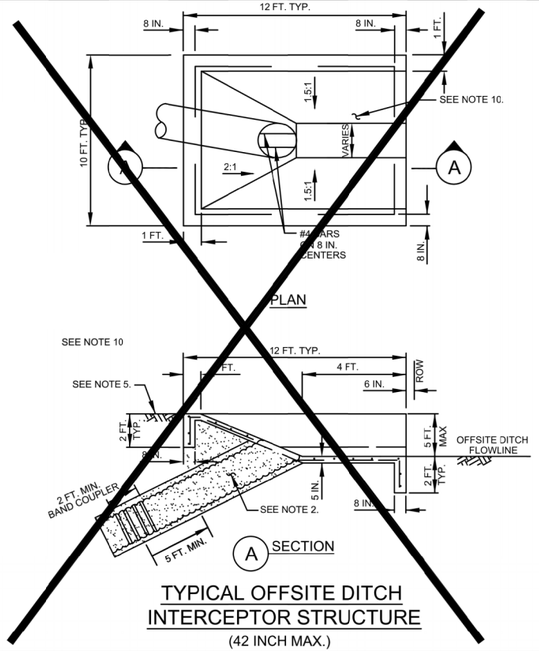
r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	INTERCEPTOR STRUCTURE DETAILS
DRAWN BY:	N/A
CK'D BY:	MJ
SCALE:	N/A
DATE:	6/18/24
SHEET NO:	110/ 133

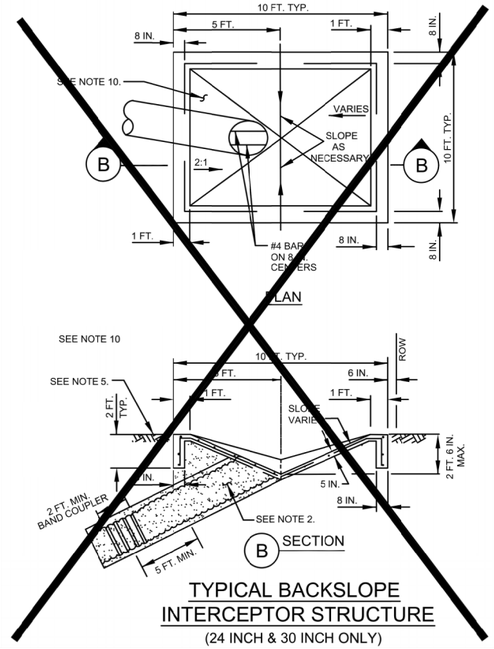
CIVIL STANDARD

M:\04755.000 20116 Stella Road\CAD\DWG\07- 04755 - Details.dwg



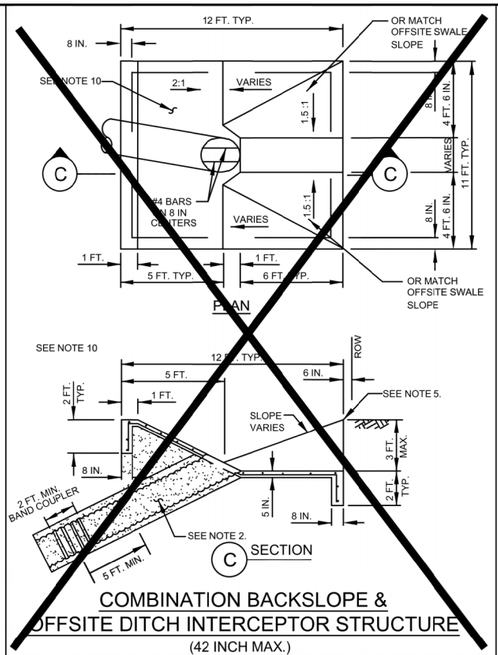
TYPICAL OFFSITE DITCH INTERCEPTOR STRUCTURE

(42 INCH MAX.)



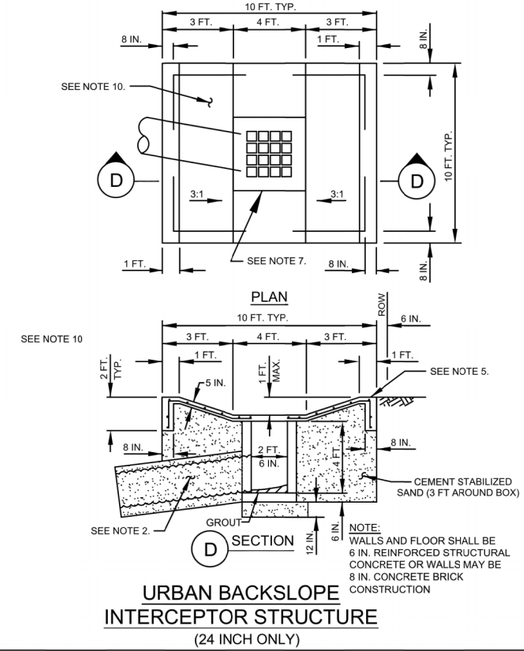
TYPICAL BACKSLOPE INTERCEPTOR STRUCTURE

(24 INCH & 30 INCH ONLY)



COMBINATION BACKSLOPE & OFFSITE DITCH INTERCEPTOR STRUCTURE

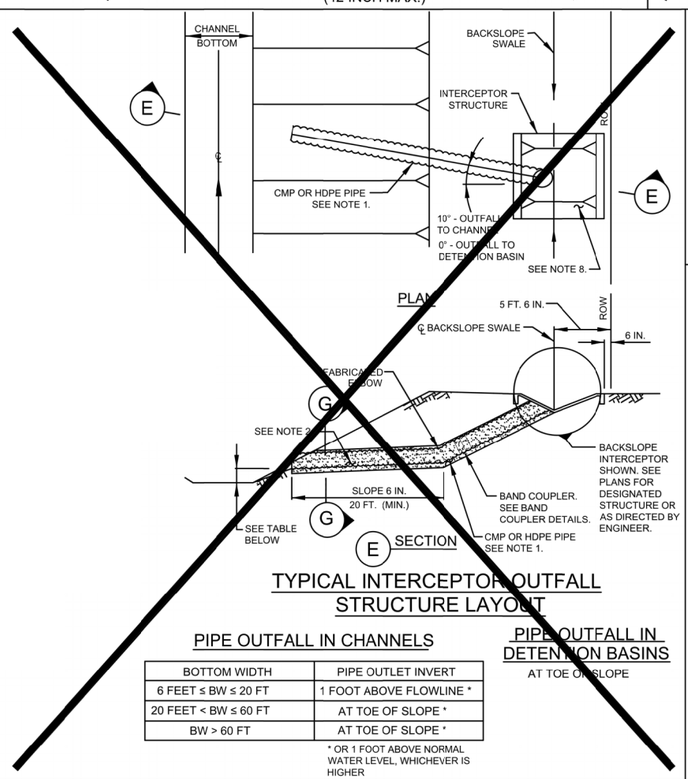
(42 INCH MAX.)



URBAN BACKSLOPE INTERCEPTOR STRUCTURE

(24 INCH ONLY)

NOTE:
WALLS AND FLOOR SHALL BE 6 IN. REINFORCED STRUCTURAL CONCRETE OR WALLS MAY BE 8 IN. CONCRETE BRICK CONSTRUCTION



TYPICAL INTERCEPTOR OUTFALL STRUCTURE LAYOUT

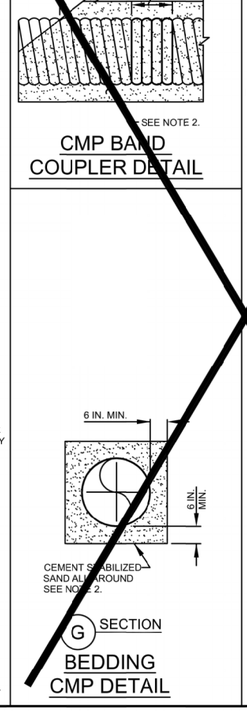
PIPE OUTFALL IN CHANNELS

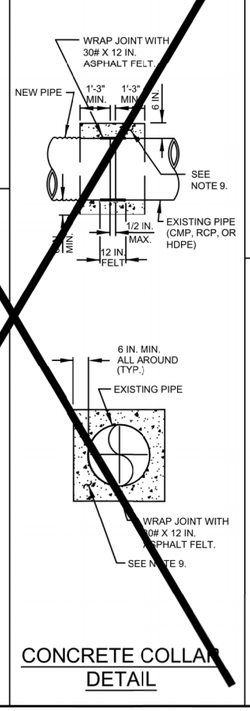
BOTTOM WIDTH	PIPE OUTLET INVERT
6 FEET ≤ BW ≤ 20 FT	1 FOOT ABOVE FLOWLINE *
20 FEET < BW ≤ 60 FT	AT TOE OF SLOPE *
BW > 60 FT	AT TOE OF SLOPE *

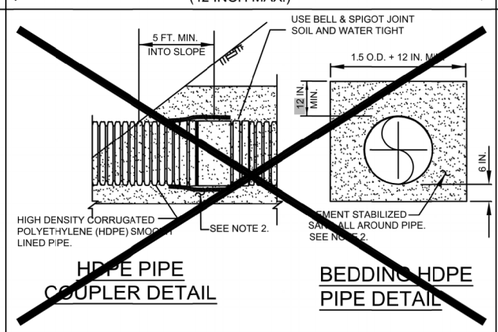
* OR 1 FOOT ABOVE NORMAL WATER LEVEL, WHICHEVER IS HIGHER

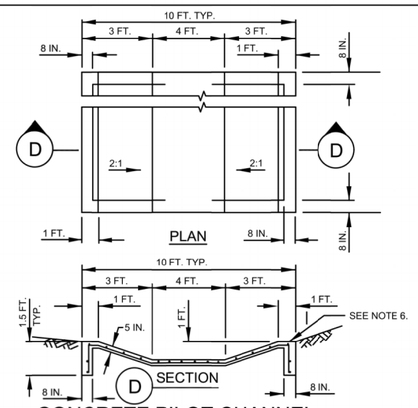
PIPE OUTFALL IN DETENTION BASINS

AT TOE OF SLOPE









CONCRETE PILOT CHANNEL - DETENTION BASIN

NOTES:

1. INTERCEPTOR OUTFALL PIPES WITHIN THE HCFCD RIGHT-OF-WAY SHALL BE CMP OR HDPE PIPE IN ACCORDANCE WITH SPECIFICATION SECTION 02642- CORRUGATED METAL PIPE, HIGH DENSITY POLYETHYLENE (HDPE) PIPE IN ACCORDANCE WITH SPECIFICATION SECTION 2505-HIGH DENSITY POLYETHYLENE, OR APPROVED EQUAL. USE TABLE ON STORM SEWER AND RIPRAP DETAILS SHEET FOR CORRUGATED GALVANIZED STEEL PIPE THICKNESS.
2. PROVIDE AND PLACE CEMENT STABILIZED SAND IN ACCORDANCE WITH SPECIFICATION SECTION 02321-CEMENT STABILIZED SAND AND SECTION 02316 - STRUCTURAL EXCAVATING.
3. EXCAVATION, FILL AND BACKFILL FOR INTERCEPTOR OUTFALLS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02316-STRUCTURAL EXCAVATING AND BACKFILLING.
4. CONCRETE SHALL BE STRUCTURAL CONCRETE IN ACCORDANCE WITH SPECIFICATION SECTION 03310-CONCRETE.
5. INTERCEPTOR STRUCTURES:
   a. ADJUST LENGTH AND WIDTH IN FIELD AS NECESSARY.
   b. 2-FEET DEEP X 8-INCH WIDE TOE ALL AROUND THE STRUCTURE.
   c. STEEL REINFORCING-#4 BARS (GRADE 60) AT 12 INCHES ON CENTER EACH WAY.
   d. ANY INTERCEPTOR OUTFALL PIPE LARGER THAN MAXIMUM SIZE INDICATED REQUIRES A SEPARATE DETAIL.
   e. MATCH TOP OF CONCRETE WITH NATURAL GROUND.
6. CONCRETE PILOT CHANNEL
   a. 1.5 FEET DEEP X 8-INCH WIDE TOE ALL AROUND THE STRUCTURE.
   b. STEEL REINFORCING - #4 BARS (GRADE 60) AT 12 INCHES ON CENTER EACH WAY.
   c. MATCH TOP OF CONCRETE WITH BOTTOM OF DETENTION BASIN.
7. CONCRETE PAD AROUND URBAN BACKSLOPE INTERCEPTOR: PAID FOR AS CONCRETE INTERCEPTOR STRUCTURE PER UNIT PRICE SCHEDULE. TYPE "A" INLET BOX, COH DWG. NO. 2084-08 WITH GRATE TOP, VULCAN FOUNDRY COMPANY, V-4880-1 OR APPROVED EQUAL, APPROX. 473 SQ.IN. OPENING. PAID 2632-05
8. BACKSLOPE SWALE AND INTERCEPTOR STRUCTURE ELEVATIONS AND LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE. FINAL ELEVATIONS AND LOCATIONS SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO INSTALLATION.
9. STRUCTURAL CONCRETE WITH #4 BARS (GRADE 60) 12 INCH O.C. EACH WAY, 3 ROWS MIN. EACH WAY. - FOR COLLARS ONLY. WAIT A MINIMUM OF 24 HOURS AFTER PLACING CONCRETE TO BACKFILL.
10. EPOXY "CLEAN WATER CLEAR CHOICE" LOGO BUTTON ON INTERCEPTORS. LOCATION TO BE DETERMINED BY THE ENGINEER.

THIS DETAIL SHEET HAS BEEN PREPARED FOR USE ON HCFCD PROJECTS OR PROJECTS TO BE MAINTAINED BY THE HCFCD WHEN COMPLETED BY OTHERS. AN ENGINEER WHO INCORPORATES THE DETAILS ON THIS SHEET BECOMES RESPONSIBLE FOR ITS USE IN THE END PRODUCT IN ACCORDANCE WITH RULE 137.33 (b) AND (c) OF THE TEXAS BOARD OF PROFESSIONAL ENGINEERS.

ENGINEER - CONFIRM, CHANGE, OR FILL IN

P.E. SEAL AND SIGNATURE

M:\04755.000 20116 Stella Road\CAD\DWG\07- 04755 - Details.dwg

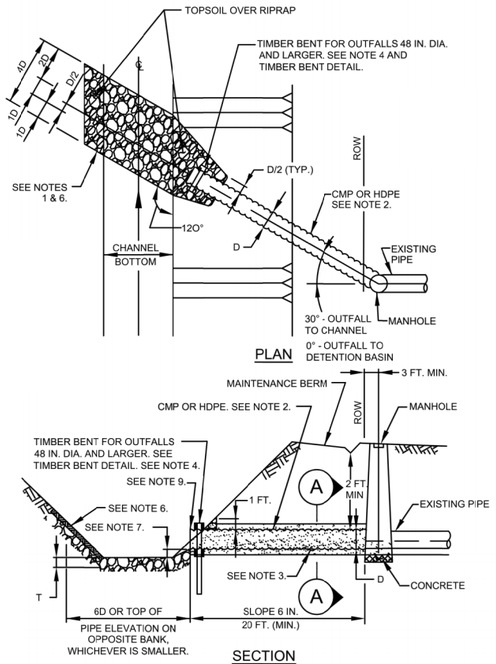
NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

FORT BEND COUNTY ENGINEERING DEPARTMENT

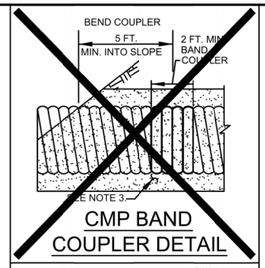
r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

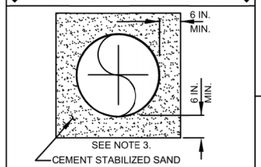
PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	URBAN INTERCEPTOR STRUCTURE DETAILS
DRAWN BY:	N/A
CK'D BY:	MJ
SCALE:	N/A
CIVIL STANDARD	
DATE:	6/18/24
SHEET NO:	111/ 133



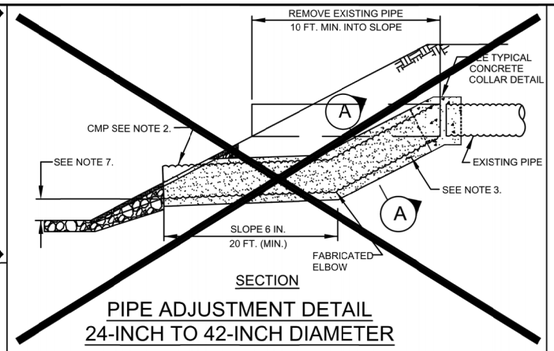
TYPICAL STORM SEWER OUTFALL STRUCTURE LAYOUT



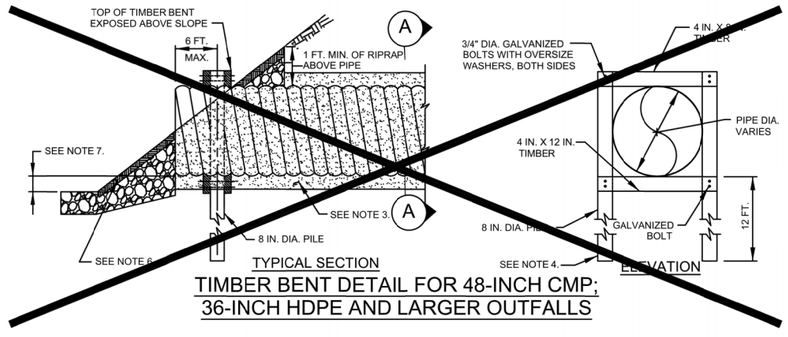
CMP BAND COUPLER DETAIL



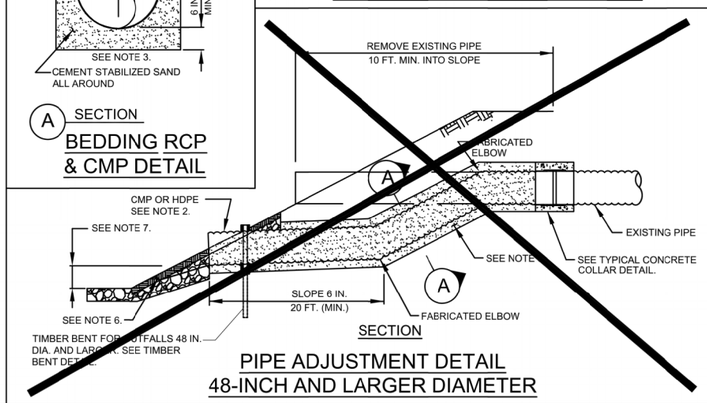
BEDDING RCP & CMP DETAIL



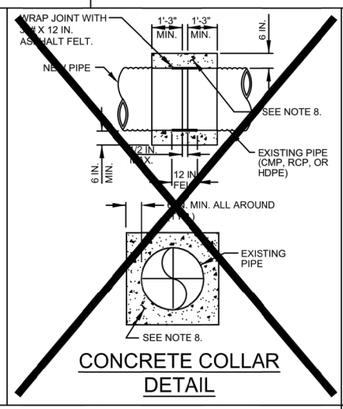
PIPE ADJUSTMENT DETAIL 24-INCH TO 42-INCH DIAMETER



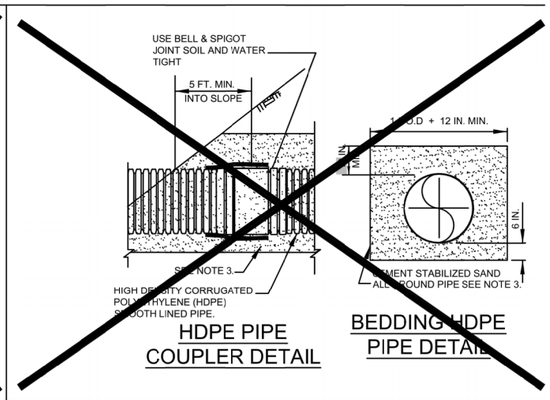
TIMBER BENT DETAIL FOR 48-INCH CMP; 36-INCH HDPE AND LARGER OUTFALLS



PIPE ADJUSTMENT DETAIL 48-INCH AND LARGER DIAMETER

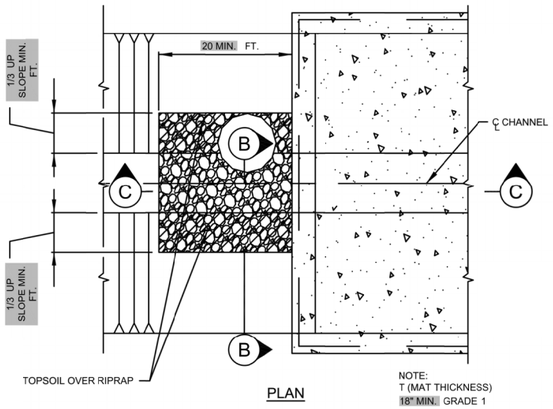


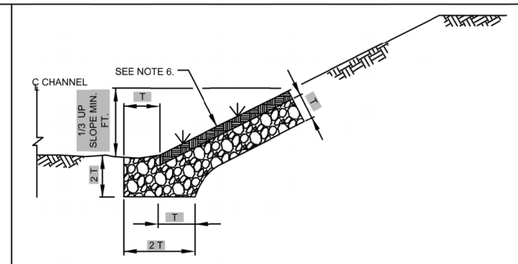
CONCRETE COLLAR DETAIL



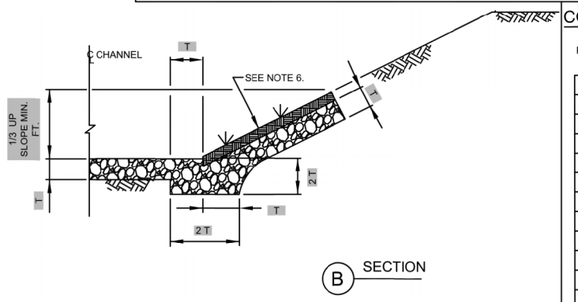
HDPE PIPE COUPLER DETAIL

BEDDING HDPE PIPE DETAIL





TYPICAL RIPRAP LINING DETAIL-SIDE SLOPE ONLY



TYPICAL RIPRAP AT CONCRETE CHANNEL LINING

PIPE OUTFALL IN CHANNELS

BOTTOM WIDTH	PIPE OUTLET INVERT
6 FEET ≤ BW ≤ 20 FT	1 FOOT ABOVE FLOWLINE *
20 FEET < BW ≤ 60 FT	AT TOE OF SLOPE *
BW > 60 FT	AT TOE OF SLOPE *

