24-08-C - Corporate Drive Segments 2 & 3

Project Overview

Project Details	
Reference ID	24-08-C
Project Name	Corporate Drive Segments 2 & 3
Project Owner	Earl Whitaker
Project Type	CSP
Department	Engineering
Budget	$0.00 - $0.00
Project Description	The City of Lewisville is accepting competitive sealed proposals from qualified vendors for the Corporate Drive Segments 2 & 3 Construction Project. This competitive sealed proposal is issued in accordance with Texas Government Code, Chapter 2269, Subchapter D. Award will be on the basis of highest evaluation score. Proposers are required to submit a Bid Bond (with proper Power of Attorney) from a surety licensed to do business in the State of Texas, payable without recourse to the City of Lewisville, in an amount not less than five (5%) percent of the total amount of the base bid submitted to insure that the successful bidder will enter into a contract and execute all necessary bonds within fifteen (15) days after notice of award of the contract to them. The bid security and Proposal form MUST be uploaded with bid documents to Bonfire or included within the proposal envelope along with the proposal sheet for the proposer to be considered responsive. The successful proposer will be required to furnish performance, payment, and maintenance bonds as described in the specifications. The successful proposer shall begin work under this contract on or before the date specified in the Notice to Proceed. All insurance certificates and bonds are to be provided and approved by the City prior to commencement of any work. All documents that require a signature are to be signed and uploaded to Bonfire, or provided within vendor's proposal if delivered to the City of Lewisville. All goods and services

	provided to the City must be compliant with the Americans with Disabilities Act ("ADA").
Open Date	Oct 21, 2023 8:00 AM CDT
Intent to Bid Due	Nov 15, 2023 2:00 PM CST
Close Date	Nov 15, 2023 2:00 PM CST

Responses

Error: Check cell(s) B8

Corporate Drive Segments @ & 3

Status	#	Item	Item Description	Quantity Required	Unit of Measure	Unit Price (Numeric)	Total Cost
Error: Missing value for 'Unit Price' in cell I8	#1-1	**Mobilization**	Start-up (Bonds, Insurance, Move-In, Sanitary Facilities) not to exceed 5%	1	Lump Sum		-
Error: Missing value for 'Unit Price' in cell I9	#1-2	**Temporary Traffic Control**	Includes Barriers, Barricades, and Detour Signs	1	Lump Sum		-
Error: Missing value for 'Unit Price' in cell I10	#1-3	**Prepare Right of Way**	.	84	Stations		-
Error: Missing value for 'Unit Price' in cell I11	#1-4	**Sawcut and Remove Concrete Flatwork**	Includes sawcutting, removal and disposal	4035	Square Feet		-
Error: Missing value for 'Unit Price' in cell I12	#1-5	**Sawcut and Remove Curb and Gutter**	Includes sawcutting, removal and disposal	529	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I13	#1-6	**Remove Gravel Pavement**	.	3494	Square Feet		-
Error: Missing value for 'Unit Price' in cell I14	#1-7	**Remove Fences (All Types)**	.	325	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I15	#1-8	**Remove Headwall (for 4 feet by 3 feet Box Culvert)**	.	2	Each		-
Error: Missing value for 'Unit Price' in cell I16	#1-9	**Unclassified Excavation**	.	22973	Cubic Yard		-
Error: Missing value for 'Unit Price' in cell I17	#1-10	**Borrow from Mitigation Site**	.	68556	Cubic Yard		-
Error: Missing value for 'Unit Price' in cell I18	#1-11	**Install Barbed Wire Fence**	.	59	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I19	#1-12	**Clearing and Grubbing**	.	30	Acres		-
Error: Missing value for 'Unit Price' in cell I20	#1-13	**Heavy Tree Clearing and Grubbing**	.	11.51	Acres		-
Error: Missing value for 'Unit Price' in cell I21	#1-14	**Erosion Control (SWPPP) and Removal**	.	1	Lump Sum		-
Error: Missing value for 'Unit Price' in cell I22	#1-15	**4-Inch Topsoil and Hydromulch Seeding**	.	54300	Square Yard		-
Error: Missing value for 'Unit Price' in cell I23	#1-16	**4-Inch Topsoil and Seeding with Soil Retention Blanket**	.	59613	Square Yard		-
Error: Missing value for 'Unit Price' in cell I24	#1-17	**Concrete Riprap Type RR8**	.	1581	Square Yard		-
Error: Missing value for 'Unit Price' in cell I25	#1-18	**6-Inch Lime Stabilized Subgrade**	.	38284	Square Yard		-
Error: Missing value for 'Unit Price' in cell I26	#1-19	**Furnish Lime (36 pounds per square yard)**	.	688	Ton		-
Error: Missing value for 'Unit Price' in cell I27	#1-20	**8-Inch Flex Base**	.	3807	Square Yard		-
Error: Missing value for 'Unit Price' in cell I28	#1-21	**10-Inch Reinforced Concrete Pavement Inclucing 6-Inch Curb**	.	35753	Square Yard		-
Error: Missing value for 'Unit Price' in cell I29	#1-22	**Concrete Header**	.	100	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I30	#1-23	**Anchorage Joint**	.	968	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I31	#1-24	**Sawtooth Curb and Gutter**	.	90	Linear Feet		-

Error: Missing value for 'Unit Price' in cell I32	#1-25	**Concrete Curb and Gutter**	.	133	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I33	#1-26	**5-Inch Thick Concrete Sidewalk**	.	102255	Square Feet		-
Error: Missing value for 'Unit Price' in cell I34	#1-27	**Stamped Concrete Median Pavement**	.	1519	Square Feet		-
Error: Missing value for 'Unit Price' in cell I35	#1-28	**6-Inch Gravel Driveway**	.	307	Square Yard		-
Error: Missing value for 'Unit Price' in cell I36	#1-29	**Barrier-Free Sidewalk Ramp -12-Feet Modified Type 3 (5-Inch Thick Concrete ADA Ramp)**	.	3	Each		-
Error: Missing value for 'Unit Price' in cell I37	#1-30	**Barrier-Free Sidewalk Ramp -5-Feet Modified Type 7 (5-Inch Thick Concrete ADA Ramp)**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I38	#1-31	**Barrier-Free Sidewalk Ramp -6-Feet Modified Type 7 (5-Inch Thick Concrete ADA Ramp)**	.	2	Each		-
Error: Missing value for 'Unit Price' in cell I39	#1-32	**Barrier-Free Sidewalk Ramp -12-Feet Modified Type 7 (5-Inch Thick Concrete ADA Ramp)**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I40	#1-33	**Barrier-Free Sidewalk Ramp -12-Feet Modified Type 21 (5-Inch Thick Concrete ADA Ramp)**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I41	#1-34	**Barrier-Free Sidewalk Ramp -5-Feet Modified Type 21 (5-Inch Thick Concrete ADA Ramp)**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I42	#1-35	**MSE Retaining Wall**	.	4004	Square Feet		-
Error: Missing value for 'Unit Price' in cell I43	#1-36	**Anti-Graffiti Xoating (Permanent-TY III)**	.	4004	Square Feet		-
Error: Missing value for 'Unit Price' in cell I44	#1-37	**Type C402 (HPC) Traffic Rail**	.	628	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I45	#1-38	**Traffic Rail Transition**	.	160	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I46	#1-39	**Pedestrian Rail with Coping**	.	20	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I47	#1-40	**Pedestrian Rail with Coping Transition**	.	10	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I48	#1-41	**Drill Shaft (24-Inch)**	.	657	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I49	#1-42	**Drill Shaft (36-Inch)**	.	13526	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I50	#1-43	**Drill Shaft (42-Inch)**	.	1088	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I51	#1-44	**Class C Concrete (ABUT) (HPC)**	.	211	Cubic Yard		-
Error: Missing value for 'Unit Price' in cell I52	#1-45	**Class C Concrete (CAP) (HPC)**	.	654.4	Cubic Yard		-
Error: Missing value for 'Unit Price' in cell I53	#1-46	**Class C Concrete (COL) (HPC)**	.	381.5	Cubic Yard		-
Error: Missing value for 'Unit Price' in cell I54	#1-47	**Class S Concrete (BAS) (HPC)**	.	354.2	Cubic Yard		-
Error: Missing value for 'Unit Price' in cell I55	#1-48	**Class S Concrete (Median) (HPC)**	.	324.3	Cubic Yard		-
Error: Missing value for 'Unit Price' in cell I56	#1-49	**Reinforced Concrete Slab Class S (HPC)**	.	174153	Square Feet		-
Error: Missing value for 'Unit Price' in cell I57	#1-50	**Prestress Concrete Girder (Tx46)**	.	19620.28	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I58	#1-51	**Prestress Concrete Girder (Tx54)**	.	1894.34	Linear Feet		-

Error: Missing value for 'Unit Price' in cell I59	#1-52	**Structural Steel (Misc. Non-Bridge) (BS-EJCP) (TXDOT Item 442)**	.	3040	Pounds		-
Error: Missing value for 'Unit Price' in cell I60	#1-53	**C402 Rail (HPC) (Bridge)**	.	4378	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I61	#1-54	**Rail (Custom Pedestrian Rail)**	.	4380	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I62	#1-55	**Sealed Exp JT (4-inch) (SEJ-M)**	.	1081	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I63	#1-56	**Pavement Markings and Signage**	.	1	Lump Sum		-
Error: Missing value for 'Unit Price' in cell I64	#1-57	**Trench Safety for Storm Drain Lines**	.	4763	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I65	#1-58	**18-Inch Class III Reinforced Concrete Pipe**	.	921	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I66	#1-59	**24-Inch Class III Reinforced Concrete Pipe**	.	1766	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I67	#1-60	**30-Inch Class III Reinforced Concrete Pipe**	.	1695	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I68	#1-61	**36-Inch Class III Reinforced Concrete Pipe**	.	341	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I69	#1-62	**4 feet by 3 feet Class III Reinforced Concrete Box Extension**	.	40	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I70	#1-63	**24-Inxh CMP Temporary Culverts**	.	160	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I71	#1-64	**Replace 10-foot Inlet Top**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I72	#1-65	**10-foot Recessed Curb Inlet**	.	22	Each		-
Error: Missing value for 'Unit Price' in cell I73	#1-66	**4-feet Square Storm Drain Manhole**	.	8	Each		-
Error: Missing value for 'Unit Price' in cell I74	#1-67	**Sloped Headwall for 30-Inch RCP**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I75	#1-68	**Sloped Headwall for 36-Inch RCP**	.	2	Each		-
Error: Missing value for 'Unit Price' in cell I76	#1-69	**Wingwall for 4 feet by 3 feet RCB (SET - Type 1)**	.	2	Each		-
Error: Missing value for 'Unit Price' in cell I77	#1-70	**18-Inch Grouted Rock Riprap**	.	79	Cubic Yard		-
Error: Missing value for 'Unit Price' in cell I78	#1-71	**2-Inch RM Conduit on Bridge**	.	4461	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I79	#1-72	**2-Inch Conduit for Street Lights**	.	6082	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I80	#1-73	**2-Inch Conduit for Irrigation**	.	2184	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I81	#1-74	**Street Light Mount on Bridge**	.	8	Each		-
Error: Missing value for 'Unit Price' in cell I82	#1-75	**Street Light Foundation**	.	12	Each		-
Error: Missing value for 'Unit Price' in cell I83	#1-76	**Street Light Pole and Luminare**	.	12	Each		-
Error: Missing value for 'Unit Price' in cell I84	#1-77	**Street Light Pole and Luminare on Bridge**	.	8	Each		-
Error: Missing value for 'Unit Price' in cell I85	#1-78	**Street Light Ground Box**	.	15	Each		-
Error: Missing value for 'Unit Price' in cell I86	#1-79	**Irrigation Ground Box**	.	4	Each		-

Error: Missing value for 'Unit Price' in cell I87	#1-80	**No 8 AWG Insulated Stranded Copper Conductor**	.	21086	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I88	#1-81	**No 8 AWG Bare Solid Copper Conductor**	.	10543	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I89	#1-82	**No 12 AWG Insulated Stranded Copper Conductor**	.	4368	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I90	#1-83	**No 12 AWG Bare Solid Copper Conductor**	.	2184	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I91	#1-84	**Electrical Service for Lighting**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I92	#1-85	**Electrical Service for Irrigation**	.	2	Each		-
Error: Missing value for 'Unit Price' in cell I93	#1-86	**4-Inch SCH 40 PVC Irrigation Sleeve**	.	87	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I94	#1-87	**6-Inch SCH 40 PVC Irrigation Sleeve**	.	87	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I95	#1-88	**Ground Box TY D W/Apron**	.	8	Each		-
Error: Missing value for 'Unit Price' in cell I96	#1-89	**Conduit (PVC) (SCH 80) (4-Inch)**	.	530	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I97	#1-90	**Conduit (PVC) (SCH 80) (4-Inch) (Bore)**	.	315	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I98	#1-91	**Abandon Existing Water Line and Fill with Grout**	.	434	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I99	#1-92	**Trench Safety for Water Lines and Sanitary Sewer Lines**	.	11026	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I100	#1-93	**6-Inch PVC Water Line (Open Cut)**	.	518	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I101	#1-94	**8-Inch PVC Water Line (Open Cut)**	.	10	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I102	#1-95	**10-Inch PVC Water Line (Open Cut)**	.	370	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I103	#1-96	**12-Inch PVC Water Line (Open Cut)**	.	9415	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I104	#1-97	**12-Inch PVC Water Line (Open Cut) (Restrained Joints)**	.	160	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I105	#1-98	**12-Inch PVC Water Line (In Casing)**	.	221	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I106	#1-99	**20-Inch OD x 3/8-inch Thick Steel Casing (By Other Than Open Cut)**	.	221	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I107	#1-100	**6-Inch Gate Valve**	.	19	Each		-
Error: Missing value for 'Unit Price' in cell I108	#1-101	**8-Inch Gate Valve**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I109	#1-102	**12-Inch Gate Valve**	.	24	Each		-
Error: Missing value for 'Unit Price' in cell I110	#1-103	**8-Inch Cut-In Tee and Gate Valve**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I111	#1-104	**Fire Hydrant Assembly**	.	17	Each		-
Error: Missing value for 'Unit Price' in cell I112	#1-105	**Connect to Existing Water Line**	.	3	Each		-
Error: Missing value for 'Unit Price' in cell I113	#1-106	**Blow-Off Valve**	.	1	Each		-

Error: Missing value for 'Unit Price' in cell I114	#1-107	**2-Inch Combination Air Valve Assembly**	.	2	Each		-
Error: Missing value for 'Unit Price' in cell I115	#1-108	**12-Inch by 12-Inch Tapping Sleeve and Gate Valve**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I116	#1-109	**12-Inch SCH 40 Welded Steel Water Pipe with Epoxy Lining/Coating**	.	2073	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I117	#1-110	**Water Pipe Support and Hanger Single Roller**	.	164	Each		-
Error: Missing value for 'Unit Price' in cell I118	#1-111	**Water Pipe Support and Hanger Double Roller**	.	41	Each		-
Error: Missing value for 'Unit Price' in cell I119	#1-112	**Water Line Mechanical Expansion Joint for Straith Sections**	.	3	Each		-
Error: Missing value for 'Unit Price' in cell I120	#1-113	**Water Line Flexible Mechanical Joint for Curve Sections**	.	3	Each		-
Error: Missing value for 'Unit Price' in cell I121	#1-114	**Abandon Sanitary Sewer Line and Fill with Grout**	.	569	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I122	#1-115	**Remove Existing Sanitary Sewer Manhole**	.	1	Each		-
Error: Missing value for 'Unit Price' in cell I123	#1-116	**24-Inch PS 115 PVC Sanitary Sewer**	.	553	Linear Feet		-
Error: Missing value for 'Unit Price' in cell I124	#1-117	**6-Foot Sanitary Sewer Manhole**	.	3	Each		-
Error: Missing value for 'Unit Price' in cell I125	#1-118	**6-Foot Sanitary Sewer Manhole Extra Depth**	.	19	Vertical Feet		-

Alternate #1

Error: Missing value for 'Unit Price' in cell I128	#2-1	**ADDED COST FOR DELAYED START by CITY**	.	3	Months		-

SPECIFICATIONS AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

CORPORATE DRIVE
SEGMENTS 2 & 3
PROJECT NO. G1122 & G1123

DEPARTMENT OF ENGINEERING

OCTOBER 2023

LEWISVILLE

Deep Roots. Broad Wings. Bright Future.

LEWISVILLE

Deep Roots. Broad Wings. Bright Future.

CITY OF LEWISVILLE
COMPETITIVE SEALED PROPOSAL
#24-08-C
CORPORATE DRIVE SEGMENT 2 & 3
PROJECT NO. G1122 & G1123

1. INTRODUCTION

1.1 Competitive Sealed Proposals

The City of Lewisville shall use the procedures as authorized in Texas Government Code Chapter 2269 as described below to evaluate Competitive Sealed Proposals (CSPs). The City views the CSP as the framework to be used by the Proposer in preparing and submitting the proposal, and as an integral part of the final contractual agreement to be negotiated with the Proposer. It is important for the Proposer to become familiar with the requirements contained in the Instructions to Proposers as they will prevail in the event of any discrepancies or differences between project-related or contractual documents.

The contents of the successful Proposal acceptable to the City will become a part of the subsequent contractual documents. Failure of the Proposer to accept this obligation may result in the cancellation of any award. Any damages occurring to the City because of the Proposer's failure to adhere to the contract may be recovered from the Proposer.

1.2 Definition of Terms

- "CSP" shall refer to this Request for Competitive Sealed Proposals.
- "Proposal" or "CSP" shall mean a written offer to provide the equipment and services in accordance with requirements specified herein.
- "Proposer" shall mean a person, firm or corporation who submits a Proposal to provide equipment, material, and/or services necessary in the performance of the requirements specified herein.
- "Lewisville", "City", "Purchaser", or "Owner" shall refer to the City of Lewisville, Texas.
- "Furnish", "provide", "propose", or "offer" shall mean to supply, equip, and deliver the specified equipment, material and/or services to the Owner.
- "Must", "shall", "will", "is required", and "are required" are terms that identify a mandatory

item or factor. Failure to comply with a mandatory item or factor may result in the elimination of the Proposer's Proposal from future consideration.

- "Agreement" or "Contract" shall refer to the contract that will be negotiated with the selected Proposer and agreed to by the Owner and Proposer for award.
- "Bid Proposal Form" shall refer to the cost table and may be referred to in other areas of the contract as contract bid schedule, proposal pricing, bid form, or bid proposal.

1.3 CSP Schedule

A. CSP project dates are available on Bonfire. It is the Contractor's responsibility to review the project dates and all public notices for changes to the CSP schedule.

1.4 Obligations of Proposers

Proposers are required to submit their Proposals upon the following express conditions:

A. Proposers shall thoroughly examine all drawings, specifications, plans, instructions, and all other contract documents pertaining to this CSP.

B. Proposers shall make all investigations necessary to thoroughly inform themselves regarding project site and facilities for delivery of materials or equipment and the performance of services as required by the CSP conditions.

C. No plea of ignorance by the Proposer of conditions that exist or that may hereafter exist because of failure or omission on the part of the Proposer to make the necessary examinations and investigations will be accepted as a basis for varying the requirements of the City.

D. Proposal must comply with all Federal, state, county and local laws concerning these types of services.

1.5 Pre-Proposal Conference

The City will conduct a Pre-Proposal Conference for all interested parties. Attending the Pre-Proposal Conference is not mandatory but is **strongly recommended** for their own benefit. Proposers should submit pertinent questions to the City via *https://cityoflewisville.bonfirehub.com/portal* a minimum of **two business days prior** to the Pre-proposal conference to allow the City adequate time to prepare the responses.

1.6 Submittal of Proposal

A. Proposals maybe submitted through Bonfire at *https://cityoflewisville.bonfirehub.com/portal* OR

B. One (1) hard copy and one (1) digital copy of the proposal shall be submitted to the Purchasing Manager no later than the date and time prescribed and at the place indicated in the advertisement or Notice to Proposers.

C. Hard Copy proposals shall be submitted in two (2) opaque sealed envelopes plainly marked on the outside with the Project Title, CSP Number, acknowledgement of any addenda, and the name and address of the Proposer.

1. The first envelope shall be labeled "Proposal Pricing" and include:

i. The completed Bid Proposal Form described in Section 2.1A.
ii. A Bid Bond as described in Section 3.1.
iii. The completed Proposal Form, acknowledging all addenda.

2. The second envelope shall include the following items:

i. All other required forms listed in Section 2.1.B, and not included in the first envelope.
ii. Complete Proposal Evaluation Criteria as described in Sections 2.1.C through 2.1.F.
iii. Owner-Contractor Agreement review comments (if any), as described in Section 2.1.G. If none, please provide one page stating the Agreement is acceptable as is.

D. Incomplete proposals will not be evaluated and will not be eligible for contract award.

E. Regardless of the chosen delivery method, it is the sole responsibility of the contractor to ensure their complete submittal is inside the Finance Administration Department – Purchasing Division before the required time. The City will not be responsible for, without limitation, any delays occasioned by third parties. Late or emailed submittals shall not be accepted, without exception. All packages to be marked with the firm's name and CSP # 24-08-C.

2. PROPOSAL EVALUATION AND SELECTION CRITERIA

2.1 The Owner will initially review and evaluate each Proposal received to determine the Proposer's ability to meet the requirements of the City, which does not include cost. The Evaluation Committee will determine the Proposer's best suited to meet the needs of the city based on the scoring of the evaluation criteria. These Proposers will form the Proposer shortlist. Cost points will be applied at the timing in the evaluation process determined by the Evaluation Team. The City reserves the right to review cost proposals at any stage in the process, following initial review of the written proposals, to ensure pricing is within internal budget planning ranges. Cost points may be refined or replaced in the event of a subsequent Request for Best and Final Offer (BAFO). The Proposals will be evaluated using the following criteria and weighting factors.

Rating Category	Description	Maximum Points Available
A	Cost Proposal Form	37
B	Qualifications, Financial Soundness & Relevant Project Experience of Proposer	23
C	Qualifications & Experience of the Proposed Project Personnel	20
D	Project Schedule and Construction Sequence	10

E	Safety Practices and Record for Last 5 Years & Required Purchasing Documents	10
	Total	100

A. Cost Proposal Form: Submit the completed Cost Proposal form using the following steps:

The City may request candidate(s) to provide more detailed information from candidate(s) at the interviews, as it deems necessary to better understand the Contractor's Proposal cost submitted by any candidate.

The City will not accept responsibility for any errors of any kind submitted by any respondent. All information provided will be assumed to be a true accurate representation of cost for each line item.

The amounts in the Contractor's Bid Proposal form may be changed during negotiations between the Proposer and Owner. Negotiations, if any, will be conducted in accordance with Texas Government Code Section 2269.155.

B. Proposer's Other Required Forms

a. A completed Proposal Form
b. A completed Additional Terms Form
c. A completed Proposer Evaluation Acceptance Form

C. Qualifications and Relevant Project Experience of Proposer:

1. Provide general information about the Proposer's business organization. General information includes corporate name and address, form of business (corporation, partnership, joint venture, etc.), historical information of the business including previous names and organization of predecessor business ventures that have evolved into the present organization, names and titles of key executives operating the business, list of branch offices, if any, number of employees and estimated annual revenues, etc.

2. The Proposer must furnish details of the company demonstrating qualifications to complete the work. **Provide a list of at least three (3) and no more than five (5) public sector roadway and bridge projects** of similar scope and size to this project, completed within the past eight (8) years. For each project include the following information:

    a. Name & Description of the Project outlining work done on roadway pavement construction, bridge construction, water line construction, sanitary sewer construction, drainage facility construction, and MSE retaining wall construction.
    b. Names of supervisors and types of major equipment used to perform the work.
    c. Original & Final Contract Amount
    d. Start Date, Completion Date, Contract Duration (original and final).

e. Owner's Contact Information (Provide the contact person most familiar with your firm's work)
f. Proof that Contractor has constructed a roadway and bridge construction project of similar scope and size successfully within the DFW area.

3. **Financial Management**: Proposer shall provide financial statements to determine the eligibility to receive a contract. Financial statements shall be composed of a balance sheet, income statement, and appropriate supporting schedules, such as note disclosures or cash flows, as of the end of the company's most recent fiscal year. Financial statements are to be audited, reviewed, or compiled by an independent Certified Public Accountant. Pro-forma financial statements will not be accepted by the City. Financial statements are considered confidential information, are reviewed by a member of the City of Lewisville Finance Department and will be returned to the proposer upon request.

D. Experience & Qualifications of Proposed Project Personnel

1. **Organizational Chart for this project**: Provide an organizational chart showing your firm's proposed project team; roles and responsibilities; and relationships to the City, Engineer, and subcontractors.

2. **Resumes of Key personnel assigned to this project**: Provide resumes with the details of education, experience, and qualifications of the management team and key personnel proposed for this Project. Key personnel typically include the Project Manager, Project Superintendent, Safety Manager including experience with traffic control plans, and Quality Control Manager. If one or more key roles are to be filled by one individual, this information is to be provided with the list of proposed individuals. Qualifications and certifications of these individuals and their experience on similar types of projects will be considered in evaluating the Proposer.

E. Project Schedule and Sequence:

1. **Project Schedule**: Submit a detailed project delivery and implementation schedule which defines the specific order and duration of project tasks referenced to contract award date. Identify the critical path for completion, and any materials or work items with durations not under the control of the Proposer that can impact project completion date on the schedule. Proposer is to enter in the number of calendar days proposed to complete the Work required for final payment. No work will be allowed during City holidays which should be reflected in the proposed schedule. This schedule should include one activity just before Substantial Completion showing the amount of normal (i.e., NOAA 10 year average) weather days assumed for the project.

F. Safety Practices and Record for Last 5 Years: Please submit a summary of your firm's safety practices and any unique strategies for this project. Provide your firm's Experience Modification Rate (EMR) for each of the last five (5) years, and the five (5) year average EMR, including the name of insurance company/companies providing those rates.

G. Owner-Contractor Agreement

1. The proposed City-Contractor Agreement will be provided in this package.
2. Candidates are advised to contact their attorney, insurance provider, home office contract reviewing staff (if any), and any other contract approval stakeholders in their organization for a thorough, timely review of this Agreement. Each candidate's response to this RFP will be assumed to be their last, best and final opportunity to provide comments to the City's proposed Agreement.
3. The documents will be provided in PDF, but the text will be accessible (i.e., it will not be "flattened"). In the event a candidate would like to propose edit(s) to any Section(s), please transfer the text under consideration to a separate MS Word document and follow the instructions directly below.
4. Candidates shall provide suggested edits to this Agreement provided electronically in MS Word with "Track Changes" left on to show all changes "in line" with strikeout and underlining (i.e., not as "balloons" in the margin). In addition, these same comments should be provided in hard copy in the appendix to each candidate's submittal, printed in color to show all revisions more clearly

3.0 ADDITIONAL INFORMATION FOR PROPOSERS

3.1 Bonds/Warranty

All work performed under this contract for the City of Lewisville shall be warranted for a period of two (2) years. If within two years after acceptance of work, any of the work is found to be defective or not in accordance with the contract documents, the contractor shall correct it promptly after receipt of notice from the City.

A performance, payment and two (2) year maintenance bond shall be required with this contract. It shall be made out for the total amount of the contract, and enforceable for two (2) years from final acceptance of the project.

A bid bond equal to five percent (5%) of the project amount is to be included within the sealed proposal. If you are providing documents via Bonfire, you must submit a copy of bid bond with your proposal documents online. The hard copy of the bid bond maybe requested after proposal opening.

3.2 Insurance

Insurance shall be supplied by the awarded contractor within ten (10) days of notification of award, as detailed in Exhibit D of this bid. Insurance must be approved by the City prior to the commencement of work and shall remain in effect throughout the entire duration of this project. Please note Explosion, Collapse, and Underground (XCU) coverage will be required for this contract.

3.3 Procedural and Content Questions

Any Proposer requiring further clarification of the CSP procedures, or the project requirements should submit specific questions in writing via Bonfire at:

https://cityoflewisville.bonfirehub.com/portal for consideration. Only written responses from the City will be binding regarding inquiries requesting clarification or additional information. These City responses to any inquiry will be distributed simultaneously to all CSP document holders of record with the City, also via Bonfire. During the review of the CSP requirements and preparation of the Proposal, certain errors, omissions or ambiguities may be discovered. Any explanation, clarification, or interpretation desired by a Proposer regarding any part of this CSP or the procedures should be requested in writing via Bonfire. Oral explanations or instructions given before the award of the Contract are not binding.

3.4 Exceptions to CSP Specifications and Addenda

During the proposal process changes or corrections to the CSP requirements may be identified. Any interpretations, corrections, exceptions, or changes to the CSP requirements will be made by written addendum issued by the City. Addenda will be provided to all Proposers who are known to have received this CSP from the City via Bonfire. Only information supplied in writing by the City should be used in the preparation of proposals.

3.5 Disclosure of Proposal Contents

A. Proposals will be opened in a manner that avoids disclosure of the contents to competing Proposers and keeps the proposals secret during negotiations. Proposals will be afforded security sufficient to preclude disclosure of the contents prior to award or rejection action. All proposals are open for public inspection after the contract award, but trade secrets and confidential information in the proposals are not open for public inspection if such data is clearly identified as such. This identification will be done by individually marking each page with the words "Proprietary Information" on which such proprietary information is found. If the Proposer fails to identify proprietary information, they agree that by submission of their proposal that those sections shall be deemed non-proprietary and made available upon public request.

B. Proposers are advised that the confidentiality of the proposals will be protected by the City to the extent permitted by law. Proposers should consider the implications of the Texas Open Records Act, particularly after the Proposal process has ceased and the contract has been awarded. While there is provision in the Texas Open Records Act to protect proprietary information, particularly under Section 3(9) and Section 3(10) of this act where the Proposer can meet certain evidentiary standards, Proposers are advised that a determination on whether those standards have been met will not be decided by the Purchasing Department of the City of Lewisville, but by the Office of the Attorney General of the State of Texas.

