



**CONSENT AGENDA
DRAINAGE DISTRICT
BOARD OF DIRECTORS
May 19, 2015
9:00 A.M.**

NOTICE is hereby given in accordance with Chapter 551, Texas Government Code, that a SPECIAL MEETING of the Drainage District #1 Board of Directors will be held at the Edinburg Council Chambers 415 W. University Drive, Edinburg, Hidalgo County, Texas. Discussion and possible action relating to the following business will be transacted:

**NOTICE TO THE PUBLIC
CONSENT AGENDA**

The following items are of a routine or administrative nature. The Drainage District #1 Board has been furnished with background and support on each item, and/or it has been discussed at a previous meeting. All items will be acted upon by one vote without being discussed separately unless requested by a Board Member, in which event the item or items will immediately be withdrawn for individual consideration in its normal sequence after the items not requiring separate discussion have been acted upon. The remaining items will be adopted by one vote.

1. Approval of check register and payment of claims and bills - County Treasurer

2. **AI -49690** For clarification purposes only Agenda Item No. AI-49387 (F) April 29, 2015; iPhone amount listed as \$49.99 should be \$199.99.

3. **AI -49689** A. Request approval to issue payment on the following items after review and audit procedures are complete:
 1. Invoice No. 5567 in the amount of \$1,710.32 from Guzman & Muñoz Engineering and Surveying, Inc. related to Work Authorization No. 6-Surveying Services for West Main Drain Weir. PO#623079.

 2. Invoice No. 5566 in the amount of \$13,302.02 from Guzman & Muñoz Engineering and Surveying, Inc. related to Work Authorization No. 5-Basic Engineering Services for West Main Drain Weir Structure-Final Payment. PO#623077.

 3. Invoice No. 5565 in the amount of \$1,730.32 from Guzman & Muñoz Engineering and Surveying, Inc. related to Work Authorization No. 2-Surveying Services for Edinburg Stub Drain into South Main Drain. PO#623075.

4. Invoice No. 5564 in the amount of \$1,737.50 from Guzman & Muñoz Engineering and Surveying, Inc. related to Work Authorization No. 1-Basic Engineering Services for Edinburg Stub to South Main Drain (Near Canton Rd and Cesar Chavez Rd). PO#623074.

5. Invoice No. 11325138 in the amount of \$35,443.09 from L&G Consulting Engineers, Inc. related to Work Authorization No. 4-La Joya Watershed Improvements-Design, Geotechnical, Survey and ROW Acquisition Services. PO#625396.

6. Invoice No. 3757 in the amount of \$14,904.00 from R. Gutierrez Engineering Corporation related to Work Authorization No. 2-Las Milpas Road Crossings South Floodwater Channel East of FM 907 Alamo Road -Surveying Services. PO#626435.

7. Invoice No. U1445-18 in the amount of \$428,395.00 from S&B Infrastructure, LTD related to Work Authorization No. 18- Master Drainage System Ph.2 of the Raymondville Drain Project. PO#623983.

8. Invoice No. 20152272 in the amount of \$68,229.88 from Tedsi Infrastructure Group related to Work Authorization No. 13-Lower Rio Grande Valley Regional Water Management Program-Preliminary Engineering Rpt. PO#623666.

9. Invoice No. 11325115 in the amount of \$516.33 from L&G Consulting Engineers related to Work Authorization No. 1-FM 676 Outfall Analysis and Evaluation. PO#622895

10. Invoice No. 11325143 in the amount of \$15,291.04 from L&G Consulting Engineers related to Work Authorization No. 1-Pharr-McAllen Drain & South Flood Water Channel Watershed Improvement. PO#626860.

B. Request approval of the following Budge Line Item Transfers:

1. Maintenance & Operations-Budget 006

4. **AI -49718** Request approval of Invoice No. U9444.103 and 812-05a in the amount \$178,280 from S & B Infrastructure. LTD related to Work Authorization No. 16 and 17 - Raymondville Drain Project, purchase order number 623918.

AI -49690

2.

DRAINAGE - CONSENT

Meeting Date: 05/19/2015

Submitted For: Jaime Salazar

Submitted By: Jaime Salazar, DRAINAGE
DISTRICT

Department: DRAINAGE DISTRICT

Information

CAPTION

For clarification purposes only Agenda Item No. AI-49387 (F) April 29, 2015;
iPhone amount listed as \$49.99 should be \$199.99.

BACKGROUND

Fiscal Impact

Attachments

No file(s) attached.

Form Review

Inbox	Reviewed By	Date
Budget & Management	Veronica Ortiz	05/14/2015 02:03 PM
Final Approval	Monica Badillo	05/15/2015 04:34 PM
Form Started By: Jaime Salazar		Started On: 05/14/2015 01:36 PM
Final Approval Date: 05/15/2015		

AI -49689

3.

DRAINAGE - CONSENT

Meeting Date: 05/19/2015

Submitted By: Claudette Guerrero,
DRAINAGE DISTRICT

Department: DRAINAGE DISTRICT

Information

CAPTION

A. Request approval to issue payment on the following items after review and audit procedures are complete:

1. Invoice No. 5567 in the amount of \$1,710.32 from Guzman & Muñoz Engineering and Surveying, Inc. related to Work Authorization No. 6-Surveying Services for West Main Drain Weir. PO#623079.
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5. Invoice No. 11325138 in the amount of \$35,443.09 from L&G Consulting Engineers, Inc. related to Work Authorization No. 4-La Joya Watershed Improvements-Design, Geotechnical, Survey and ROW Acquisition Services. PO#625396.
6. Invoice No. 3757 in the amount of \$14,904.00 from R. Gutierrez Engineering Corporation related to Work Authorization No. 2-Las Milpas Road Crossings South

Floodwater Channel East of FM 907 Alamo Road -Surveying Services. PO#626435.

7. Invoice No. U1445-18 in the amount of \$428,395.00 from S&B Infrastructure, LTD related to Work Authorization No. 18- Master Drainage System Ph.2 of the Raymondville Drain Project. PO#623983.

8. Invoice No. 20152272 in the amount of \$68,229.88 from Tedsi Infrastructure Group related to Work Authorization No. 13-Lower Rio Grande Valley Regional Water Management Program-Preliminary Engineering Rpt. PO#623666.

9. Invoice No. 11325115 in the amount of \$516.33 from L&G Consulting Engineers related to Work Authorization No. 1-FM 676 Outfall Analysis and Evaluation. PO#622895

10. Invoice No. 11325143 in the amount of \$15,291.04 from L&G Consulting Engineers related to Work Authorization No. 1-Pharr-McAllen Drain & South Flood Water Channel Watershed Improvement. PO#626860.

B. Request approval of the following Budge Line Item Transfers:

1. Maintenance & Operations-Budget 006

BACKGROUND

Fiscal Impact

Attachments

Guzman Inv#5567

DD1 PE LTR-Guzman Inv#5567

Guzman Inv#5566

DD1 PE LTR-Guzman Inv#5566

Guzman Inv#5565

DD1 PE LTR-Guzman Inv#5565

L&G Inv#11325138

DD1 PE LTR-L&G Inv#11325138

R. Gtz Inv#3757

DD1 PE LTR-R. Gtz Inv#3757

Tedsi Inv#20152272

DD1 PE LTR- Tedsi Inv#20152272

M&O Bdgt Line Item Transfer

L&G Inv#11325115

DD1 PE LTR-Tedsi Inv#11325115

L&G Inv#11325143

DD1 PE LTR-L&G Inv#11325143

Form Review

Inbox	Reviewed By	Date
Budget & Management	Veronica Ortiz	05/15/2015 10:09 AM
Final Approval	Monica Badillo	05/15/2015 04:34 PM
Form Started By: Claudette Guerrero		Started On: 05/14/2015 01:12 PM
Final Approval Date: 05/15/2015		



Hidalgo County Drainage District No. 1

902 North Doolittle Road Edinburg, Texas 78542 Office: (956) 292-7080 Fax: (956) 292-7089

Invoice Processing Checklist

Date Received: April 16, 2015

Engineer/Firm Name: Guzman & Muñoz Eng.

Project Name/Number: WA#6 Surveying Service for WMD Weir

Invoice No.: 5567

Purchase Order No.: _____

Received By: Rosa Arce

Forwarded to: Joey Garza

Total # of Pages Submitted: 2 + Trans.

Attachments: CD: _____ USB: _____ Other: _____ N/A:

Additional Comments: _____

WORK AUTHORIZATION NO. 6
ATTACHMENT "D"
ESTIMATED COST PROPOSAL
WEST MAIN DRAIN CONTROL WEIR STRUCTURE (MCCOLL ROAD BETWEEN CHAPIN RD AND SCHUNIOR RD)

GUZMAN & MUNOZ ENGINEERING AND SURVEYING, INC.
CLIENT: HIDALGO COUNTY DRAINAGE DISTRICT NO. 1
PROJECT: WEST MAIN DRAIN CONTROL WEIR STRUCTURE
GMES PROJECT NO.: P790-02

GMES TASK	DESCRIPTION OF WORK TASK	PRINCIPAL	SR PROJECT MANAGER	SENIOR ENGINEER	EIT	SR DESIGNER	CADD TECH	SECRETARY	RPLS	SURVEY DESIGNER	2 PERSON SURVEY CREW	GPS	CONSTRUCTION MANAGER	SENIOR INSPECTOR	TOTAL MANHOURS	TOTAL COST PER TASK	
SPECIAL SERVICES - SURVEYING																	
	Field Surveying																
1	Topography								4.0	8.0	16.0				28.0	\$ 3,287.60	
2	Set Control / TBM								0.5	1.0	4.0				5.5	\$ 710.95	
3	Construction Staking								1.0	2.0	8.0		1.0		12.0	\$ 1,606.82	
4	Verify "As Built" Conditions		0.5	0.5					0.5	2.0	4.0			2.0	9.5	\$ 1,114.70	
Percent of Time Based on Fee		0.0%	0.9%	0.9%	0.0%	0.0%	0.0%	0.0%	10.9%	23.6%	58.2%	0.0%	1.8%	3.6%	100.0%		
GRAND TOTAL HOURS		0.0	0.5	0.5	0.0	0.0	0.0	0.0	6.0	13.0	32.0	0.0	1.0	2.0	55.0	\$ 6,720.07	
HOURLY RATE		\$ 261.97	\$ 184.92	\$ 154.10	\$ 86.30	\$ 80.13	\$ 61.64	\$ 55.48	\$ 98.62	\$ 61.64	\$ 150.00	\$ 30.00	\$ 184.92	\$ 86.30			
GRAND TOTAL SPECIAL SERVICES LABOR COST		\$0	\$92	\$77	\$0	\$0	\$0	\$0	\$592	\$801	\$4,800	\$0	\$185	\$173	\$6,720.07		
GRAND TOTAL BASIC AND SPECIAL SERVICES LABOR COST																\$ 6,720.07	
REIMBURSABLE DIRECT COST																	
Mileage = 300 Miles @ 0.55/ Mile =		\$ 165.00															
Overnight carrier cost = 3 @ 20/ Ea.		\$ 60.00															
Copies = At cost																	
Subtotal (RDC)		\$ 225.00															
GRAND TOTAL		\$ 6,945.07															

REIMBURSABLE DIRECT COST \$ 225.00
GRAND TOTAL \$ 6,945.07

ASSUMPTIONS

- Surveying:**
- GMES will provide two (2) horizontal and vertical benchmarks based off of State Plane Coordinates, South Texas Zone, reference to W.D.S. Virtual Network
 - GMES will locate underground utilities as per Texas 811 Locate or City Utility
 - No building lines or easements will be noted on boundary survey plat unless a recorded legal document is provided. If legal document is submitted after the work is done and revisions are required, additional fees will be incurred.
 - GMES will allow one set of minor revisions within the Standards allowed by the Texas Surveyor's Act. If additional revisions are requested, additional fees will be



2020 E. EXPRESSWAY 83, MERCEDES, TEXAS 78570
 PHONE NO. 565-4637 FAX NO. 565-4636

LETTER OF TRANSMITTAL

Dated: April 16, 2015	Project No. P-790-06
RE:	
<i>Hidalgo County Drainage District #1</i>	
<i>WA #6 Surveying Services for West Main Drain Weir.</i>	
<i>Invoice #: 5567</i>	
Via:	
Tracking #	

TO: Hidalgo Co. Drainage District No. 1
Attn: Godfrey Garza Jr.
902 N. Doolittle
Edinburg, TX 78542

WE ARE SENDING:

Submittals	Application	Sketch	Letter
Attached	Prints	Drawings	Final Plat
Change Order	Plans	X Invoice	Submittals
			Release of Lien

COPIES	DATE	NO.	DESCRIPTION
1	4/16/2015	P790-06	One (1) Original Invoice # 5567 for the above referenced project.

THESE ARE TRANSMITTED AS CHECKED BELOW:

<input checked="" type="checkbox"/>	For approval	_____	Approved as submitted	_____	Resubmit	_____	Copies for approval
<input checked="" type="checkbox"/>	Final approval	_____	Approved as noted	_____	Submit	_____	Copies for distribution
_____	As requested	_____	Returned for corrections	_____	Return	_____	Correction prints
<input checked="" type="checkbox"/>	For review and payment	Other _____					
_____	For bids due	_____					

REMARKS: *Please review and process for final approval. Should you have any questions or concerns, please contact our office at (956)565-4637. Thank you.*

Received by : _____

SIGNED: *Olh*
 GMES Representative

If enclosures are not as noted, kindly notify us at once.

RECEIVED
 HIDALGO COUNTY
 DRAINAGE DISTRICT #1

APR 16 2015
 12:00 AM/PM
 BY: *Rosalva*



**HIDALGO COUNTY
DRAINAGE
DISTRICT No. 1**

RAUL E. SESIN, PE, CFM
General Manager
Floodplain Administrator

902 N. Doolittle Road
Edinburg, Texas 78542
Off 956 292.7080
Fax 956 292.7089

BOARD OF DIRECTORS

RAMON GARCIA
Chairman of the Board

A.C. CUELLAR, JR.
Board Member

EDUARDO "EDDIE" CANTU
Board Member

JOE M. FLORES
Board Member

JOSEPH PALACIOS
Board Member

Handwritten initials in a circle.

April 30, 2015

Lora Briones
Financial Officer

Re: Invoices

- 1.) Guzman & Munoz Engineering
Invoice # 5564/ 3-30-2015 / \$1737.50**
- 2.) Guzman & Munoz Engineering
Invoice # 5565 / 3-30-15 / \$1,730.32**
- 3.) Guzman & Munoz Engineering
Invoice # 5566 / 3-30-2015 / \$17,151.83**
- 4.) Guzman & Munoz Engineering
Invoice # 5567/ 3-30-2015 / \$1,710.32**

I have reviewed the invoice referenced above, and have no issues for payment based on the back up information and complete percentages they are billing the Drainage District. Should you have any questions, please feel free to contact me.

Thank you,

J. Noe Saldivar, P.E.
J. Noe Saldivar. P.E.
Hydraulic Engineer

LB
4/30/2015

Date: 04/30/15 Time: 4:20 PM

Cc: Raul E. Sesin, PE, CFM



COVERSHEET
APPROVED-BOND INVOICES

Submitted to Noe

DATE: 4/27/2015

Prepared By: Joey Garza

JP

Vendor	Unit #	Invoice #	Invoice Date	Invoice Amount	Received By	Received Date	COMMENTS
GUZMAN & MUNOZ	WA #2 SURVEYING SERVICES FOR EDINBURG STUB DRAIN INTO SOUTH MAIN DRAIN	5565	03/30/15	\$1,730.32 ✓	R. ARCE	04/16/15	<i>JAG</i> 04/30/15
GUZMAN & MUNOZ	WA #6 SURVRYING SERVICES FOR WEST MAIN DRAIN WEIR	5567	03/30/15	\$1,710.32 ✓	R. ARCE	04/16/15	<i>JAG</i> 04/30/15
GUZMAN & MUNOZ	EDINBURG STUB TO SOUTH MAIN DRAIN NEAR CANTON RD. & CESAR CHAVEZ RD.	5564	03/30/15	\$1,737.50 ✓	R. ARCE	04/16/15	<i>JAG</i> 04/30/15 PO #623074 ATTACHED
GUZMAN & MUNOZ	WEST MAIN DRAIN CONTROL WEIR STRUCTURE	5566	03/30/15	\$17,151.83 ✓	R. ARCE	04/16/15	<i>JAG</i> 04/30/15 PO #623077 ATTACHED
R. GUTIERREZ	LAS MILPAS RD. BRIDGE REHAB	3757	04/17/15	\$14,904.00	R. ARCE	04/17/15	<i>JAG</i> 04/30/15 PO #626436 & 626435 ATTACHED



Hidalgo County Drainage District No. 1

902 North Doolittle Road Edinburg, Texas 78542 Office: (956) 292-7080 Fax: (956) 292-7089

Invoice Processing Checklist

Date Received: April 16, 2015

Engineer/Firm Name: Guzman & Muñoz Eng.

Project Name/Number: WMO Control Weir Structure

Invoice No.: 55666

Purchase Order No.: 623077

Received By: Rosa Au

Forwarded to: Joey Arzua

Total # of Pages Submitted: 3 + transmittal

Attachments: CD: _____ USB: _____ Other: _____ N/A: _____

Additional Comments: _____

GUZMAN & MUNOZ ENGINEERING AND SURVEYING, INC.
 2020 E. EXPRESSWAY 83
 MERCEDDES, TEXAS 78570
 (956)565-4637 PHONE * (956)-565-4636 FAX

TO: HIDALGO COUNTY DRAINAGE DISTRICT NO. 1
 Attn: Godfrey Garza, Jr.
 902 North Doolittle Road
 Edinburg, Texas 78542

CLIENT: HIDALGO COUNTY DRAINAGE DISTRICT NO. 1
 PO No.:623077
 PROJECT: WEST MAIN DRAIN CONTROL WEIR STRUCTURE
 GMS PROJECT NO.: P790-05

DATE: 3/30/2015
 INVOICE NO.: 5566

RECEIVED
 HIDALGO COUNTY
 DRAINAGE DISTRICT #1

APR 16 2015

12:02 AM PM
 BY: *Rosalia*

GMS TASK	DESCRIPTION OF WORK TASK	TOTAL COST PER TASK	PERCENT COMPLETE	AMOUNT EARNED TO DATE	PREVIOUSLY PAID	AMOUNT DUE THIS INVOICE
BASIC SERVICES						
PRELIMINARY ENGINEERING						
1	Data Collection	\$ 3,753.89	100%	\$ 3,753.89	\$ 3,753.89	\$ -
2	Planning Meeting with the Client					
3	Preparation of the Draft Preliminary Engineering Report (2 Alternatives)					
4	Preparation of Preliminary Probably Construction Cost Estimate					
5	Address Preliminary Engineering Report Comments from Client and Selection of Alternative					
6	Finalize the Preliminary Engineering Report and Submit it to the Client					
7	Preparation of Meeting Minutes and Logs					
DESIGN PHASE						
1	Prepare Preliminary Layout for Client Review	\$ 5,791.08	100%	\$ 5,791.08	\$ 5,791.08	\$ -
2	Address Client Comments of Preliminary Layout					
3	Preparation of 30% Structural Plans and Specifications					
4	Preparation of 60% Structural Plans and Specifications					
5	Preparation of 100% Structural Plans and Specifications					
6	Preparation of Final Probably Construction Cost Estimate					
BID PHASE						
1	Preparation of the Bid Documents	\$ 2,086.53	100%	\$ 2,086.53	\$ 2,086.53	\$ -
2	Administrative Assistance during the Bid Process					
CONSTRUCTION PHASE						
1	Project Management and Coordination	\$ 13,302.02	100%	\$ 13,302.02	\$ -	\$ 13,302.02
2	Provide Daily / Weekly Reports					
3	Review and Process Contractor Pay Requests					
4	Provide Shop Drawing Review					
5	Provide Responses to RFIs					
6	Review and Process Change Orders					
7	Preparation of Meeting Minutes and Logs					

GUZMAN & MUNOZ ENGINEERING AND SURVEYING, INC.
 2020 E. EXPRESSWAY 83
 MERCEDDES, TEXAS 78570
 (956)565-4637 PHONE * (956)-565-4636 FAX

DATE: 3/30/2015
 INVOICE NO.: 5566

TO: HIDALGO COUNTY DRAINAGE DISTRICT NO. 1
 Attn: Godfrey Garza, Jr.
 902 North Doolittle Road
 Edinburg, Texas 78542

CLIENT: HIDALGO COUNTY DRAINAGE DISTRICT NO. 1
 PO No.:623077
 PROJECT: WEST MAIN DRAIN CONTROL WEIR STRUCTURE
 GMS PROJECT NO.: P790-05

PROJECT CLOSEOUT	\$ 3,725.11	100%	\$ 3,725.11	\$ -	\$ 3,725.11
1 Perform Initial Walkthrough and Develop Punch List					
2 Perform FINAL Walkthrough and FINALIZE Punch List					
3 Preparation and submittal of As-Builts					
4 PROJECT CLOSEOUT (Final Meeting: Submittal of all Project Documents / Final Acceptance)					
TOTAL COST FOR BASIC SERVICES	\$ 28,658.63	100%	\$ 28,658.63	\$ 11,631.50	\$ 17,027.13
REIMBURSABLE DIRECT COSTS					
Mileage = 200 Miles @ 0.55/ Mile =	\$ 110.00	100%	\$ 110.00	\$ 25.30	\$ 84.70
Overnight carrier cost = 2 @ 20/ Ea.	\$ 40.00	100%	\$ 40.00	\$ -	\$ 40.00
Copies = At cost					
GRAND TOTAL BASIC AND REIMBURSABLE DIRECT COSTS	\$ 28,808.63	100%	\$ 28,808.63	\$ 11,656.80	\$ 17,151.83

WORK AUTHORIZATION NO. 5
ATTACHMENT "D"
ESTIMATED COST PROPOSAL
WEST MAIN DRAIN CONTROL WEIR STRUCTURE
NEAR MCCOLL ROAD BETWEEN CHAPIN ROAD AND SCHUNIOR ROAD

GUZMAN & MUNOZ ENGINEERING AND SURVEYING, INC.
CLIENT: HIDALGO COUNTY DRAINAGE DISTRICT NO. 1
PROJECT: WEST MAIN DRAIN CONTROL WEIR STRUCTURE
GMES PROJECT NO.: P790-02

DATE: 3/30/2015
INVOICE No: 5566

GMES TASK	DESCRIPTION OF WORK TASK	PRINCIPAL	SR PROJECT MANAGER	SENIOR ENGINEER	EIT	SR DESIGNER	CADD TECH	SECRETARY	RPLS	SURVEY DESIGNER	2 PERSON SURVEY CREW	GPS	CONSTRUCTION MANAGER	SENIOR INSPECTOR (PSR)	TOTAL MANHOURS	TOTAL COST PER TASK
BASIC SERVICES																
Percent of Time Based on Fee		4.6%	8.7%	14.5%	0.0%	12.2%	3.3%	1.8%	0.0%	0.0%	0.0%	0.0%	35.8%	19.3%		
PRELIMINARY ENGINEERING																
1	Data Collection		0.0	0.0		0.0									0.0	\$ -
2	Planning Meeting with the Client		0.0	0.0				0.0							0.0	\$ -
3	Preparation of the Draft Preliminary Engineering Report (2 Alternatives)	0.0	0.0	0.0	0.0		0.0	0.0							0.0	\$ -
4	Preparation of Preliminary Probably Construction Cost Estimate		0.0	0.0			0.0								0.0	\$ -
5	Address Preliminary Engineering Report Comments from Client and Selection of Alternative		0.0	0.0											0.0	\$ -
6	Finalize the Preliminary Engineering Report and Submit it to the Client		0.0	0.0			0.0								0.0	\$ -
7	Preparation of Meeting Minutes and Logs			0.0											0.0	\$ -
DESIGN PHASE																
1	Prepare Preliminary Layout for Client Review	0.0	0.0	0.0		0.0	0.0	0.0							0.0	\$ -
2	Address Client Comments of Preliminary Layout		0.0	0.0		0.0	0.0								0.0	\$ -
3	Preparation of 30% Structural Plans and Specifications		0.0	0.0	0.0	0.0	0.0								0.0	\$ -
4	Preparation of 60% Structural Plans and Specifications	0.0	0.0	0.0	0.0	0.0	0.0								0.0	\$ -
5	Preparation of 100% Structural Plans and Specifications	0.0	0.0	0.0	0.0	0.0	0.0								0.0	\$ -
6	Preparation of Final Probably Construction Cost Estimate		0.0	0.0		0.0		0.0							0.0	\$ -
BID PHASE																
1	Preparation of the Bid Documents	0.0	0.0	0.0		0.0		0.0							0.0	\$ -
2	Administrative Assistance during the Bid Process		0.0	0.0		0.0		0.0							0.0	\$ -
CONSTRUCTION PHASE																
1	Project Management and Coordination	2.0	4.0	8.0		20.0	4.0	4.0					4.0	8.0	54.0	\$ 13,302.02
2	Provide Daily / Weekly Reports												6.0	24.0	30.0	\$ 5,997.58
3	Review and Process Contractor Pay Requests		1.0	1.0		1.0							4.0	1.0	8.0	\$ 1,245.13
4	Provide Shop Drawing Review			1.0		1.0							2.0		4.0	\$ 604.07
5	Provide Responses to RFI's			1.0		1.0							2.0		4.0	\$ 604.07
6	Review and Process Change Orders		1.0	1.0		1.0							2.0	1.0	6.0	\$ 875.29
7	Preparation of Meeting Minutes and Logs		1.0	1.0		1.0							2.0	1.0	5.0	\$ 795.16
PROJECT CLOSEOUT																
1	Perform Initial Walkthrough and Develop Punch List			1.0									1.0	1.0	3.0	\$ 425.32
2	Perform FINAL Walkthrough and FINALIZE Punch List			1.0									1.0	1.0	3.0	\$ 425.32
3	Preparation and submittal of As-Builts			1.0		1.0	4.0						1.0	1.0	8.0	\$ 752.01
4	PROJECT CLOSEOUT (Final Meeting: Submittal of all Project Documents / Final Acceptance)	1.0	1.0			1.0	1.0	1.0					8.0		13.0	\$ 2,122.46
TOTAL HOURS - BASIC SERVICES		3.0	8.0	16.0	0.0	26.0	9.0	5.0	0.0	0.0	0.0	0.0	33.0	38.0	138.0	
TOTAL COST FOR BASIC SERVICES		\$ 785.91	\$ 1,479.36	\$ 2,465.60	\$ -	\$ 2,083.38	\$ 554.76	\$ 277.40	\$ -	\$ -	\$ -	\$ -	\$ 6,102.36	\$ 3,279.40		\$ 17,027.13
Percent of Time Based on Fee		4.6%	8.7%	14.5%	0.0%	12.2%	3.3%	1.8%	0.0%	0.0%	0.0%	0.0%		19.3%		
GRAND TOTAL HOURS		3	8	16	0	26	9	5	0	0	0	0	33	38	138	\$ 17,028.17
HOURLY RATE		\$ 261.97	\$ 184.92	\$ 154.10	\$ 86.30	\$ 80.13	\$ 61.64	\$ 55.48	\$ 98.62	\$ 61.64	\$ 150.00	\$ 30.00	\$ 184.92	\$ 86.30		
GRAND TOTAL BASIC AND SPECIAL SERVICES LABOR COST		\$786	\$1,479	\$2,466	\$0	\$2,083	\$555	\$277	\$0	\$0	\$0	\$0	\$6,102	\$3,279	\$17,028.17	
GRAND TOTAL BASIC AND SPECIAL SERVICES LABOR COST																\$ 17,027.13
REIMBURSABLE DIRECT COST																
Mileage = 154 Miles @ 0.55/ Mile = \$110.00		\$	84.70													\$ 124.70
Overnight carrier cost = 2 @ 20/ Ea. = \$40.00		\$	40.00													
Copies = At cost																
Subtotal (RDC)		\$	124.70													
GRAND TOTAL		\$	17,151.83													\$ 17,151.83

ASSUMPTIONS

PRELIMINARY ENGINEERING INCLUDING STUDY AND REPORT - ALL FLOW DATA FOR DESIGN SHALL BE PROVIDED BY THE OWNER.



2020 E. EXPRESSWAY 83, MERCEDES, TEXAS 78570
 PHONE NO. 565-4637 FAX NO. 565-4636

LETTER OF TRANSMITTAL

Dated: April 16, 2015	Project No. P-790-05
RE:	
<i>Hidalgo County Drainage District #1</i>	
<i>West Main Drain Control Weir Structure</i>	
<i>Invoice #: 5566</i>	
Via:	
Tracking #	

TO: Hidalgo Co. Drainage District No. 1
Attn: Godfrey Garza Jr.
902 N. Doolittle
Edinburg, TX 78542

WE ARE SENDING:

Submittals	Application	Sketch	Letter
Attached	Prints	Drawings	Final Plat
Change Order	Plans	X Invoice	Submittals
			Pay Application
			Release of Lien

COPIES	DATE	NO.	DESCRIPTION
<i>1</i>	<i>4/16/2015</i>	<i>P790-05</i>	<i>One (1) Original Invoice # 5566 for the above referenced project.</i>

THESE ARE TRANSMITTED AS CHECKED BELOW:

For approval _____ Approved as submitted _____ Resubmit _____ Copies for approval
 Final approval _____ Approved as noted _____ Submit _____ Copies for distribution
 _____ As requested _____ Returned for corrections _____ Return _____ Correction prints
 For review and payment _____ Other _____
 _____ For bids due _____

REMARKS: Please review and process for final approval. Should you have any questions or concerns, please contact our office at (956)565-4637. Thank you.

Received by : _____

SIGNED:
 GMES Representative

If enclosures are not as noted, kindly notify us at once.

RECEIVED
 HIDALGO COUNTY
 DRAINAGE DISTRICT #1

APR 16 2015
12:00 AM / PM
 BY: Rosa Cue



**HIDALGO COUNTY
DRAINAGE
DISTRICT No. 1**

RAUL E. SESIN, PE, CFM
General Manager
Floodplain Administrator

902 N. Doolittle Road
Edinburg, Texas 78542
Off 956 292.7080
Fax 956 292.7089

BOARD OF DIRECTORS

RAMON GARCIA
Chairman of the Board

A.C. CUELLAR, JR.
Board Member

EDUARDO "EDDIE" CANTU
Board Member

JOE M. FLORES
Board Member

JOSEPH PALACIOS
Board Member

Handwritten initials in a circle.

April 30, 2015

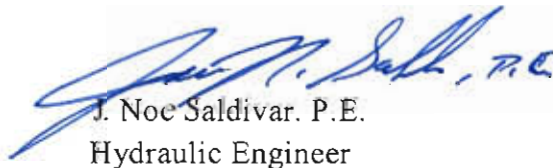
Lora Briones
Financial Officer

Re: Invoices

- 1.) Guzman & Munoz Engineering
Invoice # 5564/ 3-30-2015 / \$1737.50**
- 2.) Guzman & Munoz Engineering
Invoice # 5565 / 3-30-15 / \$1,730.32**
- 3.) Guzman & Munoz Engineering
Invoice # 5566 / 3-30-2015 / \$17,151.83**
- 4.) Guzman & Munoz Engineering
Invoice # 5567/ 3-30-2015 / \$1,710.32**

I have reviewed the invoice referenced above, and have no issues for payment based on the back up information and complete percentages they are billing the Drainage District. Should you have any questions, please feel free to contact me.

Thank you,


J. Noe Saldivar, P.E.
Hydraulic Engineer

Handwritten initials 'JB' and date '4/30/2015'.

Date: 04/30/15 Time: 4:20 PM

Cc: Raul E. Sesin, PE, CFM



COVERSHEET
APPROVED-BOND INVOICES

Submitted to Noe

DATE: 4/27/2015

Prepared By: Joey Garza

JP

Vendor	Unit #	Invoice #	Invoice Date	Invoice Amount	Received By	Received Date	COMMENTS
GUZMAN & MUNOZ	WA #2 SURVEYING SERVICES FOR EDINBURG STUB DRAIN INTO SOUTH MAIN DRAIN	5565	03/30/15	\$1,730.32	R. ARCE	04/16/15	<i>JAG</i> 04/30/15
GUZMAN & MUNOZ	WA #6 SURVRYING SERVICES FOR WEST MAIN DRAIN WEIR	5567	03/30/15	\$1,710.32	R. ARCE	04/16/15	<i>JAG</i> 04/30/15
GUZMAN & MUNOZ	EDINBURG STUB TO SOUTH MAIN DRAIN NEAR CANTON RD. & CESAR CHAVEZ RD.	5564	03/30/15	\$1,737.50	R. ARCE	04/16/15	<i>JAG</i> 04/30/15 PO #623074 ATTACHED
GUZMAN & MUNOZ	WEST MAIN DRAIN CONTROL WEIR STRUCTURE	5566	03/30/15	\$17,151.83	R. ARCE	04/16/15	<i>JAG</i> 04/30/15 PO #623077 ATTACHED
R. GUTIERREZ	LAS MILPAS RD. BRIDGE REHAB	3757	04/17/15	\$14,904.00	R. ARCE	04/17/15	<i>JAG</i> 04/30/15 PO #626436 & 626435 ATTACHED



Hidalgo County Drainage District No. 1

902 North Doolittle Road Edinburg, Texas 78542 Office: (956) 292-7080 Fax: (956) 292-7089

Invoice Processing Checklist

Date Received: April 16, 2015

Engineer/Firm Name: Guzman & Muñoz Eng.

Project Name/Number: WA#7 Surveying EDBG Stub to SMD

Invoice No.: 5565

Purchase Order No.: _____

Received By: Rosa Oñe

Forwarded to: Joey Garza

Total # of Pages Submitted: 2+ trans.

Attachments: CD: _____ USB: _____ Other: _____ N/A:

Additional Comments: _____

TO: HIDALGO COUNTY DRAINAGE DISTRICT #1
 ATTN: GODFREY GARZA, JR.
 902 NORTH DOOLITTLE ROAD
 EDINBURG, TEXAS 78542

GUZMAN & MUNOZ ENGINEERING AND SURVEYING, INC.
 2020 E. EXPRESSWAY 83
 MERCEDDES, TEXAS 78570
 (956)565-4637 OFFICE * (956)565-4636 FAX

DATE: 3/30/2015
 INVOICE: 5565

12:00 AM (M)
 BY: Rosa Deco

RECEIVED
 HIDALGO COUNTY
 DRAINAGE DISTRICT #1
 APR 16 2015

PROJECT: WA #2 SURVEYING SERVICES FOR EDINBURG STUB DRAIN INTO SOUTH MAIN DRAIN
 GMS PROJECT NO.: P790-02

GMS TASK	DESCRIPTION OF WORK TASK	TOTAL COST PER TASK	PERCENT COMPLETE	AMOUNT EARNED TO DATE	PREVIOUSLY PAID	AMOUNT DUE THIS INVOICE
SPECIAL SERVICES - SURVEYING						
Field Surveying						
1	Topography	\$ 3,287.60	100%	\$ 3,287.60	\$ 3,287.60	\$ -
2	Set Control / TBM	\$ 710.95	100%	\$ 710.95	\$ 710.95	\$ -
3	Construction Staking	\$ 1,606.82	100%	\$ 1,606.82	\$ -	\$ 1,606.82
4	Verify "As Built" Conditions	\$ 1,114.70	0%			\$ -
TOTAL SPECIAL SERVICES-SURVEYING		\$ 6,720.07	83%	\$ 5,605.37	\$ 3,998.55	\$ 1,606.82
REIMBURSABLE DIRECT COST		\$ 225.00	90%	\$ 202.50	\$ 79.00	\$ 123.50
GRAND TOTAL SPECIAL SERVICES AND REIMBURSABLES		\$ 6,945.07	84%	\$ 5,807.87	\$ 4,077.55	\$ 1,730.32

WORK AUTHORIZATION NO. 2
ATTACHMENT "D"
ESTIMATED COST PROPOSAL
EDINBURG STUB TO SOUTH MAIN DRAIN (NEAR CANTON RD AND CESAR CHAVEZ RD)

GUZMAN & MUNOZ ENGINEERING AND SURVEYING, INC.

CLIENT: HIDALGO COUNTY DRAINAGE DISTRICT NO. 1

PROJECT: EDINBURG STUB TO SOUTH MAIN DRAIN (NEAR CANTON RD AND CESAR CHAVEZ RD)

GMES PROJECT NO.: P790-02

Invoice: 5565 Date: 3/30/2015

GMES TASK	DESCRIPTION OF WORK TASK	PRINCIPAL	SR PROJECT MANAGER	SENIOR ENGINEER	EIT	SR DESIGNER	CADD TECH	SECRETARY	RPLS	SURVEY DESIGNER	2 PERSON SURVEY CREW	GPS	CONSTRUCTION MANAGER	SENIOR INSPECTOR	TOTAL MANHOURS	TOTAL COST PER TASK	
SPECIAL SERVICES - SURVEYING																	
	Field Surveying																
1	Topography								0.0	0.0	0.0				0.0	\$ -	
2	Set Control / TBM								0.0	0.0	0.0				0.0	\$ -	
3	Construction Staking								1.0	2.0	8.0		1.0		12.0	\$ 1,606.82	
4	Verify "As Built" Conditions		0.0	0.0					0.0	0.0	0.0			0.0	0.0	\$ -	
Percent of Time Based on Fee		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%	16.7%	86.7%	0.0%	8.3%	0.0%	100.0%		
GRAND TOTAL HOURS		0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	8.0	0.0	1.0	0.0	12.0	\$ 1,606.82	
HOURLY RATE		\$ 261.97	\$ 184.92	\$ 154.10	\$ 86.30	\$ 80.13	\$ 61.64	\$ 55.48	\$ 98.62	\$ 61.64	\$ 150.00	\$ 30.00	\$ 184.92	\$ 86.30			
GRAND TOTAL SPECIAL SERVICES LABOR COST		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$99	\$123	\$1,200	\$0	\$185	\$0	\$1,606.82		
GRAND TOTAL BASIC AND SPECIAL SERVICES LABOR COST																\$ 1,606.82	
REIMBURSABLE DIRECT COST																	
Mileage = 300 Miles @ 0.55/ Mile =		\$ -															REIMBURSABLE DIRECT COST \$ 123.50
Overnight carrier cost = 3 @ 20/ Ea.		\$ -															
Copies = At cost		\$ 123.50															GRAND TOTAL \$ 1,730.32
Subtotal (RDC)		\$ 123.50															
GRAND TOTAL		\$ 1,730.32															

ASSUMPTIONS

Surveying:

- 1) GMES will provide two (2) horizontal and vertical benchmarks based off of State Plane Coordinates, South Texas Zone, reference to W.D.S. Virtual Network
- 2) GMES will locate underground utilities as per Texas 811 Locate or City Utility Spotters
- 3) No building lines or easements will be noted on boundary survey plat unless a recorded legal document is provided. If legal document is submitted after the work is done and revisions are required, additional fees will be incurred.
- 4) GMES will allow one set of minor revisions within the Standards allowed by the Texas Surveyor's Act. If additional revisions are requested, additional fees will be incurred.



2020 E. EXPRESSWAY 83, MERCEDES, TEXAS 78570
 PHONE NO. 565-4637 FAX NO. 565-4636

LETTER OF TRANSMITTAL

Dated: April 16, 2015	Project No. P-790-02
RE:	
<i>Hidalgo County Drainage District #1</i>	
<i>WA #2 Surveyin Edinburg Stub To South Main Drain</i>	
<i>Invoice #: 5565</i>	
Via:	
Tracking #	

TO: Hidalgo Co. Drainage District No. 1
Attn: Godfrey Garza Jr.
902 N. Doolittle
Edinburg, TX 78542

WE ARE SENDING: Submittals Application Sketch Letter

 Attached Prints Drawings Final Plat Pay Application

 Change Order Plans **X Invoice** Submittals Release of Lien

COPIES	DATE	NO.	DESCRIPTION
1	4/16/2015	P790-02	One (1) Original Invoice # 5565 for the above referenced project.

THESE ARE TRANSMITTED AS CHECKED BELOW:

For approval _____ Approved as submitted _____ Resubmit _____ Copies for approval

Final approval _____ Approved as noted _____ Submit _____ Copies for distribution


_____ As requested _____ Returned for corrections _____ Return _____ Correction prints

For review and payment Other _____

_____ For bids due _____

REMARKS: Please review and process for final approval. Should you have any questions or concerns, please contact our office at (956)565-4637. Thank you.

Received by : _____

SIGNED: 
 GMES Representative

If enclosures are not as noted, kindly notify us at once.

RECEIVED
 HIDALGO COUNTY
 DRAINAGE DISTRICT #1

APR 16 2015

12:00 AM (PM)
 BY: Rosa Oee



**HIDALGO COUNTY
DRAINAGE
DISTRICT No. 1**

RAUL E. SESIN, PE, CFM
General Manager
Floodplain Administrator

902 N. Doolittle Road
Edinburg, Texas 78542
Off 956 292.7080
Fax 956 292.7089

BOARD OF DIRECTORS

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Chairman of the Board

A.C. CUELLAR, JR.
Board Member

EDUARDO "EDDIE" CANTU
Board Member

JOE M. FLORES
Board Member

JOSEPH PALACIOS
Board Member

Handwritten initials in a circle.

April 30, 2015

Lora Briones
Financial Officer

Re: Invoices

- 1.) Guzman & Munoz Engineering
Invoice # 5564/ 3-30-2015 / \$1737.50**
- 2.) Guzman & Munoz Engineering
Invoice # 5565 / 3-30-15 / \$1,730.32**
- 3.) Guzman & Munoz Engineering
Invoice # 5566 / 3-30-2015 / \$17,151.83**
- 4.) Guzman & Munoz Engineering
Invoice # 5567/ 3-30-2015 / \$1,710.32**

I have reviewed the invoice referenced above, and have no issues for payment based on the back up information and complete percentages they are billing the Drainage District. Should you have any questions, please feel free to contact me.

Thank you,

J. Noe Saldivar, P.E.
J. Noe Saldivar, P.E.
Hydraulic Engineer

LB
4/30/2015

Date: 04/30/15 Time: 4:20 PM

Cc: Raul E. Sesin, PE, CFM



COVERSHEET
APPROVED-BOND INVOICES

Submitted to Noe

DATE: 4/27/2015

Prepared By: Joey Garza

JP

Vendor	Unit #	Invoice #	Invoice Date	Invoice Amount	Received By	Received Date	COMMENTS
GUZMAN & MUNOZ	WA #2 SURVEYING SERVICES FOR EDINBURG STUB DRAIN INTO SOUTH MAIN DRAIN	5565	03/30/15	\$1,730.32	R. ARCE	04/16/15	<i>JAG</i> 04/30/15
GUZMAN & MUNOZ	WA #6 SURVRYING SERVICES FOR WEST MAIN DRAIN WEIR	5567	03/30/15	\$1,710.32	R. ARCE	04/16/15	<i>JAG</i> 04/30/15
GUZMAN & MUNOZ	EDINBURG STUB TO SOUTH MAIN DRAIN NEAR CANTON RD. & CESAR CHAVEZ RD.	5564	03/30/15	\$1,737.50	R. ARCE	04/16/15	<i>JAG</i> 04/30/15 PO #623074 ATTACHED
GUZMAN & MUNOZ	WEST MAIN DRAIN CONTROL WEIR STRUCTURE	5566	03/30/15	\$17,151.83	R. ARCE	04/16/15	<i>JAG</i> 04/30/15 PO #623077 ATTACHED
R. GUTIERREZ	LAS MILPAS RD. BRIDGE REHAB	3757	04/17/15	\$14,904.00	R. ARCE	04/17/15	<i>JAG</i> 04/30/15 PO #626436 & 626435 ATTACHED



Hidalgo County Drainage District No. 1

902 North Doolittle Road Edinburg, Texas 78542 Office: (956) 292-7080 Fax: (956) 292-7089

Invoice Processing Checklist

Date Received:

5/1/2015

Engineer/Firm Name:

L&G Consulting Engineers Inc.

Project Name/Number:

La Joya Watershed Imp. WA No. 4

Invoice No.:

11325138

Purchase Order No.:

625396

Received By:

Rosa Arce

Forwarded to:

Joey Garza

Total # of Pages Submitted:

Attachments:

CD: Invoice No. 11325138

(3) Geo. Investigations Task A-Liberty Pit Detention Basin

(3) Geo. Investigations Task B-South Detention Basin

Additional Comments:

L & G Consulting Engineers Inc
2100 W. Expressway 83
Mercedes, TX 78570
(956)565-9813 Fax (956)565-9018

RECEIVED
HIDALGO COUNTY
DRAINAGE DISTRICT #1

INVOICE#: 11325138
INVOICE DATE: 4/30/2015

MAY 01 2015

12:00 AM/PM

BY: *Rosa Lee*

JOB:130104
La Joya Watershed Imp
WA#4
PO #625396

BILL TO:
Hidalgo County Drainage District#1
902 N. Doolittle
Edinburg, TX 78542

DESCRIPTION	CONTRACT	PREVIOUS APPLICATIONS	CURRENT COMPLETED	TOTAL COMPLETED	% COMPL	BALANCE TO FINISH
Engineering services for the month of April 2015.						
Task A - Construction Plans for Liberty Pit Detention Facility						
13001-Task 1a - Coord. & Management of ROW & Design Survey	10,704.28	9,778.90	231.34	10,010.24	93.5	694.04
15010-Task 2a - SUB: Field & Design Survey (Utility Locates)	27,168.00	24,451.00		24,451.00	90.0	2,717.00
13010-Task 3a - SUB: ROW Map Parcel Sketches & Field Notes	22,400.00	20,160.00		20,160.00	90.0	2,240.00
60001-Task 4a - Acquisition of ROW for Proposed Facility	28,100.00	5,400.00		5,400.00	19.2	22,700.00
33010-Task 5a - SUB: Geotech. Exploration & Analysis	27,538.64	25,049.28	2,489.36	27,538.64	100.0	-
11006-Task 6a - Conceptual Site Plan Identify 60% of Record	11,498.80	11,498.80		11,498.80	100.0	-
16001-Task 7a - Plans, Specification & Estimates (PS&E)	50,384.04	40,317.32		40,317.32	80.0	10,066.72
Task B - Construction Plans for South Basin Pit Detention Facility						
13002-Task 1b - Coord. & Management of ROW & Design Survey	7,928.16	7,215.37	231.34	7,446.71	93.9	481.45
15020-Task 2b - SUB: Field & Design Survey (Utility Locates)	24,935.00	22,442.00		22,442.00	90.0	2,493.00
13020-Task 3b - SUB: ROW Map Parcel Sketches & Field Notes	7,488.00	6,739.00		6,739.00	90.0	749.00
60003-Task 4b - Acquisition of ROW for Proposed Facility	14,800.00	0.00		0.00	0.0	14,800.00
33320-Task 5b - SUB: Geotech. Exploration & Analysis	21,162.28	12,326.12	8,836.16	21,162.28	100.0	-
11007-Task 6b - Conceptual Site Plan Identify 60% of Record	8,966.44	8,966.44		8,966.44	100.0	-
16002-Task 7b - Plans, Specification & Estimates (PS&E)	33,589.36	26,874.03		26,874.03	80.0	6,715.33
Task C - Phase I Outfall Development of La Joya Watershed Drainage Master Plan						
13003-Task 1c - Coord. & Management of ROW Base Map. Design	13,030.24	3,488.89	1,463.08	4,951.97	38.0	8,078.27
15030-Task 2c - SUB: Design Survey (Utility Locates)	67,062.00	28,062.00	12,175.00	40,237.00	60.0	26,825.00
33030-Task 3c - SUB: Geotechnical Exploration & Analysis	29,301.96	0.00		0.00	0.0	29,301.96
11008-Task 4c - Preliminary Detailed Schematic for Proposed	37,866.28	37,866.28		37,866.28	100.0	-
16003-Task 5c - Plans, Specifications & Estimates (PS&E)	200,524.00	90,266.92	10,016.81	100,283.73	50.0	100,240.27
	644,447.48	380,902.35	35,443.09	416,345.44	64.6	228,102.04
TOTALS:	644,447.48	380,902.35	35,443.09	416,345.44	64.6	228,102.04

ORIGINAL CONTRACT SUM \$ 644,447.48
CHANGE BY CHANGE ORDER \$ 0.00
CONTRACT SUM TO DATE \$ 644,447.48
TOTAL COMPLETED TO DATE \$ 416,345.44
LESS PREVIOUS INVOICES \$ 380,902.35
CURRENT PAYMENT DUE \$ 35,443.09

PROJECT MANAGER'S SIGNATURE

L&G Consulting Engineers, Inc
 2100 W. Expressway 83
 Mercedes, Texas 78570
 (956) 565-9813

Project Workhour Report

La Joya Watershed Improvements WA#4
 Reference: Inv# 11325138
 Date: 4/30/2015
 P.O. #625396

	Hrs		Rate	Total
Senior Project Manager	6.00	X	212.59	\$1,275.54
Senior Engineer	22.00	X	175.07	\$3,851.54
Design Engineer	25.00	X	112.55	\$2,813.75
Senior Engineer Tech	44.00	X	78.16	\$3,439.04
Admin/Clerical	10.00	X	56.27	\$562.70

Grand Total of Hours	\$ 11,942.57
(Difference due to rounding hours)	\$ -

Invoice Summary				
Man Hours				\$ 11,942.57
Sub Contract				\$ 23,500.52
<small>(See Attached Sub Invoice for Man Hour Breakdown)</small>				
Direct Expenses	Current			
	Units		Rate	
10 Sets of Plans and Geo Report - As per contract requirements	0	X	500.00	\$ -
				\$ -
			(Difference due to rounding)	\$ -
Total Per Invoice Submitted				\$ 35,443.09

DAS

INVOICE PERIOD: 4/01/15 through 4/30/15
INVOICE AMOUNT: \$11,325.52

April 30, 2015

 Mr. Jacinto Garza, P.E. – President
 L&G Consulting Engineers, Inc. (L&G Engineering)
 2100 W. Expressway 83
 Mercedes, Texas 78570

**RE: Geotechnical Drilling, Testing, & Engineering for La Joya Watershed Project (Phase I)
 Invoice No. 9101**

Dear Mr. Garza,

Attached for your review and approval is our invoice for services rendered during the month of January 2015 on the subject referenced project.