* OR 1 FOOT ABOVE NORMAL WATER LEVEL, WHICHEVER IS HIGHER

NOTES:

1. INSTALL RIPRAP EROSION PROTECTION IN GRASS LINED CHANNELS AND DETENTION BASINS FOR ANY SIZE STORM SEWER PIPE AND TREATMENT PLANT OUTFALL, DIMENSIONED AS SHOWN IN "TYPICAL STORM SEWER OUTFALL STRUCTURE LAYOUT."
2. STORM SEWER OUTFALL PIPES WITHIN THE HCFCD RIGHT-OF-WAY SHALL BE CMP OR HDPE IN ACCORDANCE WITH SPECIFICATION SECTION 02642-CORRUGATED METAL PIPE, HIGH DENSITY POLYETHYLENE PIPE (HDPE) IN ACCORDANCE WITH SPECIFICATION SECTION 02505-HIGH DENSITY POLYETHYLENE PIPE, OR APPROVED EQUAL. USE TABLE BELOW FOR CORRUGATED GALVANIZED STEEL PIPE.
3. PROVIDE AND PLACE CEMENT STABILIZED SAND IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02321-CEMENT STABILIZED SAND.
4. TIMBER BENTS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02464-TIMBER BENTS.
5. EXCAVATION, FILL, AND BACKFILL FOR STORM SEWER OUTFALLS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02316- STRUCTURAL EXCAVATING AND BACKFILLING.
6. RIPRAP SHALL BE PLACED IN ACCORDANCE WITH SPECIFICATION SECTION 02378-RIPRAP AND GRANULAR FILL. FILL RIPRAP VOIDS AND BURY RIPRAP A MINIMUM OF 6 INCHES WITH TOPSOIL ON SIDE SLOPE AS DIRECTED BY THE ENGINEER.
7. IN DETENTION BASINS, SET FLOWLINE OF OUTFALL AT TOE OF THE SLOPE OR FLOWLINE OF PILOT CHANNEL. IN CHANNEL, USE ELEVATION INDICATED IN THE PIPE OUTFALL IN CHANNELS TABLE.
8. STRUCTURAL CONCRETE #4 BARS (GRADE 40) 12 INCH O.C. EACH WAY - FOR COLLARS ONLY. WAIT A MINIMUM OF 24 HOURS AFTER PLACING CONCRETE TO BACKFILL.
9. FOR RCP OUTFALL IN GRASS LINED CHANNELS AND DETENTION BASINS, USE HEADWALL/ WINGWALL/APRON DETAIL ON SHEET _____. FOR RCP OUTFALL IN CONCRETE LINED CHANNEL AND DETENTION BASINS , SEE HCFCD CONCRETE CHANNEL LINING DETAILS.

CORRUGATED GALVANIZED STEEL PIPE (TYPE I)

PIPE DIA. (in.)	2-2/3" X 1/2" CORRUGATION MIN. FILL* (in.)	SHEET THICKNESS gage	SHEET THICKNESS (in.)	SHEET THICKNESS (mm)	3" X 1" & 5" X 1" CORRUGATION MIN.FILL* (in.)	SHEET THICKNESS gage	SHEET THICKNESS (in.)	SHEET THICKNESS (mm)
24	12	16	.064	1.63	-	-	-	-
30	12	16	.064	1.63	-	-	-	-
36	12	16	.064	1.63	-	-	-	-
42	12	16	.064	1.63	12	16	.064	1.63
48	12	16	.064	1.63	12	16	.064	1.63
54	12	14	.079	2.01	12	16	.064	1.63
60	15	12	.109	2.77	12	16	.064	1.63
66	15	12	.109	2.77	15	16	.064	1.63
72	18	10	.138	3.51	15	16	.064	1.63
78	18	8	.168	4.27	18	16	.064	1.63
84	18	8	.168	4.27	18	14	.079	2.01
90	-	-	-	-	18	14	.079	2.01
96	-	-	-	-	18	14	.079	2.01

* MINIMUM DEPTH OF COVER ABOVE TOP OF PIPE, MAXIMUM DEPTH OF COVER ABOVE TOP OF PIPE IS 20 FEET.

THIS DETAIL SHEET HAS BEEN PREPARED FOR USE ON HCFCD PROJECTS OR PROJECTS TO BE MAINTAINED BY THE HCFCD WHEN COMPLETED BY OTHERS. AN ENGINEER WHO INCORPORATES THE DETAILS ON THIS SHEET BECOMES RESPONSIBLE FOR ITS USE IN THE END PRODUCT IN ACCORDANCE WITH RULE 137.33 (b) AND (c) OF THE TEXAS BOARD OF PROFESSIONAL ENGINEERS.

ENGINEER - CONFIRM, CHANGE, OR FILL IN.

P.E. SEAL AND SIGNATURE

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

FORT BEND COUNTY ENGINEERING DEPARTMENT

THE STATE OF TEXAS FORT BEND COUNTY

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS MENGYANG JIANG 138195 LICENSED PROFESSIONAL ENGINEER

06/18/24

PROJECT TITLE: STELLA ROAD
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD
SHEET DESCRIPTION: STORM SEWER AND RIPRAP DETAILS
DRAWN BY: N/A
DATE: 6/18/24
CK'D BY: MJ
SCALE: N/A
SHEET NO: 112/ 133

M:\04755.000 20116 Stella Road\CAD\DWG\07- 04755 - Details.dwg

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

DATE:
FILE:

M:\04755.000 20116 Stella Road\CAD\DWG\07- 04755 - Details.dwg

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Dimensions					Variable Reinforcing				Estimated Quantities (3) per ft of wing length (2~wings)	
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J1		Bars J2			
					Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2~wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

Hw = H + T + C - 0.250'
Lw = (Hw - 0.333') (SL)

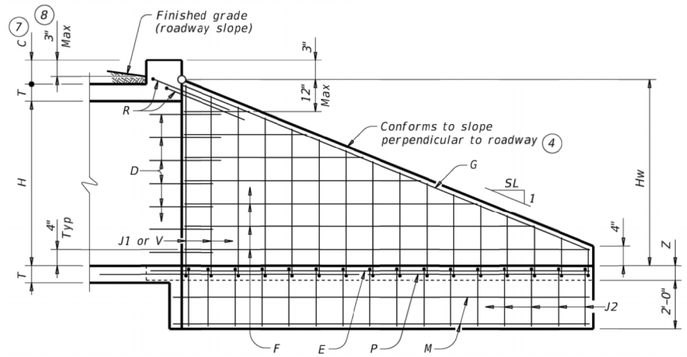
For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U)

For precast culverts:
Ltw = (N) (2U + S) + (N - 1) (0.5')

Total Wingwall Area (two wings ~ SF) = (Hw + 0.333') (Lw)

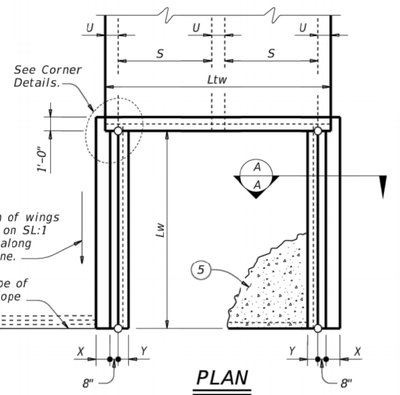
Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

See applicable box culvert standard sheet for H, S, T, and U values.



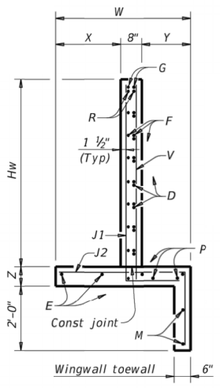
INSIDE ELEVATION

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

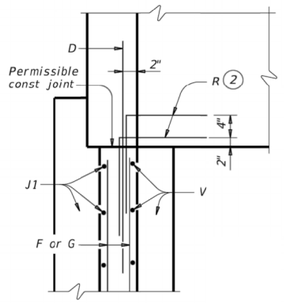


PLAN

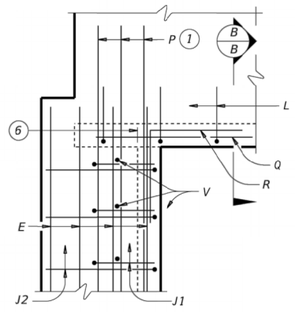
(Showing dimensions.)



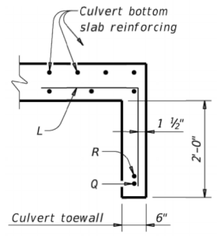
SECTION A-A



WINGWALL

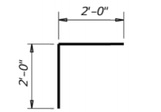


FOOTING AND TOEWALL

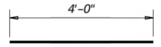


SECTION B-B (5)

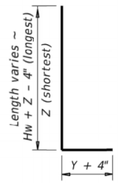
CORNER DETAILS



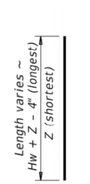
BARS R



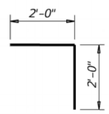
BARS D



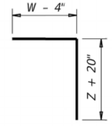
BARS J1



BARS V



BARS L



BARS J2

(1) Extend Bars P 3'-0" minimum into bottom slab of box culvert.

(2) Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.

(3) Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.

(4) Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.

(5) When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.

(6) At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.

(7) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs talier than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

(8) For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS
WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS

SW-0

FILE: sw-0std-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

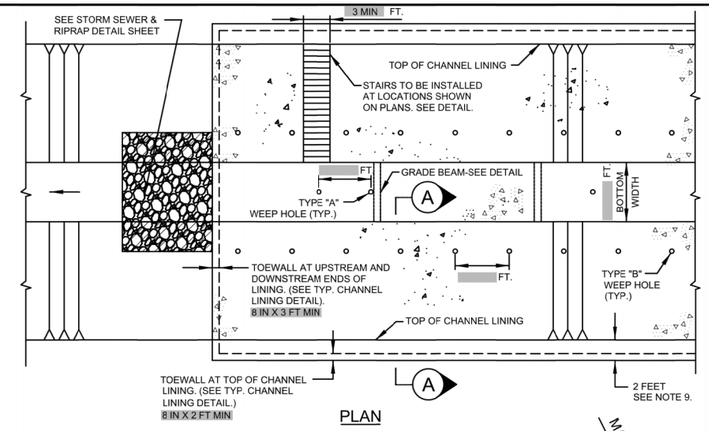
NO.	REVISIONS	DATE	NAME

FORT BEND COUNTY
ENGINEERING DEPARTMENT

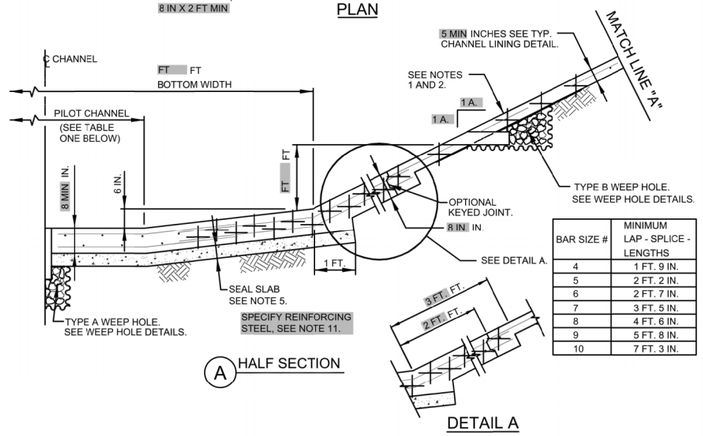
r.g. miller DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS — MENGYANG JIANG — 138195 — LICENSED PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
SHEET DESCRIPTION:	CONCRETE HEADWALL DETAIL
DRAWN BY:	N/A
CK'D BY:	MJ
SCALE:	N/A
CIVIL STANDARD	
DATE:	6/18/24
SHEET NO:	113 / 133

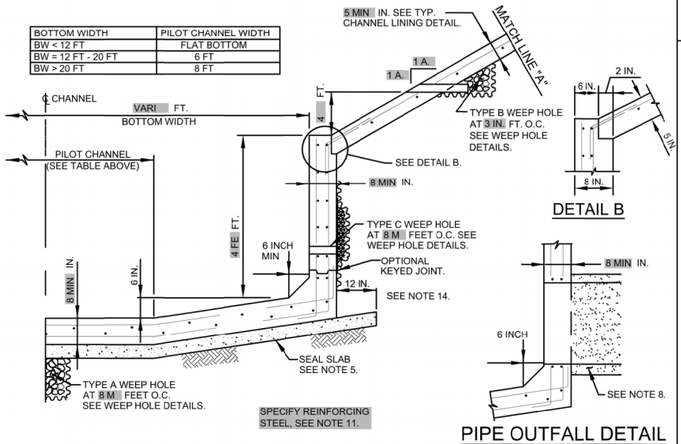


PLAN



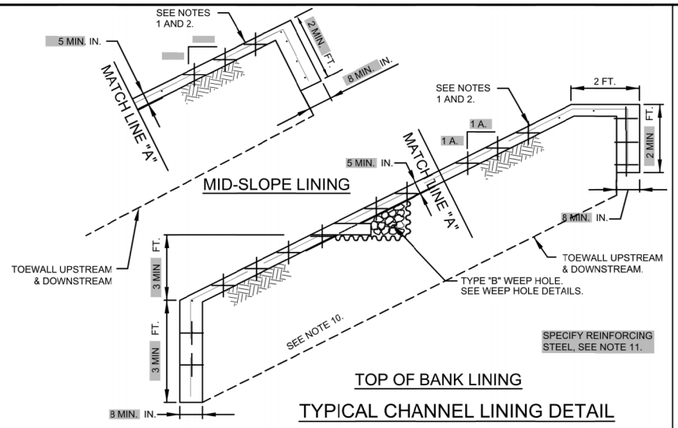
BAR SIZE #	MINIMUM LAP - SPLICE - LENGTHS
4	1 FT. 9 IN.
5	2 FT. 2 IN.
6	2 FT. 7 IN.
7	3 FT. 5 IN.
8	4 FT. 6 IN.
9	5 FT. 8 IN.
10	7 FT. 3 IN.

TYPICAL TRAPEZOIDAL CHANNEL LINING



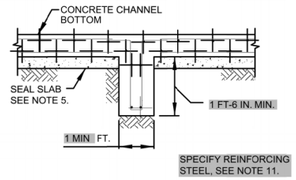
TYPICAL RECTANGULAR CONCRETE CHANNEL LINING HALF SECTION

PIPE OUTFALL DETAIL
(FOR RCP OUTFALLS 42 INCH DIA. AND LESS)

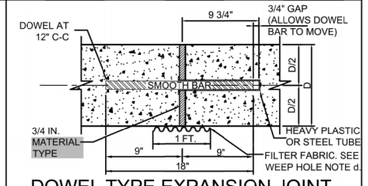


TOP OF BANK LINING

TYPICAL CHANNEL LINING DETAIL



GRADE BEAM DETAIL
(SEE NOTE 6)

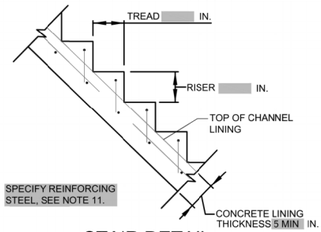


DOWEL TYPE EXPANSION JOINT

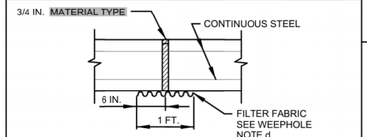
1. CENTER DOWEL HORIZONTALLY ON JOINT.
2. EXPANSION JOINT BARS SHALL BE HELD PARALLEL TO THE FINISHED CONCRETE SURFACE.

SMOOTH EXPANSION JOINT DOWELS

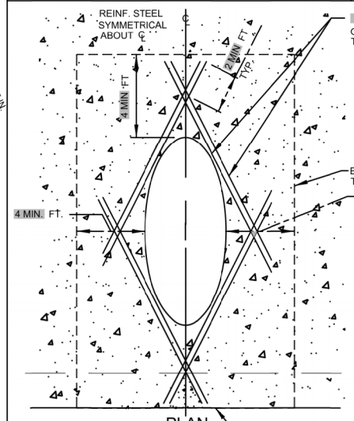
CONCRETE THICKNESS (D)	DOWEL DIA.
5" - 6"	3/4"
7" - 8"	1"
9" AND UP	1 1/4"



STAIR DETAIL



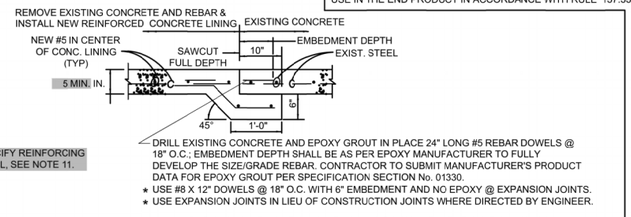
CONSTRUCTION JOINT



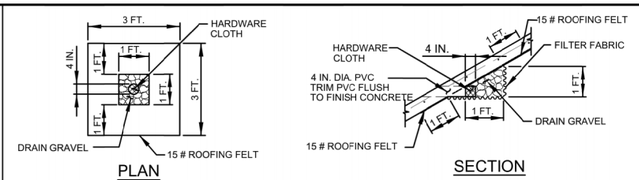
WHEN PLACING THROUGH EXISTING CHANNEL LINING, SAW-CUT FULL DEPTH AND REMOVE 4 FEET ALL AROUND.

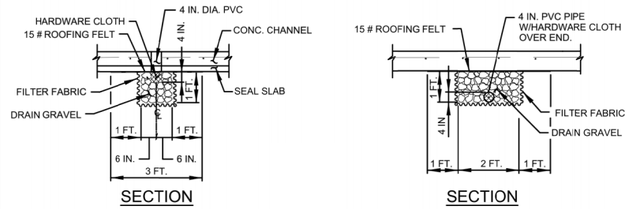
PIPE OUTFALL DETAILS
(FOR RCP OUTFALLS 42 INCH DIA. AND LESS)

SECTION



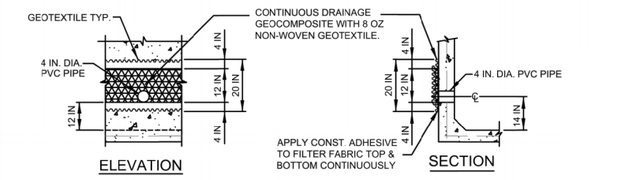
CONNECTION TO EXISTING CONCRETE





TYPE "A" WEEP HOLE

TYPE "B" WEEP HOLE



TYPE "C" WEEP HOLE

WEEP HOLE NOTES:

1. MATERIALS:
   a. PIPE: 4 INCH DIA. SCH. 40 PVC
   b. DRAIN GRAVEL: SEE NOTE 14

SIEVE SIZE	% FINER
1 IN	100
3/4 IN	70 - 100
3/8 IN	20 - 90
NO. 4	0 - 60
NO. 8	0

   c. HARDWARE CLOTH: MIN. OPEN 1/8 IN, MAX. OPEN 1/4 IN
   d. FILTER FABRIC: NON-WOVEN GEOTEXTILE
      MIN. AOS SIEVE NO. [redacted]
      MAX. AOS SIEVE NO. [redacted]
      WEIGHT OZ/SY [redacted]
2. CUT WEEP HOLE PIPE FLUSH WITH CONCRETE SURFACE.
3. TYPE "A" AND "C" WEEP HOLES FOR TYPICAL RECTANGULAR CONCRETE CHANNEL LINING. TO BE STAGGERED.

WEEP HOLE DETAILS

NOTES:

1. STRUCTURAL CONCRETE FOR CONCRETE CHANNEL LINING AND NONSTRUCTURAL CONCRETE FOR SEAL SLAB SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 03310-CONCRETE.
2. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 03310-CONCRETE.
3. EXCAVATION AND BACKFILL FOR CONCRETE CHANNEL LINING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02316-STRUCTURAL EXCAVATING AND BACKFILLING.
4. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02378-RIPRAP AND GRANULAR FILL.
5. A NON-REINFORCED [redacted] NONSTRUCTURAL CONCRETE SEAL SLAB IS REQUIRED BENEATH THE BOTTOM OF CONCRETE CHANNELS.
6. STRUCTURAL CONCRETE GRADE BEAMS SHALL BE INSTALLED TRANSVERSELY AT [redacted] CENTERS ON CONCRETE LINED CHANNELS WITH BOTTOM WIDTHS EQUAL TO OR GREATER THAN 20 FEET.
7. JOINTS:
   A. PLACE [redacted] JOINT IN CONCRETE LOW-FLOW, TRAPEZOIDAL BOTTOM SECTIONS AND SLOPES AT [redacted] SPACING CONTINUOUSLY THROUGH CHANNEL LINING.
   B. PLACE EXPANSION JOINT IN CONCRETE LOW-FLOW, TRAPEZOIDAL BOTTOM SECTIONS, AND SLOPES AT [redacted] SPACING CONTINUOUSLY THROUGH CHANNEL LINING.
8. CEMENT STABILIZED SAND SHALL BE PROVIDED AND PLACED IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02321 -CEMENT STABILIZED SAND.
9. DELETE 2 FT FLAT EDGE WHEN LINING IS BELOW TOP OF BANK. SEE MID-SLOPE LINING DETAIL.
10. UPSTREAM AND DOWNSTREAM TOE WALL [redacted] AT BOTTOM OF SLOPE AND 8 INCHES THICK.
11. [redacted]
12. VARIES BASED ON SIDE SLOPE. MINIMUM 1 FOOT VERTICAL AT TOE OF SLOPE.
13. FOR RCP OUTFALLS 48 INCHES DIA. AND LARGER, USE HEADWALL/WINGWALL DETAIL ON SHEET [redacted]
14. FOR STRUCTURAL BACKFILL MATERIAL PER SPECIFICATION SECTION 2316, USE CONCRETE COARSE AGGREGATE ASTM C33 SIZE NO. 467. LIMESTONE AND RECYCLED CONCRETE NOT ALLOWED.