3.6 Cost of Proposal

A. This CSP does not commit the City to pay any costs incurred by any Proposer in preparation and/or submission of a proposal, or for procuring or contracting for the items to be furnished under the Proposal. All costs directly or indirectly related to responding to this CSP, including all costs incurred in providing supplementary documentation or presentation which may be required by the City, will be borne by the Proposer.

B. Each Proposer will be responsible for all costs incurred in preparing or responding to this CSP. The Proposer agrees to bear all risks for loss, injury, or destruction of hardware,

software or goods and materials (ordered or supplied as the result of the eventual contract) which might occur prior to delivery to the City, and such loss, injury, or destruction shall not release the Proposer from any obligations under the Proposal or any resulting contract.

3.7 Risk of Loss

The Proposer agrees to bear all risks of loss, injury, or destruction of hardware, software or goods and materials (ordered or supplied as the result of the eventual contract) which might occur prior to delivery to the City, and such loss, injury, or destruction will not release the Proposer from any obligations under the Proposal or any resulting contract.

3.8 No Obligation

This procurement in no manner obligates the City or any of its agencies to the eventual purchase, rental, or lease of any software, hardware or services offered until authorized by the City Council and confirmed by a written contract signed by an authorized representative of the City.

3.9 Rights to Proposal and Contractual Material

All reports, charts, schedules, or other appended documentation to any proposal, content of basic proposal, or contracts and any responses, inquiries, correspondence, and related material submitted by the Proposer shall become property of the City upon receipt.

3.10 Use of City Logo

The City of Lewisville's Logos and Images (hereinafter "Logo") are registered trademarks with the State of Texas Secretary of State and the City of Lewisville is the owner of all rights to the Logo. Unauthorized use of the Logo is strictly prohibited.

3.11 Proposal Offer Firm

Proposals received in response to this CSP, including pricing information, will be considered firm for 90 days after Proposal opening date.

3.12 Termination

The City reserves the right, at its sole and unqualified discretion, to cancel this CSP at any time prior to award of a contract. The City makes no warranty regarding this Proposal that a contract will be awarded to any Proposer.

3.13 Proposal Format Requirements

A. Proposal pages are to be 8-1/2" x 11" size printed on one side only using a minimum font size of 10. Include 11" x 17" sheets as needed folded to the size of an 8-1/2" x 11" sheet. Provide a tab to separate materials responding to each of the Categories described in Section 2.1, for each of the contents of both envelopes.

B. Provide a digital copy of the Proposal in Portable Document Format (PDF) on a flash drive. This digital copy shall exactly match the content of the printed copy of the Proposal. When creating the digital copy:

   1. Create PDF documents from native format files.
   2. Rotate pages so that the top of the document appears at the top of the file when opened in PDF viewing software.

3. Submit PDF documents with adequate resolution to allow documents to be printed in a format equivalent to the original documents. Documents are to be scalable to allow printing on standard 8-1/2" x 11" or 11" x 17" paper.
4. Submit color PDF documents if color is used in the printed version of the documents.

3.14 Signing of Proposals

A. Proposals must show the full firm name and address of the Proposer and be manually signed. The person signing the proposal must show title or authority to bind the firm in a contract. The submission and signature of a proposal will indicate the intention of the Proposer to adhere to the provisions in this CSP.

B. Proposals which are signed for a partnership must be signed in the firm's name by at least one partner of the firm or by an attorney-in-fact. If signed by an attorney-in-fact, there should be, attached to the proposal, a Power of Attorney evidencing authority to sign proposals, dated the same date as the proposal, and executed in accordance with legal requirements of the firm.

C. Proposals which are signed for a corporation must have the correct corporate name thereon and signature of the authorized company official. The title of the office held by the person signing for the corporation must appear below the signature of the officer.

D. Proposals which are signed by an individual doing business under a firm name must be signed in the name of the individual doing business under the proper firm's name.

3.15 Withdrawal of Proposal

A Proposer's Proposal may be withdrawn by a duly authorized representative of the Proposer at any time prior to the proposal submission deadline, upon presentation of acceptable identification.

3.16 Amending of Proposals

A Proposer may submit an amended proposal before the deadline for receipt of proposals. Such amended proposals must be complete replacements of a previously submitted proposal and must be clearly identified as such in the transmittal letter. The City will not merge, collate, or assemble proposal materials.

3.17 Rejection of Proposals

Proposals tendered or delivered after the official time designated for receipt of the proposal shall not be considered and will be returned unopened.

4.0 PROPOSAL EVALUATION PROCESS:

4.1 Pre-Qualification of Proposers is not required to submit a Proposal.

4.2 Proposals will be opened publicly to identify the names of the Proposers and their respective proposed contract amounts.

4.3 The Purchasing Manager shall convene a Proposal Evaluation Committee (the Committee) for this project utilizing the Competitive Sealed Proposal method of procurement. Within forty-five (45) calendar days after opening the Proposals, the Committee shall evaluate all submitted proposals and rank order the responsive Proposals from highest to lowest score.

4.4 Following the opening of Proposals, the Committee shall meet to conduct a preliminary examination of each Proposal for compliance with the Evaluation Criteria provided herein. All Proposals will be reviewed for completeness and those found to be either incomplete or non-responsive will be rejected from further consideration. The Committee decision will be final. The Committee will evaluate only responsive and complete proposals.

4.5 After preliminary examination and ranking, an award may be made to the Proposer offering the best value, without discussion, clarification or modification, or the Committee may decide to further evaluate potentially favorable Proposals.

4.6 The Committee shall conduct thorough evaluations of all responsive Proposals to rank each from best-to-least-desirable. The Committee will base its recommended ranking on the information provided in the Proposals, as well as reference checks, interviews, and/or personal knowledge, as determined by the Committee to be in the best interests of the City. The Committee may elect to conduct any of the following additional activities regarding any responsible Proposer:

i. Proposer client reference checking
ii. Proposer sub-contractor reference checking
iii. Financial and insurance verifications
iv. Proposer client site visits to inspect ongoing or completed work performed by the Proposer

4.7 The Committee may make such investigation as is deemed necessary to determine the ability of the Proposer to provide the equipment, material, and/or services as required by this CSP and to determine the adequacy of the proposed equipment, material, and/or services. The Proposer shall furnish, upon request and in a timely manner, all such data and information requested for this purpose.

4.8 Discussions may be conducted individually with Proposers who submit responsive proposals and who are determined reasonably qualified for award of a contract. Revisions and/or clarifications may be requested after proposal submission and before contract award to obtain best-and-final offers. The Committee will endeavor not to disclose any information derived from the Proposals submitted by competing firms in conducting such discussions.

4.9 Proposers may be interviewed in person by the Committee. Selected Proposers will be notified of the date, time, and location of any interviews in advance, and every effort will be made to conduct interviews in a time that is mutually beneficial to the City evaluation team and the perspective Proposers.

4.10 If the Owner determines that it is unable to reach a satisfactory agreement with the first ranked Proposer, the Owner will terminate discussions with that Proposer. The Owner will then proceed with negotiations with each successive Proposer as they appear in the order of ranking until an agreement is reached, or until the Owner has rejected all Proposals. After termination of discussions with any Proposer, Owner will not resume discussions with that Proposer.

4.11 The Owner reserves the right to accept or reject any or all alternates or to accept any combination of alternates considered advantageous to the Owner.

4.12 If a Contract is awarded, it will be awarded to the Proposer offering the best value to the Owner, based upon the published selection criteria, and upon its ranking evaluation. The Owner is not bound to accept the lowest priced Proposal if that Proposal is judged not to be the best value for the Owner, as determined by the Owner.

4.13 Disqualification of Proposals

Proposers may be disqualified for any of the following reasons:

A. The Proposer is involved in any litigation against the City.

B. The Proposer is in arrears on an existing contract or has defaulted on a previous contract with the City.

C. The Proposer lacks financial stability.

D. Proposer has failed to perform under previous or present contracts with the City.

E. The Proposer failed to adhere to one or more of the provisions established in this CSP.

F. The Proposer failed to submit its proposal in the format specified herein.

G. Any attempt by the Proposer to negotiate or give information concerning the contents of its proposal to the City or its representatives other than as officially requested by the Purchasing Manager.

H. If it is determined by the City that gratuities in the form of entertainment, gifts, or otherwise, were offered or given by the Proposer, or any agent or representative of the Proposer, to any officer or employee of the City with a view toward securing or amending, or the making of any determinations with respect to the CSP or contract.

4.14 Alteration of Proposals

Proposals may be rejected if they show any alteration of words or figures, additions not called for, conditional or uncalled-for alternate proposals, incomplete proposals, erasures, or irregularities of any kind, or contain any unbalanced values.

4.15 Right to Waive Irregularities

Proposals will be considered as being "irregular" if they show any omission, alterations of form, additions, or conditions not called for, or irregularities of any kind. The City reserves the right to waive minor irregularities in proposals. This right is at the sole discretion of the City.

4.16 Award

A. Receipt of any proposal shall under no circumstances obligate City to accept the lowest Bid Proposal.

B. The City reserves the right to reject any or all proposals submitted in response to this CSP. City reserves the right to reject any Proposal, if indication or review of any services or equipment proposed is deemed to have an unsatisfactory performance record or does not completely meet the requirements for the project.

C. Until award of a Contract is made by the City, the City may re-advertise for new

proposals, or to proceed with the work in any manner as may be considered in the best interest of the City.

D. A purchase contract will be developed and executed with the selected Proposer.

4.17 Proposer Project Manager

Upon award of contract, the Proposer shall assign a project manager who shall be the single point of contact for the Proposer and shall have the power to make decisions concerning all technical and implementation matters. Any proposal submission that lacks any of these components will not constitute a proposal, will not be evaluated, and will not be eligible for contract award.

PROPOSAL

City of Lewisville
Purchasing Office
151 West Church Street
P.O. Box 299002
Lewisville, Texas 75029-9002

CORPORATE DRIVE SEGMENTS 2 & 3
PROJECT NO. G1122 & G1123

Proposal of _____
(hereinafter called Bidder), a corporation organized and existing under the laws of the State of _____, a partnership, or an individual doing business as _____
(Strike out inapplicable terms).

To the City of Lewisville, Texas (Owner)

The undersigned Bidder, in response to the Notice to Bidders for the construction of the above project and in conformity with the bidding documents; having examined the plans, specifications, related documents and the site of the proposed work; being familiar with all of the conditions relating to the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, supplies, equipment, staking, testing, traffic control, superintendence, etc., for the construction of the project in accordance with the plans, specifications, and contract documents at the unit prices proposed herein.

The undersigned Bidder proposes, acknowledges and agrees to construct the entire project as shown on the plans, fully in accordance with the requirements of the plans, specifications, and the contract documents for the prices included in this Proposal and fully understands and agrees that the various items of material, labor and construction not specifically enumerated and provided for herein are considered subsidiary to the several items for which direct payment is specifically provided. Further, the undersigned agrees that one such subsidiary item is the protection, adjustment, maintenance, repair or replacement of all underground lines and services, whether shown on the plans or not, all to the full satisfaction of the City Engineer in a timely manner.

The undersigned Bidder agrees to begin work under the contract on or before the date specified in the written Notice to Proceed, and to fully complete the project within **915 calendar days**. These calendar days are assuming 6 days per week. It is specifically stated and understood that the entire construction including clean up shall be completed within the above stated time.

The undersigned Bidder has contacted, within 168 hours (1 week) prior to the bid opening, the Office of the City Engineer (972) 219-3490, and has determined that all Addenda are as follows:

Addendum No. 1 dated	_____	_____ (Signature)
Addendum No. 2 dated	_____	_____ (Signature)
Addendum No. 3 dated	_____	_____ (Signature)

The undersigned Bidder acknowledges that the Owner reserves the right to waive any informality and to reject any or all proposals.

The undersigned Bidder acknowledges and agrees that this Proposal shall be good and may not be withdrawn for 120 days from the date of bid opening.

The undersigned Bidder has shown unit prices and amounts and agrees that in the case of discrepancy, the unit prices shown in figures shall stand and that the amounts and total will be adjusted to correspond to the unit prices shown.

The undersigned Bidder agrees to execute the Agreement and furnish the required Performance Bond and Payment Bond within fifteen calendar days from the date of award of a contract by the City; and agrees that any delay in furnishing the signed Agreement and Bonds will result in liquidated damages being applied in accordance with Item 108.8.1. of the Standard Specifications.

The undersigned Bidder has attached and made a part of this Proposal a bid security in conformance with Item 102.5. of the Standard Specifications and in accordance with the Notice to Bidders.

A 5% contingency line item will be included with the resulting contract and purchase order for this project. The contingency shall be used at the City's discretion and only upon written approval from the City. The amount listed as a contingency is not an obligation for payment from the City. Any unused contingency is retained by the City and is not payable to the Contractor.

Submitted:

_____
(Signature)

_____
(Name - Typed or Printed)

_____
(Title)

(Seal, if corporation)

_____
(Firm Name)

_____
(Address)

_____
(City/County/State/Zip Code)

_____
(Telephone Number/Include Area Code)

_____
(Date)

_____
(Attest)

24-08-C Corporate Drive Segments 2 & 3

PROPOSED SUBCONTRACT BREAKDOWN

1. Subcontractor _____

   Address _____

   Phone # _____

   Description of Work _____

2. Subcontractor _____

   Address _____

   Phone # _____

   Description of Work _____

3. Subcontractor _____

   Address _____

   Phone # _____

   Description of Work _____

4. Subcontractor _____

   Address _____

   Phone # _____

   Description of Work _____

Reference is made to Item _108.5_ on Page SS-11_

24-08-C Corporate Drive Segments 2 & 3

LIST OF SUPPLIERS

1. Item Supplied _____

   Supplier _____

   Address _____

   Phone # _____

2. Item Supplied _____

   Supplier _____

   Address _____

   Phone # _____

3. Item Supplied _____

   Supplier _____

   Address _____

   Phone # _____

4. Item Supplied _____

   Supplier _____

   Address _____

   Phone # _____

CONTRACTOR'S QUALIFICATIONS

ALL BIDDERS ARE NOTIFIED THAT THE FOLLOWING QUALIFICATION STATEMENT MUST BE COMPLETED AND SUBMITTED WITH THE BID OR PROPOSAL.

The contractor shall show they have experience with similar projects that require working in confined areas in close proximity to many physical features (fences, utility poles, guy lines, gas lines and meters, sewer manholes, cleanouts, etc.) which requires the contractor to plan work efforts and equipment needs with these limitations in mind. The contractor shall submit a list of Public Works Projects successfully completed within the last five (5) years, including the names of supervisors and type of equipment used to perform this work.

BIDDER'S QUALIFICATION STATEMENT

Project: _____

Contractor: _____

Name: _____ Title: _____

Address: _____

Phone: _____ Email: _____

Type of Business:

☐ Sole Proprietor ☐ Partnership ☐ Corporation ☐ Joint Venture Other _____

State and Date of Incorporation, Partnership, Ownership, Etc. _____

Principal Office Address: _____

Principal Office Contact & Phone: _____

Insurance:

Insurance Agency Name: _____

Insurance Agency Address: _____

Contact Name: _____ Phone: _____

Liability Insurance Provided and Limits of Coverage: _____

Workers Compensation Insurance Provider: _____

Surety Bonding Company (Performance & Payment: _____

Total Number of Employees to be Associated with this Job:

____ Managerial ____ Administrative ____ Professional

____ Skilled ____ Semi-Skilled ____ Other

Percentage of Work to be Done by Bidder's Employees (Based on Dollars Bid): _____

Type(s) of Work to be Done by Bidder's Employees (Examples: Concrete Paving, Structural Concrete, Water Lines, Sanitary Sewer Lines, Storm Pipe, Storm Inlets, Excavation, Lime, Bridge Fencing, etc.)

_____

_____

Access to Tools and Equipment: Percent Owned: _____ Percent Rented: _____

Number of Years in Business as a Contractor on Above Types of Work: _____

Sub-Contractor Information (use additional sheets, if needed.):

Name: _____ Phone: _____

Address: _____

Type of Work _____

List the most current completed projects like the type of work bid (use additional sheets, if necessary.)

Project: _____

Owner/Agency: _____

Year Built: _____ Contract Price: _____

Equipment Used: _____

Contact Name: _____ Title: _____

Email: _____ Phone: _____

Project: _____

Owner/Agency: _____

Year Built: _____ Contract Price: _____

Equipment Used: _____

Contact Name: _____ Title: _____

Email: _____ Phone: _____

Project: _____

Owner/Agency: _____

Year Built: _____ Contract Price: _____

Equipment Used: _____

Contact Name: _____ Title: _____

Email: _____ Phone: _____

Trade References (attach additional sheets if needed):

Company: _____ Contact: _____

Address: _____

Email: _____ Phone: _____

Company: _____ Contact: _____

Address: _____

Email: _____ Phone: _____

Company: _____ Contact: _____

Address: _____

Email: _____ Phone: _____

Bank References (attach additional sheets if needed):

Institution: _____ Contact Name: _____

Address: _____ Phone: _____

Financial statements are not required as part of this bid package, however a balance sheet and income statement from the previous fiscal year shall be required from the apparent low bidder to be reviewed and approved by the Finance Director prior to contract award.

Claims and Suits (If the answer to any of the questions is yes, please attach details):

Has your organization ever failed to complete any work awarded to it? ☐ Yes ☐ No

Are there any judgments, claims, arbitration proceedings, or suits pending or outstanding against your organization or its officers? ☐ Yes ☐ No

Has your organization filed any lawsuits or requested arbitration regarding construction contracts within the last five years? ☐ Yes ☐ No

Within the last five (5) years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract?
☐ Yes ☐ No

BID BOND

STATE OF TEXAS
COUNTY OF DENTON

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____, whose address is _____ , hereinafter called Principal, and _____, a corporation organized and existing under the laws of the State of _____, and fully licensed to transact business in the State of Texas, as Surety, are held and firmly bound unto the City of Lewisville, a home-rule municipal corporation organized and existing under the laws of the State of Texas, hereinafter referred to as "Owner," in the penal sum of $_____as the proper measure of liquidated damages arising out of or connected with the submission of a Bid Proposal for the construction of a public work project, in lawful money of the United States, to be paid in Denton County, Texas, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors jointly and severally, firmly by these presents. The condition of the above obligation is such that whereas the Principal has submitted to Owner a certain Bid Proposal, attached hereto and hereby made a part hereof, to enter into a contract in writing, for the **Corporate Drive Segments 2 & 3** the "Project").

NOW, THEREFORE, if the Principal's Proposal shall be rejected or, in the alternative, if the Principal's Proposal shall be accepted and the Principal shall execute and deliver a contract in the form of the Contract attached hereto (properly completed in accordance with said Proposal) and shall furnish performance, payment and maintenance bonds required by the Contract Documents for the Project and provide proof of all required insurance coverages for the Project and shall in all other respects perform the agreement created by the acceptance of said Proposal, then this obligation shall be void, otherwise the same shall remain in force and affect; it being expressly understood and agreed that the liability of the Surety for any breech of condition hereunder shall be in the face amount of this bond and forfeited as a proper measure of liquidated damages.

PROVIDED FURTHER, that if any legal action were filed on this Bond, exclusive Venue shall lie in Denton County, Texas.

AND PROVIDED FURTHER, the Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by an extension of the time within which the Owner may accept such Proposal; and said Surety does hereby waive notice of any such extension.

The undersigned and designated agent is hereby designated by the Surety herein as the Resident Agent in Denton County or Dallas County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Article 7.19-1 of the Insurance Code, Vernon's Annotated Civil Statutes of the State of Texas.

IN WITNESS WHEREOF, this instrument is executed in _____ copies, each one of which shall be deemed an original, this, the _____ day of _____, 20____.

ATTEST:

By: _____
Signature

_____
Typed/Printed Name

_____
Title

_____
Address

_____
City State Zip

_____
Phone Fax

PRINCIPAL:

_____
Company Name

By: _____
Signature

_____
Typed/Printed Name

_____
Title

_____
Address

_____
City State Zip

_____
Phone Fax

ATTEST:

By: _____
Signature

_____
Printed Name

_____
Title

_____
Address

_____
City State Zip

_____
Phone Fax

SURETY:

By: _____
Signature

_____
Printed Name

_____
Title

_____
Address

_____
City State Zip

_____
Phone Fax

The Resident Agent of the Surety in Denton County or Dallas County, Texas, for delivery of notice and service of the process is:

NAME: _____
STREET ADDRESS: _____
CITY, STATE, ZIP: _____

NOTE: If Resident Agent is not a corporation, give a person's name.

PERFORMANCE BOND

STATE OF TEXAS
COUNTY OF DENTON

KNOW ALL MEN BY THESE PRESENTS: That _____ of the City of _____, County of _____, and State of _____, as Principal, and _____ authorized under the laws of the State of Texas to act as Surety on bonds for Principal, are held and firmly bound unto the City of Lewisville (Owner), in the penal sum of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract (Contract) with the Owner, dated the ____ day of _____, 20____ to construct:

CORPORATE DRIVE SEGMENTS 2 & 3

which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform said Contract and shall in all respects duly and faithfully observe and perform all and singular the covenants, conditions and agreements in and by said Contract agreed and covenanted by the Principal to be observed and performed, and according to the true intent and meaning of said Contract and the Plans and Specifications hereto annexed, then this obligation shall be void; otherwise to remain in full force and effect;

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code as amended and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications, or drawings accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20___.

Principal	Surety
By:	By
Title:	Title
Address:	Address:

The name and address of the Resident Agent of Surety is:

Bond Number_____

PAYMENT BOND

STATE OF TEXAS
COUNTY OF DENTON

KNOW ALL MEN BY THESE PRESENTS: That _____ of the City of _____, County of _____, and State of _____, as Principal, and _____ authorized under the laws of the State of Texas to act as Surety on bonds for Principal, are held and firmly bound unto the City of Lewisville (Owner), in the penal sum of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract (Contract) with the Owner, dated the _____ day of _____, 20___ to construct:

CORPORATE DRIVE SEGMENTS 2 & 3

which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay all claimants supplying labor and material to him or a subcontractor in the prosecution of the work provided for in said Contract, then, this obligation shall be void; otherwise to remain in full force and effect;

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code as amended and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications or drawings accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20___.

Principal	Surety
By:	By
Title:	Title
Address:	Address:

The name and address of the Resident Agent of Surety is:

_____
_____
_____

MAINTENANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
(hereinafter called **Principal**), and _____, a corporation organized under the laws of the State of _____ and authorized to do a surety business in the State of Texas, (hereinafter called **Surety**), are held and firmly bound unto the City of Lewisville, Texas (hereinafter called the **City**) in the full and just sum of _____, lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, said **Principal** has performed _____ **improvements**, which have been or are about to be completed and accepted by the **City** for the project known as:

CORPORATE DRIVE SEGMENTS 2 & 3

AND WHEREAS, it is required that the **Principal** should guarantee the project from defects caused by faulty or defective materials, workmanship, or design for a period of two years from and after the date of acceptance of the completed project by the **City**.

NOW, THEREFORE, if the **Principal** shall for a period of two years from and after the date of acceptance of the completed project by the **City** replace any and all defects arising in said work whether resulting from faulty or defective materials, workmanship, or design, then the above obligation shall be null and void; otherwise the obligation shall remain in full force and effect for two years from the date of acceptance of the completed project by the **City**.

The **City** shall notify the **Principal** in writing of any defects for which the **Principal** is responsible and shall specify in said notice a reasonable time within which the **Principal** shall have to correct said defects. If the **Principal** fails to correct said defects within the time specified in said notice, the **City**, in its discretion, may permit the **Surety** to correct said defects. If the **City** allows the **Surety** to correct said

defects, the **Surety** shall have sixty (60) days thereafter within which to take such action as it deems necessary to insure performance of the **Principal's** obligation.

If such defects are not corrected after the time period specified in the notice or after the expiration of the sixty (60) day time period, whichever is applicable, the **City** shall have the right to correct the defects, and the **Principal** and **Surety**, jointly and severally, shall pay all costs and expenses incurred by the **City** in correcting the defects, including, but not limited to, the engineer, legal and other costs, together with any damages either direct or consequential, which the **City** sustains, or may sustain, on account of the **Principal's** failure to correct the defects. In addition, the **City** shall have the right to contract for the correction of said defects and, upon acceptance of a bid in accordance with the **City's** normal bidding process, the **Principal** and **Surety** shall become immediately liable for the amount of the bid. In the event that the **City** commences legal proceedings for the collection thereof, interest shall accrue on said amount at the rate of six (6) percent per annum, beginning at the commencement of said legal proceedings.

If the City commences suit for collection of any sums due hereunder, the **Principal** and **Surety**, jointly and severally, agree to pay all costs and expenses incurred by the **City**, including, but not limited to, attorney's fees.

IN WITNESS WHEREOF, the parties have caused this instrument to be signed and sealed by their respective authorized officers this _____ day of _____ 20___.

Principal:_____ ***Surety:***_____

By:_____ ***By:***_____

_____***, Attorney-in-Fact***

Address:_____ ***Address:***_____

_____ _____

Witness as to Principal

_____

CITY OF LEWISVILLE
PURCHASING DIVISION

BOND REQUIREMENTS AND RETAINAGE

BONDS

The successful bidder will be required to furnish the following bonds from a surety licensed to do business in the State of Texas. These bonds, along with proper insurance papers, will be incorporated as part of the final contract documents and will remain in effect until the completion and acceptance of the project. Maintenance bonds shall be in effect based on their stated term after final acceptance of the project:

Project amount $10,001 to $24,999 – a payment bond at the project amount and a maintenance bond for one year from the date of final payment.

Project amount $25,000 to $99,999 – a payment bond at the project amount and a maintenance bond for two years from the date of the final payment.

Project amount $100,000 and grater – a bid bond equal to five percent (5%) of the project amount is to be included with the sealed bid; a payment bond and performance bond at the project amount and a maintenance bond for two years from the date of the final payment.

RETAINAGE

Retainage will be based on the following: Fifteen percent (15%) retainage for contracts up to $25,000; ten percent (10%) retainage for contracts more than $25,000 and less than $400,000; five percent (5%) retainage for contracts in excess of $400,000.

EXHIBIT A

PURCHASE ORDER
TERMS & CONDITIONS

Seller and Buyer agree to comply with the following terms and conditions. These Terms and Conditions along with the purchase order shall constitute a contract between the Seller and Buyer upon the Seller issuing an invoice and/or providing any of the goods and services described in the purchase order. In the event of a conflict between these Terms and Conditions and a separate written agreement between the Seller and Buyer, the terms of the separate written agreement shall prevail.

1. SELLER TO PACKAGE GOODS: Seller will package goods in accordance with good commercial practice. Each shipping container shall be clearly and permanently packed as follows: (a) Seller's name and address; (b) Consignee's name, address and purchase order or purchase order release number and the supply agreement number if applicable; (c) Container number and total number of containers, e.g. box 1 of 4 boxes; and (d) the number of the container bearing the packing slip. Seller shall bear cost of packaging unless otherwise provided. Goods shall be suitably packed to secure lowest transportation costs and to conform with requirements of common carriers and any applicable specifications. Buyer's count or weight shall be final and conclusive on shipments not accompanied by packing lists.

2. SHIPMENT UNDER RESERVATION PROHIBITED: Seller is not authorized to ship the goods under reservation and no tender of a bill of lading will operate as a tender of goods.

3. TITLE AND RISK OF LOSS: The title and risk of loss of the goods shall not pass to Buyer until Buyer actually receives and takes possession of the goods at the point or points of delivery.

4. DELIVERY TERMS AND TRANSPORTATION CHARGES: F.O.B. Inside Delivery, Municipal Facility, Lewisville, Texas, and shall include all delivery and packaging costs. The Buyer assumes no liability for goods delivered in damaged or unacceptable condition. The Seller shall handle all claims with carriers, and in case of damaged goods, shall ship replacement goods immediately upon notification by Seller of damage.

5. NO REPLACEMENT OF DEFECTIVE TENDER: Every tender or delivery of goods must fully comply with all provisions of this contract as to time of delivery, quality and the like. If a tender is made which does not fully conform, this shall constitute a breach and Seller shall not have the right to substitute a conforming tender provided, where the time for performance has not yet expired, the Seller may notify Buyer of his intention to cure and may then make a conforming tender within the contract time but not afterward.

6. PLACE OF DELIVERY: The place of delivery shall be that set forth on the purchase order. Any change thereto shall be effected by modification as provided for in Clause 20, "Modifications", hereof. The terms of this contract are "no arrival, no sale".

7. INVOICES AND PAYMENTS: (a) Seller shall submit separate invoices on each purchase order after each delivery. Invoices shall indicate the purchase order number, shall be itemized and transportation charges, if any, shall be listed separately. A copy of the bill of lading, and the freight weigh bill when applicable, should be attached to the invoice. Mail to: City of Lewisville Accounts Payable, PO Box 299002 Lewisville, Texas 75029-9002. Payments shall be made thirty days after the goods are delivered to the Buyer, or a correct invoice is received, whichever is later. Suppliers should keep the Accounts Payable Office advised of any changes in remittance addresses. (b) Buyer's obligation is payable only and solely from funds available for the purpose of the purchase. Lack of funds shall render this contract null and void to the extent funds are not available and any delivered but unpaid for goods will be returned to Seller by Buyer. (c) Do not include Federal Excise, State or City Sales Tax. Buyer shall furnish tax exemption certificate, if required.

8. GRATUITIES: The Buyer may, by written notice to the Seller, cancel this contract without liability to Seller if it is determined by Buyer that gratuities, in the form of entertainment, gifts, or otherwise, were offered or given by the Seller, or any agent, or representative of the Seller, to any officer or employee of the City of Lewisville with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending or the making or any determinations with respect to the performing of such a contract. In the event this contract is cancelled by Buyer pursuant to this provision, Buyer shall be entitled, in addition to any other rights and remedies, to recover or withhold the amount of the cost incurred by Seller in providing such gratuities.