The following is attached:

- L&G Lab's Invoice No. 9101
- Invoice Backup incl. Final Geotechnical Reports (Task A – Liberty Pit & Task B – South Pit)

The following is a narrative of the progress for this period.

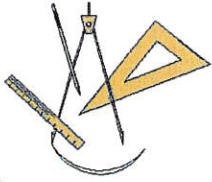
TASK	
(1) – Geotechnical Exploration & Laboratory Testing (Task A)	% Complete = 100%
No Update – See Jan 2015 Invoice and Progress Report for last update. Task Completed.	
(2) – Geotechnical Engineering & Report (Task A)	% Complete = 100%
Update – L&G has completed Geotechnical Report for this Task. This task has been completed this period.	
(3) – Geotechnical Exploration & Laboratory Testing (Task B)	% Complete = 100%
No Update – See March 2015 Invoice and Progress Report for last update. Task Completed.	
(4) – Geotechnical Engineering & Report (Task B)	% Complete = 100%
Update – L&G has completed Geotechnical Report for this Task. This task has been completed this period.	
(5) – Geotechnical Exploration & Laboratory Testing (Task C)	% Complete = 0%
No Update	
(6) – Geotechnical Engineering & Report (Task C)	% Complete = 0%
No Update	

Should you have any comments or questions regarding this submittal, please do not hesitate to call me at (956) 583-7117.

Respectfully Submitted,



David A. Saenz, P.E., C.F.M.
Project Manager / Project Engineer



L & G Engineering Laboratory, LLC Invoice

2100 W. Expressway 83
 Mercedes, Texas 78570
 (956) 565-0760 • Fax (956) 565-6746

Date	4/30/2015
Invoice #	9101

Bill To
L&G Engineering 2100 W. Exp 83 Mercedes, Tx 78570

Ship To
La Joya Watershed Imprvts. Project Ph. I Geotechnical Engineering Services

Job #	Due Date
GL14030	5/10/2015

Description	% Complete	Neg. Amt	Prev. Invoiced	Inv. To Date	Amount Due
(Task A)					
(1) Geotechnical Exploration Laboratory Testing	100.00%	16,829.66	16,829.66		0.00
(2) Geotechnical Engineering & Report	100.00%	10,708.98	8,219.62		2,489.36
(Task B)					
(3) Geotechnical Exploration & Laboratory Testing	100.00%	12,326.12	12,326.12		0.00
(4) Geotechnical Engineering & Report	100.00%	8,836.16			8,836.16
(Task C)					
(5) Geotechnical Exploration & Laboratory Testing	0.00%	15,235.62			0.00
(6) Geotechnical Engineering & Report	0.00%	14,066.34			0.00

L&G appreciates the opportunity to serve your Geotechnical & Construction Material Testing needs.

Total \$11,325.52

Payments/Credits \$0.00

Balance Due \$11,325.52

275

R. O. W. SURVEYING SERVICES, LLC.

April 30, 2015

Jacinto Garza, President/CEO
L & G Engineering
Attn: **Reza Badiozzamani, P.E.**
2100 W. Expressway 83
Mercedes, Texas 78570

RE: **La Joya Watershed-Work Authorization #8**
Invoice #R15-026
Limits: From: 3 ½ Mile North Tom Gil To: Liberty Road Caliche Pit

Dear Mr. Badiozzamani:

Attached for your approval is our invoice for services rendered for the month of April, 2015:

ROW's Invoice

Exhibit C – Work Schedule

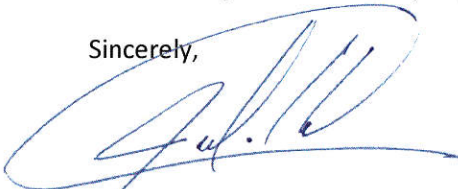
Progress Report

	Contract Amount	Invoice to Date	Paid to Date	Current Amount Due	Contract Balance	Percent Complete
FC 150-Field Surveying						
Phase I - Primary & Secondary Control Phase II – DTM Topography and Cross-Sections Phase III – Final Report and Deliverables Project Management & Oversight	\$67,062	\$40,237	\$6,706	\$12,175	\$26,825	60%
Total	\$67,062	\$40,237	\$6,706		\$26,825	60%
		<i>Total Due</i>		\$12,175		

Make Checks Payable to: **R.O.W. Surveying Services, LLC.**

Thank you for your business. Should you have any questions or require additional information, please do not hesitate to give me a call at (956) 451-2670.

Sincerely,



Julio Cerda, P.E.
President/CEO

DPS

R. O. W. SURVEYING SERVICES

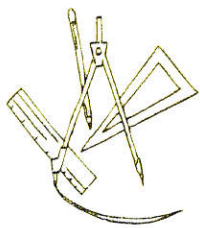
La Joya Outfall Progress Report as of 04/30/15:

Project Management:

- Continued communication between landowners regarding right of entry. Attached updated Ownership list in excel format.
- Met with TxDOT, Hidalgo County, L&G regarding ongoing projects in the Peñitas area
- Coordinate office staff on daily assignments and project progress

General Task:

- Continue topographic survey along proposed alignment on properties who have replied with a positive right of entry.
- Project Horizontal and Vertical control has been set with GPS and vertical values tied to Liberty Road Control
- Continue locating utilities that may be in conflict with proposed alignment.
- Continue to process field data for final deliverable.



L&G Consulting Engineers, Inc.

April 30, 2015

Mr. Raul Sesin, P.E. – District Manager

Hidalgo County Drainage District #1

902 N. Doolittle

Edinburg, Texas 78542

RE: Work Authorization #4 on La Joya Watershed Improvement Project

Job # 130104

P.O. # 625396

Dear Mr. Sesin,

Attached for your review and approval is our invoice for the services rendered during the month of April 2015 on the subject referenced project.

The following is attached:

- L&G's Invoice #11325138
- CD w/ Electronic Files of Data for:
 - R.O.W. Surveying Services – Monthly Progress Report and Invoice (#R15-026) – April 30, 2015
 - L&G Lab – Monthly Progress Report and Invoice (#9101) – April 30, 2015
 - Task A (Task 1a & 5a)
 - Task B (Task 1b & 5b)
 - Task C (Task 1c, 2c & 5c)

TASK		% COMPL
<u>Task A</u>		
Construction Plans for Liberty Pit Detention Facility		
Task 1a ~ Coordination & Management of ROW and Design Survey, & Geotechnical	L&G	93.5%
Update – L&G has held weekly meetings with L&G Lab and has coordinated the Geotechnical aspect of this project through to completion.		
Task 2a ~ (SUB): Field and Design Survey (Utility Locates) - #3 (FC150)	ROW SS	90.0%
No Update – See progress report from R.O.W. S.S as of January 30, 2015		
Task 3a ~ (SUB): ROW Map, Parcel Sketches & Field Notes - #3 (FC130)	ROW SS	90.0%
No Update – See progress report from R.O.W. S.S as of December 31, 2014		
Task 4a ~ Acquisition of ROW for Proposed Facility; Negotiation with Land Owner(s)	L&G ROW	19.2%
No Update – See progress report dated April 1, 2015		

Task 5a ~ (SUB): Geotechnical Exploration & Analyses for Proposed Facility - #2	L&G LAB	100.0%
Update – See progress report from L&G Lab dated April 30, 2015		
Task 6a ~ Conceptual Site Plan Identifying 60% of Recovered ROW & Design Surveys (Prior to PS&E Release)	L&G	100.0%
Task Complete – See progress report dated January 2, 2015		
Task 7a ~ Plans, Specifications & Estimates (PS&E) for Proposed Facility & 400ft. Zone for Commercial Development	L&G	80.0%
No Update – See progress report dated March 2, 2015		
<u>Task B</u>		
Construction Plan for South Basin Pit Detention Facility		
Task 1b ~ Coordination & Management of ROW and Design Survey, & Geotechnical	L&G	93.9%
Update – L&G has held weekly meetings with L&G Lab and has coordinated the Geotechnical aspect of this project through to completion.		
Task 2b ~ (SUB): Field and Design Survey (Utility Locates) - #3 (FC150)	ROWS S	90.0%
No Update – See progress report from R.O.W. SS as of December 31, 2014		
Task 3b ~ (SUB): ROW Map, Parcel Sketches & Field Notes - #3 (FC130)	ROWS S	90.0%
No Update – See progress report from R.O.W. SS as of October 31, 2014		
Task 4b ~ Acquisition of ROW for Proposed Facility; Negotiation with Land Owner(s)	L&G ROW	0.0%
Task Not Started		
Task 5b ~ (SUB): Geotechnical Exploration & Analyses for Proposed Facility - #2	L&G LAB	100.0%
Update – See progress report from L&G Lab dated April 30, 2015 (see attached)		
Task 6b ~ Conceptual Site Plan Identifying 60% of Recovered ROW & Design Surveys (Prior to PS&E Release)	L&G	100.0%
Task Complete – See progress report dated January 2, 2015		
Task 7b ~ Plans, Specifications & Estimates (PS&E) for Proposed Facility	L&G	80.0%
No Update – See progress report dated March 2, 2015		
<u>Task C</u>		
Phase I Outfall Development of La Joya Watershed Drainage Master Plan		
Task 1c ~ Coordination & Management of ROW Base Map, Design Survey & Geotechnical	L&G	38.0%

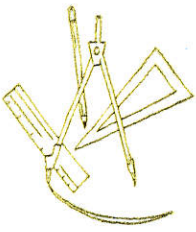
Update – L&G has held weekly meetings with R.O.W. Surveying Services, LLC and continued to coordinate the ROW and Design Survey aspect of this project.		
Task 2c ~ Design Surveys (Utility Locates) - #3 (FC150)	ROWS S	60.0%
Update – See progress report from R.O.W. SS as of April 30, 2015 (see attached)		
Task 3c ~ (SUB): Geotechnical Exploration & Analyses for Proposed Facility	L&G LAB	0.0%
Task Not Started		
Task 4c ~ Preliminary Detailed Schematic for Proposed Phase I Outfall	L&G	100.0%
Task Complete – See progress report dated February 2, 2015		
Task 5c ~ Plans, Specifications & Estimates (PS&E) for Proposed Facility	L&G	50.0%
Update – L&G has continued project development of PS&E including Title Sheet, Overall Project Layout, Plan & Profile (P&P) Sheets, Culvert Crossings and incorporation of pertinent Design Standards.		

Should you have any questions regarding this submittal or would like clarification on any aspect of the project, please do not hesitate to call me at (956) 585-1909.

Sincerely,



David Saenz, P.E., C.F.M.
Project Manager
L&G Engineering



L&G Engineering Laboratory

Construction Material Testing
Geotechnical Engineering

**GEOTECHNICAL INVESTIGATION
FOR
LA JOYA WATERSHED IMPROVEMENT PROJECT – PHASE I
TASK A – LIBERTY PIT DETENTION BASIN**

HIDALGO COUNTY

**Prepared For:
L&G Consulting Engineers, Inc.**

**Prepared By:
L&G Engineering Laboratory, L.L.C.
[Texas Registered Engineering Firm F-6633]**

**L&G Project No. GL14030
April 30, 2015**



04/30/2015

**David A. Saenz, P.E
Project Engineer**

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INTRODUCTION

L&G Engineering Laboratory, L.L.C. (L&G Lab) has been contracted by **L&G Consulting Engineers, Inc. (L&G Eng)**, to perform a subsurface geotechnical investigation and engineering analysis to assist in the preparation of Plans, Specifications and Estimates (PS&E) for the La Joya Watershed Improvement Project (Phase I) – Task A Liberty Pit Detention Basin in Hidalgo County, Texas. This report includes boring logs, figures, global stability modeling of proposed detention pond side slopes (slope stability), analysis of proposed excavation soils (based on proposed PS&E cut line) and general overall construction recommendations.

GENERAL PROJECT OVERVIEW

Project Description

L&G Lab is pleased to submit this document presenting our findings as a result of the Geotechnical Study performed at the request of **L&G Eng**. It is our understanding that this project consists of the development of a proposed detention basin facility to be built in the area of an existing caliche pit located north of Peñitas, TX, approximately 1.75 miles north of US Expressway 83 and along the east side of Liberty Rd in Hidalgo County. It is further our understanding that the existing caliche pit is approximately 60 acres and varies in elevation from approximately +205 feet to +170 feet. The proposed project consists of excavating the entirety of the existing pit to an assumed bottom elevation of +170 feet (or approximately 30 to 35 feet in depth) and utilizing maximum 3 (horizontal) to 1 (vertical) side slopes while leaving a 16 to 20 foot perimeter access road at the top. A bench section will be incorporated into the slope; however for conservatism the bench is not included in the slope stability model (generic 3:1 slope full maximum height modeled for worst case analysis). General illustrations of the existing site and proposed project schematic can be found in Appendix A of this report.

Scope and Limitations of Investigation

This report has been prepared in accordance with accepted Geotechnical Engineering practices for the subject project site and the anticipated construction. No specific warranty program or other standards, except acceptable industry standards, were followed in this investigation. This report is intended for use by **L&G Eng** and their representatives. This report may not contain sufficient information for purposes of other parties or other uses in determining construction means and methods.

The strata shown on the boring logs (included in Appendix B of this report) represent the in-situ conditions at the boring log locations during exploration. These stratifications represent approximate boundaries between subsurface materials; their actual transition may be gradual. Variations may occur between boring locations. It should be noted that the exploratory borings were performed within the limits of the proposed construction as requested and agreed upon by **L&G Eng**.

The benchmarks of this geotechnical study are to:

1. explore the general existing subsurface conditions at the site
2. evaluate the relevant engineering properties of the subsurface materials
3. develop global stability models and analyses for verification of proposed slope stability
4. analyze soil make-up of the proposed cut materials and log for future usage
5. provide general construction recommendations regarding all aspects of the project

The scope of this geotechnical engineering study does not include environmental assessment of the air, soil, rock or water conditions on or adjacent to the site. No environmental opinions are presented in this report.

EXISTING SURFACE AND SUB-SURFACE CONDITIONS

Site Location / Description

The site of the proposed project is located in Hidalgo County north of Peñitas, TX, approximately 1.75 miles north of US Expressway 83 and along the east side of Liberty Rd. The existing site is currently utilized as a materials pit (primarily for caliche) and shows signs of heavy excavation in the past (elevations within the existing pit vary from +205 feet to +170 feet). The boring locations were drilled as close as possible to the locations specified by the Client as shown on Figure 2 in Appendix A. No surveyor was contracted to determine the exact coordinates for the borings, as this was not part of the scope of work for the project; however, field handheld GPS coordinates were retrieved and are noted on the boring logs in Appendix B.

Geology

The Geologic Atlas of Texas, McAllen-Brownsville Sheet, dated 1976, indicates that the project site is located primarily within the *Goliad Formation (Pg)* of the Pliocene geological epoch (part of the Tertiary period). The Goliad Formation includes “*Clay, sand, sandstone, marl, caliche, limestone, and conglomerate; clay, commonly light shades of pink and green, calcareous concretions; sand and sandstone, medium to very coarse grained, in part crossbedded, mostly quartz, some black and red chert; conglomerate, black chert and dark siliceous granules and pebbles in calcareous (caliche) matrix; sandstone and conglomerate locally well bedded; marl and limestone poorly bedded or massive; Tertiary vertebrate and reworked Cretaceous invertebrate fossils fairly common; thickness up to 600 feet*”.

Soil Survey Description

According to the Soil Survey of Hidalgo County, Texas, published by the United States Department of Agriculture (issued June 1981, soil maps current), the proposed project encompasses several soil map units along the alignment. The primary soil map unit along the alignment and description of said unit is as follows:

Soil Map Unit #3 – Brennan Fine Sandy Loam, 0 to 1 Percent Slopes – This unit consists of deep, nearly level formations on convex uplands. This unit is well drained and has a moderate available water capacity (about 8.5 inches). It is non-saline to very slightly saline (1.0 to 4.0

mmhos/cm) with no frequency of flooding or ponding. Permeability is moderate and surface runoff is medium. Soil has a maximum calcium carbonate content of 30%. The typical profile for this soil is 0 to 13 inches: dark brown fine sandy loam, 13 to 47 inches: brown to pale brown sandy clay loam and 47 to 65 inches: very pale brown sandy clay loam. Primary soil properties of soil unit include Silty Sand (SM), Silty Clayey Sand (SM-SC), Clayey Sand (SC) and Lean Sandy Clay (CL) with PI ranging from NP to 9 in the upper 13 feet and 8 to 22 in the 13 to 65 feet range (low shrink-swell potential). It should be noted, for clarity, this soil would be representative of the upper perimeter section of the existing caliche pit only (where existing ground matched general existing grade).

Rainfall

The mean annual precipitation for this area of Hidalgo County is approximately 19-24 inches, as reported by the U.S. Department of Agriculture Soil Conservation Service. The geotechnical investigation, performed in November 2014, was conducted during a non-drought condition (“none” as noted by the U.S. Drought Monitor). The National Oceanic and Atmospheric Administration (NOAA) reports for the subject date indicated that no significant rainfall observations (at least one inch) occurred immediately prior to or during our exploration.

SITE INVESTIGATION

Soil Borings and Field/Laboratory Tests

Subsurface conditions at the site were evaluated through ten (10) borings drilled to a depth of 6.5 to 45 feet below natural ground (variation in depths was based on location and elevation within the existing caliche pit). The overall breakdown of borings and corresponding depths is as follows in Table 1:

Boring No.	Approx. Boring Location	Approx. Ground El.	Boring Depth
B-DP-01	NW Perimeter of Pit	+205 feet	45 feet
B-DP-02	NE Perimeter of Pit	+205 feet	45 feet
B-DP-03	Interior of Pit	+180 feet	**6.5 feet
B-DP-04	Central East Perimeter of Pit	+205 feet	45 feet
B-DP-05	Central West Perimeter of Pit	+200 feet	40 feet
B-DP-06	Interior of Pit (High Grade)	+205 feet	45 feet
B-DP-07	SW Perimeter of Pit	+200 feet	40 feet
B-DP-08	Interior of Pit (SW)	+180 feet	20 feet
B-DP-09	Interior of Pit (SE)	+200 feet	40 feet
B-DP-10	SE Perimeter of Pit	+200 feet	40 feet

Table 1 – Geotechnical Boring Description (Location/Elevation/Depth)

**all depths are referenced from existing natural ground*

***boring was originally scheduled to be drilled to 20 feet but was terminated due to very dense layer*

All exploratory borings were drilled at the approximate locations shown on Figures in Appendix A. The borings were drilled in general accordance with American Society of Testing Materials Procedure (ASTM) D 420 and D 1452 using a truck mounted drilling rig.

As part of the sampling procedures, split barrel (spoon) and Standard Penetration Tests (SPT) were performed and recorded. Standard Penetration Test results are noted on the boring logs as blows per foot or twelve (12) inch increment. The sampler was advanced through three (3) consecutive six (6) inch increments; however, the first six inch increment is considered the seating drive, which eliminates the effect of cuttings or disturbances on the test result. The sum of the blows for the last two six (6) inch increments is considered the “standard penetration resistance value” or “field N-value”. Where hard or very dense materials were encountered, the SPT was terminated and noted on the boring log when one of the following situations occurred:

1. *a total of 50 blows were applied on one six inch increment*
2. *a total of 100 blows were applied during the test*
3. *no observation of advancement of the sampler was detected during the application of 10 consecutive blows from the hammer*

Representative portions of the samples were identified, packaged, sealed in containers to reduce moisture loss, and transported to our laboratory for subsequent testing. In the laboratory, each sample was evaluated and visually classified by a member of our geotechnical engineering staff. The properties of each stratum were evaluated by a series of laboratory index tests. A summary of the laboratory data and their corresponding depths are presented on the boring logs in Appendix B.

Samples will be retained in our laboratory for 30 days after submittal of this report. Other arrangements may be provided at the request of the Client.

Field Vane Shear Testing

In-situ vane shear testing was performed to compliment the SPT test results and to verify calculations of undrained shear strength as correlated from SPT testing where very soft cohesive materials were present (at locations selected by Geotechnical Engineer). Field vane shear testing was performed in accordance with American Society of Testing Materials procedures (ASTM D2573) and results are noted on the boring logs and in Table 2. The field vane is particularly helpful in determining more accurate approximations of soil strength in very soft clays. It should be noted, shear strength values noted in the table have been corrected based on Appendix X1 of ASTM D2573.

Boring No.	Approx. Location	Depth (ft)	Undrained Shear Strength (psf)
B-DP-10	SE Corner of Pit	2	1360
		6	840
		12	2590

Table 2 – Geotechnical Boring Description (Location/Elevation/Depth)

**all depths are referenced from existing natural ground*

Subsurface Stratigraphy

On the basis of our soil borings, there are several generalized strata that possess similar physical and engineering characteristics at the boring locations associated with each particular site. The lines designating the interfaces between strata on the boring logs represent approximate boundaries. Transitions between strata may be gradual and may vary from the reported logs. Table 3A through Table 3G show a summary (generalized) of the respective soil strata in the profile for sections of the project limits. (See Appendix B for detailed boring logs).

Location 1 – North Perimeter of Pit Soil Borings Utilized for Analysis: Borings B-DP-01 thru B-DP-02

This location showed primarily a mixture of dark brown to brown sandy lean clay (CL) in the upper 24 to 34 feet of soil profile with clayey gravel and poorly graded gravel with clay/sand (GC & GP-GC) below. The upper soils plasticity index ranged from 16 to 35 and fines contents (% of clay & silt) ranged from 51 to 62. The lower soils were noted as primarily gravel with gravel sized primarily ½ inch to 2 inch (sub-rounded and sub-angular). All soils were noted as dry.

Table 3A – Existing Soil Strata & Description

**all depths are referenced from existing natural ground*

Location 2 – Interior of Pit (Near +170 Elevation Section) Soil Borings Utilized for Analysis: Boring B-DP-03

This location showed a brown silty clayey sand w/ gravel layer (SC-SM) in the upper 6.5 feet of soil profile followed by a very dense/hard sandstone or claystone bedrock layer (drilling was terminated upon determination of the layer). The upper soils plasticity index ranged from Non-Plastic (NP) to 8 and fines contents (% of clay & silt) ranged from 11 to 16. All soils were noted as dry.

Table 3B – Existing Soil Strata & Description

**all depths are referenced from existing natural ground*

Location 3 – Central Perimeter Section of Pit Soil Borings Utilized for Analysis: Boring B-DP-04 thru B-DP-05

This location showed primarily a mixture of dark brown to brown sandy lean clays and clayey sands (CL & SC) in the upper 24 feet of soil profile with clayey gravel, poorly graded gravel with clay/sand and poorly graded gravel (GC, GP-GC & GP) below. The upper soils plasticity index ranged from 11 to 29 on the East (B-DP-04) and 9 to 45 on the West (B-DP-05) and fines contents (% of clay & silt) ranged from 18 to 64 (binder was fat on the West). The lower soils were noted as primarily gravel with gravel sized primarily ¼ inch to 1 inch (sub-rounded and sub-angular). All soils were noted as dry.

Table 3C – Existing Soil Strata & Description

**all depths are referenced from existing natural ground*

Location 4 – Interior of Pit (High Grade – Hill Section in Pit)

Soil Borings Utilized for Analysis:

Boring B-DP-06

This location showed a dark brown to brown clayey sand (lean) and sandy lean clay layer (SC & CL) in the upper 34 feet followed by a reddish brown w/ olive streaks fat clay layer (CH) below. The upper soils plasticity index ranged from 14 to 16 and fines contents (% of clay & silt) ranged from 34 to 51. The lower soils plasticity index was noted as 37 and fines content was 95. Upper soils were noted as dry and lower soils were noted as moist.

Table 3D – Existing Soil Strata & Description

**all depths are referenced from existing natural ground*

Location 5 – SW Perimeter of Pit

Soil Borings Utilized for Analysis:

Boring B-DP-07

This location showed a dark brown to light brown sandy lean clay layer (CL) in the upper 15 feet followed by a 10 foot clayey gravel layer (GC) and ending in a clayey sand and poorly graded sand w/ clay layer (SC & SP-SC). The upper soils plasticity index ranged from 11 to 20 and fines contents (% of clay & silt) ranged from 51 to 58. The clayey gravel layer plasticity index was noted as 11 and fines content was 19. The lower sand layer plasticity indices were not determined (or proved NP). Upper soils (clay and gravel) were noted as dry and lower soils were noted as moist to wet (water-strike noted at 20 feet from top of bore).

Table 3E – Existing Soil Strata & Description

**all depths are referenced from existing natural ground*

Location 6 – Interior of Pit (SW & SE)

Soil Borings Utilized for Analysis:

Borings B-DP-08 thru B-DP-09

This location showed primarily a mixture of brown to light brown clayey sand, silty clayey sand and silty sand (SC, SC-SM & SM) throughout the soil profile. Plasticity index ranged from NP to 16 (excluding outlier lean clay layer with PI = 28 noted in B-DP-08). Fines contents (% of clay & silt) ranged from 17 to 48% (excluding outlier lean clay layer with %-200 = 90 noted in B-DP-08). Soils were noted as dry in the upper 20 feet and moist to wet in the lower soils (water-strike noted at 12 feet for B-DP-08 and 27 feet for B-DP-09 from top of bore).

Table 3F – Existing Soil Strata & Description

**all depths are referenced from existing natural ground*

Location 7 – SE Perimeter of Pit

Soil Borings Utilized for Analysis:

Borings B-DP-10

This location showed a dark brown to brown clayey sand layer (SC) in the upper 15 feet followed by a thin seam layer of clayey gravel (GC) atop a 15 foot layer of fat clay (CH) ending in another clayey sand layer (SC). The upper soils plasticity index ranged from 14 to 15 and fines contents (% of clay & silt) were 44. The fat clay layer plasticity index was noted as 32 and fines content was 97. The bottom clayey sand layer plasticity index was not noted, however the fines content was 13. Soils were noted as dry in the upper 35 feet and moist to wet in the lower soils (water-strike noted at 28 feet from top of bore).

Table 3G – Existing Soil Strata & Description

**all depths are referenced from existing natural ground*

Water Strikes

Water strikes were encountered during the drilling operations at 4 boring locations (all on the southern section of the site). Water strikes were noted at approximately 12 to 28 feet below top of natural ground at the 4 boring locations (elevation 168 to 180 feet). Water strikes are noted on the boring logs in Appendix B. 24 hour water level readings were not taken as part of this study. It should be noted that fluctuations in groundwater levels are influenced by variations in rainfall and surface water run-off from season to season. The construction process itself may also cause variations in the groundwater level. If the subsurface water elevation is critical to the construction process the Contractor should check the subsurface water conditions just prior to construction excavation using piezometer wells.

GEOTECHNICAL BORING ANALYSIS

The following tests were completed on various soil samples retrieved as part of this Geotechnical Investigation at each boring location. The general summary of results by location is presented in the 'Subsurface Stratigraphy' section of this report. The detailed results are included on the boring logs and gradation curves included in Appendix B.

Moisture Content

The moisture content of a soil is defined as the ratio of the weight of the water in the sample to the dry weight of the soil sample. The moisture contents for the samples obtained as part of our geotechnical exploration were performed in compliance with ASTM procedure D2216 (and Tex-103-E). Variance in percentages within the samples can be attributed to a multitude of issues including, range in depth, distance between samples, location of groundwater table and seasonal moisture zone. The variation could also be caused by differences in soil classifications, as some soils such as loose gravels and sands are made up of larger particles and thus exhibit more voids as a soil structure (higher capability to hold water than fine grained soils). Finer grained denser soils, though, due to high impermeability, may also exhibit high moisture contents in certain instances due to the slower movement of water through the soil structure. A comprehensive list of all moisture contents by corresponding depth can be found on the boring logs.

Plasticity Index

The Plasticity Index (PI) is defined as the difference between the liquid limit and the plastic limit of a soil. These limits are commonly referred to as the Atterberg limits, which describe the consistency of soils with respect to their varying moisture contents. The liquid limit is defined as the moisture content at which soil begins to transition from a plastic to a liquid state and begins to behave as a liquid material by beginning to flow. The plastic limit refers to the water content of a soil at the point of transition from a semisolid to a plastic state where soil starts to exhibit plastic behavior. A soils behavior can be divided into four basic states: liquid, plastic, semisolid and solid. The plasticity index shows the range in which a soil acts in a plastic state. Experience has shown that the more plastic a soil is the more expansive and compressive it will act. The plasticity indices for the samples obtained as part of our geotechnical exploration were performed in compliance with ASTM procedure D4318 (and Tex-104-E thru Tex-106-E). A

comprehensive list of all plasticity indices by corresponding depth can be found on the boring logs.

Particle Size Analysis (Determination of Fines Content)

The standard grain size analysis is used to determine the relative proportions of different grain sizes as they are distributed along a range of different sized sieves. The minus 200 sieve analysis is used commonly as a tool for soil classification and identification using the Unified Soils Classification System. Results for this test are reported as a percentage of soil passing the No. 200 sieve, which has openings 0.075mm wide. This test is also used to determine the suitability of soil for construction purposes and to estimate probable seepage through soils. Generally a % - 200 greater than 50% indicates a non-granular cohesive soil with large amounts of fines in the soil composition. The particle size analyses for the samples obtained as part of our geotechnical exploration were performed in compliance with ASTM procedure D1140 (and Tex-111-E). A comprehensive list of all fines contents by corresponding depth can be found on the boring logs.

GEOTECHNICAL ENGINEERING ANALYSES

Global Stability of Detention Basin Side Slopes

It is the understanding of **L&G Lab** that the proposed Detention Basin facility geometry will utilize a relatively flat access perimeter road (minimal cross slope) with maximum pond side slopes of no steeper than 3 horizontal units to 1 vertical unit (3:1) with a maximum depth of 30 to 35 feet as previously noted in this report (See 'Project Description').

This report includes complete Global Stability Analysis as the means to evaluate detention basin side slope geometry with regard to existing top strata (proposed slope sections), section geometry and underlying foundation soils. The Factor of Safety requirements utilized in this analysis are referenced from the 2012 TxDOT Geotechnical Manual. For this project, we will utilize the threshold value of $FS = 1.3$ for all analyses.

The limit equilibrium method of analysis is the most commonly used method of analyzing the overall stability of both natural and manmade slopes as well as retaining wall structures. The fundamental principles behind this method are that the soil mass above a potential failure surface acts as a rigid body, and the shear strength of the material is fully engaged at all points along the surface at the moment of initial movement. A failure criterion is adopted and the conditions for static equilibrium are applied to analyze the problem. This method of analysis assumes that no strain takes place until the failure condition is reached. The results of the analyses are expressed in terms of a safety factor in the form of a ratio of the available shear strength along the potential failure surface to the shear stress required to maintain equilibrium of the failure mass under the applied loads. This method has traditionally been used in the analysis of man-made earth structures such as embankments, levees and retaining wall structures.

The Global Stability Analyses of the embankment sections (slopes) was performed using **GSTABL with STEDwin** Version 7 software program. Analyses were performed using the Modified Bishop Method of slices for circular surfaces (random surfaces were not investigated in this report). It should be noted that the possibility of undetected anomalies in the soil, such as

remnants of previous sliding, tension cracks or water-bearing seams of sand, could potentially alter or negate the findings of the stability analysis. Through the utilization of the GSTABL software program, conservative modeling techniques, and engineering judgment we present what we believe are the most accurate factors of safety.

Input parameters such as shear strength (cohesion and angle of friction) were correlated from the results of the SPT testing and laboratory soil classification testing (unit weight was assumed based on material properties from laboratory tests). Both short-term (undrained) and long-term (drained) conditions were analyzed in accordance with the TxDOT Geotechnical Manual. Correlations for undrained parameters were based on correlation equations of Stroud (1974), Bowles (1988) and Teng (1962). In addition it should be noted, undrained parameters were verified and supplemented with In-Place Vane Shear testing in accordance with ASTM D 2573. Correlations for drained parameters were based on correlation equations of Holtz & Kovacks (1981), Bjerrum and Simons (1960) and Gibson (1953). It should be noted; only total shear strengths of soils were input into the GSTABL models for the short-term (undrained) condition, as opposed to individual cohesions and friction angles to maintain consistency with the strength correlations. In addition it should be noted, a minimum residual cohesion value of 50 pounds per square foot (psf) was incorporated into the long-term (drained) condition models.

The geometric model of the Detention Basin Side Slopes utilized for analysis consisted of maximum height (approximated as 35 feet) assumed at all boring locations along the proposed detention basin for a worst case analysis. Traffic surcharge loading was incorporated into the modeling considered equivalent to two (2) feet of soil (approximately 250 psf) placed atop the slopes (to model the access road). Piezometric surfaces (groundwater surfaces) were modeled at depths noted in boring logs. The model was analyzed as follows (See Appendix D for Global Stability Runs):

- Worst Case Analysis – Maximum Ht. Pond, Maximum Side Slope, Worst Boring
 - The global stability analysis for this side slope was completed utilizing an assumed pond height of 35.0 foot with 3:1 slopes.
 - The global stability analysis was completed using boring B-DP-10 (undrained) and B-DP-05 (drained). The resulting critical Factors of Safety were equal to **1.81** for the short-term condition (undrained) and **1.67** for the long-term condition (drained). It should be noted, the FOS values are above the project threshold minimum of 1.30.

Analyses of Proposed Excavation Soils (Future Usage)

Based on the contour of the existing Liberty Pit the area that will contain the majority of excavated soils will be the southern section of the site. This section of the site contains borings B-DP-04 through B-DP-10. Table 4 provides an estimate of the approximate proposed excavation (cut) depths at each general location. Table 5 provides general soil description within the excavation (cut) depths.

Boring No.	Approx. Boring Location	Approx. Ground El.	Prop. Ground El.	Approx. Cut Depth
B-DP-04	Central East Perimeter of Pit	+205 feet	+170 feet	35 feet
B-DP-05	Central West Perimeter of Pit	+200 feet		30 feet
B-DP-06	Interior of Pit (High Grade)	+205 feet		35 feet
B-DP-07	SW Perimeter of Pit	+200 feet		30 feet
B-DP-08	Interior of Pit (SW)	+180 feet		10 feet
B-DP-09	Interior of Pit (SE)	+200 feet		30 feet
B-DP-10	SE Perimeter of Pit	+200 feet		30 feet

Table 4 – Approximate Excavation Depth (Cut) at General Location of Borings

Boring No.	*Soils in Excavation Depths	Atterberg Limits (Plasticity Index)	Fines Content (-200)
B-DP-04	CL/SC/GP-GC	11-29	24-64
B-DP-05	SC/GC	9-45	18-43
B-DP-06	SC/CL	14-16	34-51
B-DP-07	CL/GC/SP-SC	11-20	19-58
B-DP-08	SC/CL	6-28	31-90
B-DP-09	SC/SC-SM	5-16	27-48
B-DP-10	SC/GC/CH	13-32	30-97

Table 5 – Soil Description in Approximate Excavation Depths (Cut)

*See Boring Logs Legend Sheet in Appendix B for Soil Description

In general the soils slated for removal based on the proposed construction of the Liberty Pit Detention Basin will be suitable for usage as typical roadway embankment in the TxDOT Pharr District based on the requirements denoted in the TxDOT Pharr District Master General Notes for Item 132 – Embankment.

GENERAL CONSTRUCTION CONSIDERATIONS

Excavation and Trenching Recommendations

Where trenches or shallow excavations are to extend to or below a depth of five (5) feet, the Contractor or persons performing the trenching or shallow excavations should adhere to the current Occupational Health and Safety Administration (OSHA) guidelines on trench excavation safety and protection measures. Other industry standards may be applicable. If proposed trenching is to require excavation protection, **L&G Lab** recommends protection be provided in accordance with the requirements of TxDOT 2004 ‘Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges’, Item 402 – Trench Excavation Protection and/or Item 403 – Temporary Special Shoring.

Drainage / Dewatering Recommendations

Drainage is one of the most important aspects to be addressed to ensure the successful construction, installation and longevity of construction projects. Positive surface drainage

should be implemented prior to and during construction to prevent water ponding in all construction areas (especially at trench locations and bedding area of the proposed entrance and exit culverts). If water is present at the construction area, **L&G Lab** recommends that dewatering techniques be used (bailing, point wells, pumping wells, cofferdam structures, or other approved methods) to ensure proper construction of the proposed culvert crossing(s) on a firm dry surface. This will reduce the probability of maintenance problems in the future at these locations. If the culvert areas cannot be de-watered, stabilizing material (lean concrete or cement stabilized fill) may be used to establish a working platform. This material should meet the requirements of Items 400 and 401 of the TxDOT 2004 Standard Specifications.

Detention Pond Side Slope Recommendations

L&G Lab generally recommends utilizing 3(horizontal) to 1(vertical) slopes or flatter for the banks (side slopes) of the detention pond, where possible. Slopes steeper than these may have the potential to cause problems with erosion, slope stability failures (in the form of sloughing or global failures), and general maintenance of the slopes. If steeper slopes become a requirement of this project, **L&G Lab** should be notified to provide updated Slope Stability modeling and calculations. The construction of the channel slopes should include the installation of topsoil and vegetation to assist in reducing erosion, preventing slough failures, and increasing the general slope stability.

Erosion Protection of Inlet & Outlet Structures

Erosion protection is essential in prolonging the life of the proposed drainage structures due to the higher velocities and water forces caused by these structures. Though no locations investigated noted very loose sands in the upper soils, we recommend general good practice measures to counteract any potential problems with future erosion. **L&G Lab** recommends utilizing multiple erosion protection measures at the detention basin entrance and exit locations (culverts, pipes, etc.):

- **L&G Lab** recommends general good practice measures such as good embedment and compaction of supporting soils surrounding these structures to help ensure stability.
- **L&G Lab** recommends that if concrete box culverts or pipes are utilized they include concrete headwalls, wingwalls and riprap at inlet/outlet points with two (2) foot minimum toe walls along all structures for enhanced stability and protection of culvert/pipe bedding and subgrade.
- **L&G Lab** recommends that any circular pipe inlet points to the detention pond provide a concrete splash-pad (or outlet to concrete riprap or flexible erosion protection system) to avoid localized erosion points.
- **L&G Lab** recommends utilizing flexible erosion protection on the detention basin side slopes such as rock riprap (in accordance with Article 432.3 of the TxDOT Standard Specifications) at inlet/outlet locations (alternatively erosion protection measures such as articulated block or rigid erosion protection systems (concrete riprap) may be utilized). In areas where bank protection will not (or cannot) be used, vegetation of earthen slopes and topsoil should be utilized as a minimum to reduce erosion problems.

Embankment Recommendations (If Required)

L&G Lab recommends that Embankment Fill Sections utilized on this project be constructed in accordance with the requirements of TxDOT 2004 'Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges', Item 132 – Embankment. Furthermore, L&G recommends the following controls be followed in accordance with TxDOT Pharr District Master General Notes:

- 'Embankment (DENS CONT) shall be Type C with a max. PI of 40. Material used as embankment material in the top two feet below the bottom of Flexible Base shall meet the following requirements based on preliminary tests and such other tests found necessary by the Engineer.
 - The material shall be such as to produce a well-bonded embankment and shall have a minimum PI of 8 and a maximum PI of 30.'

Compaction method is recommended for Embankment Fill Sections and shall be Density Controlled in accordance with the requirements of TxDOT 2004 'Standard Specifications', Item 132 – Embankment. As specified in the 'Estimated Settlement Analysis' section of this report, we recommend constructing a wick drain grid with sand cap layer prior to constructing embankments. In addition, we recommend Contractor place full height embankments and allow surcharge load to assist in accelerating the settlement process for a minimum of 2 months prior to completing pavement structure atop embankment.

REFERENCES

1. Jacobs, Jerry L., 1981, "Soil Survey of Hidalgo County, Texas", Washington, D.C.
2. TxDOT, 2004, "Standard Specification for the Construction of Highways, Streets, and Bridges", Austin, TX.
3. TxDOT, 2005, "100-E, Soils & Aggregates Test Procedures", Austin, TX.
4. Bureau of Economic Geology, 1976, "Geologic Atlas of Texas, McAllen-Brownsville Datasheet", Austin, TX.
5. Das, Braja M., 1990, "Principles of Foundation Engineering", Boston, Massachusetts.
6. TxDOT, 2000, 2006, 2012 "Geotechnical Manual", Austin, TX
7. TxDOT, 2012, "TxDOT Pharr District Master General Notes" (Updated Nov. 2013)

APPENDIX A – FIGURES

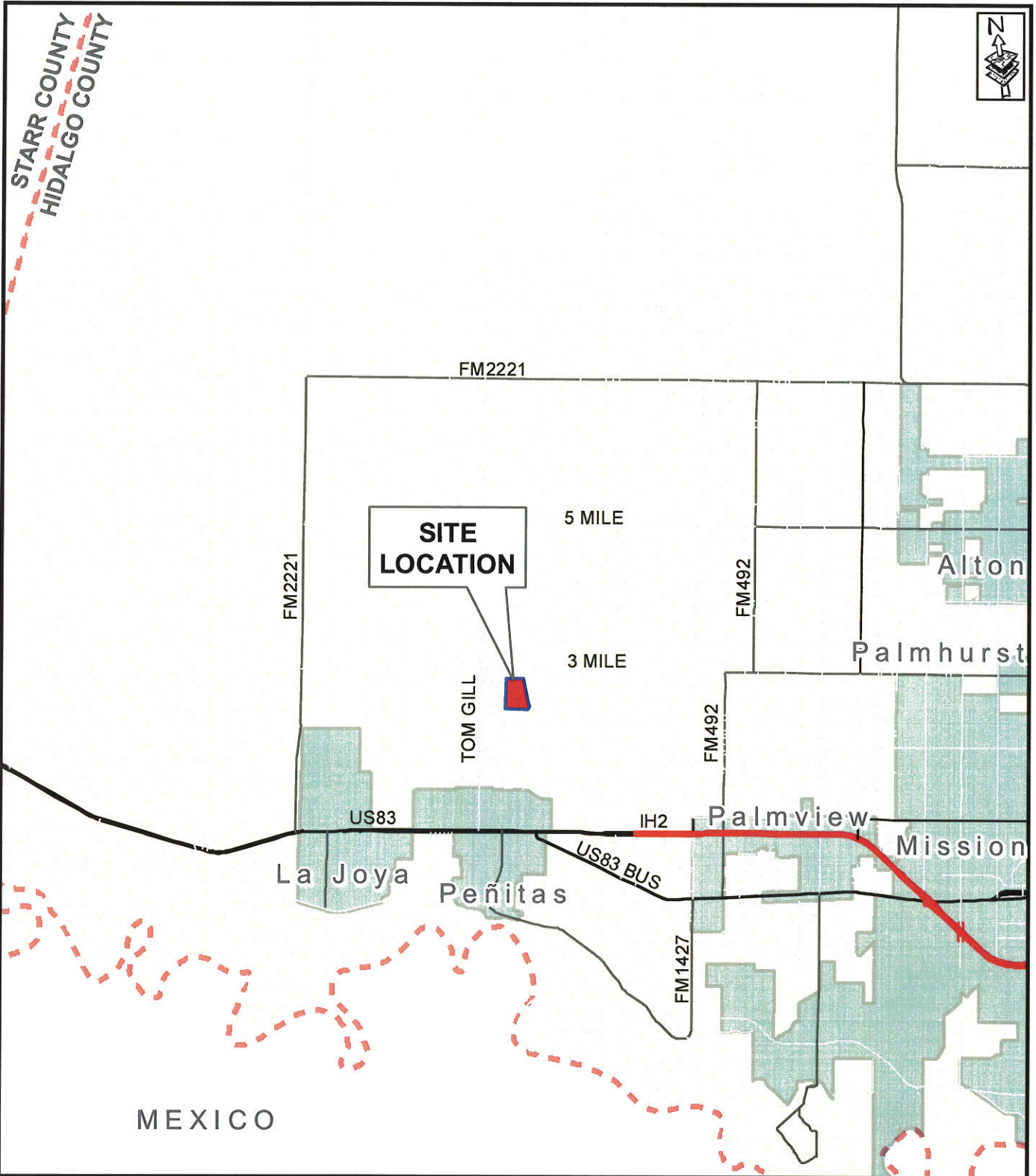


Figure 1

L&G Engineering
 La Joya Watershed
 Improvement Project
Location Map

Legend



-  Interstate
-  US Highway
-  State Highway
-  FM / Rural Road
-  City
-  County

10,000
 Feet
 1 inch = 10,000 feet



Figure 2
 L&G Engineering
 La Joya Watershed
 Improvement Project
 Boring Location Map

Legend

-  Boring Locate
-  Proposed Detention Facility

350
 Feet
 1 inch = 350 feet

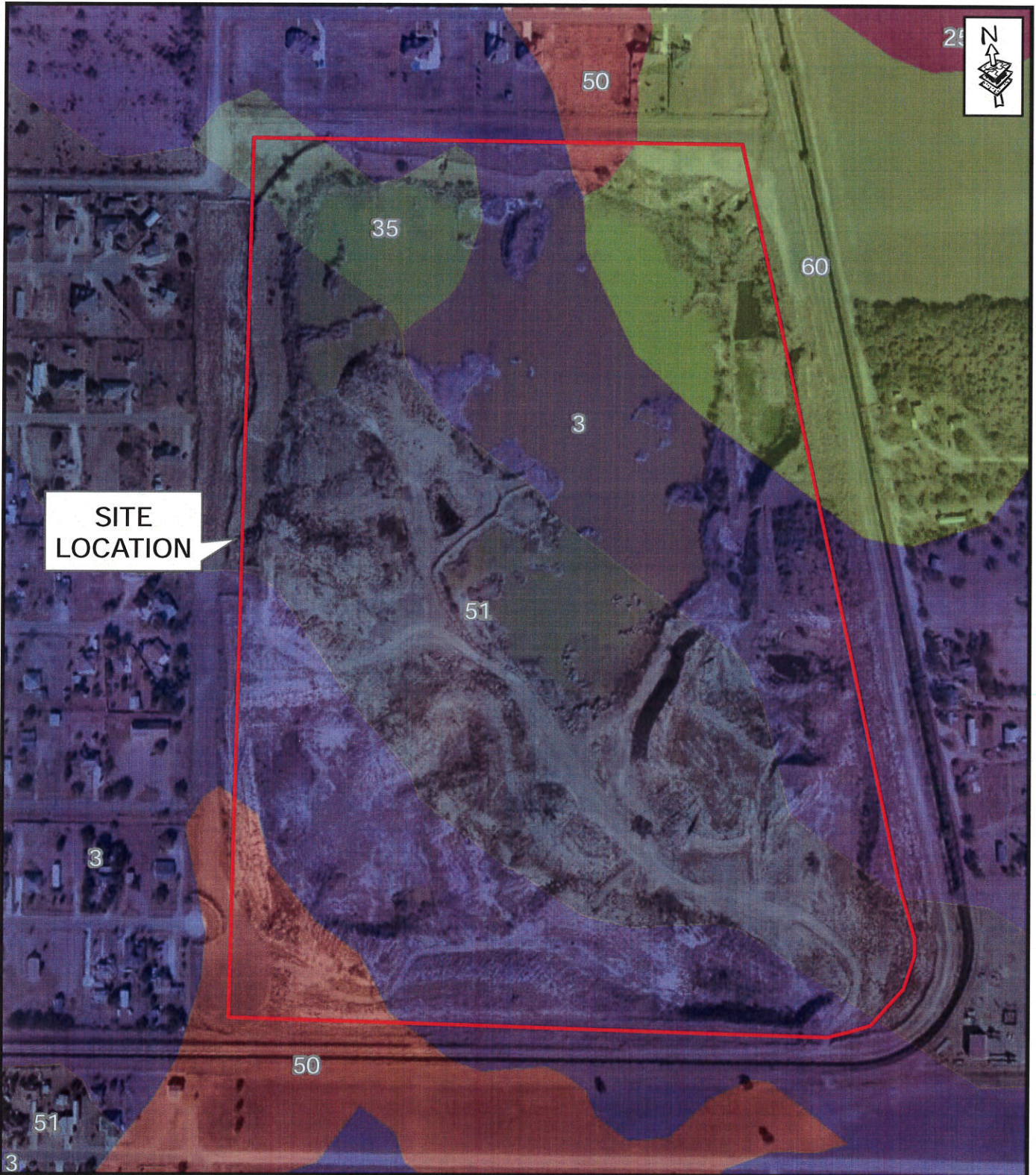


Figure 3
 L&G Engineering
 La Joya Watershed
 Improvement Project
Soil Classification Map
 USDA SOIL CONSERVATION
 SERVICE