P.E. SEAL AND SIGNATURE

ENGINEER - CONFIRM, CHANGE, OR FILL IN.

M:\04755.000 20116 Stella Road\CAD\DWG\07- 04755 - Details.dwg

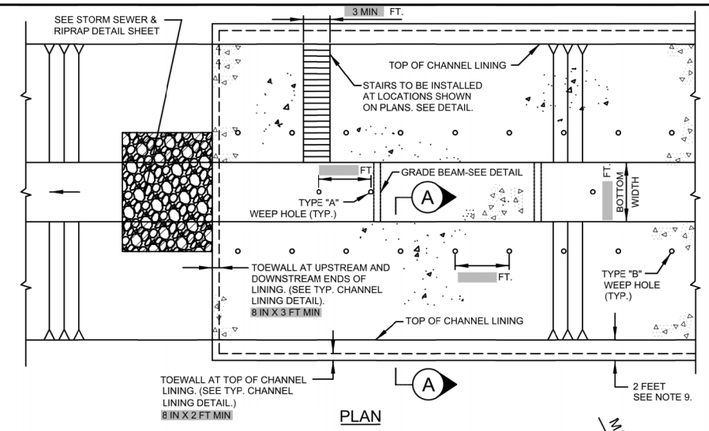
NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

FORT BEND COUNTY ENGINEERING DEPARTMENT

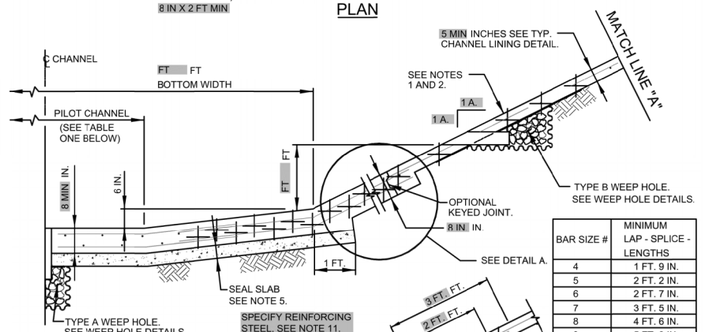
r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE: STELLA ROAD
FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD
CIVIL STANDARD
SHEET DESCRIPTION: CONCRETE CHANNEL LINING DETAILS
DRAWN BY: N/A
DATE: 6/18/24
CK'D BY: MJ
SCALE: N/A
SHEET NO: 114 / 133



PLAN



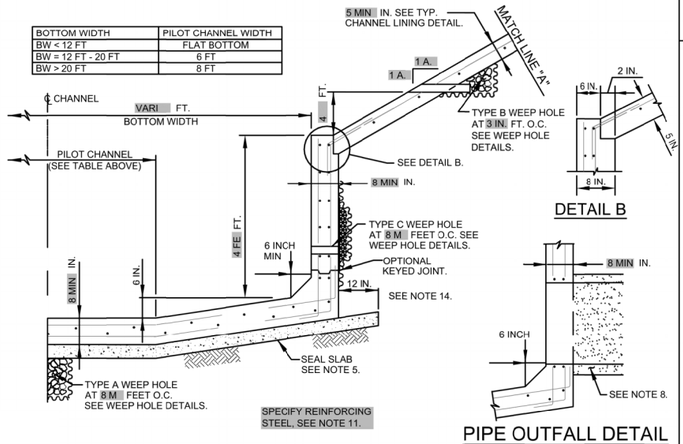
BAR SIZE #	MINIMUM LAP - SPLICE - LENGTHS
4	1 FT. 9 IN.
5	2 FT. 2 IN.
6	2 FT. 7 IN.
7	3 FT. 5 IN.
8	4 FT. 6 IN.
9	5 FT. 8 IN.
10	7 FT. 3 IN.

A HALF SECTION

DETAIL A

TYPICAL TRAPEZOIDAL CHANNEL LINING

BOTTOM WIDTH	PILOT CHANNEL WIDTH
BW < 12 FT	FLAT BOTTOM
BW = 12 FT - 20 FT	6 FT
BW > 20 FT	8 FT

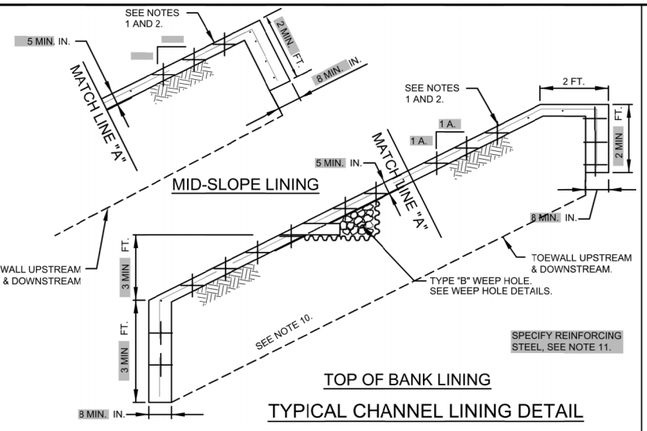


TYPICAL RECTANGULAR CONCRETE CHANNEL LINING HALF SECTION

DETAIL B

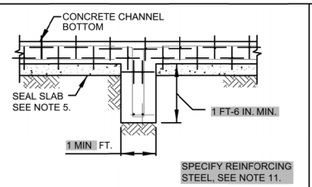
PIPE OUTFALL DETAIL

(FOR RCP OUTFALLS 42 INCH DIA. AND LESS)



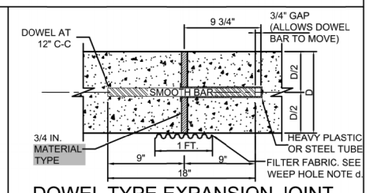
TOP OF BANK LINING

TYPICAL CHANNEL LINING DETAIL



GRADE BEAM DETAIL

(SEE NOTE 6)

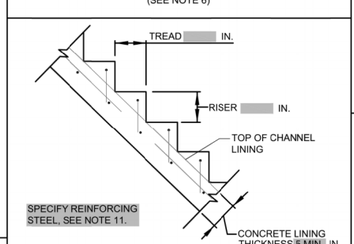


DOWEL TYPE EXPANSION JOINT

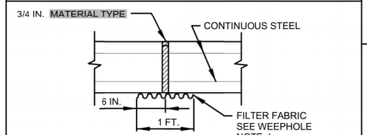
1. CENTER DOWEL HORIZONTALLY ON JOINT.
2. EXPANSION JOINT BARS SHALL BE HELD PARALLEL TO THE FINISHED CONCRETE SURFACE.

SMOOTH EXPANSION JOINT DOWELS

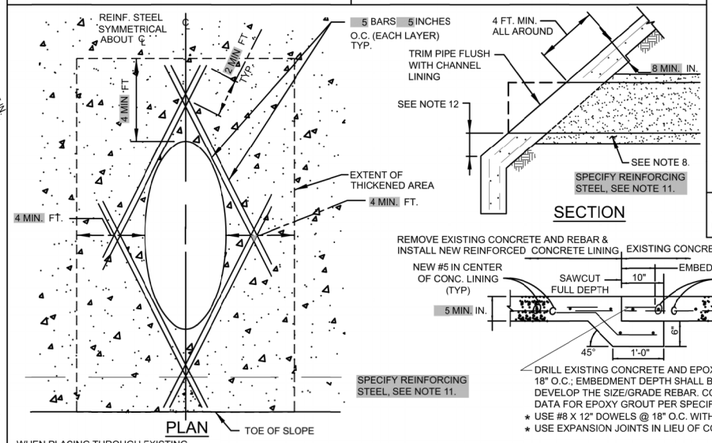
CONCRETE THICKNESS (D)	DOWEL DIA.
5" - 6"	3/4"
7" - 8"	1"
9" AND UP	1 1/4"



STAIR DETAIL



CONSTRUCTION JOINT

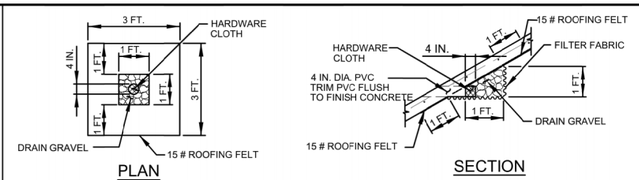


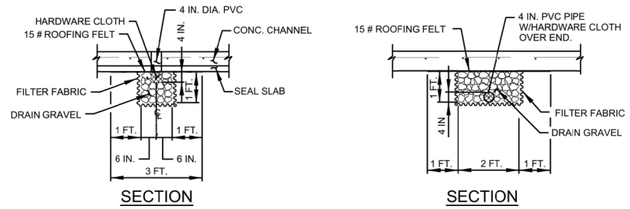
WHEN PLACING THROUGH EXISTING CHANNEL LINING, SAW-CUT FULL DEPTH AND REMOVE 4 FEET ALL AROUND.

PIPE OUTFALL DETAILS

(FOR RCP OUTFALLS 42 INCH DIA. AND LESS)

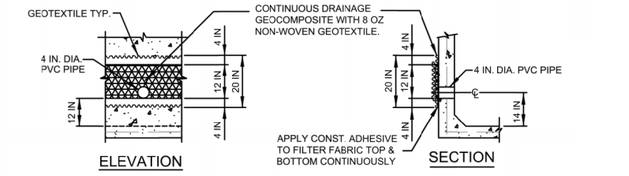
CONNECTION TO EXISTING CONCRETE





TYPE "A" WEEP HOLE

TYPE "B" WEEP HOLE



TYPE "C" WEEP HOLE

WEEP HOLE NOTES:

1. MATERIALS:
   a. PIPE: 4 INCH DIA. SCH. 40 PVC
   b. DRAIN GRAVEL: SEE NOTE 14

SIEVE SIZE	% FINER
1 IN	100
3/4 IN	70 - 100
3/8 IN	20 - 90
NO. 4	0 - 60
NO. 8	0

   c. HARDWARE CLOTH: MIN. OPEN 1/8 IN, MAX. OPEN 1/4 IN
   d. FILTER FABRIC: NON-WOVEN GEOTEXTILE
      MIN. AOS SIEVE NO.
      MAX. AOS SIEVE NO.
      WEIGHT OZ/SY
2. CUT WEEP HOLE PIPE FLUSH WITH CONCRETE SURFACE.
3. TYPE "A" AND "C" WEEP HOLES FOR TYPICAL RECTANGULAR CONCRETE CHANNEL LINING. TO BE STAGGERED.

WEEP HOLE DETAILS

NOTES:

1. STRUCTURAL CONCRETE FOR CONCRETE CHANNEL LINING AND NONSTRUCTURAL CONCRETE FOR SEAL SLAB SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 03310-CONCRETE.
2. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 03310-CONCRETE.
3. EXCAVATION AND BACKFILL FOR CONCRETE CHANNEL LINING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02316-STRUCTURAL EXCAVATING AND BACKFILLING.
4. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02378-RIPRAP AND GRANULAR FILL.
5. A NON-REINFORCED [redacted] NONSTRUCTURAL CONCRETE SEAL SLAB IS REQUIRED BENEATH THE BOTTOM OF CONCRETE CHANNELS.
6. STRUCTURAL CONCRETE GRADE BEAMS SHALL BE INSTALLED TRANSVERSELY AT [redacted] CENTERS ON CONCRETE LINED CHANNELS WITH BOTTOM WIDTHS EQUAL TO OR GREATER THAN 20 FEET.
7. JOINTS:
   A. PLACE [redacted] JOINT IN CONCRETE LOW-FLOW, TRAPEZOIDAL BOTTOM SECTIONS AND SLOPES AT [redacted] SPACING CONTINUOUSLY THROUGH CHANNEL LINING.
   B. PLACE EXPANSION JOINT IN CONCRETE LOW-FLOW, TRAPEZOIDAL BOTTOM SECTIONS, AND SLOPES AT [redacted] SPACING CONTINUOUSLY THROUGH CHANNEL LINING.
8. CEMENT STABILIZED SAND SHALL BE PROVIDED AND PLACED IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02321 -CEMENT STABILIZED SAND.
9. DELETE 2 FT FLAT EDGE WHEN LINING IS BELOW TOP OF BANK. SEE MID-SLOPE LINING DETAIL.
10. UPSTREAM AND DOWNSTREAM TOE WALL [redacted] AT BOTTOM OF SLOPE AND 8 INCHES THICK.
11. [redacted]
12. VARIES BASED ON SIDE SLOPE. MINIMUM 1 FOOT VERTICAL AT TOE OF SLOPE.
13. FOR RCP OUTFALLS 48 INCHES DIA. AND LARGER, USE HEADWALL/WINGWALL DETAIL ON SHEET [redacted]
14. FOR STRUCTURAL BACKFILL MATERIAL PER SPECIFICATION SECTION 2316, USE CONCRETE COARSE AGGREGATE ASTM C33 SIZE NO. 467. LIMESTONE AND RECYCLED CONCRETE NOT ALLOWED.

THIS DETAIL SHEET HAS BEEN PREPARED FOR USE ON HCFC PROJECTS OR PROJECTS TO BE MAINTAINED BY THE HCFCD WHEN COMPLETED BY OTHERS. AN ENGINEER WHO INCORPORATES THE DETAILS ON THIS SHEET BECOMES RESPONSIBLE FOR ITS USE IN THE END PRODUCT IN ACCORDANCE WITH RULE 137.33 (b) AND (c) OF THE TEXAS BOARD OF PROFESSIONAL ENGINEERS.

P.E. SEAL AND SIGNATURE

ENGINEER - CONFIRM, CHANGE, OR FILL IN.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

FORT BEND COUNTY ENGINEERING DEPARTMENT

THE STATE OF TEXAS FORT BEND COUNTY

r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

STATE OF TEXAS MENGYANG JIANG 138195 LICENSED PROFESSIONAL ENGINEER

06/18/24

PROJECT TITLE: STELLA ROAD

FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD

CIVIL STANDARD

SHEET DESCRIPTION: CONCRETE CHANNEL LINING DETAILS

DRAWN BY: N/A

DATE: 6/18/24

CK'D BY: MJ

SCALE: N/A

SHEET NO: 115/ 133

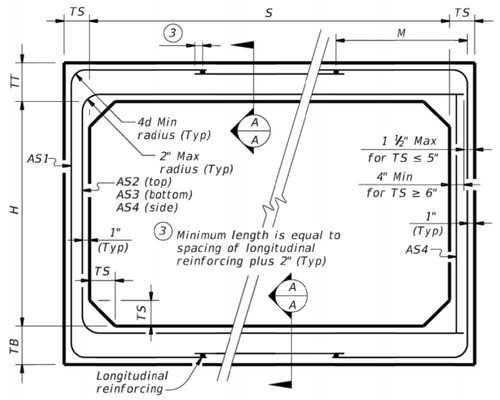
M:\04755.000 20116 Stella Road\CAD\DWG\07- 04755 - Details.dwg

BOX DATA

SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (sq. in. / ft.) (2)							(1) Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
3	2	7	6	4	< 2	–	0.17	0.25	0.16	0.10	0.17	0.17	0.14	3.3
3	2	4	4	4	2 < 3	31	0.13	0.19	0.18	0.10	–	–	–	2.4
3	2	4	4	4	3 – 5	31	0.10	0.11	0.12	0.10	–	–	–	2.4
3	2	4	4	4	10	31	0.10	0.10	0.10	0.10	–	–	–	2.4
3	2	4	4	4	15	31	0.10	0.13	0.13	0.10	–	–	–	2.4
3	2	4	4	4	20	31	0.11	0.17	0.17	0.10	–	–	–	2.4
3	2	4	4	4	25	31	0.14	0.21	0.21	0.10	–	–	–	2.4
3	2	4	4	4	30	31	0.17	0.25	0.25	0.10	–	–	–	2.4
3	2	4	4	4	35	31	0.20	0.29	0.30	0.10	–	–	–	2.4
3	3	7	6	4	< 2	–	0.17	0.27	0.17	0.10	0.17	0.17	0.14	3.7
3	3	4	4	4	2 < 3	31	0.10	0.22	0.21	0.10	–	–	–	2.8
3	3	4	4	4	3 – 5	31	0.10	0.14	0.14	0.10	–	–	–	2.8
3	3	4	4	4	10	31	0.10	0.11	0.11	0.10	–	–	–	2.8
3	3	4	4	4	15	31	0.10	0.14	0.15	0.10	–	–	–	2.8
3	3	4	4	4	20	31	0.10	0.18	0.19	0.10	–	–	–	2.8
3	3	4	4	4	25	31	0.10	0.23	0.23	0.10	–	–	–	2.8
3	3	4	4	4	30	31	0.12	0.27	0.28	0.10	–	–	–	2.8
3	3	4	4	4	35	31	0.14	0.32	0.32	0.10	–	–	–	2.8

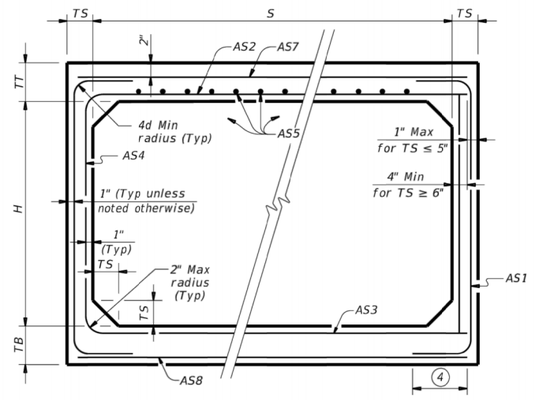
(1) For box length = 8'-0"

(2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



CORNER OPTION "A" CORNER OPTION "B"

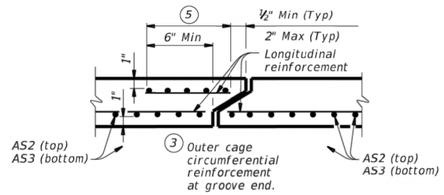
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

(4) Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ).



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.

Provide Class H concrete (f`c = 5,000 psi).

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS PRECAST

3'-0" SPAN

SCP-3

FILE:	scp03sts-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS					
		DIST	COUNTY		SHEET NO.