9. SPECIAL TOOLS AND TEST EQUIPMENT: If the price stated on the face hereof includes the cost of any special tooling or special test equipment fabricated or required by Seller for the purpose of filling this order, such special tooling equipment and any process sheets related thereto shall become the property of the Buyer and to the extent feasible shall be identified by the Seller as such.

10. WARRANTY PRICE: (a) The price to be paid by the Buyer shall be that contained in Seller's bid which Seller warrants to be no higher than Seller's current prices on orders by others for products of the kind and specification covered by this contract for similar quantities under similar or like conditions and methods of purchase. In the event Seller breaches this warranty, the prices of the items shall be reduced to the Seller's current prices on orders by others, or in the alternative, Buyer may cancel this contract without liability to Seller for breach or Seller's actual expense. (b) The Seller warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for commission, percentage, brokerage, or contingent fee excepting bona fide employees of bona fide established commercial or selling agencies maintained by the Seller for the purpose of securing business. For breach of violation of this warranty, the Buyer shall have the right in addition to any other right or rights to cancel this contract without liability and to deduct from the contract price, or otherwise recover the full amount of such commission, percentage, brokerage or contingent fee.

11. WARRANTY PRODUCTS: Seller shall not limit or exclude any implied warranties and any attempt to do so shall render this contract voidable at the option of the Buyer. Seller warrants that the goods furnished will conform to the specifications, drawings and descriptions listed in the bid invitation and to the sample(s) furnished by Seller, if any. In the event of a conflict between the specifications, drawings and descriptions, the specifications shall govern.

12. SAFETY WARRANTY: Seller warrants that the product sold to Buyer shall conform to the standards promulgated by the U. S. Department of Labor under the Occupational Safety and Health Act of 1970. In the event the product does not conform to OSHA standards, Buyer may return the product for correction or replacement at the Seller's expense. In the event Seller fails to make the appropriate correction within a reasonable time, correction made by Buyer will be at Seller's expense.

13. NO WARRANTY BY BUYER AGAINST INFRINGEMENTS: As part of this contract for sale Seller agrees to ascertain whether goods manufactured in accordance with the specifications attached to this contract will give rise to the rightful claim of any third person by way of infringement or the like. Buyer makes no warranty that the production of goods according to the specification will not give rise to such a claim, and in no event shall Buyer be liable to Seller for indemnification in the event that Seller is sued on the grounds of infringement or the like. If seller is of the opinion that an infringement or the like will result, he will notify Buyer to this effect in writing within two weeks after the signing of this contract. If Buyer does not receive notice and is subsequently held liable for the infringement of the like, Seller will save Buyer harmless. If Seller in good faith ascertains that production of the goods in accordance with the specifications will result in infringement or the like, this contract shall be null and void except that Buyer will pay Seller the reasonable cost of his search as to infringements.

14. RIGHT OF INSPECTION: Buyer shall have the right to inspect the goods at delivery before accepting them.

15. CANCELLATION: Buyer shall have the right to cancel for default all or any part of the undelivered portion of this order if Seller breaches any of the terms hereof including warranties of Seller or if the Seller becomes insolvent or commits acts of bankruptcy. Such right of cancellation is in addition to and not in lieu of any other remedies which Buyer may have in law or equity.

16. TERMINATION: The performance of work under this order may be terminated in whole or in part by the Buyer in accordance with this provision. Termination of work hereunder shall be effected by the delivery to the Seller of a "Notice of Termination" specifying the extent to which performance of work under the order is terminated and the date upon which such termination becomes effective. Such right of termination is in addition to and not in lieu of rights of Buyer set forth in Clause 15, herein.

17. FORCE MAJEURE: If by reason of Force Majeure, either party hereto shall be rendered unable wholly or in part to carry out its obligations under this contract then such party shall give notice and full particulars of Force Majeure in writing to the other party within a reasonable time after occurrence of the event or cause relied upon, and the

obligation of the party giving such notice, so far as it is affected by such Force Majeure, shall be suspended during the continuance of the inability then claimed, except as hereinafter provided, but for no longer period, and such party shall endeavor to remove or overcome such inability with all reasonable dispatch. The term Force Majeure as employed herein, shall mean acts of God, strikes, lockouts, or other industrial disturbances, act of public enemy, orders of any kind of government of the United States or the State of Texas or any civil military authority, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, or other causes not reasonably within the control of the party claiming such inability.

18. ASSIGNMENT DELEGATION: No right or interest in this contract shall be assigned or delegation of any obligation made by Seller without the written permission of the Buyer. Any attempted assignment or delegation by Seller shall be wholly void and totally ineffective for all purposes unless made in conformity with this paragraph.

19. WAIVER: No claim or right arising out of a breach of this contract can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved.

20. MODIFICATIONS: This contract may be modified or rescinded only by a writing signed by both of the parties or their duly authorized agents. This shall include any change orders.

21. INTERPRETATION PAROLE EVIDENCE: This writing is intended by the parties as a final expression of their agreement and is intended also as a complete and exclusive statement of the terms of their agreement. No course of prior dealings between the parties and no usage of the trade shall be relevant to supplement or explain any term used in this contract. Acceptance or acquiescence in a course of performance rendered under this contract shall not be relevant to determine the meaning of this contract even though the accepting or acquiescing party has knowledge of the performance and opportunity for objection. Whenever a term defined by the Uniform Commercial Code is used in this contract, the definition contained in the Code is to control.

22. APPLICABLE LAW: This contract shall be governed by the Uniform Commercial Code. Wherever the term "Uniform Commercial Code" is used, it shall be construed as meaning the Uniform Commercial Code as adopted in the State of Texas as effective and in force on the date of this contract.

23. ADVERTISING: Seller shall not advertise or publish, without Buyer's prior consent, the fact that Buyer has entered into this contract, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal, state or local government.

24. RIGHT TO ASSURANCE: Whenever one party to this contract in good faith has reason to question the other party's intent to perform he may demand that the other party give written assurance of his intent to perform. In the event that a demand is made and no assurance is given within five (5) days, the demanding party may treat this failure as an anticipatory repudiation of the contract.

25. VENUE: Both parties agree that venue for any litigation arising from this contract shall lie in Denton County, Texas.

26. DISCLOSURE: Pursuant to Chapter 176 of the Texas Local Government Code, a person or agent of a person who contracts or seeks to contract with the City of Lewisville must complete a conflict of interest questionnaire if the person or agent has an affiliation or business relationship that might cause a conflict of interest with the City. The conflict of interest questionnaire, which is available online at ethics.state.tx.us, must be filed with the City Secretary of the City of Lewisville no later than the seventh business day after the person or agent begins contract discussions or negotiations with the City of Lewisville or submits to the City of Lewisville an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of Lewisville. An updated conflict of interest questionnaire must be filed in accordance with Chapter 176 of the Local Government Code

Seller should consult with legal counsel if you have questions regarding its compliance with the requirements of Chapter 176. It is the responsibility of each person or agent who is contracting or seeking to contract with the City of Lewisville to comply with the filing requirements of Chapter 176.

27. INDEPENDENT CONTRACTOR: Seller shall be considered an independent contractor and not an agent, servant, employee, or representative of Buyer in the performance of the work. No term or provision herein or act of the Seller shall be construed as changing that status.

28. TERMINATION FOR DEFAULT: Buyer reserves the right to enforce the performance of any Purchase Order in any manner prescribed by law or deemed to be in the best interest of Buyer in the event of breach or default. The Buyer reserves the right to terminate any purchase order and/or agreement with the Seller in the event the Seller fails to: (a) meet delivery schedules, or (b) otherwise perform in accordance with these terms and conditions.

29. PROTESTS: All protests regarding the solicitation process must be submitted in written form to the Purchasing Manager within five (5) working days following the opening of bids/proposals. This includes all protests relating to legal advertisements, deadlines, bid/proposal openings, and all other related procedures under the Local Government Code

Post-award protests must be submitted in written form to the City Manager within five (5) working days after award. The protest must include, at a minimum, the name of protester, bid/proposal number or description of goods or services, and a statement of grounds for protest.

30. INDEMNIFICATION: SELLER AGREES TO DEFEND, INDEMNIFY AND HOLD BUYER, ITS OFFICERS, AGENTS AND EMPLOYEES, HARMLESS AGAINST ANY AND ALL CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES FOR PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT, SUFFERED BY ANY PERSON OR PERSONS, THAT MAY ARISE OUT OF OR BE OCCASIONED BY SELLER'S BREACH OF ANY OF THESE TERMS AND CONDITIONS OR BY ANY NEGLIGENT OR STRICTLY LIABLE ACT OR OMISSION, INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER COMMITTED BY SELLER, ITS OFFICERS, AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THIS CONTRACT; EXCEPT THAT THE INDEMNITY PROVIDED FOR IN THIS PARAGRAPH SHALL NOT APPLY TO ANY LIABILITY RESULTING FROM THE SOLE NEGLIGENCE OR FAULT OF BUYER, ITS OFFICERS, AGENTS, EMPLOYEES OR SEPARATE CONTRACTORS, AND IN THE EVENT OF JOINT AND CONCURRING NEGLIGENCE OR FAULT OF THE SELLER AND BUYER, RESPONSIBILITY AND INDEMNITY, IF ANY, SHALL BE APPORTIONED IN ACCORDANCE WITH THE LAW OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO BUYER UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW. THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY OTHER PERSON OR ENTITY.

31. SEVERABILITY: In case any one or more of the provisions contained in these Terms and Conditions shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof, and these Terms and Conditions shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

32. IMMIGRATION REFORM AND CONTROL ACT (8 U.S.C 1324a): The Buyer supports the Immigration Reform and Control Act (IRCA), which is a comprehensive scheme prohibiting the employment of unauthorized aliens in the United States. The Seller and its subcontractors shall at all times during the term of the contract with the Buyer comply with the requirements of IRCA and shall notify the Buyer within fifteen (15) working days of receiving notice of a violation of IRCA. The Seller also warrants that it has not had an IRCA violation within the last five (5) years. The Buyer may terminate a contract with the Seller if the Buyer determines that (a) the Seller or its subcontractors have been untruthful regarding IRCA violations in the preceding five (5) years or (b) the Seller or its subcontractors fail to timely notify the Buyer of an IRCA violation.

33. ADA COMPLIANCE: All goods and services provided to the Buyer must be compliant with the Americans with Disabilities Act and any amendments thereto (the "ADA") and all regulations promulgated pursuant to the ADA. Seller will be required to certify compliance, if required under the law or otherwise required by the Buyer.

34. PROTECTION OF RESIDENT WORKERS: The Buyer actively supports the Immigration and Nationality Act (INA), which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9). The Seller shall establish appropriate procedures and controls so no services under the contract will be performed by any worker who is not legally eligible to perform such services or employment. The Buyer reserves the right to audit Seller's employment records to verify the existence of a completed Employment Eligibility Verification Form (I-9) for every worker performing services under the contract. The audit will be at the Buyer's expense.

35. TEXAS GOVERNMENT CODE CHAPTER 2252. Pursuant to Texas Government Code Chapter 2252, Subchapter F, Consultant affirms, by entering into this Agreement, that is it not identified on a list created by the Texas Comptroller of Public Accounts as a company known to have contracts with or provide supplies or services to Iran, Sudan, or a foreign terrorist organization.

36. TEXAS GOVERNMENT CODE CHAPTER 2271. Pursuant to Texas Government Code Chapter 2271, Consultant affirms that execution of this Agreement serves as written verification that Consultant: (1) does not boycott Israel, as defined by Texas Government Code Section 808.001; and (2) will not boycott Israel during the term of the Agreement. This section shall not apply if Consultant employs fewer than ten (10) full-time employees, or if the funds to be paid wholly or partly from public funds of the City under this Agreement are less than $100,000.00.

37. TEXAS GOVERNMENT CODE CHAPTER 2274. Pursuant to Texas Government Code Chapter 2274, Consultant verifies the following:

A. Consultant: (1) does not boycott energy companies, as defined by Texas Government Code Section 809.001; and (2) will not boycott energy companies during the term of this Agreement.
B. Consultant: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, as those terms are defined in that chapter; and (ii) will not discriminate during the term of this Agreement against a firearm entity or firearm trade association.

This section shall not apply if Consultant employs fewer than ten (10) full-time employees, if the funds to be paid wholly or partly from public funds of the City under this Agreement are less than $100,000.00, or if this Agreement is otherwise exempted from the requirements of Texas Government Code Chapter 2274.

CITY OF LEWISVILLE
PURCHASING DIVISION

INSTRUCTIONS TO BIDDERS

INSTRUCTIONS: These instructions apply to all bids and become a part of the terms and conditions of any bid submitted.

BIDS must not be faxed, but are to be submitted to the City in one of the following manners:

A. **Electronic Receipt:** Bidders are encouraged to submit bids to the City through Bonfire. The City is a member of this electronic bidding platform and the submittal of bids to the City is at no cost to the bidder. The internet site is www.gobonfire.com.

or

B. **Paper Bid Receipt:** Paper bids may be submitted to the City. Bidders are to submit the original and one PDF copy of the bid on a flash drive in a sealed envelope to the Purchasing Division prior to response due date/time. The sealed envelope is to be marked on the outside with the bidder's name, address, the bid invitation number, and closing date recorded on the bottom left corner of the envelope.
Address to:

City of Lewisville
Finance Administration - Purchasing Division
151 W. Church St.
Lewisville, Texas 75057

Sealed bids must be submitted in sufficient time as to be received and time stamped at the above location on or before the published bid date and time shown on the bid invitation. Bids received after submission deadline shall be returned unopened and will be considered void and unacceptable. The City of Lewisville is not responsible for lateness of mail carrier, etc.

BID: The bidder should quote its lowest and best price, F.O.B. destination on each item bid. If delivery and shipping quantities affect unit bid price, multiple bids may be made so as to indicate "price break" quantities in order for the City to determine maximum economic benefits. Pricing for paper bids shall be entered on the Bid Sheet in ink or typewritten. Totals shall be entered in the "Total Price" column of the Bid Sheet. In all cases of discrepancy between unit price and extended price, the unit price will be presumed to be correct.

MAKE-MODEL Items must be the best and latest model available of the type specified. If the bid invitation indicates a specific brand of product, the brand listed is deemed to be descriptive and not restrictive and is used to indicate the type and quality level desired for comparison purposes. Bidders may offer an approved equal to the brand listed, unless otherwise noted. The City shall make the final determination as to the brand offered being an approved equal to the brand listed. A Complete catalog or brochure showing in detail the item offered must accompany the bid.

SPLIT-AWARD: Bidders may furnish pricing for all or any portion of the bid invitation. Unless the bidder specifies otherwise in his bid, the City may award the contract for any item or group of items shown on the bid invitation.

BID FORMS: Bids submitted on other than City forms, whether electronic or paper, or with different terms or provisions may not be considered as responsive bids.

Bids must be held firm for ninety (90) days to allow for evaluation unless otherwise noted in the bid document.

F.O.B./DAMAGE: Quotations shall be bid F.O.B. Inside Delivery, Municipal Facility, Lewisville, Texas, and shall include all delivery and packaging costs. The City of Lewisville assumes no liability for goods delivered in damaged or unacceptable condition. The successful bidder shall handle all claims with carriers, and in case of damaged goods, shall ship replacement goods immediately upon notification by the City of damage.

INVOICES: Invoices must be submitted by the successful bidder in duplicate to the City of Lewisville Accounts Payable, P O Box 299002, Lewisville, TX 75029-9002 or may be emailed to: accountspayable_col@cityoflewisville.com.

TAXES: The City of Lewisville is exempt from Federal Manufacturer's Excise, and State Sales taxes. TAX MUST NOT BE INCLUDED IN BID. Tax exemption certificates will be executed by the City and furnished upon request.

PRICING: Bids should be firm. If the bidder, however, believes it necessary to base its price on price adjustment, such a bid may be considered, but only as an alternate bid.

PAYMENT TERMS: Payment terms are net 30 days after the goods are provided or services are completed, as required, or a correct invoice is received, whichever is later.

DELIVERY PROMISE - PENALTIES: Bids MUST show the number of calendar days required to place the materials in the possession of the City. DO NOT quote shipping dates. Consistent failure of a bidder to meet his delivery promises without valid reason may be cause for removal from the Bidder's List. When Delivery delays can be foreseen, the bidder shall give prior notice to the Purchasing Division which shall have the right to extend the delivery due date if reasons for delay appear acceptable. Default in promised delivery, without acceptable reasons, or failure to meet specifications, authorizes the Purchasing Division to purchase the goods elsewhere, and charge any increase in cost and handling to the defaulting bidder.

PACKAGING: Unless otherwise indicated, items will be new, unused, and in first class condition in containers suitable for damage-free delivery and storage.

CORRESPONDENCE: The bid number must appear on ALL correspondence, inquiries, etc. pertaining to the bid.

DELIVERY TIMES: Deliveries will be acceptable only during normal working hours at the designated City Municipal Facility.

PATENT RIGHTS: The Vendor agrees to indemnify and hold the City harmless from any and all claims involving patent right infringement or copyrights on goods supplied.

EVALUATION: Response to the specification in this bid is of primary importance in determining the lowest responsible bid.

BID AWARD: Bids will be awarded either on Lowest Responsible Bid or Best Value. The Criteria used to determine Best Value is as follows:

- Purchase Price
- The reputation of the bidder and of the bidder's goods and service
- The quality of the bidder's goods or services
- The extent to which the goods or services meet the municipality's needs.
- The bidder's past relationship with the municipality.
- The impact on the ability of the city to comply with laws and rules relating to contracting with historically underutilized businesses and non-profit organizations employing persons with disabilities.

The total long-term cost to the city to acquire the bidders good or services (Life Cycle Costing).

Any other relevant factors that a private business would consider in selecting a bidder.

FUNDING: The City of Lewisville is a home-rule municipal government operated and funded on an October 1 to September 30 Fiscal Year; accordingly, the City reserves the right to terminate, without liability to the City any contract for which funding is not available.

RESERVATIONS: The City expressly reserves the right to:

A. Waive as an informality, minor deviations from specifications.
B. Waive any defect, irregularity or informality in any bid or bidding procedure.
C. Reject or cancel any or all bids.
D. Reissue a bid invitation.
E. Extend the bid opening time and date.
F. Procure any item by other means.
G. Increase or decrease the quantity specified in the bid invitation, unless the Bidder specifies otherwise.
H. Consider and accept an alternate bid as provided herein when most advantageous
I. to the City.

ASSIGNMENT: The successful bidder shall not sell, assign, transfer or convey this contract in whole or in part, without the prior written consent of the City.

AUDIT: The City of Lewisville reserves the right to audit the records and performance of the successful bidder during the term of the contract and for three years after the contract is completed.

PROTESTS: All protests regarding the bid solicitation process must be submitted in writing to the City Purchasing Manager within five (5) working days following the opening of bids. This includes all protests relating to advertising of bid notices, deadlines, bid opening, and all other related procedures under the Local Government Code, as well as any protests relating to alleged improprieties with the bidding process.

This limitation does not include protests relating to staff recommendations as to award of this bid. Protests relating to staff recommendations may be directed to the City Council by contacting the City Secretary.

Failure to Protest within the time allotted shall constitute a waiver of any protest.

ALTERING BIDS: Bid cannot be altered or amended after submission deadline. Any interlineation, or alteration made before opening time for sealed bids must be initialed by the signer of the bid, guaranteeing authenticity.

CHANGE ORDERS: No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders to the contract will be made in writing by the City of Lewisville.

ADDENDA: Any interpretations, corrections or changes to this Invitation for Bid and Specifications will be made by ADDENDA. Sole authority to issue addenda shall be vested in the City of Lewisville. Bidders shall acknowledge receipt of all addenda on bid form.

MINIMUM STANDARDS FOR RESPONSIBLE PROSPECTIVE BIDDERS: A prospective bidder must affirmatively demonstrate bidder's responsibility. A prospective bidder must meet the following requirements:

- Have adequate financial resources, or the ability to obtain such resources as required;
- Be able to comply with the required or proposed delivery schedule;
- Have a satisfactory record of performance;
- Have a satisfactory record of integrity and ethics;
- Be otherwise qualified and eligible to receive an award; and
- The City of Lewisville may request representation and other information sufficient to determine bidder's ability to meet these minimum standards listed above.

BIDDER SHALL PROVIDE with this bid response, all documentation required. Failure to provide this information may result in rejection of bid.

SUCCESSFUL BIDDER SHALL defend, indemnify and save harmless the City of Lewisville and all its officers, agents and employees and all entities, their officers, agents and employees who are participating in this contract from all suits, actions, or other claims of any character,

name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the successful bidder, or of any agent, employee, subcontractor or supplier in the execution of, or performance under, any contract which may result from bid award. Successful bidder shall pay any judgment with cost which may be obtained against the City of Lewisville and participating entities growing out of such injury or damages.

TERMINATION FOR DEFAULT: The City of Lewisville reserves the right to enforce the performance of this contract in any manner prescribed by law or deemed to be in the best interest of the City in the event of breach or default of this contract. The City reserves the right to terminate the contract immediately in the event the successful bidder fails to 1) meet delivery schedules, or 2) otherwise perform in accordance with these specifications. Breach of contract or default authorizes the City to award to another bidder. Purchase elsewhere and charge the full increase in cost and handling to the defaulting successful bidder.

TESTING: Testing may be performed at the request of the City without expense to the City.

REMEDIES: The successful bidder and City of Lewisville agree that each party have all rights, duties, and remedies available as stated in the Uniform Commercial Code.

VENUE: This agreement will be governed and construed according to the laws of the State of Texas. This agreement is performable in Denton County, Texas.

SILENCE OF SPECIFICATION: The apparent silence of these specifications as to any detail or to the omission from it of a detailed description concerning any point shall be regarded as meaning that only the best commercial products and practices are to prevail. All interpretations of the specifications in this bid shall be made on the basis of this statement.

DEVIATIONS from specifications and alternate bids must be clearly shown on the bid form with complete information attached to form. They may or may not be considered.

NO EMPLOYEE of the City of Lewisville who has a financial interest in a prospective vendor shall participate in submitting a bid or proposal to conduct work for the City.

NO EMPLOYEE of the City of Lewisville shall receive any compensation for or as a result of a contract for goods or services purchased by the City if that employee was in a position to influence the City with respect to the contract.

ELIGIBLE BIDDER: Bidders are limited to those persons or firms who are qualified and engaged in a full-time business and can assume liabilities for any performance or warranty service required.

REJECTED ITEM(S): Item(s) that are rejected for failure to meet prescribed minimum specifications shall be returned to the supplier at no cost to the City of Lewisville.

INDEMNITY: The City of Lewisville will not accept a contract that contains any provision causing the City of Lewisville to indemnify the vendor for any reason.

VENDOR AGREEMENT: Any vendor agreements (service, maintenance, etc.) to be signed by the City of Lewisville must be submitted with your bid.

CITY OF LEWISVILLE
PURCHASING DIVISION

ADDITIONAL TERMS

ANTI-LOBBYING PROVISION

During the period between proposal / sealed bid submission date and the contract award, proposers, including their agents and representatives, shall not directly discuss or promote their proposal with any member of the City of Lewisville City Council or City staff except during City-Sponsored inquiries, briefings, interviews, or presentations, unless requested by the City.

This provision is not meant to preclude offerors from discussing other matters with City Council members or City staff. This policy is intended to create a level playing field for all potential offerors, assure that contract decisions are made in public, and to protect the integrity of the RFP / Bid Evaluation process. Violation of this provision may result in rejection of the offeror's proposal.

LAWS AND ORDINANCES

Laws and Ordinances: The Contractor shall always observe and comply with all Federal, State and local laws, ordinances and regulations which in any manner affect the Contract or the work and shall indemnify and save harmless the City against any claim arising from the violation of any such laws, ordinances and regulations whether by the Contractor or his employees.

PROTECTION OF RESIDENT WORKERS

Protection of Resident Workers: The City of Lewisville actively supports the Immigration and Nationality Act (INA) which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9). The Contractor and its Subcontractors shall establish appropriate procedures and controls so no services or products under the Contract Documents will be performed or manufactured by any worker who is not legally eligible to perform such services or employment. The City reserves the right to audit Contractor's or Subcontractor's employment records to verify the existence of a completed Employment Eligibility Verification Form (I-9) for every worker performing services or manufacturing products under the Contract Documents. The audit will be at the City's expense.

IMMIGRATION REFORM AND CONTROL ACT

Immigration Reform and Control Act (8 U.S.C. §1324a): The City of Lewisville supports the Immigration Reform and Control Act (IRCA) which is a comprehensive scheme prohibiting the employment of unauthorized aliens in the United States. The Contractor shall submit a declaration signed under penalty of perjury of the laws of the State of Texas stating that it has not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor shall ensure that its Subcontractors submit a declaration signed under penalty of perjury of the laws of the State of

Texas stating that they have not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor and its Subcontractors shall at all times during the term of the contract with the City comply with the requirements of IRCA and shall notify the City within fifteen (15) working days of receiving notice of a violation of IRCA. The City may terminate a contract with the Contractor if the City determines that (a) the Contractor or its Subcontractors have been untruthful regarding IRCA violations in the preceding five (5) years; (b) if the Contractor fails to ensure that its Subcontractors submit the aforementioned declaration; or (c) the Contractor or its Subcontractors fail to timely notify the City of an IRCA violation.

_____ _____

Contractor Name Authorized Signature

_____

Date

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

Lewisville 2025 - Sustainability

Lewisville City Council unanimously adopted the Lewisville 2025 plan on July 14, 2014. The plan was developed after more than a year of public input and discussion that garnered hundreds of ideas and suggestions. That input was studied extensively by the Lewisville 2025 Steering Committee, City staff and professional consultants and formulated into the Lewisville 2025 plan. The plan provides a clear shared vision for the kind of community Lewisville wants to be when it turns 100 years old in 2025: a place that people choose to live, work and visit.

Lewisville 2025 identifies nine "Big Moves" to guide the community's efforts toward being a thriving, desirable community. One of these Big Moves is sustainability. Lewisville defines sustainability in this way:

> *Limited resources, such as land, water, energy, clean air, natural assets, and public funds are used efficiently to provide a desirable quality of life and business climate today without reducing Lewisville's ability to provide the desired quality of life and business climate for success of future generations.*

The Purchasing Division's goal is to support and encourage sustainable management practices through the purchase and use of materials, products and services that demonstrate environmental stewardship as well as fiscal and social responsibility. To that end, Lewisville will consider environmental factors such as but not limited to, recycled content, product life cycle, waste reduction, energy efficiency, toxicity, water consumption, and human health impacts when making purchasing recommendations. To assist City staff with evaluating these factors, prospective vendors may be required to provide specific information about their products and services that addresses environmental impacts.

Does Product or Service?	Yes	No	Details
Reduce energy consumption			
Reduce toxicity, including emissions			
Reduce waste			
Contain recyclable materials			
Reduce water consumption			
List other environmental impacts			

Attach supporting documentation if needed

CITY OF LEWISVILLE
PURCHASING DIVISION

STATE RECIPROCAL REQUIREMENT

The City of Lewisville, as a governmental agency of the State of Texas, may not award a contract for general construction, improvements, services or public works projects or purchases of supplies, materials, or equipment to a non-resident bidder unless the non-resident's bid is lower than the lowest bid submitted by a responsible Texas resident bidder by the same amount that a Texas resident bidder would be required to underbid a non-resident bidder to obtain a comparable contract in the state in which the non-resident's principal place of business is located (Section 2252.002 of the Government Code). Bidder shall answer all the following questions by encircling the appropriate response or completing the blank provided.

1. Where is your principal place of business? _____

2. Only if your principal place of business is not in the state of Texas, please indicate:

   A. In which state is your principal place of business located? _____

   B. Does that state favor resident bidders (bidders in your state) by some dollar increment or percentage? ☐ YES ☐ NO

   C. If "YES", what is that dollar increment or percentage? _____

NON-COLLUSION STATEMENT

The undersigned affirms that they are duly authorized to execute this contract, that this company, corporation, firms, partnership or individual has not prepared this bid in collusion with any other Bidder, and that the contents of this bid as to prices, terms or conditions of said bid have not been communicated by the undersigned nor by any employer or agent to any other person engaged in this type of business prior to the official opening of this bid.

Vendor:	
Address:	
City, State, Zip:	
Phone:	
Email:	
Bidder (Print Name):	
Bidder Signature:	
Job Title:	
Signature of company official authorizing this bid:	
Company Official (Print name):	
Job Title:	

CITY OF LEWISVILLE, TEXAS

CONSTRUCTION AGREEMENT

Project: Corporate Drive Segments 2 & 3 Construction Project No. G1122 & G1123 (the "Project").

This Construction Agreement (the "Agreement") is made on _____, 2023, between the **City of Lewisville** (the "City") and _____ (the "Contractor").

1. Services. The Contractor shall commence and complete the construction of the paving, bridge, drainage, water and sanitary sewer improvements along Corporate Drive Segments 2 & 3, a future collector four lane divided roadway from Railroad Street to east of the Elm Fork Trinity River Bridge (the "Services"), and all extra work, under the terms as stated in the Specifications and Contract Documents for Corporate Drive Segments 2 & 3 Construction Project (the "Specifications"), attached hereto as **Exhibit A**, the Plans of Proposed Roadway Improvements Corporate Drive Segments 2 & 3 Final Plans (the "Plans"), attached hereto as **Exhibit B**, and this Agreement, and at the Contractor's own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the Services, in accordance with the conditions and prices stated in the Contractor's Proposal (the "Proposal") attached hereto as **Exhibit C**, and in accordance with the Specifications (**Exhibit A**) and Plans (**Exhibit B**), as prepared by the City and attached hereto. The Contractor will perform all Services in a good and professional manner and in accordance with industry standards. The Contractor is responsible for constructing a final product that is fully functional and fit for its intended purposes, and meets all requirements set forth in the Agreement, the Specifications (**Exhibit A**), and the Plans (**Exhibit B**). The City will be the sole judge of the acceptability of all work and Services performed under this Agreement.