Legend

	3 - Brennan Fine Sandy Loam
	35 - McAllen Fine Sandy Loam
	50 - Ramadero Sandy Clay Loam
	51 - Randado-Cuevitas Complex
	60 - Rio Clay Loam

350
 Feet
 1 inch = 350 feet

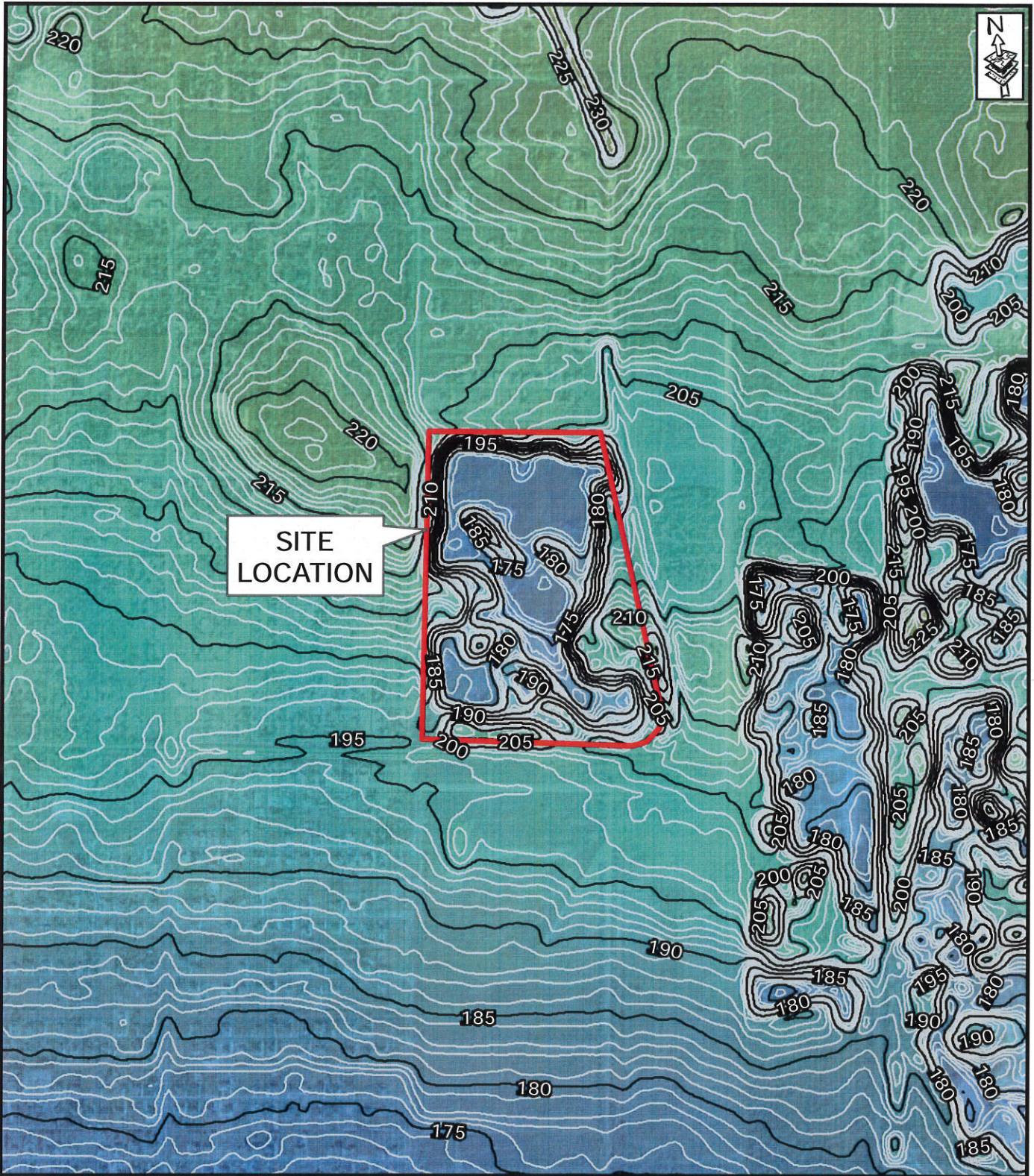
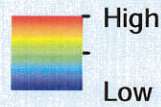


Figure 4
 L&G Engineering
 La Joya Watershed
 Improvement Project
 Digital Elevation Map

Legend

- 5ft Contours
- 1ft Contours



1,000
 Feet
 1 inch = 1,000 feet

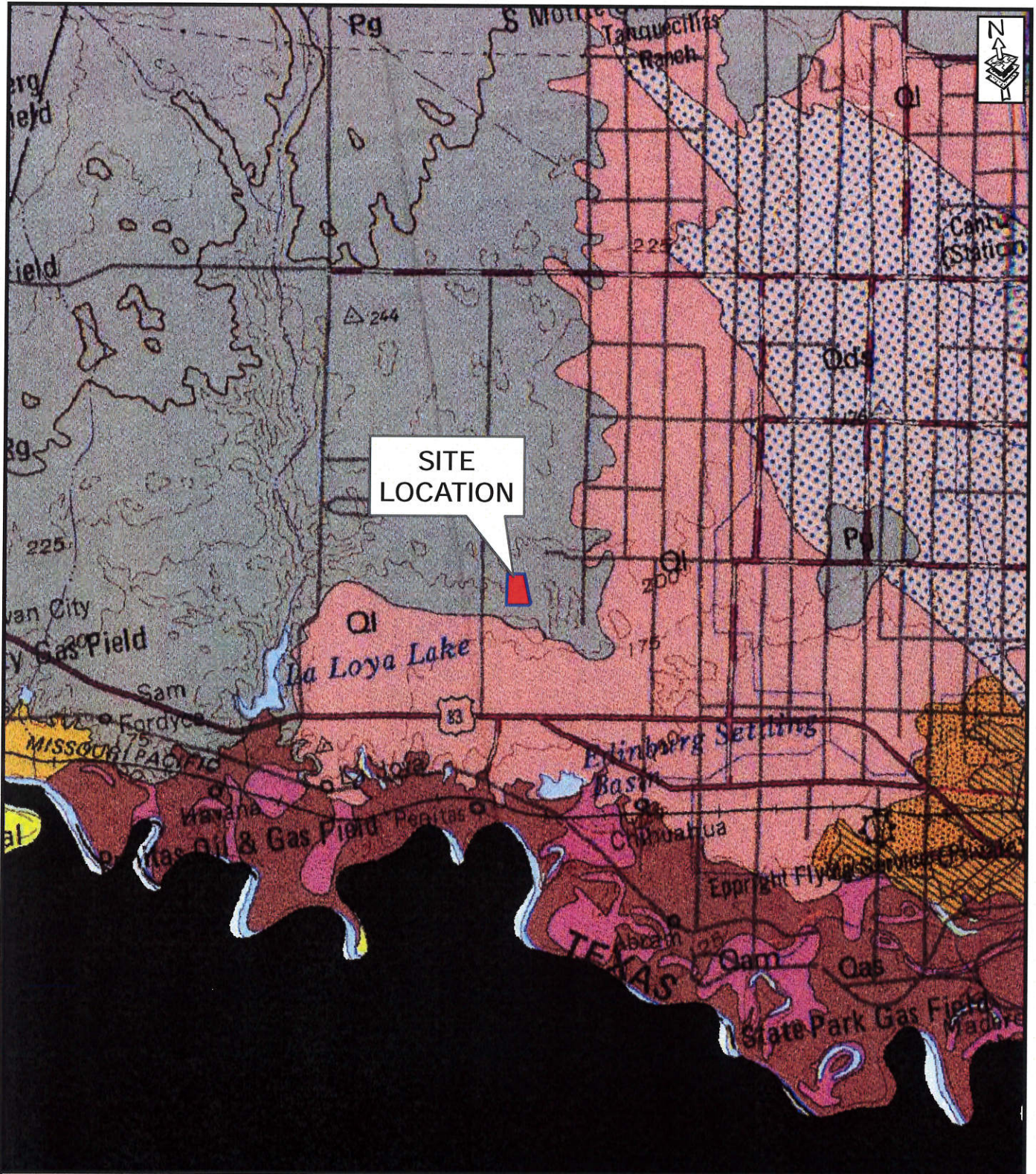


Figure 5
 L&G Engineering
 La Joya Watershed
 Improvement Project
 Geologic Atlas of Texas

Legend

Pg	Goliad Formation	10,000 Feet 1 inch = 10,000 feet
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L&G Engineering Laboratory, I.I.C.
 Construction Material Testing
 Geotechnical Engineering

APPENDIX B – BORING LOGS

1. 1950-1951
2. 1952-1953
3. 1954-1955
4. 1956-1957
5. 1958-1959
6. 1960-1961
7. 1962-1963
8. 1964-1965
9. 1966-1967
10. 1968-1969
11. 1970-1971
12. 1972-1973
13. 1974-1975
14. 1976-1977
15. 1978-1979
16. 1980-1981
17. 1982-1983
18. 1984-1985
19. 1986-1987
20. 1988-1989
21. 1990-1991
22. 1992-1993
23. 1994-1995
24. 1996-1997
25. 1998-1999
26. 2000-2001
27. 2002-2003
28. 2004-2005
29. 2006-2007
30. 2008-2009
31. 2010-2011
32. 2012-2013
33. 2014-2015
34. 2016-2017
35. 2018-2019
36. 2020-2021
37. 2022-2023
38. 2024-2025

APPENDIX A

1. 1950-1951
2. 1952-1953
3. 1954-1955
4. 1956-1957
5. 1958-1959
6. 1960-1961
7. 1962-1963
8. 1964-1965
9. 1966-1967
10. 1968-1969
11. 1970-1971
12. 1972-1973
13. 1974-1975
14. 1976-1977
15. 1978-1979
16. 1980-1981
17. 1982-1983
18. 1984-1985
19. 1986-1987
20. 1988-1989
21. 1990-1991
22. 1992-1993
23. 1994-1995
24. 1996-1997
25. 1998-1999
26. 2000-2001
27. 2002-2003
28. 2004-2005
29. 2006-2007
30. 2008-2009
31. 2010-2011
32. 2012-2013
33. 2014-2015
34. 2016-2017
35. 2018-2019
36. 2020-2021
37. 2022-2023
38. 2024-2025

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - Task A (Liberty Pit)
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 11/14/14 COMPLETED 11/14/14 GROUND ELEVATION 205 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger AT TIME OF DRILLING --- No Water Strike Encountered
 LOGGED BY J. Sinclair CHECKED BY D. Saenz, P.E. AT END OF DRILLING ---
 NOTES GPS 26°16'22.61"N, 98°26'1.74"W (Approx. Elev.) AFTER DRILLING ---

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 4/27/15 10:54 - L:\GINT\PROJECTS\L&G ENG - LJ WATSHED IMP PH I (TASK A - LIBERTY PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Brown to Dk. Brown, Heavily Calcareous (Caliche), Med. Stiff to Hard, Dry	SPT 1		3-4-4 (8)			11				61
			SPT 2		15-20-14 (34)				29	13	16	
			SPT 3		10-10-10 (20)							
			SPT 4		6-10-10 (20)		13					
			SPT 5		8-9-10 (19)							
10			SPT 6		5-9-8 (17)		10					51
			SPT 7		5-14-19 (33)				49	14	35	
			SPT 8		15-17-39 (56)		11					
		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules, Very Stiff to Hard (w/ Soft Layer Noted at 23.5 to 25 ft.), Dry to Moist	SPT 9		10-17-16 (33)				44	19	25	60
20			SPT 10		13-21-21 (42)		12					
			SPT 11		2-2-2 (4)							53
			SPT 12		3-4-16 (20)		14	36	18	18		
30		(GC) Clayey Gravel w/ Sand, Brown to Dk. Brown, Gravel Sized 1/4 to 2 in. - Sub-Rounded, Dense to Very Dense, Moist	SPT 13		14-15-23 (38)							48
			SPT 14		50/1"		14	44	15	29		
40			SPT 15		50/1"							27
Bottom of borehole at 45.0 feet.												

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - Task A (Liberty Pit)
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 11/14/14 COMPLETED 11/14/14 GROUND ELEVATION 205 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger AT TIME OF DRILLING --- No Water Strike Encountered
 LOGGED BY J. Sinclair CHECKED BY D. Saenz, P.E. AT END OF DRILLING ---
 NOTES GPS 26°16'21.48"N, 98°25'55.30"W (Approx. Elev.) AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
		(CL) Sandy Lean Clay, Dk. Brown, w/ Traces of Roots & Calcareous Nodules, Soft to Stiff, Dry	▲ SPT 1		1-1-2 (3)			13				56
▲ SPT 2				2-2-2 (4)			32	16	16			
▲ SPT 3				2-3-3 (6)		13						
▲ SPT 4				4-6-6 (12)								
▲ SPT 5				5-7-9 (16)				42	17	25	51	
		(CL) Sandy Lean Clay, Brown, Heavily Calcareous (Caliche), w/ Traces of Gravel, Hard, Dry	▲ SPT 6		11-14-17 (31)			6				
▲ SPT 7				7-10-15 (25)			42	15	27			
▲ SPT 8				10-15-24 (39)							62	
▲ SPT 9				10-16-22 (38)		7						
		(SC) Clayey Sand w/ Gravel, Brown w/ Dk. Gray to Black Streaks, Gravel Sized 1/4 to 1 in. - Sub-Angular & Angular, Very Dense, Dry	▲ SPT 10		50/5"				37	14	23	
			(GC) Clayey Gravel, Brown, Gravel Sized 1/4 to 1 1/2 in. - Sub-Angular & Sub-Rounded, Very Dense, Dry	SPT 11		50/0"						17
		(GP-GC) Poorly Graded Gravel w/ Clay & Sand, Brown, Gravel Sized 1/2 to 2 in. - Sub-Angular & Sub-Rounded, Very Dense, Dry	SPT 12		50/0"							
			SPT 13		50/0"						6	
			SPT 14		50/0"							
			SPT 15		50/0"						6	
Bottom of borehole at 45.0 feet.												

GEOTECH BH COLUMNS - GINT STD US LAB GDT - 4/27/15 10:54 - LIGINTPROJECTSL&G ENG - LJ WATSHED IMP PH I (TASK A - LIBERTY PIT).GPJ



CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - Task A (Liberty Pit)
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 11/18/14 COMPLETED 11/18/14 GROUND ELEVATION 205 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger AT TIME OF DRILLING --- No Water Strike Encountered
 LOGGED BY J. Sinclair CHECKED BY D. Saenz, P.E. AT END OF DRILLING ---
 NOTES GPS 26°16'12.61"N, 98°25'53.01"W (Approx. Elev.) AFTER DRILLING ---

GEOTECH BH COLUMNS - GINT STD US LAB GDT - 4/27/15 10:54 - L:\GINT\PROJECTS\L&G ENG - LJ WATSHED IMP PH I (TASK A - LIBERTY PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Dk. Brown, w/ Traces of Roots & Calcareous Nodules, Stiff, Dry	SPT 1		3-5-9 (14)			12	45	20	25	
			SPT 2		2-6-7 (13)							64
		(CL) Sandy Lean Clay, Brown to Grayish Brown, Heavily Calcareous (Caliche), Very Stiff, Dry	SPT 3		11-13-11 (24)			8	45	19	26	
			SPT 4		10-14-13 (27)							52
10			SPT 5		24-39-44 (83)			9	37	16	21	
		(SC) Clayey Sand, Brown to Lt. Brown, Heavily Calcareous (Caliche), w/ Traces of Gravel (Sized 1/4 to 1 in. - Sub-Angular), Very Dense, Dry	SPT 6		26-37-41 (78)							49
			SPT 7		22-20-40 (60)			6	28	17	11	
			SPT 8		26-29-42 (71)							42
			SPT 9		33-38-44 (82)			4	44	15	29	
20			SPT 10		31-38-42 (80)							24
		(GP-GC) Poorly Graded Gravel w/ Clay & Sand, Grayish Brown, Heavily Calcareous (Caliche), Gravel Sized 1/4 to 1 in. - Sub-Angular & Sub-Rounded, Very Dense, Dry	SPT 11		42-49-50/4"			5	41	16	25	
			SPT 12		46-50/4"			3				
30			SPT 13		50/4"							
		(GP) Poorly Graded Gravel w/ Sand, Gravel Sized 1/4 to 1 in. - Sub-Angular & Sub-Rounded, Very Dense, Dry	SPT 14		50/4"			1				
40			SPT 15		50/4"							
Bottom of borehole at 45.0 feet.												

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - Task A (Liberty Pit)
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 11/14/14 COMPLETED 11/14/14 GROUND ELEVATION 200 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger ∇ AT TIME OF DRILLING 25.50 ft / Elev 174.50 ft
 LOGGED BY J. Sinclair CHECKED BY D. Saenz, P.E. AT END OF DRILLING ---
 NOTES GPS 26°16'10.72"N, 98°26'7.61"W (Approx. Elev.) AFTER DRILLING ---

GEO TECH BH COLUMNS - GINT STD US LAB.GDT - 4/27/15 10:54 - L:\GINT\PROJECTS\L&G ENG - LJ WATSHED IMP PH I (TASK A - LIBERTY PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(SC) Clayey Sand, Brown to Tan w/ Brown & Black Mottles, w/ Calcareous Nodules & Traces of Gravel (Sized 1/4 in. - Sub-Rounded), Med. Dense to Very Dense, Dry	SPT 1		3-5-7 (12)			16				43
			SPT 2		3-5-6 (11)				63	18	45	
			SPT 3		14-23-41 (64)							
			SPT 4		16-25-39 (64)			19				
10			SPT 5		8-10-10 (20)							47
			SPT 6		9-12-12 (24)				56	22	34	
		(SC) Clayey Sand, Brown, w/ Traces of Gravel (Sized 1/4 to 1/2 in. - Sub-Angular), Med. Dense, Dry	SPT 7		3-5-8 (13)			7				18
			SPT 8		4-7-9 (16)				24	15	9	
			SPT 9		12-14-7 (21)			5				
20			SPT 10		10-12-11 (23)							
		(GC) Clayey Gravel w/ Sand, Brown to Lt. Brown, Gravel Sized 1/4 to 1/2 in. - Sub-Angular, Very Dense, Dry	SPT 11		20-50/6"				34	15	19	21
			SPT 12		28-50/6"							
30			SPT 13		2-3-7 (10)							
		(GP-GC) Poorly Graded Gravel w/ Clay, Lt. Brown, Gravel Sized 1/4 to 1 in. - Sub-Rounded, Loose, Dry	SPT 14		3-4-6 (10)							9

Bottom of borehole at 40.0 feet.

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - Task A (Liberty Pit)
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 11/15/14 COMPLETED 11/15/14 GROUND ELEVATION 205 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger AT TIME OF DRILLING --- No Water Strike Encountered
 LOGGED BY J. Sinclair CHECKED BY D. Saenz, P.E. AT END OF DRILLING ---
 NOTES GPS 26°16'7.20"N, 98°25'56.47"W (Approx. Elev.) AFTER DRILLING ---

GEO TECH BH COLUMNS - GINT STD US LAB.GDT - 4/27/15 10:54 - L:\GINT\PROJECTS\L&G ENG - LJ WATSHED IMP PH I (TASK A - LIBERTY PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)	
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
0													
		(SC) Clayey Sand, Dk. Brown to Brown, w/ Traces of Roots & Calcareous Nodules, Loose to Med. Dense, Moist	▲ SPT 1		4-4-6 (10)			10				40	
▲ SPT 2				5-6-6 (12)			32	16	16				
		(SC) Clayey Sand, Lt. Brown, Heavily Calcareous (Caliche), w/ Traces of Gravel (Sized 1/4 to 1 1/2 in. - Sub-Angular), Loose to Med. Dense, Dry	▲ SPT 3		4-9-13 (22)			8					
▲ SPT 4				4-7-10 (17)									
▲ SPT 5				3-3-2 (5)				7					
▲ SPT 6				4-3-5 (8)					30	16	14		
▲ SPT 7				7-9-7 (16)				6				34	
▲ SPT 8				2-2-2 (4)									
		(SC) Clayey Sand, Brown, w/ Calcareous Nodules, Loose, Dry	▲ SPT 9		3-2-4 (6)			8					
▲ SPT 10				3-3-3 (6)				30	16	14			
		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules, Hard, Dry	▲ SPT 11		50/3"			10					51
			▲ SPT 12		12-26-50/1"			12					
		(CH) Fat Clay, Brown to Reddish Brown w/ Olive Streaks, w/ Calcareous Nodules, Hard, Moist	▲ SPT 13		21-30-48 (78)			15	64	27	37		
	▲ SPT 14			50/1"			18					95	

Bottom of borehole at 45.0 feet.

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - Task A (Liberty Pit)
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 11/17/14 COMPLETED 11/17/14 GROUND ELEVATION 200 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger ▽ AT TIME OF DRILLING 20.00 ft / Elev 180.00 ft
 LOGGED BY J. Sinclair CHECKED BY D. Saenz, P.E. AT END OF DRILLING ---
 NOTES GPS 26°16'3.50"N, 98°26'9.67"W (Approx. Elev.) AFTER DRILLING ---

GEO TECH BH COLUMNS - GINT STD US LAB.GDT - 4/27/15 10:54 - L:\GINT\PROJECTS\L&G ENG - LJ WATSHED IMP PH I (TASK A - LIBERTY PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Dk. Brown to Lt. Brown, w/ Calcareous Nodules & Traces of Gravel (Sized 1/4 to 1 in. - Sub-Angular), Med. Stiff to Hard, Dry	SPT 1		2-2-3 (5)			15				58
			SPT 2		3-2-3 (5)				35	15	20	
			SPT 3		5-13-16 (29)			12				51
			SPT 4		7-14-16 (30)				51	19	32	
			SPT 5		25-26-40 (66)			11				
			SPT 6		28-31-47 (78)				31	20	11	
			SPT 7		36-50/5"			5				53
		(GC) Clayey Gravel w/ Sand, Grayish Brown to Gray, Very Cemented, Gravel Sized 1/4 in. - Sub-Angular, Very Dense, Dry	SPT 8		50/4"							
			SPT 9		50/4"		2	26	15	11		
			SPT 10		50/4"							19
		(SP-SC) Poorly Graded Sand w/ Clay, Brown, w/ Traces of Gravel (Sized 1/2 to 1 in. - Sub-Angular), Very Dense, Moist to Wet	SPT 11		50/6"			18				
			SPT 12		50/5"			20				
		(SC) Clayey Sand, Brown, Very Dense, Wet	SPT 13		50/4"			25				41
			SPT 14		50/0"			30				

Bottom of borehole at 40.0 feet.

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - Task A (Liberty Pit)
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 11/17/14 COMPLETED 11/17/14 GROUND ELEVATION 180 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger ∇ AT TIME OF DRILLING 12.00 ft / Elev 168.00 ft
 LOGGED BY J. Sinclair CHECKED BY D. Saenz, P.E. AT END OF DRILLING ---
 NOTES GPS 26°16'3.33"N, 98°25'57.71"W (Approx. Elev.) AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(SC) Clayey Sand, Brown w/ Calcareous Nodules & Traces of Gravel (Sized 1/4 to 1 in. - Sub-Rounded), Dense, Dry	SPT 1		11-24-20 (44)			9				31
			SPT 2		9-21-19 (40)				28	22	6	
		(CL) Lean Clay, Brown w/ Gray & Reddish Brown Streaks, Hard, Dry to Moist	SPT 3		14-19-29 (48)			20				90
			SPT 4		15-20-31 (51)				49	21	28	
10			SPT 5		50/1"			16				
		(SM) Silty Sand, Lt. Brown, Very Dense, Moist to Wet	SPT 6		19-29-43 (72)							19
			SPT 7		13-27-50/3"			21				
			SPT 8		50/2"							
			SPT 9		50/4"			25	NP	NP	NP	
20			SPT 10		50/5"							17

Bottom of borehole at 20.0 feet.

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CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - Task A (Liberty Pit)
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 11/15/14 COMPLETED 11/15/14 GROUND ELEVATION 200 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger ∇ AT TIME OF DRILLING 27.00 ft / Elev 173.00 ft
 LOGGED BY J. Sinclair CHECKED BY D. Saenz, P.E. AT END OF DRILLING ---
 NOTES GPS 26°16'2.33"N, 98°26'5.19"W (Approx. Elev.) AFTER DRILLING ---

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 4/27/15 10:54 - L:\GINT\PROJECTS\L&G ENG - LJ WATSHED IMP PH I (TASK A - LIBERTY PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(SC) Clayey Sand, Brown, w/ Calcareous Nodules, Med. Dense, Dry	SPT 1		5-8-8 (16)			12	33	17	16	48
			SPT 2		5-8-7 (15)							
			SPT 3		5-6-6 (12)			13				
			SPT 4		5-7-11 (18)							
10		(SC-SM) Silty Clayey Sand, Brown to Lt. Brown, w/ Calcareous Nodules & Traces of Gravel (Sized 1/4 in. - Sub-Angular & Sub-Rounded, Dense to Very Dense (w/ Loose Layer Noted at 14.5 to 16 ft.), Dry to Moist	SPT 5		6-14-14 (28)			13				24
			SPT 6		8-11-9 (20)				24	18	6	
			SPT 7		9-13-20 (33)			11				
			SPT 8		3-4-3 (7)							
			SPT 9		7-14-11 (25)			11				
			SPT 10		14-50/1"							
20			SPT 11		30-50/2"			27	24	19	5	27
			SPT 12		50/3"			27				
			SPT 13		50/6"			22	NP	NP	NP	
			SPT 14		50/1"			37				
30		(SM) Silty Sand, Lt. Grayish Brown, w/ Traces of Gravel (Sized 1/4 in. - Sub-Angular), Very Dense, Wet										36
40												

Bottom of borehole at 40.0 feet.

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - Task A (Liberty Pit)
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 11/15/14 COMPLETED 11/15/14 GROUND ELEVATION 200 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger AT TIME OF DRILLING 28.00 ft / Elev 172.00 ft
 LOGGED BY J. Sinclair CHECKED BY D. Saenz, P.E. AT END OF DRILLING ---
 NOTES GPS 26°15'59.56"N, 98°25'53.43"W (Approx. Elev.) AFTER DRILLING ---

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(SC) Clayey Sand, Dk. Brown to Brown, w/ Calcareous Nodules, Very Loose to Loose, Dry	SPT 1		2-2-2 (4)			9	31	17	14	
			SPT 2		2-2-3 (5)							
			SPT 3		2-2-2 (4)			9				
			SPT 4		2-3-3 (6)							44
10			SPT 5		3-2-1 (3)			10	32	17	15	
			SPT 6		3-2-1 (3)							
			SPT 7		2-1-2 (3)			11				
		(GC) Clayey Gravel w/ Sand, Lt. Brown, Highly Calcareous (Caliche), Gravel Sized 1/4 to 1 1/2 in. - Sub-Angular, Loose, Dry	SPT 8		3-3-3 (6)							
			SPT 9		3-4-3 (7)			15				30
20		(CH) Fat Clay, Brown to Gray w/ Lt. Gray Streaks, w/ Calcareous Nodules (Highly Calcareous from 28.5 to 30 ft.), Hard, Dry	SPT 10		50/4"				26	13	13	
			SPT 11		25-28-50/2"			18				97
30			SPT 12		31-41-50/1"			18	58	26	32	
		(SC) Clayey Sand, Brown, w/ Traces of Gravel (Sized 1/4 to 2 in. - Sub-Angular), Very Dense, Moist to Wet	SPT 13		26-50/2"			12				
40			SPT 14		50/1"			24				13

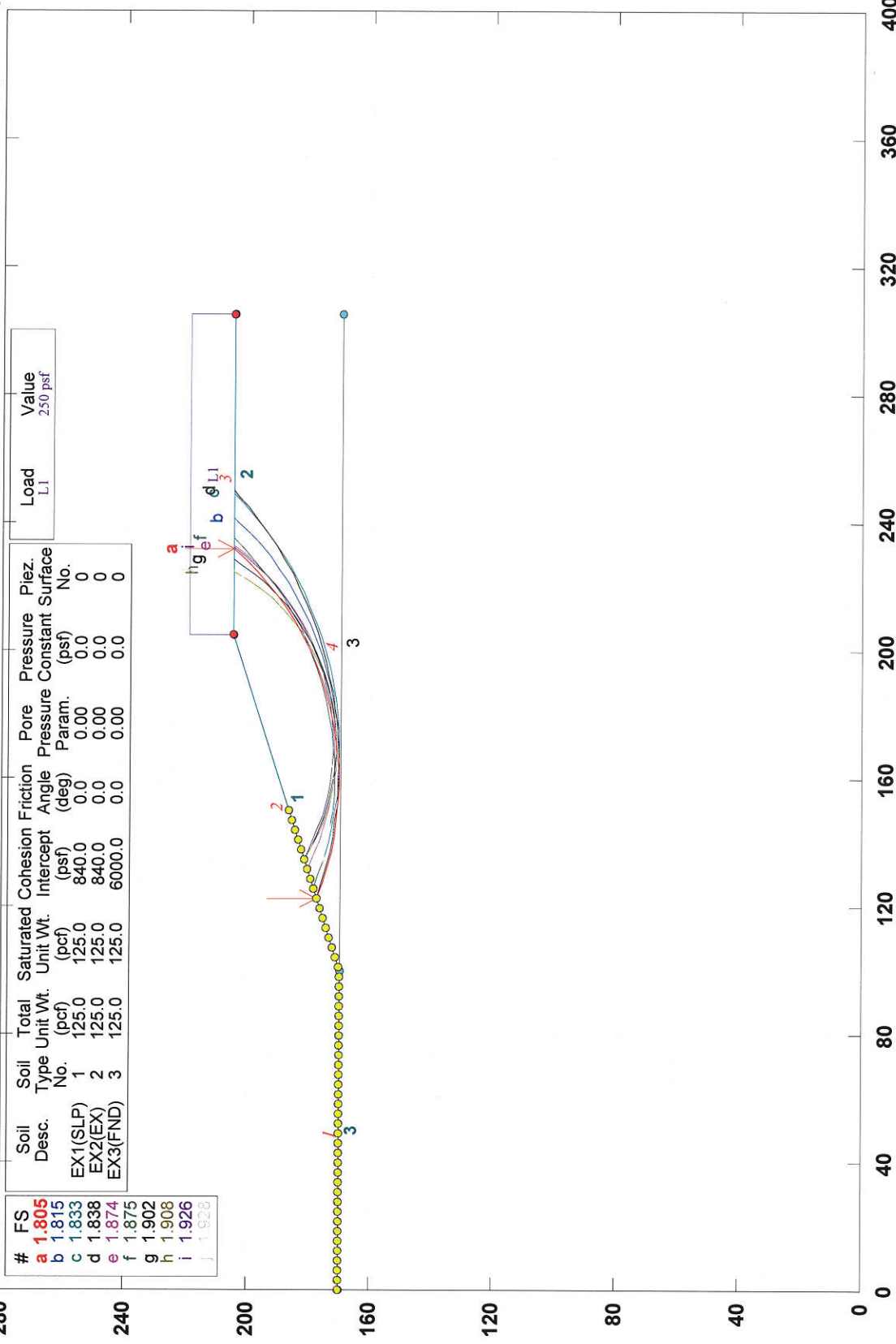
Bottom of borehole at 40.0 feet.

Vane Shear Testing (ASTM D2573):
 At 2 ft. depth = 1360 psf (Undrained Shear Strength)
 At 6 ft. depth = 840 psf (Undrained Shear Strength)
 At 12 ft. depth = 2590 psf (Undrained Shear Strength)

APPENDIX C – GLOBAL STABILITY (SIDE SLOPES)

La Joya Watershed - Phase I (Task A) Liberty Pit Det Basin - WC (Und)

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GSTABL7 v.2 FSmin=1.805
Safety Factors Are Calculated By The Modified Bishop Method

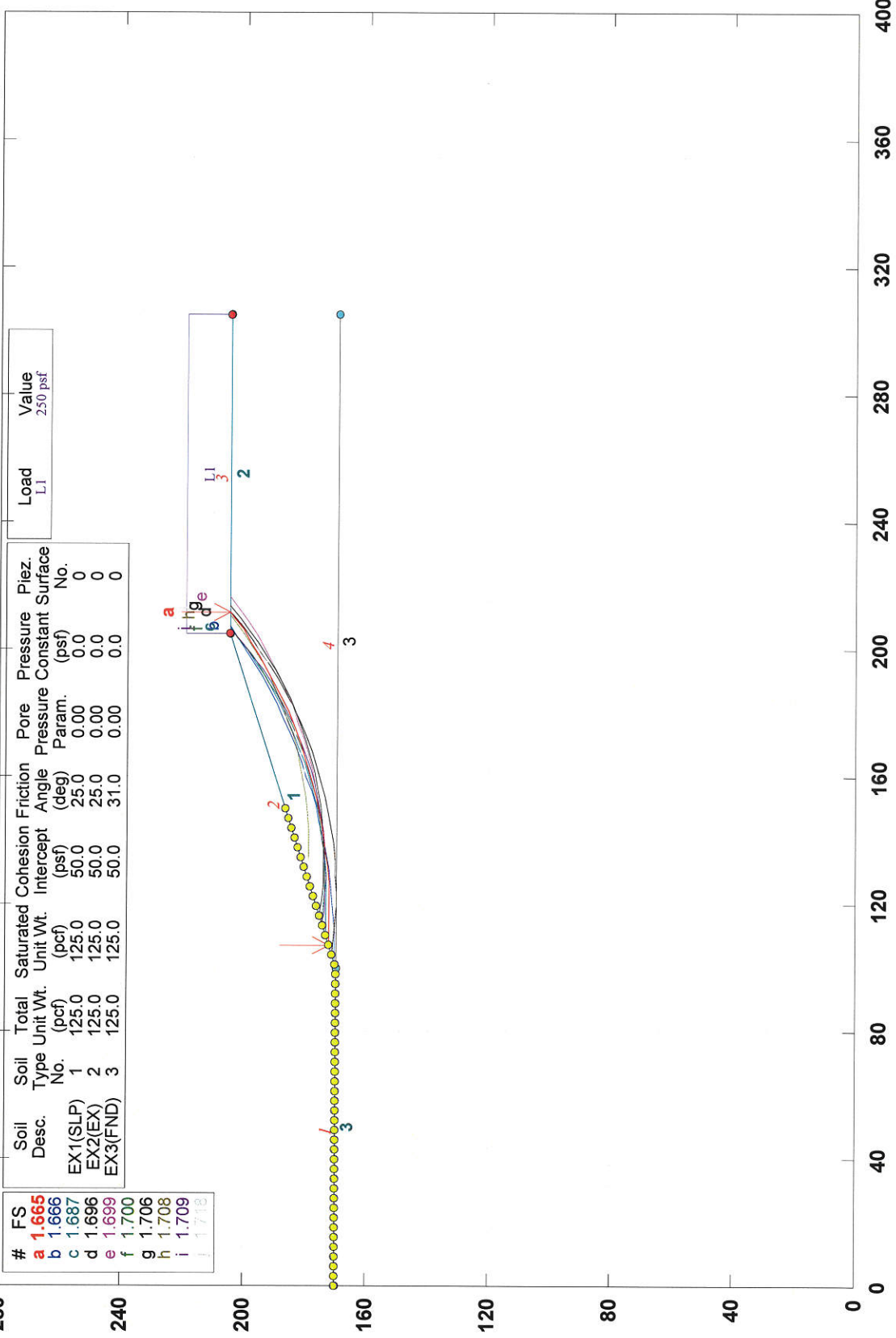


La Joya Watershed - Phase I (Task A) Liberty Pit Det Basin - WC (Dr)

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280

#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.	Load	Value
a	1.665	EX1(SLP)	1	125.0	125.0	50.0	25.0	0.00	0.0	0	L1	250 psf
b	1.666	EX2(EX)	2	125.0	125.0	50.0	25.0	0.00	0.0	0		
c	1.687	EX3(FND)	3	125.0	125.0	50.0	31.0	0.00	0.0	0		
d	1.696											
e	1.699											
f	1.700											
g	1.706											
h	1.708											
i	1.709											
j	1.718											



GSTABL7 v.2 FSmin=1.665

Safety Factors Are Calculated By The Modified Bishop Method



APPENDIX D – MISCELLANEOUS PROJECT INFO

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Preliminary Plans Provided By L&G Engineering

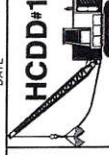


- LEGEND:
- PROP. CHAINING GRADE
 - CHAINLINK FENCE W/ POSTS
 - EXIST. ROW LINES
 - EXIST. ROW LINES
 - EXIST. EASEMENT LINES

Proposed Toe of Detention Facility
To Be At Deepest Elevation of +170 to Elevation of +180 (Final PS&E in
Development at time this report was written)

NOT A BIDDING DOCUMENT
THIS DOCUMENT IS FOR
INTERIM REVIEW AND
NOT INTENDED FOR
CONSTRUCTION, BIDDING,
OR PERMIT PURPOSES.

JORGE A. MADRIGAL
P.E. 97243
1/30/2015
DATE



L&G Engineering
Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105

3120 W. Evergreen St.
Mercedes, TX 78570
Phone : (866) 465-6813
Fax : (866) 255-0278

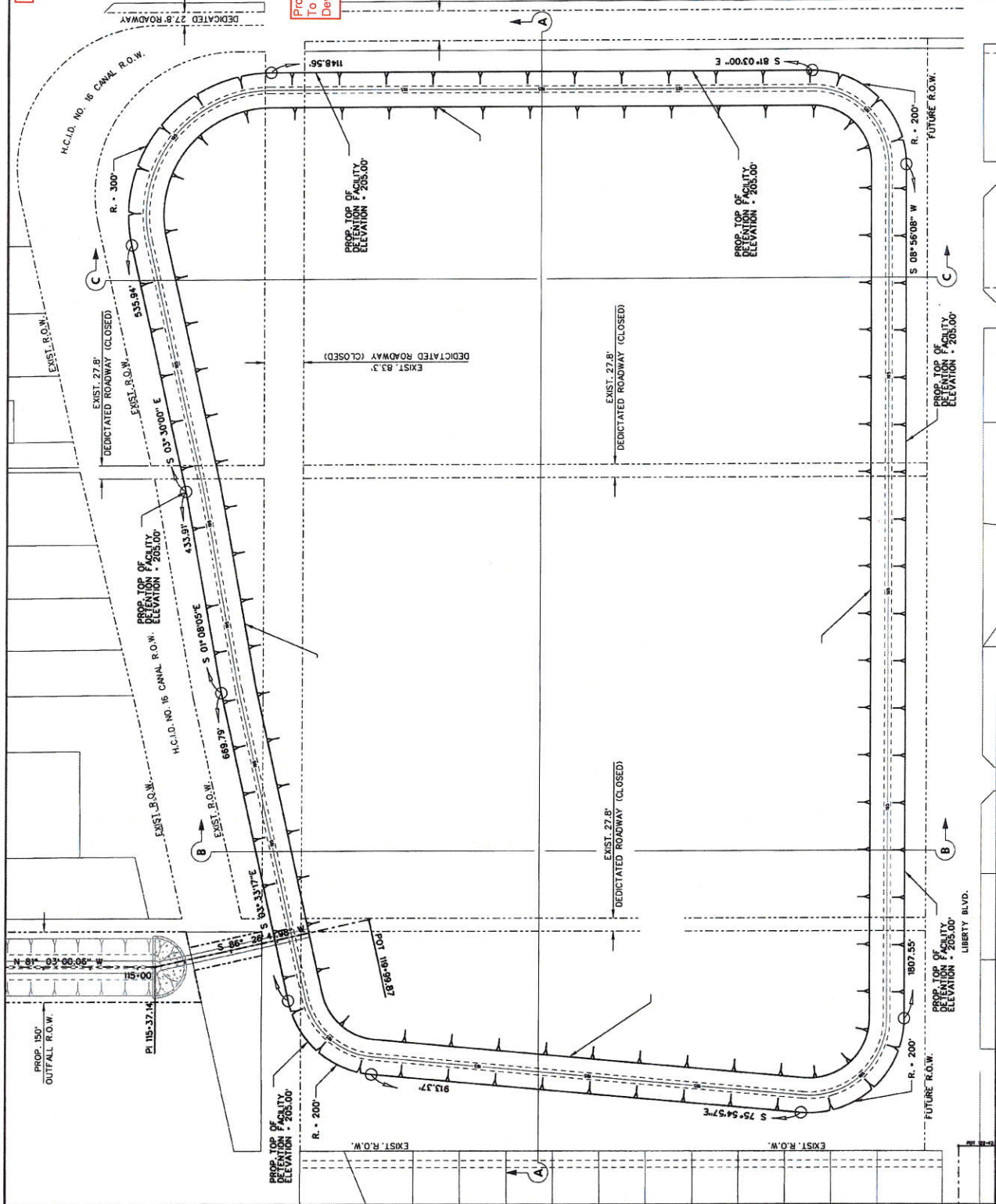
902 S. Stewart Rd., Ste. 10
Mercedes, TX 78570
Phone : (866) 385-1609
Fax : (866) 385-1627

GRADING LAYOUT
LA JOYA WATERSHED IMPROVEMENT PROJECT
NORTH DETENTION BASIN

SCALE: 1" = 200'

DATE	BY	CHK'D	DATE	BY	CHK'D
JAN 2015	JAM	JAM	JAN 2015	JAM	JAM
DATE	BY	CHK'D	DATE	BY	CHK'D
JAN 2015	JAM	JAM	JAN 2015	JAM	JAM
DATE	BY	CHK'D	DATE	BY	CHK'D
JAN 2015	JAM	JAM	JAN 2015	JAM	JAM

SHEET NO. 1
PROJECT NO. 15010
TAXAS
COUNTY
CITY
L.P.N.





L&G Engineering Laboratory

Construction Material Testing
Geotechnical Engineering

**GEOTECHNICAL INVESTIGATION
FOR
LA JOYA WATERSHED IMPROVEMENT PROJECT – PHASE I
TASK B – SOUTH DETENTION BASIN**

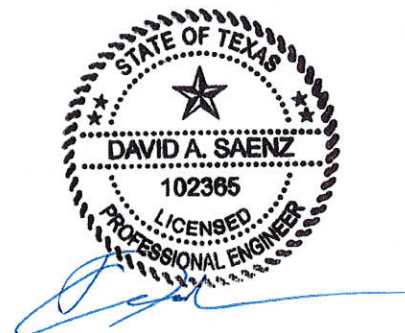
HIDALGO COUNTY



**Prepared For:
L&G Consulting Engineers, Inc.**

**Prepared By:
L&G Engineering Laboratory, L.L.C.
[Texas Registered Engineering Firm F-6633]**

**L&G Project No. GL14030
April 30, 2015**



**David A. Saenz, P.E.
Project Engineer**

04/30/2015

COPY

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INTRODUCTION

L&G Engineering Laboratory, L.L.C. (L&G Lab) has been contracted by **L&G Consulting Engineers, Inc. (L&G Eng)**, to perform a subsurface geotechnical investigation and engineering analysis to assist in the preparation of Plans, Specifications and Estimates (PS&E) for the La Joya Watershed Improvement Project (Phase I) – Task B South Detention Basin in Hidalgo County, Texas. This report includes boring logs, figures, global stability modeling of proposed detention pond side slopes (slope stability), analysis of proposed excavation soils (based on proposed PS&E cut line) and general overall construction recommendations.

GENERAL PROJECT OVERVIEW

Project Description

L&G Lab is pleased to submit this document presenting our findings as a result of the Geotechnical Study performed at the request of **L&G Eng**. It is our understanding that this project consists of the construction of a proposed two-cell detention basin facility located behind frontage development along the south side of US Expressway 83 in Peñitas, TX, and along the east side of existing TxDOT US Expressway 83 drain ditch in Hidalgo County. The proposed project consists of excavating to a bottom elevation of +145 feet (or approximately 20 feet in depth) and utilizing maximum 3 (horizontal) to 1 (vertical) side slopes while leaving a perimeter access road at the top. General illustrations of the existing site and proposed project schematic can be found in Appendix A of this report.

Scope and Limitations of Investigation

This report has been prepared in accordance with accepted Geotechnical Engineering practices for the subject project site and the anticipated construction. No specific warranty program or other standards, except acceptable industry standards, were followed in this investigation. This report is intended for use by **L&G Eng** and their representatives. This report may not contain sufficient information for purposes of other parties or other uses in determining construction means and methods.

The strata shown on the boring logs (included in Appendix B of this report) represent the in-situ conditions at the boring log locations during exploration. These stratifications represent approximate boundaries between subsurface materials; their actual transition may be gradual. Variations may occur between boring locations. It should be noted that the exploratory borings were performed within the limits of the proposed construction as requested and agreed upon by **L&G Eng**.

The benchmarks of this geotechnical study are to:

1. explore the general existing subsurface conditions at the site
2. evaluate the relevant engineering properties of the subsurface materials
3. develop global stability models and analyses for verification of proposed slope stability
4. analyze soil make-up of the proposed cut materials and log for future usage
5. provide general construction recommendations regarding all aspects of the project

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McAllen Fine Sandy Loam, 1 to 3 Percent Slopes (Soil Map Unit 36) – These soils are deep, gently sloping soils on convex uplands. This unit is well drained with a moderate available water capacity (about 8.4 inches). Permeability is moderate and surface runoff is medium. Soil has a maximum calcium carbonate content of 5%. It is non-saline (1.0 to 4.0 mmhos/cm) with no frequency of flooding or ponding. The typical profile for this soil is 0 to 18 inches: grayish brown fine sandy loam; 18 to 39 inches: pale brown sandy clay loam; and 39 to 65 inches: very pale brown sandy clay loam. The soil is calcareous throughout. This soil map unit's suitability for use as roadfill construction material is noted as fair, with low strength. It has a moderate potential for seepage when used in pond reservoir areas. It should be noted, for clarity, this soil would be representative of the upper perimeter section of the proposed detention basin only (where existing ground matched general existing grade).

McAllen Fine Sandy Loam, 0 to 1 Percent Slopes (Soil Map Unit 35) – These soils are deep, nearly level soils on convex uplands. This unit is well drained with a moderate available water capacity (about 8.4 inches). Permeability is moderate and surface runoff is medium. Soil has a maximum calcium carbonate content of 5%. It is non-saline (1.0 to 4.0 mmhos/cm) with no frequency of flooding or ponding. The typical profile for this soil is 0 to 14 inches: light brownish gray fine sandy loam; 14 to 37 inches: pale brown sandy clay loam; and 37 to 72 inches: very pale brown sandy clay loam. The soil is calcareous throughout. This soil map unit's suitability for use as roadfill construction material is noted as fair, with low strength. It has a moderate potential for seepage when used at a pond reservoir area. It should be noted, for clarity, this soil would be representative of the upper perimeter section of the proposed detention basin only (where existing ground matched general existing grade).

Rainfall

The mean annual precipitation for this area of Hidalgo County is approximately 20-24 inches, as reported by the U.S. Department of Agriculture Soil Conservation Service. The geotechnical investigation, performed in March 2015, was conducted during a non-drought condition ("none" as noted by the U.S. Drought Monitor). The National Oceanic and Atmospheric Administration (NOAA) reports for the subject date indicated that no significant rainfall observations (at least one inch) occurred immediately prior to or during our exploration.