DATE:
FILE:

M:\04755.000 20116 Stella Road\CAD\DWG\07- 04755 - Details.dwg

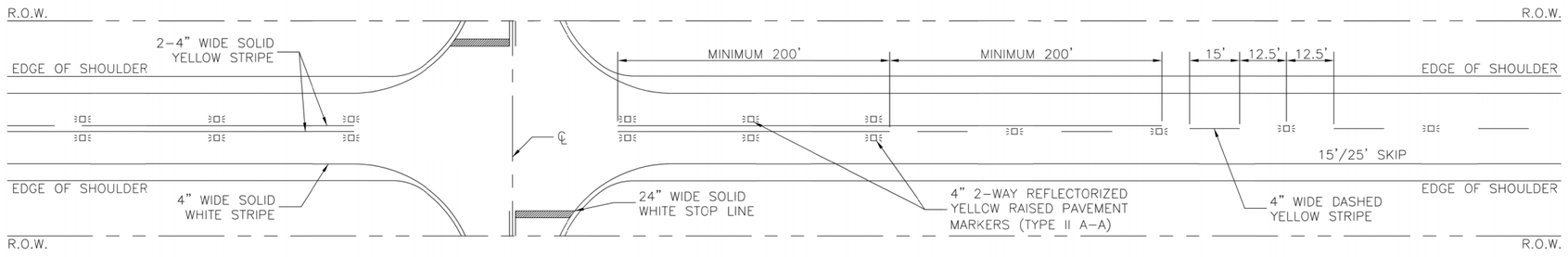
NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

FORT BEND COUNTY
ENGINEERING DEPARTMENT

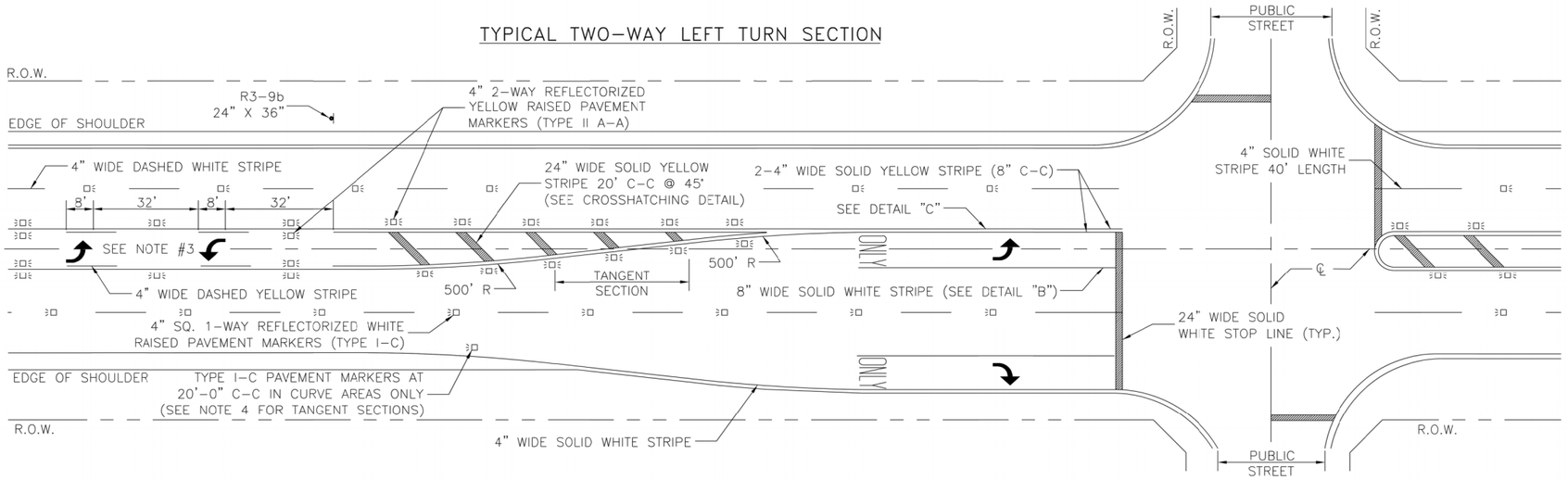
r.g. miller
DCCM
R.G. Miller Engineers, Inc. | TxEng F - 487
16340 Park Ten Place, Ste 350
Houston, TX 77084
713.461.9600 | rgmiller.com

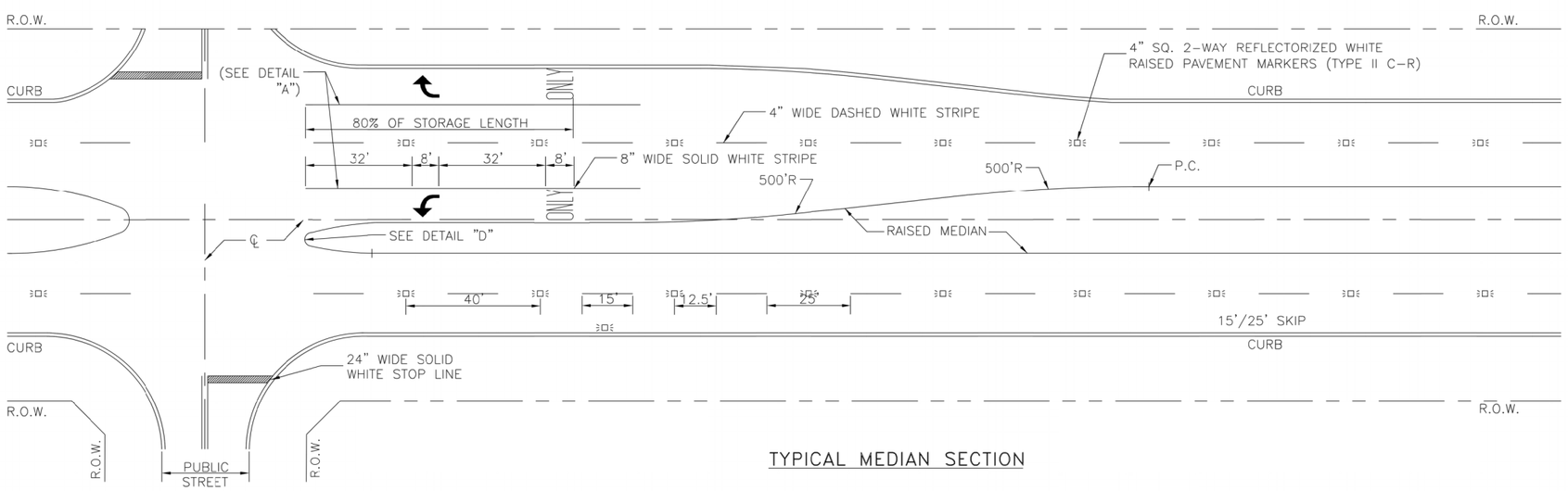
STATE OF TEXAS
MENGYANG JIANG
138195
LICENSED
PROFESSIONAL ENGINEER
06/18/24

PROJECT TITLE:	STELLA ROAD		
	FROM COTTONWOOD SCHOOL ROAD TO BAND ROAD		CIVIL STANDARD
SHEET DESCRIPTION:	SINGLE BOX CULVERT DETAIL		
DRAWN BY: N/A			DATE: 6/18/24
CK'D BY: MJ	SCALE: N/A		SHEET NO: 116/133



TYPICAL TWO LANE TWO–WAY ROAD



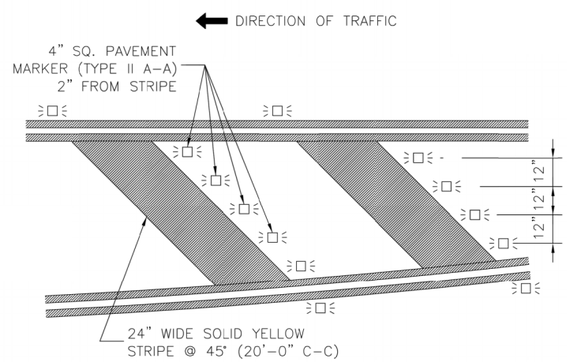


TYPICAL MEDIAN SECTION

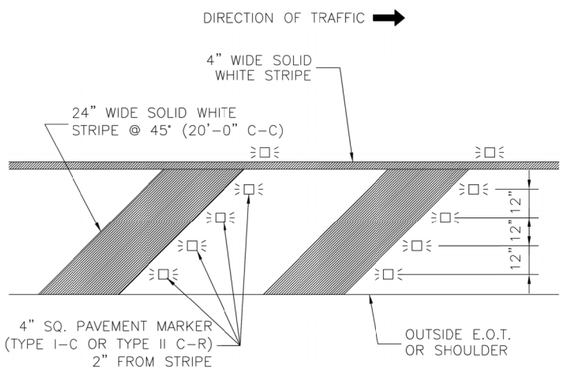
NOTES:

1. ALL PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (TMUTCD).
2. ALL TRAFFIC BUTTONS AND MARKERS SHALL BE INSTALLED ADJACENT TO STRIPES (APPROXIMATELY 2").
3. REPEAT ARROWS AT APPROXIMATELY 1000' INTERVALS WITHIN TWO–WAY LEFT TURN SECTION.
4. WITHIN A TANGENT SECTION THE TYPE I–C PAVEMENT MARKERS SHALL BE PLACED AT 40' C–C ON ROADWAYS WITHOUT CURB AND GUTTERS.
5. WHEN PAVEMENT MARKINGS EXTEND INTO OR CONTINUE THROUGH AN INTERSECTION AREA, THEY SHALL BE THE SAME COLOR AND AT LEAST THE SAME WIDTH AS THE LINE MARKINGS THEY EXTEND.
6. WHEN CROSSWALK MARKINGS ARE USED WITHIN AN ESTABLISHED SCHOOL ZONE, MID–BLOCK, OR AT UNCONTROLLED INTERSECTIONS, CROSSWALK SHALL BE CONTINENTAL STYLE.
7. ADDITIONAL SET OF "WORD" AND "ARROW" PAVEMENT MARKINGS SHALL BE USED WHEN TURN LANE STORAGE LENGTH IS 160 FEET OR GREATER.

CROSSHATCHING DETAIL



OUTSIDE EDGE CROSSHATCHING DETAIL



NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3–1–22	RJS
2			
3			
4			
5			

FORT BEND COUNTY TEXAS

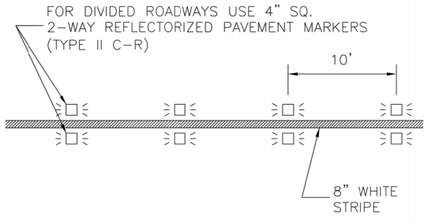
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

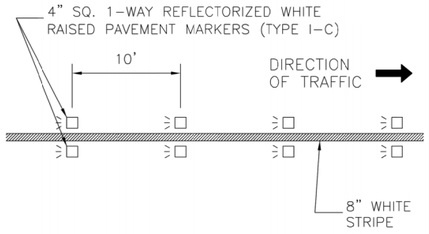
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED PAVEMENT MARKING DETAILS (1 OF 2)
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 117 / 133

X:\Engineering\2021\21060 – Stella Road\117 FBCED PAVEMENT MARKING DETAILS (1 OF 2).dwg Charlie Valenzuela

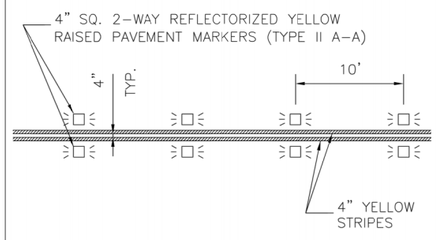
DETAIL "A"
(FOR DIVIDED ROADWAYS)



DETAIL "B"
(FOR UNDIVIDED ROADWAYS)



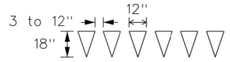
DETAIL "C"



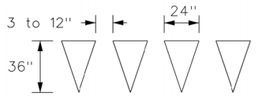
PAVEMENT MARKER LEGEND

SYMBOL	DESCRIPTION
≥□≤	4" x 4" REFLECTORIZED RAISED PAVEMENT MARKER
□≤	INDICATED DIRECTION OF TRAFFIC FLOW

YIELD LINE DETAILS



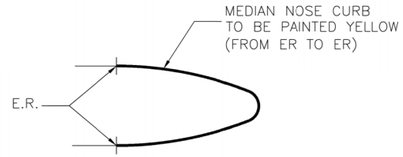
FOR POSTED SPEED ON ROAD BEING MARKED EQUAL TO OR LESS THAN 40 MPH.



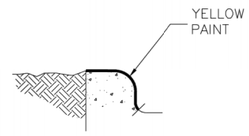
FOR POSTED SPEED ON ROAD BEING MARKED EQUAL TO OR GREATER THAN 45 MPH

DETAIL "D"

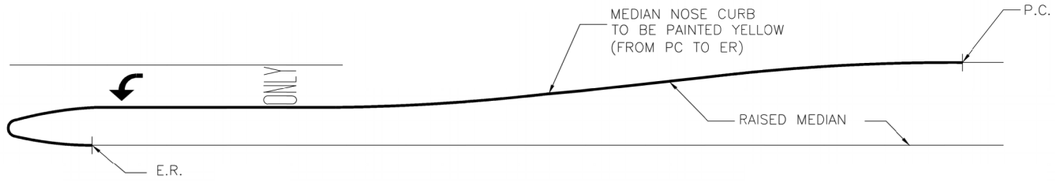
* PAINT FROM THE BACK OF CURB TO THE GUTTER LINE



TYPICAL MEDIAN NOSE



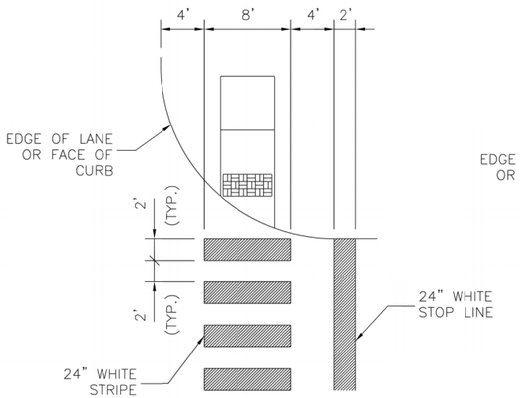
TYPICAL CURB SECTION



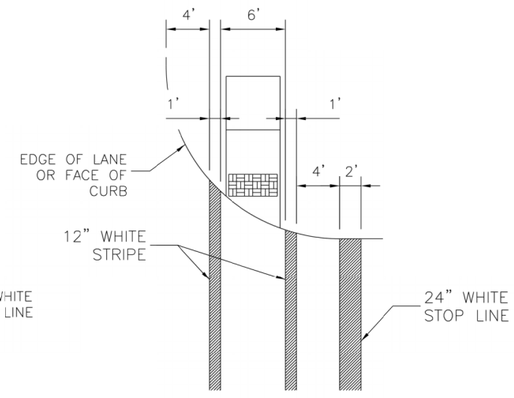
RAISED MEDIAN WITH TURN BAY

TYPICAL CROSSWALK PLACEMENT

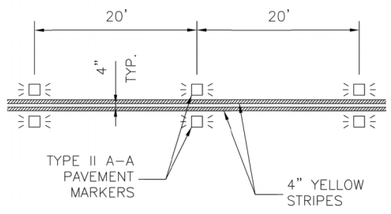
CONTINENTAL TYPE



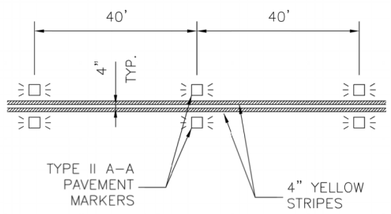
STANDARD TYPE



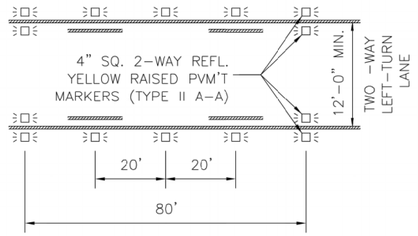
CENTER LINE DETAIL
CURVE SECTION



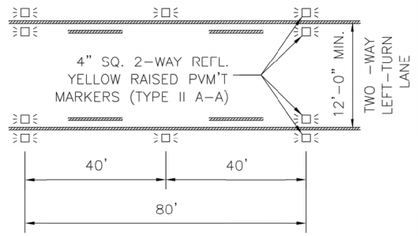
CENTER LINE DETAIL
TANGENT SECTION



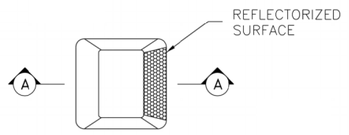
TWO-WAY LEFT TURN
CURVE SECTION



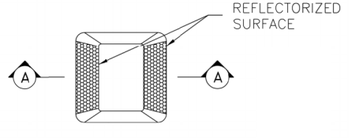
TWO-WAY LEFT TURN
TANGENT SECTION



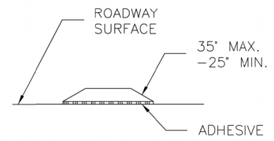
RAISED PAVEMENT MARKERS



TYPE I (TOP VIEW)



TYPE II (TOP VIEW)



SECTION A-A

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

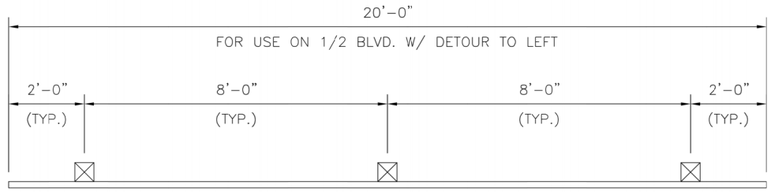
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103500
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

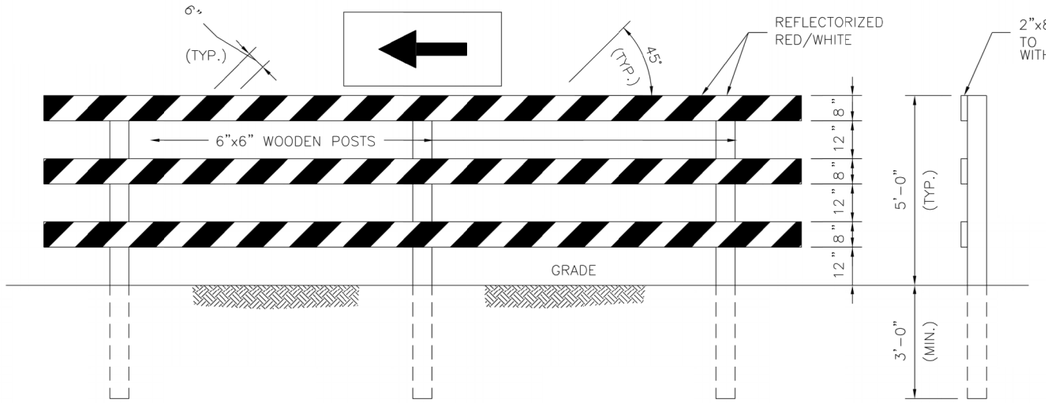
STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER · 7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED PAVEMENT MARKING DETAILS (2 OF 2)
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 118 / 133

X:\Engineering\2021\21060 - Stella Road\118 FBCED PAVEMENT MARKING DETAILS (2 OF 2).dwg Charlie Valenzuela