   The City shall perform such services as outlined in the Specifications (**Exhibit A**), if any.

2. Completion of Services. The Contractor hereby agrees to commence work within ten (10) calendar days after the date of the written notice to commence work and to fully complete the same within **915** consecutive calendar days after the date of the written notice to commence work, subject to such extensions of time as are provided by the Specifications (**Exhibit A**).

3. Agreement Documents. The Agreement shall include the following documents, and this Agreement does hereby expressly incorporate same herein as if set forth verbatim in this Agreement:

   A. This Agreement
   B. The Specifications (**Exhibit A**) and the Plans (**Exhibit B)**
   C. The Proposal (**Exhibit C**)

   To the extent that any exhibit is in conflict with provisions of this Agreement or each other, the provisions of this Agreement, then the provisions of **Exhibit A** and **Exhibit B** jointly, then **Exhibit C** shall prevail in the order, except as specifically provided for in Section 29 of this Agreement.

4. Confidential Information. To the extent allowed by law, the City will safeguard and keep from release any documents marked "proprietary" or information not generally available to the public. However, the City will, if required, comply with all requirements of the Texas Public Information Act with regard to any documents in its possession at the time of a request made under that Act.

5. Pricing. The City agrees to pay the Contractor in current funds the price or prices shown in the Proposal (**Exhibit C**).

6. Payment. Payments will be subject to the terms outlined in the Specifications (**Exhibit A**). The City shall remit payment within thirty (30) days after receipt of an invoice, in accordance with the Texas Prompt Payment Act (Tex. Gov't Code Ch. 2251). All original invoices are to be sent to the City of Lewisville, Attention: AP Division, 151 West Church Street, Lewisville, Texas 75057 or P.O. Box 299002, 75029-9002.

7. Change Orders. Any changes to the Services that change the Agreement price or the Agreement time, as specified herein, must be authorized by the City in writing PRIOR to commencement of said work, as provided for in the Specifications (**Exhibit A**). Any work performed without the City's prior written consent will be at the sole expense of the Contractor.

8. Subcontractors. If subcontractors are used, the subcontractor will be directed and supervised solely by the Contractor, as provided for in the Specifications (**Exhibit A**). The Contractor shall require the subcontractor to hold the same insurance as required of the Contractor under this Agreement.

9. Right of Inspection and Required Repairs. The City shall have the right to observe and check all ongoing work in sufficient detail to determine if the Services are proceeding satisfactorily. The City shall have the right to inspect all Services completed before accepting them and making payments in accordance with this Agreement, as provided for in the Specifications (**Exhibit A**). Should any portion of the completed Services fail to meet the requirements of the City, the Contractor shall repair or replace items failing to meet requirement until items can be demonstrated to comply.

10. Termination. This Agreement may be terminated by the City under the terms outlined in the Specifications (**Exhibit A**).

11. Insurance. During the period of this Agreement, the Contractor will maintain, at its expense, insurance with limits not less than those prescribed in the Specifications (**Exhibit A**). All insurance must be reviewed and approved by the City **prior to commencement of work.**

12. Bonds. The Contractor shall provide bonds as required by the Specifications (**Exhibit A**) **prior to commencement of work**.

13. Retainage. The Services shall be considered substantially complete when the paving, bridge, drainage, water, sanitary sewer improvements, and lighting improvements are operational through segments 2 &3. All other testing requirements for the project must be met, all punch list items must be addressed to the satisfaction of the inspector assigned to the project and redline drawings and all bond documentation must be submitted to the engineer, to release full retainage. The City will release all or a portion of the retainage for substantially completed portions of the

Services or fully completed and accepted portions of the Services as provided for in the Specifications (**Exhibit A**).

14. Worker's Compensation. The Contractor shall abide by the workers compensation requirements outlined in the Specifications (**Exhibit A**).

15. Independent Contractor. Contractor shall be considered an independent contractor and not an agent, servant, employee, or representative of the City in the performance of the work and Services. No term or provision herein or act of the City shall be construed as changing that status.

16. Compliance with Laws. The Contractor shall comply with all applicable federal, state, and local statutes, regulations, ordinances, and other laws, including, but not limited to the Immigration Reform and Control Act (IRCA).

17. Governing Law and Venue. Venue and governing law shall be as provided for in the Specifications (**Exhibit A**).

18. Arbitration. In the event of a dispute which may arise under this Agreement, the City does not agree to arbitration.

19. Tax Exempt Status. The City is exempt from and shall not pay state and local sales and use taxes on labor and materials incorporated into the Project. If necessary, it is the responsibility of the Contractor to obtain from the State Comptroller's Office a sales tax permit, resale certificate, and exemption certificate that will enable the Contractor to buy any materials for the Services and then resell the aforementioned materials to the City without paying the tax on the materials at the time of purchase.

20. Entire Agreement. This Agreement and its exhibits contain the entire agreement of the parties with respect to the matter contained herein. All provisions of this Agreement shall be strictly complied with and conformed to by the Contractor, and no amendment to the Agreement shall be made except upon the written agreement of the parties, which shall not be construed to release either party from any obligation of the Agreement except as specifically provided for in such amendment.

21. Assignment. This Agreement may not be assigned except as provided for in the Specifications (**Exhibit A**).

22. Governmental Immunity. Unless otherwise required under the law, the Parties agree that the City has not waived its governmental immunity by entering into and performing their obligations under this Agreement.

23. Notice. Any notice provided or permitted to be given under this Agreement must be in writing and may be served by depositing same in the United States mail, addressed to the party to be notified, postage pre-paid and registered or certified with return receipt requested, or by delivering the same in person to such party via a hand-delivery service, Federal Express or any courier service that provides a return receipt showing the date of actual delivery of same, to the address thereof. Notice given in accordance herewith shall be effective upon receipt at the

address of the addressee. For purposes of notification, the addresses of the parties shall be as follows:

If to Contractor, to: _____

_____

_____

_____

If to City, to: City of Lewisville
Attn: Earl Whitaker, Purchasing Manager
151 W. Church Street
Lewisville, Texas 75057

24. Severability. In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof, and this Agreement shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

25. Representations. Each signatory represents this Agreement has been read by the party for which this Agreement is executed and that such party has had an opportunity to confer with its counsel.

26. Miscellaneous Drafting Provisions. This Agreement shall be deemed drafted equally by all parties hereto. The language of all parts of this Agreement shall be construed as a whole according to its fair meaning, and any presumption or principle that the language herein is to be construed against any party shall not apply. Headings in this Agreement are for the convenience of the parties and are not intended to be used in construing this document.

27. Force Majeure. If by reason of Force Majeure, either party hereto shall be rendered unable wholly or in part to carry out its obligations under this Agreement then such party shall give notice and full particulars of Force Majeure in writing to the other party within a reasonable time after occurrence of the event or cause relied upon, and the obligation of the party giving such notice, so far as it is affected by such Force Majeure, shall be suspended during the continuance of the inability then claimed, except as hereinafter provided, but for no longer period, and such party shall endeavor to remove or overcome such inability with all reasonable dispatch. The term Force Majeure as employed herein, shall mean acts of God, strikes, lockouts, or other industrial disturbances, act of public enemy, order of any kind of government of the United States or the State of Texas or any civil military authority, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, or other causes not reasonably within the control of the party claiming such inability.

28. Waiver. No claim or right arising out of a breach of this Agreement can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved.

29. **INDEMNIFICATION. CONTRACTOR AGREES TO DEFEND, INDEMNIFY AND HOLD THE CITY, ITS OFFICERS, AGENTS AND EMPLOYEES, HARMLESS AGAINST ANY AND ALL CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES FOR PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT, SUFFERED BY ANY PERSON OR PERSONS, THAT MAY ARISE OUT OF OR BE OCCASIONED BY CONTRACTOR'S BREACH OF ANY OF THESE TERMS AND CONDITIONS OR BY ANY NEGLIGENT OR STRICTLY LIABLE ACT OR OMISSION, INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER COMMITTED BY OF CONTRACTOR, ITS OFFICERS, AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THIS AGREEMENT; EXCEPT THAT THE INDEMNITY PROVIDED FOR IN THIS PARAGRAPH SHALL NOT APPLY TO ANY LIABILITY RESULTING FROM THE SOLE NEGLIGENCE OR FAULT OF THE CITY, ITS OFFICERS, AGENTS, EMPLOYEES OR SEPARATE CONTRACTORS, AND IN THE EVENT OF JOINT AND CONCURRING NEGLIGENCE OR FAULT OF THE CONTRACTOR AND THE CITY, RESPONSIBILITY AND INDEMNITY, IF ANY, SHALL BE APPORTIONED IN ACCORDANCE WITH THE LAW OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW AND THE CITY'S REASONABLE ATTORNEY'S FEES SHALL BE REIMBURSED IN PROPORTION TO THE CONTRACTOR'S LIABILITY. THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY PERSON OR ENTITY. ANY INDEMNIFICATION AGREED TO BY THE CITY IS ONLY TO THE EXTENT ALLOWED BY LAW.**

    Section A.17 of the Special Specifications outlined in the Specifications (Exhibit A) shall control regarding indemnification of the Engineer, as that term is defined therein.

30. Immigration Reform and Control Act (8 U.S.C. 1324a). The City of Lewisville supports the Immigration Reform and Control Act (IRCA) which is a comprehensive scheme prohibiting the employment of unauthorized aliens in the United States. The Contractor shall submit a declaration signed under penalty of perjury of the laws of the State of Texas stating that it has not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor shall ensure that its Subcontractors submit a declaration signed under penalty of perjury of the laws of the State of Texas stating that they have not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor and

its Subcontractors shall at all times during the term of the contract with the City comply with the requirements of IRCA and shall notify the City within fifteen (15) working days of receiving notice of a violation of IRCA. The City may terminate a contract with the Contractor if the City determines that (a) the Contractor or its Subcontractors have been untruthful regarding IRCA violations in the preceding five (5) years; (b) if the Contractor fails to ensure that its Subcontractors submit the aforementioned declaration; or (c) the Contractor or its Subcontractors fail to timely notify the City of an IRCA violation.

31. ADA Compliance. All goods and services provided to the City must be compliant with the Americans with Disabilities Act and any amendments thereto (the "ADA') and all regulations promulgated pursuant to the ADA. Contractor will be required to certify compliance, if required under the law or otherwise required by the City.

32. Protection of Resident Workers. The City actively supports the Immigration and Nationality Act (INA), which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9) for every worker performing services under the Agreement. The Contractor and its Subcontractors shall establish appropriate procedures and controls so no services or products under the Contract Documents will be performed or manufactured by any worker who is not legally eligible to perform such services or employment. The City reserves the right to audit Contractor's or Subcontractor's employment records to verify the existence of a completed Employment Eligibility Verification Form (I-9) for every worker performing services or manufacturing products under the Contract Documents. The audit will be at the City's expense.

33. Advertising. Contractor shall not advertise or publish, without the City's prior consent, the fact that the Contractor has entered into this Agreement, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal, state or local government.

34. Disclosure. Pursuant to Chapter 176 of the Texas Local Government Code, a person or agent of a person who contracts or seeks to contract with the City of Lewisville must complete a conflict of interest questionnaire if the person or agent has an affiliation or business relationship that might cause a conflict of interest with the City. The conflict of interest questionnaire, which is available online at ethics.state.tx.us, must be filed with the City Secretary of the City of Lewisville no later than the seventh business day after the person or agent begins contract discussions or negotiations with the City of Lewisville or submits to the City of Lewisville an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of Lewisville. An updated conflict of interest questionnaire must be filed in accordance with Chapter 176 of the Local Government Code. An offense under Chapter 176 is a Class C misdemeanor.

Contractor should consult with legal counsel if you have questions regarding its compliance with the requirements of Chapter 176. It is the responsibility of each person or agent who is contracting or seeking to contract with the City of Lewisville to comply with the filing requirement of Chapter 176.

35. Preservation of Contracting Information. In accordance with Section 552.372 of the Texas Government Code, if this Agreement has a stated expenditure of at least $1,000,000.00 in public funds for the purchase of goods or services by the City or results in the expenditure of at least $1,000,000.00 in public funds for the purchase of goods or services by the City during the City's fiscal year, the Contractor shall:

    A. Preserve all contracting information related to this Agreement for the duration of this Agreement;
    B. Promptly provide to the City any contracting information related to this Agreement that is in the custody or possession of the Contractor on request of the City; and
    C. On completion of this Agreement, either:

        i. Provide at no cost to the City all contracting information related to this Agreement that is in the custody or possession of the Contractor, or

        ii. Preserve the contracting information related to this Agreement as follows:
            1. Construction projects: permanently
            2. All other projects: four (4) years following completion of the Agreement.

    For the purposes of this section, "contracting information" shall have the meaning given in Section 552.003 of the Texas Government Code.

    The requirements of Subchapter J, Chapter 552, Government Code, may apply to this contract and the contractor or vendor agrees that the contract can be terminated if the contractor or vendor knowingly or intentionally fails to comply with a requirement of that subchapter.

36. Texas Government Code Chapter 2271. Pursuant to Texas Government Code Chapter 2271, Contractor affirms that execution of this Agreement serves as written verification that Contractor: (1) does not boycott Israel, as defined by Texas Government Code Section 808.001; and (2) will not boycott Israel during the term of the Agreement. This section shall not apply if Contractor employs fewer than ten (10) full-time employees, or if the funds to be paid wholly or partly from public funds of the City under this Agreement are less than $100,000.00.

37. Texas Government Code Chapter 2252. Pursuant to Texas Government Code Chapter 2252, Subchapter F, Contractor affirms, by entering into this Agreement, that is it not identified on a list created by the Texas Comptroller of Public Accounts as a company known to have contracts with or provide supplies or services to Iran, Sudan, or a foreign terrorist organization.

38. Texas Government Code Chapter 2274. Pursuant to Texas Government Code Chapter 2274, Contractor verifies the following:

A. Contractor: (1) does not boycott energy companies, as defined by Texas Government Code Section 809.001; and (2) will not boycott energy companies during the term of this Agreement.

B. Contractor: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, as those terms are defined in that chapter; and (ii) will not discriminate during the term of this Agreement against a firearm entity or firearm trade association.

This section shall not apply if Contractor employs fewer than ten (10) full-time employees, if the funds to be paid wholly or partly from public funds of the City under this Agreement are less than $100,000.00, or if this Agreement is otherwise exempted from the requirements of Texas Government Code Chapter 2274.

(SIGNATURES ON FOLLOWING PAGE)

IN WITNESS, WHEREOF, we, the contracting parties, by our duly authorized agents, hereto affix our signatures as of the date listed above.

CITY OF LEWISVILLE, TEXAS
Approved by the Lewisville City Council _____

By: _____
Claire Powell, City Manager

Date: _____

CONTRACTOR:
[CONTRACTOR NAME]

By: _____

Date: _____

[ADDRESS]

_____
Telephone Number

_____
E-mail Address

_____
Federal Tax ID Number

Attest: _____ Attest: _____
Julie Worster

CITY OF LEWISVILLE
151West Church Street
Lewisville, Texas 75057

APPROVED AS TO FORM:

_____
Lizbeth Plaster, City Attorney

CITY OF LEWISVILLE, TEXAS

CONSTRUCTION AGREEMENT

Project: Corporate Drive Segments 2 & 3 Construction Project No. G1122 & G1123 (the "Project").

This Construction Agreement (the "Agreement") is made on _____, 2023, between the **City of Lewisville** (the "City") and _____ (the "Contractor").

1. Services. The Contractor shall commence and complete the construction of the paving, bridge, drainage, water and sanitary sewer improvements along Corporate Drive Segments 2 & 3, a future collector four lane divided roadway from Railroad Street to east of the Elm Fork Trinity River Bridge (the "Services"), and all extra work, under the terms as stated in the Specifications and Contract Documents for Corporate Drive Segments 2 & 3 Construction Project (the "Specifications"), attached hereto as **Exhibit A**, the Plans of Proposed Roadway Improvements Corporate Drive Segments 2 & 3 Final Plans (the "Plans"), attached hereto as **Exhibit B**, and this Agreement, and at the Contractor's own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the Services, in accordance with the conditions and prices stated in the Contractor's Proposal (the "Proposal") attached hereto as **Exhibit C**, and in accordance with the Specifications (**Exhibit A**) and Plans (**Exhibit B**), as prepared by the City and attached hereto. The Contractor will perform all Services in a good and professional manner and in accordance with industry standards. The Contractor is responsible for constructing a final product that is fully functional and fit for its intended purposes, and meets all requirements set forth in the Agreement, the Specifications (**Exhibit A**), and the Plans (**Exhibit B**). The City will be the sole judge of the acceptability of all work and Services performed under this Agreement.

   The City shall perform such services as outlined in the Specifications (**Exhibit A**), if any.

2. Completion of Services. The Contractor hereby agrees to commence work within ten (10) calendar days after the date of the written notice to commence work and to fully complete the same within **915** consecutive calendar days after the date of the written notice to commence work, subject to such extensions of time as are provided by the Specifications (**Exhibit A**).

3. Agreement Documents. The Agreement shall include the following documents, and this Agreement does hereby expressly incorporate same herein as if set forth verbatim in this Agreement:

   A. This Agreement
   B. The Specifications (**Exhibit A**) and the Plans (**Exhibit B)**
   C. The Proposal (**Exhibit C**)

   To the extent that any exhibit is in conflict with provisions of this Agreement or each other, the provisions of this Agreement, then the provisions of **Exhibit A** and **Exhibit B** jointly, then **Exhibit C** shall prevail in the order, except as specifically provided for in Section 29 of this Agreement.

4. Confidential Information. To the extent allowed by law, the City will safeguard and keep from release any documents marked "proprietary" or information not generally available to the public. However, the City will, if required, comply with all requirements of the Texas Public Information Act with regard to any documents in its possession at the time of a request made under that Act.

5. Pricing. The City agrees to pay the Contractor in current funds the price or prices shown in the Proposal (**Exhibit C**).

6. Payment. Payments will be subject to the terms outlined in the Specifications (**Exhibit A**). The City shall remit payment within thirty (30) days after receipt of an invoice, in accordance with the Texas Prompt Payment Act (Tex. Gov't Code Ch. 2251). All original invoices are to be sent to the City of Lewisville, Attention: AP Division, 151 West Church Street, Lewisville, Texas 75057 or P.O. Box 299002, 75029-9002.

7. Change Orders. Any changes to the Services that change the Agreement price or the Agreement time, as specified herein, must be authorized by the City in writing PRIOR to commencement of said work, as provided for in the Specifications (**Exhibit A**). Any work performed without the City's prior written consent will be at the sole expense of the Contractor.

8. Subcontractors. If subcontractors are used, the subcontractor will be directed and supervised solely by the Contractor, as provided for in the Specifications (**Exhibit A**). The Contractor shall require the subcontractor to hold the same insurance as required of the Contractor under this Agreement.

9. Right of Inspection and Required Repairs. The City shall have the right to observe and check all ongoing work in sufficient detail to determine if the Services are proceeding satisfactorily. The City shall have the right to inspect all Services completed before accepting them and making payments in accordance with this Agreement, as provided for in the Specifications (**Exhibit A**). Should any portion of the completed Services fail to meet the requirements of the City, the Contractor shall repair or replace items failing to meet requirement until items can be demonstrated to comply.

10. Termination. This Agreement may be terminated by the City under the terms outlined in the Specifications (**Exhibit A**).

11. Insurance. During the period of this Agreement, the Contractor will maintain, at its expense, insurance with limits not less than those prescribed in the Specifications (**Exhibit A**). All insurance must be reviewed and approved by the City **prior to commencement of work.**

12. Bonds. The Contractor shall provide bonds as required by the Specifications (**Exhibit A**) **prior to commencement of work**.

13. Retainage. The Services shall be considered substantially complete when the paving, bridge, drainage, water, sanitary sewer improvements, and lighting improvements are operational through segments 2 &3. All other testing requirements for the project must be met, all punch list items must be addressed to the satisfaction of the inspector assigned to the project and redline drawings and all bond documentation must be submitted to the engineer, to release full retainage. The City will release all or a portion of the retainage for substantially completed portions of the

Services or fully completed and accepted portions of the Services as provided for in the Specifications (**Exhibit A**).

14. Worker's Compensation. The Contractor shall abide by the workers compensation requirements outlined in the Specifications (**Exhibit A**).

15. Independent Contractor. Contractor shall be considered an independent contractor and not an agent, servant, employee, or representative of the City in the performance of the work and Services. No term or provision herein or act of the City shall be construed as changing that status.

16. Compliance with Laws. The Contractor shall comply with all applicable federal, state, and local statutes, regulations, ordinances, and other laws, including, but not limited to the Immigration Reform and Control Act (IRCA).

17. Governing Law and Venue. Venue and governing law shall be as provided for in the Specifications (**Exhibit A**).

18. Arbitration. In the event of a dispute which may arise under this Agreement, the City does not agree to arbitration.

19. Tax Exempt Status. The City is exempt from and shall not pay state and local sales and use taxes on labor and materials incorporated into the Project. If necessary, it is the responsibility of the Contractor to obtain from the State Comptroller's Office a sales tax permit, resale certificate, and exemption certificate that will enable the Contractor to buy any materials for the Services and then resell the aforementioned materials to the City without paying the tax on the materials at the time of purchase.

20. Entire Agreement. This Agreement and its exhibits contain the entire agreement of the parties with respect to the matter contained herein. All provisions of this Agreement shall be strictly complied with and conformed to by the Contractor, and no amendment to the Agreement shall be made except upon the written agreement of the parties, which shall not be construed to release either party from any obligation of the Agreement except as specifically provided for in such amendment.

21. Assignment. This Agreement may not be assigned except as provided for in the Specifications (**Exhibit A**).

22. Governmental Immunity. Unless otherwise required under the law, the Parties agree that the City has not waived its governmental immunity by entering into and performing their obligations under this Agreement.

23. Notice. Any notice provided or permitted to be given under this Agreement must be in writing and may be served by depositing same in the United States mail, addressed to the party to be notified, postage pre-paid and registered or certified with return receipt requested, or by delivering the same in person to such party via a hand-delivery service, Federal Express or any courier service that provides a return receipt showing the date of actual delivery of same, to the address thereof. Notice given in accordance herewith shall be effective upon receipt at the

address of the addressee. For purposes of notification, the addresses of the parties shall be as follows:

If to Contractor, to: _____

_____

_____

_____

If to City, to: City of Lewisville
Attn: Earl Whitaker, Purchasing Manager
151 W. Church Street
Lewisville, Texas 75057

24. Severability. In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof, and this Agreement shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

25. Representations. Each signatory represents this Agreement has been read by the party for which this Agreement is executed and that such party has had an opportunity to confer with its counsel.

26. Miscellaneous Drafting Provisions. This Agreement shall be deemed drafted equally by all parties hereto. The language of all parts of this Agreement shall be construed as a whole according to its fair meaning, and any presumption or principle that the language herein is to be construed against any party shall not apply. Headings in this Agreement are for the convenience of the parties and are not intended to be used in construing this document.

27. Force Majeure. If by reason of Force Majeure, either party hereto shall be rendered unable wholly or in part to carry out its obligations under this Agreement then such party shall give notice and full particulars of Force Majeure in writing to the other party within a reasonable time after occurrence of the event or cause relied upon, and the obligation of the party giving such notice, so far as it is affected by such Force Majeure, shall be suspended during the continuance of the inability then claimed, except as hereinafter provided, but for no longer period, and such party shall endeavor to remove or overcome such inability with all reasonable dispatch. The term Force Majeure as employed herein, shall mean acts of God, strikes, lockouts, or other industrial disturbances, act of public enemy, order of any kind of government of the United States or the State of Texas or any civil military authority, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, or other causes not reasonably within the control of the party claiming such inability.

28. Waiver. No claim or right arising out of a breach of this Agreement can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved.

29. **INDEMNIFICATION. CONTRACTOR AGREES TO DEFEND, INDEMNIFY AND HOLD THE CITY, ITS OFFICERS, AGENTS AND EMPLOYEES, HARMLESS AGAINST ANY AND ALL CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES FOR PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT, SUFFERED BY ANY PERSON OR PERSONS, THAT MAY ARISE OUT OF OR BE OCCASIONED BY CONTRACTOR'S BREACH OF ANY OF THESE TERMS AND CONDITIONS OR BY ANY NEGLIGENT OR STRICTLY LIABLE ACT OR OMISSION, INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER COMMITTED BY OF CONTRACTOR, ITS OFFICERS, AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THIS AGREEMENT; EXCEPT THAT THE INDEMNITY PROVIDED FOR IN THIS PARAGRAPH SHALL NOT APPLY TO ANY LIABILITY RESULTING FROM THE SOLE NEGLIGENCE OR FAULT OF THE CITY, ITS OFFICERS, AGENTS, EMPLOYEES OR SEPARATE CONTRACTORS, AND IN THE EVENT OF JOINT AND CONCURRING NEGLIGENCE OR FAULT OF THE CONTRACTOR AND THE CITY, RESPONSIBILITY AND INDEMNITY, IF ANY, SHALL BE APPORTIONED IN ACCORDANCE WITH THE LAW OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW AND THE CITY'S REASONABLE ATTORNEY'S FEES SHALL BE REIMBURSED IN PROPORTION TO THE CONTRACTOR'S LIABILITY. THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY PERSON OR ENTITY. ANY INDEMNIFICATION AGREED TO BY THE CITY IS ONLY TO THE EXTENT ALLOWED BY LAW.**

    Section A.17 of the Special Specifications outlined in the Specifications (Exhibit A) shall control regarding indemnification of the Engineer, as that term is defined therein.

30. Immigration Reform and Control Act (8 U.S.C. 1324a). The City of Lewisville supports the Immigration Reform and Control Act (IRCA) which is a comprehensive scheme prohibiting the employment of unauthorized aliens in the United States. The Contractor shall submit a declaration signed under penalty of perjury of the laws of the State of Texas stating that it has not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor shall ensure that its Subcontractors submit a declaration signed under penalty of perjury of the laws of the State of Texas stating that they have not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor and

its Subcontractors shall at all times during the term of the contract with the City comply with the requirements of IRCA and shall notify the City within fifteen (15) working days of receiving notice of a violation of IRCA. The City may terminate a contract with the Contractor if the City determines that (a) the Contractor or its Subcontractors have been untruthful regarding IRCA violations in the preceding five (5) years; (b) if the Contractor fails to ensure that its Subcontractors submit the aforementioned declaration; or (c) the Contractor or its Subcontractors fail to timely notify the City of an IRCA violation.

31. ADA Compliance. All goods and services provided to the City must be compliant with the Americans with Disabilities Act and any amendments thereto (the "ADA') and all regulations promulgated pursuant to the ADA. Contractor will be required to certify compliance, if required under the law or otherwise required by the City.

32. Protection of Resident Workers. The City actively supports the Immigration and Nationality Act (INA), which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9) for every worker performing services under the Agreement. The Contractor and its Subcontractors shall establish appropriate procedures and controls so no services or products under the Contract Documents will be performed or manufactured by any worker who is not legally eligible to perform such services or employment. The City reserves the right to audit Contractor's or Subcontractor's employment records to verify the existence of a completed Employment Eligibility Verification Form (I-9) for every worker performing services or manufacturing products under the Contract Documents. The audit will be at the City's expense.

33. Advertising. Contractor shall not advertise or publish, without the City's prior consent, the fact that the Contractor has entered into this Agreement, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal, state or local government.

34. Disclosure. Pursuant to Chapter 176 of the Texas Local Government Code, a person or agent of a person who contracts or seeks to contract with the City of Lewisville must complete a conflict of interest questionnaire if the person or agent has an affiliation or business relationship that might cause a conflict of interest with the City. The conflict of interest questionnaire, which is available online at ethics.state.tx.us, must be filed with the City Secretary of the City of Lewisville no later than the seventh business day after the person or agent begins contract discussions or negotiations with the City of Lewisville or submits to the City of Lewisville an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of Lewisville. An updated conflict of interest questionnaire must be filed in accordance with Chapter 176 of the Local Government Code. An offense under Chapter 176 is a Class C misdemeanor.

Contractor should consult with legal counsel if you have questions regarding its compliance with the requirements of Chapter 176. It is the responsibility of each person or agent who is contracting or seeking to contract with the City of Lewisville to comply with the filing requirement of Chapter 176.

35. Preservation of Contracting Information. In accordance with Section 552.372 of the Texas Government Code, if this Agreement has a stated expenditure of at least $1,000,000.00 in public funds for the purchase of goods or services by the City or results in the expenditure of at least $1,000,000.00 in public funds for the purchase of goods or services by the City during the City's fiscal year, the Contractor shall:

    A. Preserve all contracting information related to this Agreement for the duration of this Agreement;
    B. Promptly provide to the City any contracting information related to this Agreement that is in the custody or possession of the Contractor on request of the City; and
    C. On completion of this Agreement, either:

        i. Provide at no cost to the City all contracting information related to this Agreement that is in the custody or possession of the Contractor, or

        ii. Preserve the contracting information related to this Agreement as follows:
            1. Construction projects: permanently
            2. All other projects: four (4) years following completion of the Agreement.

    For the purposes of this section, "contracting information" shall have the meaning given in Section 552.003 of the Texas Government Code.

    The requirements of Subchapter J, Chapter 552, Government Code, may apply to this contract and the contractor or vendor agrees that the contract can be terminated if the contractor or vendor knowingly or intentionally fails to comply with a requirement of that subchapter.