SITE INVESTIGATION

Soil Borings and Field/Laboratory Tests

Subsurface conditions at the site were evaluated through nine (9) borings drilled to a depth of twenty-five (25) feet below existing natural ground. The borings were drilled at the locations shown on Figure 2 in Appendix A. The soil borings were drilled and sampled in general accordance with American Society of Testing Materials Procedures (ASTM) D1452 and D1586 using a truck mounted drilling rig (Simco 2800 HS (HT)) and solid stem augers.

As part of the sampling procedures, split barrel (spoon) and Standard Penetration Tests (SPT) were performed and recorded. Standard Penetration Test results are noted on the boring logs as blows per foot or twelve (12) inch increment. The sampler was advanced through three (3)

consecutive six (6) inch increments; however, the first six inch increment is considered the seating drive, which eliminates the effect of cuttings or disturbances on the test result. The sum of the blows for the last two six (6) inch increments is considered the “standard penetration resistance value” or “field N-value”. Where hard or very dense materials were encountered, the SPT was terminated and noted on the boring log when one of the following situations occurred:

1. a total of 50 blows were applied on one six inch increment
2. a total of 100 blows were applied during the test
3. no observation of advancement of the sampler was detected during the application of 10 consecutive blows from the hammer

Representative portions of the samples were identified, packaged, sealed in containers to reduce moisture loss, and transported to our laboratory for subsequent testing. In the laboratory, each sample was evaluated and visually classified by a member of our geotechnical engineering staff. The properties of each stratum were evaluated by a series of laboratory index tests. A summary of the laboratory data and their corresponding depths are presented on the boring logs in Appendix B.

It should be noted, once the samples were received in the laboratory, technicians noted a distinct petroleum odor associated with the soils samples. No issues were noted during the laboratory testing of the samples; however L&G Lab feels that further evaluation of the soils may be warranted by an environmental consultant.

Samples will be retained in our laboratory for 30 days after submittal of this report. Other arrangements may be provided at the request of the Client.

Subsurface Stratigraphy

On the basis of our soil borings, there are several generalized strata that possess similar physical and engineering characteristics at the boring locations associated with each particular site. The lines designating the interfaces between strata on the boring logs represent approximate boundaries. Transitions between strata may be gradual and may vary from the reported logs. Table 1 shows a summary (generalized) of the respective soil strata in the profile within the project limits. (See Appendix B for detailed boring logs).

<u>South Detention Basin</u> All Borings
This location showed primarily a mixture of brown sandy lean clay and lean clay with sand (CL) in the upper 8 to 10 feet of soil profile with a mixture of brown (w/ gray streaks) fat clay with sand and fat clay (CH) below. The upper soils plasticity index ranged from 8 to 27 and fines contents (% of clay & silt) ranged from 51 to 74. The lower soils plasticity index generally ranged from 25 to 48 (with an outlier of PI = 11) and fines contents (% of clay & silt) generally ranged from 78 to 99 (with an outlier of 13%). All soils were noted as dry. Petroleum odor was noted in all soil samples retrieved as part of this investigation.

Table 1 – Existing Soil Strata & Description

**all depths are referenced from existing natural ground*

Water Strikes

No water strikes were encountered during the drilling operations at boring locations. Twenty-four hour water level readings taken as part of this study also showed no water table at the boring locations. It should be noted that fluctuations in groundwater levels are influenced by variations in rainfall and surface water run-off from season to season. The construction process itself may also cause variations in the groundwater level. If the subsurface water elevation is critical to the construction process the Contractor should check the subsurface water conditions just prior to construction excavation using piezometer wells.

GEOTECHNICAL BORING ANALYSIS

The following tests were completed on various soil samples retrieved as part of this Geotechnical Investigation at each boring location. The general summary of results by location is presented in the 'Subsurface Stratigraphy' section of this report. The detailed results are included on the boring logs and gradation curves included in Appendix B.

Moisture Content

The moisture content of a soil is defined as the ratio of the weight of the water in the sample to the dry weight of the soil sample. The moisture contents for the samples obtained as part of our geotechnical exploration were performed in compliance with ASTM procedure D2216 (and Tex-103-E). Variance in percentages within the samples can be attributed to a multitude of issues including, range in depth, distance between samples, location of groundwater table and seasonal moisture zone. The variation could also be caused by differences in soil classifications, as some soils such as loose gravels and sands are made up of larger particles and thus exhibit more voids as a soil structure (higher capability to hold water than fine grained soils). Finer grained denser soils, though, due to high impermeability, may also exhibit high moisture contents in certain instances due to the slower movement of water through the soil structure. A comprehensive list of all moisture contents by corresponding depth can be found on the boring logs.

Plasticity Index

The Plasticity Index (PI) is defined as the difference between the liquid limit and the plastic limit of a soil. These limits are commonly referred to as the Atterberg limits, which describe the consistency of soils with respect to their varying moisture contents. The liquid limit is defined as the moisture content at which soil begins to transition from a plastic to a liquid state and begins to behave as a liquid material by beginning to flow. The plastic limit refers to the water content of a soil at the point of transition from a semisolid to a plastic state where soil starts to exhibit plastic behavior. A soils behavior can be divided into four basic states: liquid, plastic, semisolid and solid. The plasticity index shows the range in which a soil acts in a plastic state. Experience has shown that the more plastic a soil is the more expansive and compressive it will act. The plasticity indices for the samples obtained as part of our geotechnical exploration were performed in compliance with ASTM procedure D4318 (and Tex-104-E thru Tex-106-E). A comprehensive list of all plasticity indices by corresponding depth can be found on the boring logs.

Particle Size Analysis (Determination of Fines Content)

The standard grain size analysis is used to determine the relative proportions of different grain sizes as they are distributed along a range of different sized sieves. The minus 200 sieve analysis is used commonly as a tool for soil classification and identification using the Unified Soils Classification System. Results for this test are reported as a percentage of soil passing the No. 200 sieve, which has openings 0.075mm wide. This test is also used to determine the suitability of soil for construction purposes and to estimate probable seepage through soils. Generally a % - 200 greater than 50% indicates a non-granular cohesive soil with large amounts of fines in the soil composition. The particle size analyses for the samples obtained as part of our geotechnical exploration were performed in compliance with ASTM procedure D1140 (and Tex-111-E). A comprehensive list of all fines contents by corresponding depth can be found on the boring logs.

GEOTECHNICAL ENGINEERING ANALYSES

Global Stability of Detention Basin Side Slopes

It is the understanding of **L&G Lab** that the proposed Detention Basin facility geometry will utilize a relatively flat access perimeter road (minimal cross slope) with maximum pond side slopes of no steeper than 3 horizontal units to 1 vertical unit (3:1) with a maximum depth of 20 feet as previously noted in this report (See 'Project Description').

This report includes complete Global Stability Analysis as the means to evaluate detention basin side slope geometry with regard to existing top strata (proposed slope sections), section geometry and underlying foundation soils. The Factor of Safety requirements utilized in this analysis are referenced from the 2012 TxDOT Geotechnical Manual. For this project, we will utilize the threshold value of FS = 1.3 for all analyses.

The limit equilibrium method of analysis is the most commonly used method of analyzing the overall stability of both natural and manmade slopes as well as retaining wall structures. The fundamental principles behind this method are that the soil mass above a potential failure surface acts as a rigid body, and the shear strength of the material is fully engaged at all points along the surface at the moment of initial movement. A failure criterion is adopted and the conditions for static equilibrium are applied to analyze the problem. This method of analysis assumes that no strain takes place until the failure condition is reached. The results of the analyses are expressed in terms of a safety factor in the form of a ratio of the available shear strength along the potential failure surface to the shear stress required to maintain equilibrium of the failure mass under the applied loads. This method has traditionally been used in the analysis of man-made earth structures such as embankments, levees and retaining wall structures.

The Global Stability Analyses of the embankment sections (slopes) was performed using **GSTABL with STEDwin** Version 7 software program. Analyses were performed using the Modified Bishop Method of slices for circular surfaces (random surfaces were not investigated in this report). It should be noted that the possibility of undetected anomalies in the soil, such as remnants of previous sliding, tension cracks or water-bearing seams of sand, could potentially alter or negate the findings of the stability analysis. Through the utilization of the GSTABL

software program, conservative modeling techniques, and engineering judgment we present what we believe are the most accurate factors of safety.

Input parameters such as shear strength (cohesion and angle of friction) were correlated from the results of the SPT testing and laboratory soil classification testing (unit weight was assumed based on material properties from laboratory tests). Both short-term (undrained) and long-term (drained) conditions were analyzed in accordance with the TxDOT Geotechnical Manual. Correlations for undrained parameters were based on correlation equations of Stroud (1974), Bowles (1988) and Teng (1962). Correlations for drained parameters were based on correlation equations of Holtz & Kovacks (1981), Bjerrum and Simons (1960) and Gibson (1953). It should be noted; only total shear strengths of soils were input into the GSTABL models for the short-term (undrained) condition, as opposed to individual cohesions and friction angles to maintain consistency with the strength correlations. In addition it should be noted, a minimum residual cohesion value of 50 pounds per square foot (psf) was incorporated into the long-term (drained) condition models.

The geometric model of the Detention Basin Side Slopes utilized for analysis consisted of maximum height (approximated as 20 feet) assumed at all boring locations along the proposed detention basin for a worst case analysis. Traffic surcharge loading was incorporated into the modeling considered equivalent to two (2) feet of soil (approximately 250 psf) placed atop the slopes (to model the access road). Piezometric surfaces (groundwater surfaces) were modeled at depths noted in boring logs. The model was analyzed as follows (See Appendix D for Global Stability Runs):

- Worst Case Analysis – Maximum Ht. Pond, Maximum Side Slope, Worst Boring
 - The global stability analysis for this side slope was completed utilizing an assumed pond height of 20 feet with 3:1 slopes.
 - The global stability analysis was completed using boring B-DP-06 (undrained) and B-DP-01 (drained). The resulting critical Factors of Safety were equal to **10.420** for the short-term condition (undrained) and **1.756** for the long-term condition (drained). It should be noted, the FOS values are above the project threshold minimum of 1.3.

Analyses of Proposed Excavation Soils (Future Usage)

Table 2 provides an estimate of the approximate proposed excavation (cut) depths at each general location. Table 3 provides general soil description within the excavation (cut) depths.

Boring No.	Approx. Boring Location	Approx. Ground El.	Prop. Ground El.	Approx. Cut Depth
B-DP-01	NW Perimeter of North Cell	+164 feet	+145 feet	19 feet
B-DP-02	NE Perimeter of North Cell	+164 feet		19 feet
B-DP-03	SW Perimeter of North Cell	+165 feet		20 feet
B-DP-04	SE Perimeter of North Cell	+164 feet		19 feet
B-DP-05	NW Perimeter of South Cell	+165 feet		20 feet
B-DP-06	NE Perimeter of South Cell	+165 feet		20 feet
B-DP-07	W Interior of South Cell	+165 feet		20 feet
B-DP-08	SW Perimeter of South Cell	+161 feet		16 feet
B-DP-09	SE Perimeter of South Cell	+159 feet		14 feet

Table 2 – Approximate Excavation Depth (Cut) at General Location of Borings

Boring No.	*Soils in Excavation Depths	Atterberg Limits (Plasticity Index)	Fines Content (-200)
B-DP-01	CL/CH	21-63	61-99
B-DP-02	CL/CH	23-48	58-98
B-DP-03	CL/CH	11-41	68-95
B-DP-04	CL/CH	22-38	74-86
B-DP-05	CL/CH	18-36	62-95
B-DP-06	CL	12-26	59-97
B-DP-07	CL/CH	8-45	67-93
B-DP-08	CL/CH	11-31	58-98
B-DP-09	CL/CH	27-36	51-91

Table 3 – Soil Description in Approximate Excavation Depths (Cut)

*See Boring Logs Legend Sheet in Appendix B for Soil Description

In general the soils slated for removal based on the proposed construction of the South Detention Basin will be suitable for usage as typical roadway embankment in the TxDOT Pharr District based on the requirements denoted in the TxDOT Pharr District Master General Notes for Item 132 – Embankment. It should be noted, however in the areas of borings B-DP-01 through B-DP-03 we only recommend the top 10 to 12 feet for usage as embankment material based on the high PI soils below those depths as referenced from the boring logs.

GENERAL CONSTRUCTION CONSIDERATIONS

Excavation and Trenching Recommendations

Where trenches or shallow excavations are to extend to or below a depth of five (5) feet, the Contractor or persons performing the trenching or shallow excavations should adhere to the current Occupational Health and Safety Administration (OSHA) guidelines on trench excavation safety and protection measures. Other industry standards may be applicable. If proposed trenching is to require excavation protection, **L&G Lab** recommends protection be provided in accordance with the requirements of TxDOT 2014 ‘Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges’, Item 402 – Trench Excavation Protection and/or Item 403 – Temporary Special Shoring.

Drainage / Dewatering Recommendations

Drainage is one of the most important aspects to be addressed to ensure the successful construction, installation and longevity of construction projects. Positive surface drainage should be implemented prior to and during construction to prevent water ponding in all construction areas (especially at trench locations and bedding area of the proposed entrance and exit culverts). If water is present at the construction area, **L&G Lab** recommends that dewatering techniques be used (bailing, point wells, pumping wells, cofferdam structures, or other approved methods) to ensure proper construction of the proposed culvert crossing(s) on a firm dry surface. This will reduce the probability of maintenance problems in the future at these locations. If the culvert areas cannot be de-watered, stabilizing material (lean concrete or cement stabilized fill) may be used to establish a working platform. This material should meet the requirements of Items 400 and 401 of the TxDOT 2014 Standard Specifications.

Detention Pond Side Slope Recommendations

L&G Lab generally recommends utilizing 3(horizontal) to 1(vertical) slopes or flatter for the banks (side slopes) of the detention pond, where possible. Slopes steeper than these may have the potential to cause problems with erosion, slope stability failures (in the form of sloughing or global failures), and general maintenance of the slopes. If steeper slopes become a requirement of this project, **L&G Lab** should be notified to provide updated Slope Stability modeling and calculations. The construction of the channel slopes should include the installation of topsoil and vegetation to assist in reducing erosion, preventing slough failures, and increasing the general slope stability.

Erosion Protection of Inlet & Outlet Structures

Erosion protection is essential in prolonging the life of the proposed drainage structures due to the higher velocities and water forces caused by these structures. Though no locations investigated noted very loose sands in the upper soils, we recommend general good practice measures to counteract any potential problems with future erosion. **L&G Lab** recommends utilizing multiple erosion protection measures at the detention basin entrance and exit locations (culverts, pipes, etc.):

- **L&G Lab** recommends general good practice measures such as good embedment and compaction of supporting soils surrounding these structures to help ensure stability.
- **L&G Lab** recommends that if concrete box culverts or pipes are utilized they include concrete headwalls, wingwalls and riprap at inlet/outlet points with two (2) foot minimum toe walls along all structures for enhanced stability and protection of culvert/pipe bedding and subgrade.
- **L&G Lab** recommends that any circular pipe inlet points to the detention pond provide a concrete splash-pad (or outlet to concrete riprap or flexible erosion protection system) to avoid localized erosion points.

- **L&G Lab** recommends utilizing flexible erosion protection on the detention basin side slopes such as rock riprap (in accordance with Article 432.3 of the TxDOT Standard Specifications) at inlet/outlet locations (alternatively erosion protection measures such as articulated block or rigid erosion protection systems (concrete riprap) may be utilized). In areas where bank protection will not (or cannot) be used, vegetation of earthen slopes and topsoil should be utilized as a minimum to reduce erosion problems.

Embankment Recommendations (If Required)

L&G Lab recommends that Embankment Fill Sections utilized on this project be constructed in accordance with the requirements of TxDOT 2014 ‘Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges’, Item 132 – Embankment. Furthermore, L&G recommends the following controls be followed in accordance with TxDOT Pharr District Master General Notes:

- ‘Embankment (DENS CONT) shall be Type C with a max. PI of 40. Material used as embankment material in the top two feet below the bottom of Flexible Base shall meet the following requirements based on preliminary tests and such other tests found necessary by the Engineer.
 - The material shall be such as to produce a well-bonded embankment and shall have a minimum PI of 8 and a maximum PI of 30.’

Compaction method is recommended for Embankment Fill Sections and shall be Density Controlled in accordance with the requirements of TxDOT 2014 ‘Standard Specifications’, Item 132 – Embankment. As specified in the ‘Estimated Settlement Analysis’ section of this report, we recommend constructing a wick drain grid with sand cap layer prior to constructing embankments. In addition, we recommend Contractor place full height embankments and allow surcharge load to assist in accelerating the settlement process for a minimum of 2 months prior to completing pavement structure atop embankment.

REFERENCES

1. Jacobs, Jerry L., 1981, "Soil Survey of Hidalgo County, Texas", Washington, D.C.
2. TxDOT, 2014, "Standard Specification for the Construction of Highways, Streets, and Bridges", Austin, TX.
3. TxDOT, 2005, "100-E, Soils & Aggregates Test Procedures", Austin, TX.
4. Bureau of Economic Geology, 1976, "Geologic Atlas of Texas, McAllen-Brownsville Datasheet", Austin, TX.
5. Das, Braja M., 1990, "Principles of Foundation Engineering", Boston, Massachusetts.
6. TxDOT, 2000, 2006, 2012 "Geotechnical Manual", Austin, TX
7. TxDOT, 2012, "TxDOT Pharr District Master General Notes" (Updated Nov. 2013)

APPENDIX A – FIGURES

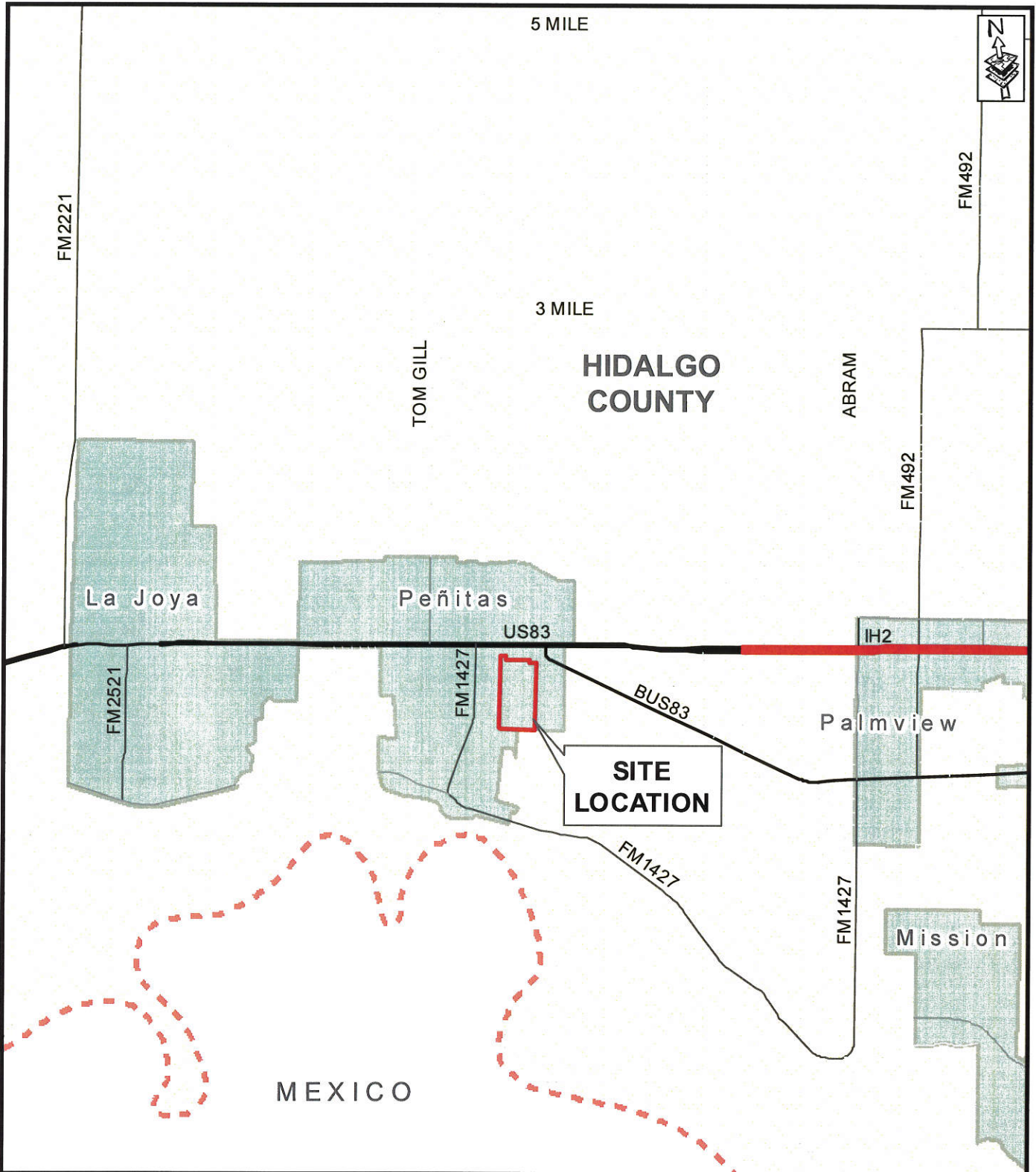


Figure 1
 L&G Consulting Engineers
 La Joya Watershed
 Phase I - Task B
Location Map

Legend		 1 inch = 5,000 feet
Interstate US Highway State Highway FM Roadway Off-System Roadway	City County	

L&G Consulting Engineers, Inc.

[Faint, illegible text covering the majority of the page]

[Faint, illegible text in a horizontal band]

<p>1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030</p>	<p>1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030</p>	<p>1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030</p>
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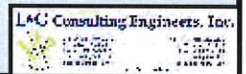


Figure 3
 L&G Consulting Engineers
 La Joya Watershed
 Phase I - Task B
 Soil Classification Map
 USDA SOIL CONSERVATION SERVICE

Legend

- | | |
|-----------------------------------|------------------------------------|
| 35 McAllen Fine Sandy Loam | 38 McAllen Sandy Clay Loam |
| 36 McAllen Fine Sandy Loam | 50 Ramadero Sandy Clay Loam |
| 37 McAllen Fine Sandy Loam | |

1,000 Feet
 1 inch = 1,000 feet



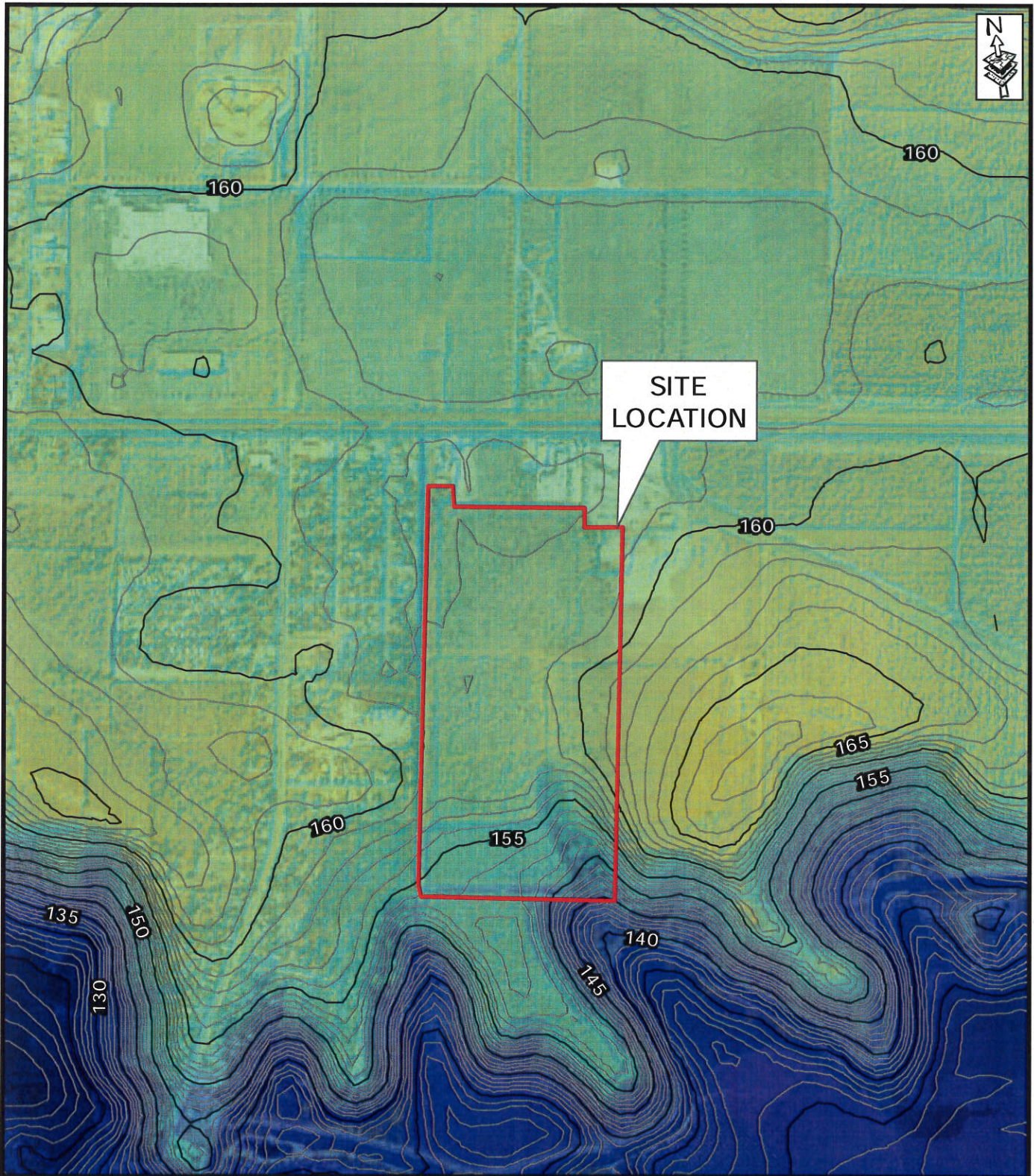


Figure 4
 L&G Consulting Engineers
 La Joya Watershed
 Phase I - Task B
 Digital Elevation Map

- Legend**
- 5ft Contours
 - 1ft Contours

High

Low

1,000
 Feet
 1 inch = 1,000 feet

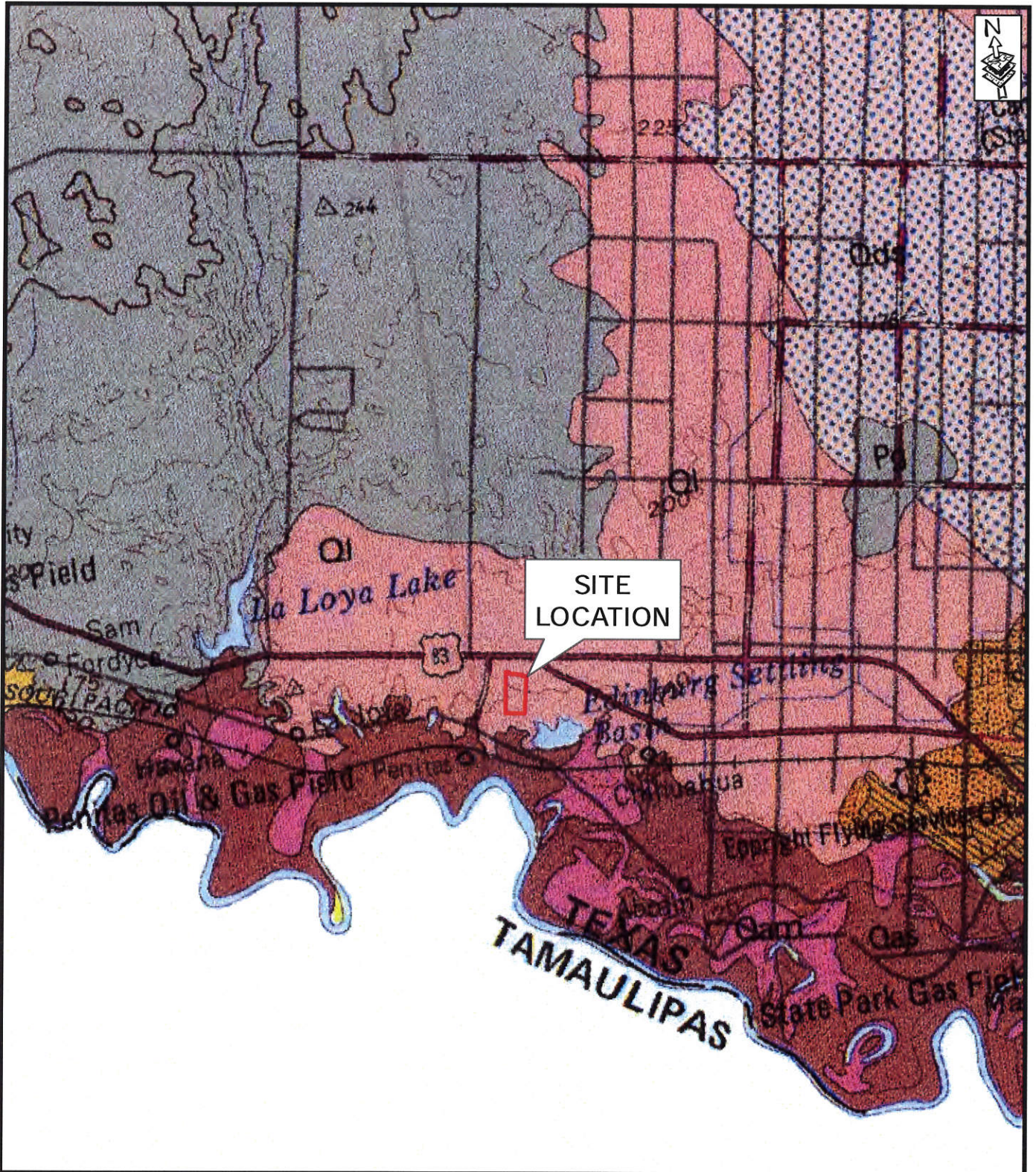
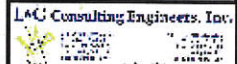


Figure 5
 L&G Consulting Engineers
 La Joya Watershed
 Phase I - Task B
 Geologic Atlas of Texas
 McAllen - Brownsville Sheet

Legend
 Lissie Formation Undivided

10,000
 Feet
 1 inch = 10,000 feet



APPENDIX B – BORING LOGS



L & G Engineering Laboratory

Construction Material Testing
Geotechnical Engineering

L&G Engineering Laboratory LLC
2100 W. Expressway 83
Mercedes TX 78570
Telephone: 956-565-0760

KEY TO SYMBOLS

CLIENT L&G Consulting Engineers, Inc.

PROJECT NAME La Joya Watershed Ph I - South Basin Detention Pond

PROJECT NUMBER GL14030

PROJECT LOCATION Hidalgo County

LITHOLOGIC SYMBOLS (Unified Soil Classification System)



CH: USCS High Plasticity Clay



CL: USCS Low Plasticity Clay



SC: USCS Clayey Sand

SAMPLER SYMBOLS



Standard Penetration Test

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
W - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
-200 - PERCENT PASSING NO. 200 SIEVE
PP - POCKET PENETROMETER (TSF)

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION
▽ Water Level at Time
Drilling, or as Shown
▼ Water Level at End of
Drilling, or as Shown
▽ Water Level After 24
Hours, or as Shown

CLIENT L&G Consulting Engineers, Inc. **PROJECT NAME** La Joya Watershed Ph I - South Basin Detention Pond
PROJECT NUMBER GL14030 **PROJECT LOCATION** Hidalgo County
DATE STARTED 3/20/15 **COMPLETED** 3/23/15 **GROUND ELEVATION** 164 ft **HOLE SIZE** 4 inches
DRILLING CONTRACTOR L&G Engineering Laboratory **GROUND WATER LEVELS:**
DRILLING METHOD Solid Stem Auger **AT TIME OF DRILLING** --- No Waterstrike Encountered
LOGGED BY E. Gonzalez **CHECKED BY** D. Saenz, PE **AT END OF DRILLING** ---
NOTES GPS 26°14'25.40"N, 98°15'15.04"W (Approx. Elev.) **24hrs AFTER DRILLING** --- No Waterstrike (Cave-In Depth = 24.00 ft)

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 4/30/15 08:37 - L:\GINT\PROJECTS\L&G ENG - L.J. WATSHED IMP PH I (SOUTH PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules, Medium Stiff to Hard, Dry	SPT 1		6-3-3 (6)			14				61
			SPT 2		4-7-10 (17)			15	37	16	21	
5			SPT 3		9-12-14 (26)			13				
			SPT 4		16-25-30 (55)							
			SPT 5		28-32-42 (74)			17				
10		(CH) Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Dry	SPT 6		22-34-42 (76)							82
			SPT 7		16-24-30 (54)			13	90	27	63	
15		(CH) Fat Clay, Brown w/ Grayish Brown Streaks, Hard, Dry	SPT 8		12-20-20 (40)							
			SPT 9		22-24-22 (46)			21				99
20			SPT 10		23-23-23 (46)			15	64	23	41	
25												

Bottom of borehole at 25.0 feet.

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - South Basin Detention Pond
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 3/23/15 COMPLETED 3/23/15 GROUND ELEVATION 164 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger AT TIME OF DRILLING --- No Waterstrike Encountered
 LOGGED BY E. Gonzalez CHECKED BY D. Saenz, PE AT END OF DRILLING ---
 NOTES GPS 26°14'24.50"N, 98°26'09.10"W (Approx. Elev.) 24hrs AFTER DRILLING --- No Waterstrike (Cave-In Depth = 23.50 ft)

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules, Stiff to Hard, Dry	SPT 1		7-5-6 (11)			15				58
			SPT 2		5-7-7 (14)				37	14	23	
5			SPT 3		11-11-22 (33)			10				
			SPT 4		14-15-17 (32)							
			SPT 5		25-30-45 (75)			12				
10		(CH) Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Dry	SPT 6		27-37-40 (77)							85
			SPT 7		23-36-42 (78)			14	75	27	48	
15			SPT 8		21-23-30 (53)							
		(CL) Lean Clay, Brown, w/ Calcareous Nodules, Hard, Dry	SPT 9		25-25-35 (60)			17				98
20			SPT 10		24-25-30 (55)			13	41	16	25	
25		Bottom of borehole at 25.0 feet.										

GEO TECH BH COLUMNS - GINT STD US LAB.GDT - 4/30/15 08:38 - L:\GINT\PROJECTS\L&G ENG - L\J WATSHED IMP PH I (SOUTH PIT).GPJ

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - South Basin Detention Pond
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 3/23/15 COMPLETED 3/23/15 GROUND ELEVATION 165 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger AT TIME OF DRILLING --- No Waterstrike Encountered
 LOGGED BY E. Gonzalez CHECKED BY D. Saenz, PE AT END OF DRILLING ---
 NOTES GPS 26°14'20.70"N, 98°26'15.40"W (Approx. Elev.) 24hrs AFTER DRILLING --- No Waterstrike (Cave-In Depth = 25.00ft)

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules, Medium Stiff to Hard, Dry	SPT 1		3-3-3 (6)			14				68
			SPT 2		4-5-5 (10)				39	19	20	
5			SPT 3		8-12-17 (29)			13				
			SPT 4		16-23-36 (59)							
		(CL) Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Dry	SPT 5		30-45-50 (95)			11				80
10			SPT 6		10-22-30 (52)							
		(CH) Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Dry	SPT 7		20-27-30 (57)			13	67	26	41	
15			SPT 8		22-24-26 (50)							
		(CL) Lean Clay, Brown, Hard, Dry	SPT 9		27-29-33 (62)			14				95
20			SPT 10		22-23-27 (50)			10	29	18	11	
25		Bottom of borehole at 25.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 4/30/15 08:38 - L:\GINT\PROJECTS\L&G ENG - L.J. WATSHED IMP PH I (SOUTH PIT).GPJ

CLIENT L&G Consulting Engineers, Inc. **PROJECT NAME** La Joya Watershed Ph I - South Basin Detention Pond
PROJECT NUMBER GL14030 **PROJECT LOCATION** Hidalgo County
DATE STARTED 3/23/15 **COMPLETED** 3/23/15 **GROUND ELEVATION** 165 ft **HOLE SIZE** 4 inches
DRILLING CONTRACTOR L&G Engineering Laboratory **GROUND WATER LEVELS:**
DRILLING METHOD Solid Stem Auger **AT TIME OF DRILLING** --- No Waterstrike Encountered
LOGGED BY E. Gonzalez **CHECKED BY** D. Saenz, PE **AT END OF DRILLING** ---
NOTES GPS 26°14'13.50"N, 98°26'18.00"W (Approx. Elev.) **24hrs AFTER DRILLING** --- No Waterstrike (Cave-In Depth = 23.50 ft)

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Brown, w/ Traces of Small Roots (Noted in Upper 4 ft), w/ Calcareous Nodules, Medium Stiff to Stiff, Dry	SPT 1		4-4-4 (8)			15				62
			SPT 2		3-6-9 (15)				35	17	18	
5			SPT 3		10-19-21 (40)			13				
			SPT 4		17-20-21 (41)							
10		(CH) Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Dry	SPT 5		15-18-26 (44)			12				83
			SPT 6		20-23-30 (53)							
			SPT 7		21-27-31 (58)			14	74	45	29	
15			SPT 8		20-22-23 (45)							
20		(CH) Fat Clay, Brown w/ Grayish Brown Streaks, Hard, Dry	SPT 9		15-21-25 (46)			14				95
			SPT 10		16-20-24 (44)			15	61	25	36	
25		Bottom of borehole at 25.0 feet.										

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 4/30/15 08:38 - L:\GINT\PROJECTS\L&G ENG - L.J. WATSHED IMP PH I (SOUTH PIT).GPJ

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - South Basin Detention Pond
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 3/24/15 COMPLETED 3/24/15 GROUND ELEVATION 165 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger AT TIME OF DRILLING --- No Waterstrike Encountered
 LOGGED BY E. Gonzalez CHECKED BY D. Saenz, PE AT END OF DRILLING ---
 NOTES GPS 26°14'12.10"N, 98°26'09.80"W (Approx. Elev.) 24hrs AFTER DRILLING --- No Waterstrike (Cave-In Depth = 24.75 ft)

GEO TECH BH COLUMNS - GINT STD US LAB.GDT - 4/30/15 08:38 - L:\GINT\PROJECTS\L&G ENG - L.J. WATSHED IMP. PH.I (SOUTH PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Brown, Medium Stiff, Dry	SPT 1		4-3-3 (6)			16				59
		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules & Black Mottles, Medium Stiff, Dry	SPT 2		3-3-4 (7)				39	16	23	
5		(CL) Lean Clay, Brown, w/ Reddish Brown & Grayish Brown Streaks (Noted From 18.5 ft to 25 ft), w/ Calcareous Nodules & Black Mottles, Very Stiff to Hard, Dry	SPT 3		6-9-10 (19)			12				
			SPT 4		7-8-8 (16)							
			SPT 5		7-9-11 (20)			15				97
			SPT 6		7-10-25 (35)							
			SPT 7		12-14-18 (32)			15	46	20	26	
			SPT 8		14-18-25 (43)							
			SPT 9		22-23-24 (47)			15				93
			SPT 10		23-24-26 (50)				29	17	12	
25		Bottom of borehole at 25.0 feet.										

CLIENT L&G Consulting Engineers, Inc. **PROJECT NAME** La Joya Watershed Ph I - South Basin Detention Pond
PROJECT NUMBER GL14030 **PROJECT LOCATION** Hidalgo County
DATE STARTED 3/24/15 **COMPLETED** 3/24/15 **GROUND ELEVATION** 165 ft **HOLE SIZE** 4 inches
DRILLING CONTRACTOR L&G Engineering Laboratory **GROUND WATER LEVELS:**
DRILLING METHOD Solid Stem Auger **AT TIME OF DRILLING** --- No Waterstrike Encountered
LOGGED BY E. Gonzalez **CHECKED BY** D. Saenz, PE **AT END OF DRILLING** ---
NOTES GPS 26°14'10.20"N, 98°26'17.60"W (Approx. Elev.) **24hrs AFTER DRILLING** --- No Waterstrike (Cave-In Depth = 25.00 ft)

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 4/30/15 08:38 - L:\GINT\PROJECTS\L&G ENG - L.J. WATSHED IMP.PH.I (SOUTH PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules (Noted From 2.5 ft to 8.5 ft), Very Stiff, Dry										
			SPT 1		7-10-8 (18)			9	23	15	8	
			SPT 2		4-7-9 (16)							
5			SPT 3		9-9-11 (20)			14				67
			SPT 4		12-13-15 (28)							
		(CH) Fat Clay, Brown w/ Reddish Brown Streaks, w/ Gray Streaks (Noted From 14.5 ft to 25 ft), w/ Calcareous Nodules & Black Mottles, Hard, Dry	SPT 5		20-24-39 (63)			12	65	20	45	
			SPT 6		22-28-28 (56)							
			SPT 7		20-27-35 (62)			20				86
15			SPT 8		14-17-20 (37)							
			SPT 9		15-22-24 (46)			17	55	21	34	
			SPT 10		13-23-28 (51)							93
25		Bottom of borehole at 25.0 feet.										

CLIENT L&G Consulting Engineers, Inc. **PROJECT NAME** La Joya Watershed Ph I - South Basin Detention Pond
PROJECT NUMBER GL14030 **PROJECT LOCATION** Hidalgo County
DATE STARTED 3/24/15 **COMPLETED** 3/24/15 **GROUND ELEVATION** 161 ft **HOLE SIZE** 4 inches
DRILLING CONTRACTOR L&G Engineering Laboratory **GROUND WATER LEVELS:**
DRILLING METHOD Solid Stem Auger **AT TIME OF DRILLING** --- No Waterstrike Encountered
LOGGED BY E. Gonzalez **CHECKED BY** D. Saenz, PE **AT END OF DRILLING** ---
NOTES GPS 26°14'06.60"N, 98°26'18.50"W (Approx. Elev.) **24hrs AFTER DRILLING** --- No Waterstrike (Cave-In Depth = 25.00 ft)

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 4/30/15 08:38 - L:\GINT\PROJECTS\L&G ENG - L.J. WATSHED IMP. PH I (SOUTH PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules (Noted From 2.5 ft to 6.5 ft), Soft to Medium Stiff, Dry	SPT 1		3-2-2 (4)			12	27	16	11	
			SPT 2		2-3-3 (6)							58
5			SPT 3		3-4-4 (8)			12				
		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules, Very Stiff to Hard, Dry	SPT 4		5-8-10 (18)				47	20	27	
			SPT 5		16-22-28 (50)			12				
10		(CH) Fat Clay, Brown w/ Grayish Brown Streaks, w/ Calcareous Nodules, Hard, Dry	SPT 6		15-21-28 (49)							
			SPT 7		16-18-24 (42)			18				
			SPT 8		18-21-28 (49)							98
			SPT 9		22-21-20 (41)			9	55	24	31	
20			SPT 10		18-25-25 (50)							98
25		Bottom of borehole at 25.0 feet.										

CLIENT L&G Consulting Engineers, Inc. PROJECT NAME La Joya Watershed Ph I - South Basin Detention Pond
 PROJECT NUMBER GL14030 PROJECT LOCATION Hidalgo County
 DATE STARTED 3/24/15 COMPLETED 3/24/15 GROUND ELEVATION 159 ft HOLE SIZE 4 inches
 DRILLING CONTRACTOR L&G Engineering Laboratory GROUND WATER LEVELS:
 DRILLING METHOD Solid Stem Auger AT TIME OF DRILLING --- No Waterstrike Encountered
 LOGGED BY E. Gonzalez CHECKED BY D. Saenz, PE AT END OF DRILLING ---
 NOTES GPS 26°14'05.90"N, 98°26'13.70"W (Approx. Elev.) 24hrs AFTER DRILLING --- No Waterstrike (Cave-In Depth = 25.00 ft)

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 4/30/15 08:38 - L:\GINT\PROJECTS\L&G ENG - L\J WATSHED IMP PH I (SOUTH PIT).GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		(CL) Sandy Lean Clay, Brown, w/ Calcareous Nodules (Noted From 2.5 ft to 8.5 ft), Medium Stiff to Stiff, Dry	SPT 1		2-3-2 (5)							51
			SPT 2		3-5-10 (15)			16	44	17	27	
5			SPT 3		10-14-17 (31)							
			SPT 4		13-16-23 (39)			11				
		(CH) Fat Clay, Brown, w/ Grayish Streaks (Noted From 18.5 ft to 23.5 ft), w/ Calcareous Nodules & Black Mottles, Hard, Dry	SPT 5		25-33-29 (62)				62	26	36	
10			SPT 6		26-30-33 (63)			13				91
			SPT 7		20-22-32 (54)							
15			SPT 8		18-21-35 (56)			14	52	20	32	
			SPT 9		18-22-22 (44)							89
20			SPT 10		27-30-30 (60)			6				13
25		(SC) Clayey Sand, Fat, Brown w/ Grayish Streaks, w/ Calcareous Nodules & Black Mottles, Very Dense, Dry										
Bottom of borehole at 25.0 feet.												

APPENDIX C – GLOBAL STABILITY (SIDE SLOPES)

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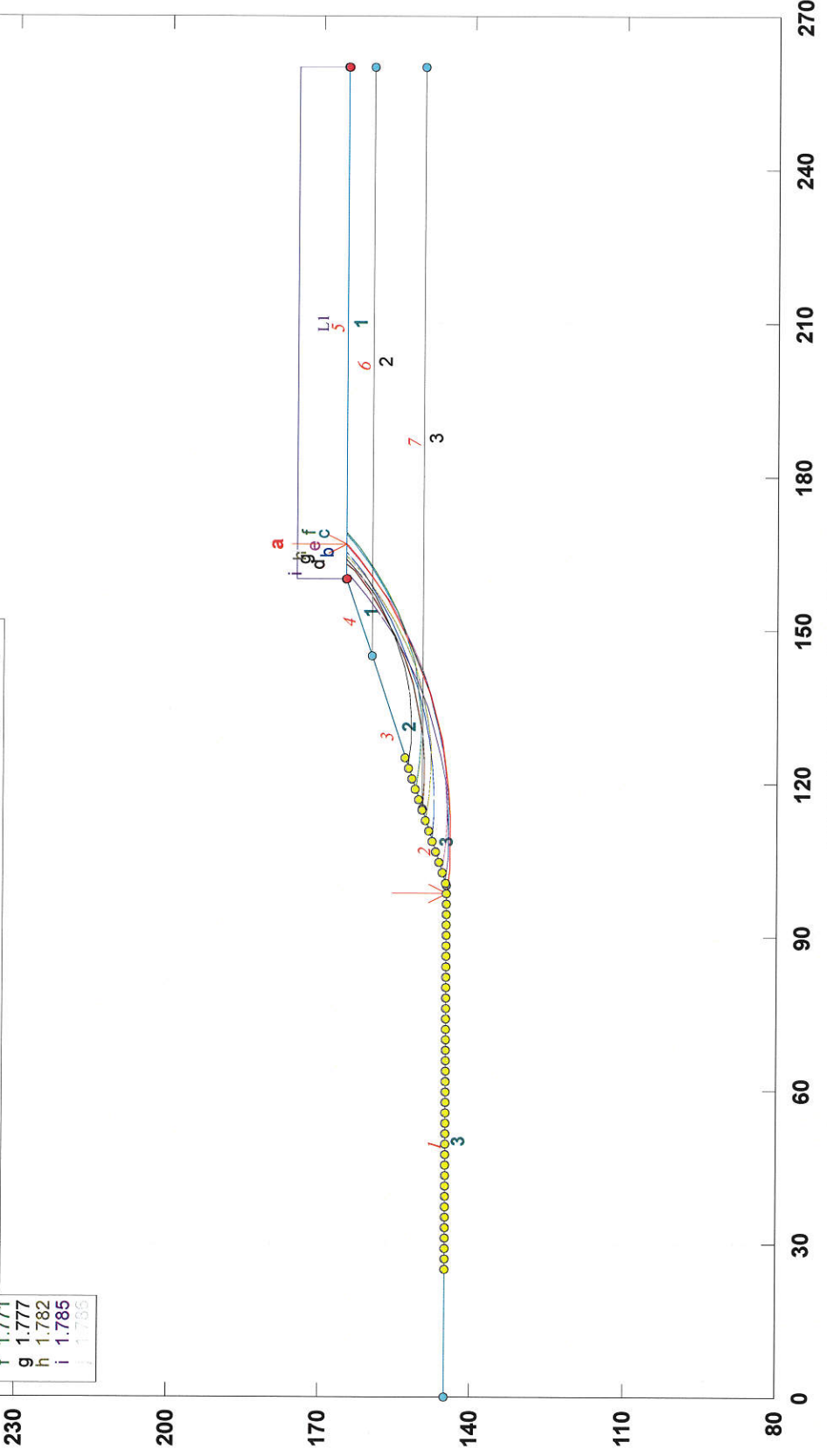
La Joya Watershed - Phase I (Task B) South Det Basin - WC (Dr)

I:\projects\year_2014_projects\l&g_engineering\l14030 - la joya watershed imp. proj. (phase i)\calculations\section 2 - south detention basin\gstabl\southdb_dr (wc).pl2 Run By: JBS 4/29/2015 04:39PM

260

#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Piez. Constant Surface No.	Load	Value
a	1.756	EX1	1	125.0	125.0	50.0	29.5	0.0	0	L1	250 psf
b	1.757	EX2	2	125.0	125.0	50.0	23.0	0.0	0		
c	1.759	EX3	3	125.0	125.0	50.0	25.5	0.0	0		
d	1.766										
e	1.769										
f	1.771										
g	1.777										
h	1.782										
i	1.785										
j	1.786										

230



GSTABL7 v.2 FSmin=1.756

Safety Factors Are Calculated By The Modified Bishop Method

270

APPENDIX D – MISCELLANEOUS PROJECT INFO

Preliminary Plans Provided By L&G Engineering

HIDALGO COUNTY DRAINAGE DISTRICT NO.1

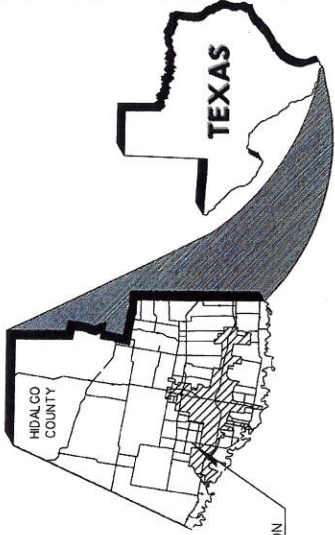
PLANS OF PROPOSED DRAINAGE IMPROVEMENT

NET LENGTH OF PROJECT : X,XXX FT. • XX MI.