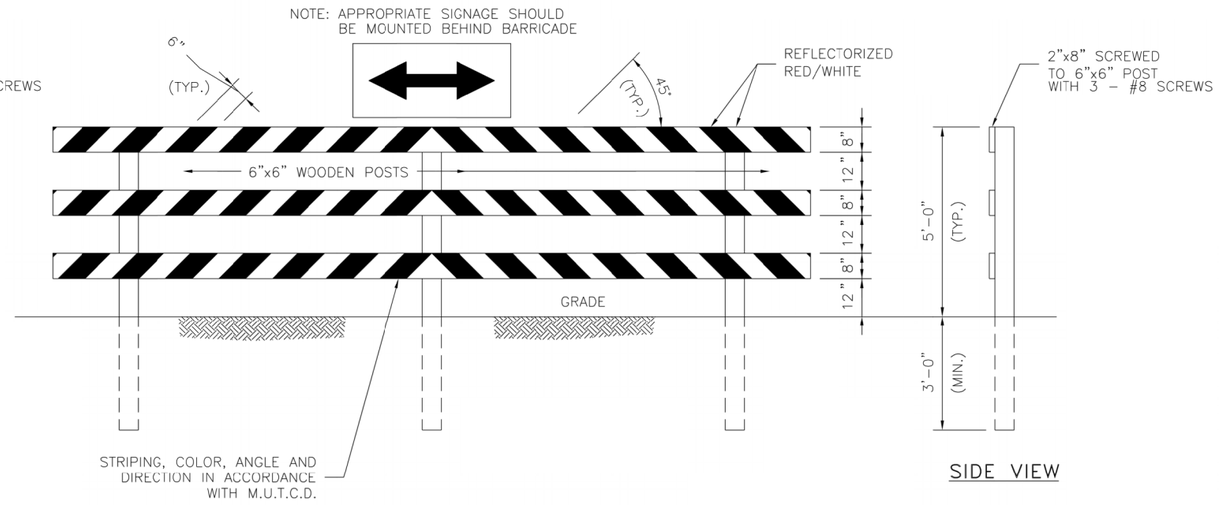
PLAN VIEW



FRONT VIEW

SIDE VIEW

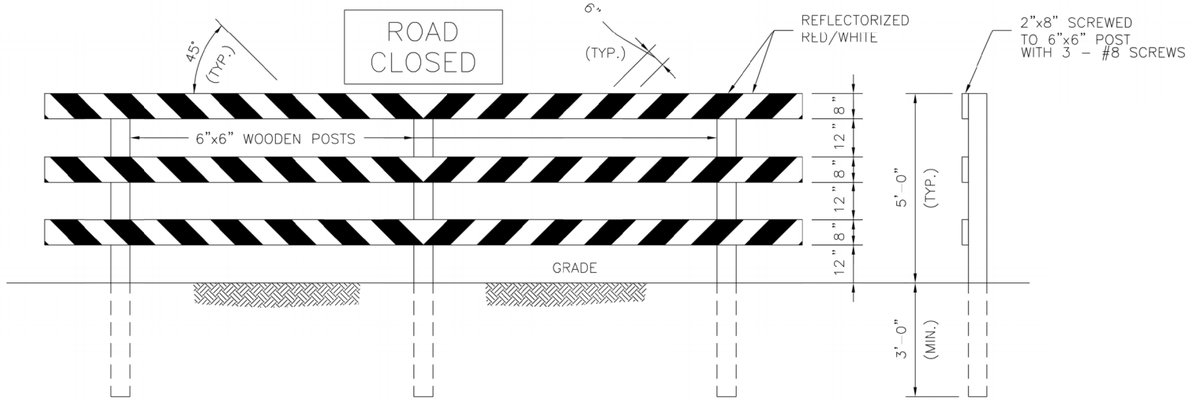
DETOUR ROUTE



FRONT VIEW

SIDE VIEW

T-INTERSECTION



FRONT VIEW

SIDE VIEW

ROAD CLOSED - NO OUTLET

APPLICATION: PERMANENT AND SEMI-PERMANENT CLOSURE OF ROADWAY OR ROADWAY TERMINATION

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

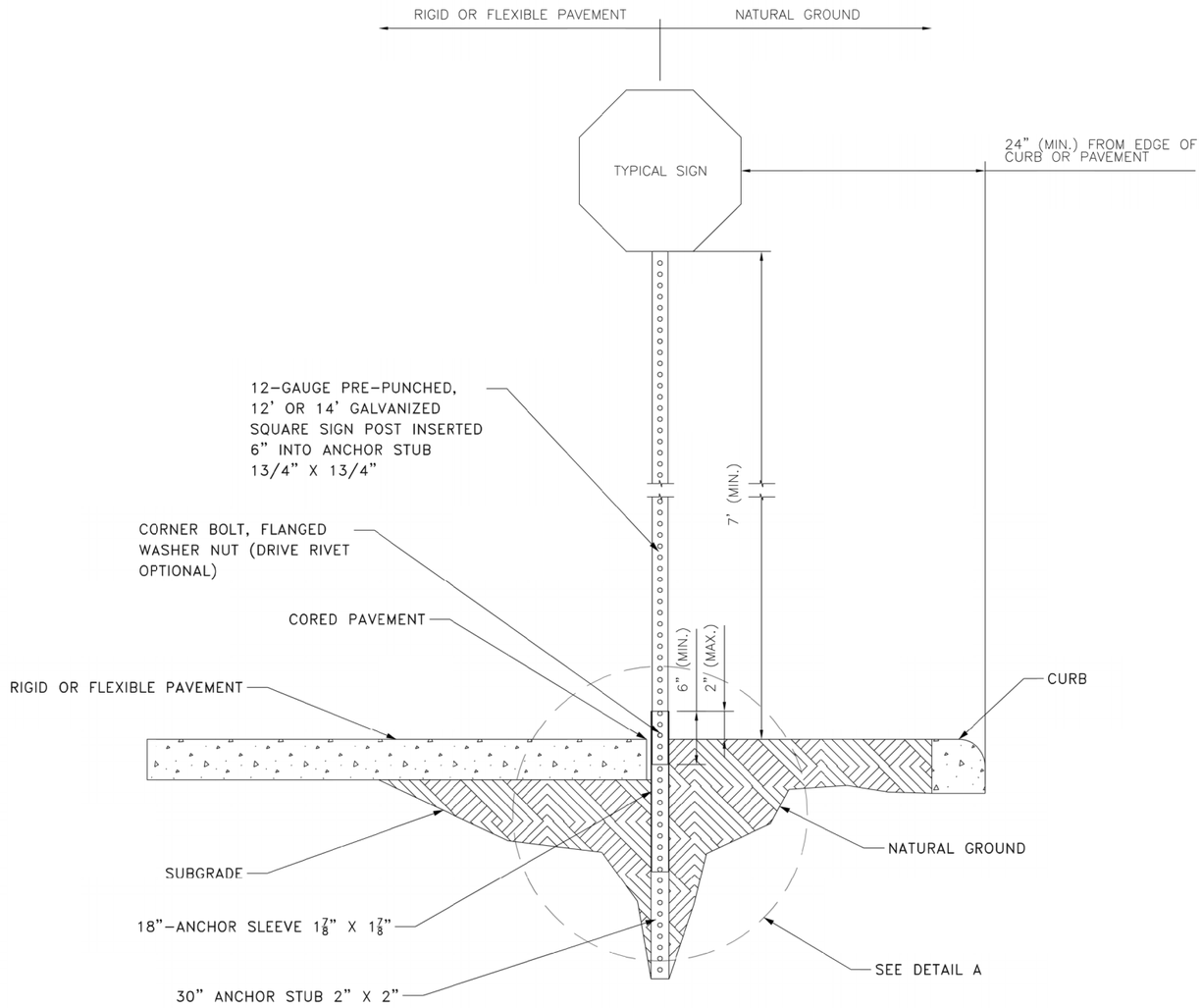
FORT BEND COUNTY TEXAS

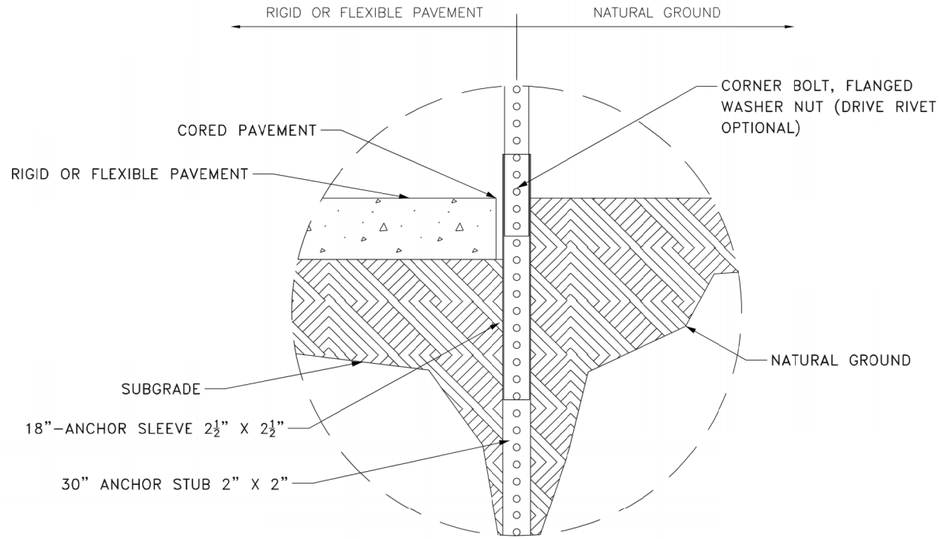
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED TYPE III BARRICADE DETAILS
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 119 / 133

X:\Engineering\2021\21060 - Stella Road\122 FBCED SWPPP DETAILS.dwg Charlie Valenzuela





TYPICAL GROUND SIGN INSTALLATION
DETAIL A

NOTES:

1. THE CROSS SECTION OF ALL MEMBERS SHALL BE SQUARE TUBE FORMED OF 12 GAUGE AND MANUFACTURED FROM HOT-GALVANIZED STEEL
2. THE TELESCOPE BREAKAWAY SYSTEM OR "SYSTEM" IS DEFINED AS FOLLOW:
   - A MINIMUM 30" ANCHOR STUB;
   - 18" ANCHOR SLEEVE.
3. DRIVE THE SYSTEM TOGETHER MAKING SURE THE HOLES ARE ALIGNED.
4. THE SYSTEM IS TO BE DRIVEN INTO NATURAL GROUND EXPOSED SUBGRADE UNTIL ONLY 1 TO 2 INCHES ARE LEFT EXPOSED.
5 ATTACH THE SIGN TO AN 1 3/4" SQUARE POST AT THE DESIRED HEIGHT, SUCH THAT IT MEETS THE MINIMUM VERTICAL CLEARANCE.
6. SIGNS ARE FASTENED TO THE POST BY USING DRIVE RIVETS OR BOLTS.
7. INSERT THE SIGN POST APPROXIMATELY 6 TO 8 INCHES INTO THE ANCHOR BASE.
8. BOLT THE SIGN POST TO THE ANCHOR ASSEMBLY WITH A CORNER BOLT.
9. WHEN INSTALLING IN RIGID OR FLEXIBLE PAVEMENT, USE A CORING MACHINE TO EXPOSE THE SUBGRADE MATERIAL AND INSTALL THE SYSTEM.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

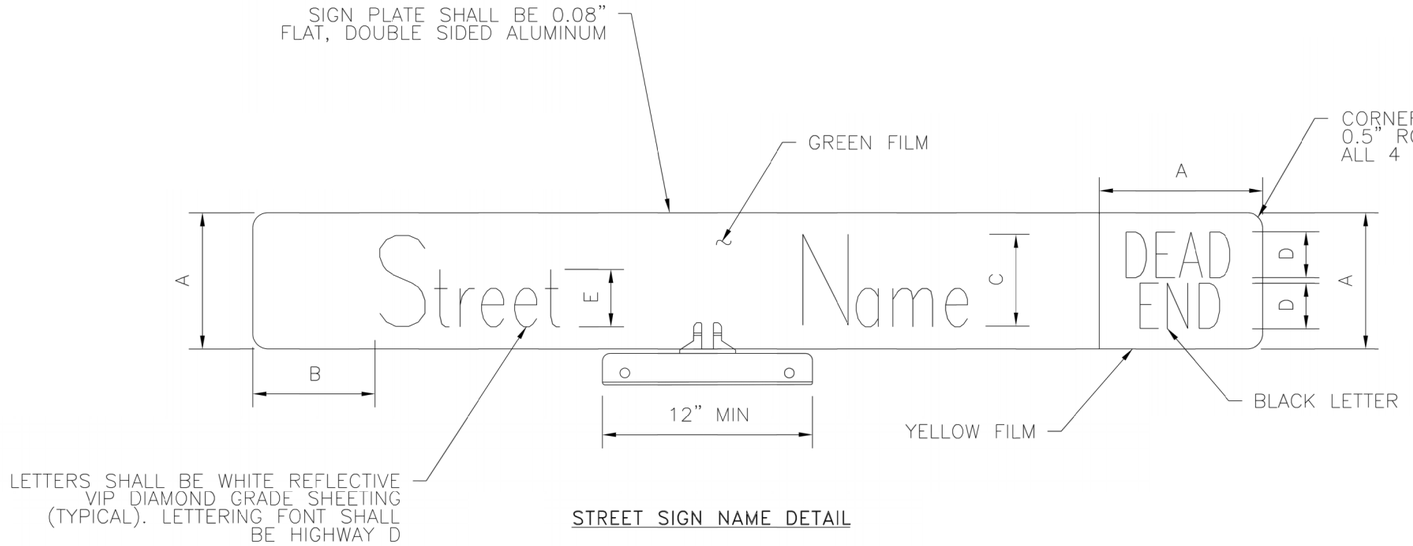
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103500
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED TYPICAL GROUND SIGN INSTALLATION
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 120 / 133

X:\Engineering\2021\21060 - Stella Road\122 FBCED SWPPP DETAILS.dwg Charlie Valenzuela



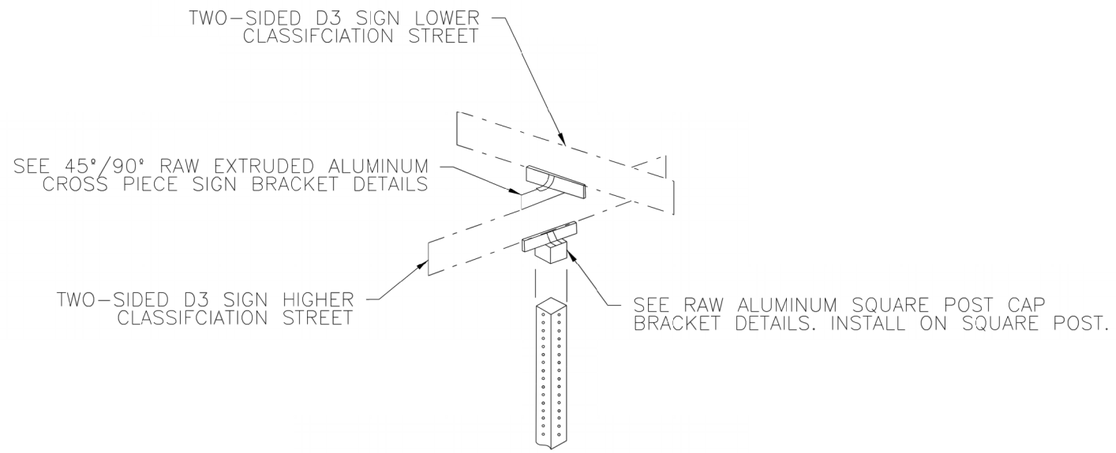
STREET SIGN NAME DETAIL

DIMENSION SCHEDULE

9" SIGN	
'A'	9"
'B'	2"
'C'	6"
'D'	3.5"
'E'	4.5"

NOTES:

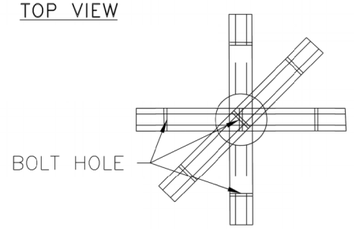
ALL STREET BLADES SHALL BE 9" IN HEIGHT



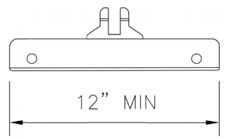
DUAL SIDED STREET SIGN DETAIL

45°/90° RAW EXTRUDED ALUMINUM CROSS PIECE SIGN BRACKET DETAILS

TOP VIEW



SIDE VIEW



RAW ALUMINUM SQUARE POST CAP BRACKET DETAILS

FRONT VIEW

SIDE VIEW

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

FORT BEND COUNTY TEXAS

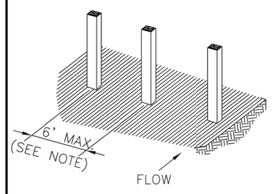
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103500
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/2/2024

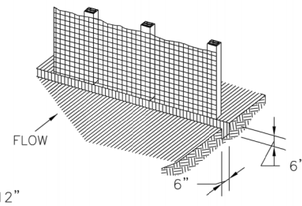
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED STREET SIGN NAME DETAILS
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 121 / 133

X:\Engineering\2021\21060 - Stella Road\122 FBCED SWPPP DETAILS.dwg Charlie Valenzuela

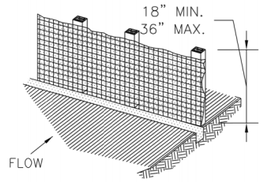
1. SET POSTS AT REQUIRED SPACING

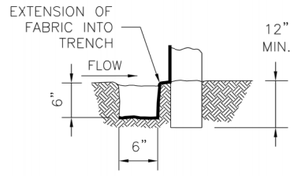


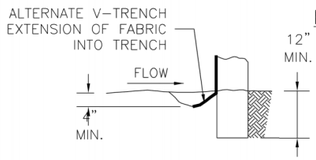
2. EXCAVATE A 6"x6" TRENCH UPSLOPE ALONG THE LINE OF POSTS AND SECURE WIRE FENCE TO POSTS.



3. ATTACH FILTER FABRIC TO POSTS AND EXTEND IT INTO THE TRENCH. BACKFILL AND COMPACT THE EXCAVATED SOIL.





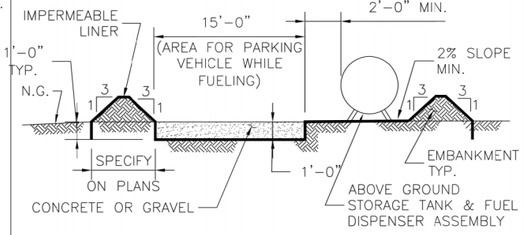


REINFORCED FILTER FABRIC BARRIER

RFB
SYMBOL

GENERAL NOTES:

1. SECURELY FASTEN MESH FENCING TO POSTS WITH STAPLES OR TIE WIRES.
2. SECURELY FASTEN FILTER FABRIC TO MESH FENCING.
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, OVERLAP 6 INCHES AT A POST, FOLD TOGETHER, AND ATTACH TO A POST.
4. REMOVE SEDIMENT DEPOSITS WHEN SILT REACHES ONE-THIRD OF THE HEIGHT OF THE FENCE IN DEPTH.
5. SILT FENCE MINIMUM 2' BEHIND CURB.

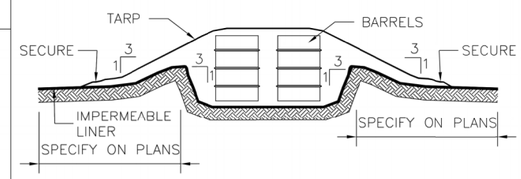


ABOVE GROUND TEMP. VEHICLE & EQUIPMENT FUELING AREA WITH TANK

TFA
SYMBOL

GENERAL NOTES:

1. THE SIZE OF TANK FOUNDATION AREA DEPENDS ON THE SIZE OF ABOVE GROUND STORAGE TANK AND DISPENSER ASSEMBLY.
2. PROVIDE A MINIMUM SLOPE OF 2 % TOWARD THE SUMP PIT.
3. INSTALL IMPERMEABLE LINER AS PER MANUFACTURER'S RECOMMENDATIONS.

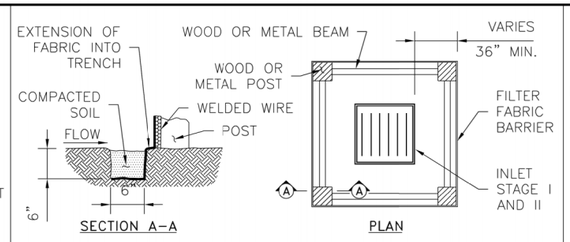


BARREL STORAGE AREA

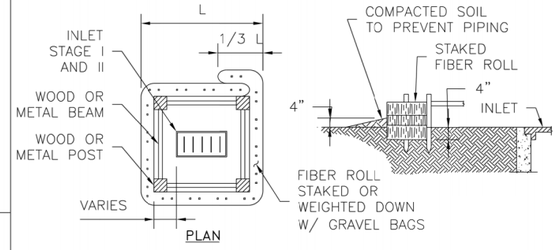
BSA
SYMBOL

GENERAL NOTES:

1. ALTERNATIVELY, STORE BARRELS IN AN ENCLOSED BUILDING OR SHED.
2. INSTALL IMPERMEABLE LINER AS PER MANUFACTURER'S RECOMMENDATIONS. 60 mil MINIMUM.
3. CONSTRUCT BERMED AREA WITH VOLUME GREATER THAN OR EQUAL TO 110% VOLUME OF BARRELS.



INLET PROTECTION BARRIER WITH REINFORCED FILTER FABRIC



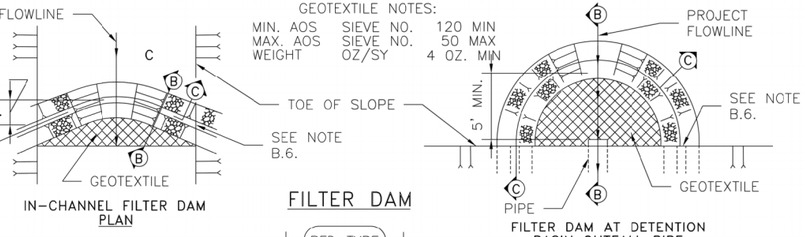
INLET PROTECTION BARRIER WITH FILTER ROLLS

GENERAL NOTES:

1. FIBER ROLLS WILL BE UTILIZED ONLY WHEN SITE CONDITIONS DO NOT PERMIT THE USE OF FILTER FABRIC BARRIER, AND AS APPROVED BY THE ENGINEER.

INLET PROTECTION BARRIERS FOR STAGE I INLETS

IPB
SYMBOL



IN-CHANNEL FILTER DAM
PLAN

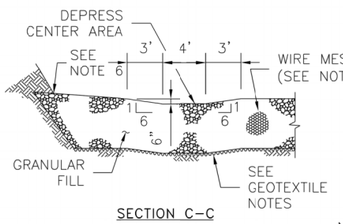
GEOTEXTILE NOTES:

MIN. AOS	SIEVE NO.	120 MIN
MAX. AOS	SIEVE NO.	50 MAX
WEIGHT	OZ/SY	4 OZ. MIN

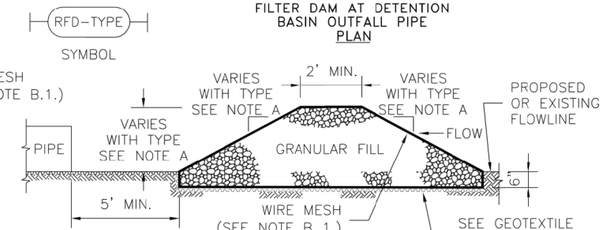
FILTER DAM AT DETENTION BASIN OUTFALL PIPE
PLAN

FILTER DAM

RFD-TYPE
SYMBOL



SECTION C-C



NOTE: ONLY APPLIES FOR DETENTION BASIN OUTFALL PIPE PROTECTION.

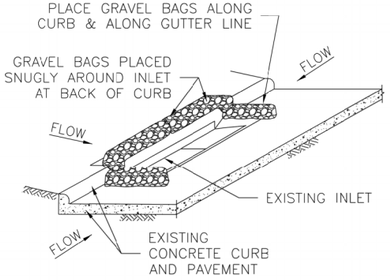
SECTION B-B

A. TYPES OF FILTER DAMS

1. TYPE 1 (NON-REINFORCED)
   a. HEIGHT - 18-24 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
   b. TOP WIDTH - 2 FEET (MINIMUM)
   c. SLOPES - 2:1 (MAXIMUM).
2. TYPE 2 (REINFORCED).
   a. HEIGHT - 18-36 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
   b. TOP WIDTH - 2 FEET (MINIMUM).
   c. SLOPES - 2:1 (MAXIMUM).
3. TYPE 3 (REINFORCED)
   a. HEIGHT - 36-48 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
   b. TOP WIDTH - 2 FEET (MINIMUM).
   c. SLOPES - 3:1 (MAXIMUM).
4. TYPE 4 (GABION)
   a. HEIGHT - 30 INCHES (MINIMUM). MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
   b. TOP WIDTH - 2 FEET (MINIMUM).
5. TYPE 5. AS SHOWN ON THE PLANS.

B. CONSTRUCT FILTER DAMS ACCORDING TO THE FOLLOWING CRITERIA UNLESS SHOWN OTHERWISE ON THE PLANS.

1. TYPE 2 AND 3 FILTER DAMS: SECURE WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1 INCH DIAMETER HEXAGONAL OPENINGS.
2. PLACE GRANULAR FILL ON THE WIRE MESH TO HEIGHT AND SLOPES SHOWN ON PLANS OR AS SPECIFIED BY THE ENGINEER.
   a. 3-5 INCHES FOR ROCK FILTER DAM TYPES 1, 2 AND 4.
   b. 4-8 INCHES FOR ROCK FILTER DAM TYPE REFER TO GRANULAR FILL IN SPECIFICATION SECTION No. 02378 RIPRAP AND GRANULAR FILL.
3. FOLD WIRE MESH AT UPSTREAM SIDE OVER GRANULAR FILL AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS.
4. IN STREAMS: SECURE OR STAKE MESH TO STREAM BED PRIOR TO AGGREGATE PLACEMENT.
5. SEE HCFCD SPECIFICATION SECTION NO. 02364-FILTER DAMS.
6. EMBED ONE FOOT MINIMUM INTO SLOPE AND RAISE ONE FOOT HIGHER THAN CENTER OF DEPRESSED AREA AT SLOPE.

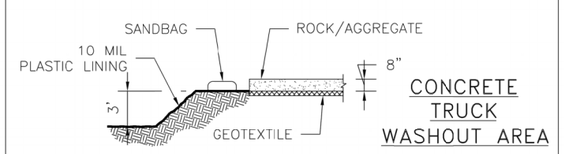


INLET PROTECTION BARRIERS FOR STAGE II INLETS

IPB-II
SYMBOL

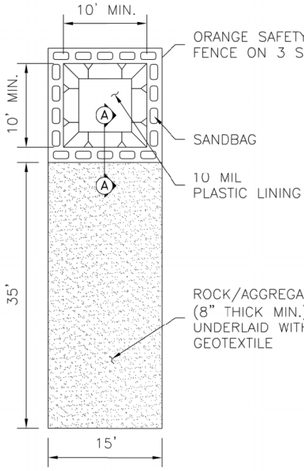
GENERAL NOTES:

1. REMOVE SEDIMENT DEPOSIT WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-THIRD THE HEIGHT OF THE BARRIER.
2. GRAVEL BAGS SHALL NOT BLOCK THROAT OF INLET UNLESS DIRECTED BY ENGINEER.