36. Texas Government Code Chapter 2271. Pursuant to Texas Government Code Chapter 2271, Contractor affirms that execution of this Agreement serves as written verification that Contractor: (1) does not boycott Israel, as defined by Texas Government Code Section 808.001; and (2) will not boycott Israel during the term of the Agreement. This section shall not apply if Contractor employs fewer than ten (10) full-time employees, or if the funds to be paid wholly or partly from public funds of the City under this Agreement are less than $100,000.00.

37. Texas Government Code Chapter 2252. Pursuant to Texas Government Code Chapter 2252, Subchapter F, Contractor affirms, by entering into this Agreement, that is it not identified on a list created by the Texas Comptroller of Public Accounts as a company known to have contracts with or provide supplies or services to Iran, Sudan, or a foreign terrorist organization.

38. Texas Government Code Chapter 2274. Pursuant to Texas Government Code Chapter 2274, Contractor verifies the following:

A. Contractor: (1) does not boycott energy companies, as defined by Texas Government Code Section 809.001; and (2) will not boycott energy companies during the term of this Agreement.

B. Contractor: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, as those terms are defined in that chapter; and (ii) will not discriminate during the term of this Agreement against a firearm entity or firearm trade association.

This section shall not apply if Contractor employs fewer than ten (10) full-time employees, if the funds to be paid wholly or partly from public funds of the City under this Agreement are less than $100,000.00, or if this Agreement is otherwise exempted from the requirements of Texas Government Code Chapter 2274.

(SIGNATURES ON FOLLOWING PAGE)

IN WITNESS, WHEREOF, we, the contracting parties, by our duly authorized agents, hereto affix our signatures as of the date listed above.

CITY OF LEWISVILLE, TEXAS
Approved by the Lewisville City Council _____

By: _____
Claire Powell, City Manager

Date: _____

CONTRACTOR:
[CONTRACTOR NAME]

By: _____

Date: _____

[ADDRESS]

_____
Telephone Number

_____
E-mail Address

_____
Federal Tax ID Number

Attest: _____ Attest: _____
Julie Worster

CITY OF LEWISVILLE
151West Church Street
Lewisville, Texas 75057

APPROVED AS TO FORM:

_____
Lizbeth Plaster, City Attorney

STANDARD SPECIFICATIONS

The Standard Specifications for this project are the "Public Works Construction Standards" (Fifth Edition 2017) as published under the authority of the North Central Texas Council of Governments.

A. Special Provisions to the General Provisions of the Standard Specifications:

1. Technical specifications (Special Specifications), if included, in the Contract document package shall supersede the standard specifications.
2. Prospective offerors may submit a request in the *Messages* section in the project's Bonfire portal for clarification and alterations in the plans, specifications, and form of contract. Such request must be received by the City no later than the questions due date specified on the project calendar in Bonfire. The City will be the sole judge as to the necessity to an addendum or letter of clarification. Oral statements shall in no way be considered as part of the contract and will not be considered as binding.
3. Five (5) sets of the contract documents, exclusive of the "Public Works Construction Standards" referenced above will be furnished without charge to the CONTRACTOR for construction purposes. Additional copies may be obtained from the City at actual reproduction cost.
4. **Item 102.3 Examination of Plans, Specifications and Site of the Work:** Add the following paragraph after Paragraph 2:

   In preparation of Drawings and Specifications, The ENGINEER has established and relied upon the following reports of exploration and test of subsurface conditions at the site of the work: Report dated November 6, 2018, prepared by Alpha Testing, Inc., Fort Worth, Texas entitled: "Geotechnical Exploration – Corporate Drive Extension". The technical data contained in such report is the log of borings shown for Borings B-1 through B-21 provided in the Appendix of the report and it represents the conditions only at the point of the borings at the time the borings were made and furnished for general information only. Report dated January 28, 2019, prepared by Alpha Testing, Inc., Fort Worth, Texas entitled: "Geotechnical Exploration – Corporate Drive Extension – Bridge Foundations and Abutments". The technical data contained in such report is the log of borings shown for Borings B-1 through B-10 provided in the Appendix of the report and it represents the conditions only at the point of the borings at the time the borings were made and furnished for general information only. Report dated June 13, 2019, prepared by Alpha Testing, Inc., Fort Worth Texas entitled: "Geotechnical Investigation – Corporate Drive Extension-Global Stability Analysis". The technical report contains supplemental design information for global stability of the bridge abutments and roadway embankments. Report dated December 6, 2022, prepared by Terracon Consultants, Inc., Dallas, Texas entitled: "Geotechnical Engineering Report – Lewisville Corporate Drive Segment 4". The technical data contained in such report is the log of borings shown for Borings R-1 through R-2 provided in the Appendix of the report and it represents the conditions only at the point of the borings at the time the borings were made and furnished for general information

only. A copy of these reports is included in these documents. Variations from the conditions indicated by the borings shall not be used as a basis for a claim of changed conditions.

The CONTRACTOR may take borings at the site to satisfy his self as to subsurface conditions prior to bidding.

5. **Item 102.4. Preparation of Proposa**l: Sentence 4 shall be changed to read: "In the cases of discrepancy between unit prices and amounts, the unit price shown in figures shall stand and the amount and total will be adjusted to correspond to the unit price shown".

6. **Item 103.3.1.1. Performance Bonds:** Paragraph (a) Performance Bond. The last sentence of this paragraph is hereby deleted and replaced with: This Bond shall provide for the repair and/or replacement of all defects due to faulty materials and workmanship that appears within a period of two years from the date of acceptance of the improvements project by the Lewisville City Council.

7. **Item 103.3.3. Sureties: The following applies to Surety Bonds**:

Texas Government Code Title 10, Chapter 2253

"(d) A bond required by this section must be executed by corporate surety in accordance with Chapter 3503, Texas Insurance Code."

Texas Insurance Code Section 3503.005. Additional Requirements for Certain Bonds

"(a) A bond that is made, given, tendered, or filed under Chapter 53, Property Code, or Chapter 2253, Government Code, may be executed only by a surety company that is authorized to write surety bonds in this state. If the amount of the bond exceeds $100,000, the surety company must also:

(1) hold a certificate of authority from the United States secretary of the treasury to qualify as a surety on obligations permitted or required under federal law; or
(2) have obtained reinsurance for any liability in excess of $100,000 from a reinsurer that:
    (A) is an authorized reinsurer in this state; and
    (B) holds a certificate of authority from the United States secretary of the treasury to qualify as a surety or reinsurer on obligations permitted or required under federal law.

"(b) To determine whether the surety on the bond or the reinsurer holds a certificate of authority from the United States secretary of the treasury, a party may conclusively rely on the list published in the Federal Register by the United States Department of the Treasury, covering the date on which the bond was executed, of the companies holding certificates of authority as acceptable sureties on federal bonds and as acceptable reinsuring companies. A purchaser, insurer of title, or lender acquiring or insuring an interest in or title to real property may also conclusively rely on, and is protected by, a statement on a recorded bond or a sworn, recorded statement by the surety that refers to the specific

recorded bond and states that, at the time the bond was executed, the surety complied with Subsection (a)(1) or (2)."

8. **Item 103.4. Insurance**: delete and replace with the following:

Vendor shall procure and maintain for the duration of the contract, insurance against claims for injuries to persons or damages to property, which may arise from or in connection with the performance of the work hereunder by the vendor, his agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Vendor's bid.

A. <u>MINIMUM SCOPE OF INSURANCE</u>

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage "occurrence" form CG 00 01 (10 01). "**Claims Made" form is unacceptable.**

2. Workers' Compensation insurance as required by the Labor Code of the State of Texas, including Employers' Liability Insurance.

3. Automobile Liability – as required by the State of Texas, covering all owned, hired, or non-owned vehicles. Automobile Liability is only required if vehicle(s) will be used under this contract. Coverage not required for delivery services.

B. <u>MINIMUM LIMITS OF INSURANCE</u>

Vendor shall maintain throughout contract limits not less than:

1. Commercial General Liability: $500,000 per occurrence/$1,000,000 aggregate for bodily injury, personal injury and property damage. Policy will include coverage for:

a. Premises – Operations

b. Broad Form Contractual Liability

c. Products and Completed Operations

d. Use of Contractors and Subcontractors

e. Personal Injury

f. Broad Form Property Damage

g. If applicable, Explosion Collapse and Underground (XCU) Coverage, Fire Damage, and Medical Expenses.

NOTE: The aggregate loss limit applies to each project.

2. Workers' Compensation and Employer's Liability: Workers' Compensation Statutory limits as required by the Labor Code of the State of Texas and Employer's Liability minimum limits of $500,000 per injury, $500,000 per occurrence, and $500,000 per occupational disease.

3. Automobile Liability - $500,000 Combined Single Limit. Limits can only be reduced if approved by the HR Director or designee.

4. Builders' Risk Insurance (as applicable) – Completed value form, insurance carried must equal the completed value of the structure.

C. DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductible or self-insured retentions must be declared to and approved by the City.

D. OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain the following provisions:

1. General Liability and Automobile Liability Coverages

a. The City, its officers, officials, employees, boards/commissions and volunteers are to be added as "Additional Insured" as respects liability arising out of activities performed by or on behalf of the vendor, products and completed operations of the vendor, premises owned, occupied or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the City, its officers, officials, employees or volunteers. It is understood that the business auto policy under "Who is an Insured" automatically provides liability coverage in favor of the City. The coverage shall include defense of claims against the City as additional insured.

b. The vendor's insurance coverage shall be primary and non-contributory insurance as respects the City, its officers, officials, employees and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees or volunteers shall be excess of the vendor's insurance and shall not contribute with it.

c. Any failure to comply with reporting provisions of the policy shall not affect coverage provided to the City, its officers, officials, and employees, Boards and Commissions or volunteers.

d. The vendor's insurance shall apply separately to each insured against whose claim is made or suit is brought, except to the limits of the insured's liability.

2. Waiver of Subrogation – All coverages
Each insurance policy required by this exhibit shall waive all rights of subrogation against the City, its officers, officials, employees, and volunteers for losses arising from work performed by the vendor for the City.

3. Notice of Cancellation - All Coverages
Each insurance policy required by this exhibit shall be endorsed to state that coverage shall not be suspended, voided, canceled or non-renewed by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given the City, or ten (10) days prior written notice for non-payment of premium.

E. ACCEPTABILITY OF INSURERS

The City prefers that Insurance be placed with insurers with an A.M. Best's rating of no less than **A-:VI, or A or better** by Standard and Poors.

F. VERIFICATION OF COVERAGE

Contractor shall furnish the City with certificates of insurance affecting coverage required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Certificates of Insurance must be provided on forms approved by the Texas Department of Insurance. City will not accept Memorandums of Insurance or Binders as proof of insurance. The City reserves the right to require complete, certified copies of all required insurance policies at any time.

G. HOLD HARMLESS AND INDEMNIFICATION

THE CONSULTANT/CONTRACTOR AGREES TO DEFEND, INDEMNIFY AND HOLD THE CITY, ITS OFFICERS, AGENTS AND EMPLOYEES, HARMLESS AGAINST ANY AND ALL CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES FOR PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT, SUFFERED BY ANY PERSON OR PERSONS, THAT MAY ARISE OUT OF OR BE OCCASIONED BY CONSULTANT'S/CONTRACTOR'S BREACH OF ANY OF THESE TERMS AND CONDITIONS OR BY ANY NEGLIGENT OR STRICTLY LIABLE ACT OR OMISSION OR INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER COMMITTED BY, CONSULTANT/CONTRACTOR, ITS OFFICERS, AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THIS AGREEMENT; EXCEPT THAT THE INDEMNITY PROVIDED FOR IN THE PARAGRAPH SHALL NOT APPLY TO ANY LIABILITY RESULTING FROM THE SOLE

NEGLIGENCE OR FAULT OF THE CITY, ITS OFFICERS, AGENTS, EMPLOYEES OR SEPARATE CONTRACTORS, AND IN THE EVENT OF JOINT AND CONCURRING NEGLIGENCE OR FAULT OF THE CONSULTANT/CONTRACTOR AND THE CITY, RESPONSIBILITY AND INDEMNITY, IF ANY, SHALL BE APPORTIONED IN ACCORDANCE WITH THE LAW OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW AND THE CITY'S REASONABLE ATTORNEY'S FEES SHALL BE REIMBURSED IN PROPORTION TO THE CONSULTANT'S LIABILITY. THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY OTHER PERSON OR ENTITY.

H. PROOF OF INSURANCE

Contractor is required to submit proof of insurance on a form acceptable to the City of Lewisville. Certificates of Insurance similar to the ACCORD form are acceptable. City will not accept Memorandums of Insurance or Binders as proof of insurance. City, at its own discretion, may require a copy of any policy presented to the City.

I. STATE REQUIREMENTS FOR WORKERS COMPENSATION INSURANCE

As required by 28 Tex.Admin.code §110.110(c)(7):

A. Definitions:

Certificate of coverage ("certificate")- A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (DWC-81, DWC-82, DWC-83, or DWC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project - includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.

Persons providing services on the project ("subcontractor" in §406.096) - includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project.

"Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

B. The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the contractor providing services on the project, for the duration of the project.

C. The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

D. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

E. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

(1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(2) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

G. The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.

H. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Department of Insurance, Division of Workers' Compensation, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

I. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:

(1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory

requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project;

(2) provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;

(3) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(4) obtain from each other person with whom it contracts, and provide to the contractor:

(a) a certificate of coverage, prior to the other person beginning work on the project; and

(b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(7) contractually require each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.

J. By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

K. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the

contract void if the contractor does not remedy the breach within ten days after receipt of notice of breach from the governmental entity.

9. **Item 105.1.1. Priority of Contract Documents** is revised as follows: Insert the words "addenda (last over first)" between "Proposal" and "Special Provision".

10. **Item 105.1.3. Contract Drawings and Specifications**: Obtaining copies of NCTCOG Public Works Construction Standards is the responsibility of the CONTRACTOR.

11. **Item 105.2.2. Special Warranty**: The first sentence of this paragraph is hereby deleted and replaced with:
"If within two years after the final acceptance of the work by the OWNER, as evidenced by the final certificate of acceptance or within a longer or shorter period of time as may be prescribed by law or by the terms of any other special warranty on designated equipment, any of the work is found to be defective or not in accordance with the contract documents, the CONTRACTOR shall correct it promptly after receipt of a written notice from the OWNER to do so".

12. **Special Provision to Item 105.3. Shop Drawings, Product Data and Samples**: add the following:
"Review of Shop Drawings by the CITY and/or ENGINEER shall be for the sole purpose of determining the sufficiency of said drawings or schedules to result in finished improvements in conformance with the plans and specifications, and shall not relieve the CONTRACTOR of his duty as an independent contractor. It being understood and agreed that the Engineer does not assume any duty to pass upon the propriety or adequacy of such drawings or schedules or any means or methods reflected thereby in relation to the safety of either person or property during the contractor's performance hereunder."

13. **Special Provision to Item 105.4. "Construction Stakes":** is amended to the extent that the ENGINEER will provide initial horizontal and vertical control and construction staking for this project. The ENGINEER will provide the following construction staking:

    a. Verify and re-establish the design baseline and monuments set for horizontal and vertical control.

    b. Provide offset line and grade stakes at a minimum of 100-foot intervals for tangents, and at 50-foot intervals for curves. The ENGINEER will provide clearing limits, offset line and grade stakes for pavement back of curb (rough and final cut), storm drain and water lines as applicable, including appurtenances. The offset distance shall be determined by the CONTRACTOR. Lost or destroyed stakes will be replaced at the CONTRACTOR'S expense. A minimum of five (5) days notice must be given before staking.

    The CONTRACTOR shall provide any additional stakes and other materials and incidentals necessary for the correct construction of all facilities at no additional charge. It is the

CONTRACTOR'S sole responsibility to ensure the correctness of all stakes and that the work is constructed to the lines and grades shown on the plans.

14. **Item 105.6 Supervision by Contractor:** The CONTRACTOR shall designate a **full-time superintendent who shall be on the job site at all times during construction including times when work is being performed by subcontractors**. The OWNER'S Representative will communicate only with the superintendent. The CONTRACTOR may replace the designated superintendent by written notification to the OWNER.

15. **Special Provision to Item 105.7.1. Authority of the Engineer**: add the following:

    "The Engineer shall make periodic visits to the site to familiarize himself generally with the progress of the executed work and to determine if such work generally meets the essential performance and design features and the technical and functional engineering requirements of the Contract Documents; provided and except, however, that the Engineer shall not be responsible for making any detailed, exhaustive, comprehensive or continuous on-site inspection of the quality or quantity of the work or be in any way responsible, directly or indirectly, for the construction means, methods, techniques, sequences, quality, procedures, programs, safety precautions or lack of same incident thereto or in connection therewith. Notwithstanding any other provision of this agreement or any other Contract Document, the Engineer shall not be in any way responsible or liable for any acts, errors, omissions or negligence of the CONTRACTOR, any subcontractor or any of the CONTRACTOR'S or sub-contractor's agents, or employees or any other person, firm or corporation performing or attempting to perform any of the work."

16. **Item 106.5: Samples and Tests of Materials:** Delete the first and last paragraphs on Item 106.5 and replace with the following:

    "The CONTRACTOR shall engage the services of an acceptable testing laboratory company to perform all required testing services. The CONTRACTOR (not the OWNER) shall pay all costs for these services, including any retesting after failure to pass tests. The CONTRACTOR shall obtain OWNER'S acceptance of the testing laboratory before having the services performed."

    Written reports of tests and engineering data furnished by CONTRACTOR for OWNER'S review shall be submitted as specified in Item 105.3, "Shop Drawings, Product Data and Samples" and as modified by the Special Specifications.

17. **Special Provisions to Item 107.3. Indemnification**: delete Item 107.3. in its entirety and substitute the following:

    "The CONTRACTOR and his sureties shall indemnify, defend and save harmless the OWNER and all of their officers, agents and employees, Engineer and all of its officers and employees from all suits, actions or claims of any character, name and description brought for or on account of any injuries, including death or damages received or sustained by any person, persons or property on account of the operations of the CONTRACTOR, his agents, employees or subcontractors; or on account of any negligent act or fault of the CONTRACTOR, his agents, employees or subcontractors in the execution of said contract; or on account of the failure of the CONTRACTOR to provide the necessary barricades,

warning lights or signs; and shall be required to pay any judgment, with cost, which may be obtained against the OWNER or Engineer growing out of such injury, including death or damage."

18. **Item 107.12. Supervision and Construction Procedures**: The CONTRACTOR'S attention is drawn to paragraphs 1 and 4 of this item and paragraphs 1 and 3 of Item 105.6.

19. **Item 107.25. Project Clean-Up**: All objectionable surplus and waste material due to construction shall be removed from the site at the CONTRACTOR'S expense.

20. **Item 108.1. Progress Schedule**: add the following paragraph:

    "The CONTRACTOR shall submit to the OWNER a construction schedule setting out items of construction, road closings, detours, utility interruptions, limits, times and actual dates. If the schedule is acceptable to the OWNER, the OWNER will approve it; if the schedule is unacceptable, it will be returned to the CONTRACTOR for revision and resubmittal. If the CONTRACTOR wants to deviate from the approved schedule, he must submit a revised schedule to the OWNER for consideration. The entire work shall be prosecuted in a continuous manner in accordance with the approved schedule. Proposed stockpile locations must be approved by the OWNER prior to depositing material. The CONTRACTOR shall update this schedule on a monthly basis."

21. **Item 108.5. Subcontracts**: add the following paragraph:

    "The CONTRACTOR shall perform with his own organization and with the assistance of workmen under his immediate superintendence, work of a value not less than 50 percent of the value of all work embraced in the contract exclusive of items not commonly found in contract for similar work and exclusive of items that require highly specialized knowledge, craftsman and/or equipment not ordinarily available in the organization of CONTRACTORS performing work of the character embraced in the contract". For the purpose of evaluating the percentage of work performed by subcontractors, the cost of all equipment, supplies, and materials used or installed on the project by subcontractors shall be considered as part of the work of subcontractors. This will apply even if the contractor supplies and pays for some or all equipment, supplies, or materials used by subcontractors.

22. **Item 108.8. Delays; Extension of Time; Liquidated Damages**: Delete the first paragraph of Section 108.8. and replace with the following:

    "The CONTRACTOR hereby agrees that no work will be performed on CITY holidays or on Sundays. In addition, he agrees that work will be performed between 7:00 a.m. and sunset on weekdays and between 8:00 a.m. and 6:00 p.m. on Saturdays. The only exception to the preceding will be the performance of work in response to emergency situations and/or when directed to work by the OWNER. Also, the CONTRACTOR hereby concurs that the preceding has been taken into account in setting the contract time." The CONTRACTOR will be responsible for reimbursing the City of Lewisville for overtime charges for construction inspection services on Saturdays, Sundays and all City holidays. The overtime charges will be $118.80 per hour and a minimum of four (4) hours will be charged for each occurrence of such service. The overtime charges will be billed on a monthly basis. Failure

to pay for these services will result in delaying the final acceptance and payment.

"The CONTRACTOR shall be entitled to an extension of working time under this contract only when claim for such extension is submitted to the OWNER in writing by the CONTRACTOR within seven days from and after the time when any alleged cause of delay shall occur; and then only when such time is approved by the OWNER. In adjusting the working time for the completion of the project, the OWNER will consider delays due to acts of God, or the public enemy, acts of the OWNER, fires, floods, epidemics and quarantine restrictions. The OWNER may, but is not obligated to, take into account any unforeseeable causes of delay which the OWNER considers beyond the control and without the fault or negligence of the CONTRACTOR. It is anticipated that during the course of the contract, inclement weather (rain or freezing temperatures) will hinder or prevent work. The contract time has been established assuming that up to 20% of the contract days will be inclement weather days, during which no work can be performed. No extension of time will be granted for such inclement weather days. The OWNER may grant an extension of time for inclement weather days beyond 20% of the contract time, but is under no obligation to do so."

23. **Item 109.3. Payment for Extra Work**: Replace the first sentence of 109.3.1. General; with the following:

    "No work shall be undertaken which requires extra payment without having executed a change order or field change approved by the CONTRACTOR and the OWNER, except when specifically ordered to do so in writing."

24. **Item 109.5. Monthly Estimate, Partial Payments, Retainage, Final Inspection, Acceptance and Final Payment**

    Delete from the first paragraph of 109.5.1: "The monthly estimate may include acceptable non-perishable materials delivered to the work; such payment shall be allowed on same percentage basis of the net invoice value as provided hereinafter."

    Add in its place, the following:

    The OWNER will pay for materials on hand only under the following conditions:

    a. The CONTRACTOR shall provide proof of payment for the materials.

    b. The materials shall be secured in a manner acceptable to the OWNER.

    c. Payment will not be made for small items, and other items not easily measured.

    d. No payment will be made for small quantities of material on hand (less than 0.5 percent of the contract amount).

    e. No payment for materials on hand will be made for items such as paint, mastics, cement, and other similar materials.

25. Delays associated with delivery of materials of appurtenances by the manufacturers will not be considered for any extension of contract time. It shall be the sole responsibility of the CONTRACTOR to ensure that the materials are manufactured and delivered on time.

B. Special Provisions to the Materials and Construction Methods of the Standard Specifications:

Only items in the Proposal are Pay Items. Other specification items will be complied with; however, their measurement and payment provisions are hereby deleted.

The price bid shall cover all work required by the Contract Documents. All costs in connection with the proper and successful completion of the work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plant, equipment, and tools; and performing all necessary labor and supervision to fully complete the work, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item in the Proposal shall be considered a subsidiary obligation of the CONTRACTOR and all costs in connection therewith shall be included in the prices bid.

Work that is subsidiary to pay items includes, but is not limited to the following: protection, adjustment, maintenance, repair or replacement of all underground public or franchise utilities and services, whether shown on the plans or not; cutting and removing and plugging existing utilities, as required; crushed stone base, embedment sand; modified flowable backfill; pipe fittings; bends; joint restraint and thrust blocks; valve stack risers, concrete valve boxes; valve extensions; grouting abandoned waterlines; cutting and plugging waterlines as required; removal or abandonment of existing valves; removal of existing fire hydrant assembly; delivery of salvaged items to 1100 North Kealy Avenue; maintaining water and sanitary sewer service to all adjacent properties; adjustment of the existing water line to avoid conflicts; trench dewatering; preventive measures of pipe flotation; installation of temporary orange polyethylene construction fencing adjacent to residences and businesses in construction areas as required; removal of existing thrust blocks; repair and replacement of landscape irrigation systems damaged during construction by a licensed irrigator; topsoil and sodding in areas outside of pay limits; placement of sod in all remaining disturbed areas after contract time has expired; concrete and/or asphalt pavement replacement (in areas outside of pay limits damaged by contractor); protection against flooding; removal of waste material from the site; replacement of property markers or monuments disturbed; sawcut and removal of existing pavement; replacement of damaged fences; clean up; additional traffic control not in plans including message boards; temporary asphalt pavement; replacement of existing traffic buttons and striping; miscellaneous grading; all other work required to complete the project and restore the areas of construction to their preconstruction condition; disposal of heavily chlorinated water main flushing water and all required testing of all the of the components of the project.

CONTRACTOR TO FURNISH COST BREAKDOWN

The CONTRACTOR shall furnish the City with a breakdown of any lump sum bid suitable for use in the preparation of progress estimates of the job to make partial payments on that lump sum item. Such a breakdown shall be in sufficient detail so as to permit its use in a manner satisfactory to the City. The breakdown shall not be unbalanced. Progress payments for materials on hand and equipment delivered will be based on invoices. The City will not recommend approval of a progress estimate for payment until a satisfactory cost breakdown of the project has been submitted by the CONTRACTOR.

Special provisions to the materials and construction methods of the Standard Specifications as applicable to the Proposal Pay Items are as follows:

1. Payment for "Start-Up" shall be on a lump sum basis. The amount bid for these items shall not exceed five (5) percent of the Total Amount Bid. If the bid for these items exceeds 5% of the total amount bid, the amount in excess of 5% shall be paid on the project progress estimates throughout the duration of the project, with the amount determined by the percent complete on all other bid items for the project.

2. Payment for "Traffic Control" shall be on a lump sum basis. This pay item shall consist of designing, furnishing, installing, maintaining, and removing the required traffic control devices during each phase of construction in accordance with the approved traffic control plan and TMUTCD. Inclusive with this pay item is the requirement for adequate notification and instruction to be given to adjacent businesses and property owners and to the traveling public regarding interruptions or changes to established traffic flow patterns to, from and along the work site.

   The CONTRACTOR shall submit a Traffic Control Plan to the City for approval prior to beginning work. Any traffic control items necessary for safe facilitation of vehicular and pedestrian traffic shall be furnished by the contractor. This item shall include detours, barrels, panels, arrow boards, removing striping, temporary lane lines and/or markers, construction signing and barricades, construction pavement markers, temporary asphalt, message boards and all other work required to provide for passage of vehicular traffic for all phases of construction.

   Two-way traffic on the roadways must be maintained at all times during construction. Access must be maintained at all times to all houses and businesses. If necessary, CONTRACTOR must furnish flagmen to direct traffic through work zone at no additional compensation. Any temporary asphalt or flex base necessary to maintain proper lane configurations and transitions is subsidiary to this item. Store all materials and equipment not in use in a manner and at locations that will not interfere with the safe passage of traffic. The amount bid for this item shall be paid over the duration of the project with the amount paid on each monthly progress estimate determined by the percent complete on all other bid items.

3. Surveying and Construction Staking includes all survey work required for construction of the project except the initial one-time only, setting of alignment stakes by the ENGINEER as shown on page SS-9, Item 13, Special provision to Item 105.4. Construction Stakes. The CONTRACTOR shall offset alignment stakes and benchmarks as required to ensure that they are protected during construction. This work shall be subsidiary to all the other bid items.

4. Payment for "Prepare Right-of-Way" shall be per 100-foot station (STA) as measured along centerline of streets right-of-way from beginning of street paving to end of street paving. It will include the area within the right-of-way and easement limits shown on the plans. Work shall include, but not be limited to: all obstructions above ground or below such as trees, shrubs, stumps, brush, roots, vegetation, logs, trash concrete, concrete driveways, culverts, curb and gutter, asphalt pavement, fences, structures, foundations, lumber, scrap metal, abandoned appliances, sprinkler systems, abandoned utility pipes or

conduits and any other items not included as pay items elsewhere in the contract documents but necessary for the preparation of the easement and/or permanent or temporary easements for construction. The maintenance/relocation of street signs shall be considered as part of this item. This item shall also include the protection of any trees, shrubs, fences, structures, signs or other items that are to be preserved and/or relocated as shown on the plans. This pay item will also include removal of improvements or obstructions not specifically provided for in other pay items of the bid proposal. This pay item will include the installation and removal of temporary orange construction fencing along wetland boundaries and at other locations as indicated in the plans. This pay item will include the temporary relocation and reinstallation of mailboxes. If necessary, the CONTRACTOR shall coordinate with the U.S. Postal Service to ensure uninterrupted mail service to each property. All materials removed shall be properly disposed of offsite in a timely manner. **Disposal of materials in the City of Lewisville City limits must be taken to Republic Services.**

5. Payment for "Sawcut and Remove Concrete Flatwork" shall be made on the basis of the price bid per square foot (SF) and shall include the cost of sawcutting, removing and disposing off-site the existing pavements, curb and gutter, driveways, alleys, sidewalks, concrete-lined channel and riprap. Flatwork shall be neatly sawcut along straight lines as shown on the plans and to the nearest joint.
6. Payment for "Sawcut and Remove Curb and Gutter" shall be made on the basis of the price bid per linear foot (LF) and shall include the cost of sawcutting, removing and disposing off-site the existing pavements. Curb and Gutter shall be neatly sawcut full depth along straight lines as shown on the plans.
7. Payment for "Remove Gravel Pavement" shall be made on the basis of the price bid per square foot (SF) and shall include the cost of removing and disposing off-site the existing pavements.
8. Payment for "Remove Fences (All Types)" shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for removal, disposal and furnishing all labor, materials, equipment, backfill, and any other incidentals necessary to complete the work.
9. Payment for "Install Barbed Wire Fence" shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for installation complete in place and furnishing of all labor, materials, equipment, backfill, and any other incidentals necessary to complete the work. Fencing shall be replaced to the right of way line or as shown on the plans. All fencing material shall be of equal or better quality materials. New fences shall match the character, style, dimensions and color of the existing fence. Temporary fencing shall be installed as required. Cost of temporary fencing is incidental to contract bid items. CONTRACTOR shall notify the property owner a minimum of 72 hours in advance of fence removal.
10. Payment for "Remove Headwall (for 4'x3' Box Culvert)" shall be made on the basis of the price bid per each (EA) and shall be total compensation for removal, disposal and furnishing all labor, materials, equipment, backfill, and any other incidentals necessary to complete the work.