HIDALGO COUNTY

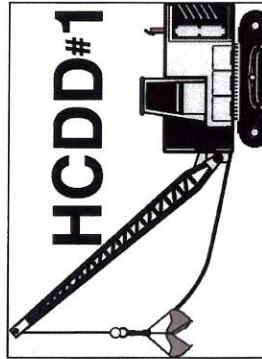
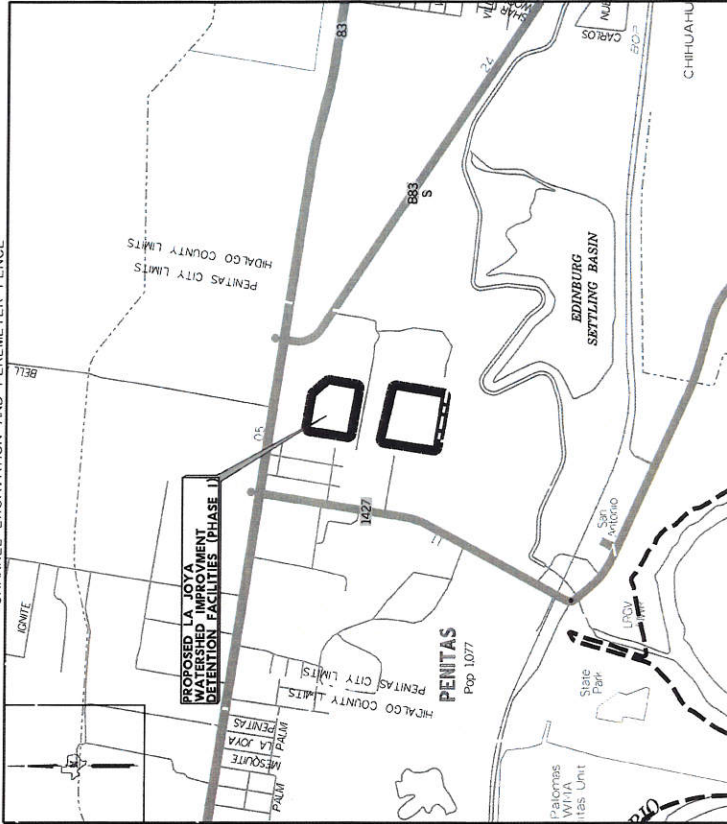
LA JOYA WATERSHED IMPROVEMENTS DETENTION FACILITIES (PHASE D)

PROJECT LOCATION



LIMITS: SOUTH DETENTION BASIN

CHANNEL EXCAVATION AND PEREMETER FENCE



2100 W. Expressway 83
Mercedes, TX, 78570
Phone : (956) 565-9813
Fax : (956) 565-9018

L & G Engineering

Highway / Civil
Structural / Bridge
Environmental
Firm No. : F-4105



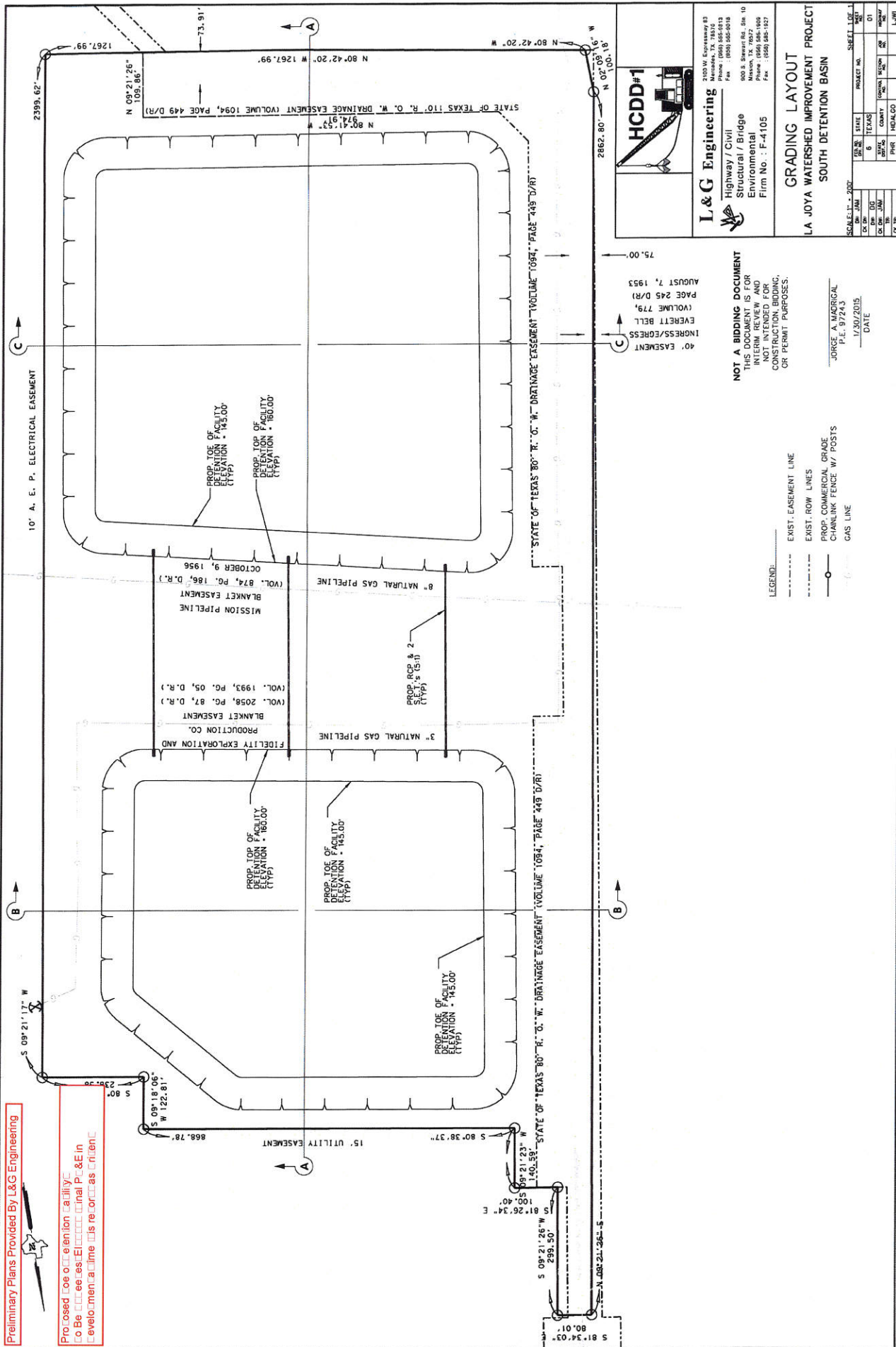
900 S. Stewart Rd., Ste. 10
Mission, TX, 78572
Phone : (956) 585-1809
Fax : (956) 585-1927

RAMON GARCIA
COMMISSIONER JOE M. FLORES

COUNTY JUDGE
PRECINCT No. 3

Preliminary Plans Provided By L&G Engineering

Proposed location of utility facilities shall be determined by L&G Engineering. All utility easements shall be shown as indicated.



HCDD#1

L & G Engineering
 Highway / Civil
 Structural / Bridge
 Environmental
 Firm No. : F-4105

2103 W. Expressway #3
 Mesquite, TX 78150
 Phone: (866) 666-6113
 Fax: (866) 666-6113

800 S. Barnett Rd. Ste. 10
 Phone: (866) 666-1008
 Fax: (866) 666-1027

GRADING LAYOUT
SOUTH DETENTION BASIN

SCALE: 1" = 200'

DATE	BY	CHK'D	APP'D
1/30/2015	JAM	JAM	JAM

SHEET NO. 1
 PROJECT NO. 150101
 COUNTY: TARRANT
 CITY: FORT WORTH
 STATE: TEXAS
 DRAWN BY: JAM
 CHECKED BY: JAM
 APPROVED BY: JAM

NOT A BIDDING DOCUMENT
 THIS DOCUMENT IS FOR INTERIM REVIEW AND NOT INTENDED FOR CONSTRUCTION BIDDING OR PERMIT PURPOSES.

40' EASEMENT
 75.00'
 AUGUST 7, 1953
 EVERETT BELL
 (VOLUME 779,
 PAGE 245 D/R)

LEGEND:
 - - - - - EXIST. EASEMENT LINE
 - - - - - EXIST. ROW LINES
 - - - - - PROP. COMMERCIAL GRADE
 - - - - - CHARLIEK FENCE W/ POSTS
 - - - - - GAS LINE

JORGE A. MADRIGAL
 P.E. 97243
 DATE: 1/30/2015



**HIDALGO COUNTY
DRAINAGE
DISTRICT No. 1**

RAUL E. SESIN, PE, CFM
General Manager
Floodplain Administrator

902 N. Doolittle Road
Edinburg, Texas 78542
Off 956 292.7080
Fax 956 292.7089

BOARD OF DIRECTORS

RAMON GARCIA
Chairman of the Board

A.C. CUELLAR, JR.
Board Member

EDUARDO "EDDIE" CANTU
Board Member

JOE M. FLORES
Board Member

JOSEPH PALACIOS
Board Member

May 05, 2015

Lora Briones
Financial Officer
Re: Invoice

910

I. L&G Consulting Engineers Inc.
Invoice# 11325138/ 4-30-2015/ \$35,443.09

I have reviewed the invoice referenced above, and have no issues for payment based on the digital/ back up information and complete percentages they are billing the Drainage District. Should you have any questions, please feel free to contact me.

Thank you,

J. Noe Saldivar, P.E.
Hydraulic Engineer

Date: 05/05/15 Time: 4:00 PM

Cc: Raul E. Sesin, PE, CFM

51615
8:43 AM.

AJ# 49689
Boo 5/19/15



COVERSHEET
APPROVED-BOND INVOICES

Submitted to Noe

DATE: 5/4/2015

Prepared By: Joey Garza

Jo MON.

Vendor	Unit #	Invoice #	Invoice Date	Invoice Amount	Received By	Received Date	COMMENTS
L & G ENGINEERING	MISSION INLET RECERTIFICATION PROJECT. WA #4	11325140	04/30/15	\$25,738.60	R. ARCE	05/01/15	<i>ARCE</i> <i>05/05/15</i> PO #624010 ATTACHED W/ DISC INV. #11325140
L & G ENGINEERING	LA JOYA WATERSHED IMP. WA #4	11325138	04/30/15	\$35,443.09	R. ARCE	05/01/15	<i>ARCE</i> <i>05/05/15</i> PO #625396 ATTACHED W/ DISC INV. #11325138
L & G ENGINEERING	MISSION INLET RECERTIFICATION PROJECT WA #1	11325137	04/30/15	\$17,201.54	R. ARCE	05/01/15	PO #622510 ATTACHED W/ DISC INV. #11325137



Hidalgo County Drainage District No. 1

902 North Doolittle Road Edinburg, Texas 78542 Office: (956) 292-7080 Fax: (956) 292-7089

Invoice Processing Checklist

Date Received: 4.17.15

Engineer/Firm Name: R. Gutierrez Eng.

Project Name/Number: Las Milpas Rd. Bridge Rehab

Invoice No.: 3757

Purchase Order No.: 100434/1020435

Received By: Rosa Rene

Forwarded to: Joey Garza

Total # of Pages Submitted: _____

Attachments: CD: _____ USB: _____ Other: _____ N/A: _____

Additional Comments: _____



Professional Engineers & Land Surveyors

130 E. PARK AVENUE • PHARR, TEXAS 78577

(TEL) 956-782-2557 • (FAX) 956-782-2558

Engineering Firm F - 486 • Surveying Firm #101650-00

RECEIVED
HIDALGO COUNTY
DRAINAGE DISTRICT #1

Invoice Number 3757

Date 4/17/2015

Due on receipt

APR 17 2015

11:37 AM / PM

BY: *Rosa*

Invoice

Hidalgo County Drainage District No. 1
Raul Sesin
902 N. Doolittle Road
Edinburg, TX 78542

Project: Las Milpas Road Bridge Rehab

Project No.: ENG14.014
Contract No.:
PO No. 66436/626435

Const. Cost
% of Const. Cost
Billing Fee 19,008.00

<u>Phase</u>	<u>Phase Fee</u>	<u>% Complete</u>	<u>Fee Earned</u>	<u>Prior Billing</u>	<u>Current Fee</u>
Data Collection	2,462.40	100.00%	2,462.40		2,462.40
Preliminary Engineering & Design	2,462.40	100.00%	2,462.40		2,462.40
Final Design	8,208.00	90.00%	7,387.20		7,387.20
Construction	3,283.20	0.00%			0.00
QA/QC	0.00				0.00
Surveying & Special Services	2,592.00	100.00%	2,592.00		2,592.00

Balance Due \$14,904.00

R. Gutierrez Engineering Corporation

Transmittal Form

TO: Noe Saldivar
Hidalgo County Drainage Dist. No. 1
902 N. Doolittle
Edinburg TX 78542

FROM: Jaime Jaimez, Jr.
SUBJECT: Las Milpas Road Bridge Rehab
PROJECT NO.: ENG14.014
DATE: April 17, 2015

WE ARE SENDING YOU ATTACHED UNDER SEPARATE COVER VIA Hand Delivery THE FOLLOWING ITEMS:

BLUEPRINTS PLANS SHOP DRAWINGS CD
 CHANGE ORDER SAMPLES PAYMENT REQUEST OTHER: INVOICE
 BID TABULATION CONTRACT DOCUMENTS RECORD DRAWINGS 3 1/2" DISKETTE

QUANTITY / SETS	DATED	ITEM DESCRIPTION
1	4/17/15	Invoice 3757
1	-	Plans Submittal (90%)

THESE ARE TRANSMITTED AS CHECKED BELOW:

FOR BIDS DUE APPROVED AS NOTED FOR YOUR RECORDS
 FOR APPROVAL APPROVED AS SUBMITTED FOR YOUR ACKNOWLEDGEMENT
 FOR YOUR USE RETURN FOR CORRECTIONS RESUBMIT FOR APPORVAL
 AS REQUESTED FOR FURTHER PROCESSING ON LOAN
 FOR REVIEW AND COMMENT FOR SIGNATURE OTHER

COMMENTS: _____

RECEIVED
 HIDALGO COUNTY
 DRAINAGE DISTRICT #1

APR 17 2015
 11:37 AM/PM

Copy Distribution: file

Received by: BY: *Rosaldo*

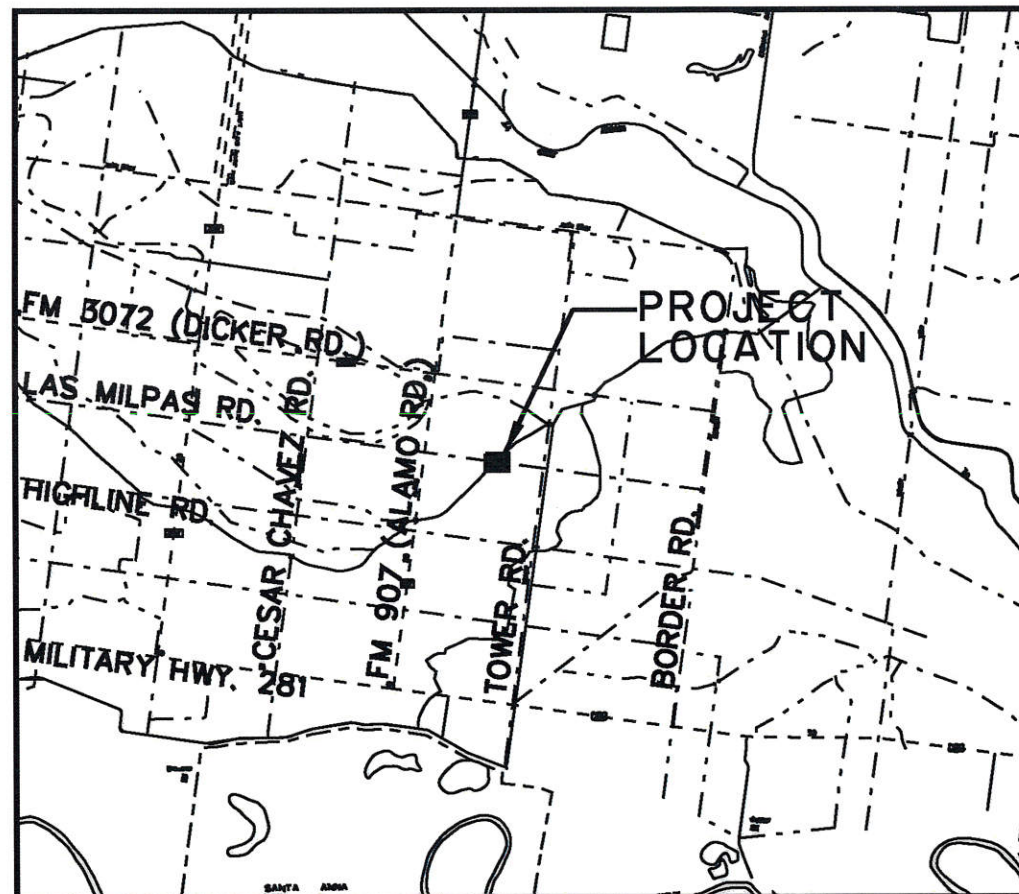
LAS MILPAS ROAD BRIDGE PILING REPAIR PROJECT

90% SUBMITTAL

INDEX OF SHEETS

GENERAL

- 1 COVER SHEET
- 2 GENERAL NOTES
- 3 TRAFFIC CONTROL PLAN
- 4-7 BC(1), BC(4), BC(8) & BC(10) - 13
- 8 EXISTING BRIDGE PILING REPAIR LAYOUT
- 9 EXISTING BRIDGE PILING REPAIR PLAN & PROFILE LAYOUT
- 10 EXISTING BRIDGE PILING REPAIR TYPICAL DETAILS
- 11-13 BRIDGE PILING REPAIR DETAILS
- 14 EC(1) - 09
- 15 EC(3) - 93



DISTRICT BOARD OF DIRECTORS

CHAIRMAN OF THE BOARD	RAMON GARCIA
BOARD MEMBER	A.C. CUELLAR
BOARD MEMBER	EDUARDO "EDDIE" CANTU
BOARD MEMBER	JOE M. FLORES
BOARD MEMBER	JOSEPH PALACIOS
DISTRICT MANAGER	RAUL SESIN

R. Gutierrez Professional Engineers & Land Surveyors
Engineering Corporation

130 E. PARK AVENUE • PHARR, TEXAS 78577
 (TEL) 956 782-2557 • (FAX) 956 782-2558

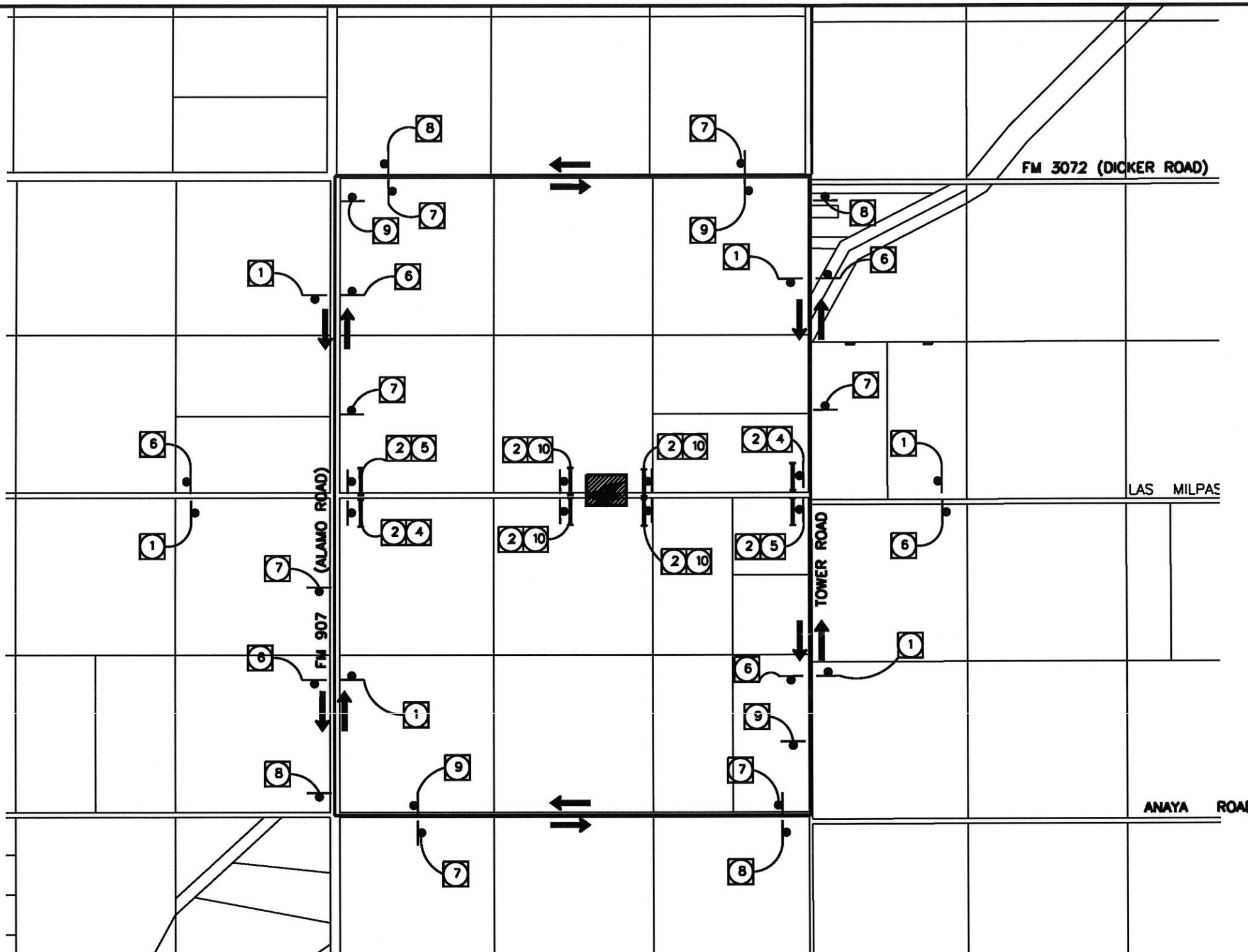
FIRM No. 486

PRELIMINARY-FOR REVIEW ONLY






These documents are for Design Review and not intended for Construction, Bidding or Permit Purposes. They were prepared by, or under the supervision of:

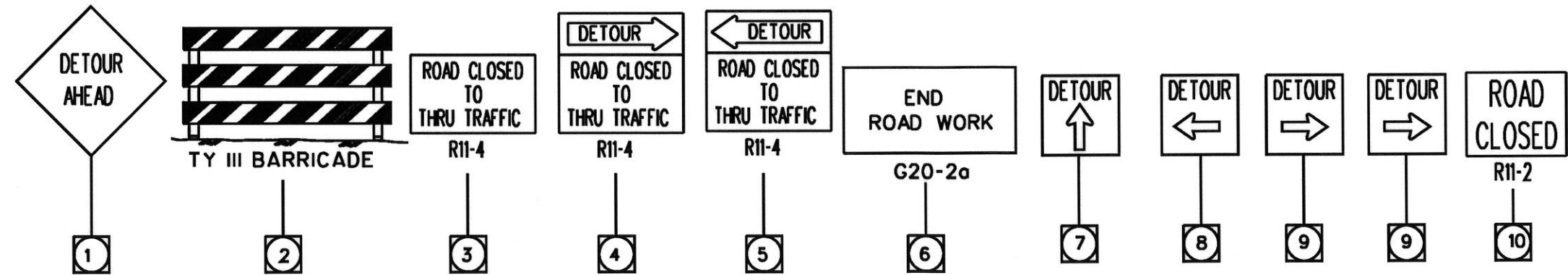
Ramiro Gutierrez 65948
 Print Name PE# Date

SCALE 1"=1000'



LEGEND

-  SIGN I.D.
-  TRAFFIC SIGN
-  TY III BARRICADE
-  TRAFFIC FLOW
-  CONSTRUCTION AREA



Professional Engineers & Land Surveyors
R. Gutierrez Engineering Corporation
 130 E. PARK AVENUE • PHARR, TEXAS 78577
 (TEL) 956 782-2557 • (FAX) 956 782-2558
 FIRM No. 486

PRELIMINARY-FOR REVIEW ONLY
 These documents are for Design Review and not intended for Construction, Bidding or Permit Purposes. They were prepared by, or under the supervision of:
 Remiro Gutierrez 65948
 PEJ Date

LAS MILPAS ROAD BRIDGE
 PILING REPAIR PROJECT
 TRAFFIC CONTROL PLAN

FB. No.:	LOCATION	REVISION	DATE	BY

SHEET No. 3

SEE L&S

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

WORKER SAFETY APPAREL NOTES:

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

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

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

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

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

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SHEET 1 OF 12

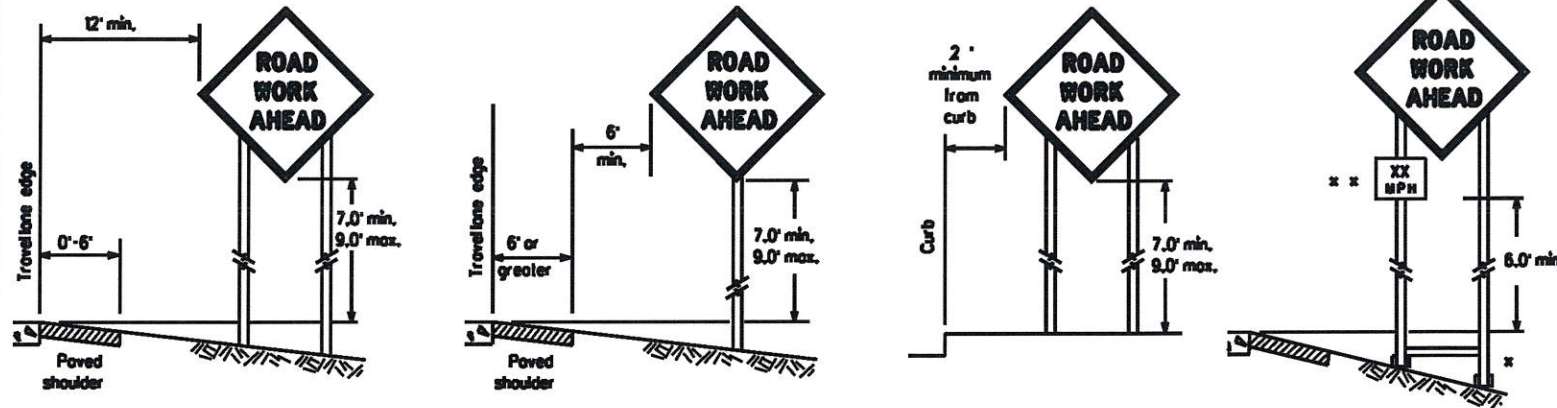


**BARRICADE AND CONSTRUCTION
 GENERAL NOTES
 AND REQUIREMENTS**

BC(1)-13

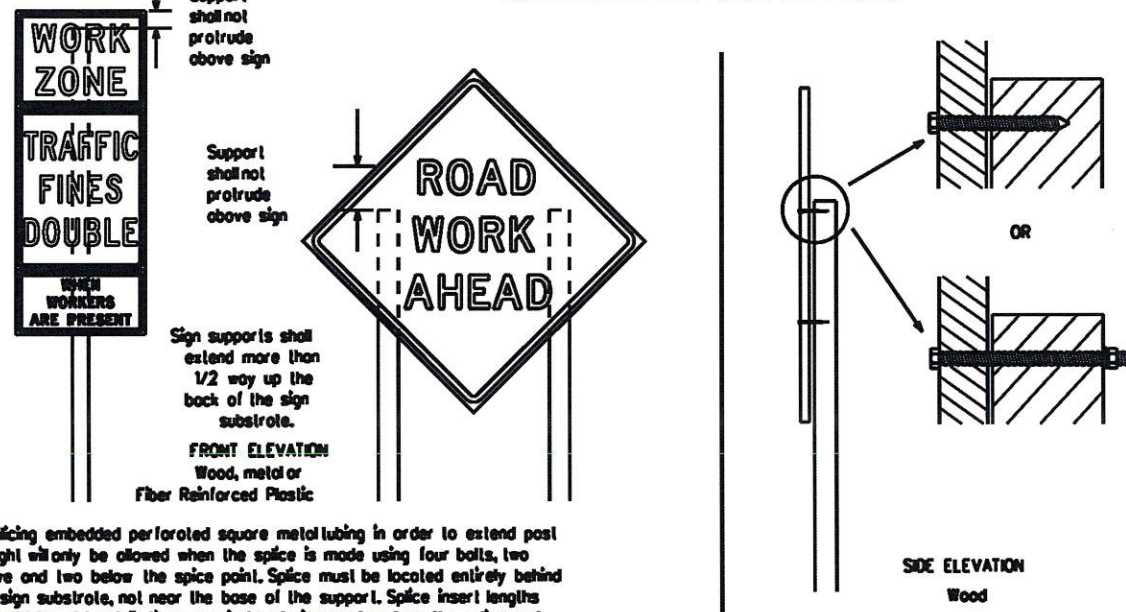
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TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



- * When placing sign supports on uneven ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under signs as a means of leveling.
- * * When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



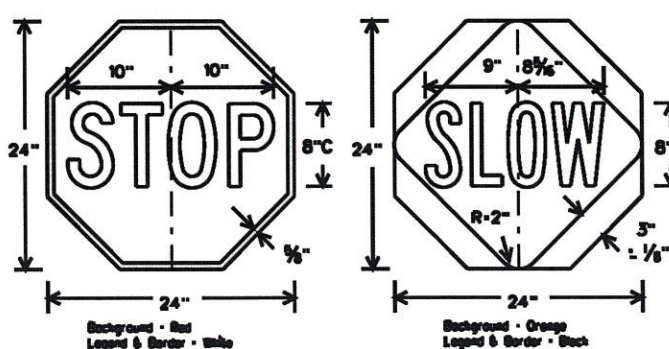
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCO. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 302.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
 2. Wooden sign posts shall be painted white.
 3. Barricades shall NOT be used as sign supports.
 4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
 5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD), The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
 6. The Contractor shall furnish sign supports listed in the "Compliance Work Zone Traffic Control Device List" (CWZTCO). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
 7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
 8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
 9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.
- DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)**
- a. Long-term stationary - work that occupies a location more than 3 days.
 - b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
 - c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - d. Short duration - work that occupies a location up to 1 hour.
 - e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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



BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-13

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

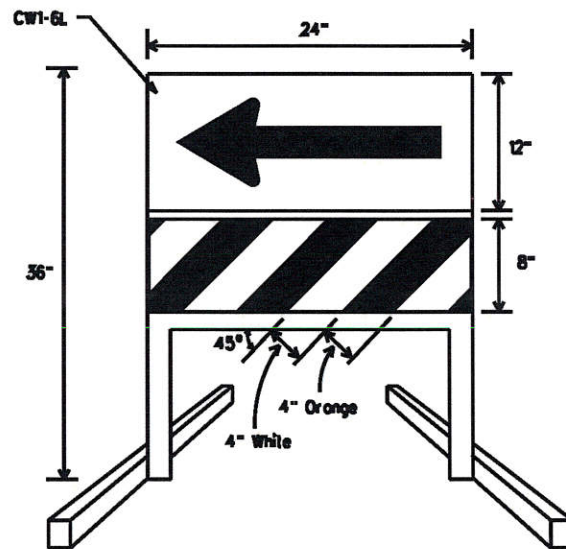
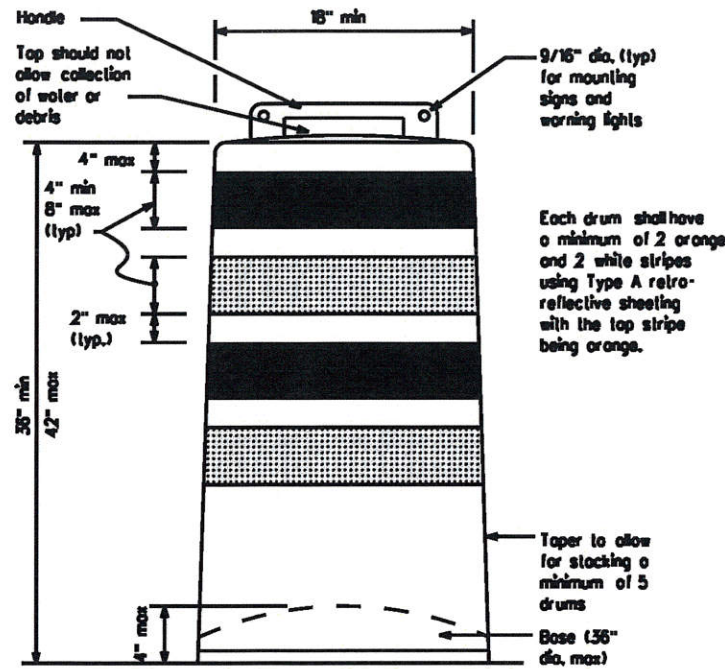
- Plastic drums shall be a two-piece design the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

RETROREFLECTIVE SHEETING

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

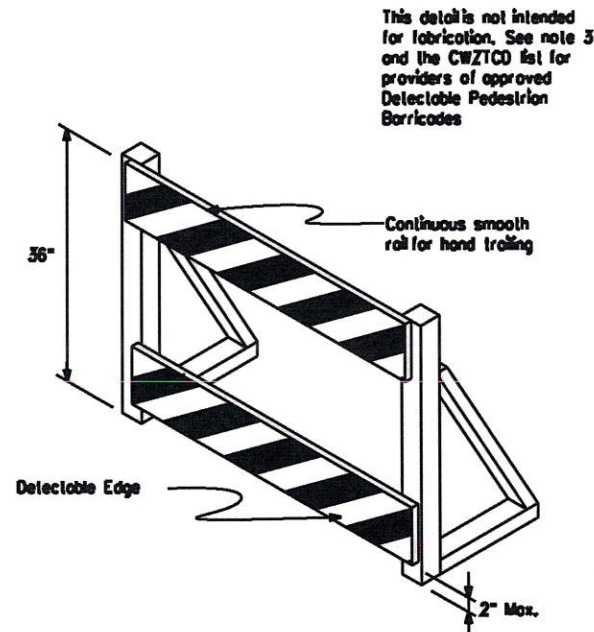
BALLAST

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



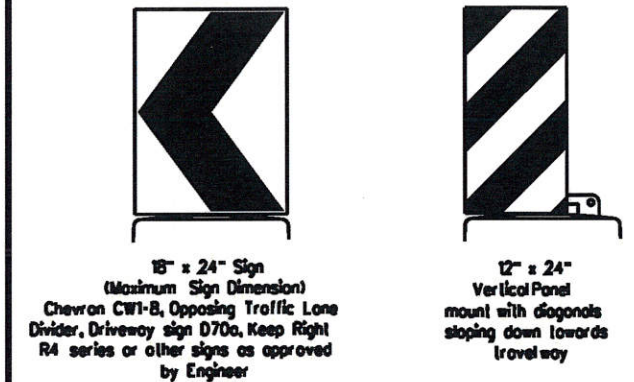
DIRECTION INDICATOR BARRICADE

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



DETECTABLE PEDESTRIAN BARRICADES

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



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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-13

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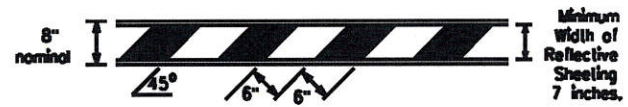
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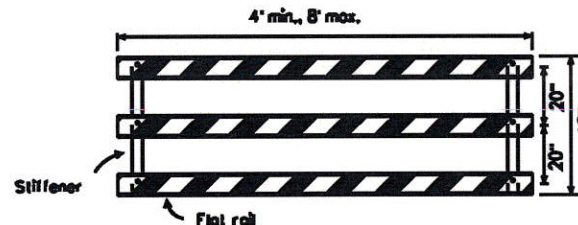
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

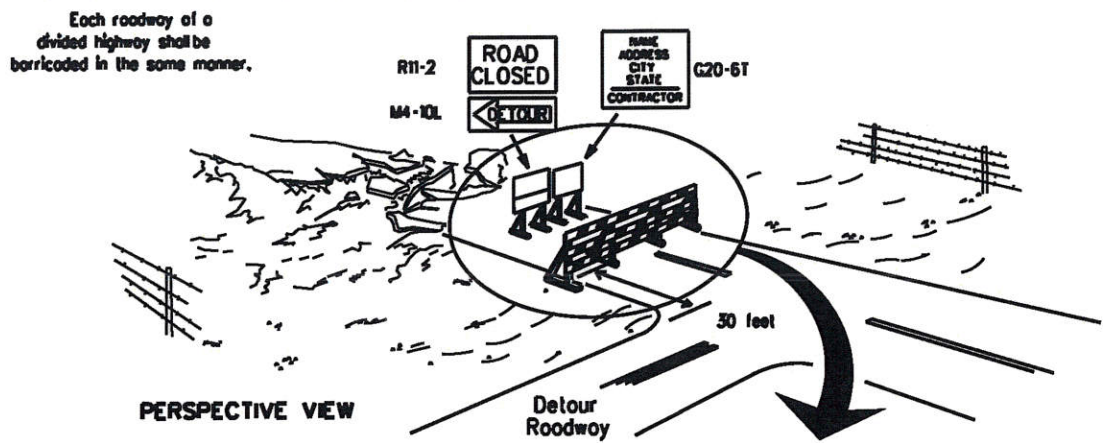


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



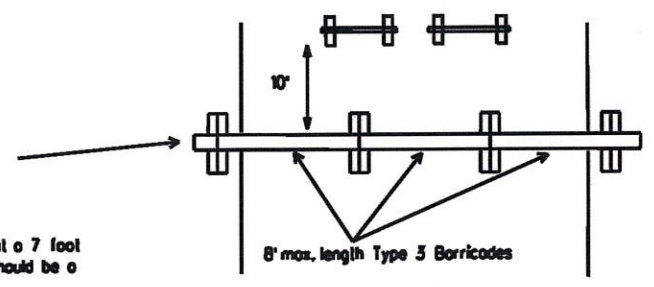
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



PERSPECTIVE VIEW

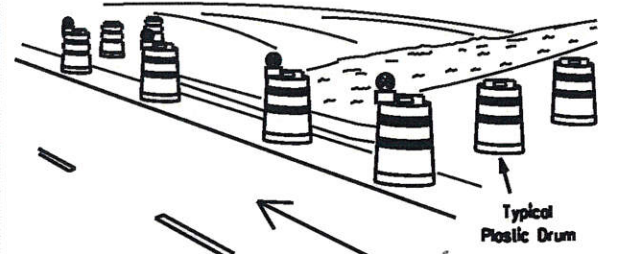
The three rolls on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



PLAN VIEW

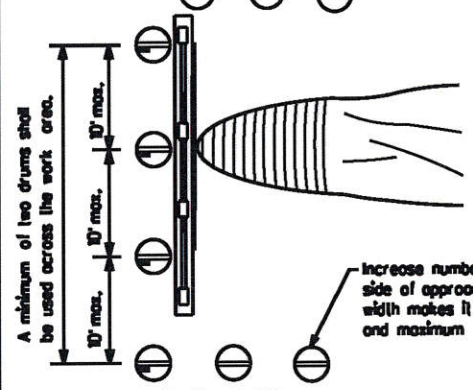
1. Signs should be mounted on independent supports of a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

These drums are not required on one-way roadway



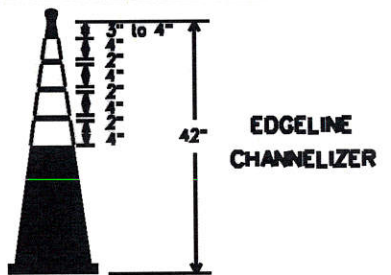
PLAN VIEW

Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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



EDGE LINE CHANNELIZER

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

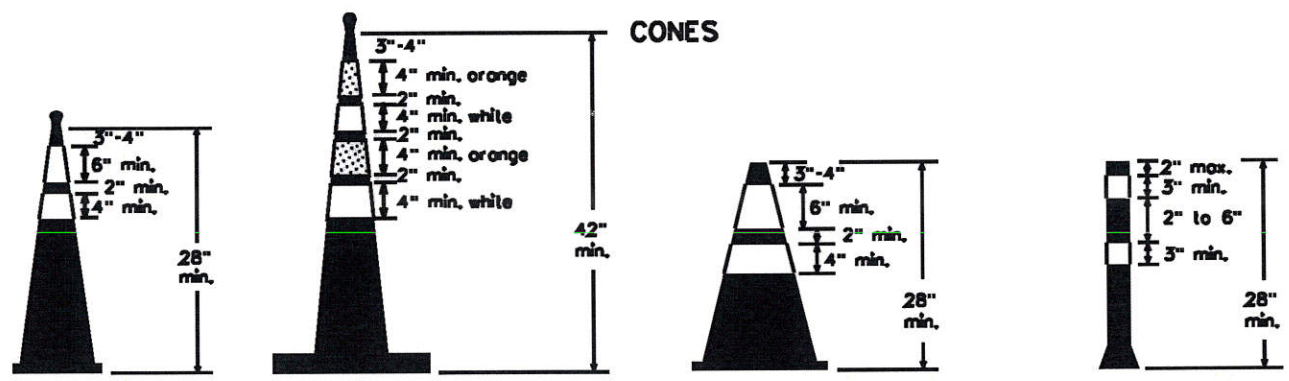
SHEET 10 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-13

FILE: bc-13.dgn	DATE: 9-07	BY: TxDOT	CHK: TxDOT	APP: TxDOT	CR: TxDOT
© TxDOT November 2002	REVISED: 7-13	CONTRACT NO.	SECTION	JOB	HIGHWAY
		DIST	COUNTY	SHEET NO. 7	



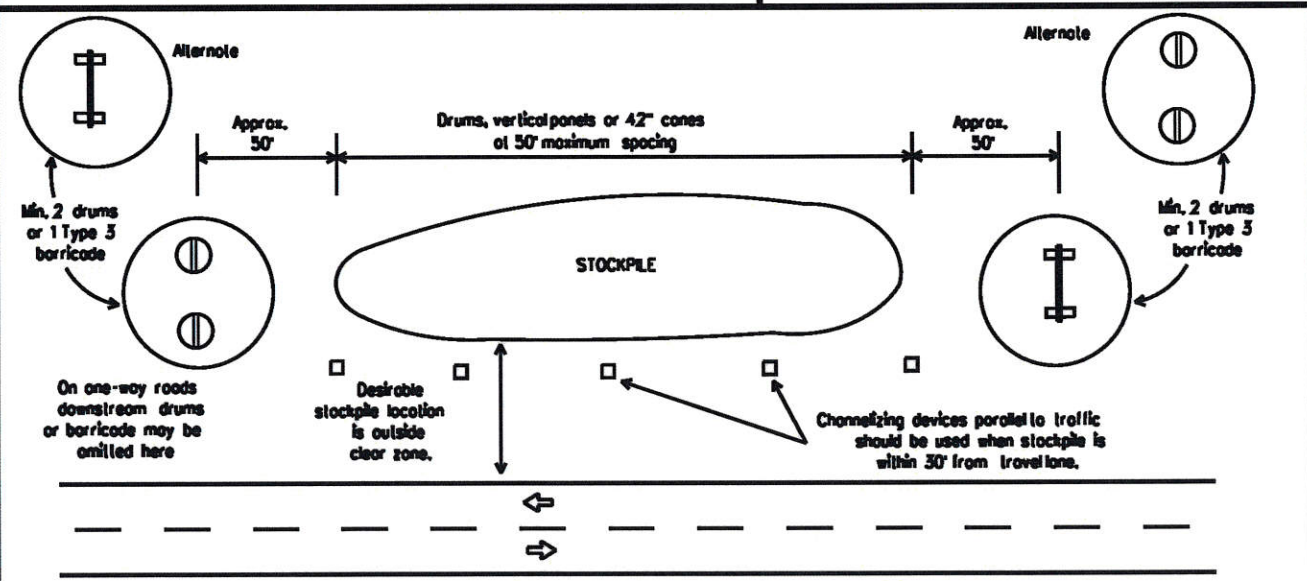
Two-Piece cones

One-Piece cones

Tubular Marker

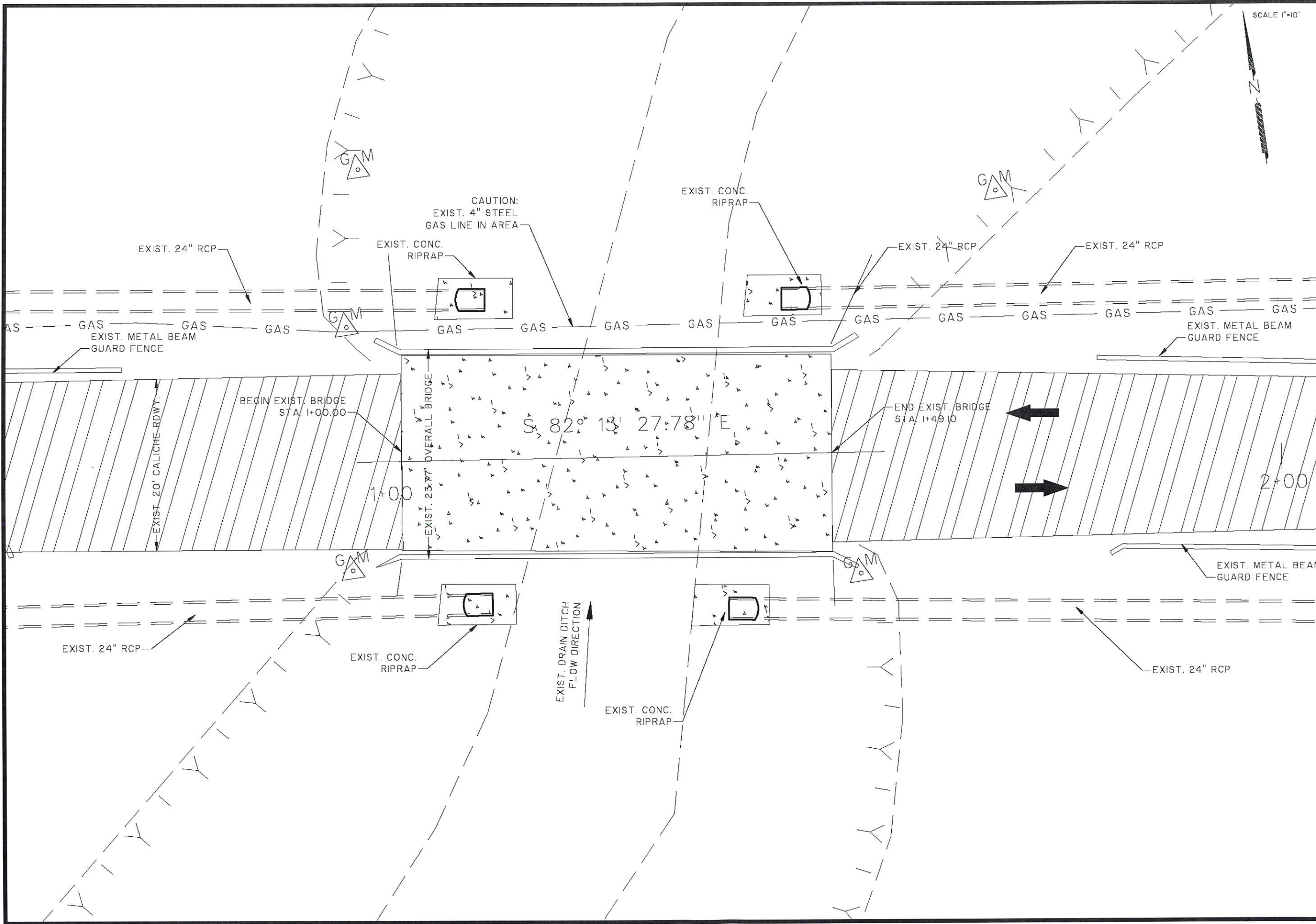
28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs, including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(14). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