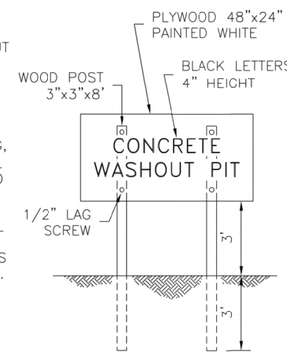
CONCRETE TRUCK WASHOUT AREA

CTW
SYMBOL

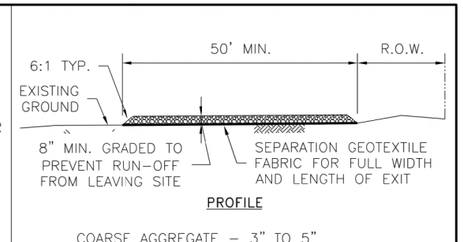


GENERAL NOTES:

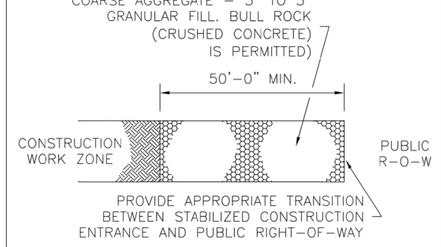
1. POST A SIGN READING "CONCRETE WASHOUT PIT" NEXT TO THE PIT.
2. VERBALLY INSTRUCT THE CONCRETE TRUCK DRIVERS WHERE THE PIT IS AND TO WASHOUT THEIR TRUCKS IN THE PIT AND NOWHERE ELSE.
3. UPON THE CONCRETE SETTING UP (CURING, DRYING OUT), THE CONCRETE WASTE SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF PROPERLY BY THE CONTRACTOR. AFTER REMOVAL OF THE CONCRETE WASTE, THE WASHOUT PIT SHALL BE FILLED WITH CLEAN FILL MATERIAL AND COMPACTED TO IN-SITU CONDITIONS, OR AS DIRECTED BY THE PROJECT SPECIFICATIONS.
4. CONCRETE WASHOUT PITS SHALL NOT BE LOCATED DIRECTLY ADJACENT TO, NOR AT ANY TIME DRAIN INTO THE STORM SEWER SYSTEM OR ANY OTHER SWALE, DITCH, OR WATERWAY.
5. CONSTRUCT ENTRY ROAD AND BOTTOM OF WASHOUT AREA TO SUPPORT EXPECTED LOADINGS FROM TRUCKS EQUIPMENT.



SIGN DETAIL
(OR EQUIVALENT)



PROFILE



PLAN

STABILIZED CONSTRUCTION ACCESS

SC-1
SYMBOL

GENERAL NOTES:

1. MINIMUM LENGTH IS AS SHOWN ON CONSTRUCTION DRAWINGS OR 50 FEET, WHICHEVER IS MORE.
2. CONSTRUCT AND MAINTAIN CONSTRUCTION EXIT WITH CONSTANT WIDTH ACROSS ITS LENGTH, INCLUDING ALL POINTS OF INGRESS OR EGRESS.
3. UNLESS SHOWN ON THE CONSTRUCTION DRAWINGS, STABILIZATION FOR OTHER AREAS WILL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION EXIT.
4. WHEN SHOWN ON THE CONSTRUCTION DRAWINGS, WIDEN OR LENGTHEN STABILIZED AREA TO ACCOMMODATE A TRUCK WASHING AREA. PROVIDE OUTLET SEDIMENT TRAP FOR THE TRUCK WASHING AREA.
5. PROVIDE PERIODIC TOP DRESSING WITH ADDITIONAL COARSE AGGREGATE TO MAINTAIN THE REQUIRED DEPTH OR WHEN SURFACE BECOMES PACKED WITH MUD.
6. PERIODICALLY TURN AGGREGATE TO EXPOSE A CLEAN DRIVING SURFACE.
7. MINIMUM 14' WIDTH FOR ONE WAY TRAFFIC AND 20' WIDTH FOR TWO WAY TRAFFIC.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

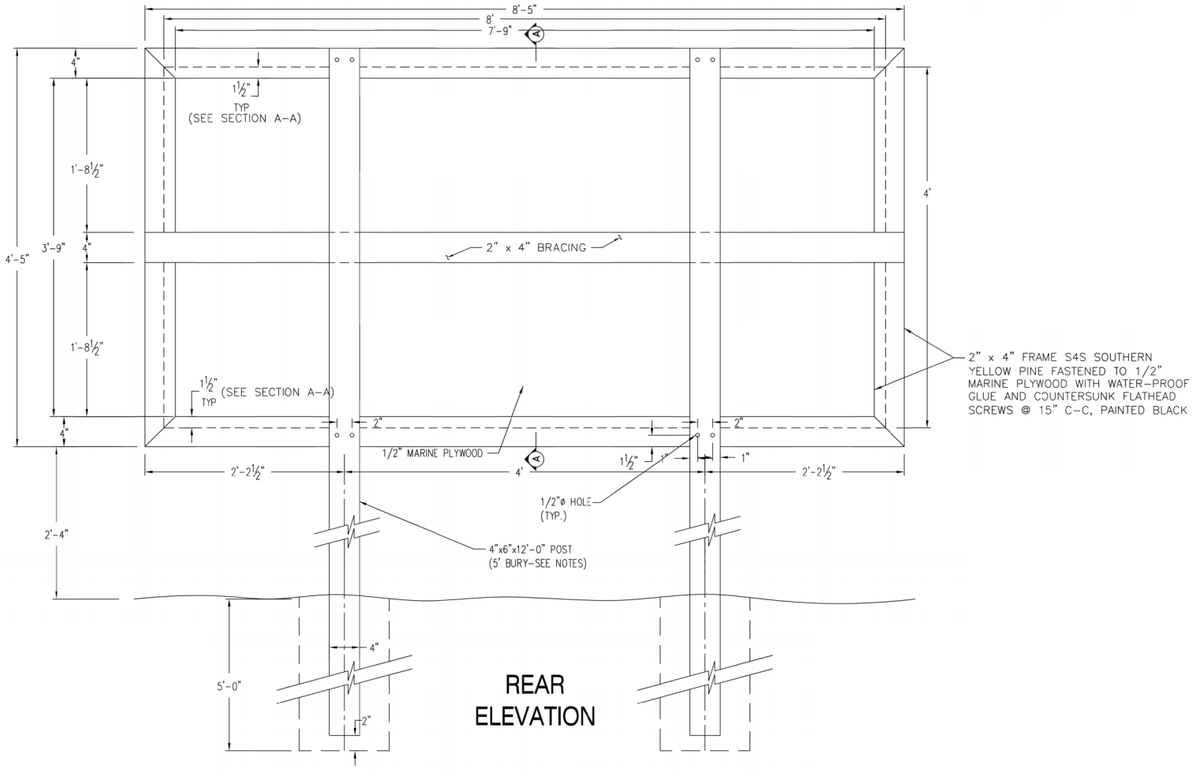
FORT BEND COUNTY TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103500
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

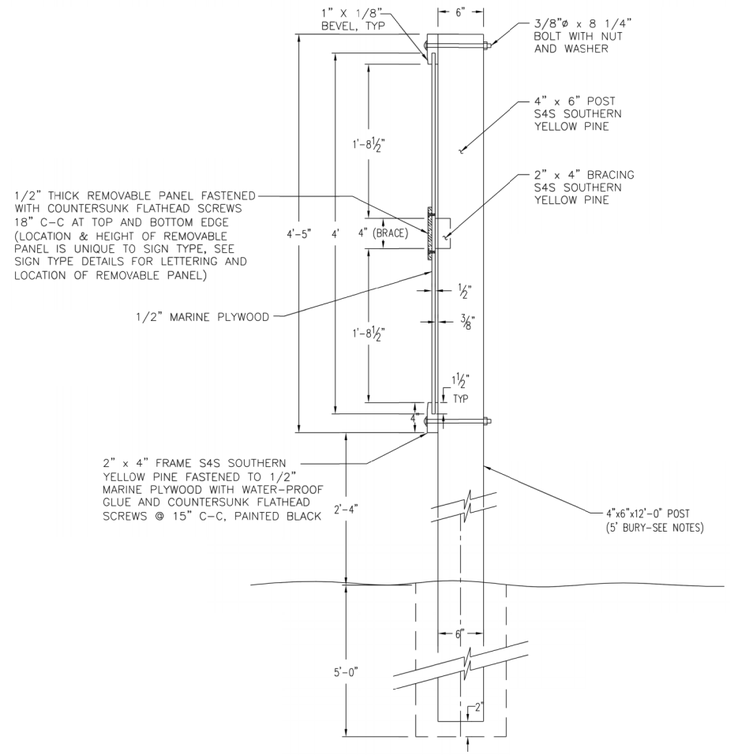
STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED SWPPP DETAILS
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 122 / 133

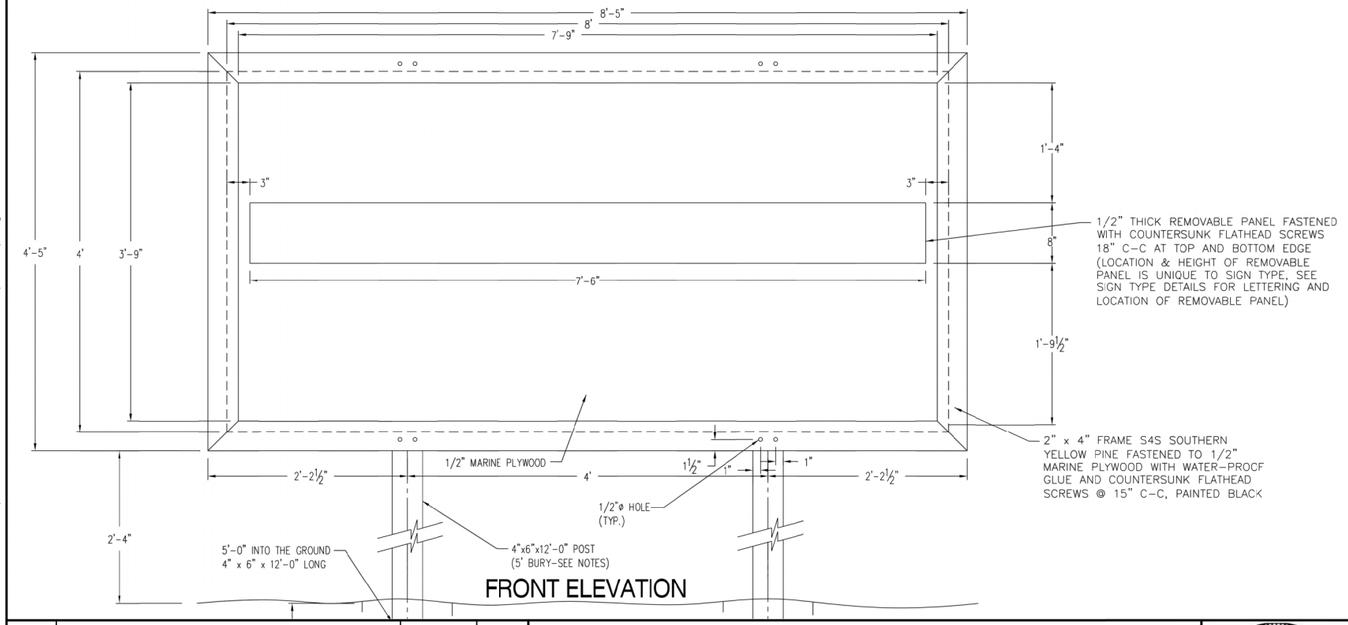
X:\Engineering\2021\21060 - Stella Road\122 FBCED SWPPP DETAILS.dwg Charlie Valenzuela



REAR ELEVATION



SECTION A-A



FRONT ELEVATION

GENERAL NOTES:

1. THE SIGN SHALL HAVE BLACK LETTERS WITH WHITE BACKGROUND.
2. ALL LETTERING SHALL BE EITHER AERIAL FONT OR HELVETICA FONT.
3. SIGN SHALL BE MOUNTED ON 4" x 6" POSTS AND LOCATED BY THE ENGINEER.
4. REMOVABLE PANEL SHALL BE 1/2" MARINE PLYWOOD.
5. ALL BOLTS, SCREWS, NAILS, NUTS AND WASHERS SHALL BE GALVANIZED OR CADMIUM PLATED.
6. 4" x 6" POST SHALL BE WOLMANIZED OR PENTACHLOROPHENOL TREATED.
7. ALL WOOD SURFACES SHALL HAVE PRIME COAT AND TWO (2) COATS OF SHERWIN-WILLIAMS KEM-LUSTRA ENAMEL OR EQUAL.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

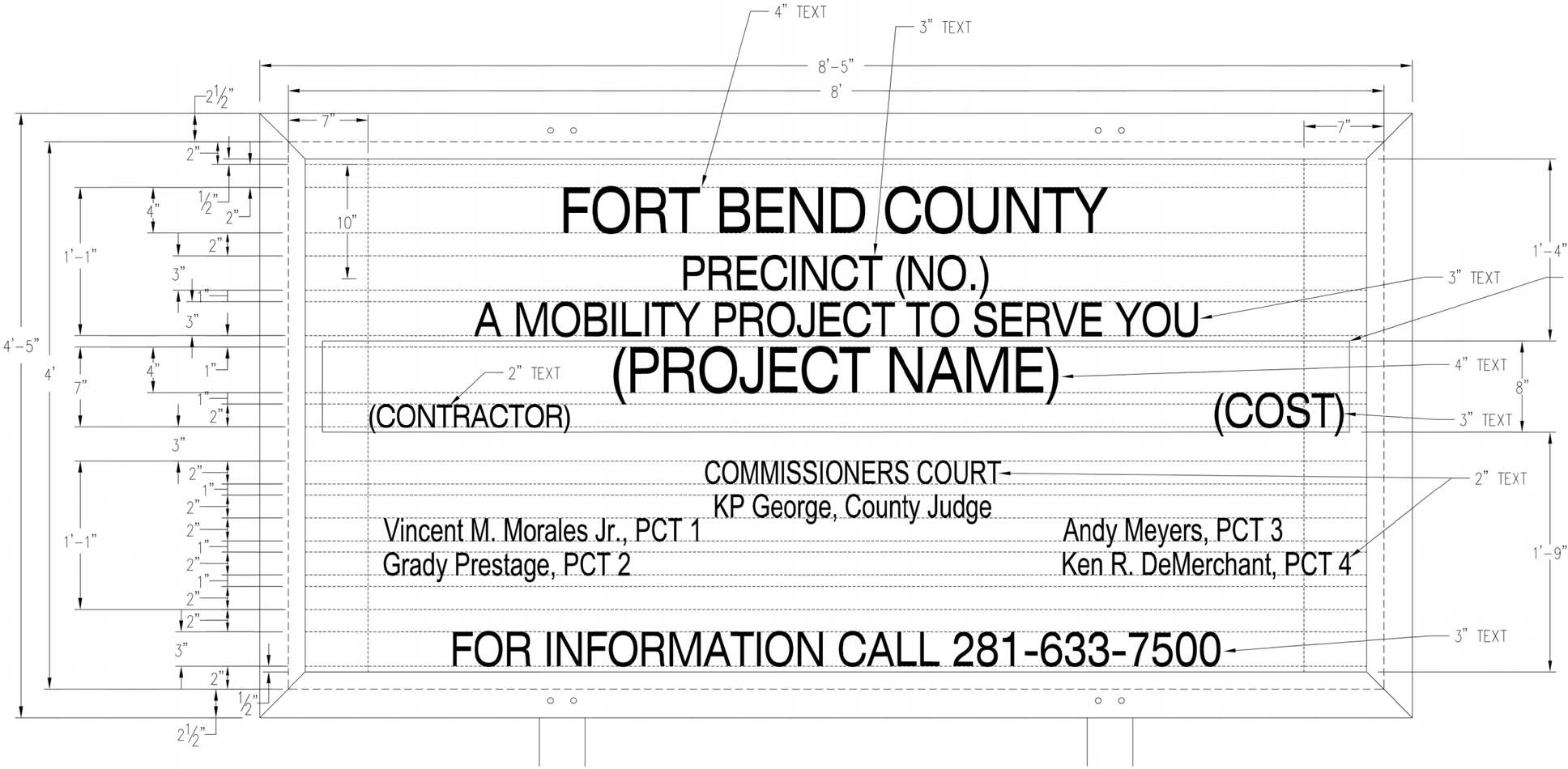
FORT BEND COUNTY TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103500
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER · 7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBCED PROJECT SIGN DETAILS (1 OF 2)
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 123 / 133

X:\Engineering\2021\21060 – Stella Road\123 FBCED PROJECT SIGN DETAILS (1 OF 2).dwg Charlie Valerzuela



NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	3-1-22	RJS

FORT BEND COUNTY
TEXAS

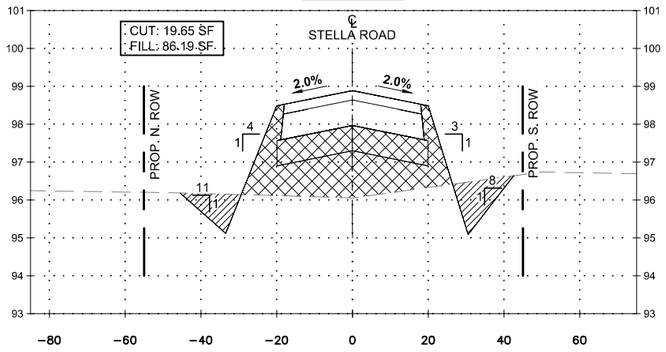
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

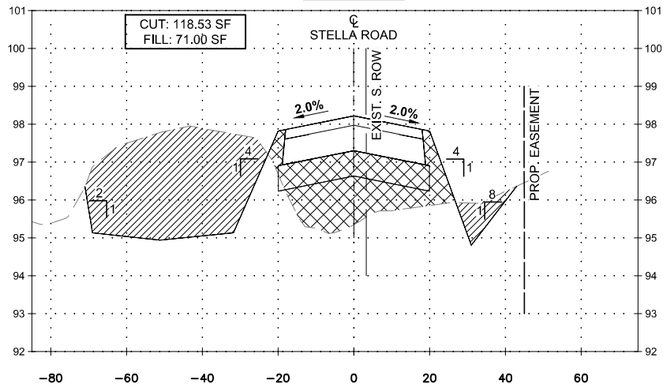
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: FBECD PROJECT SIGN DETAILS (2 OF 2)
SCALE: 1" = 40'	
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 124 / 133

X:\Engineering\2021\21060 - Stella Road\124 FBECD PROJECT SIGN DETAILS (2 OF 2).dwg Charlie Valenzuela

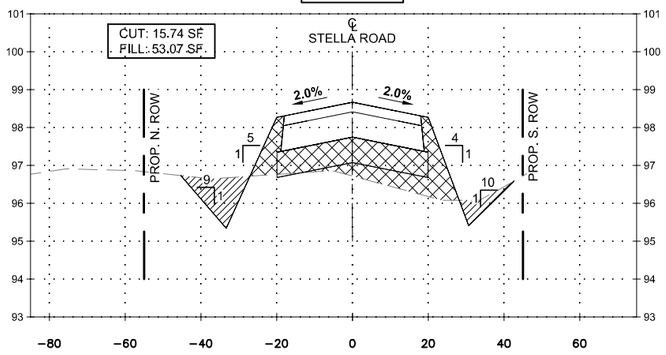
2+00.00



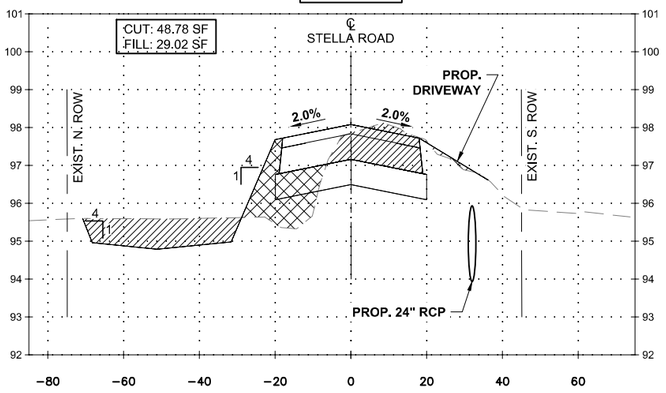
5+00.00



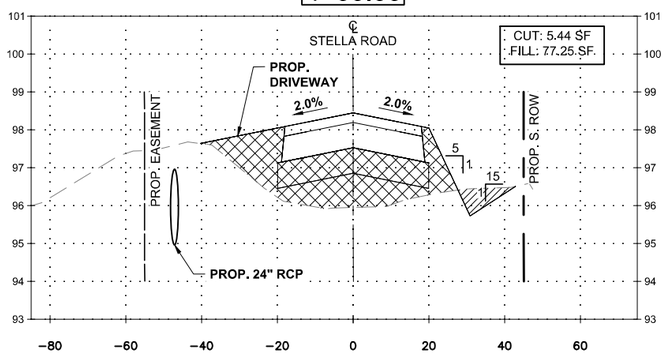
3+00.00



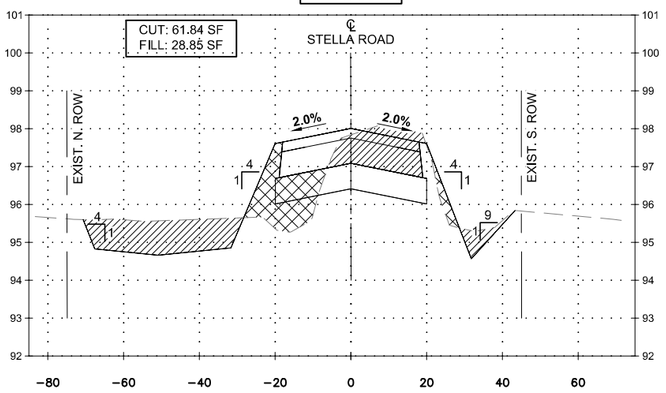
6+00.00



4+00.00



7+00.00



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

FILL

CUT

NOTES:

1) ALL EXISTING UTILITIES ARE SHOWN APPROXIMATELY IN BOTH VERTICAL AND HORIZONTAL LOCATION. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITIES PRIOR TO CONSTRUCTION.