11. Payment for "Unclassified Excavation" shall not be measured for payment. Payment will be made using the plan quantities given in the Bid Proposal. The CONTRACTOR shall be satisfied as to the amount of work involved prior to submitting the bid. All street excavation, channel excavation, grading embankment, and wasting of surplus and unsuitable material are subsidiary to this bid item. All work associated with excavating for the proposed roadway improvements shall be in accordance with NCTCOG Item 203.2 "Unclassified Excavation". Excess material suitable as fill shall be placed within the areas where fill material is required for this project. **There shall be no compensation for any quantities in addition to what is provided in the bid documents unless the lines and grades are changed by the Engineer.**

12. Payment for "Borrow from Mitigation Site" shall be made on the basis of the price per cubic yard of required unclassified excavation, removal, and proper utilization of materials obtained from an approved mitigation site in place to the limits of construction as shown on the plans and the cross-section provided with the Bid documents. There shall be no compensation for any quantities in addition to what is provided in the Bid documents unless the lines and grades are changed by the Engineer. This item consists of the unclassified excavation from an approved mitigation site required to grade the streets, parkways, and adjacent property outside the limits of the right-of-way to the proposed grades including compaction as per city specifications. Borrow from Mitigation Site shall be to the lines and grades shown on the plans and in accordance with City of Lewisville and N.C.T.C.O.G. standards for excavation. Refer to NCTCOG Specifications Item No. 203.4 (Borrow & Spoil). A location has been designated in the plans where the CONTRACTOR can excavate material for street embankment.

13. Payment for "Clearing and Grubbing" shall be made on the basis of the price bid per acre (AC) and shall be total compensation for furnishing and/or operating all labor, materials, tools, equipment and other incidentals necessary to complete the work. This item shall consist of the removal and disposal of all trees (regardless of size), stumps (regardless of size), brush, roots, vegetation, logs, rubbish and other objectionable matter from the designated area. Areas designated as "Heavy Tree Clearing" on the plans shall be paid under a separate bid item. All trees must be marked and approved by the City prior to removal. Any tree or brush pruning is subsidiary to this item.

14. Payment for "Heavy Tree Clearing and Grubbing" shall be made on the basis of the price bid per acre (AC) and shall be total compensation for furnishing and/or operating all labor, materials, tools, equipment and other incidentals necessary to complete the work. This item covers clearing and grubbing of areas designated as "Heavy Tree Clearing" on the plan. This item shall consist of the removal and disposal of all trees (regardless of size), stumps (regardless of size), brush, roots, vegetation, logs, rubbish and other objectionable matter from the designated area. All trees must be marked and approved by the City prior to removal. Any tree or brush pruning is subsidiary to this item.

15. Payment for "Erosion Control (SWPPP) and Removal" shall be on a lump sum basis. The amount bid for this item shall be paid over the duration of the project with the amount paid on each monthly progress estimate determined by the percent complete on all other bid items. This item shall include installation and maintenance of silt fence, construction entrances, inlet protection, rock check dams, other erosion control features, and all costs

for preparing, implementing and maintaining a Storm Water Pollution Prevention Plan (SWPPP), from the beginning of construction through final acceptance and establishment of grass coverage, including all fees and costs associated with submitting an NOI and NOT for both the CONTRACTOR and the CITY. It will be the responsibility of the CONTRACTOR to develop a SWPPP. The CONTRACTOR shall submit two (2) copies of the plan to the OWNER for general conformance review. Once the SWPPP is deemed acceptable, the CONTRACTOR shall obtain a National Pollutant Discharge Elimination System (NPDES) permit. The SWPPP is to be kept on the construction site and implemented throughout the construction duration. Once construction is complete, the system shall be dismantled and removed from the site.

16. Payment for Hydromulch Seeding and Seeding with Soil Retention Blanket and 4-inch Topsoil will not be measured for payment. Payment will be made using the plan quantities given in the Bid Schedule for this item. This item includes all costs for furnishing all materials, equipment, labor including fine grading, placing the topsoil and hydromulch seeding, rolling and tamping, fertilizing, water, disposal of waste materials, and any other incidentals necessary to complete the work. Soil retention blanket shall be installed on all side slopes where specified immediately after seeding. Soil retention blanket shall be American Excelsior Company Curlex I or approved equal. Soil retention blanket shall be installed by rolling mat parallel to the direction of water flow and in accordance with manufacturer's recommendations. No more than 50% of this item shall be paid until 100% grass coverage has been established to the satisfaction of the Owner. This pay item shall consist of all work, materials and incidentals necessary to restore grass in all disturbed areas to an equal or better condition than prior to construction. Disturbed areas along the length of the project shall be fine graded and cut to receive grass as determined by the Owner. Topsoil shall be placed in low areas to bring them to grade and shall consist of a friable surface soil reasonably free of grass, roots, weeds, sticks, stones, or other foreign materials. The topsoil shall consist of sandy loam, with soil particles within the following percentages: clay; 0-25; silt; 25-50; sand; 50-70; decomposed organic matter; 5-10. The clay content is optional. The soil shall have a soil acidity range between a pH 5.0 to pH 7.0. The soil salinity shall not exceed 3 millimhos per centimeter at 25º C (as described by USDA Circular No. 982). Unless otherwise directed by the Owner, grass matching the species that existed prior to construction and/or the species adjacent to the disturbed areas shall be placed in all disturbed areas where improved lawn or established turf existed prior to construction. Contractor shall be required to water, establish growth, and protect and repair any damaged areas until completion and final acceptance of the project by the Owner. It is the intent of the Owner that all disturbed areas along the project be restored. If there are areas outside of the project limits that are disturbed by the Contractor during the performance of this work, those additional areas shall be restored in accordance with the requirements provided herein at the Contractor's sole expense. Work shall be in accordance with NCTCOG Item 204.

17. Payment for "Concrete Riprap Type RR8" shall be made on the basis of the price bid per square yard (SY). Payment for excavation of toe wall trenches, for all necessary excavation below natural ground or bottom of excavated channel, and for shaping of slopes for riprap will be included in the unit price. This price is full compensation for furnishing, hauling, and placing riprap and for filter fabric, expansion joint material, concrete and reinforcing

steel, grout and mortar, scales, test weights, equipment, labor, tools, and incidentals. See TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014 Edition, Item No. 432, "Riprap" for specifications governing this item.

18. Payment for "6-Inch Lime Stabilized Subgrade" shall be made on the basis of the price bid per square yard (SY) and shall be total compensation for furnishing all labor, equipment and any other incidentals necessary to complete the work. Subgrade shall be lime stabilized using a minimum of 8% hydrated lime by dry soil weight to a depth of 6" and recompacted in accordance with the geotechnical report and Texas Department of Transportation's Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges Item 260. Lime Stabilized Subgrade shall extend a minimum of one foot beyond the edge of the pavement. The Contractor shall add lime to the subgrade after clearing and grubbing and rough grade cut/fill. Only lime stabilized soil will be allowed for fine grading. After fine grading each area in preparation for paving, the subgrade shall be lightly moistened, as needed, and re-compacted to obtain a tight non-yielding subgrade.

19. Payment for "Furnish Lime (36lbs/SY)" shall be made on the basis of the price bid per Ton (TON) and shall be total compensation for furnishing materials, hauling, and any other incidentals necessary to complete the work. Payment shall be made for the dry cement prior to mixing with water, to achieve an application rate of 36 lbs per square yard for a depth of six (6) inches.

20. Payment for "8-Inch Flex Base" shall be made on the basis of the price bid per square yard (SY) and shall be total compensation for furnishing all labor, materials, equipment and any other incidentals necessary to complete the work. Flex base shall be in accordance with TxDOT Item 247 Type A, Grade 1 or 2.

21. Payment for "10-Inch Reinforced Concrete Pavement Including 6-Inch Curb" shall be made on the basis of the price bid per square yard (SY) and shall be total compensation for furnishing all labor, materials, equipment and any other incidentals necessary to complete the work. This item shall include all costs associated with staged construction sequencing including mobilization and remobilization costs, additional labor required for hand finishing intersections and pavement leave-outs, constructing temporary ramps to permit access to driveways, and any additional work required to maintain access to properties during construction.

22. Payment for "Concrete Header" shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for furnishing all labor, materials, equipment and any other incidentals necessary to complete the work. Concrete pavement headers shall be installed at all locations where new concrete pavement is terminated and future extension is expected as shown on the plans. Pavement headers shall be installed according to the plan details.

23. Payment for "Anchorage Joint" shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for furnishing all labor, materials, equipment and any other incidentals necessary to complete the work. Anchorage joints shall be paid for at connections to existing concrete streets. Anchorage Joints shall be installed according to the plan details.

24. Pavement for “Sawtooth Curb and Gutter” and “Concrete Curb and Gutter” shall be made at the contract unit price per linear foot, complete in place and include all concrete, reinforcing steel, form work, required joint work, expansion material, joint seal material, and all incidentals necessary to complete the work. Sawtooth Curb and Gutter and Concrete Curb and Gutter shall be constructed according to plan details.

25. Payment for “5-Inch Thick Concrete Sidewalk” shall be made on the basis of the price bid per square foot (SF) and shall be total compensation for furnishing all labor, materials, equipment and any other incidentals necessary to complete the work. Concrete sidewalks shall be constructed in accordance with the plan details. Connection to existing concrete sidewalks shall be subsidiary to this item.

26. Payment for “Stamped Concrete Median Pavement” be at the contract unit price per square foot (SF) and shall include integral colored concrete, patterning, reinforcing steel, jointing, sealing materials, equipment and incidentals necessary to complete the work. Stained and stamped medians shall be constructed in accordance with the lengths and widths as shown on the plans and according to the plan details. This item includes the cost of installing concrete median pavement with a stamped and patterned surface with integral coloring in accordance with the following:
    a. In addition to the requirements of the standard specifications, median pavement shall be in accordance with either “Patterned Concrete Industries, Inc.” or “Bominite Corporation” specifications. This includes their requirements for expansion joints, joint filler boards, and concrete mix.
    b. A letter from one of the above tooling manufacturers stating that the installer of the work is trained and/or licensed to perform the specified work is required.
    c. All work performed must be of the same manufacturer and all materials used, including concrete mix, must be the same for the entire project. Color hardeners and release agents as recommended by the tooling manufacturer shall be used.
    d. A field sample shall be provided to the City for approval prior to installation

27. Payment for “6-Inch Gravel Driveway” shall be made on the basis of the price bid per square yard (SY) and shall be total compensation for furnishing all labor, materials, equipment and any other incidentals necessary to complete the work. 6-Inch Gravel Driveways shall consist of 6-inch flexbase material over 6-inch compacted subgrade. Provisions of Item 247 in the TxDOT Standard Specifications, latest edition shall apply to the flex base material. The subgrade shall be compacted to 95% maximum density according to ASTM D698 to +4% above optimum moisture content. Flexbase TY A Grade 1 or 2 shall be used.

28. Payment for Modified Type 3, Type 7, and Type 21 Barrier-Free Sidewalk Ramp shall be made on the basis of the price bid per each (EA) and shall be total compensation for furnishing all labor, materials, equipment and any other incidentals necessary to complete the work. Barrier-free ramps shall be constructed in accordance with the plan details.

29. Payment for “MSE Retaining Wall” shall be made on the basis of price bid per square foot (SF) of the front surface area of the wall. This is a plans quantity measurement item and shall meet the specifications of TxDOT Item 423. The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement”

will be paid for at the unit price bid for "Retaining Walls" of the type or special surface finish specified. Precast MSE wall panels shall include an ashlar stone surface finish created using formliner, which shall be approved by the engineer prior to wall panel fabrication. This price is full compensation for excavation in back of retaining walls and for footings; furnishing and placing footings, leveling pads, copings, and traffic railing foundations; furnishing, placing, and compacting backfill (except in embankment areas), including cement for stabilization; proof rolling; furnishing and placing concrete, reinforcing steel, waterproofing material, filter material and drain pipe, joint material, water stop, and filter fabric when required; fabricating, curing, surface finish, and finishing all panels; furnishing and placing earth reinforcement, anchorage systems, and fasteners; wall erection; and equipment, labor, tools, and incidentals.

30. Payment for "ANTI-GRAPHITI COATING (PERMANENT – TY III)" shall be made on the basis of price bid per square foot (SF) of the front surface area of the wall. This is a plans quantity measurement item and shall meet the specifications of TxDOT Item 740. This price is full compensation for furnishing and applying coating including equipment, labor, tools, and incidentals.

31. Payment for "Type C402 (HPC) Traffic Rail" shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for furnishing all labor, materials, hardware, equipment and any other incidentals necessary to complete the work. This item shall include the furnishing and installation of TxDOT C402 traffic rail at the locations shown in the construction plans or as determined by the Engineer in accordance with TxDOT standard details and the specifications of TxDOT Item 450. Galvanization of the rails shall be subsidiary to the unit cost of traffic rail.

32. Payment for "Traffic Rail Transition" shall be made on the basis of the price bid per linear foot (LF) complete in place and shall be total compensation for furnishing all work including excavation, post installation, drilling, terminal anchor sections, concrete, materials, labor, equipment, tools, and incidentals necessary to complete the work. This item shall include furnishing and installation of traffic rail transitions at locations identified in the construction plans, or as determined by the Engineer in accordance with TxDOT standard details and TxDOT Item 450.

33. Payment for "Drill Shaft (24 IN)," "Drill Shaft (36 IN)" and "Drill Shaft (42 IN)" shall be made per linear foot (LF) installed at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. See TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014 Edition, Item No. 416, "Drilled Shaft Foundations" for specifications governing this item.

34. Payment for Bid Items "CL C Concrete (ABUT)(HPC)," "CL C Concrete (CAP)(HPC)," "CL S Concrete (BAS)(HPC)," "CL S Concrete (Median)(HPC)," "CL S Concrete (COL)(HPC)," and "Reinforced Concrete Slab CL S(HPC)" shall be made per cubic yard (CY) at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. See TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014 Edition, Item No. 420, "Concrete Structures" for specifications governing this item.

35. Payment for "Reinforced Concrete Slab CL S(HPC)" shall be made per square foot (SF) at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. See TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014 Edition, Item No. 420, "Concrete Structures" for specifications governing this item.

36. Payment for "Prestressed Concrete Girder (Tx54)" and "Prestressed Concrete Girder (Tx46)" shall be made per linear foot (LF) installed at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. See TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014 Edition, Item No. 425, "Precast Prestressed Concrete Structural Members" for specifications governing this item.

37. Payment for "Concrete Surface Treatment (CL II)" shall be made per square yard (SY) at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. See TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014 Edition, Item No. 427, "Surface Finishes for Concrete" for specifications governing this item. This item shall cover surface treatment for bridge structures only. Concrete surface finishes for retaining wall shall be subsidiary to the other bid items.

38. Payment for "Anti-Graffiti Coating (Permanent – TY III)" shall be made per square foot (SF) measured from top of mow strip to top of coping of the MSE retaining wall, at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. See TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014 Edition, Item No. 740, "Graffiti Removal and Anti-Graffiti Coating" for specifications governing this item.

39. Payment for "C402 Rail (HPC) (BRIDGE)" shall be made per linear foot (LF) installed at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. See TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014 Edition, Item No. 450, "Railing" for specifications governing this item.

40. Payment for "Custom Pedestrian Rail" shall be made per linear foot (LF) installed at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. Custom pedestrian rail shall be constructed as per the structural details as shown on the plans. Contractor shall provide sealed engineering shop drawings of the decorative handrail based upon the concept drawings provided in the plans. Handrail shall conform to all applicable codes and standards. Handrail shall be hot dip galvanized. Handrail posts to match bolt pattern spacing shown on the bridge plans and details. Contractor shall provide two in color sample mock-ups or 2 complete railing sections for review and approval by the City of Lewisville. Final color selections will be based upon approval of mock-up.

41. Payment for "Sealed Expansion Joint (4")(SEJ-M) shall be made per linear foot (LF) installed at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. See TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014

Edition, Item No. 454, "Bridge Expansion Joints" for specifications governing this item. This bid shall include the installation of an ADA approved rubber safety cover system (RSC) across the expansion joints along within the 12-foot wide sidewalk. RSC shall be MM Systems' Model RSC Slab-to-Slab, or approved equal.

42. Payment for "Pedestrian Rail with Coping" and "Pedestrian Rail with Coping Transition" shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for furnishing all labor, materials, hardware, equipment and any other incidentals necessary to complete the work. Rail and Rail Transitions shall be constructed in accordance with the plan details.

43. Payment for "Pavement Markings and Signage" shall be made on the basis of the price bid per lump sum (LS) and shall be total compensation for furnishing all labor, materials, hardware, equipment and any other incidentals necessary to complete the work. This item includes all costs for the installation of all permanent pavement markings, pavement surface preparation for markings, all permanent and regulatory signage (including pole mounted street name signs), and the relocation of existing signs. All conflicting striping and/or signage shall be removed and is considered subsidiary to this bid item.

44. Payment for "Trench Safety" for Storm Drain, Sanitary Sewer and Water Lines shall be made on the basis of price bid per linear foot (LF) for the actual implementation of the trench safety excavation and support system required for the actual construction activities and shall be total compensation for furnishing the design and all materials, tools, equipment, labor, and any other incidentals necessary to complete the work. This pay item shall consist of the design and implementation of a trench safety excavation and support system required for construction activities. The Contractor shall furnish a site-specific trench safety plan prior to construction. The system shall meet the requirements of the Occupational Safety and Health Administration (OSHA). The Contractor is directed to become knowledgeable with the standards as set forth by OSHA and to provide a viable trench safety system at all times during construction activities, and the Contractor is responsible for conforming to such regulations as prescribed by OSHA standards. This pay item includes all additional excavation, backfill, pavement reconstruction and repair made necessary by the protection system. No separate payment shall be made for excavation protection made necessary due to the selection of an optional design or sequence of work that creates the need for the protection system. The trench safety plan shall be signed and sealed by a Texas Licensed Professional Engineer.

45. Payment for Reinforced Concrete Pipe (RCP) shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for furnishing all labor, materials, excavation, embedment, backfill, equipment and any other incidentals necessary to complete the work. All storm drain pipes shall be Class III unless noted otherwise. All proposed storm drain connections shall be prefabricated. Field connections can be used for connection to existing lines only. Pipe collars shall be installed at all pipe size and grade changes. This item shall include plugs, cutting and plugging existing lines, tapping, collars, fittings, wyes, supporting and protecting existing utilities and connections to adjacent structures necessary for complete installation. There shall be no separate pay item for pipe through structures, such as manholes, junction boxes, etc. Pipe joints shall be sealed with "Omni-Flex, T&G Joint Seal" or equal, at no extra pay.

46. Payment for Reinforced Concrete Box (RCB) shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for furnishing all labor, materials, excavation, embedment, backfill, equipment and any other incidentals necessary to complete the work. Concrete box culvert shall be installed in accordance with the standard storm drain details and TxDOT Item 462. All ditch lines shall be mechanically tamped with the cost incidental to this Bid Item. Backfill should be placed in 6" – 8" loose lifts and shall be compacted to 95% of the maximum dry density as defined by ASTM D-698 (Standard Proctor) procedures under existing and proposed pavement, and to 90% Standard Proctor procedures elsewhere. The moisture content of the fill at the time of compaction should be near optimum to four percentage points above the proctor optimum value. Densities shall be taken every one (1) lift at staggered hundred feet increments. This price is full compensation for constructing, furnishing, and transporting sections; preparation and shaping of the bed; backfill material between box sections; jointing of sections; jointing material; cutting of sections on skew or slope; connections to new or existing structures; breaking back, removing and disposing of portions of the existing structure and replacing portions of the existing structure as required to make connections; concrete and reinforcing steel; and equipment, labor, materials, tools, and incidentals necessary to complete the work.

47. Payment for "Replace 10' Inlet Top" shall be made on a per each (EA) basis and shall be full compensation for inlet tops removed and replaced of the various sizes, including saw cutting, concrete removal and disposal, excavation, form work, concrete, reinforcing steel, backfill, labor, materials, and incidentals necessary to complete the work. The provisions of NCTCOG Items 203.1 and 702 shall apply except as modified below:

    a. These items shall include the removal and replacement of existing curb inlet tops and associated apron and depression section in accordance with details provided in the plans and NCTCOG Items 203.1 and 702.

    b. Concrete apron and depression section shall be neatly sawcut and removed along existing joints to limits identified in plan details. The top and throat of the existing inlet shall be removed and disposed of offsite. Contractor shall ensure that no rebar is exposed within the new cold joint. Surface of box shall be scoured to provide a rough surface prior to new concrete installation.

    c. Epoxied Dowel bars shall be embedded a minimum of 5 inches into the existing inlet walls. Bars shall be #4 bars at 18-inch center to center. Epoxy shall be HIT-HY-200 or approved equal.

    d. Contractor shall construct the new standard curb inlet tops, including concrete apron, in accordance with standard details. Concrete for inlet tops shall be Class "C" with a minimum compressive strength of 3,600 psi when tested at 28 days.

48. Payment for "10' Recessed Curb Inlet" shall be paid for on an each (EA) basis and shall be total compensation for furnishing all labor, materials, excavation, form work, concrete, reinforcing steel, backfill, equipment and any other incidentals necessary to complete the work. Inlet shall be constructed in accordance with the plan details. This item includes connecting to the lateral.

49. Payment for “Sloped Headwall for 30” RCP” and “Sloped Headwall for 36” RCP” shall be made on the basis of the price bid per each (EA) and shall be total compensation for furnishing all labor, materials, excavation, form work, concrete, reinforcing steel, backfill, equipment and any other incidentals necessary to complete the work. Headwall shall be constructed in accordance with the plan details. Surfaces adjacent to headwalls shall be graded to provide positive drainage.
50. Payment for “Wingwall for 4’x3’ RCB (SET – Type 1)” be made on the basis of the price bid per each (EA) and shall be total compensation for furnishing all labor, materials, excavation, form work, concrete, reinforcing steel, backfill, equipment and any other incidentals necessary to complete the work. Wingwalls shall be constructed in accordance with the TxDOT details. Surfaces adjacent to wingwalls shall be graded to provide positive drainage.
51. Payment for “4’ Square Storm Drain Manhole” shall be made on the basis of the price bid per each (EA) and shall be total compensation for furnishing all labor, materials, excavation, form work, concrete, reinforcing steel, backfill, equipment and any other incidentals necessary to complete the work. Storm drain manhole and riser shall be constructed in accordance with the plan details. This item includes connecting to the storm drain conduits.
52. Payment for “24” CMP Temporary Culverts” shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for installation, removal, and furnishing all labor, materials, equipment, backfill, and any other incidentals necessary to complete the work.
53. Payment for “18” Grouted Rock Riprap” shall be made on the basis of the price bid per cubic yard (CY) and shall be total compensation for furnishing all labor, materials, excavation, subgrade preparation, filter fabric, stone, equipment and any other incidentals necessary to complete the work. Rock riprap shall be constructed in accordance with the plan details.
54. Payment for “2-inch Conduit for Street Lights,” “2-inch RM Conduit on Bridge” and “2-inch Conduit for Irrigation” shall be made on the basis of the price bid per linear foot (LF) and shall be total compensation for furnishing all labor, materials, excavation, embedment, backfill, equipment and any other incidentals necessary to complete the work. This item shall be performed in accordance with Item 805 “Electrical Components and Conduit” of the NCTCOG Standard Specifications Fifth Edition. Conduit for street lights shall be Schedule rigid metal and shall be installed a minimum of 24 inches below grade. Conduit on Bridge shall be ridged metal and shall be installed in accordance with the plan details. Conduit shall be installed with ¼” nylon pull string.
55. Payment for “Street Light Foundation” and “Street Light Mount on Bridge” shall be made on the basis of the price bid per each (EA) and shall be total compensation for furnishing all labor, materials, excavation, form work, concrete, reinforcing steel, backfill, equipment and any other incidentals necessary to complete the work. Street light foundations and mounts shall be installed in accordance with the plan details. Concrete for street light foundations and mounts shall have a minimum compressive strength of 3,000 psi at 28 days. Anchor bolt patterns to be supplied by electric provider. Contractor shall provide

bolts. Electric provider shall inspect street light foundations and mounts prior to placing concrete.

56. Payment for “Street Light Pole and Luminaire” and “Street Light Pole and Luminaire on Bridge” shall be made on the basis of the price bid per each (EA) and shall be total compensation for furnishing all labor, materials, pole, LED luminaire, transformer base, equipment and any other incidentals necessary to complete the work. Street light pole and luminaire shall be installed in accordance with the plan details. Electric provider shall inspect street light pole and luminaire prior to final assembly.

57. Payment for “Street Light Ground Box,” “Irrigation Ground Box” and “Ground Box Type D with Apron” shall be made on the basis of the price bid per each (EA) ground box installed and shall be total compensation for furnishing all labor, materials, excavation, form work, concrete, reinforcing steel, backfill, equipment and any other incidentals necessary to complete the work. Ground boxes shall be installed in accordance with the plan details.

58. Payment for Bid Items #8 AWG Insulated Stranded Copper, #8 AWG Bare Solid Copper, #12 AWG Insulated Stranded Copper, and #12 AWG Bare Solid Copper Electrical Conductors shall be made on the basis of the price bid per linear foot (LF) of conductor installed and shall be total compensation for furnishing all labor, materials, excavation, embedment, backfill, equipment and any other incidentals necessary to supply electrical power from the source to the lamps and to complete the work. This item shall be performed in accordance with Item 805 “Electrical Components and Conduit” of the NCTCOG Standard Specifications Fifth Edition. Conductor for street lights and electrical service shall be installed inside conduit as indicated on the plans. Conductor gauge shall be as shown on the plans. The Contractor shall coordinate with Electric provider and verify that the designated source will be available to connect to at the Contractor’s schedule time.

59. Payment for “Electrical Service for Lighting” and “Electrical Service for Irrigation” shall be made on the basis of the price bid per each (EA) electrical service installed and shall be total compensation for furnishing all necessary accessories, meter pedestal, concrete pad, rebar, conduit elbows, anchor bolts, labor, materials, excavation, backfill, equipment, and incidentals necessary to complete the work per plan details. This item will govern for the purchase and installation of contact enclosures at locations provided in the plans along the street light conduit. The Contractor shall coordinate with Electric provider to verify location of the transformer providing power to the street lights. The Contractor will need to extend power from the transformer to the contact enclosure and connect the appropriate conductor as shown on the plans. Meter pedestal shall be in accordance with Electric provider requirements and standards.

60. Payment for “4-Inch SCH 40 PVC Irrigation Sleeve” and “6-Inch SCH 40 PVC Irrigation Sleeve” shall be per linear foot (LF) of size installed. Payment shall include all labor, materials, testing, and incidentals necessary to complete the work. Conduit shall be Schedule 40 PVC and shall be installed a minimum of 24 inches below grade. Markers shall be placed on top of curbs to locate sleeves for future irrigation installation.

61. Payment for “CONDT (PVC)(SCH 80)(4”)” and “CONDT (PVC)(SCH 80)(4”)(BORE)”

shall be per linear foot (LF) of type installed. Payment shall include all labor, materials, testing, and incidentals necessary to complete the work. Conduit shall be Schedule 80 PVC and shall be installed a minimum of 36 inches below grade. All bores within TxDOT right-of-way shall be dry. It is the Contractor's responsibility to verify all existing utilities (location and depth) prior to commencing installation. It is the Contractor's responsibility to prevent damage to streets, driveways, walkways, and other structures during and after installation. Contractor shall repair any such damage at no extra pay.

62. Payment for "6-Inch PVC Water Line," "8-Inch PVC Water Line," "10-Inch PVC Water Line," and "12-Inch PVC Water Line" shall be made on the basis of price bid per linear foot (LF). The cost of trench excavation, embedment, and backfill is incidental to this bid item. The cost of fittings and thrust blocking is incidental to the unit cost of pipe. The cost of cutting, plugging, and abandoning existing water lines is incidental to the unit cost of pipe. The ends of all abandoned lines shall be plugged with an adequate quantity of concrete to form a tight enclosure. The unit price bid for this item shall consist of all materials, equipment, labor, tools, and incidentals necessary to complete the work.

63. Payment for "12-Inch PVC Water Line with Restrained Joints" shall be made on the basis of price bid per linear foot (LF). The cost of trench excavation, embedment, and backfill is incidental to this bid item. The cost of fittings, restrained joints and thrust blocking is incidental to the unit cost of pipe. Pipe joints shall be integral bell or restrained type conforming to ASTM D3139 with gaskets conforming to ASTM F477. Water pipe shall have ANSI/NSF 61 Certification. The cost of cutting, plugging, and abandoning existing water lines is incidental to the unit cost of pipe. The ends of all abandoned lines shall be plugged with an adequate quantity of concrete to form a tight enclosure. The unit price bid for this item shall consist of all materials, equipment, labor, tools, and incidentals necessary to complete the work.