DATE: FILE:



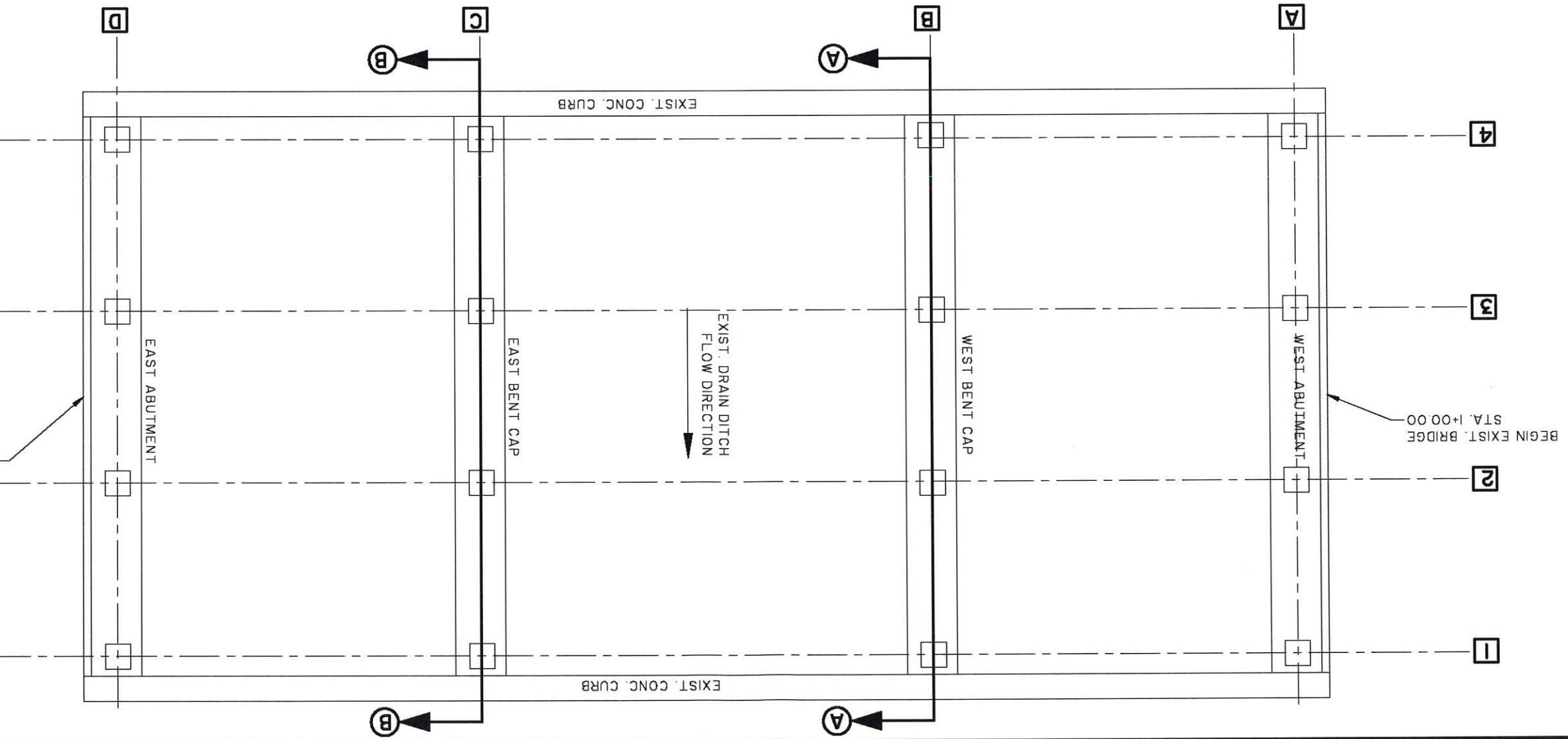
SCALE 1"=10'

R. Gutierrez
Professional Engineers & Land Surveyors
Engineering Corporation
 130 E. PARK AVENUE • PHOENIX, TEXAS 76857
 (TEL) 959.782.6557 • (FAX) 959.782.6558
 FIRM No. 488

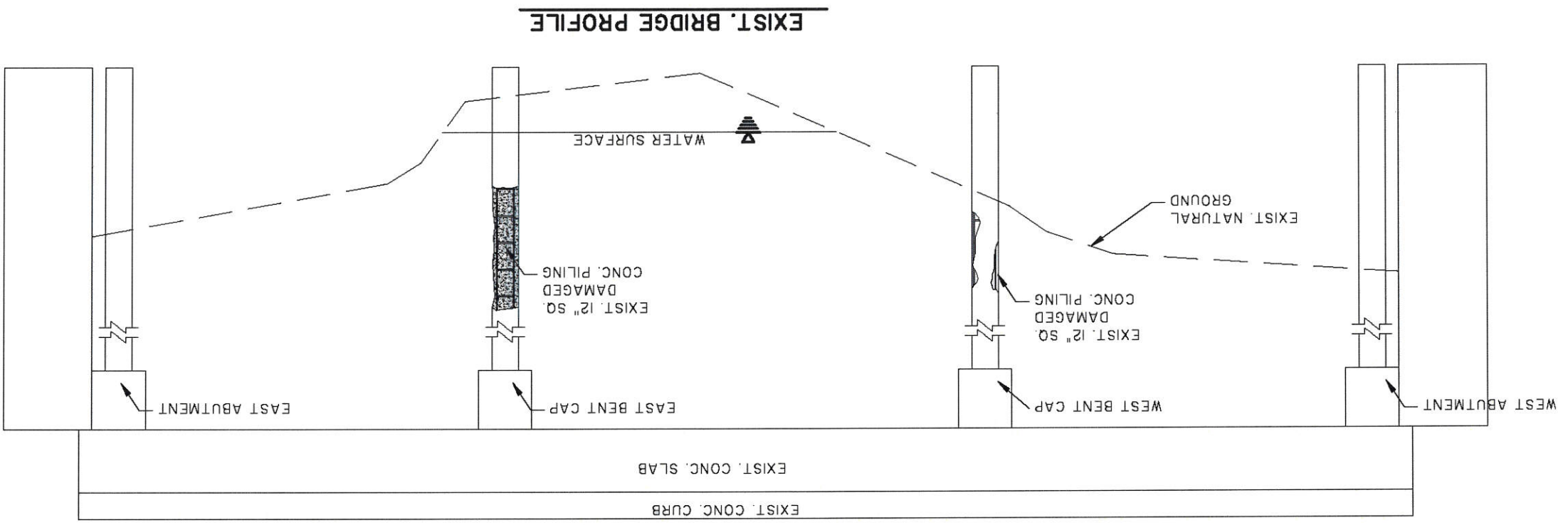
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 by, or under the supervision of:
 RAMIRO GUTIERREZ PE# 65948
 Print Name PE# Date

**LAS MILPAS ROAD
 EXISTING BRIDGE PILING REPAIR
 LAYOUT**

SCALE/INITS	DATE	BY
DATE: 01-28-2015		
FB. No.: 550		
SURVEY BY: MLJCDV		
DRAWN BY: MH		
PREPARED BY:		
CHECKED BY:		



EXISTING BRIDGE DIAGRAM LAYOUT



EXIST. BRIDGE PROFILE

NOTE: ALL CONC. PILING ARE 12" SQ.

SCALE 1"=5' (HORZ.)
1"=5' (VERT.)

**LAS MILPAS ROAD
EXISTING BRIDGE PILING REPAIR
PLAN AND PROFILE
LAYOUT**

SCHEMATIC

DATE: 01-28-2015	REVISION
FR. No.: 590	DATE
SURVEY BY: MLUCOV	BY
DRAWN BY: MH	
PREPARED BY:	
CHECKED BY:	

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RAMON COUTERREZ, P.E.
DATE

R. Gaudinier
Professional Engineers & Land Surveyors
130 E. PARK AVENUE - PHOENIX, ARIZONA 85017
(602) 955-7855 - (602) 955-7858
P.E. No. 488

SCALE 1"=5' (HORZ.)
1"=5' (VERT.)

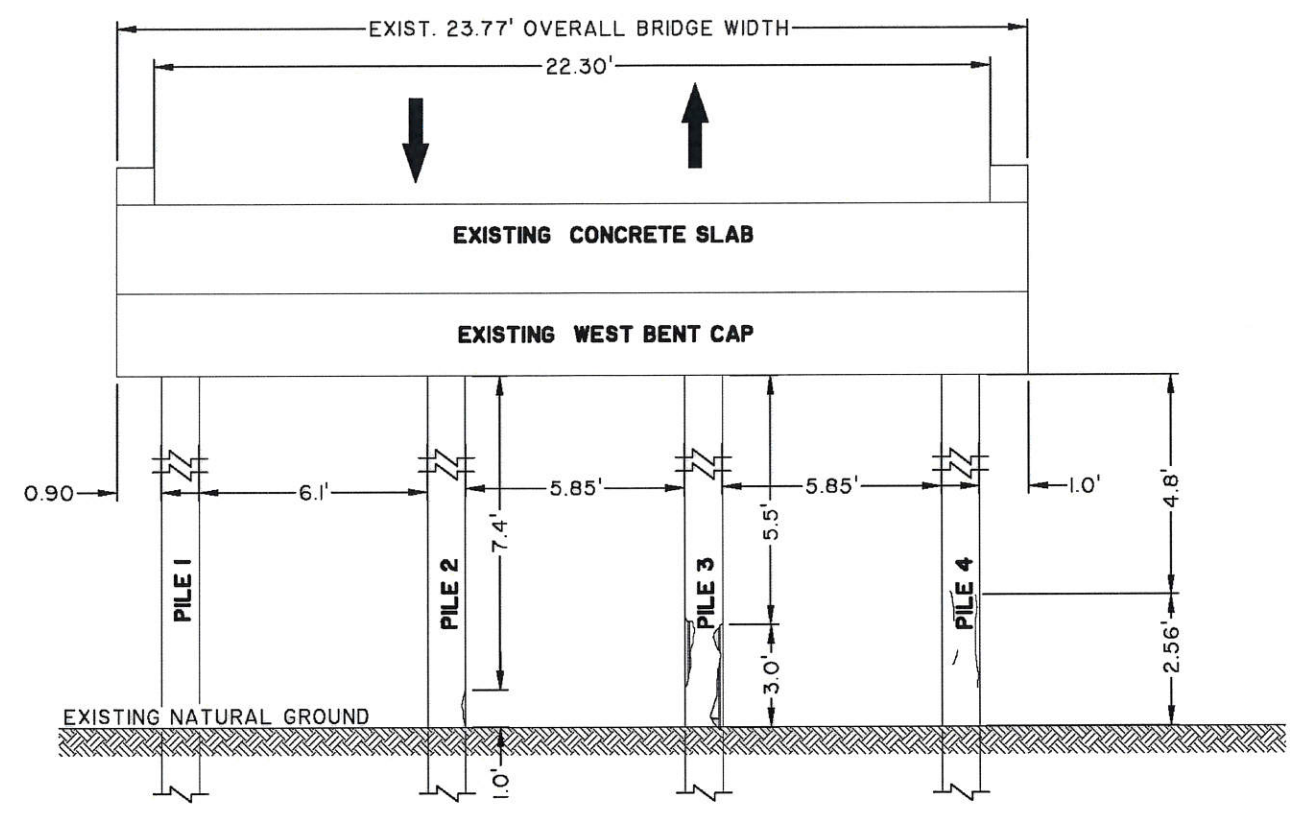


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RAUL PALMA 65656
Print Name PE# Date

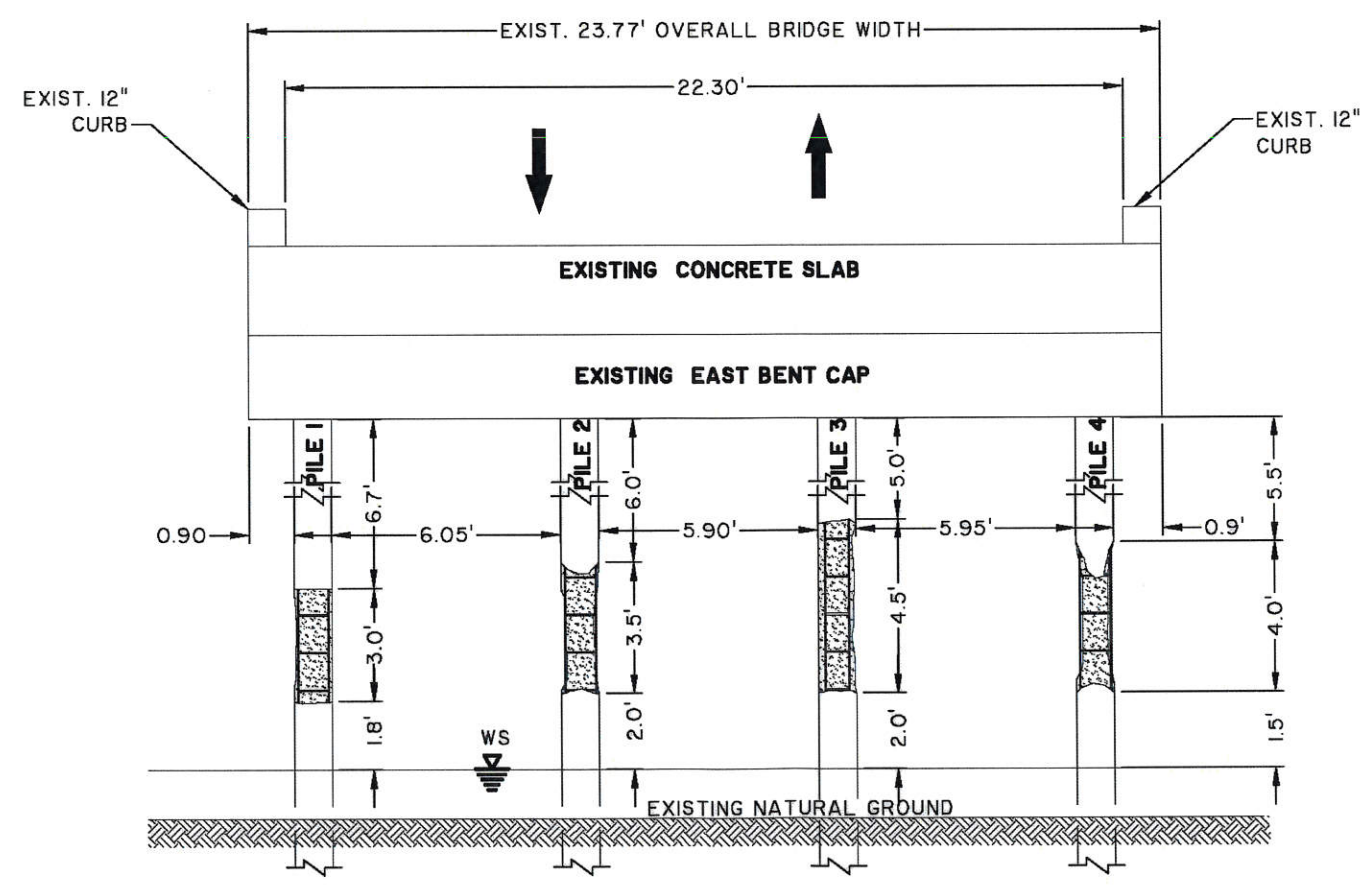
Professional Engineers & Land Surveyors
130 E. PARK AVENUE • PHARR, TEXAS 78677
(TEL) 958 782-2557 • (FAX) 958 782-2558
FIRM No.: 486



SECTION A-A (EXISTING WEST BENT CAP W/CONC. PILING TYPICAL)

NOTE:
1.) ALL CONC. PILING ARE 12" SQ.
2.) LENGTH OF ENCASEMENT EQUALS LENGTH OF DAMAGE TO PILE PLUS 5- FEET. (SEE "FINAL CONDITION" DETAIL ON "REPAIR DETAILS" PLAN SHEET.)

PILE ENCASEMENT QUANTITIES	
LOCATION	QTY. (LF)
WEST BENT CAP	
PILE 1	-
PILE 2	6
PILE 3	8
PILE 4	8
SUB-TOTAL	22
EAST BENT CAP	
PILE 1	8
PILE 2	8.5
PILE 3	9.5
PILE 4	9
SUB-TOTAL	35
TOTAL	57



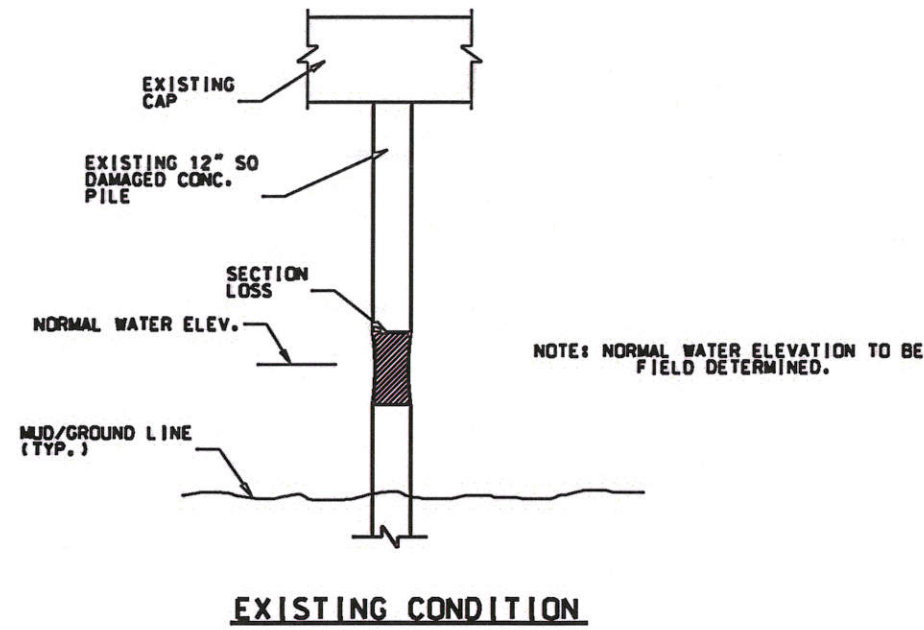
SECTION B-B (EXISTING EAST BENT CAP W/CONC. PILING TYPICAL)

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RAMIRO GUTIERREZ 65948
Print Name PE# Date

LAS MILPAS ROAD
EXISTING BRIDGE PILING REPAIR
TYPICAL DETAILS
LAS MILPAS ROAD

NO.	REVISION	DATE	BY

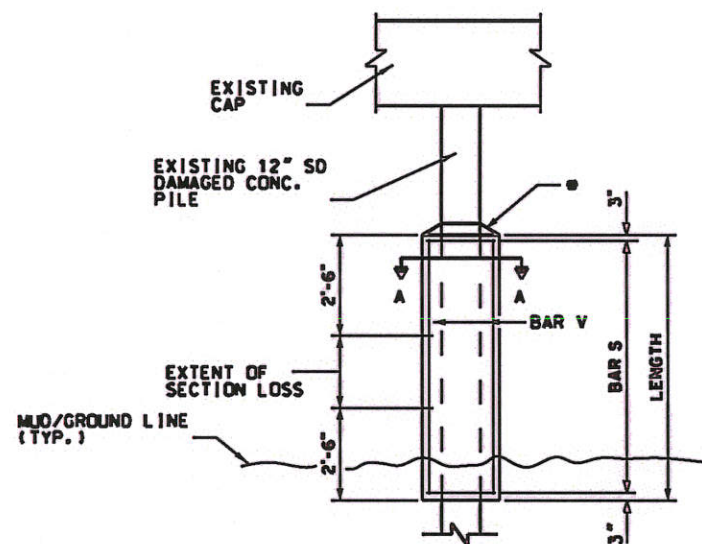
SCALE: N.T.S.
DATE: 01-28-2015
FB. No.: 550
SURVEY BY: M.DC/DV
DRAWN BY: MH
PREPARED BY:
CHECKED BY:



PRELIMINARY-FOR REVIEW ONLY

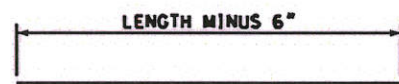
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RAUL PALMA 65656
 Print Name PEJ Date

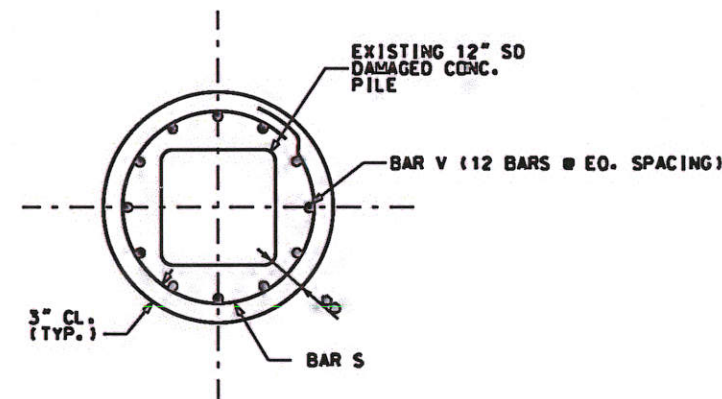


FINAL CONDITION

• SLOPE TOP OF ENCASEMENT TO ENSURE POSITIVE DRAINAGE.

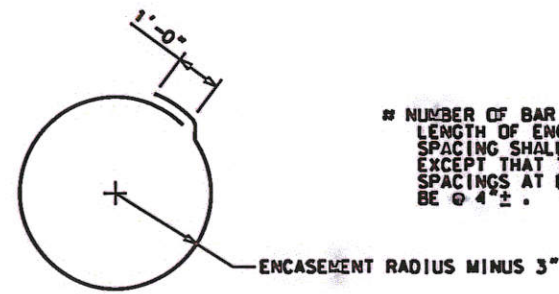


BAR V
 BAR SIZE No. = #5



SECTION A-A

•• DIMENSIONS OF ENCASEMENT SHALL BE A MINIMUM 1'-0" WIDER ALONG THE DIAGONAL THAN EXISTING PILE. FIELD VERIFY DIMENSIONS AND ADJUST BARS ACCORDINGLY.



BAR S
 BAR SIZE No. = #3

NUMBER OF BAR S EQUALS LENGTH OF ENCASEMENT IN FEET + 5
 SPACING SHALL BE 12" ± EXCEPT THAT THE FIRST 3 SPACINGS AT EACH END SHALL BE @ 4" ±.

GENERAL NOTES:

- 1.) ALL STEEL SHALL BE GRADE 60.
- 2.) ALL CONCRETE SHALL BE CLASS C CONCRETE (3600 psi @ 28 DAYS) OR STRUCTURAL GROUT (5800 psi @ 28 DAYS) ACCORDING TO TxDOT SPECIAL SPECIFICATION 5775.

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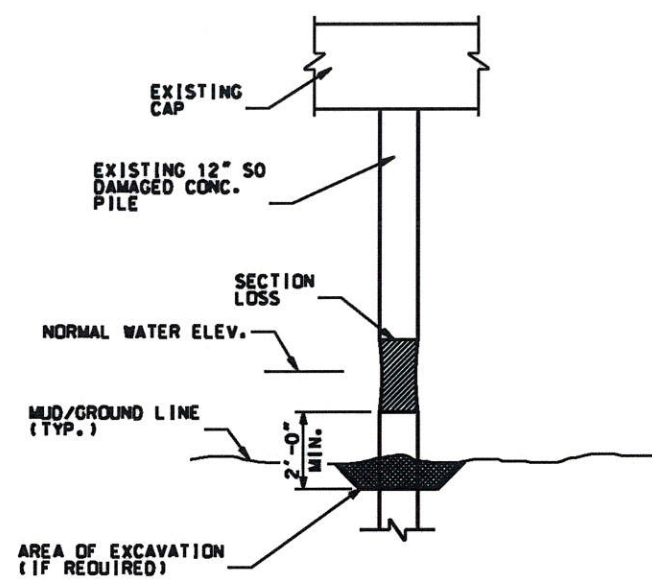
LAS MILPAS ROAD BRIDGE
 PILING REPAIR PROJECT
 BRIDGE PILING REPAIR DETAILS

FB. No.:	SURVEY BY:	DATE	BY
REVISION	DATE	BY	BY

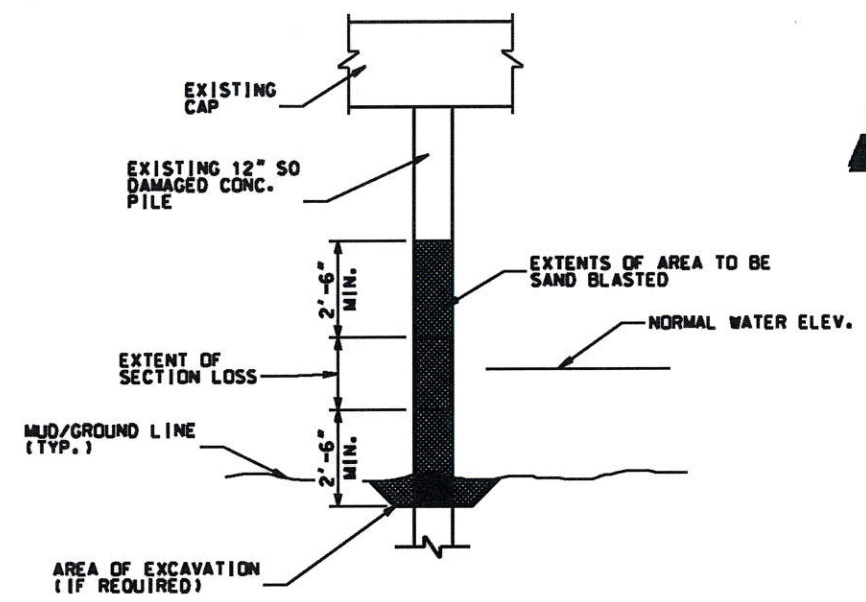
**CONCRETE PILE ENCASEMENT
 SECTION LOSS REPAIR
 EXISTING AND FINAL CONDITION**

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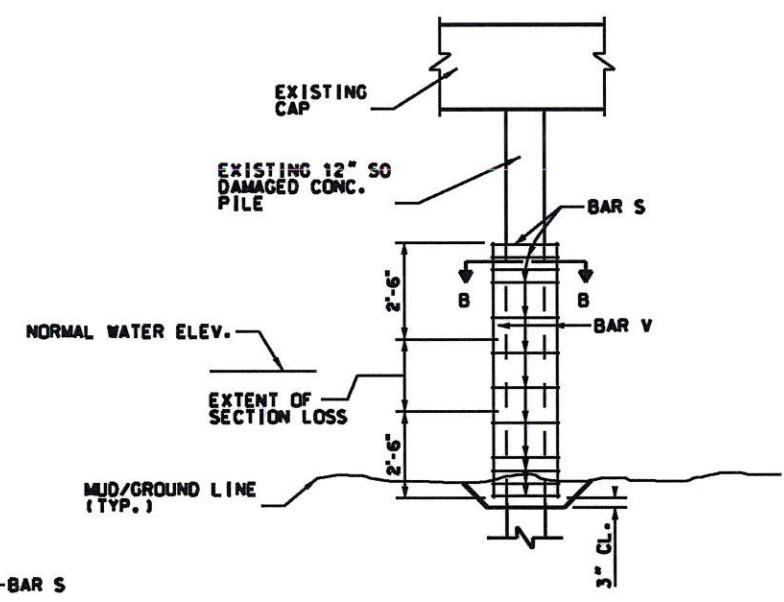
Professional Engineers & Land Surveyors
 100 E. PARK AVENUE • PHARR, TEXAS 78577
 (TEL) 956 782-2557 • (FAX) 956 782-2558
 FIRM No. 486
 R. Gutierrez
 Engineering Corporation



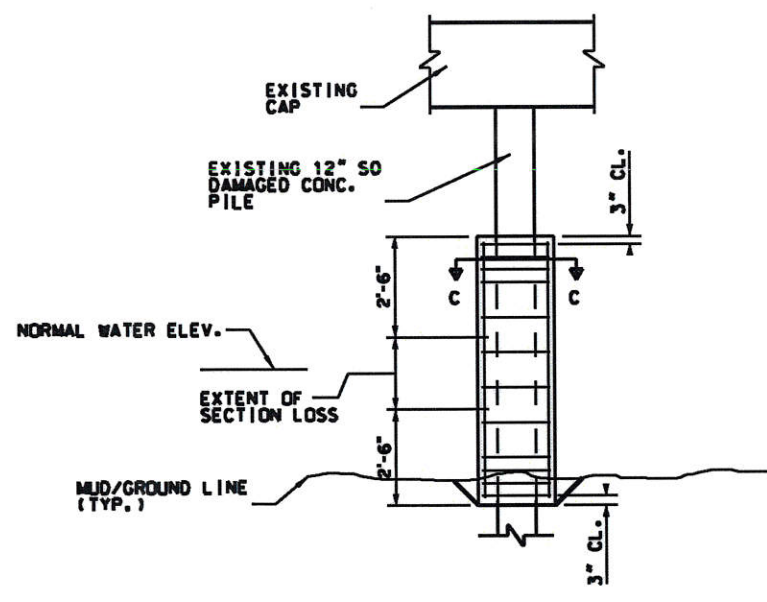
- STEP 1**
- DETERMINE LOCATION OF PILE TO BE ENCASED.
 - DETERMINE LENGTH OF ENCASEMENT. (ROUND LENGTH TO NEAREST 1.0' INCREMENT)



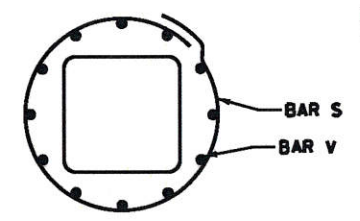
- STEP 2**
- EXCAVATE BELOW MUD/GROUND A MINIMUM OF 2'-0" BEYOND EXTENT OF SECTION LOSS. (IF REQUIRED)
 - ANY LOOSE CONCRETE SPALLS SHALL BE REMOVED.
 - SANDBLAST THE EXISTING CONCRETE PILE AS SHOWN.
 - ANY EXPOSED REINFORCED CONCRETE SHALL BE CLEANED AND FREE OF SURFACE RUST.



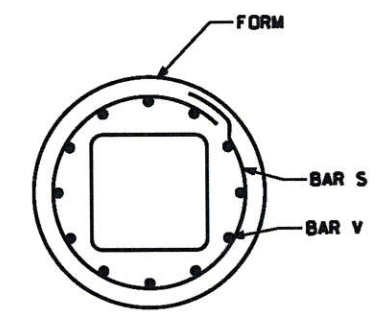
- STEP 3**
- ERECT, TIE & SUPPORT STEEL REINFORCING.



- STEP 4**
- PLACE AND SECURE FORMS.



SECTION B-B



SECTION C-C

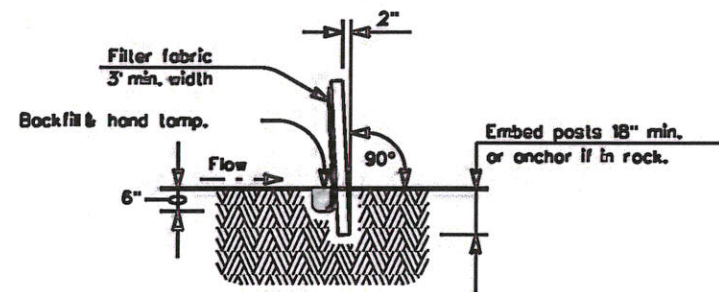
**CONCRETE PILE ENCASEMENT
 SECTION LOSS REPAIR
 CONSTRUCTION DETAILS**

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 Remiro Gutierrez 65948
 Print Name PE# Date

LAS MILPAS ROAD BRIDGE
 PILING REPAIR PROJECT
 BRIDGE PILING REPAIR DETAILS

FB. No.:	SURVEY BY:	DATE	BY
DRAWN BY:	REVISION	DATE	BY
PREPARED BY:	REVISION	DATE	BY
CHECKED BY:	REVISION	DATE	BY

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SECTION A-A

GENERAL NOTES

1. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

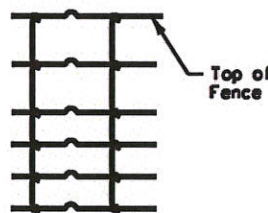
Sediment Control Fence — SCF —

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

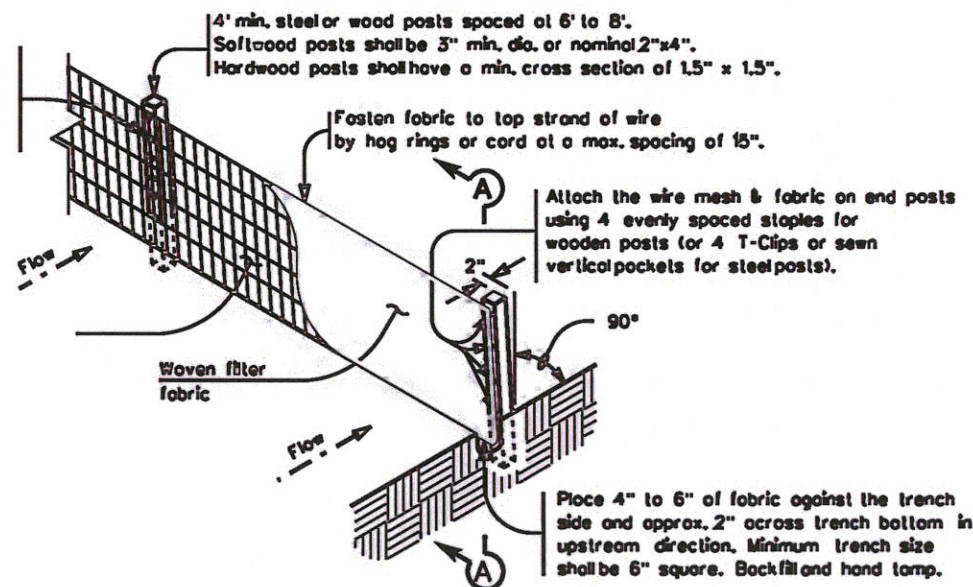
Sediment control fence should be sized to filter a max. flow through rate of 100 GPM/FT. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

Galv. Hinge joint knot woven mesh (12.5 Ga. Min.) requires a minimum of five horizontal wires spaced at a max. 12 inches apart and all vertical wires spaced at a max. 12 inches apart.



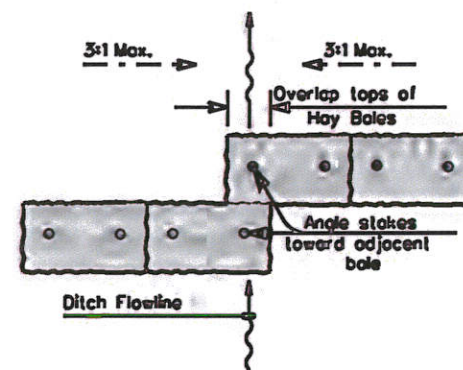
Hinge Joint Knot Woven Mesh (Option)

Galv. Welded wire mesh (W.W.M.) with a max. opening size of 2"x 4", or Woven Mesh (W.M.) (See Detail)

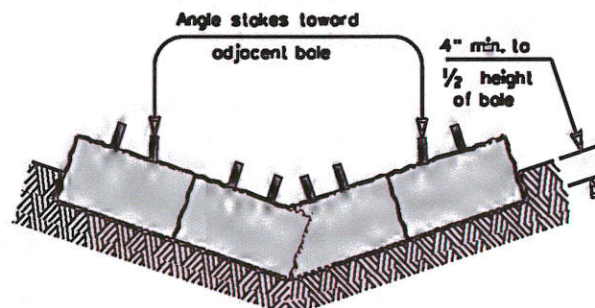


TEMPORARY SEDIMENT CONTROL FENCE

SCF



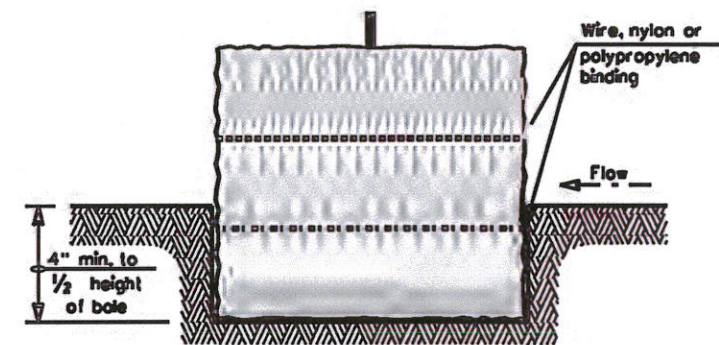
PLAN VIEW



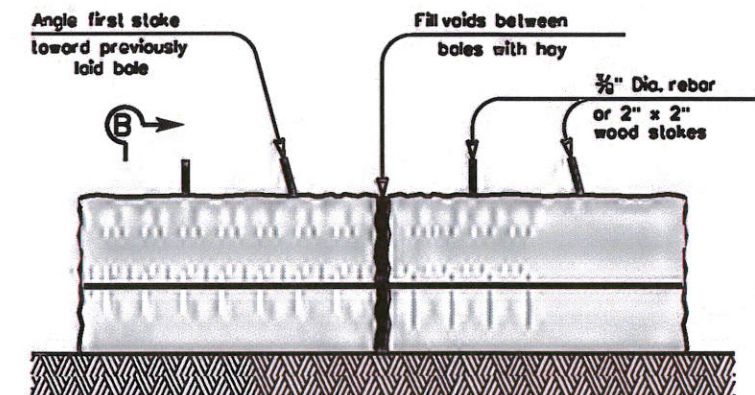
PROFILE VIEW

PLANS SHEET LEGEND

Baled Hay — BH —



SECTION B-B



BALED HAY FOR EROSION CONTROL

BH

GENERAL NOTES

- Hay bales shall be a minimum of 30" in length and weigh a minimum of 50 Lbs.
- Hay bales shall be bound by either wire or nylon or polypropylene string. The bales shall be composed entirely of vegetative matter.
- Hay bales shall be embedded in the soil a minimum of 4" and where possible 1/2 the height of the bale.
- Hay bales shall be placed in a row with ends tightly abutting the adjacent bales. The bales shall be placed with bindings parallel to the ground.
- Hay bales shall be securely anchored in place with 3/8" Dia. rebar or 2" x 2" wood stakes, driven through the bales. The first stake shall be angled towards the previously laid bale to force the bales together.
- The guidelines shown hereon are suggestions only and may be modified by the Engineer.

BALED HAY USAGE GUIDELINES

A Baled Hay installation may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A two year storm frequency may be used to calculate the flow rate to be filtered. The installation should be sized to filter a maximum flow thru rate of 5 GPM/FT² of cross section area. Baled hay may be used at the following locations:

- Where the runoff approaching the baled hay flows over disturbed soil for less than 100'. If the slope of the disturbed soil exceeds 10%, the length of slope upstream the baled hay should be less than 50'.
- Where the installation will be required for less than 3 months.
- Where the contributing drainage area is less than 1/2 acre.

For Baled Hay installations in small ditches, the additional following considerations apply:

- The ditch sideslopes should be graded as flat as possible to maximize the drainage flow rate thru the hay.
- The ditch should be graded large enough to contain the overlapping drainage when sediment has filled to the top of the baled hay.

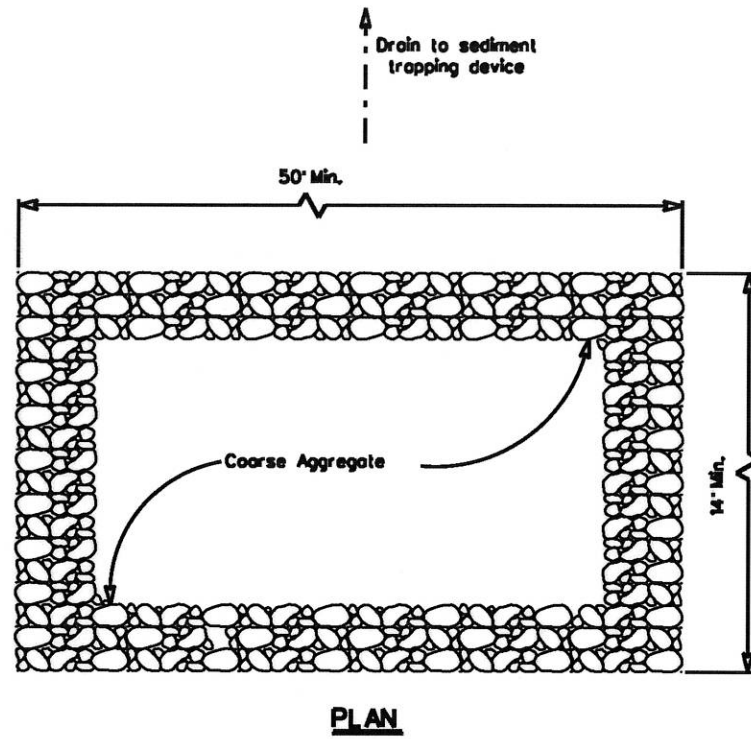
Bales should be replaced usually every 2 months or more often during wet weather when loss of structural integrity is accelerated.



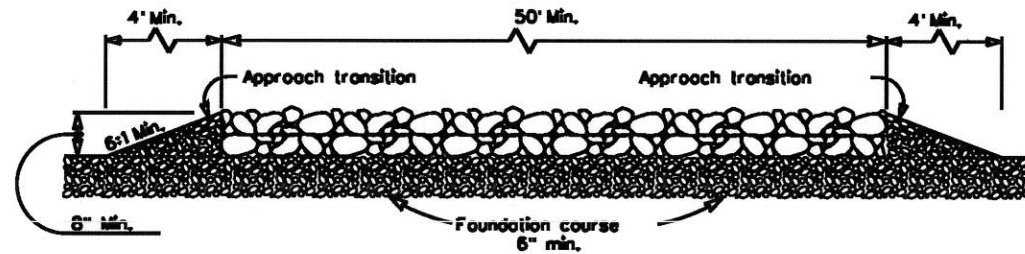
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & BALED HAY EC(1)-09

PLC	DATE	AM	BY	BY
10/1/00	June	ERB		
	CONT	DECT	JOB	HWYWAY
	DIST	COUNTY	SHEET NO.	
			14	

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PLAN

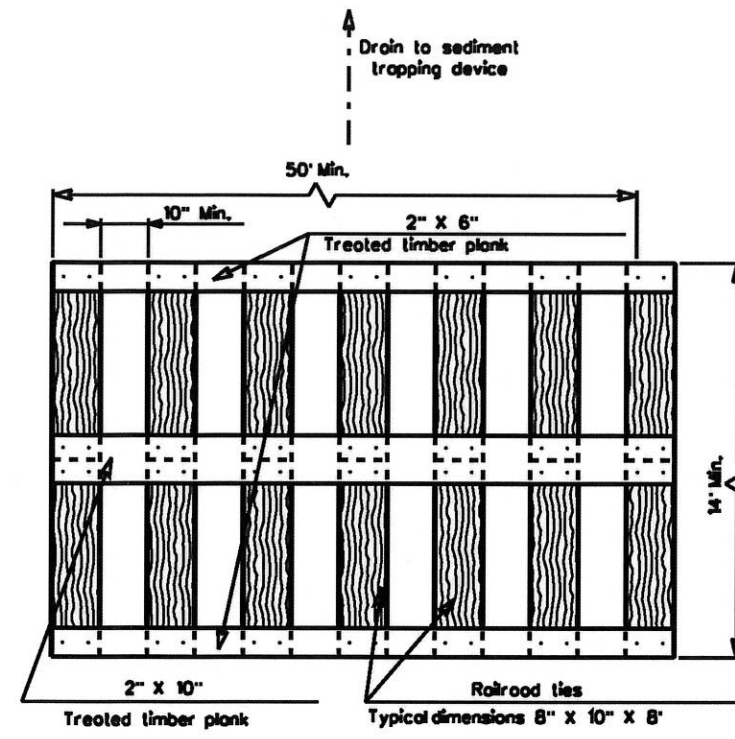


PROFILE

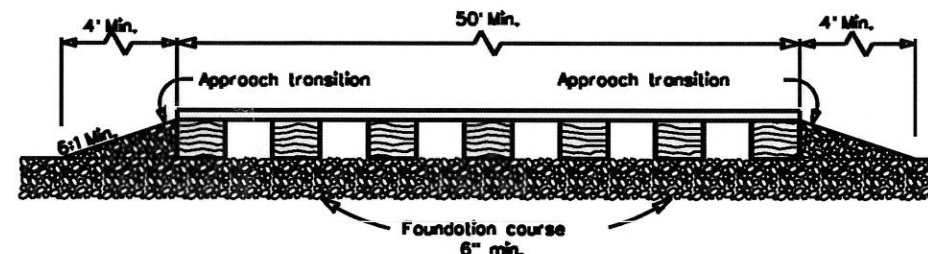
CONSTRUCTION EXIT (TYPE 1)

GENERAL NOTES

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



PLAN

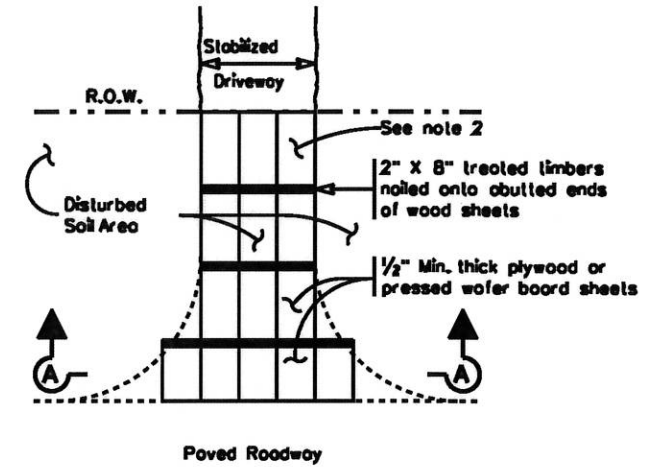


PROFILE

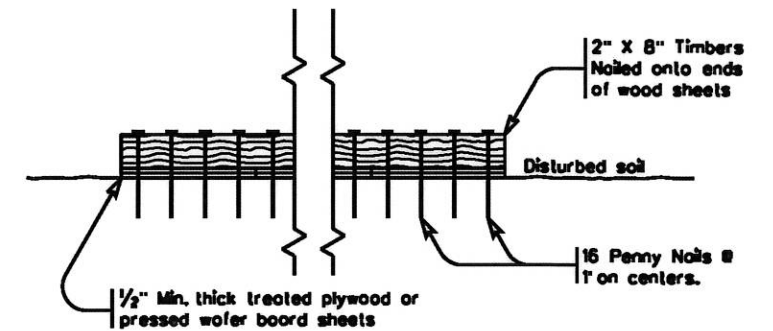
CONSTRUCTION EXIT (TYPE 2)

GENERAL NOTES

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with 1/2" x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



PLAN



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

GENERAL NOTES

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

DATE: FILE:

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC(3)-93			
FILE: ec393.dgn	DATE: TxDOT	BY: HEJ	DATE: BD
© TxDOT June 1993	CONT	SECT	JOB
REVISIONS	DIST	COUNTY	SHEET NO.
			15



**HIDALGO COUNTY
DRAINAGE
DISTRICT No. 1**

RAUL E. SESIN, PE, CFM
General Manager
Floodplain Administrator

902 N. Doolittle Road
Edinburg, Texas 78542
Off 956 292.7080
Fax 956 292.7089

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JOSEPH PALACIOS
Board Member

① 48

April 30, 2015

Lora Briones
Financial Officer
Re: Invoices

I. R. Gutierrez Corporation
Invoice # 3757/ 4-17-2015 / \$14,904.00

I have reviewed the invoice referenced above, and have no issues for payment based on the back up information and complete percentages they are billing the Drainage District. Should you have any questions, please feel free to contact me.