2) REGRADE FILLED DITCHES AND DEMOLISHED ROAD AREA TOWARDS STELLA ROAD PROP ROADSIDE SWALES.

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

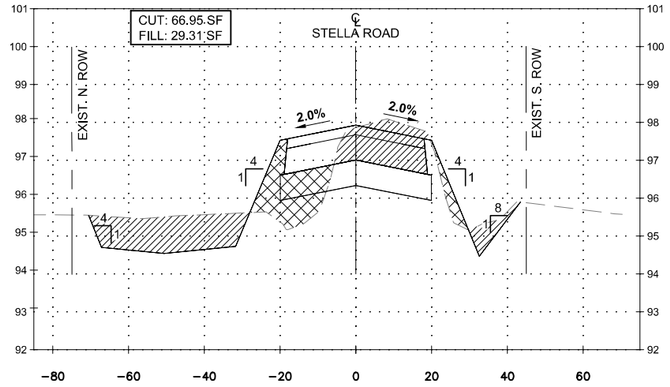
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

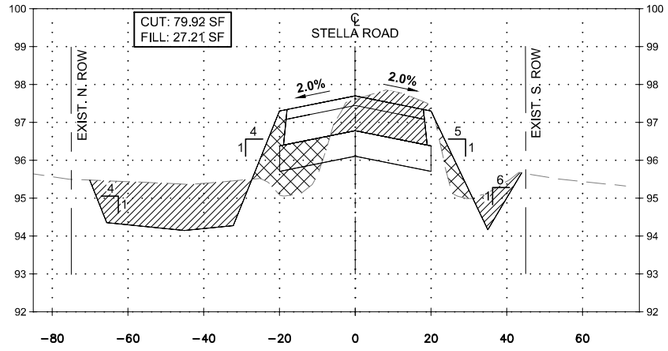
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: CROSS SECTIONS
SCALE: 1" = 20'	2+00 TO 7+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 125 / 133

X:\Engineering\2021\21060 - Stella Road\125 CROSS SECTIONS 2+00 TO 7+00.dwg Charlie Valenzuela

8+00.00



11+00.00



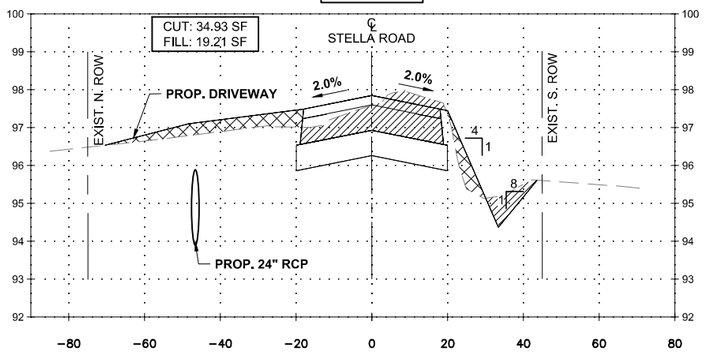
SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

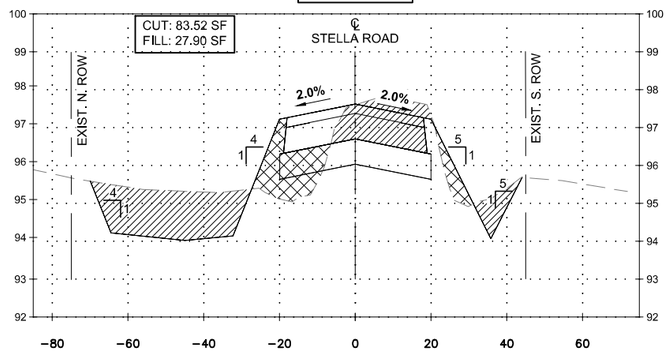
4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

9+00.00



12+00.00

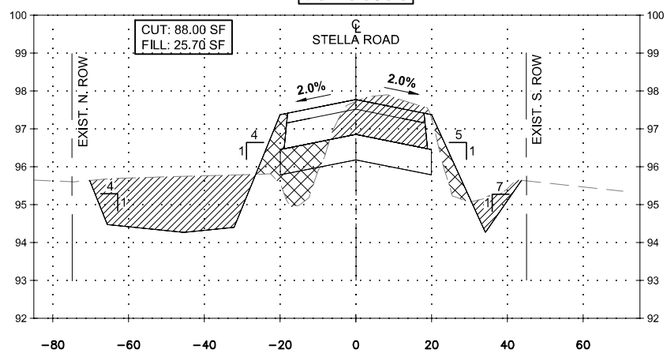


LEGEND

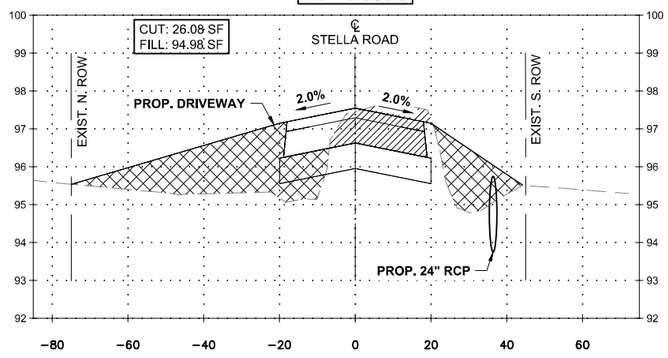
FILL

CUT

10+00.00



13+00.00



X:\Engineering\2021\21060 – Stella Road\126 CROSS SECTIONS 8+00 TO 13+00.dwg Charlie Valenzuela

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

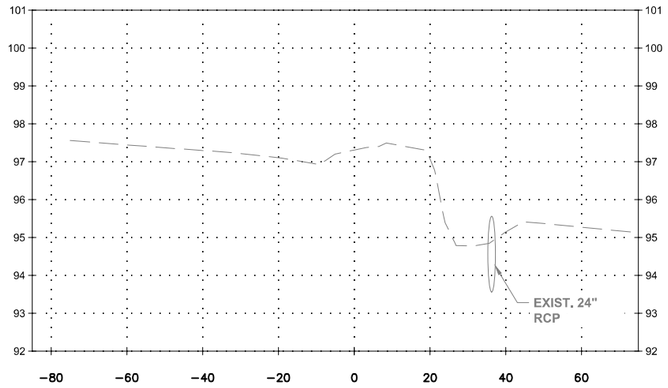
FORT BEND COUNTY
TEXAS

McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

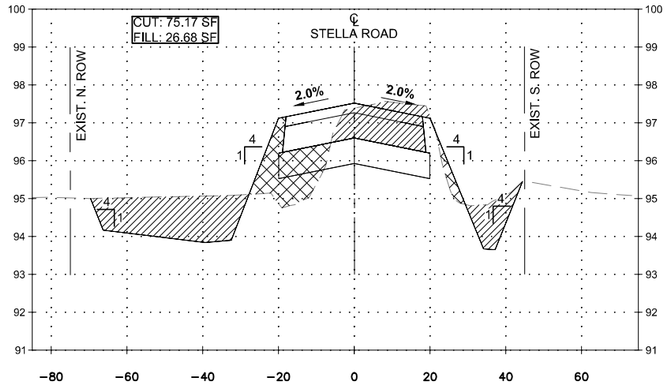
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: CROSS SECTIONS
SCALE: 1" = 40'	8+00 TO 13+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 126 / 133

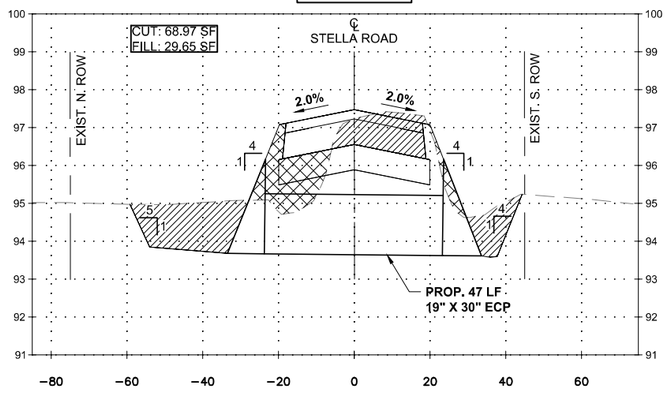
14+00.00



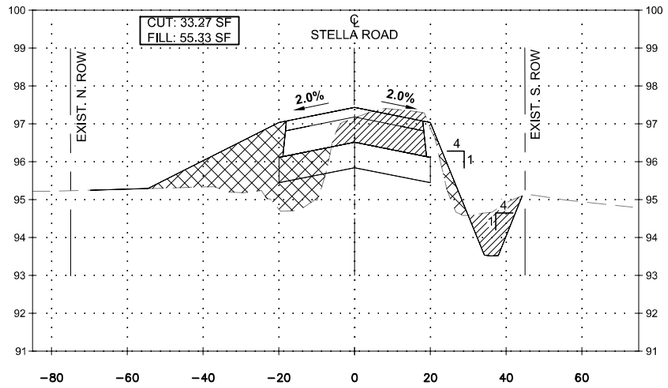
15+00.00



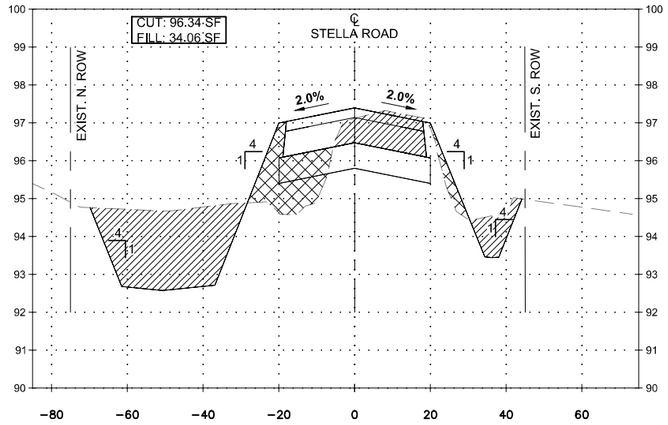
16+00.00



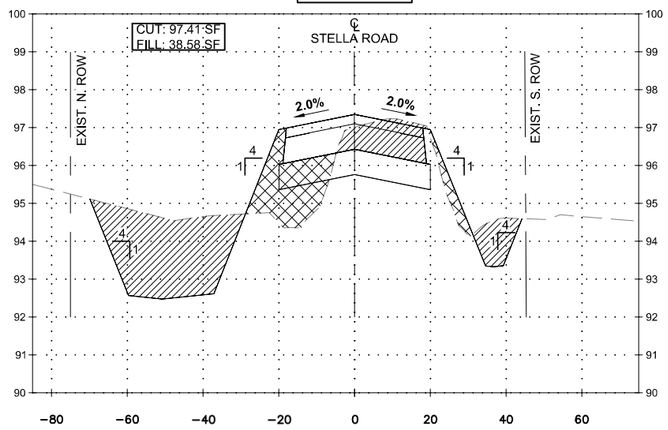
17+00.00



18+00.00



19+00.00



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

FILL

CUT

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

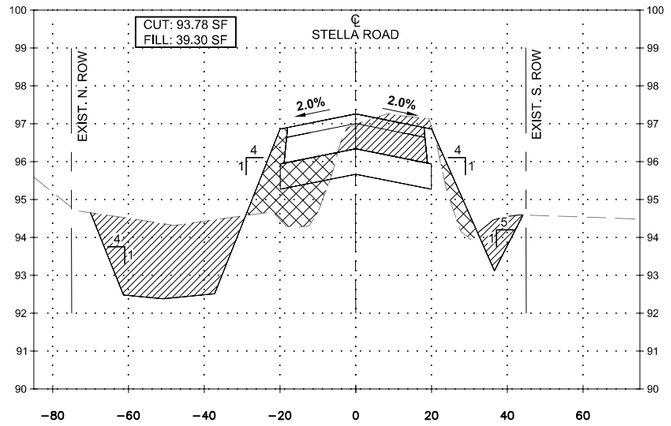
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/2/2024

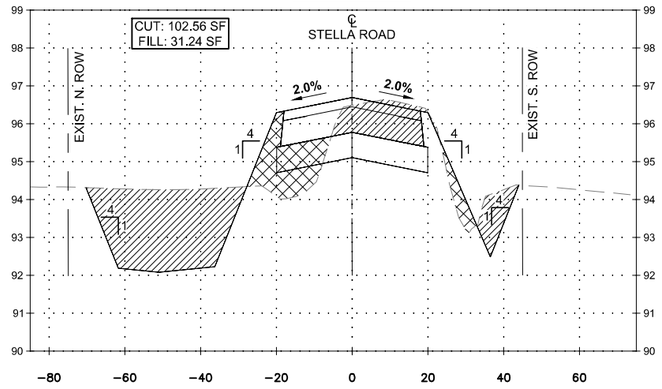
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: CROSS SECTIONS
SCALE: 1" = 40'	14+00 TO 19+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 127 / 133

X:\Engineering\2021\21060 – Stella Road\127 CROSS SECTIONS 14+00 TO 19+00.dwg Charlie Valenzuela

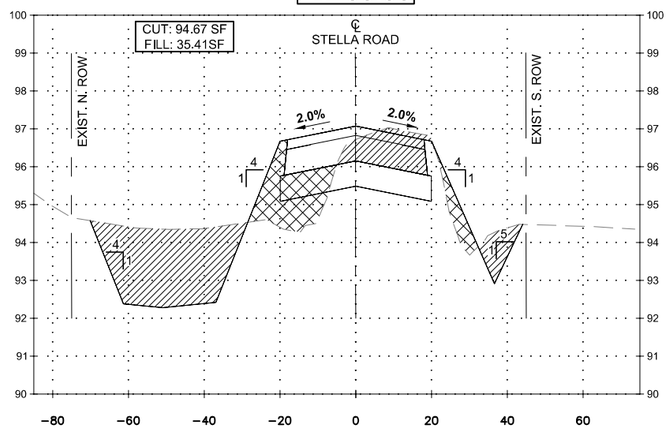
20+00.00



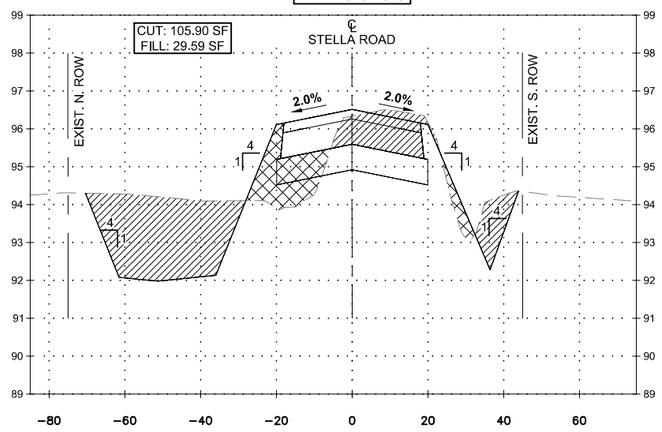
23+00.00



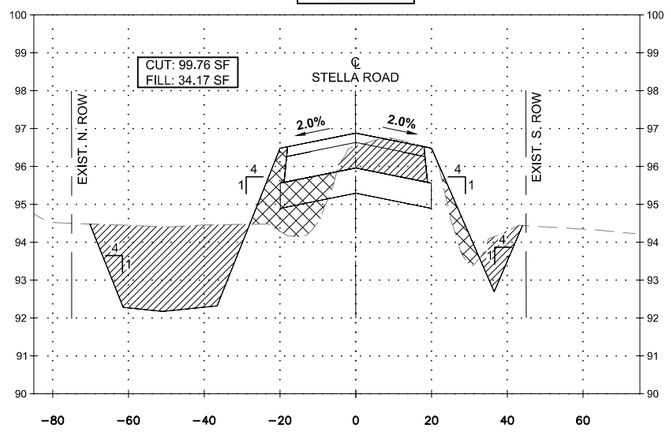
21+00.00



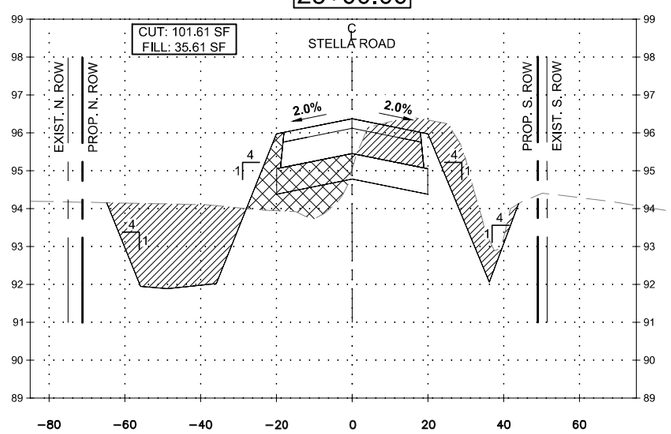
24+00.00



22+00.00



25+00.00



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

FILL

CUT

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

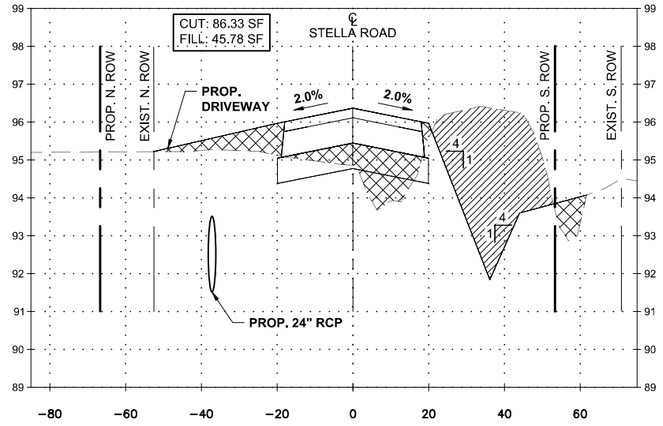
McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS · AUSTIN P. MCLEAN · 132535 · LICENSED PROFESSIONAL ENGINEER
7/3/2024

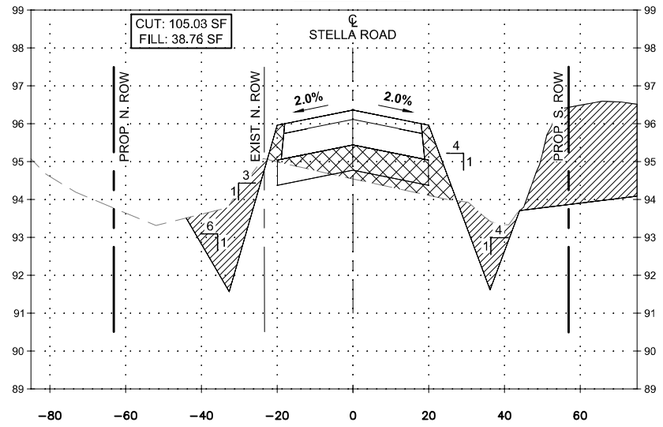
PROJECT TITLE:	STELLA ROAD		
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.		
CK'D BY: AM	SHEET DESCRIPTION: CROSS SECTIONS		
SCALE: 1" = 40'	20+00 TO 25+00	SHEET NO:	128 / 133
DATE: 1/16/2023	APPROVED BY:		

X:\Engineering\2021\21060 - Stella Road\128 CROSS SECTIONS 20+00 TO 25+00.dwg Charlie Valenzuela