64. Payment for "12-Inch PVC Water Line In Casing" shall be made on the basis of price bid per linear foot (LF). The cost of trench excavation, embedment, and backfill is incidental to this bid item. All joints within and adjacent to steel casing to be restrained. The cost of fittings and thrust blocking is incidental to the unit cost of pipe. Pipe to be installed in casing shall not rest on bells and shall be anchored inside the casing pipe with full circle stainless steel bands with rubber gromets, or approved equal to avoid movement in any direction. The cost of cutting, plugging, and abandoning existing water lines is incidental to the unit cost of pipe. The ends of all abandoned lines shall be plugged with an adequate quantity of concrete to form a tight enclosure. The unit price bid for this item shall consist of all materials, equipment, labor, tools, and incidentals necessary to complete the work.

65. Payment for "20-Inch O.D. x 3/8" Thick Steel Casing (By Other Than Open Cut)" shall be made on the basis of price bid per linear foot (LF) and shall include the cost of trench excavation, embedment, and backfill for bore pits, both launch and receiving pits, shall be subsidiary to this pay item. The contractor shall be responsible to ensure all materials are of sufficient strength for the installation method and soil conditions encountered. All bore pit lengths and widths for pipe installation by other than open cut shall be kept to a minimum where possible. If working in paved street and driveways areas open to traffic, the Contractor shall provide a temporary 3-inch hot mix asphalt surface material

pavement Type "B" of the TxDOT Item 340 to be placed over the ditch area until the final improvements are made. This work shall be subsidiary to General Site Preparation and Water pay items. All bore pits shall be mechanically tamped with the cost subsidiary to this pay item. Backfill should be placed in 6-inch to 8-inch loose lifts and compacted to 95% of the maximum dry density as defined by ASTM D-698 (Standard Proctor) procedures under existing and proposed pavement, and to 90% Standard Proctor procedures elsewhere. Densities shall be taken every one (1) lift at staggered hundred feet increments. All bores within TxDOT right-of-way shall be dry.

66. Payment for "6-inch Gate Valve," "8-inch Gate Valve," "8-inch Cut-In Tee and Gate Valve" and "12-inch Gate Valve" shall be made on the basis of price bid per each (EA). This item shall conform to the City of Lewisville Standard Details. The unit price bid for this item shall consist of all materials, excavation, embedment, backfill, equipment, labor, tools, and incidentals necessary to complete the work.

67. Payment for "Fire Hydrant Assembly" shall be paid for on an each (EA) basis. The unit price shall include a 6-inch gate valve installed at the tee from the mainline, 6-inch PVC pipe (various lengths), fire hydrant, painting of the fire hydrant, backfill, compaction, and testing. The unit price shall include all labor, materials, tools, equipment, and incidentals necessary to complete the work in accordance with the plans, specifications, and details.

68. Payment for "Connect to Existing Water Line" shall be paid for on an each (EA) basis and include locating end of pipe, shutdown of line and removal of plug (if required) and concrete blocking. The CONTRACTOR shall coordinate shutdown of water lines with City of Lewisville personnel. Excavation to locate exact end of pipe shall be the responsibility of the Contractor.

69. Payment for "Blow-Off Valve Assembly" shall be made on the basis of price bid per each (EA). This item shall conform to the City of Lewisville Standard Details. The unit price bid for this item shall consist of all materials, valve, piping, concrete pads, valve block, equipment, labor, tools, and incidentals necessary to complete the work.

70. Payment for "2-Inch Combination Air Valve Assembly" shall be made on the basis of price bid per each (EA). This item shall conform to the City of Lewisville Standard Details. Vent piping for Combination Air Release Valves shall be installed in the right-of-way at a location approved by the Owner per N.C.T.C.O.G. standard details. The unit price bid for this item shall consist of all materials, combination air and vacuum release valve, meter box, underground piping, vent piping, concrete pads, valve block, equipment, labor, tools, and incidentals necessary to complete the work.

71. Payment for "12-inch x 12-inch Tapping Sleeve and Gate Valve" shall be paid for on an each (EA) basis and include locating end of pipe, removal of plug (if required), concrete blocking, adaptor, tapping sleeve, gate valve, equipment, labor, tools, and incidentals necessary to make a clean connection from the proposed to the existing system and complete the work. This bid item shall also include making temporary connections needed during construction. Contractor shall field locate pipeline at the connection point prior to ordering or fabricating materials. Contractor shall verify the pipe size, pipe type, elevation and horizontal location. Contractor shall make all necessary adjustments to

connect to existing line after approval from the Engineer. Excavation to locate exact end of pipe shall be the responsibility of the Contractor.

72. Payment for "Water Pipe Support and Hanger Single Roller" and "Water Pipe Support and Hanger Double Roller" shall be made per each (EA) pipe support and hanger installed at the unit price shown and shall include full compensation for all labor, tools and incidentals necessary to complete the work. Water pipe support shall be Dayton Superior F50 Rocket/Kohler Ferrule Insert, plain finish, or approved equal per the plan details. Water pipe hanger single roller shall be Anvil Adjustable Steel Yoke Pipe Roll Fig. 181, or approved equal per the plan details. Water pipe hanger double roller shall be two Anvil Adjustable Pipe Roll Supports Fig. 171, or approved equal per the plan details. Water pipe hanger shall be Anvil Adjustable Steel Yoke Pipe Roll Fig. 181, or approved equal per the plan details. Water pipe supports and hangers shall be installed in accordance with the details as shown on the plans.

73. Payment for "Water Line Mechanical Expansion Joints for Straight Sections" and "Water Line Mechanical Expansion Joints for Curved Sections" shall be made per each (EA) mechanical expansion joint installed at the unit price shown on the proposal and will include full compensation for all labor, tools and incidentals necessary to complete the work. Expansion Joints for straight sections shall be EBAA Iron EX-TEND, Force Balanced, Weld-On Flanged Ends Expansion Joint, or approved equal. Expansion Joints for curved sections shall be EBAA Iron FLEX-TEND, Force Balanced, Weld-On Flanged Ends Expansion Joint, or approved equal. Water Line Mechanical Expansion Joints shall be installed in accordance with the details as shown on the plans.

74. Payment for "12-Inch SCH 40 Welded Steel Water Line with Epoxy Lining/Coating" shall be made on the basis of price bid per linear foot (LF). The cost of trench excavation, embedment, backfill, fittings, welds, epoxy lining/coating, restraints, fittings, flange spool piece (integrally cast with anchor) and thrust blocking is incidental to the unit cost of pipe. The cost for labor and equipment to install pipe on water pipe supports is incidental to the unit cost of pipe. Water pipe supports and hangers shall be paid by separate bid item. This item shall be performed in accordance with Item 501.9 "Steel Pipe and Fittings" and Item 501.9.5 "Lining and Coating" of the NCTCOG Standard Specifications Fifth Edition. The unit price bid for this item shall consist of all materials, equipment, labor, tools, and incidentals necessary to complete the work.

75. Payment for "Abandon Existing Sanitary Sewer and Water Lines and Fill with Grout" shall be paid per linear foot of pipe abandoned. Payment shall include the cost of cutting and plugging the existing pipe and furnishing and installing grout within the pipeline. Removal of existing storm drain, water, and sanitary sewer lines where proposed lines are constructed along the same alignment or where proposed lines conflict with existing lines is not a separate pay item but is incidental to the unit cost of the new facilities.

76. Payment for "Remove Existing Sanitary Sewer Manhole" shall be made on the basis of the price bid per each (EA) and shall be total compensation for removal, disposal and furnishing all labor, materials, equipment, backfill, and any other incidentals necessary to complete the work.

77. Payment for “24-Inch PS 115 PVC” sanitary sewer line shall be made on the basis of the price bid per linear foot (LF). Should the existing sanitary sewer main be disrupted, the Contractor shall use bypass sewage pumping to avoid disrupting sewer flow during construction of the new sewer main. The cost of sewage pumping shall be covered under these bid items. There will be no separate pay for sewage pumping. The Contractor shall have pumps on the job site capable of handling the flow. Refer to Lewisville Sanitary Sewer Standard Detail Sheets. The unit price bid for this item shall consist of all materials, equipment, labor, tools, and incidentals necessary to complete the work.
78. Payment for “6-foot Sanitary Sewer Manholes” shall be paid for on an each (EA) basis and shall be total compensation for furnishing all labor, materials, excavation, form work, concrete, reinforcing steel, backfill, equipment and any other incidentals necessary to complete the work. Sanitary sewer manholes shall be constructed in accordance with the plan details. This item includes connecting to the sanitary sewer conduits. Extra depth in excess of 11 feet (6’ manholes) shall be measured and paid as “Extra Depth for manholes” on a per vertical foot (VF) basis.

C. Special Specifications

1. Shop Drawings:

   The CONTRACTOR shall submit three copies of shop drawings to the OWNER for all proposed materials including concrete mix designs. CONTRACTOR shall keep one (1) set of prints for making construction notes and mark-ups for submittal of as-built drawings.

2. **Property Owner Notification/Approval:**

   The Contractor must notify all affected property owners 30 days prior to accessing the property. Notification must be made by certified mail with a copy of the letter, certified mail receipt and domestic return receipt submitted to the City. The CONTRACTOR shall obtain a written letter of approval from the affected property owners prior to city acceptance of the work.

3. **US Army Corps of Engineers Individual Permit #SWF-2018-00485, Corporate Drive Extension**

   The permit is included as an attachment. The project layout sheets 5 – 8 show the areas identified as delineated wetlands that should be protected as well as the delineated wetlands that are permitted to be disturbed. The removal and fence plan sheets 19 – 25 show the areas to be protected with temporary fencing. All additional requirements are specified in the permit, and we will review them with you prior to commencement of construction.

4. **Possible Delay to start of construction:**

   The City is diligently working on obtaining all of the needed easements for construction activities. We have included an add alternate item for a delayed start of up to three months.

5. **Bridge Construction at Elm Fork Trinity River**

   Canoes, kayaks, and other boats regularly traverse the Elm Fork Trinity River through the Corporate Drive construction area. The CONTRACTOR shall prepare a detailed construction plan that addresses the safety of river traffic for all phases of construction. Floating barriers, construction fencing, and other measures shall be used to safely guide river traffic through the construction area. The CONTRACTOR shall be responsible for posting warning signs at river boat launches to provide notice of construction for boaters. The river may only be closed to boat traffic for short durations between November and March. The CONTRACTOR shall phase construction to limit the need for river closure as much as feasibly possible. River closure is only expected during specific events for the span directly over the river such as bridge girder placement, precast deck panel placement, deck form work placement and removal, and deck concrete pour. The CONTRACTOR shall notify the City a minimum of 48 hours prior to closure of the river. Notices shall be posted at all boat launches during closure. The main boat launch upstream of Corporate Drive is located inside Lewisville Lake Environmental Learning Area (LLELA) just downstream from the Lewisville Lake dam. The State Highway 121 Business bridge over the Elm Fork Trinity River is an alternate boat launch upstream of Corporate Drive. During river closure an appropriate floating barrier shall be placed upstream and downstream of the construction area to prevent boaters from entering the work area.

The CONTRACTOR shall contact Rob Jordan at the USACE Lewisville Lake Location, 469-645-9100, hours 8:00am to 4:30pm for lake operations coordination. The construction area is within the floodplain of the river and at risk of flooding. CONTRACTOR shall be responsible for the safety of the workers at all times. Under threatening weather conditions where flooding is possible, obstructions in the floodplain shall be immediately removed by the CONTRACTOR.

6. **Additional Insurance Requirements for Waste Management Easements:**

   During periods of accessing the Waste Management (the Grantor) easement area, the contractor shall maintain the following: (a) Broad form Commercial General Liability insurance policy with a minimum policy limit of $2,000,000 per occurrence, $2,000,000 in the aggregate; (b) Automobile Liability insurance for each automobile owned or leased by the contractor, with a $1,000,000 per occurrence policy limit; and (c) Worker's Compensation/Employer's Liability with statutory coverage with a $1,000,000/accident, $1,000,000/Disease-Policy, $1,000,000/Disease-per employee. The Commercial General Liability insurance policy shall name the Grantor as additional insured. The Commercial General Liability and Automobile Liability policies required in this paragraph shall include the following endorsement: "The insurance afforded to the additional insured is primary insurance. If the Grantor has other insurance which is applicable to the loss on a contributing, excess or contingent basis, the amount of this insurance company's liability under this policy shall not be reduced by the existence of such other insurance. Any insurance carried by the Grantor shall be excess and non-contributing with the insurance provided by the insured." On or before the commencement of any work pursuant to this easement, Grantor shall be provided with certificates of insurance evidencing the existence of the coverage described above.

7. Inspection:

   The word "inspection" or other forms of the word, as used in the contract documents for this project shall be understood as meaning the OWNER'S Representative will observe the construction on behalf of the OWNER. The OWNER'S Representative will observe and check the construction in sufficient detail to satisfy himself that the work is proceeding in general accordance with the contract documents, but he will not be a guarantor of the CONTRACTOR'S performance.

8. "Street Construction Ahead" and "End Construction" signs shall be installed in accordance with Figure 6-1 (Rural District) of the "Texas Manual on Uniform Traffic Control Devices", latest edition and the traffic control plans. Some signs may have to be relocated during construction. The exact locations will be determined by the OWNER. The CONTRACTOR shall provide flagmen to protect the public in accordance with all governing laws and regulations. The installation of "Street Construction Ahead," "Utility Construction Ahead" and "End Construction" signs shall be made and such approved at least 48 hours prior to any construction or the moving of any equipment or materials onto or nearby the site.

9. Construction signing shall be placed on new 4" X 4" wooden posts (two required except "Street Construction Ahead" may be on one post). Upon post removal, the holes shall be filled and compacted. Signs shall be new.

10. Street signs shall be mounted in accordance with TxDOT standard details. All posts and hardware shall be galvanized in accordance with Item 445 – Galvanizing, contained in the Standard Specifications for Construction of Highways, Streets, and Bridges, published by the Texas Department of Transportation.

11. The CONTRACTOR shall provide detour signs, barricades, barrels, vertical panels, flashing lights, construction pavement markers, construction and maintenance signs, construction lights, construction speed limit signs, channelizing devices, and flagmen as required providing for the safety of the traveling public. These items shall be in accordance with the traffic control plan and the recommended practices of the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways", latest edition.

    Flashing light panel board signs or changeable message board signs shall be placed at locations to be determined by the City Inspector and moved at his discretion during construction.

12. The CONTRACTOR shall provide two (2) project signs at the site with active construction, the cost of which will be subsidiary to the various bid items. Signs will be installed as directed by the City. The City will provide the CONTRACTOR with information with regards to the size of lettering, content, and size of signs (see detail at back of spec book). The four project signs shall be relocated, as directed by the City, as the work locations progress within each stage of construction.

13. Construction signing shall not be removed from the project until approved by the OWNER.

14. No street shall be closed except upon written authority from the OWNER.

15. The CONTRACTOR shall remove all trees, stumps, vegetation, roots, brush, logs, shrubs, plants, and landscaping within the right-of-way. All trees, stumps, slashings, brush, other debris or deleterious material generated as a part of this work shall be removed from the project. Any required disposal permits shall be in the sole responsibility of the CONTRACTOR. All stumps shall be grounded to below the finished grade, using a stump grinder. Tree branches that overhang into the right-of-way shall be trimmed by the CONTRACTOR, if required, to facilitate the construction. Tree removal or trimming shall be paid for as a part of the bid item "Prepare Right of Way".

    Trees to remain will be protected from damage by the CONTRACTOR. Employees of the CONTRACTOR (his subcontractors) will not park closer than ten (10) feet to any tree that is to remain.

16. The CONTRACTOR shall coordinate his activities with other CONTRACTOR'S working within, and close proximity to the project. To facilitate cooperation, regular progress meetings will be held among all CONTRACTOR'S.

17. Water and sanitary sewer service shall be maintained for all properties during construction. This includes the construction of temporary connections, if required. Temporary connections shall be considered subsidiary to the various bid items.

18. At the end of each day, the CONTRACTOR shall prepare the work to the satisfaction of the OWNER to leave a safe and accessible job site.

19. Prior to beginning construction, the CONTRACTOR shall contact all utility companies with utilities in the area and the property owners, 48 hours in advance of starting work. If necessary, test ditches will be dug to verify actual locations and conditions.

    Atmos Energy 945-275-1335
    AT&T 214-745-2976
    CoServ Electric (Attn: Dean Rhea ext. 6916) 940-321-7800
    Frontier Communications (formerly Verizon) 972-318-3245
    Spectrum (formerly Time Warner Cable) 469-464-4993
    Texas-New Mexico Power Company 972-353-5006
    Unite Private Networks 972-841-5695
    ONCOR Transmission .....
    City of Lewisville Public Services 972-219-3510
    United States Post Office 800-275-8777
    For line locates, call **811**

20. Information shown on these plans concerning type and location of underground utilities is not guaranteed to be accurate or all-inclusive. The CONTRACTOR is responsible for making his own determination as to type and location of underground utilities as may be necessary to avoid damage thereto. The CONTRACTOR shall verify location of underground pipelines, conduits and structures by contacting the owners of the underground facilities and prospecting in advance of excavation operations. The CONTRACTOR shall pay for all repairs resulting from the construction of this project and no additional payment will be made by the CITY.

    Furthermore, whenever the OWNER requests the CONTRACTOR to uncover any water line, sewer line or pipe line, or any other underground utility line well in advance of his construction activity in order to confirm locations of utilities, the CONTRACTOR shall comply with the OWNER'S request.

21. Boundary fences or other improvements removed to permit this construction shall be replaced in the same location or at the proposed ROW, as specified on the plans. Temporary fencing shall be installed as required. Cost of temporary fencing is incidental to contract bid items.

22. The CONTRACTOR shall at all times keep the job site as free from all material, debris and rubbish as is practical and shall remove same from any portion of the job site as construction of that portion is completed. No item of work will be considered complete for payment purposes until required cleanup has been performed.

    Upon completion of the work, the CONTRACTOR shall remove from the site all plants, materials, tools and equipment belonging to him and leave the site with an acceptable appearance.

23. No material, which has been used by the CONTRACTOR for any temporary purpose whatever, is to be incorporated in the permanent structure without written consent of the CITY.

    Where materials or equipment are specified by a trade or brand name, it is not the intention of the OWNER to discriminate against an equal product of another manufacturer, but rather to set a definite standard of quality of performance, and to establish an equal basis for the

evaluation of bids. Where words "equivalent", "proper", or "equal to" are used, they shall be understood to mean that the thing referred to shall be proper, the equivalent to, or equal to some other thing, in the opinion or judgment of the ENGINEER. Unless otherwise specified, all materials shall be the best of their respective kinds and shall be in all cases fully equal to approved samples. Notwithstanding that the words "or equal to" or other such expressions may be used in the specifications in connection with a material, article or process specifically designated shall be used, unless a substitute shall be approved in writing by the ENGINEER, and the ENGINEER shall have the right to require the use of such specifically designated material, article or process.

24. Tree Protection

    The CONTRACTOR shall be responsible for taking measures to minimize damage to tree limbs, tree trunks, and tree roots adjacent to the project unless otherwise specified in the plans to remove trees. The protected trees are identified on the demolition and paving plan and profile sheets. When the construction passes by or close to trees, the CONTRACTOR shall erect a temporary construction fence to limit activity to outside of the drip line of the tree. CONTRACTOR shall inspect the work site in advance and arrange to have any tree limbs pruned that might be damaged by equipment operations. The City shall be notified at least 24 hours prior to any tree trimming work. Nothing shall be stored or parked over the tree root system within the drip line area of any tree. The CONTRACTOR shall employ a qualified landscaper for all the work required for tree care to ensure utilization of the best agricultural practices and procedures.

25. The CONTRACTOR'S attention is directed to the requirement by Item 505.1 Open Cut – General Conduit Installation in the Standard Specifications for Public Works Construction. Specifically, the last paragraph of 505.1.6 the CONTRACTOR is required to provide, and to install at the end of each working day or when work is suspended, a temporary plug or watertight seal in the end of the utility main being installed under this contract. All caps (plugs) used shall be manufactured by the supplier of the pipe being used, or approved equal.

26. The CONTRACTOR is responsible for the preparation and proper execution of a Trench/Excavation Safety Program. This shall include submittal of a Shoring Plan prepared by a professional engineer licensed in the state of Texas. Trench safety and excavation systems must meet all the requirements of the Occupational Safety and Health Administration's Standards in effect during the construction period for the project. This work is subsidiary to all bid items unless otherwise noted.

27. The following material tests will be required for the project:

    a. Trench Backfill Compaction: All trench backfill under roadbed areas shall be mechanically compacted as required by North Central Texas Council of Governments Specifications and these special site-specific specifications. The testing laboratory will make tests of in-place density in accordance with ASTM D 698 of points selected by the City Inspector. All trenches shall be compacted to 95% of standard Proctor maximum dry density within the range of 2% below and 2% above the material's optimum moisture content. A minimum of one density test will be made for each 100

linear feet of every 8-inch loose lift of fill for water, storm drain and sanitary sewer construction. When backfill tested fails to meet the required density, trench backfill in the vicinity of the test, i.e. for a minimum of 50 feet in both directions from the test location, shall be removed and replaced with compaction. Thereafter, three tests shall be performed on the material removed and replaced, to determine if it is in accordance with the project compaction requirements.

b. Pavement Subgrade: The testing laboratory will make tests of in-place subgrade density in accordance with ASTM D 2922-81 at points selected by the City Inspector. A minimum of one field density test shall be conducted per lift for each 5,000 square feet of pavement subgrade.

c. Roadway Embankment: The testing laboratory will make tests of in-place density in accordance with ASTM D 6938-08 of points selected by the City Inspector. A minimum of two field density tests shall be conducted per lift for each 5,000 square feet of compacted area, except that in critical areas such as around and over structures, the frequency of tests may be reduced to one test per 2,500 square feet.

d. Concrete: Four standard 6-inch test cylinders shall be made from each type or strength of concrete for each pouring operation, but not less than five cylinders from each 100 yards of concrete placed. For twenty-eight (28) day concrete test cylinders shall be made and cured, as prescribed by ASTM Specification C-31, and broken, one at seven (7) days, two at twenty-eight (28) days, and hold one, as prescribed by ASTM Specification C-39. For three (3) day concrete test cylinders shall be made and cured, as prescribed by ASTM Specification C-31, and broken, two at three (3) days, one at seven (7) days, and hold one, as prescribed by ASTM Specification C-39.

e. Pavement Thickness Test: The CONTRACTOR shall have the new pavement cored (1-inch diameter) for thickness testing. In addition to the number of cores for pavement testing, one core shall be required at each area that is hand-poured pavement. The CONTRACTOR shall pay the cost of coring pavement. A City inspector must be present when coring is performed. The OWNER shall determine the locations for taking cores.

28. Existing concrete pavement, sidewalks, driveways, curb, asphalt pavement, curb and gutter, or concrete channel paving to be removed, shall be sawed along neat lines where portions are to be left in place. When sidewalks must be removed, full panels shall be removed and then replaced.

29. The CONTRACTOR shall furnish and install permanent pavement markings at locations as shown on the plans. The elimination of existing raised pavement markers and markings, and the surface preparation required prior to installation of new signs and markings shall be considered subsidiary to the bid item for “Pavement Markings and Signage”. All pavement markings and signs will be in accordance with the Texas Department of Transportation (TxDOT) Standard Specifications for the Construction of Highways, Streets, and Bridges, as well as in accordance with TxDOT standard drawings for signs. Wood shall not be used in the construction of permanent signs or their supports.

30. Valves, fire hydrants, meter boxes, and cleanouts shall be located outside the future sidewalk areas.

31. Positive drainage shall be established during the initial phase of grading and maintained throughout construction. Any softening or saturation of any lift will necessitate removal and replacement of the affected area. Where surface drainage channels are blocked during construction, they shall be restored to their original grade and cross-section.

32. Delays associated with delivery of materials by the manufacturer will not be considered for any extension of contract time. It shall be the sole responsibility of the CONTRACTOR to assure that the materials are manufactured and delivered on time.

33. <u>Construction Sequencing and Temporary Traffic Control</u>

The CONTRACTOR shall provide a detailed construction sequencing and traffic control plan prior to beginning work. Each phase of construction shall consist of the following general items of work:

a. Erect traffic control, warning, and detour signs
b. Street excavation and fill
c. Construct sanitary sewer lines
d. Construct storm drain lines
e. Construct water lines
f. Construct street pavement
g. Construct driveways and sidewalks
h. Move traffic to newly constructed pavement as necessary
i. Street excavation and fill
j. Construct remaining sanitary sewer lines
k. Construct remaining water lines
l. Construct remaining storm drain lines
m. Construct remaining street pavement
n. Construct remaining driveway and sidewalks
o. Clean up and restore right-of-way
p. Install block sod and seeding
q. Remove traffic control devices and open street to full traffic

Prior to construction, the CONTRACTOR will be required to submit a detailed construction sequencing and temporary traffic control plan to address all phases of construction. A schedule shall also be submitted to address times of completion of each stage of the construction sequence and projected dates of road closings, detours, and utility interruptions. The CONTRACTOR shall update this schedule on a monthly basis.

The construction schedule shall address measures to be taken in the event of heavy rain or wet weather during construction. If, in the opinion of the City, wet weather renders unpaved streets or driveways impassable to traffic or prevents access to adjacent property by residents, the Contractor shall place gravel or crushed stone in the streets. The cost of

furnishing or placing such materials shall be incidental to the unit cost of the various items of construction. Contractor's personnel shall be on call 24 hours a day to handle wet weather problems.

Proper notification must be given to all affected property owners at least 48 hours in advance of all construction operations **including sawcutting**.

No street shall be closed except upon written authority from the OWNER.

The Contractor shall provide all barricades, signing, and traffic control devices required for maintaining traffic flow.

At the end of each day, trenches shall be backfilled and streets maintained in an all-weather condition by the addition of asphalt millings, crushed stone or other means approved by the Engineer when permanent pavement is not in place. The temporary surface shall be maintained until permanent pavement is placed. This work shall be subsidiary to the Proposal Bid Items.

Construction signing shall not be removed from the project until approved by the OWNER. **Construction signing shall be maintained in good working condition throughout the duration of the project**.

34. <u>Block Sodding with 4-Inch Depth Topsoil</u>

Item 204.2 Topsoil and Item 204.5 Sodding of the Standard Specifications area hereby deleted and replaced with this specification. Item 204.4 Fertilizer is hereby revised as indicated below.

a. Description – The CONTRACTOR shall provide topsoil and block sod to all designated areas. The CONTRACTOR shall water, mow and protect the seeded areas until acceptance. Acceptance will not be made until all seeded areas are in full growth with a well-established root system. No on-site topsoil shall be used for establishing grass. **The CONTRACTOR shall provide imported topsoil obtained from a commercial source**.

b. Preparation of Areas – All areas to receive topsoil and sod shall be graded to the lines, grades and cross-sections shown on the plans and as provided for in other items of this contract, with the surface grade set four (4) inches low to allow for the placement of 4-inch depth topsoil plus sod. All rocks and foreign material shall be raked off the surface prior to the placement of topsoil.

c. **Imported Topsoil - Imported topsoil shall be obtained from an approved commercial source. Topsoil shall consist of natural, fertile, friable, screened, dark-colored sandy loam. It shall contain no acidity or alkalinity detrimental to plant growth. It shall contain no subsoil, lumps, stones, roots or other foreign matter**.

d. Grass Type –Sod shall be of the same type as on areas adjacent to the area being sodded.

e. Block Sodding – Sod blocks shall be carefully placed on the prepared areas. Sod shall be so placed that the entire designated area and disturbed areas shall be covered. Any voids left in the block sod shall be filled with additional sod and tamped. The entire sodded areas shall be rolled and tamped to form a thoroughly compact solid mass. When necessary, the sodded areas shall be smoothed after planting has been completed

and shaped to conform to the cross-section. Any excess dirt shall be removed to give a neat appearance.

f. Fertilizer – Fertilizer shall conform to the requirements of Item 204.4, Fertilizer of the Standard Specifications. Fertilizer shall be applied at the rate of 400 pounds/acre and be considered subsidiary to bid item "4-Inch Topsoil and Sodding". Section 204.4.4, Measurement and Payment is hereby deleted.

g. Watering – Sodded areas shall be watered by the CONTRACTOR as required to promote rapid growth of grass without unnecessary delay. The CONTRACTOR shall install a temporary irrigation system to water the grass in areas not covered by the permanent irrigation systems. Re-sodding shall be performed immediately, when required, without delay. Temporary irrigation, re-sodding, and replacing eroded topsoil are incidental to the contract.

h. Acceptance – The CITY will accept sodding as complete upon establishment of a growth of grass covering all areas requiring seeding. The CONTRACTOR shall mow and maintain the grass until accepted.

i. Payment – Payment will be per plan quantity. No measurement will be made.

Topsoil, sod and fertilizer required in areas disturbed by the CONTRACTOR outside of the designated areas shall be incidental to the project and not paid for separately. The CONTRACTOR shall pay for all water costs until grass is accepted by the CITY

35. <u>Reinforced Concrete Paving for City Streets and Sidewalk</u>

Reinforced concrete pavement shall be installed in accordance with the construction plans and Item 303 of the Standard Specifications. Concrete for paving streets, alleys, and driveways shall have a minimum compressive strength of 4,000 PSI at 28 days except for intersections and areas requiring hand finishing, where a minimum compressive strength of 4,500 PSI is required. If the CONTRACTOR desires, he may submit a "high early strength" design mix for use at driveways and street intersections. "High early strength" concrete should be obtained with higher cement content. Sidewalks shall have a minimum compressive strength of 3,000 PSI @ 28 days. No super plasticizers will be allowed in concrete mixes. The minimum cement ratio shall be 6.0 sacks per cubic yard for 4,000 PSI concrete and 6.5 sacks per cubic yard for 4,500 PSI concrete. Fly ash will not be permitted in street and sidewalk concrete on the project. Bar chairs are required to support reinforcing steel and dowel bars. Hand finish of concrete pavement will not be a separate pay item on the project.