Thank you,

J. Noe Saldivar, P.E. JB 4/30/2015

J. Noe Saldivar, P.E.
Hydraulic Engineer

Date: 04/30/15 Time: 4:15 PM.

Cc: Raul E. Sesin, PE, CFM

AI # 49689
Doo 5/19/15



**COVERSHEET
APPROVED-BOND INVOICES**

Submitted to Noe

DATE: 4/27/2015 *JP*

Prepared By: Joey Garza

Vendor	Unit #	Invoice #	Invoice Date	Invoice Amount	Received By	Received Date	COMMENTS
GUZMAN & MUNOZ	WA #2 SURVEYING SERVICES FOR EDINBURG STUB DRAIN INTO SOUTH MAIN DRAIN	5565	03/30/15	\$1,730.32 ✓	R. ARCE	04/16/15	<i>JAG</i> 04/30/15
GUZMAN & MUNOZ	WA #6 SURVRYING SERVICES FOR WEST MAIN DRAIN WEIR	5567	03/30/15	\$1,710.32 ✓	R. ARCE	04/16/15	<i>JAG</i> 04/30/15
GUZMAN & MUNOZ	EDINBURG STUB TO SOUTH MAIN DRAIN NEAR CANTON RD. & CESAR CHAVEZ RD.	5564	03/30/15	\$1,737.50 ✓	R. ARCE	04/16/15	<i>JAG</i> 04/30/15 PO #623074 ATTACHED
GUZMAN & MUNOZ	WEST MAIN DRAIN CONTROL WEIR STRUCTURE	5566	03/30/15	\$17,151.83 ✓	R. ARCE	04/16/15	<i>JAG</i> 04/30/15 PO #623077 ATTACHED
R. GUTIERREZ	LAS MILPAS RD. BRIDGE REHAB	3757	04/17/15	\$14,904.00	R. ARCE	04/17/15	<i>JAG</i> 04/30/15 PO #626436 & 626435 ATTACHED



Hidalgo County Drainage District No. 1

902 North Doolittle Road Edinburg, Texas 78542 Office: (956) 292-7080 Fax: (956) 292-7089

Invoice Processing Checklist

Date Received:

4-1-15

Engineer/Firm Name:

Tedsi Infrastructure

Project Name/Number:

Lower Rio Grande Valley Regional Water Management Program

Invoice No.:

2015-2272

Purchase Order No.:

Received By:

gshen

Forwarded to:

joey

Additional Comments:

Attachment: CD "Backup 2013-1128-13"



TEDSI INFRASTRUCTURE GROUP

TEDSI

Consulting Engineers
1201 E. Expressway 83 ♦ Mission, Texas 78572
(956) 424-7898

Letter of
Transmittal

TO:
Ms. Claudette Guerrero
Hidalgo County Drainage District No. 1
902 N. Doolittle Road
Edinburg, Texas 78542

DATE:
March 31, 2015

REF.:
Delta Watershed PER January thru February Invoice

TEDSI PROJECT NO.:
2013-1128-13

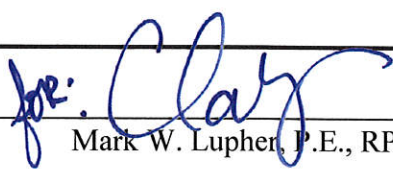
TRANSMITTED:			
<input checked="" type="checkbox"/> For Your Use	<input type="checkbox"/> Please comment	<input type="checkbox"/> Approved as Noted	
<input type="checkbox"/> As Requested	<input type="checkbox"/> Reply ASAP	<input type="checkbox"/> As Noted Below	

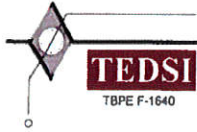
VIA:			
<input type="checkbox"/> US Mail	<input type="checkbox"/> Courier	<input type="checkbox"/> Hand Carry	
<input type="checkbox"/> E-Mail	<input checked="" type="checkbox"/> LoneStar Overnight	<input type="checkbox"/> FedEx	

COPIES	DESCRIPTION
1	Invoice No. 20142272 for Project No. 2013-1128-13
1	Progress Report No. 013
1	Monthly Progress Report No. 05
1	CD PDF Files

REMARKS:

Thank you,

Signed: 
Mark W. Lupter, P.E., RPLS



TEDSI INFRASTRUCTURE GROUP

Consulting Engineers
 1201 East Expressway 83 + Mission, Texas 78572
 Tel: (956) 424-7898
 Fax: (956) 424-7022

APR 01 2015

1:25 AM PM

BY: *Esther Layton*

March 30, 2015

Project No: 2013-1128-13

Invoice No: 20152272

Ms. Claudette Guerrero
 Hidalgo County Drainage District No. 1
 902 North Doolittle Road
 Edinburg, TX 78542

Project 2013-1128-13 Lower Rio Grande Valley Regional Water Management Program - Preliminary Engineering Report
Precinct No. 1 - 2012 Bond Referendum
P. O. No. 623666
Account Number 13-133-433-360-4330-010-000

Professional Services from January 01, 2015 to February 28, 2015
Fee

Billing Phase	Fee	Percent Complete	Earned	Previous Fee Billing	Current Fee Billing
Preliminary Engineering Report	71,922.36	100.00	71,922.36	71,922.36	0.00
Data Collection	42,610.70	100.00	42,610.70	42,610.70	0.00
Geographical Information	80,256.16	100.00	80,256.16	80,256.16	0.00
Hydrologic Analysis Verification	68,952.49	100.00	68,952.49	68,952.49	0.00
Hydraulic Analysis Verification	68,952.49	100.00	68,952.49	68,952.49	0.00
Flood Plain Mapping Verification	100,097.80	24.54	24,564.00	24,564.00	0.00
H&H Subconsultant - Civil Systems Eng.	685,957.00	84.9553	582,757.00	582,757.00	0.00
Raw Water Collection	161,061.24	93.8826	151,208.48	150,962.70	245.78
Alternate Solutions	70,599.48	6.5864	4,649.96	3,021.66	1,628.30
Final Report	150,648.64	27.2469	41,047.08	30,491.28	10,555.80
S.A. No. 1 (P.O. No. 623958)					
Geotechnical Investigations Reports	61,494.09	91.2389	56,106.53	56,106.53	0.00
S.A. No. 2 (P.O. No. 625152)					
WAM Willicy County	163,471.94	95.00	155,298.34	155,298.34	0.00
WAM Hidalgo County	171,876.14	95.00	163,282.33	163,282.33	0.00
S.A. No. 3 (P.O. No. 626144)					
Sub Surface Boring	140,895.00	39.604	55,800.00	0.00	55,800.00
Total Fee	2,038,795.53		1,567,407.92	1,499,178.04	68,229.88
		Total Fee			68,229.88

Billing Summary	Current	Prior	To-Date
Total Billings	68,229.88	1,499,178.04	1,567,407.92
Total Fee			2,038,795.53
Remaining Fee			471,387.61

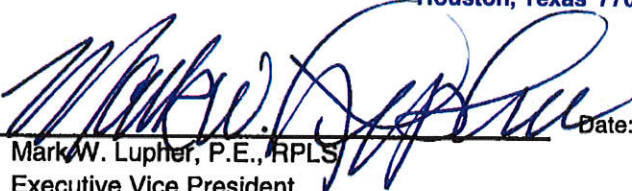
Total this Invoice \$68,229.88

Outstanding Invoices

Number	Date	Balance
20142178	12/22/2014	159,944.34
20142204	1/22/2015	95,442.44
Total		255,386.78

Total Now Due \$323,616.66

PLEASE REMIT PAYMENT TO:
TEDSI Infrastructure Group, Inc.
738 Highway 6 South, Suite 430
Houston, Texas 77079

Authorized By:  Date: 3.30.15
Mark W. Luper, P.E., RPLS
Executive Vice President

PROGRESS REPORT NO. 013

Progress Period January 1, 2015 Through February 28, 2015

DESCRIPTION	ESTIMATED COST	PERCENT COMPLETE	INVOICE TO DATE	PREVIOUS INVOICE	AMOUNT DUE
III. PRELIMINARY ENGINEERING, DESIGN AND CONSTRUCTION					
(A) PRELIMINARY ENGINEERING					
(1) Preliminary Field Surveying	\$71,922.36	100.00%	\$71,922.36	\$71,922.36	\$0.00
(2) Data Collection	\$42,610.70	100.00%	\$42,610.70	\$42,610.70	\$0.00
(3) Geographical Information System	\$80,256.16	100.00%	\$80,256.16	\$80,256.16	\$0.00
(4) Hydrologic Analysis Verification	\$68,952.49	100.00%	\$68,952.49	\$68,952.49	\$0.00
(5) Hydraulic Analysis Verification	\$68,952.49	100.00%	\$68,952.49	\$68,952.49	\$0.00
H&H Sub Consultants - CSE	\$695,957.00	83.73%	\$582,757.00	\$582,757.00	\$0.00
(6) Flood Plain Mapping Verification	\$100,097.80	24.54%	\$24,564.00	\$24,564.00	\$0.00
(7) Raw Water Collection & distribution System	\$161,061.24	93.88%	\$151,208.48	\$150,962.70	\$245.78
(9) Alternate Solutions & Recommendations	\$70,599.48	6.59%	\$4,649.96	\$3,021.66	\$1,628.30
Geotechnical Investigations	\$61,494.09	91.24%	\$56,106.53	\$56,106.53	\$0.00
(10) Final Report- "Preliminary Engineering	\$150,648.64	27.25%	\$41,047.08	\$30,491.28	\$10,555.80
SA #2 WAM Willacy County	\$163,471.94	95.00%	\$155,298.34	\$155,298.34	\$0.00
SA #2 WAM Hidalgo County	\$171,876.14	95.00%	\$163,282.33	\$163,282.33	\$0.00
Sub Surface Boring	\$140,895.00	39.60%	\$55,800.00	\$0.00	\$55,800.00
SUB TOTAL III.A					
	\$2,048,795.53	76.50%	\$1,567,407.92	\$1,499,178.04	\$68,229.88

TOTAL (LABOR AND DIRECT EXPENSES)	\$2,048,795.53	76.50%	\$1,567,407.92	\$1,499,178.04	\$68,229.88
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TOTAL LABOR AND DIRECT EXPENSES	\$2,048,795.53	76.50%	\$1,567,407.92	\$1,499,178.04	\$68,229.88
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TOTAL INVOICE AMOUNT DUE: \$68,229.88

LRGVWMP – WA#13
Monthly Progress Report No. #05 – Jan. thru Feb. 2015

Period of Coverage: January 01, 2015 to February 28, 2015
Date of Submittal: March 30, 2015
Submitted To: Claudette Guerrero, HCDD #1
PREPARED BY: Mark Lupher, P.E., TEDSI Infrastructure, Inc.

This study covers the following activities:

1. Coordination and meetings
2. Data collection and assimilation
3. Site visits/field reconnaissance
4. LiDAR topographic data processing
5. Watershed & subbasin delineations
6. Estimation of subwatershed & hydrologic parameters
7. Land use data processing
8. HEC-HMS modeling analysis
9. Main Floodwater Channel topographic data manipulation/ preparation
10. GeoRAS processing for HEC-RAS development
11. HEC-RAS model development and modeling analysis
12. Downstream flow requirements (downstream of Pachita Flood Gate).
13. Floodwater diversion and detention alternative analysis
14. Risk based economic analysis of flood damage analysis
15. Floodplain delineation/mapping
16. Water sources and water availability analysis.
17. Hydraulic analysis of preliminary alternative water development strategy
18. Draft H&H Report

PROGRESS TO REPORT FOR THIS PERIOD

Activity 1 – Coordination and Meetings

Coordination with project team members on weir structures, and gate operations, Raw Water Collection Analysis, Alternate Solution.

Activity 2 – Data Collection and Assimilation

Activity 3 – Site Visits

Activity 4 – LiDAR topographic data processing

Activity 5 – Watershed & subbasin delineations

Activity 6 – Estimation of subwatershed & hydrologic parameters

Activity 7 – Land use data processing

Activity 8 –HEC-HMS Modeling Analysis

Activity 9 – Main Floodwater Channel cross section topographic data manipulation and preparation

Activity 10 – GeoRAS processing for HEC-RAS development

Activity 11 – HEC-RAS model development and modeling analysis

Activity 12 – Downstream flow requirements (downstream of Pachita Flood Gate).

Activity 13 – Floodwater diversion and detention alternative analysis

Performed weir structures and detention sizes.

Activity 14 – Risk based economic analysis of flood damage analysis

Activity 15 – Floodplain delineation/mapping

Activity 16 – Water sources and water availability analysis.

Activity 17 – Hydraulic analysis of preliminary alternative water development strategy

***Performed alternative solutions for capturing and storing water in various locations.
Supplemental Agreement #3 Sub Surface Boring-Raba Kistner has provided borings for approximately ½ locations***

Activity 18 – Draft H&H report.

Preparing overall sections with inserts of data into report



**HIDALGO COUNTY
DRAINAGE
DISTRICT No. 1**

RAUL E. SESIN, PE, CFM
General Manager
Floodplain Administrator

902 N. Doolittle Road
Edinburg, Texas 78542
Off 956 292.7080
Fax 956 292.7089

BOARD OF DIRECTORS

RAMON GARCIA
Chairman of the Board

A.C. CUELLAR, JR.
Board Member

EDUARDO "EDDIE" CANTU
Board Member

JOE M. FLORES
Board Member

JOSEPH PALACIOS
Board Member

7. SB

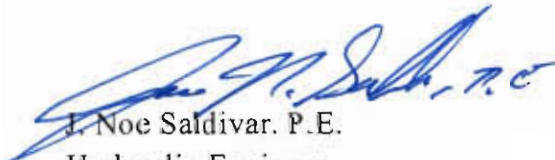
April 24, 2015

Lora Briones
Financial Officer
Re: Invoice

1.) TEDSI INFRASTRUCTURE GROUP
Invoice # 20152272 / 3-30-2015/ \$68,229.88

I have reviewed the invoice referenced above, and have no issues for payment based on the digital /back up information and complete percentages they are billing the Drainage District. Should you have any questions, please feel free to contact me.

Thank you,


J. Noe Saldivar, P.E.
Hydraulic Engineer

SB
4/24/2015

Date: 04/24/15 Time: 2:15 PM

Cc: Raul E. Sesin, PE, CFM

AI# 49609
300 5/19/15

TEDSI INFRASTRUCTURE	LRGVRWMP- PRELIMINARY ENGINEERING REPORT	20152272	03/30/15	\$68,229.88	E. LAYTON	04/01/15	<p><i>Sent comment 04/16/15</i></p> <p>ATTACHED PO #623666 W/ CD BACKUP 2013-1128-13</p>
TEDSI INFRASTRUCTURE	PCT. 1 2012 BOND REF. WA #9 GLO- REVIEW EAST LATERAL DRAIN	20152274	03/30/15	\$5,354.02	E. LAYTON	04/01/15	<p><i>Approved 04/16/15</i></p> <p>ATTACHED PO #623575 W/ BACKUP CD JAN-FEB 2015</p>
TEDSI INFRASTRUCTURE	LRGVWMP-LEGAL RIGHTS SERVICE PCT. 1 2012 BOND REFERENDUM	20152270	03/30/15	\$1,590.00	E. LAYTON	04/01/15	<p><i>Sent comments 04/16/15</i></p> <p>ATTACHED PO #623665</p>
TEDSI INFRASTRUCTURE	LRGVRWMP-GENERAL MANAGEMENT CONSULTANT PCT. 1 2012 REF. WA #8	20152273	03/30/15	\$4,568.50	E. LAYTON	04/01/15	<p><i>Sent comments 04/16/15</i></p> <p>ATTACHED PO #623578</p>

*Approved
MCS
4/24/15*

*Approved
4/24/15*

*Approved
4/24/15*



Hidalgo County Drainage District No. 1

902 North Doolittle Road Edinburg, Texas 78542 Office: (956) 292-7080 Fax: (956) 292-7089

Invoice Processing Checklist

Date Received: 5/1/2015

Engineer/Firm Name: L&G Consulting Engineers Inc.

Project Name/Number: FM 676 Outfall Analysis and Eval. WA No. 1

Invoice No.: 11325115

Purchase Order No.: 622895

Received By: Rosa Arce

Forwarded to: Joey Garza

Total # of Pages Submitted: 6

Attachments: CD: FM 676 Outfall Schematics 2A & 2B

Additional Comments:

L & G Consulting Engineers Inc
2100 W. Expressway 83
Mercedes, TX 78570
(956)565-9813 Fax (956)565-9018

INVOICE#: 11325115
INVOICE DATE: 4/30/2015

RECEIVED
 HIDALGO COUNTY
 DRAINAGE DISTRICT #1

BILL TO:

Hidalgo County Drainage District#1
 902 N. Doolittle
 Edinburg, TX 78542

MAY 01 2015
 8:30 AM / PM
 BY: *Rosa*

JOB:130401
 FM 676 Outfall Analysis and Eval.
 WA#1
 P.O.#622895

DESCRIPTION	CONTRACT	PREVIOUS APPLICATIONS	CURRENT COMPLETED	TOTAL COMPLETED	% COMPL	BALANCE TO FINISH
Engineering services for the month of April 2015.						
FC 102 - FEASIBILITY STUDIES						
Task 1 - 10201 - Coord. w/TxDOT - County - Alton Local Drainage	13,405.68	13,405.68		13,405.68	100.0	-
Task 8 - 10202 - Feasibility Report and Recommendations	5,809.62	5,527.69		5,527.69	95.1	281.93
	19,215.30	18,933.37	-	18,933.37		281.93
FC 120 - PUBLIC INVOLVEMENT						
Task 6 - 12007 - Coord. W/Landowners due to Prop. Outfall Fac.	6,411.40	4,612.17	516.33	5,128.50	80.0	1,282.90
	6,411.40	4,612.17	516.33	5,128.50		1,282.90
FC 130 - RIGHT-OF-WAY DATA						
Task 5 - 13009 - ID. Of all affected Prop. Owners on Proposed Fac	9,110.28	9,110.28		9,110.28	100.0	-
	9,110.28	9,110.28	-	9,110.28		-
FC 161 - HYDROLOGY						
Task 3 - 16107 - Hydro. Map & Outfall Cap. Analysis	25,975.00	25,975.00		25,975.00	100.0	-
Task 2 - 16108 - Gather Info on existing Drainage features	4,080.08	4,080.08		4,080.08	100.0	-
Task 4 - 16109 - Meet w/County - HCDD#1 - TxDOT - Alton Ext Hydro	3,091.68	3,091.68		3,091.68	100.0	-
	33,146.76	33,146.76	-	33,146.76		-
FC 164 - COORDINATION						
Task 7 - 16401 - Coordination w/TxDOT & FHWA on Log. For Utilizin	5,271.03	5,271.03		5,271.03	100.0	-
	5,271.03	5,271.03	-	5,271.03		-
Direct Expenses	1,900.00	1,375.00		1,375.00	72.4	525.00
	1,900.00	1,375.00	-	1,375.00		525.00
TOTALS:	75,054.77	72,448.61	516.33	72,964.94	97.2	2,089.83

ORIGINAL CONTRACT SUM	\$	75,054.77
CHANGE BY CHANGE ORDER	\$	0.00
CONTRACT SUM TO DATE	\$	75,054.77
TOTAL COMPLETED TO DATE	\$	72,964.94
LESS PREVIOUS INVOICES	\$	72,448.61
CURRENT PAYMENT DUE	\$	516.33


 PROJECT MANAGER'S SIGNATURE

L&G Consulting Engineers, Inc
 2100 W. Expressway 83
 Mercedes, Texas 78570
 (956) 565-9813

Project Workhour Report

FM 676 Outfall Analysis and Evaluation WA#1

Reference: Inv#11325115

Date: 4/30/2015

P.O.#622895

	Hrs		Rate	Total
Senior Project Manager	1.00	X	215.40	\$215.40
Senior Engineer	1.00	X	167.89	\$167.89
Design Engineer	0.00	X	114.04	\$0.00
Senior Engineer Tech	0.00	X	79.19	\$0.00
CADD Operator/GIS Analyst	2.00	X	66.52	\$133.04
Admin/Clerical	0.00	X	57.02	\$0.00

Grand Total of Hours

\$ 516.33

(Difference due to rounding hours)

\$ -

Invoice Summary

Man Hours

\$ 516.33

Sub Contract

\$ -

(See Attached Sub Invoice for Man Hour Breakdown)

Direct Expenses	Current Units		Rate		
20 ft. Long by 3 ft. Tall Hydro Map (60sq. Ft) @\$5.00/sq. ft	0	X	300.00	\$	-
8.5 X 11 Copies (i.e. Corr. w/Landowners) - (250 units)	0	X	1.00	\$	-
11 x 17 Copies (i.e. various Exhibits) - (100 units)	0	X	1.50	\$	-

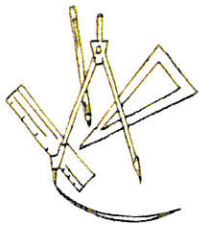
\$ -

(Difference due to rounding)

\$ -

Total Per Invoice Submitted

\$ 516.33



May 1, 2015

Mr. Raul Sesin, P.E., C.F.M. – Executive Director
Attn: Ms. Lora Briones – Chief Financial Officer
Hidalgo County Drainage District #1
902 N. Doolittle
Edinburg, Texas 78542

RE: Work Authorization #1 on Rural Drainage Development Pct #3 - FM676
P.O. #622895
Invoice #11325115

Dear Mr. Garza,

Attached for your review and approval is our invoice for the services rendered during the month of April 2015 on the subject referenced project.

The following is attached:

- L & G's Invoice #11325115
- CD with Recommended Outfall #6

TASK		% COMP L
Task 1(FC 10201) ~ Coordinate w/ TxDOT - County - Alton to Accommodate Local Drainage Needs & Corresponding Participation	L&G	100.0%
L&G met internally and will meet with the City of Alton (City Manager and Assistant City Manager) to present draft final report and obtain comments. L&G will meet with HCDD#1 to present draft final report and obtained comments. L&G has completed field visits used in an effort to identify and log existing drainage features and view area of concerns especially after recent rain events experienced. L&G presented final draft to TxDOT, Hidalgo County and City of Alton.		
Task 2 (FC 16108) ~ Gather Information Regarding Existing Drainage Features, Facilities, & Watersheds	L&G	100.0%

<p>L&G performed field visits to the project area to review and note existing drainage features that are not shown in the GIS database, and to identify drainage facility not identified in studies or reports obtained. L&G met City of Alton to further determine areas of drainage concern, which have been including in the report. L&G has created a map of the general area depicting contours, flow patterns, low areas and other potential obstacles affecting drainage.</p>		
<p>Task 3 (FC 16107) ~ Hydrologic Mapping & Outfall Capacity Analysis</p>	L&G	100.0%
<p>L&G has compiled a pre-final the general hydrologic map showing drainages areas that contribute water to the FM676 project and surrounding area. Several potential outfall locations have also been established by L&G primarily based off of minimal impacts to residences. The map is being supplemented with drainage areas (Sub-Basins) that are contributing to the flooding experienced within the project area. Recommendations obtained from several studies done for this area in the late 1990's coincide with L&G's preliminary outfalls and continue to be studied further. Additionally, preliminary hydrologic analysis has been conducted within the study area to help determine feasibility of proposed outfalls. L&G has performed preliminary runoff calculations for each drainage area in efforts to provide a conceptual sizing of facility(s) that will be needed. This map was presented to HCDD#1 for comments. L&G presented and explained the various options.</p>		
<p>Task 4 (FC 16109) ~ Meet w/ County - HCDD#1 - TxDOT - Alton and Examine Existing Hydrologic Studies</p>	L&G	100.0%
<p>L&G has obtained available drainages studies done in the late 1990's for this general area. L&G has utilized and referenced the "Master Drainage Plan, City of Alton, Texas" (1998) and HCDD#1 Report: "Flood Protection Plan for Hidalgo County, Texas" (1997) These studies have been referenced in the report.</p>		
<p>Task 5 (FC 13009) ~ Identification of All Affected Property Owners on Proposed Facilities</p>	L&G	100.0%
<p>L&G has included exhibits as part of the feasibility report that provides ownership information obtained from Hidalgo County Appraisal District to identify any and all existing property ownership within the project limits. Additionally, L&G approximate acreage affected to the affected property owners for each of the proposed outfall locations. Included in the affected property owner identifications are estimated values in dollars of them proposed impacts to each parcel.</p>		
<p>Task 6 (FC 12007) – Coordination with Landowners due to Proposed Outfalls Facilities Impacting their Properties (Limited Public Involvement)</p>	L&G	80.0%
<p>Updated – L&G has determined recommended outfall #6 which impacts two different owners including HCDD#1 and SIVAD Enterprises Inc as per Hidalgo Appraisal District data base. L&G discussed internally and will be meeting with local entities to complete this task. (See attached Schematic for Outfall)</p>		

Task 7 (FC 16401) - Coordination w/TxDOT & FHWA on Logistics for Utilizing Federal Earmark Monies.	L&G	100.0%
L&G identification of \$500,738 of federal funds available for drainage improvements for FM 676 (from SH 107 to Taylor Rd) has being referenced in the report but is awaiting further information from TxDOT on possible uses of this money. L&G continues to coordinate with TxDOT to determine why the on-system project is requiring 20% participation from the local entity (County). L&G so far has sent 4 emails (July 29 th , Aug 23 rd , Sept 11 th , and Oct 22 nd) requesting additional information to be included as part of feasibility submittal. L&G continues to coordinate with TxDOT but has not received any correspondence. L&G was unable to obtain an answer on possible usage of the +500K of federal funds.		
Task 8 (FC 10202) ~ Feasibility Report and Recommendations	L&G	95.1%
Updated - L&G is completing the final stages of compiling the information for the feasibility report to include Introduction, Assessment of Existing Storm Drain System, Proposed Outfall locations, Hydrologic Mapping Outfalls, Impacts of Drainage Outfalls, Funding Analysis and Conclusion and Recommendations. L&G will be preparing final submittal for discussions and comments from HCDD #1.		
L&G Direct Expenses	L&G	72.4%
L&G has produced 4 20ft X 3ft (Approx) Hydrologic Maps to date as a function of the contract total as well as approx 100 ~ 8.5X11 and 50 ~ 11X17 sheets (Approx).		

Should you have any questions regarding this submittal or would like clarification on any aspect of the project, please do not hesitate to call me at (956) 585 - 1909.

Sincerely,



Ricardo Gallaga, P.E.
 Project Manager
 L&G Engineering



**HIDALGO COUNTY
DRAINAGE
DISTRICT No. 1**

RAUL E. SESIN, PE, CFM
General Manager
Floodplain Administrator

902 N. Doolittle Road
Edinburg, Texas 78542
Off 956 292.7080
Fax 956 292.7089

BOARD OF DIRECTORS

RAMON GARCIA
Chairman of the Board

A.C. CUELLAR, JR.
Board Member

EDUARDO "EDDIE" CANTU
Board Member

JOE M. FLORES
Board Member

JOSEPH PALACIOS
Board Member

May 01, 2015

Lora Briones
Financial Officer
SB
Re: Invoice

I. L&G Consulting Engineers Inc.
Invoice # 11325115/ 4-30-2015 / \$516.33

I have reviewed the invoice referenced above, and have no issues for payment based on the digital /back up information and complete percentages they are billing the Drainage District. Should you have any questions, please feel free to contact me.

Thank you,

J. Noe Saldivar, P.E.
J. Noe Saldivar, P.E.

Hydraulic Engineer

Date: 05/01/15 Time: 10:30 AM

Cc: Raul E. Sessin, PE, CFM

SB
5/1/2015

AJ# 49689



COVERSHEET
APPROVED-BOND INVOICES

Submitted to Noe

DATE: 5/1/2015

Prepared By: Joey Garza

96 FRIDAY

Vendor	Unit #	Invoice #	Invoice Date	Invoice Amount	Received By	Received Date	COMMENTS
L & G ENGINEERING	WA NO.1 RURAL DRAINAGE DEVELOPMENT PROGRAM PCT. 3	11325115	04/30/15	\$516.33	R. ARCE	05/01/15	<i>Approved</i> <i>05/01/15</i> ATTACHED PO #622895 & DISC INV. 11325115



Hidalgo County Drainage District No. 1

902 North Doolittle Road Edinburg, Texas 78542 Office: (956) 292-7080 Fax: (956) 292-7089

Invoice Processing Checklist

Date Received: 5/5/2015

Engineer/Firm Name: L&G Engineering

Project Name/Number: Pharr Mcallen & S. Floodwater Ch. WA No. 1

Invoice No.: 11325143

Purchase Order No.: 626860

Received By: Rosa Arce

Forwarded to: Joey Garza

Total # of Pages Submitted: 5

Attachments: CD: Invoice No. 11325143

Additional Comments: _____

L & G Consulting Engineers Inc
2100 W. Expressway 83
Mercedes, TX 78570
(956)565-9813 Fax (956)565-9018

INVOICE#: 11325143
INVOICE DATE: 4/30/2015

RECEIVED
 HIDALGO COUNTY
 DRAINAGE DISTRICT #1

BILL TO:

Hidalgo County Drainage District#1
 902 N. Doolittle
 Edinburg, TX 78542

JOB:150301

Pharr McAllen Drain & South Flood
 Water Channel Watershed Imp. Project
 WA#1 - PO#626860

MAY 05 2015
 4:45 AM PM
 BY: *Rosalie*

DESCRIPTION	CONTRACT	PREVIOUS APPLICATIONS	CURRENT COMPLETED	TOTAL COMPLETED	% COMPL	BALANCE TO FINISH
Engineering services for this billing period.						
FC 161 - HYDROLOGY						
16107-Task 1-Coordination with TxDOT-County-City to	17,443.20	0.00	1,781.70	1,781.70	10.2	15,661.50
16101-Task 2-Gaterh/Verify Information Regarding Existing	44,941.98	0.00	6,435.40	6,435.40	14.3	38,506.58
16102-Task 3Field Reconnaissance for Identification and L	37,254.34	0.00	5,438.64	5,438.64	14.6	31,815.70
16103-Task 4-Overall Drainage Area Map (Based on S&B & CSI	24,420.74	0.00		0.00	0.0	24,420.74
16106-Task 5-Coordination & Support to Hydraulic Engineer	11,874.00	0.00		0.00	0.0	11,874.00
16140-Task 5a-(SUB): CSE-Pharr-McAllen Drain Water Study	74,487.92	0.00		0.00	0.0	74,487.92
16105-Task 6-Meetings & Coordination with County	16,353.00	0.00	1,635.30	1,635.30	10.0	14,717.70
	226,775.18	0.00	15,291.04	15,291.04		211,484.14
Direct Expenses	4,500.00	0.00		0.00	0.0	4,500.00
	4,500.00	0.00	0.00	0.00		4,500.00
TOTALS:	231,275.18	0.00	15,291.04	15,291.04	6.6	215,984.14

ORIGINAL CONTRACT SUM	\$	231,275.18
CHANGE BY CHANGE ORDER	\$	0.00
CONTRACT SUM TO DATE	\$	231,275.18
TOTAL COMPLETED TO DATE	\$	15,291.04
LESS PREVIOUS INVOICES	\$	0.00
CURRENT PAYMENT DUE	\$	15,291.04



PROJECT MANAGER'S SIGNATURE

L&G Consulting Engineers, Inc
 2100 W. Expressway 83
 Mercedes, Texas 78570
 (956) 565-9813

Project Workhour Report

Pharr McAllen Drain & South Flood Water Channel Warshed Improvement Project WA#1

Reference:Inv#11325143

Date:04/30/2015

P.O.#626860

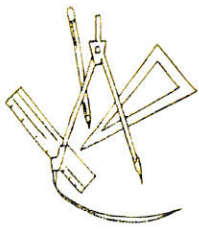
	Hrs		Rate	Total
Senior Project Manager	12.00	X	218.04	\$2,616.48
Senior Engineer	17.00	X	180.66	\$3,071.22
Project Engineer	41.00	X	133.94	\$5,491.54
Senior Engineer Tech	44.00	X	93.45	\$4,111.80
Admin/Clerical	0.00	X	62.3	\$0.00

Grand Total of Hours \$ 15,291.04

(Difference due to rounding hours) \$ -

Invoice Summary				
Man Hours				\$ 15,291.04
Sub Contract				\$ -
(See Attached Sub Invoice for Man Hour Breakdown)				
Direct Expenses	Current	Units	Rate	
20 ft. Long by 3 ft. Tall Exhibits (60sq.ft.)@5.00/sq.ft (15 total Prints)	0	X	300.00	\$ -
				\$ -
(Difference due to rounding)				\$ -
Total Per Invoice Submitted				\$ 15,291.04

Das



L&G Consulting Engineers, Inc.

May 4, 2015

Mr. Raul Sesin, P.E. – District Manager

Hidalgo County Drainage District #1

902 N. Doolittle

Edinburg, Texas 78542

RE: Work Authorization #1 on Pharr McAllen Drain & South Flood Water Channel Watershed Improvement Project

Job # 150301

P.O. # 626860

Dear Mr. Sesin,

Attached for your review and approval is our invoice for the services rendered to date on the subject referenced project.

The following is attached:

- L&G's Invoice #11325143
- CD w/ Electronic Files of Data for:
 - Task 1, 2, 3, & 6

TASK		% COMPL
Pharr-McAllen Drain & South Flood Water Channel Watershed Improvement Project		
Task 1 ~ Coordination with TxDOT-County-City to Accommodate Local Drainage Needs & Corres. Participation (McAllen & Pharr)	L&G	10.2%
Update – L&G has provided coordination in gathering all existing data in the project area. L&G coordinated with S&B to get the H&H Analysis (including HEC-RAS format) for a portion of this system. L&G has generated exhibits of the project location, existing system map and preliminary overall watershed (exhibit).		
Task 2 ~ Gather/Verify Information Regarding Existing Hydraulic Structures (Size, type, flow line elevations, etc)	L&G	14.3%
Update – L&G has provided field and office surveys for investigation of the existing structures and entrance/exit conditions of hydraulic culverts. Google Earth file (.kmz) with description notes and information has been created.		
Task 3 ~ Field Reconnaissance for Identification and Logging of Existing Conditions Along Project Alignment	L&G	14.6%
Update – L&G has provided survey of general cross sections and generation of preliminary DTM for verification of LiDAR information. L&G has also field verified channel conditions for use in proposed model.		
Task 4 ~ Overall Drainage Area Map (Based on S&B & CSE Analysis/Model/Report)	L&G	0.0%

Task Not Started		
Task 5 ~ Coordination & Support to Hydraulic Engineer for Pharr-McAllen Drain Watershed Study	L&G	0.0%
Task Not Started		
Task 5a ~ (SUB): CSE ~ Pharr-McAllen Drain Watershed Study	CSE	0.0%
Task Not Started		
Task 6 ~ Meetings & Coordination with County, HCDD#1, HCID#2, City of McAllen, City of Pharr	L&G	10.0%
Update – L&G has held meetings with City of Pharr, Hidalgo County Pct. 2, Hidalgo County Drainage District and Hidalgo County Irrigation District. In addition, many informal coordination meetings have been held with multiple parties to discuss project. Meeting minutes for major meetings have been completed.		
Direct Expenses	L&G	0.0%
Task Not Started		

Should you have any questions regarding this submittal or would like clarification on any aspect of the project, please do not hesitate to call me at (956) 585-1909.

Sincerely,

David Saenz, P.E., C.F.M.
 Project Manager
 L&G Engineering



**HIDALGO COUNTY
DRAINAGE
DISTRICT No. 1**

RAUL E. SESIN, PE, CFM
General Manager
Floodplain Administrator

902 N. Doolittle Road
Edinburg, Texas 78542
Off 956 292.7080
Fax 956 292.7089

BOARD OF DIRECTORS

RAMON GARCIA
Chairman of the Board

A.C. CUELLAR, JR.
Board Member

EDUARDO "EDDIE" CANTU
Board Member

JOE M. FLORES
Board Member

JOSEPH PALACIOS
Board Member

JB

May 06, 2015

Lora Briones
Financial Officer
Re: Invoice

I. L&G Engineering
Invoice# 11325143/ 4-30-2015/ \$15,291.04

I have reviewed the invoice referenced above, and have no issues for payment based on the digital /back up information and complete percentages they are billing the Drainage District. Should you have any questions, please feel free to contact me.

Thank you,

J. Noe Saldivar, P.E.
J. Noe Saldivar, P.E.
Hydraulic Engineer

JB
5/6/2015

Date: 05/06/15 Time: 1:30 PM

Cc: Raul E. Sesin, PE, CFM

AI# 49689.
Boo 5/19/15



COVERSHEET
APPROVED-BOND INVOICES

Submitted to Noe

DATE: 5/6/2015
Prepared By: Joey Garza

Jo *WED.*

Vendor	Unit #	Invoice #	Invoice Date	Invoice Amount	Received By	Received Date	COMMENTS
TEDSI	SPANISH PALMS OUTFALL IMP. OF MATERIAL TESTING AND CONSTRUCTION MANAGEMENT PCT. 1 WA NO. #17	20152275	03/30/15	\$1,600.00	E. LAYTON	04/01/15	<i>ANB</i> <i>05/06/15</i> NO PO ATTACHED
L & G ENGINEERING	PHARR MCALLEN DRAIN & SOUTH FLOOD WATER CHANNEL WATERSHED IMP. PROJ.	11325143	04/30/15	\$15,291.04	R. ARCE	05/05/15	<i>ANB</i> <i>05/06/15</i> PO #626860 ATTACHED

AI -49718

4.

DRAINAGE - CONSENT

Meeting Date: 05/19/2015

Submitted For: Lora Briones

Submitted By: Lora Briones, DRAINAGE
DISTRICT

Department: DRAINAGE DISTRICT

Information

CAPTION

Request approval of Invoice No. U9444.103 and 812-05a in the amount \$178,280 from S & B Infrastructure. LTD related to Work Authorization No. 16 and 17 - Raymondville Drain Project, purchase order number 623918.

BACKGROUND

Fiscal Impact

Attachments

S & B Invoice U9444.103 &812-05a

Form Review

Inbox	Reviewed By	Date
Budget & Management	Veronica Ortiz	05/15/2015 11:41 AM
Final Approval	Monica Badillo	05/15/2015 04:34 PM
Form Started By: Lora Briones		Started On: 05/15/2015 11:27 AM
Final Approval Date: 05/15/2015		



Hidalgo County Drainage District No. 1

902 North Doolittle Road Edinburg, Texas 78542 Office: (956) 292-7080 Fax: (956) 292-7089

Invoice Processing Checklist

Date Received: 12-May-15

Engineer/Firm Name: S&B Infrastructure

Project Name/Number: Ramonville Drain WA No. 16 & 17

Invoice No.: U9444.103 & 812-05a

Purchase Order No.: _____

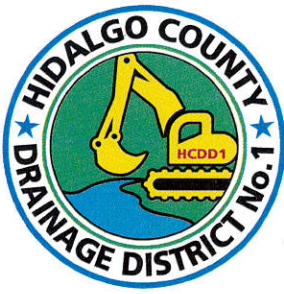
Received By: Rosa Arce

Forwarded to: Joey Garza

Total # of Pages Submitted: 32

Attachments: 1- USB

Additional Comments: _____



Raymondville Drain Project, Project for Flood Control
Lower Rio Grande Basin, (Hidalgo & Willacy Counties), Texas
Water Resources Development Act (WRDA) 1986, Title IV, Section 401,
As Amended by WRDA 2007



INVOICE TRANSMITTAL

S&BI Invoice U9444.103&812-05a
12 May 2015

RECEIVED
HIDALGO COUNTY
DRAINAGE DISTRICT #1

MAY 12 2015

1:18 AM / PM

BY: Jde

To: Lora Briones, HCDD1 Financial Officer
Claudette Guerrero, HCDD1 Accountant
José "Noe" Saldivar, PE, HCDD1 Engineer

From: Charlotte L. Teague, PE, S&BI Senior Project Manager

Dear Lora, Claudette, and Noe,

Transmitted herewith is above-referenced S&BI invoice. Under this invoice, we are respectfully requesting payment as follows:

Work Performed Under: S&BI Work Authorization No. 17

Performance Period: thru March 15, 2015

Work Tasks Performed:

For this invoice, we are primarily requesting compensation for **geotechnical** work (see "Expanded Progress Report" attached to invoice; tasks performed are outlined as follows:

1. For the period of February 9 thru February 28, 2015, S&BI coordinated with L&G Consulting Engineers, Inc. (L&G), and:
 - a. Developed an overall geotechnical exhibit/schematic showing locations of the proposed soil borings for this work authorization in accordance with the graphic files provided by S&BI.
 - b. Developed a working geometric database Boring Location File (.kmz file) in Google Earth for use in verification of field placement of borings (including any needed adjustments).
 - c. Performed field reconnaissance of general conditions at boring locations as well as preliminary staking.

Electronic back-up for a. and b. above has been provided in the attached USB, and is in the form of pdfs; hard-copies area also attached.

Also, a hard-copy of L&G's invoice has been provided for your files in support of the request for this payment.

2. For the period of March 1 thru March 31, 2015, S&BI coordinated with L&G, and:
 - a. L&G has completed the field investigation / drilling and began laboratory testing of 26 Bridge/Structural borings (B-BRG-37 through B-BRG-47, B-BRG-50 through B-BRG-55, B-BRG-60, B-BRG-61, B-BRG-66, B-BRG-67, B-BRG-70 through B-BRG-73, B-BRG-78).
 - b. Updates were made to the overall geotechnical exhibit / schematic.
 - c. Preliminary Boring Logs were created for all borings completed to-date (TxDOT Wincore format).



Raymondville Drain Project, Project for Flood Control
Lower Rio Grande Basin, (Hidalgo & Willacy Counties), Texas

Invoice Transmittal, S&BI Invoice U9444.103&812-05a, 12 May 2015

2. For the period of March 1 thru March 31, continued:

Electronic back-up for b.and c. above has been provided in the attached USB, and is in the form of pdfs; hard-copies area also attached.

Also, a hard-copy of L&G's invoice has been provided for your files in support of the request for this payment.

Respectfully Submitted By:



Charlotte Lynne Teague, PE

Attachments: S&BI Invoice U9444.103&812-05a with Expanded Line-Item Progress Report
USB (Electronic Copies of Technical Back-up as listed above and Sub-provider Invoices)
Hard-Copy:

- Overall Geotechnical Exhibit / Schematic (2-28-2015)
- Updated Overall Geotechnical Exhibit / Schematic (3-31-2015)
- Preliminary Boring Logs (3-31-2015)
- Sub-Provider Invoice (L&G 11325082 thru 2-28-2015) \$40,172.50
- Sub-Provider Invoice (L&G 11325111 thru 3-31-2015) \$121,899.94



S&B Infrastructure, Ltd.

INVOICE

May 12, 2015

Hidalgo County Drainage District No. 1
Attention: Lora Briones, Financial Officer

902 N. Doolittle
Edinburg, Texas 78542

Project Description:

Raymondville Drain

Work Authorization No. 16 "Hidalgo County - Planning, Design, Preliminary Engineering, PS&E"

Work Authorization No. 17 "Hidalgo and Willacy Counties - Planning, Design, Preliminary Engineering"

S&B Invoice No.: U9444.103&812-05a

Invoice Period: January 1, 2015 thru March 31, 2015

	QTY	UNIT	UNIT PRICE	PERCENT COMPLETE	INVOICED TO DATE	PREVIOUSLY INVOICED	AMOUNT THIS INVOICE
Hidalgo County -Planning, Design and PS&E	1	LS	\$3,007,286	40%	\$ 1,208,221.00	\$ 1,208,221.00	\$ -
Hidalgo & Willacy Counties -Planning, Design, Preliminary Engineering, and PS&E	1	LS	\$5,599,008	3%	\$ 178,280.00	\$ -	\$ 178,280.00
PAYMENT IS REQUESTED IN THE AMOUNT OF:							\$ 178,280.00

I hereby certify that this invoice is true and correct, and that all services indicated have been provided.

S & B INFRASTRUCTURE, LTD.