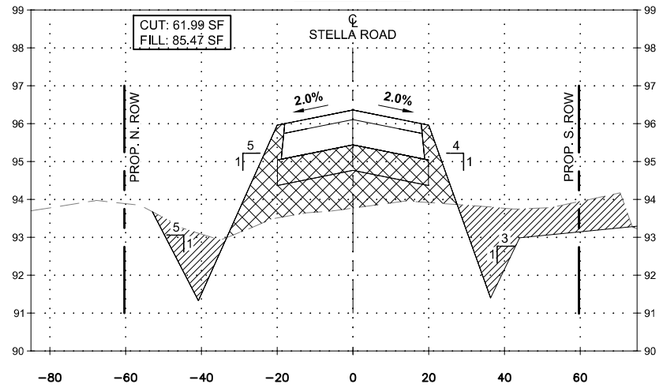
26+00.00



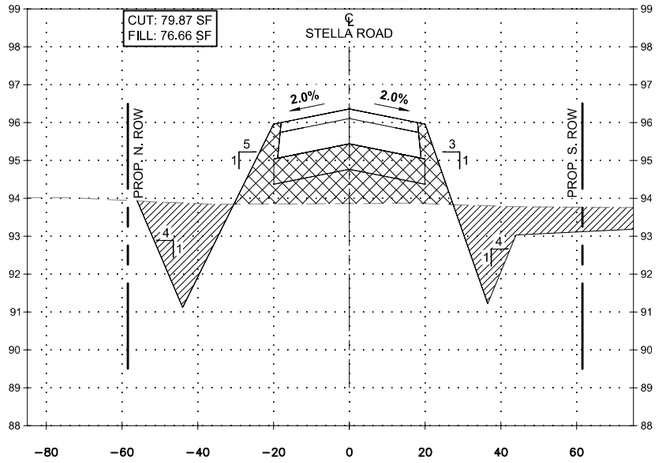
27+00.00



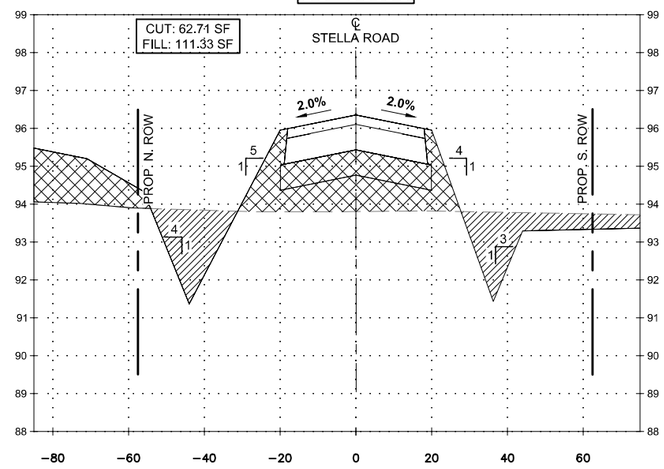
28+00.00



29+00.00



30+00.00



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

FILL

CUT

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

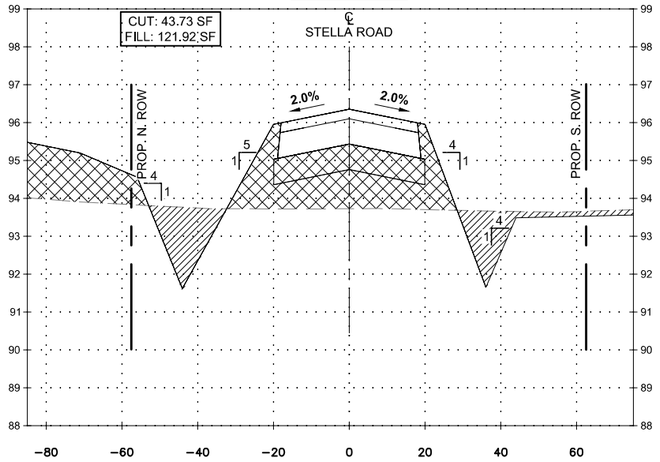
McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

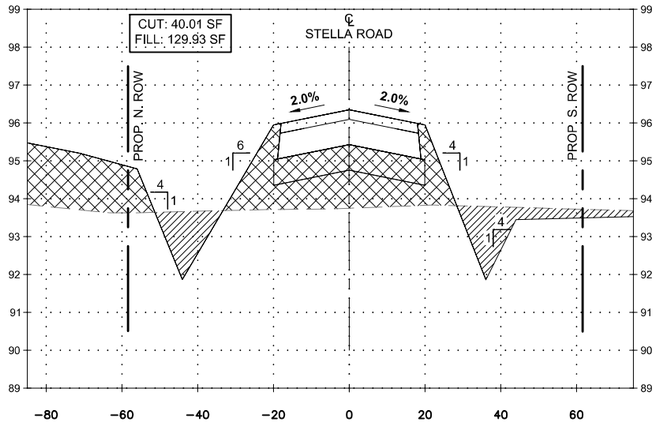
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: CROSS SECTIONS
SCALE: 1" = 40'	26+00 TO 31+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 129 / 133

X:\Engineering\2021\21060 - Stella Road\129 CROSS SECTIONS 26+00 TO 31+00.dwg Charlie Valenzuela

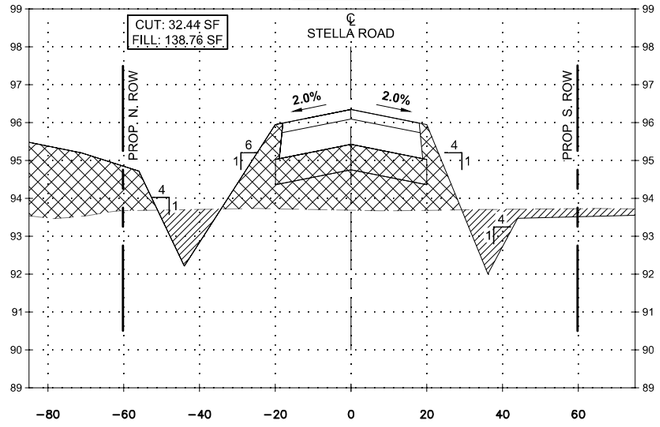
31+00.00



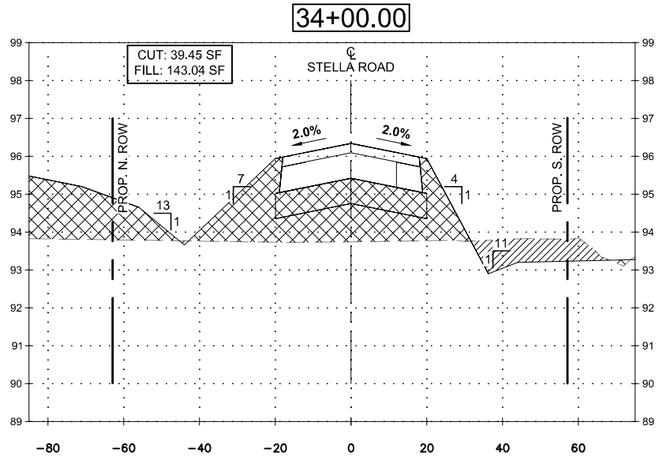
32+00.00



33+00.00



34+00.00



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

FILL

CUT

X:\Engineering\2021\21060 – Stella Road\130 CROSS SECTIONS 32+00 TO 35+00.dwg Charlie Valenzuela

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

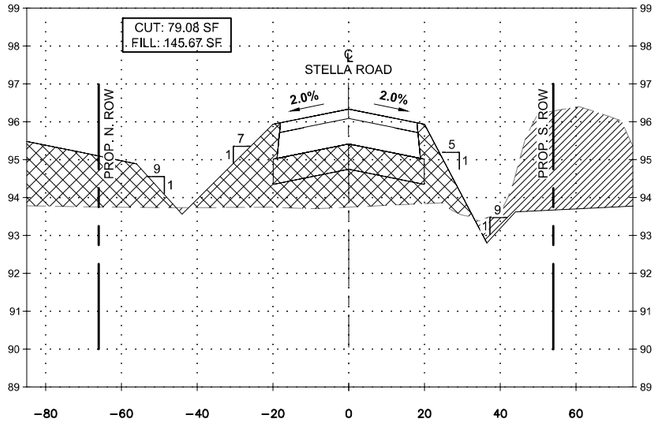
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

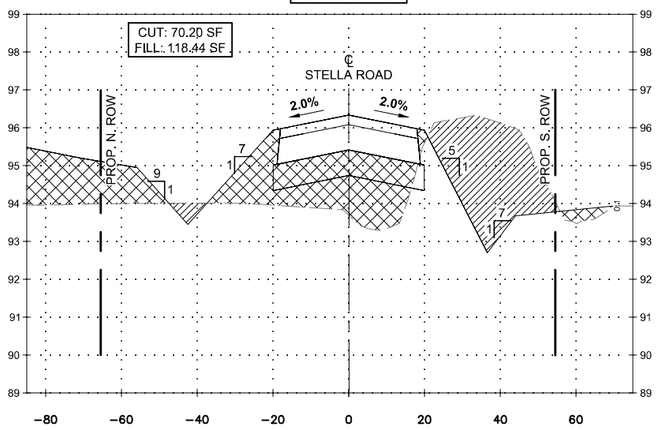
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: CROSS SECTIONS
SCALE: 1" = 40'	32+00 TO 35+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 130 / 133

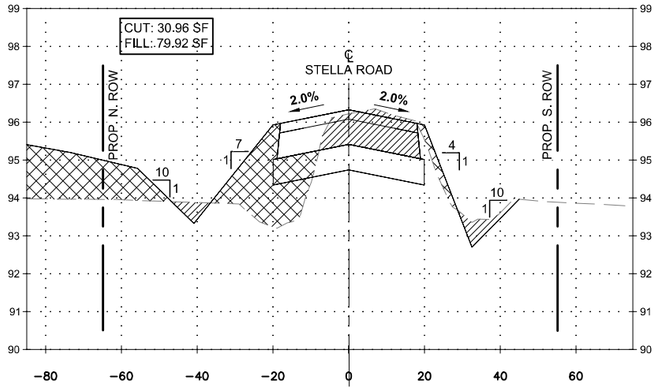
35+00.00



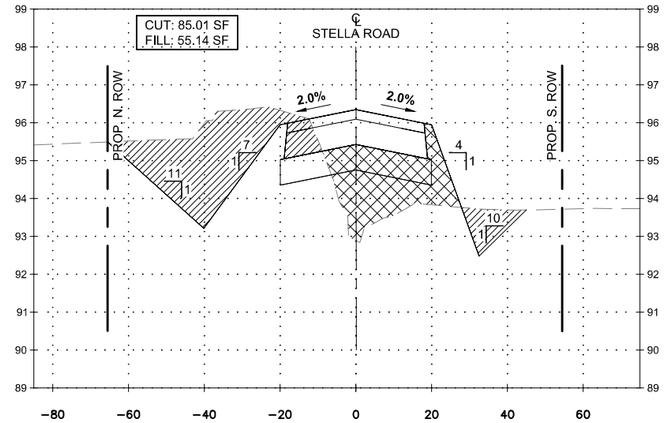
36+00.00



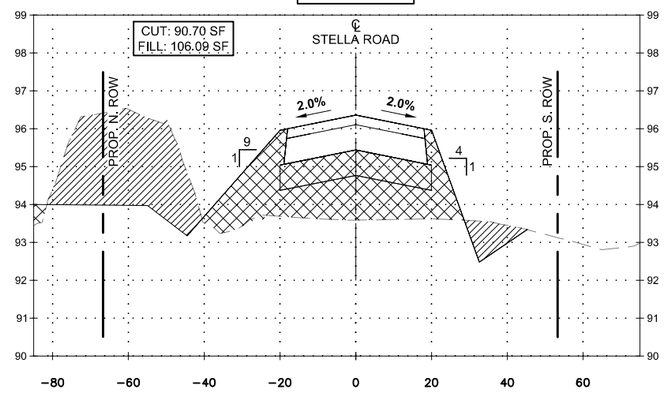
37+00.00



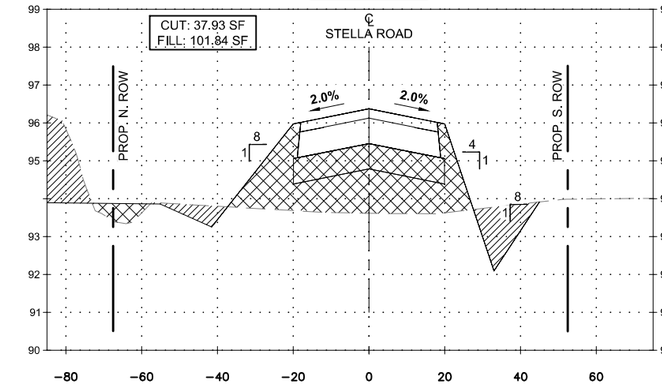
38+00.00



39+00.00



40+00.00



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

FILL

CUT

X:\Engineering\2021\21060 - Stella Road\131 CROSS SECTIONS 36+00 TO 41+00.dwg Charlie Valenzuela

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

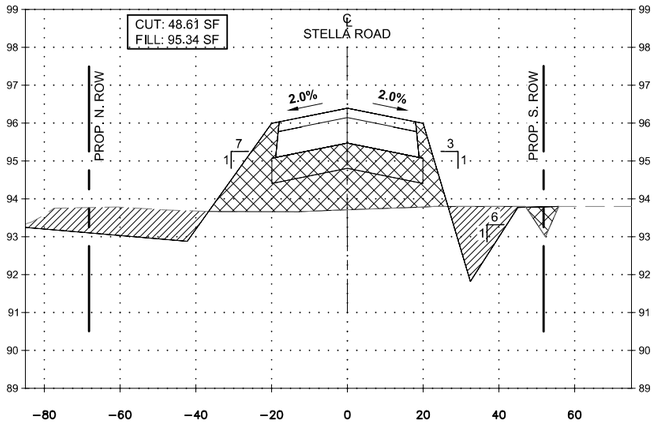
FORT BEND COUNTY
TEXAS

McDONOUGH
Civil Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

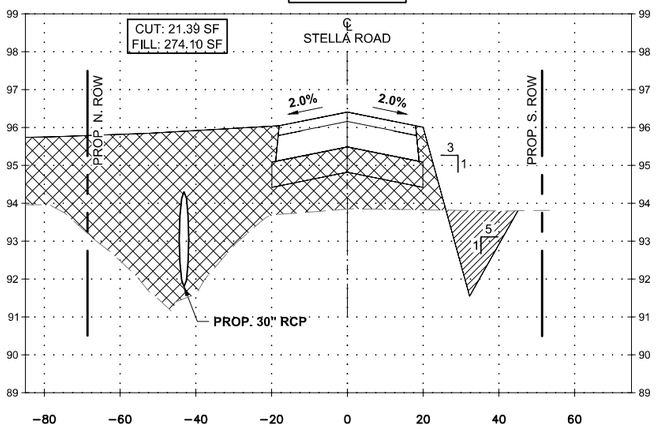
STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/3/2024

PROJECT TITLE:	STELLA ROAD	
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.	
CK'D BY: AM	SHEET DESCRIPTION: CROSS SECTIONS	
SCALE: 1" = 40'	36+00 TO 41+00	SHEET NO: 131 / 133
DATE: 1/16/2023	APPROVED BY:	

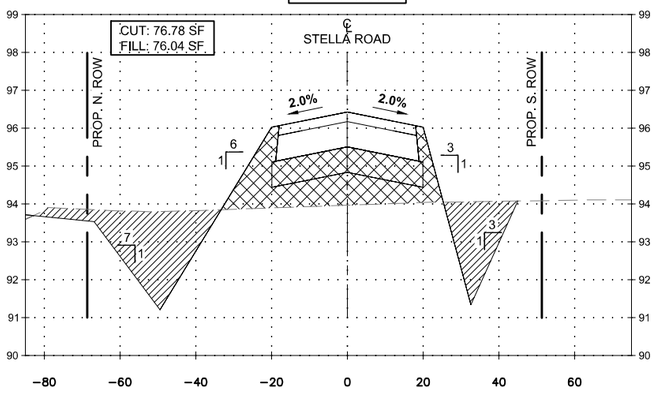
41+00.00



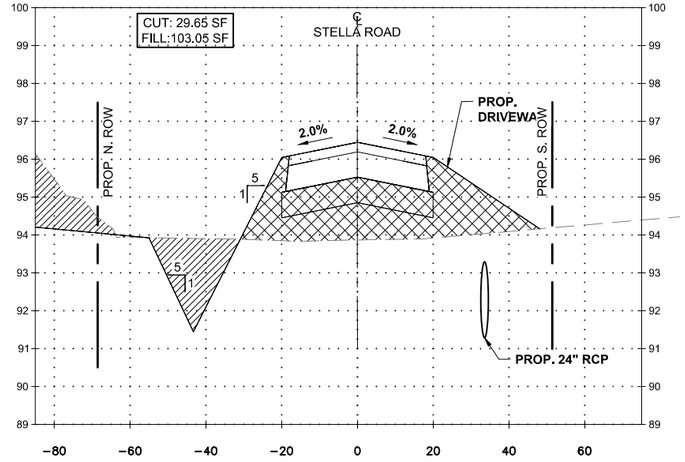
42+00.00



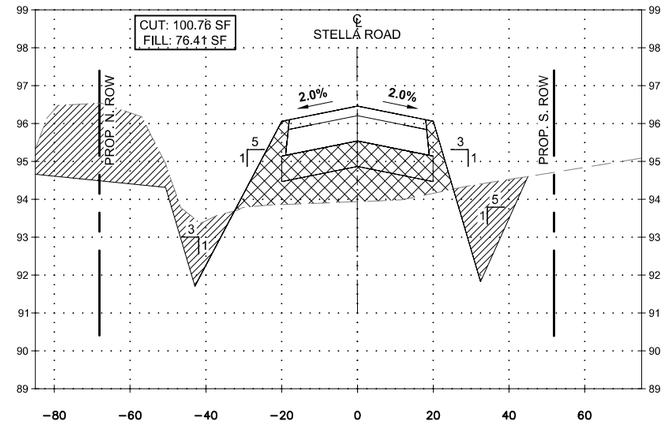
43+00.00



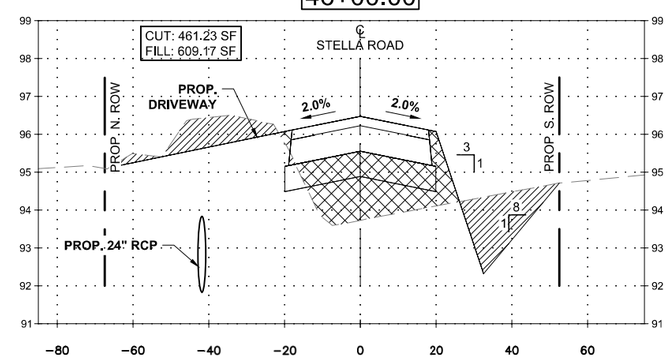
44+00.00



45+00.00



46+00.00



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

FILL

CUT

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

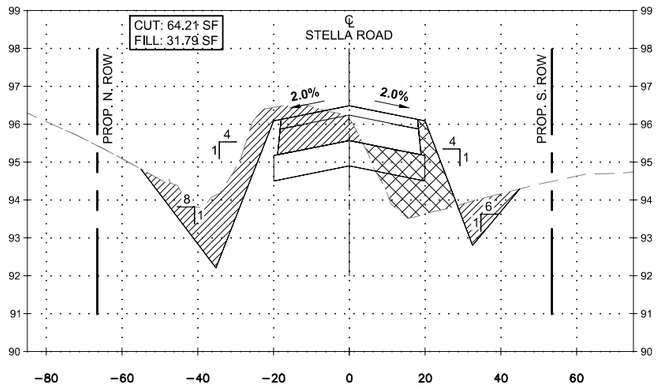
McDONOUGH
CMI Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane
Houston, Texas 77057
(713) 975-9990
www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED PROFESSIONAL ENGINEER
7/3/2024

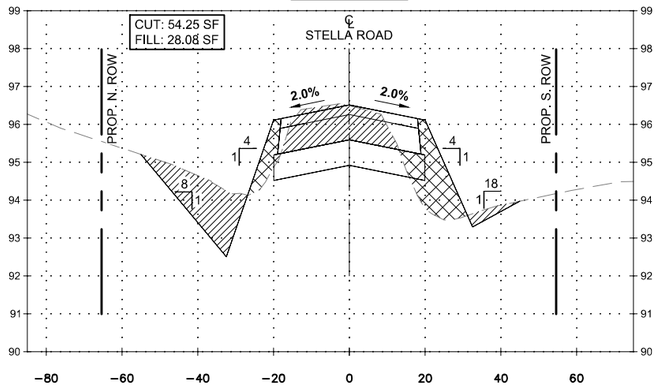
PROJECT TITLE:	STELLA ROAD
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.
CK'D BY: AM	SHEET DESCRIPTION: CROSS SECTIONS
SCALE: 1" = 40'	42+00 TO 47+00
DATE: 1/16/2023	APPROVED BY:
	SHEET NO: 132 / 133

X:\Engineering\2021\21060 - Stella Road\132 CROSS SECTIONS 42+00 TO 47+00.dwg Charlie Valenzuela

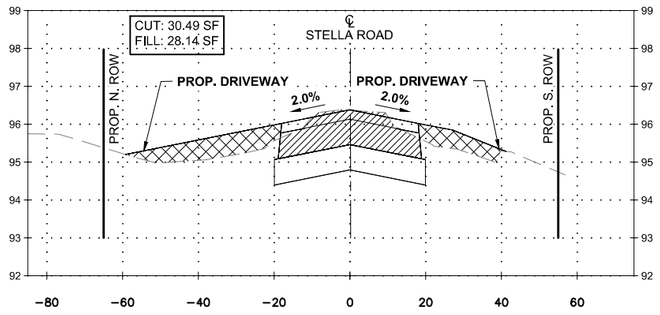
47+00.00



48+00.00



49+00.00



SCALE 1"=40' (HORIZONTAL)

40' 20' 0 40'

4' 2' 0 4'

SCALE 1"=4' (VERTICAL)

LEGEND

FILL

CUT

NO.	REVISIONS	DATE	NAME
1			
2			
3			
4			
5			

FORT BEND COUNTY
TEXAS

McDONOUGH
CM Engineers ▼ Project Managers
TBPLS Firm Registration No. 10103900
TBPE Registration No. F-000340
5625 Schumacher Lane (713) 975-9990
Houston, Texas 77057 www.mectx.com
PROJ. 21060

STATE OF TEXAS
AUSTIN P. MCLEAN
132535
LICENSED
PROFESSIONAL ENGINEER
7/2/2024

PROJECT TITLE:	STELLA ROAD	
DRAWN BY: GB	COTTONWOOD SCHOOL RD. TO W. FAIRGROUNDS RD.	
CK'D BY: AM	SHEET DESCRIPTION: CROSS SECTIONS	
SCALE: 1" = 40'	47+00 TO 49+00	SHEET NO: 133 / 133
DATE: 1/16/2023	APPROVED BY:	

X:\Engineering\2021\21060 - Stella Road\133 CROSS SECTIONS 47+00 TO 49+00.dwg Charlie Valenzuela