Charlotte L. Teague, PE
Senior Project Manager

IN ACCORDANCE WITH OUR CONTRACT,
PLEASE REMIT: \$ 178,280.00

S & B INFRASTRUCTURE, LTD.
3535 Sage Road
Houston, Texas 77056

Attachments:
PROGRESS REPORT NO. 5a

RECEIVED
HIDALGO COUNTY
DRAINAGE DISTRICT #1

MAY 12 2015

1:18 AM/PM

BY:

Raymondville Drain, Project for Flood Control
Hidalgo County Drainage District No. 1 / S&B Infrastructure, Ltd.
Work Authorization No. 16 / Work Authorization No. 17

Expanded Description	Expanded Progress Report U9444.103&812-05a Thru March 31, 2015				
	Estimated Line Item Budget	% Complete	Invoice To-Date Amount	Previously Invoiced	Amount Due This Invoice
Work Authorization No. 16:					
1 GCM	\$265,616	80%	\$ 212,493	\$ 212,493	\$ -
2 Engineering / Design (HC)	\$834,861	47%	\$ 391,893	\$ 391,893	\$ -
3 Geotechnical (HC)	\$423,909	48%	\$ 204,674	\$ 204,674	\$ -
4 Design Survey (HC)	\$241,451	85%	\$ 205,234	\$ 205,234	\$ -
5 ROW Survey (HC)	\$309,349	37%	\$ 115,509	\$ 115,509	\$ -
6 ROW Acquis Administration (HC)	\$782,100	0%	\$ 3,420	\$ 3,420	\$ -
7 Prelim ROW / Utilities (HC)	\$150,000	50%	\$ 75,000	\$ 75,000	\$ -
SUB-TOTAL (WA 16):	\$3,007,286	40%	\$ 1,208,222	\$ 1,208,222	\$ -
Work Authorization No. 17:					
1 GCM	\$703,663	0%	\$ -	\$ -	\$ -
2 Engineering / Design (HC)	\$653,667	0%	\$ -	\$ -	\$ -
3 Prelim Compensable Utilities (HC)	\$227,008	0%	\$ -	\$ -	\$ -
4 H&H Design (WC)	\$930,776	0%	\$ -	\$ -	\$ -
5 Engineering - Final Schematic (WC)	\$893,524	0%	\$ -	\$ -	\$ -
6 Prelim ROW / Design Survey (WC)	\$354,932	0%	\$ -	\$ -	\$ -
7 Prelim ROW Acquis Admin (WC)	\$270,500	0%	\$ -	\$ -	\$ -
8 Geotechnical (WC)	\$1,564,938	11%	\$ 178,280	\$ -	\$ 178,280
SUB-TOTAL (WA 17):	\$5,599,008	3%	\$ 178,280	\$ -	\$ 178,280

L & G Consulting Engineers Inc
2100 W. Expressway 83
Mercedes, TX 78570
(956) 565-9813 Fax (956) 565-9018

INVOICE #: 11325082
INVOICE DATE: 02/28/15

BILL TO: 09

S&B Infrastructure Ltd
 Attn: Infrastructure A/P
 P.O. Box 266245
 Houston, TX 77207-6245

JOB: 140202

Raymondville Drain Outfall WA2
 Willacy County PO#U9444-Z0023
 S&B Project No. U9444.813

<u>DESCRIPTION</u>	<u>CONTRACT</u>	<u>PREVIOUS APPLICATIONS</u>	<u>CURRENT COMPLETED</u>	<u>TOTAL COMPLETED</u>	<u>% COMPL</u>	<u>BALANCE TO FINISH</u>
Engineering services for the month of February 2015.						
33001-Geotech Testin	799,881.31				0.0	799,881.31
33002-Geotech Analys	610,954.80		40,172.50	40,172.50	6.6	570,782.30
33003-Geotech ODE	4,390.00				0.0	4,390.00
TOTALS:	1,415,226.11	0.00	40,172.50	40,172.50	2.8	1,375,053.61

ORIGINAL CONTRACT SUM \$ 1,415,226.11
 CHANGE BY CHANGE ORDER \$ 0.00
 CONTRACT SUM TO DATE \$ 1,415,226.11
 TOTAL COMPLETED TO DATE \$ 40,172.50
 LESS PREVIOUS INVOICES \$ 0.00



PROJECT MANAGER'S SIGNATURE

CURRENT PAYMENT DUE \$ 40,172.50

L & G Consulting Engineers Inc
2100 W. Expressway 83
Mercedes, TX 78570
(956) 565-9813 Fax (956) 565-9018

INVOICE #: 11325111
INVOICE DATE: 03/31/15

BILL TO: 09

S&B Infrastructure Ltd
 Attn: Infrastructure A/P
 P.O. Box 266245
 Houston, TX 77207-6245

JOB: 140202

Raymondville Drain Outfall WA2
 Willacy County PO#U9444-Z0023
 S&B Project No. U9444.813

<u>DESCRIPTION</u>	<u>CONTRACT</u>	<u>PREVIOUS APPLICATIONS</u>	<u>CURRENT COMPLETED</u>	<u>TOTAL COMPLETED</u>	<u>% COMPL</u>	<u>BALANCE TO FINISH</u>
Engineering services for the month of March 2015.						
33001-Geotech Testin	799,881.31		121,899.94	121,899.94	15.2	677,981.37
33002-Geotech Analys	610,954.80	40,172.50		40,172.50	6.6	570,782.30
33003-Geotech ODE	4,390.00				0.0	4,390.00
TOTALS:	1,415,226.11	40,172.50	121,899.94	162,072.44	11.5	1,253,153.67

ORIGINAL CONTRACT SUM	\$ 1,415,226.11
CHANGE BY CHANGE ORDER	\$ 0.00
CONTRACT SUM TO DATE	\$ 1,415,226.11
TOTAL COMPLETED TO DATE	\$ 162,072.44
LESS PREVIOUS INVOICES	\$ 40,172.50



PROJECT MANAGER'S SIGNATURE

CURRENT PAYMENT DUE	\$ 121,899.94
---------------------	---------------



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-37
Structure Bridge Borings
Station
Offset

District
Date 3/3/2015
Grnd. Elev. 49.00 ft
GW Elev. 31.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
43.5		5 (6) 6 (6)	SAND, Clayey Sand, Lean, Dark Brown, Loose, Moist (SC)			15.6				-200 = 34.8%
38.10		8 (6) 7 (6)	CLAY, Sandy Lean Clay, Brown, Medium Stiff, w/ Calcareous Nodules, Moist (CL)			21.6	47	32		
15.15		35 (6) 35 (6)	CLAY, Sandy Lean Clay, Brown, Stiff to Hard, w/ Calcareous Nodules, Moist (CL)			24.8				-200 = 68.8%
20.20		17 (6) 17 (6)				36.6	37	22		
25.25		19 (6) 30 (6)				32.4				-200 = 54.3%
18.30		24 (6) 48 (6)				33.7	29	13		
35.35		42 (6) 47 (6)	CLAY, Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Wet (CL)			37.4				-200 = 71.4%
8.40		50 (3) 50 (1.5)				34.0	34	18		
45.45		50 (4) 50 (2.5)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, Very Dense, Wet (SC)			36.8				-200 = 36.1%
50.50		50 (2) 50 (1)				34.0	32	19		
-2.55		50 (4) 50 (5)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, Hard, Wet (CL)			39.3				-200 = 59.3%
60.60		40 (6) 37 (6)				36.7	43	28		
65.65		47 (6) 43 (6)				30.5				-200 = 58.5%
-17.70		50 (6) 50 (4)	CLAY, Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Wet (CH)			42.4	58	37		
-26.75		50 (4) 50 (4)				44.2				-200 = 70.5%

Remarks: Sulfate Tests Performed at 65 ft. Results Provided on Separate Document. Boring Locate - N 26°29'0.40", W 97°59'23.70". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Okie Contreras

Logger: Joe Gomez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway CSJ

Hole B-BRG-38
Structure Bridge Borings
Station
Offset

District
Date 3/3/205
Grnd. Elev. 50.00 ft
GW Elev. 32.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	
5		6 (6) 5 (6)	CLAY, Sandy Lean Clay, Dark Brown, Soft to Stiff, Dry (CL)			10.5	24	10	
10		19 (6) 17 (6)				17.9			-200 = 52.2%
15		12 (6) 16 (6)	CLAY, Fat Clay w/ Sand, Brown, Stiff, Moist (CH)			15.6	51	35	
20		20 (6) 21 (6)				37.4			-200 = 72.4%
25		27 (6) 45 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, Hard, Wet (CL)			37.4	33	23	
30		40 (6) 50 (5)				37.5			-200 = 54.8%
35		26 (6) 31 (6)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, Hard, Wet (SC)			34.7	31	13	
40		30 (6) 33 (6)				32.2			-200 = 30.5%
45		50 (2) 50 (2)			44.7	33	12		
50		50 (3) 50 (1.5)			37.4			-200 = 39.5%	
55		41 (6) 47 (6)	CLAY, Fat Clay, Brown, w/ Calcareous Nodules, Hard, Wet (CH)			47.0	83	58	
60		35 (6) 35 (6)				47.6			-200 = 86.2%
65		41 (6) 37 (6)	CLAY, Fat Clay w/ Sand, w/ Calcareous Nodules, Hard, Wet (CH)			39.2	62	43	
70		38 (6) 38 (6)				41.4			-200 = 82.1%
75		40 (6) 41 (6)			44.6	56	38		

Remarks: Sulfate Tests Performed at 40 ft. Results Provided on Separate Document. Boring Locate - N 26°29'2.50", W 97°59'23.20". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Okie Contreras

Logger: Joe Gomez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-39
Structure Bridge Borings
Station
Offset

District
Date 3/3/2015
Grnd. Elev. 46.00 ft
GW Elev. 33.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		4 (6) 5 (6)	SAND, Silty Sand, Dark Brown, Loose, Moist (SM)			12.3	0	0		
10		8 (6) 10 (6)				16.9				-200 = 47.5%
15		13 (6) 17 (6)	CLAY, Sandy Fat Clay, Grayish Brown, Stiff to Very Stiff, Moist (CH)			18.4	51	37		
20		22 (6) 28 (6)				42.9				-200 = 68.7%
25		41 (6) 42 (6)	SAND, Silty Sand, Brown, Medium Dense to Very Dense, Wet (SM)			30.7		0		
30		50 (3) 50 (2.5)				21.9				-200 = 15.0%
35		16 (6) 15 (6)				26.1	0	0		
40		16 (6) 15 (6)				29.1				-200 = 22.1%
45		36 (6) 41 (6)	SAND, Clayey Sand, Lean, Brown, Dense to Very Dense, Wet (SC)			31.8	24	8		
50		50 (2.5) 50 (2.25)				37.3				-200 = 46.5%
55		50 (1.75) 50 (2)	CLAY, Sand, Lean Clay, Brown, w/ Calcareous Nodules, Hard, Wet (CL)			36.4	33	18		
60		39 (6) 45 (6)				48.0				-200 = 53.0%
65		34 (6) 36 (6)	CLAY, Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Wet (CH)			19.9	51	34		
70		36 (6) 33 (6)				51.5				-200 = 80.6%
75		41 (6) 40 (6)				52.4	54	38		

Remarks: Sulfate Tests Performed at 45 ft. Results Provided on Seperate Document. Boring Locate - N 26°29'6.90", W 97°58'51.90". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-40
Structure Bridge Borings
Station
Offset

District
Date 3/3/2015
Grnd. Elev. 46.00 ft
GW Elev. 38.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
40.		1 (6) 1 (6)	SAND, Clayey Sand, Dark Brown, Very Loose, Moist (SC)			19.7				-200 = 32.25
		5 (6) 11 (6)	CLAY, Sandy Lean Clay, Dark Grayish Brown, Medium Stiff to Stiff, Moist (CL)			27.2	26	15		
		12 (6) 16 (6)				36.2				-200 = 51.2%
25.		8 (6) 14 (6)				50.3	46	31		
		50 (4.5) 50 (5)	CLAY, Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CL)			64.7				-200 = 74.6%
		50 (4.25) 50 (4)				43.7	42	24		
		50 (4.5) 50 (4.75)				51.4				-200 = 72.9%
10.		32 (6) 38 (6)	SAND, Clayey Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Medium Dense, Wet (SC)			49.6	24	18		
		25 (6) 32 (6)				39.9				-200 = 45.4%
		50 (5) 50 (4.75)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CL)			41.8	29	12		
		50 (5.75) 50 (4.5)				49.9				-200 = 51.7%
-10.		50 (4.75) 50 (5)	CLAY, Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CH)			48.0	58	39		
		50 (5) 50 (4.75)				59.8				-200 = 76.9%
		50 (3.5) 50 (4.25)				60.9	62	43		
-29.		50 (4.25) 50 (4.5)				56.3				-200 = 75.4%

Remarks: Sulfate Tests Performed at 20 ft. Results Provided on Seperate Document. Boring Locate - N 26°29'10.00", W 97°58'51.90". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-41
Structure Bridge Borings
Station
Offset

District
Date 3/9/2015
Grnd. Elev. 50.00 ft
GW Elev. 37.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
44.	5	5 (6) 6 (6)	SAND, Clayey Sand, Lean, Dark Brown, Loose, Dry (SC)			10.3	25	12		
	10	7 (6) 8 (6)	SAND, Clayey Sand, Fat, Brown, Loose, Dry (SC)			18.1				-200 = 44.2%
34.	15	8 (6) 8 (6)				19.3	52	18		
29.	20	9 (6) 8 (6)	CLAY, Sandy Fat Clay, Brown, w/ Calcareous Nodules, Medium Stiff, Wet (CH)			39.2				-200 = 66.0%
	25	23 (6) 23 (6)	CLAY, Sandy Fat Clay, Brown, w/ Calcareous Nodules, Very Stiff to Hard, Wet (CH)			55.0	33	38		
19.	30	35 (6) 40 (6)				43.1				-200 = 68.1%
	35	27 (6) 44 (6)	CLAY, Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Wet (CL)			38.3	41	32		
	40	24 (6) 50 (5)				63.1				-200 = 74.6%
4.	45	25 (6) 39 (6)				52.1	43	26		
	50	24 (6) 43 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, Hard, Wet (CL)			40.9				-200 = 50.6%
	55	26 (6) 31 (6)				42.5	40	24		
	60	25 (6) 34 (6)				43.9				-200 = 52.1%
-11.	65	27 (6) 29 (6)	CLAY, Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, Very Stiff to Hard, Wet (CH)			51.6	62	43		
	70	29 (6) 39 (6)				54.3				-200 = 76.8%
-25.	75	32 (6) 34 (6)				51.9	68	48		

Remarks: Sulfate Tests Performed at 65 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'56.10", W 97°58'48.10". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar

Logger: Ben

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-42
Structure Bridge Borings
Station
Offset

District
Date 3/9/2015
Grnd. Elev. 45.00 ft
GW Elev. 34.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
39.5		1 (6) 2 (6)	SAND, Clayey Sand, Lean, Dark Brown, Very Loose, Dry (SC)							-200 = 45.5%
10		8 (6) 9 (6)	CLAY, Sandy Lean Clay, Grayish Brown, w/ Calcareous Nodules, Medium Stiff to Very Stiff, Wet (CL)			24.8	46	28		
29.15		20 (6) 24 (6)				2.7				-200 = 52.9%
20		30 (6) 32 (6)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, Dense to Very Dense, Wet (SC)			35.7	30	16		
25		50 (5) 50 (5)				40.1				-200 = 45.7%
30		50 (5.75) 50 (4)				0.5	25	14		
35		50 (4.5) 50 (4)				36.5				-200 = 33.1%
9.40		50 (5) 50 (3)	SAND, Poorly Graded Sand w/ Silt, Brown, Very Dense, Wet (SP-S ₁)			34.7				
45		50 (5) 50 (5.75)				30.5	0	0		-200 = 11.2%
-1.50		39 (6) 45 (6)	SAND, Clayey Sand, Lean, Brown, Dense, Wet (SC)			39.1				
55		42 (6) 46 (6)				42.7				-200 = 35.9%
60		50 (6) 50 (6)				39.6	41	25		
65		48 (6) 48 (6)				43.8				-200 = 42.3%
70		30 (6) 42 (6)				36.2				
-26.75		37 (6) 42 (6)	CLAY, Fat Clay w/ Sand, Brown, Hard, Wet (CH)			42.3	52	36		-200 = 73.1%

Remarks: Sulfate Tests Performed at 40 ft. Results Provided on Separate Document. Boring Locate - N 26°28'53.90", W 97°58'47.70". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar

Logger: Ben

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-43
Structure Bridge Borings
Station
Offset

District
Date 3/2/2015
Grnd. Elev. 57.00 ft
GW Elev. 36.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		12 (6) 12 (6)	SAND, Clayey Sand, Lean, Dark Brown, Loose to Medium Dense, Moist (SC)			13.3	26	10		
10		8 (6) 9 (6)				12.5				-200 = 41.6%
15		20 (6) 15 (6)				16.5	41	28		
20		24 (6) 23 (6)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Loose to Medium Dense, Wet (SC)			19.1				-200 = 39.4%
25		12 (6) 5 (6)				37.2	7	22		
30		50 (4) 50 (2)	SAND, Silty, Clayey Sand, Brown, Dense to Very Dense, Wet (SC-SM)			42.5				-200 = 41.5%
35		50 (5.5) 50 (3)				37.8	24	7		
40		50 (2.25) 50 (1.5)				45.4				-200 = 42.1%
45		50 (6) 50 (1)			33.9	24	7			
50		32 (6) 35 (6)			42.6					-200 = 45.5%
55		30 (6) 28 (6)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Medium Dense to Dense, Wet (SC)			45.7	39	23		
60		18 (6) 20 (6)				35.5				-200 = 35.3%
65		32 (6) 38 (6)				38.3	31	17		
70		50 (4.5) 50 (3)	CLAY, Sandy Fat Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CH)			45.9				-200 = 57.9%
75		50 (3) 50 (1.5)				60.5	69	49		

Remarks: Sulfate Tests Performed at 25 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'46.8", W 97°57'58.3". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Okie Contreras

Logger: Richard Garcia

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-44
Structure Bridge Borings
Station
Offset

District
Date 3/2/2015
Grnd. Elev. 53.00 ft
GW Elev. 40.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks	
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)		
5		7 (6) 8 (6)	SAND, Clayey Sand, Lean, Dark Brown to Brown, Traces of Roots, Very Loose to Loose, Dry (SC)			7.0				-200 = 39.9%	
10		7 (6) 5 (6)				10.8	36	22			
15		2 (6) 3 (6)				17.1					-200 = 39.5%
20		19 (6) 13 (6)	SAND, Clayey Sand, Lean Brown, Medium Dense to Dense, Wet (SC)			55.3	30	14			
25		30 (6) 32 (6)				30.4					-200 = 33.1%
30		50 (5) 50 (4.5)	SAND, Silty Sand, Brown, Medium Dense to Very Dense, Wet (SM)			22.2	0	0			
35		50 (4.75) 50 (4)				22.2					-200 = 18.9%
40		50 (4.5) 50 (4)				26.1	0	0			
45		50 (4.75) 50 (4.25)			28.9						-200 = 14.6%
50		23 (6) 26 (6)			27.3	0	0				
55		26 (6) 33 (6)			26.0						-200 = 15.7%
60		32 (6) 33 (6)	SAND, Clayey Sand, Lean, Brown, Dense, Wet (SC)			25.9	26	19			
65		30 (6) 32 (6)				34.6					
70		28 (6) 30 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Stiff to Hard, Wet (CL)			40.8	31	18			
75		33 (6) 36 (6)				48.4					

Remarks: Sulfate Tests Performed at 65 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'48.00", W 97°57'57.1". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-45
Structure Bridge Borings
Station
Offset

District
Date 3/4/2015
Grnd. Elev. 49.00 ft
GW Elev. 35.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	
43.5		6 (6) 6 (6)	SAND, Clayey Sand, Lean, Dark Brown, Traces of Roots, Loose, Dry (SC)			17.2	30	18	-200 = 39.9%
38.5		5 (6) 7 (6)	SAND, Clayey Sand, Fat, Dark Brown, Loose, Dry (SC)			16.6	52	34	
15.5		19 (6) 26 (6)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, Medium Dense, Wet (SC)			17.8			-200 = 39.5%
20.5		23 (6) 25 (6)				44.0	39	19	
25.5		30 (6) 37 (6)	SAND, Silty, Clayey Sand, Brown, Dense, Wet (SC-SM)			35.6	41	5	-200 = 33.1%
30.5		43 (6) 50 (6)				26.4			
35.5		50 (4.75) 50 (4)	SAND, Silty Sand, Brown, Dense to Very Dense, Wet (SM)			23.3			-200 = 18.9%
40.5		50 (3.75) 50 (3.25)				19.7	0	0	
45.5		50 (2.5) 50 (2)				32.8			-200 = 14.6%
50.5		50 (2) 50 (1.75)				30.4			
55.5		50 (4.25) 50 (5)				27.7	0	0	-200 = 15.7%
60.5		36 (6) 35 (6)				29.1			
65.5		35 (6) 39 (6)				33.0			-200 = 33.5%
70.5		41 (6) 44 (6)				29.6			
-22.5			CLAY, Sandy Fat Clay, Brown, Hard, Wet (CH)						
-26.5		38 (6) 42 (6)				49.5	64	46	-200 = 61.7%

PRELIMINARY

Remarks: Sulfate Tests Performed at 60 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'42.7", W 97°57'29.1". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-46
Structure Bridge Borings
Station
Offset

District
Date 3/5/2015
Grnd. Elev. 49.00 ft
GW Elev. 13.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	
5		5 (6) 4 (6)	SAND, Clayey Sand, Lean, Dark Brown, Very Loose to Loose, Dry (SC)			9.4	30	16	
10		2 (6) 2 (6)				10.7			-200 = 42.8%
15		42 (6) 50 (5.75)	CLAY, Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, Stiff to Hard, Wet (CL)			19.0	37	22	
20		16 (6) 19 (6)				33.0			-200 = 70.1%
25		39 (6) 43 (6)				31.8	29	17	
30		50 (6) 50 (5.5)	SAND, Silty, Clayey Sand, Brown, w/ Calcareous Nodules, Very Dense, Wet (SC-SM)			29.8	20	5	-200 = 38.9%
35		50 (5.5) 50 (4.25)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, Very Dense, Wet (SC)			32.9	20	8	
40		50 (4.25) 50 (4)				26.6			-200 = 23.5%
45		26 (6) 31 (6)	SAND, Silty Sand, Lean, Brown, w/ Calcareous Nodules, Dense, Wet (SM)			27.7			
50		19 (6) 22 (6)				24.2	0	0	-200 = 20.9%
55		18 (6) 24 (6)				25.2			
60		23 (6) 31 (6)				26.7			-200 = 17.2%
65		32 (6) 27 (6)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, Medium Dense to Dense, Wet (SC)			28.1	30	12	
70		33 (6) 31 (6)				25.5			-200 = 19.2%
75		30 (6) 32 (6)	SAND, Clayey Sand, Fat, Brown, w/ Calcareous Nodules, Dense, Wet (SC)			43.1	50	34	

Remarks: Sulfate Tests Performed at 35 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'44.3", W 97°57'28.4". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-47
Structure Bridge Borings
Station
Offset

District
Date 3/5/2015
Grnd. Elev. 49.00 ft
GW Elev. 36.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		6 (6) 4 (6)	SAND, Clayey Sand, Lean, Dark Brown, Very Loose to Loose, Dry (SC)			12.4				-200 = 41.4%
10		4 (6) 3 (6)				18.4	34	22		
15		50 (4) 50 (2)	CLAY, Sandy Lean Clay, Brown, Stiff to Hard, Wet (CL)			28.7				-200 = 55.7%
20		15 (6) 14 (6)				33.8	27	15		
25		17 (6) 22 (6)				31.6				-200 = 68.9%
30		50 (6) 50 (4)				33.8	32	16		
35		50 (2.5) 50 (3)				40.7				-200 = 50.6%
40		50 (3) 50 (2)	SAND, Silty Sand, Brown, w/ Calcareous Nodules, Dense to Very Dense, Wet (SM)			32.1	0	0		
45		50 (4.5) 48 (6)				39.5				-200 = 37.7%
50		17 (6) 19 (6)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Grey Streaks, Medium Dense to Very Dense, Wet (SC)			46.5	28	12		
55		50 (5.5) 50 (5)				44.4				-200 = 35.4%
60		50 (4) 50 (4)				46.5	42	27		
65		46 (6) 49 (6)	CLAY, Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, Hard, Wet (CH)			48.0				-200 = 71.5%
70		47 (6) 42 (6)	CLAY, Sandy Fat Clay, Brown, w/ Calcareous Nodules, Hard, Wet (CH)			48.6	62	44		
75		49 (6) 47 (6)				59.4				-200 = 68.6%

Remarks: Sulfate Tests Performed at 20 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'43.0", W 97°57'27.4". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Okie Garcia

Logger: Joe Ramirez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-50
Structure Bridge Borings
Station
Offset

District
Date 3/15/2015
Grnd. Elev. 42.00 ft
GW Elev. 30.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
36.5		6 (6) 5 (6)	CLAY, Sandy Lean Clay, Dark Brown, Soft, Dry (CL)			20.7	45	28		
31.1		12 (6) 12 (6)	CLAY, Sandy Lean Clay, Gray, Medium Stiff, Moist (CL)			24.1	39	22		-200 = 65.5%
15		18 (6) 19 (6)	CLAY, Sandy Lean Clay, Light Brown, w/ Traces of Gravel (Sized up to 1/4 in. Sub-Angular), Stiff to Very Stiff, Wet (CL)			27.8	29	22		
20		20 (6) 25 (6)				29.4				-200 = 69.0%
16.25		17 (6) 18 (6)				45.3	66	27		
30		15 (6) 20 (6)	CLAY, Fat Clay, Brown, w/ Reddish Brown Streaks, Stiff to Very Stiff, Wet (CH)			45.6				-200 = 93.2%
35		16 (6) 19 (6)				46.9	73	50		
40		21 (6) 24 (6)				42.5				-200 = 94.9%
45		18 (6) 21 (6)				6.73	68	45		
50		20 (6) 23 (6)				43.7				-200 = 93.2%
55		21 (6) 24 (6)				48.9	73	48		
60		19 (6) 24 (6)				45.7				-200 = 95.8%
65		22 (6) 23 (6)				49.7	76	51		
70		25 (6) 27 (6)				54.8				-200 = 97.7%
-33.75		23 (6) 23 (6)				53.3	75	53		

PRELIMINARY

Remarks: Sulfate Tests Performed at 60 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'39.40", W 97°56'30.30". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-51
Structure Bridge Borings
Station
Offset

District
Date 3/15/2015
Grnd. Elev. 48.00 ft
GW Elev. 30.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	
42.	5	6 (6) 6 (6)	CLAY, Sandy Lean Clay, Dark Brown, Soft, Dry (CL)			18.4	40	24	-200 = 57.9%
37.	10	17 (6) 20 (6)	CLAY, Fat Clay w/ Sand, Gray, Stiff, Moist (CH)			26.7	52	33	-200 = 68.3%
	15	16 (6) 18 (6)	CLAY, Lean Clay w/ Sand, Brown, w/ Traces of Gravel (Sized up to 1/4 in. Sub-Angular, Stiff, Wet (CL)			31.2			-200 = 65.7%
27.	20	15 (6) 17 (6)				32.0	27	11	
22.	25	21 (6) 26 (6)	SAND, Clayey Sand, Fat, Brown, Medium Dense, Wet (SC)			25.4			-200 = 37.5%
	30	20 (6) 21 (6)	CLAY, Sandy Fat Clay, Brown, Stiff, Wet (CH)			29.7			-200 = 61.9%
12.	35	16 (6) 19 (6)				44.1	74	47	
	40	15 (6) 19 (6)	CLAY, Fat Clay, Brown, w/ Reddish Brown and Gray Streaks, Stiff, Wet (CH)			41.9			-200 = 96.0%
	45	14 (6) 16 (6)				47.6	71	44	
-3.	50	16 (6) 19 (6)				47.2			
	55	18 (6) 21 (6)	CLAY, Fat Clay w/ Sand, Brown, w/ Reddish Brown, and Gray Streaks, Stiff to Very Stiff, Wet (CH)			45.5			-200 = 83.0%
-13.	60	20 (6) 26 (6)				46.6	55	35	
	65	19 (6) 24 (6)	CLAY, Fat Clay, Brown, w/ Reddish Brown and Gray Streaks, Stiff to Very Stiff, Wet (CH)			48.8			-200 = 86.1%
	70	18 (6) 25 (6)				49.8	56	34	
-27.	75	18 (6) 27 (6)				49.1			-200 = 89.1%

Remarks: Sulfate Tests Performed at 10 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'38.60", W 97°56'31.30". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-52
Structure Bridge Borings
Station
Offset

District
Date 3/13/2015
Grnd. Elev. 45.00 ft
GW Elev. 32.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	
39.5		10 (6) 10 (6)	SAND, Clayey Sand, Lean, Dark Brown, Medium Dense, Dry (SC)			12.5			-200 = 49.9%
39.10		7 (6) 10 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, Soft to Medium Stiff, Wet (CL)			15.2	40	27	
29.15		5 (6) 6 (6)				17.1			-200 = 53.6%
29.20		19 (6) 16 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Stiff to Hard, Wet (CL)			31.7	35	21	
25.25		23 (6) 25 (6)				41.0			-200 = 67.6%
30.30		30 (6) 29 (6)				5.7	34	16	
14.35		38 (6) 46 (6)	CLAY, Fat Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CH)			53.8			-200 = 92.4%
40.40		50 (2.75) 50 (3)				47.6	58	35	
45.45		50 (3) 50 (3.5)				43.2			-200 = 91.7%
50.50		50 (4.25) 50 (4)				48.8	56	35	
55.55		50 (4) 50 (3.5)				43.8			-200 = 95.3%
-11.60		19 (6) 21 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Medium Stiff to Very Stiff, Wet (CL)			44.9	46	28	
65.65		10 (6) 13 (6)				35.1			-200 = 59.1%
-21.70		13 (6) 18 (6)	CLAY, Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Stiff, Wet (CL)			35.6	29	16	
-30.75		15 (6) 24 (6)				38.7			-200 = 81.6%

PRELIMINARY

Remarks: Sulfate Tests Performed at 40 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'21.40", W 97°55'35.60". Assumed Natural Ground Elevation

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-53
Structure Bridge Borings
Station
Offset

District
Date 3/13/2015
Grnd. Elev. 44.00 ft
GW Elev. 31.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	
5		5 (6) 6 (6)	CLAY, Sandy Lean Clay, Dark Brown, Soft to Medium Stiff, Dry (CL)			16.3	34	18	
10		9 (6) 9 (6)				15.5			-200 = 58.1%
15		8 (6) 8 (6)	CLAY, Sandy Lean Clay, Brown, Medium Stiff to Stiff, Wet (CL)			19.4	44	29	
20		11 (6) 12 (6)				9.50			-200 = 60.0%
25		13 (6) 14 (6)	CLAY, Fat Clay w/ Sand, Brown, Stiff, Wet (CH)			34.5	55	18	
30		16 (6) 20 (6)				40.1			-200 = 73.1%
35		15 (6) 20 (6)				54.0	65	44	
40		18 (6) 21 (6)	CLAY, Fat Clay, Brown, Stiff to Very Stiff, Wet (CH)			53.5			-200 = 88.5%
45		18 (6) 21 (6)				54.3	69	46	
50		20 (6) 22 (6)				55.6			-200 = 91.5%
55		21 (6) 24 (6)				54.8	63	43	
60		20 (6) 25 (6)	CLAY, Lean Clay, Brown, Hard, Wet (CL)			57.0			-200 = 90.7%
65		25 (6) 29 (6)				34.1	39	20	
70		23 (6) 29 (6)		CLAY, Fat Clay, Brown, Hard, Wet (CH)			45.6		
75		25 (6) 30 (6)				44.8	53	33	

Remarks: Sulfate Tests Performed at 65 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'20.20", W 97°55'35.30". Assumed Natural Ground Elevation

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-54
Structure Bridge Borings
Station
Offset

District
Date 3/10/2015
Grnd. Elev. 45.00 ft
GW Elev. 31.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	
39.	5	11 (6) 10 (6)	CLAY, Sandy Lean Clay, Dark Brown, w/ Calcareous Nodules, Medium Stiff, Dry (CL)			14.4	40	27	
	10	9 (6) 10 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, Soft to Medium Stiff, Wet (CL)			14.5			-200 = 54.1%
29.	15	6 (6) 6 (6)				14.9	43	30	
24.	20	14 (6) 14 (6)	SAND, Clayey Sand, Lean, Grayish Brown, w/ Calcareous Nodules, Medium Dense, Wet (SC)			22.3			-200 = 35.8%
19.	25	18 (6) 25 (6)	SAND, Silty Sand, Brown, w/ Calcareous Nodules, Medium Dense, Wet (SM)			23.9		0	
	30	22 (6) 30 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Very Stiff, Wet (CL)			41.7			-200 = 61.0%
9.	35	20 (6) 36 (6)				45.0	38	23	
	40	22 (6) 46 (6)	CLAY, Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CH)			49.2			-200 = 83.7%
	45	27 (6) 38 (6)				46.9	57	37	
-1.	50	38 (6) 45 (6)	CLAY, Fat Clay Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, wet (CH)			47.6			-200 = 91.8%
	55	23 (6) 27 (6)				53.0	65	45	
-11.	60	18 (6) 21 (6)	CLAY, Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Stiff, Wet (CL)			52.1			-200 = 76.2%
	65	12 (6) 16 (6)				38.3	34	18	
-21.	70	14 (6) 18 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Stiff, Wet (CL)			36.5			-200 = 63.4%
-30.	75	11 (6) 17 (6)				39.4	41	26	

Remarks: Sulfate Tests Performed at 25 ft. Results Provided on Separate Document. Boring Locate - N 26°28'15.90", W 97°55'6.10". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-55
Structure Bridge Borings
Station
Offset

District
Date 3/10/2015
Grnd. Elev. 43.00 ft
GW Elev. 26.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
37.	5	6 (6) 6 (6)	SAND, Clayey Sand, Dark Brown, Traces of Roots, w/ Calcareous Nodules, Loose, Moist (SC)			15.7				-200 = 47.0%
	10	9 (6) 10 (6)	CLAY, Sandy Lean Clay, Light Brown, w/ Calcareous Nodules, Medium Stiff, Wet (CL)			16.0	48	32		
	15	8 (6) 7 (6)				16.7				-200 = 52.8%
22.	20	7 (6) 7 (6)				26.6	32	17		
	25	10 (6) 12 (6)	SAND, Poorly Graded Sand with Clay, Brown, w/ Calcareous Nodules, Medium Dense, Wet (SP-SC)			27.2				-200 = 7.7%
12.	30	16 (6) 15 (6)				31.0	21	8		
	35	23 (6) 25 (6)	CLAY, Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Very Stiff, Wet (CL)			37.6				-200 = 71.4%
	40	23 (6) 26 (6)				40.6	40	22		
2.	45	26 (6) 31 (6)	CLAY, Fat Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CH)			46.2				-200 = 93.4%
	50	25 (6) 33 (6)				44.4	63	42		
-8.	55	31 (6) 36 (6)	CLAY, Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CL)			55.5				-200 = 84.1%
	60	23 (6) 27 (6)				44.5	33	15		
-18.	65	18 (6) 24 (6)	CLAY, Sandy Lean Clay, Light Gray Brown, w/ Calcareous Nodules, w/ Reddish Brown Streaks, Stiff to Very Stiff, Wet (CL)			34.3				-200 = 51.0%
	70	16 (6) 20 (6)				36.6	35	21		
-32.	75	17 (6) 21 (6)				47.8				-200 = 67.9%

Remarks: Sulfate Tests Performed at 40 ft. Results Provided on Seperate Document. Boring Locate - N 26°28'15.00", W 97°55'7.00". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-60
Structure Bridge Borings
Station
Offset

District
Date 3/11/2015
Grnd. Elev. 37.00 ft
GW Elev. 20.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		8 (6) 10 (6)	CLAY, Sandy Lean Clay, Dark Brown, w/ Calcareous Nodules, Medium Stiff to Stiff, Moist (CL)			17.0	42	24		
10		14 (6) 13 (6)				17.1				-200 = 67.7%
15		11 (6) 12 (6)	SAND, Clayey Sand, Fat, Brown, w/ Calcareous Nodules, Medium Dense, Wet (SC)			26.9	50	33		
20		16 (6) 17 (6)				29.3				-200 = 29.9%
25		19 (6) 21 (6)	CLAY, Lean Clay w/ Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Stiff to Hard, Wet (CL)			46.7	49	23		
30		25 (6) 24 (6)				42.7				-200 = 75.1%
35		28 (6) 31 (6)				48.0	46	26		
40		27 (6) 35 (6)	CLAY, Fat Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown, and Gray Streaks, Hard, Wet (CH)			41.1				-200 = 89.0%
45		30 (6) 42 (6)				72.5	58	35		
50		33 (6) 36 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CL)			45.3				-200 = 62.6%
55		36 (6) 47 (6)				38.5	28	14		
60		34 (6) 39 (6)	SAND, Clayey Sand, Lean, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (SC)			37.1				-200 = 36.4%
65		37 (6) 46 (6)				32.8	32	17		
70		40 (6) 45 (6)				31.7				-200 = 45.1%
75		39 (6) 47 (6)				32.1	33	18		

Remarks: Sulfate Tests Performed at 45 ft. Results Provided on Seperate Document. Boring Locate - N 26°29'41.30", W 97°52'49.60". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-61
Structure Bridge Borings
Station
Offset

District
Date 3/11/2015
Grnd. Elev. 39.00 ft
GW Elev. 26.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
33.	5	6 (6) 6 (6)	CLAY, Sandy Fat Clay, Brown, Stiff, Moist (CH)			17.4				-200 = 61.9%
	10	13 (6) 15 (6)	CLAY, Sandy Fat Clay, Brown, Stiff, Moist (CH)			17.8	55	39		
23.	15	13 (6) 15 (6)				15.6				-200 = 63.8%
	20	19 (6) 21 (6)	SAND, Clayey Sand, Lean, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Medium Dense, Wet (SC)			35.1	43	25		
	25	19 (6) 23 (6)				35.1				-200 = 45.2%
8.	30	21 (6) 29 (6)				35.0	36	20		
	35	24 (6) 31 (6)	CLAY, Fat Clay w/ Sand, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CH)			36.5				-200 = 84.8%
	40	23 (6) 27 (6)				45.6	52	28		
-2.	45	28 (6) 31 (6)	CLAY, Fat Clay, Brown, w/ Calcareous Nodules, w/ Reddish Brown and Gray Streaks, Hard, Wet (CH)			48.7				-200 = 92.6%
	50	23 (6) 27 (6)				51.8	61	36		
	55	26 (6) 34 (6)				53.0				-200 = 93.4%
	60	28 (6) 33 (6)				54.5	60	39		
	65	24 (6) 30 (6)				48.3				-200 = 90.5%
	70	25 (6) 39 (6)				46.9	57	29		
-36.	75	28 (6) 41 (6)				47.0				-200 = 85.9%

Remarks: Sulfate Tests Performed at 20 ft. Results Provided on Seperate Document. Boring Locate - N 26°29'40.10", W 97°52'47.60". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-66
Structure Bridge Borings
Station
Offset

District
Date 3/16/2015
Grnd. Elev. 34.00 ft
GW Elev. 11.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	
28.	5	22 (6) 22 (6)	CLAY, Fat Clay w/ Sand, Dark Brown, Very Stiff, Wet (CH)			13.5			-200 = 72.8%
	10	10 (6) 9 (6)	CLAY, Fat Clay w/ Sand, Brown, Medium Stiff, Wet (CH)			15.7	58	37	
	15	8 (6) 10 (6)				22.2			-200 = 84.5%
13.	20	10 (6) 13 (6)				23.0	82	60	
	25	15 (6) 18 (6)	CLAY, Fat Clay, Brown, Stiff, Wet (CH)			22.0			-200 = 87.0%
8.	30	31 (6) 35 (6)	SAND, Clayey Sand, Lean, Brown, Dense to Very Dense, Wet (SC)			31.2	38	23	
	35	46 (6) 50 (3.5)				29.2			-200 = 31.9%
	40	50 (2.25) 50 (2)				27.6	26	8	
-7.	45	50 (2) 50 (2.25)	SAND, Silty Sand, Brown, Very Dense, Wet (SM)			29.6			-200 = 22.3%
	50	50 (3) 50 (2.75)				29.9	0	0	
	55	50 (4) 50 (4.25)				26.1			-200 = 18.4%
	60	50 (3.25) 50 (3)				55.9	0	0	
	65	50 (3.25) 50 (3.5)				26.5			-200 = 16.2%
	70	50 (3.5) 50 (3)				28.7	0	0	
-41.	75	50 (3.5) 50 (3.5)				13.5			-200 = 14.5%

PRELIMINARY

Remarks: Sulfate Tests Performed at 45 ft. Results Provided on Seperate Document. Boring Locate - N 26°29'41.30", W 97°52'49.60". Assumed Natural Ground Elevation.

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-67
Structure Bridge Borings
Station
Offset

District
Date 3/16/2015
Grnd. Elev. 34.00 ft
GW Elev. 16.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	
28.	5	19 (6) 16 (6)	CLAY, Fat Clay w/ Sand, Dark Brown, w/ Calcareous Nodules, Stiff, Dry (CH)			11.9	50	32	
	10	8 (6) 8 (6)	CLAY, Fat Clay w/ Sand, Brown, Medium Stiff, Wet (CH)			18.7			-200 = 77.2%
18.	15	9 (6) 12 (6)				20.2	69	57	
	20	10 (6) 12 (6)	CLAY, Lean Clay, Brown, Medium Stiff to Stiff, Wet (CL)			24.2			-200 = 89.7%
8.	25	16 (6) 18 (6)				42.2	66	32	
	30	16 (6) 19 (6)	CLAY, Sandy Lean Clay, Brown, w/ Calcareous Nodules, Stiff, Wet (CL)			35.2			-200 = 56.0%
	35	15 (6) 17 (6)				33.4	37	24	
	40	18 (6) 22 (6)				36.6			-200 = 59.6%
-12.	45	17 (6) 23 (6)				37.6	35	20	
	50	23 (6) 25 (6)	SAND, Clayey Sand, Brown w/ Calcareous Nodules, Medium Dense to Very Dense, Wet (SC)			32.5			-200 = 23.1%
	55	50 (5) 50 (5.5)				33.4	34	20	
	60	50 (5.25) 50 (5.5)				35.4			-200 = 33.8%
-27.	65	41 (6) 50 (5.5)	CLAY, Sandy Lean Clay, w/ Calcareous Nodules, Hard, Wet (CL)			34.0	43	29	
	70	42 (6) 50 (6)				33.7			-200 = 50.3%
-41.	75	41 (6) 48 (6)				35.2	41	27	

Remarks: Sulfate Tests Performed at 45 ft. Results Provided on Seperate Document. Boring Locate - N 26°31'7.80", W 97°50'46.60". Assumed Natural Ground Elevation

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-70
Structure Bridge Borings
Station
Offset

District
Date 3/17/2015
Grnd. Elev. 32.00 ft
GW Elev. 23.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties			Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	
26.5		10 (6) 11 (6)	CLAY, Sandy Lean Clay, Dark Brown, Medium Stiff, Wet (CL)			14.0	32	21	
21.0		8 (6) 11 (6)	CLAY, Sandy Lean Clay, Grayish Brown, Medium Stiff, Wet (CL)			22.2			-200 = 66.0%
15.0		10 (6) 12 (6)	CLAY, Fat Clay w/ Sand, Brown, w/ Reddish Brown and Gray Streaks, Medium Stiff to Very Stiff, Wet (CH)			41.2	59	42	
20.0		11 (6) 12 (6)				40.2			-200 = 82.5%
25.0		13 (6) 15 (6)				49.9	52	50	
30.0		25 (6) 25 (6)				40.3			-200 = 77.5%
35.0		21 (6) 26 (6)			35.4	52	28		
40.0		24 (6) 29 (6)	CLAY, Fat Clay, Brown, w/ Reddish Brown and Gray Streaks, Very Stiff to Hard, Wet (CH)			50.4			-200 = 93.6%
45.0		50 (4) 50 (3.25)			43.5	69	47		
50.0		50 (2) 50 (1.5)			45.0			-200 = 95.0%	
55.0		50 (2.25) 50 (2)			50.3	63	43		
60.0		50 (2) 50 (2)			44.4			-200 = 98.3%	
65.0		50 (2.25) 50 (2)			45.3	73	47		
70.0		50 (2.5) 50 (2.5)			46.2			-200 = 97.8%	
43.75		50 (2) 50 (2.5)			49.7	75	50		

PRELIMINARY

Remarks: Sulfate Tests Performed at 30 ft. Results Provided on Seperate Document. Boring Locate - N 26°31'37.50", W 97°49'47.90". Assumed Natural Ground Elevation

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-71
Structure Bridge Borings
Station
Offset

District
Date 3/17/2015
Grnd. Elev. 29.00 ft
GW Elev. 21.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		6 (6) 6 (6)	CLAY, Sandy Lean Clay, Dark Brown, Traces of Roots, Soft to Medium Stiff, Dry (CL)			16.4				-200 = 56.8%
10		7 (6) 8 (6)				16.8	46	32		
15		8 (6) 9 (6)	CLAY, Fat Clay, Brown, w/ Reddish Brown and Gray Streaks, Medium Stiff, Dry (CH)			44.5				-200 = 89.0%
20		9 (6) 9 (6)				39.3	51	33		
25		9 (6) 12 (6)			41.6					-200 = 91.2%
30		8 (6) 12 (6)			45.0	74	53			
35		10 (6) 11 (6)			51.0					-200 = 93.6%
40		9 (6) 10 (6)			48.2	50	34			
45		10 (6) 12 (6)	CLAY, Lean Clay w/ Sand, Brown, w/ Reddish Brown and Gray Streaks, Medium Stiff to Stiff, Wet (CL)			46.4				-200 = 74.6%
50		12 (6) 16 (6)				48.3	49	34		
55		17 (6) 17 (6)	CLAY, Fat Clay, Brown, w/ Reddish Brown and Gray Streaks, Stiff to Very Stiff, Wet (CH)			44.9				-200 = 85.7%
60		21 (6) 26 (6)				51.0	62	41		
65		23 (6) 26 (6)			72.2					-200 = 96.9%
70		24 (6) 27 (6)			66.1	69	47			
75		26 (6) 29 (6)			58.2					-200 = 96.2%

Remarks: Sulfate Tests Performed at 70 ft. Results Provided on Separate Document. Boring Locate - N 26°31'39.60", W 97°49'48.90". Assumed Natural Ground Elevation

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-72
Structure Bridge Borings
Station
Offset

District
Date 3/18/2015
Grnd. Elev. 32.00 ft
GW Elev. 14.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
26.5		5 (6) 6 (6)	CLAY, Sandy Lean Clay, Dark Brown, Soft, Moist (CL)			20.3				-200 = 61.3%
10		18 (6) 19 (6)	CLAY, Lean Clay, Light Olive Brown to Brown, Stiff, Moist (CL)			15.2	44	29		
15		17 (6) 22 (6)				15.6				-200 = 85.1%
20		17 (6) 16 (6)				15.0	43	27		
25		16 (6) 18 (6)				51.4				-200 = 91.7%
30		15 (6) 16 (6)	CLAY, Fat Clay w/ Sand, Brown, Stiff, Wet (CH)			3.4	57	40		
35		13 (6) 14 (6)				55.0				-200 = 80.7%
40		17 (6) 16 (6)				49.7	65	45		
45		19 (6) 21 (6)	CLAY, Fat Clay, Tannish Brown, Stiff, Wet (CH)			58.3				-200 = 93.4%
50		18 (6) 19 (6)				61.9	80	55		
55		16 (6) 16 (6)				62.1				-200 = 95.7%
60		18 (6) 20 (6)				68.9	95	70		
-29.65		17 (6) 18 (6)	CLAY, Sandy Fat Clay, Tannish Brown, Stiff, Wet (CH)			56.2				-200 = 59.9%
-34.70		17 (6) 20 (6)	CLAY, Fat Clay Tannish Brown, Stiff, Wet (CH)			56.5	66	47		
-43.75		18 (6) 22 (6)								-200 = 90.6%

PRELIMINARY

Remarks: Sulfate Tests Performed at 15 ft. Results Provided on Seperate Document. Boring Locate - N 26°31'37.70", W 97°48'52.00". Assumed Natural Ground Elevation

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-73
Structure Bridge Borings
Station
Offset

District
Date 3/18/2015
Grnd. Elev. 30.00 ft
GW Elev. 12.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Deviator Press. (psi)	Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
24.5		5 (6) 7 (6)	CLAY, Sandy Lean Clay, Dark Brown, w/ Calcareous Nodules, Soft, Moist (CL)			23.3	40	25		
19.5		14 (6) 14 (6)	CLAY, Sandy Lean Clay, Grayish Brown, Stiff, Moist (CL)			16.8				-200 = 69.2%
15.5		16 (6) 16 (6)	CLAY, Fat Clay, Brown, Stiff, Wet (CH)			14.2	53	37		
20.5		21 (6) 19 (6)				15.9				-200 = 88.1%
25.5		20 (6) 22 (6)				57.3	60	42		
30.5		19 (6) 21 (6)				2.1				-200 = 94.6%
35.5		16 (6) 18 (6)				46.2	50	32		
40.5		19 (6) 18 (6)	CLAY, Fat Clay w/ Sand, Light Brown, Stiff to Very Stiff, Wet (CH)			45.3				-200 = 77.3%
45.5		23 (6) 25 (6)				50.8	55	35		
50.5		20 (6) 21 (6)	CLAY, Fat Clay, Brown, Stiff, Wet (CH)			53.7				-200 = 88.8%
55.5		16 (6) 18 (6)				59.4	69	45		
60.5		14 (6) 14 (6)				62.7				-200 = 96.4%
65.5		16 (6) 18 (6)				73.5	76	67		
70.5		17 (6) 19 (6)				79.8				-200 = 92.9%
75.5		16 (6) 18 (6)				61.5	71	48		

Remarks: Sulfate Tests Performed at 40 ft. Results Provided on Separate Document. Boring Locate - N 26°31'39.40", W 97°48'52.10". Assumed Natural Ground Elevation

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory



DRILLING LOG

WinCore
Version 3.1

County Willacy
Highway
CSJ

Hole B-BRG-78
Structure Bridge Borings
Station
Offset

District
Date 3/19/2015
Grnd. Elev. 34.00 ft
GW Elev. 16.00 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test		Properties				Additional Remarks
				Lateral Press. (psi)	Deviator Stress (psi)	MC	LL	PI	Wet Den. (pcf)	
5		10 (6) 10 (6)	CLAY, Sandy Fat Clay, Dark Brown, Medium Stiff, Dry (CH)			17.3				-200 = 55.5%
10		8 (6) 6 (6)				16.6	52	36		
15		12 (6) 10 (6)	CLAY, Sandy Fat Clay, Brown, Soft to Medium Stiff, Moist (CH)			15.2				-200 = 61.9%
20		5 (6) 5 (6)				16.7	64	38		
25		8 (6) 10 (6)	SAND, Silty Sand, Brown, Loose to Medium Dense, Wet (SM)			29.0				-200 = 19.1%
30		11 (6) 10 (6)				23.3	0	0		
35		12 (6) 13 (6)	SAND, Poorly Graded Sand w/ Silt, Brown, Medium Dense, Wet (SP-SM)			21.3				-200 = 7.7%
40		14 (6) 16 (6)				20.9				
45		13 (6) 16 (6)	SAND, Poorly Graded Sand, Brown, Medium Dense, Wet (SP)			21.9				-200 = 4.7%
50		13 (6) 16 (6)				23.3	0	0		
55		26 (6) 31 (6)	SAND, Silty Sand, Brown, Very Dense, Wet (SM)			22.8				-200 = 4.6%
60		27 (6) 30 (6)				24.2				
65		50 (4.5) 50 (5)	SAND, Silty Sand, Brown, Very Dense, Wet (SM)			22.6				-200 = 16.1%
70		50 (3) 50 (3.25)				23.1	0	0		
75		50 (3.25) 50 (2.5)	SAND, Poorly Graded Sand w/ Silt, Brown, Very Dense, Wet (SP-SM)			25.3				-200 = 9.0%

PRELIMINARY

Remarks: Sulfate Tests Performed at 20 ft. Results Provided on Seperate Document. Boring Locate - N 26°31'8.30", W 97°47'13.60". Assumed Natural Ground Elevation

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: Oscar Garcia

Logger: Benito Gutierrez

Organization: L&G Engineering Laboratory