Reinforcing steel shall be 60-ksi steel, No. 4 bars placed on 18-inch center-to-center spacing each way. All work required for joints (including anchor joints), sawcutting joints and joint sealant is included in these items.

Maximum joint spacing shall be 15 feet.

The CONTRACTOR shall submit mix designs and concrete break histories for approval prior to construction.

36. <u>Storm Water Prevention Pollution Plan (SWPPP)</u>

It shall be the full responsibility of the CONTRACTOR to acquire and comply with any and all permits as may be required to avoid delay of the project.

Prior to construction, the CONTRACTOR shall comply with Federal and State storm water management regulations. The plan shall employ measures to prevent erosion and siltation from the construction disturbance from reaching stream beds, channels, storm water structures, ponds, etc. The plan shall comply with the requirements of the "Integrated Storm Water Management Design Manual for Construction" published by NCTCOG. In the event of a conflict between these requirements and Federal and State pollution control laws, rules, and regulations or other Federal, State or Local agency laws, rules, and regulations, the more restrictive shall apply. The release of the plan for construction by the CITY in no way relinquishes the CONTRACTOR of all responsibility and liability for the pollution control. The CONTRACTOR shall be solely responsible and liable for all activities at the construction site necessary for compliance with Federal and State storm water regulations and the Storm Water Pollution Prevention Plan for the site.

The SWPPP shall conform to the following City of Lewisville requirements:

a. All site-specific information required by the TCEQ Construction General Permit (Part III, Section F) must be included in the SWPPP. Restatement of information directly from the Construction General Permit is not acceptable. The CONTRACTOR must describe specifically what measures are planned at the construction site.

b. All signature documents must be signed and dated prior to submittal for review. This includes SWPPP certifications, Notices of Intent (NOI), Construction Site Notices, and Inspector Delegation Letters. If there are multiple Operators for the project, each Operator's signature documents must be signed and dated. The City of Lewisville will complete its own signature documents during the review process. All forms must be signed by an appropriate signatory authority, and include the person's job title, where required. SWPPPS without the proper signatures will be returned without review.

c. The specific inspection schedule must be described in the SWPPP. The CONTRACTOR must clearly state whether he will be implementing the 14-day (and within 24 hours after a ½ inch rainfall) schedule, or the 7-day schedule.

d. The CONTRACTOR must include a copy of the inspection form that will be used. The form must include the required certification statement and allow for signature by the inspector, as required by the Construction General Permit.

e. The SWPPP must include a section in which to document the dates of the following activities: when major grading activities occur; when construction activities temporarily or permanently cease on a portion of the site; the dates when stabilization measures are initiated. If there is no section for this information, the CONTRACTOR must document the information on the inspection reports, and the CONTRACTOR must state in the SWPPP that the information will be documented in this manner.

f. The SWPPP must describe what types of temporary and/or permanent stabilization will be implemented at the site. For example, if the plan is to seed the disturbed area and maintain it until a uniform, established vegetative growth is achieved, then this must be detailed in the SWPPP.

g. The CONTRACTOR must identify the erosion and sediment controls that are planned at the site, including sweeping activities. All structural controls (i.e. silt fence, check dams, rock entrances) must be shown on the site map. The CONTRACTOR must also describe how he plans to maintain those erosion and sediment controls in proper working order.

h. The SWPPP must include both a General Vicinity Map and a Detailed Site Map. The site map must include all of the information listed in Part III, Section F (g) of the Construction General Permit. The CONTRACTOR may use the Erosion Control map from the Construction Plans, provided that it includes all of the necessary information. It is recommended that a separate site map be developed for the SWPPP, to avoid deficiencies.

i. The SWPPP must clearly state whether or not any support activities, such as concrete or batch plants, are planned. This is because support activities do not always qualify for coverage under the Construction General Permit, and separate permit coverage may be necessary.

j. If the project disturbs 10 acres or more with a common drainage location, and a sediment basin is not employed, the rationale for this decision must be documented in the SWPPP. The equivalent erosion and sediment control devices that are to be used must be described.

k. Allow a minimum of 2 days for review of the SWPPP.

l. The City of Lewisville does not currently utilize electronic submittal of Notices of Intent. **Construction will not be allowed to begin until 7 days after the NOI has been signed by the signatory authority and postmarked for delivery**. For this reason, early submission of the SWPPP and NOI are highly recommended.

m. At least two copies of the completed SWPPP must be submitted to the City. One copy will be maintained by the Storm Water Division, and one other copy will be reviewed and returned to the CONTRACTOR.

The cost to the CONTRACTOR for the preparation of the SWPPP for the project shall be incidental to the various items of erosion control. The erosion control plan included in the project construction plans shall be incorporated into the SWPPP. Items required by the SWPPP that are not included as bid items are subsidiary to the various items of erosion control. The various bid items for erosion control shall include all costs for implementing and maintaining the Storm Water Pollution Prevention Plan, from the beginning of construction through final acceptance and establishment of grass coverage.

Any disturbed areas, whether inside or outside the project limits, where construction activities are complete or won't be worked on for 14 days, must be permanently or temporarily stabilized. **Stabilization measures must be initiated no later than one day after completing work in an area or determining that work will be temporarily stopped for more than 14 days in that area**. Temporary stabilization can include the use of erosion blankets such as Curlex or other methods approved by the City inspector. Permanent stabilization will require topsoil and sod, unless otherwise shown on the project landscaping plans.

Final acceptance of sodded areas will be granted when sod has taken root. Placement of temporary or permanent erosion control measures in unstabilized areas after contract time has expired will be considered subsidiary to this bid item. Once final acceptance of permanent stabilized areas is granted, **the Contractor shall notify the City inspector prior to removing the Construction Site Notice sign and submit the final copy to the City within one week of removal.**

37. **Water Pipe**

The following water pipe is acceptable for this project in accordance with the assigned NCTCOG Standard Specifications, item number and AWWA Standard:

a. Polyvinyl Chloride (PVC) Water Pipe, NCTCOG Item 501.14, AWWA C900, Class 235 (DR18).

38. Valves

Valves for water lines 12-inch or smaller shall be Resilient Seated Gate Valves, NCTCOG Item 502.6.2. AWWA C509. Valves for water lines greater than 12-inch shall be Butterfly Valves, NCTCOG Item 502.6.2. AWWA C504. All valves shall be flanged.

Waterline shall pass hydrostatic testing per the requirements of Item 506.5.

Waterline shall be purged and disinfected per the requirements of Item 506.7.

Valve boxes shall be equipped with devices to prevent debris from falling within the valve boxes.

Grout shall be controlled low-strength material (minimum 1000 psi concrete) consisting of fluid mixture of cement, fly ash, aggregate, water and with admixtures as necessary to provide workable properties to flow into and fill the pipe, with no voids.

39. Water for Construction

Water will be furnished free of charge by the OWNER to the CONTRACTOR in the amounts needed to properly fill and test the water line. The owner reserves the right, however, to charge the prevailing rate for water wasted through carelessness or neglect on the part of the CONTRACTOR. All other water required for the project will be at the CONTRACTOR'S expense. The CONRACTOR shall obtain a temporary water meter (deposit reimbursed when the meter is returned) from the OWNER and meter all water used for the project.

40. Rock Riprap

a. Scope – This section covers the furnishing of all labor, materials, and equipment required to place loose rock riprap on filter fabric at the locations shown on the drawings. The measured thickness of rock riprap in place shall not be less than 18 inches.

b. Filter Fabric – Filter fabric shall be furnished in accordance with NCTCOG Item 803.4, Geotextile Used in Drainage and Stabilization Applications. Filter fabric shall meet the requirements of a non-protected drainage application.

c. Riprap – Rock for riprap shall be durable, free from cracks, seams, and other defects which would tend to increase unduly its deterioration from natural causes, and

reasonably well graded between the prescribed limits as hereinafter specified. Materials from certain localized areas, zones, and strata may be rejected when failing to meet the following specific requirements:

1) Weight – One hundred fifty pounds per solid cubic foot minimum calculated from the bulk specific gravity (saturated surface dry) of the sample determined in accordance with procedure in ASTM Specifications C127-59, "Methods of Test for Specific Gravity and Absorption of Coarse Aggregate".

2) Soundness in Magnesium Sulfate – Maximum loss 20 percent weighted average 5 cycles when tested for soundness in Magnesium Sulfate in accordance with ASTM Standard C88-61T, using particles passing a 2-1/2" sieve and retained on a 1-1/2" sieve. After final drying, the material will be screened over the 1-1/2" sieve.

3) Resistance to Abrasion – Maximum percentage of wear 50 after 500 revolutions, as determined by ASTM Standard C535, Grading 1.

4) Gradation – Rock for riprap shall conform to the following gradation:

18" Stone Riprap

Sieve Size	Percent Retained On Sieve	Minimum Required Weight Per Stone Retained On Sieve Size
24"	0%	---
18"	35%	800#
15"	70%	460#
12"	100%	175#

d. Grout – If plans require rock riprap be grouted, grout shall consist of one part of Portland cement and three parts of sand, thoroughly mixed with water. Grout shall have a consistency such that it will flow into and completely fill all joints.

e. Foundation Preparation – The subgrade surfaces on which the riprap or bedding course is to be placed shall be cut or filled and graded to the lines and grades shown on the drawings. When fill to subgrade lines is required, it shall consist of approved materials and shall conform to the requirements of the specified class of fill. Riprap shall not be placed until the foundation preparation is completed and the subgrade surfaces have been inspected and approved by the ENGINEER.

f. Filter Fabric Placement – Filter fabric shall be placed with a minimum overlap of 24". Fabric shall be secured by pins and washers according to manufacturer's recommendations. Also, a minimum lap of 24" is required onto adjacent concrete structures (headwalls, wingwalls, toewalls, etc.).

g. Rock Placement – Riprap shall be placed in such a manner as to produce a reasonably well-graded mass of rock with the minimum practicable percentage of voids and shall be constructed to the lines, grades and elevations shown on the plans. The larger stones shall be well distributed and the finished riprap shall be free from objectionable pockets of small stones or clusters of large stones. Rearranging of individual stones by

mechanical equipment or by hand will be required to the extent necessary to obtain a reasonably well-graded distribution of stone sizes as specified above. After the riprap is placed, the rocks shall be wetted thoroughly and the spaces between the rocks shall be thoroughly filled with grout. The surface of the riprap shall be swept with a stiff broom after grouting. No riprap shall be grouted in freezing weather. The work shall be protected from the sun and kept moist for at least three days after grouting. The CONTRACTOR shall maintain the riprap protection until accepted and any material displaced by any cause shall be replaced at his expense to the lines and grades shown on the plans. Riprap shall be stockpiled and placed in a manner to prevent damage to adjacent structures. Care shall be exercised in placing stones to prevent damage to filter fabric.

h. Testing and Reporting – Prior to delivery of rock riprap to the project site, the CONTRACTOR shall submit to the CITY test results for the following:

   1) Specific Gravity
   2) Soundness in Magnesium Sulfate
   3) Resistance to Abrasion
   4) Gradation of Riprap

   In addition, the CONTRACTOR shall submit the manufacturer's specifications for the filter fabric and submit a one square foot sample of the fabric.

i. Measurement and Payment – Rock riprap shall be measured for payment by the cubic yard of the specified minimum thickness. The unit price shall include excavation, subgrade preparation, furnishing and placing filter fabric and stone, and for all labor, tools, equipment and incidentals necessary to complete the work in accordance with the plans and specifications.

41. **PVC Gravity Sewer Pipe**

The work to be performed under this section of the specifications shall consist of furnishing and installing PVC sanitary sewer pipe and fittings, including all clearing, grubbing, excavation, sheeting, shoring, dewatering, embedment with magnetic tape, encasement, pipe laying, jointing, testing, blocking, backfilling, and any other work that is required or necessary to complete the installation as shown in the plans and as specified herein.

Sanitary sewer pipe 15-inch diameter and smaller shall be manufactured in accordance with the latest edition of Standard Specification ASTM D-3040, SDR 26.

The quoted standard specifications cite other ASTM standards covering topics such as definitions, abbreviations, compounds or materials of construction, determination of dimensions, quality testing, recommendations for installation, tests for external loading and impact resistance, solvent cement compounds and application procedures, joints with elastomeric seals, and elastomeric seals. These related documents shall be considered part of the standard specifications cited herein.

Installation of all pipe and materials shall be in accordance with ASTM D 2321-74 (89) and as shown on the plans and these specifications.

The specified embedment shall be accurately shaped and trimmed to receive the pipe barrel and each pipe section, when in place, shall have a uniform bearing on the subgrade for the full length of the pipe barrel. Pipe shall not be laid unless the subgrade is free of water and in a satisfactory condition. Adjustments of the pipe to line and grade shall be made by scraping away or filling in with granular material, and not by wedging or blocking up the bell.

The interior of the pipe shall be clean and joint surfaces shall be clean and dry when the pipe is lowered into the trench. Each pipe, fitting and valve shall be lowered into the trench carefully and laid true to line and grade.

42. **Sanitary Sewer Manholes**

All sanitary sewer manholes shall be as indicated in the plans. All sanitary sewer manholes shall be vacuum tested and pass the requirements of 502.1.5.2.

43. **Wastewater Conduit Installation**:

The costs of all testing shall be the responsibility of the CONTRACTOR. These include low pressure air testing and deflection testing using the mandrel method.

The CONTRACTOR shall perform a pre-construction television inspection of all sanitary sewer lines to determine existing service locations. The costs of this test are included under a separate pay item: Pre-Construction/Post-Construction Television Inspection for Sanitary Sewer.

The CONTRACTOR shall perform a post-construction television inspection of all sanitary sewer lines prior to the acceptance of the project. The costs of this test are included under a separate pay item; Pre-Construction/Post-Construction Television Inspection for Sanitary Sewer.

Television inspection shall conform to the following:

The CONTRACTOR shall use color recording in all television inspections.

The CONTRACTOR may employ a firm qualified in the type of work to make the television inspections, or if qualified and acceptable to the OWNER, he may perform the inspection himself.

The OWNER'S Representative must be present during the television inspection, unless specifically otherwise authorized in writing.

The visual inspection by photographic means of the sanitary sewer mains shall commence after the backfill, the air test, and the Mandrel test are completed.

The jet ball technique may be used to remove all foreign debris and silt, prior to photographic inspection.

Television Inspection Equipment shall conform to the following:

a. All television equipment used shall have a minimum of 600 lines of horizontal resolution.

b. All information gathered must be legible, clearly understandable, and of good picture quality.

c. A run sheet shall be made, and it shall be compatible with the recording in noting deficiencies.

d. By audio on the recording the operator must:

   (1) Note the date and time the recording is made.

   (2) Note the CONTRACTOR'S name, project name, and contract number.

   (3) Note the name of company performing the inspection, if other than the CONTRACTOR, and the operator's name.

   (4) Note the location, line, designation, main size, and direction of run.

   (5) Identify every 50-foot station.

   (6) Identify the station of each manhole.

   (7) Identify deficiencies and include station number.

e. The sewer mains must be televised from manhole to manhole downstream and manhole to cleanout upstream.

f. All sanitary sewer mains must be laced with water. The television inspection must be done immediately following the lacing of the main with no water flow.

TVI Recordings:

a. Two recordings per visual photographic inspection shall be furnished to the OWNER. The recordings shall be made available to the OWNER as outlined in Item C below.

b. Recordings must be submitted via DVD.

c. All recordings and run sheets shall be submitted to the OWNER'S Representative for storage and inspection by the OWNER. All recordings and run sheets shall become the property of the OWNER.

d. Flash Drives may be accepted in lieu of DVDs.

Criteria for Repair:

a. The CONTRACTOR shall make repairs if the OWNER'S Representative notes problems, including but not limited to the following:

   (1) Pulled or slipped joints.

   (2) Water infiltration.

   (3) Cracked or damaged pipe.

(4) If standing water is found in pipes of gradients equal to or greater than 0.7 percent.

(5) In pipes or gradients less than 0.7 percent, a maximum of one-half (1/2) inch of standing water will be allowed in 6 inches through 12 inches diameter pipes; and a maximum 10 percent of pipe size or 3 inches, whichever is less in pipes greater than 12 inches diameter.

(6) Structural damage to pipe.

(7) The OWNER shall make the final determination for repairs and shall review the visual photographic tape for additional data. A letter must be transmitted to the CONTRACTOR for needed repairs within five (5) working days after the inspection. (All verbal requests shall be valid and noted in the letter.)

b. If repairs are required, another television inspection of the repaired area may be made after the repairs are complete if deemed necessary by the OWNER'S Representative at the CONTRATOR'S expense.

c. Repairs shall be made to the satisfaction of the OWNER'S Representative.

Measurement and Payment:

Sanitary sewer pipe shall be measured and paid for at the contract unit price per linear foot for all depths of cut.

44. **Low Pressure Air Test for Gravity Sewers**

The CONTRACTOR shall employ a firm qualified in the type of work to make the air tests on all sanitary sewer lines placed. The following air test requirements shall replace all less restrictive air test requirements of Item 507.5.1.3.2. Low Pressure Air Line Test Procedures.
The low-pressure air test shall conform to the procedures described in ASTM C-828, ASTM C-924 or other appropriate procedures.

For sections of pipe up to 36-inch average inside diameter, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge shall be computed from the following equation:

$T = 0.0850 (D) (K) / (Q)$ where T = time for pressure to drop 1.0 pound per square inch gauge in seconds
$K = 0.000419 (D) (L)$, but not less than 1.0
D = average inside diameter in inches
L = length of line in feet of same pipe size being tested
Q = rate of loss, 0.0015 cubic feet per minute per square foot interval surface shall be used

Since a K value of less than 1.0 shall not be used, there are minimum testing times for each pipe diameter as outlined below:

Pipe Diameter (inches)	Minimum Time (seconds)	Length for Minimum Time (feet)	Time for Longer Length (seconds)
6	340	398	0.855 (L)
8	454	298	1.520 (L)
10	567	239	2.374 (L)
12	680	199	3.419 (L)
15	850	159	5.342 (L)
18	1020	133	7.693 (L)
21	1190	114	10.471 (L)
24	1360	100	13.676 (L)
27	1530	88	17.309 (L)
30	1700	80	21.369 (L)
33	1870	72	25.856 (L)

For sections of pipe that have an average inside diameter of **15 inches** to **33 inches**, the following option is available. If no pressure loss has occurred during the first 25% of the calculated testing time, then the test may be stopped at that point. If any pressure loss or leakage has occurred during the first 25% of the testing period, then the test shall continue for the entire test duration as outlined above or until failure.

45. <u>Prevailing Wage Rate Determination</u>

The General Services Commission has adopted the Federal Davis-Bacon wage rates for our use.

General Services Commission
1711 San Jacinto - P.O. Box 13047
Austin, Texas 78711-3047
Web Site: www.gsc.state.tx.us
(512) 463-3035

Prevailing Wage Rate Determination Information

The following information from Chapter 2258 Texas Government Code Title 10 should be included in your bid specification documents and contract documents:

2258.021. Duty of Governmental Entity to Pay Prevailing Wage Rates

(a) The state or any political subdivision of the state shall pay a worker employed by it or on behalf of it:
  (1) not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the work is performed; and
  (2) not less than the general prevailing rate of per diem wages for legal holiday and overtime work.
(b) Subsection (a) does not apply to maintenance work.
(c) A worker is employed on a public work for the purposes of this section if the worker is employed by a contractor or subcontractor in the execution of a contract for the public work with the state, a political subdivision of the state, or any officer or public body of the state or a political subdivision of the state.

2258.023. Prevailing Wage Rates to be Paid by Contractor and Subcontractor; Penalty

(a) The contractor who is awarded a contract by a public body or a subcontractor of the contractor shall pay not less than the rates determined under Section 2258.022 to a worker employed by it in the execution of the contract.
(b) A contractor or subcontractor who violates this section **shall** pay to the state or a political subdivision of the state on whose behalf the contract is made, $60 for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the contract. A public body awarding a contract shall specify this penalty in the contract.
Note: This penalty applies even if the contractor or subcontractor and the worker come to an agreement on the underpaid wages (see Attorney General Opinion DM-469).

(c) A contractor or subcontractor does not violate this section if a public body awarding a contract does not determine the prevailing wage rates and specify the rates in the contract as provided by Section 2258.022.
(d) The public body shall use any money collected under this section to offset the costs incurred in the administration of this chapter.
(e) A municipality is entitled to collect a penalty under this section only if the municipality has a population of more than 10,000.

2258.051. Duty of Public Body to Hear Complaints and Withhold Payment

(a) A public body awarding a contract, and an agent or officer of the public body, shall:
  (1) take cognizance of complaints of all violations of this chapter committed in the execution of the contract; and
  (2) withhold money forfeited or required to be withheld under this chapter from the payments to the contractor under the contract, except that the public body may not withhold money from other than the final payment without determination by the public body that there is good cause to believe that the contractor has violated this chapter.

WR1001 March 1998

END OF SECTION

GEOTECHNICAL EXPLORATION

CORPORATE DRIVE EXTENSION

Between East of Holfords Prairie Road
and South Railroad Street
Lewisville, Texas
ALPHA Report No. W151710-C
November 6, 2018

Prepared for:

HALFF ASSOCIATES, INC.
4000 Fossil Creek Boulevard
Fort Worth, Texas 76137
Attention: Mr. Benjamin McGahey, P.E.

Prepared By:

ALPHA TESTING
WHERE IT ALL BEGINS

ALPHA TESTING
WHERE IT ALL BEGINS

Geotechnical
Construction Materials
Environmental
TBPE Firm No. 813

5058 Brush Creek Road
Fort Worth, Texas 76119

Tel: 817-496-5600
Fax: 817-496-5608
www.alphatesting.com

November 6, 2018

Halff Associates, Inc.
4000 Fossil Creek Boulevard
Fort Worth, Texas 76137

Attention: Mr. Benjamin McGahey, P.E.

Re: Geotechnical Exploration
Corporate Drive Extension
Public Pavement Recommendations
Between East of Holfords Prairie Road and
South Railroad Street
Lewisville, Texas
ALPHA Report No. W151710-C

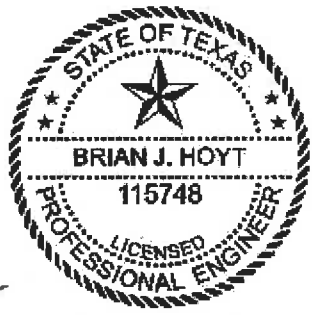
Attached is the report of the geotechnical exploration performed for the project referenced above. This study was authorized by Mr. David Smith, P.E. using the Standard Subcontract for Subsurface/Underground Services between Halff Associates, Inc. and ALPHA TESTING, Inc. and performed in accordance with ALPHA Proposal No. 43607-1-rev1, dated October 11, 2017.

This report contains results of field explorations and laboratory testing and an engineering interpretation of these with respect to available project characteristics. The results and analyses were used to develop design information to aid in design of pavement sections for new public streets in accordance with the City of Lewisville Code of Ordinances. Recommendations for portions of the project located in the City of Carrolton are issued Under ALPHA Report No. W151710-B dated July 2, 2018.

ALPHA TESTING, INC. appreciates the opportunity to be of service on this project. If we can be of further assistance, such as providing the final geotechnical exploration, please contact our office.

Sincerely,

ALPHA TESTING, INC.



November 6, 2018

Mark L. McKay, P.E.
Director of Geotechnical Engineering

Brian J. Hoyt, P.E.
Geotechnical Department Manager

BJH/MLM
Copies: (1-PDF) Client

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ALPHA REPORT NO. W151710-C

1.0 PURPOSE AND SCOPE

The purpose of this geotechnical exploration is for ALPHA TESTING, INC. ("ALPHA") to evaluate for the "Client" some of the physical and engineering properties of subsurface materials at selected locations on the subject site with respect to formulation of geotechnical design parameters for new public pavement sections in accordance with the City of Lewisville Code of Ordinances. The field exploration was accomplished by securing subsurface samples from widely spaced test borings performed along the proposed street alignment. Engineering analyses were performed from results of the field exploration and laboratory tests performed on representative samples.

Also included are general comments pertaining to reasonably anticipated construction problems and recommendations concerning earthwork and quality control testing during construction. This information can be used to evaluate subsurface conditions and to aid in ascertaining construction meets project specifications.

Recommendations provided in this report were developed from information obtained in test borings depicting subsurface conditions only at the specific boring locations and at the particular time designated on the logs. Subsurface conditions at other locations may differ from those observed at the boring locations, and subsurface conditions at boring locations may vary at different times of the year. The scope of work may not fully define the variability of subsurface materials and conditions that are present on the site.

The nature and extent of variations between borings may not become evident until construction. If significant variations then appear evident, our office should be contacted to re-evaluate our recommendations after performing on-site observations and possibly other tests.

2.0 PROJECT CHARACTERISTICS

It is proposed to construct an approximately 2.6 mile extension of Corporate Drive connecting South Railroad Street and Holfords Prairie Road in Lewisville, Texas. A site plan illustrating the general outline of the property is provided as Figure 1, the Boring Location Plan, in the Appendix.

Review of preliminary grading plans prepared by Halff Associates, Inc. (Sheets No. 27 through 56 dated May 2018) indicates cuts of up to 4 ft and fills of up to 8 ft will be required to achieve final grades along most of the alignment. Fills of up to 14 ft will be required at bridge abutments for creek crossings. We understand the new street will be classified as an Arterial street as described in Article V, Section 6-92 of the city of Lewisville Code of Ordinances.

A separate report will be issued containing recommendations for bridge structures along the subject street alignment.

3.0 FIELD EXPLORATION

Subsurface conditions on the site were explored by drilling a total of 31 borings. Ten (10) borings were drilled to a depth of about 90 ft each and 21 borings were drilled to a depth of about 10 ft each. The planned locations for Borings 29 and 30 were not accessible due to soft ground conditions and standing water. These borings can be drilled once ground conditions allow for access. The borings were performed in general accordance with ASTM D 420 using standard

rotary drilling equipment. The approximate location of each test boring is shown on the Boring Location Plan, Figure 1, enclosed in the Appendix. Details of drilling and sampling operations are briefly summarized in Methods of Field Exploration, Section A-1 of the Appendix.

Subsurface types encountered during the field exploration are presented on Log of Boring sheets included in the Appendix of this report. The boring logs contain our Field Technician's and Engineer's interpretation of conditions believed to exist between actual samples retrieved. Therefore, these boring logs contain both factual and interpretive information. Lines delineating subsurface strata on the boring logs are approximate and the actual transition between strata may be gradual.

4.0 LABORATORY TESTS

Selected samples of the subsurface materials were tested in the laboratory to evaluate their engineering properties as a basis in providing recommendations for pavement sections design and earthwork construction. The following laboratory tests were performed to facilitate pavement section recommendations:

- Moisture Content (ASTM D 2216)
- Atterberg-Limits (ASTM D 4318)
- Unconfined Compressive Strength (ASTM D 2166)
- California Bearing Ratio (ASTM D 1883)

A brief description of testing procedures used in the laboratory can be found in Methods of Laboratory Testing, Section B-1 of the Appendix. Individual test results are presented on Log of Boring sheets or summary data sheets enclosed in the Appendix.

5.0 GENERAL SUBSURFACE CONDITIONS

Based on the Geologic Atlas of Texas from the Texas Bureau of Economic Geology, published by the University of Texas at Austin, the site lies within the Alluvium and Terrace deposits underlain by the Eagle Ford formation. The Terrace and Alluvium deposits generally consist of sand, gravel and clay soils. The clay soils associated with these formations are generally characterized by low to moderate shrink/swell potential. The Eagle Ford formation is composed predominantly of shale with occasional platy beds of sandstone and limestone. Residual overburden soils associated with the Eagle Ford formation generally consist of clay and shaly clay with very high shrink/swell potential.

Subsurface conditions encountered in Borings 1 through 10 generally consisted of clay and/or sandy clay to depths of about 22 ft to 57 ft below the ground surface. The clay and sandy clay in Borings 1, 2, 3 and 5 through 10 were underlain by clayey sand and/or sand to depths of about 50 ft to 74 ft. Clay shale, shale and/or cemented sand were then encountered which extended to the 90 ft termination depth of Borings 1 through 10. The upper 4 ft of clay in encountered in Boring 3 was visually classified as fill material.

Subsurface conditions encountered in Borings 11 through 32 generally consisted of clay and/or sandy clay extending to the 10 ft termination depth of the borings. Sandy clay was encountered to a depth of about 8 ft below the ground surface in Boring 33 underlain by clayey sand extending to the 10 ft boring termination depth. The upper 4 ft to 8 ft of clay and sandy clay encountered in Borings 12 through 19 were visually classified as fill material.

More detailed stratigraphic information is presented on the Log of Boring Sheets attached to this report.

The granular soils (sand, clayey sand and cemented sand) encountered in the borings are considered relatively permeable and are expected to have a relatively rapid response to water movement. However, the clay, sandy clay, clay shale and shale encountered in the borings are considered relatively impermeable and are anticipated to have a relatively slow response to water movement. Therefore, several days of observation would be required to evaluate actual groundwater levels within the depths explored. Also, the groundwater level at the site is anticipated to fluctuate seasonally depending on the amount of rainfall, prevailing weather conditions and subsurface drainage characteristics.

Wash rotary drilling were used to drill Borings 1 through 10. This drilling technique requires introduction of water into the borehole to facilitate drilling. Therefore, initial seepage observations were made where possible, prior to introduction of external drilling water. Groundwater levels after completion of drilling could not be assessed. Groundwater was encountered on drilling tools during drilling in Borings 1 through 6, 8, and 10 at depths of about 20 ft to 31 ft below the ground surface. No free groundwater was encountered in Borings 7 and 9 prior to introducing external drilling water. No free groundwater was encountered in Borings 11 through 33.

It is common to detect seasonal groundwater in fill and granular soils, from natural fractures within the clayey matrix, at the soil/rock (shale) interface or from fractures in the rock, particularly during or after periods of precipitation. If more detailed groundwater information is required, monitoring wells or piezometers can be installed.

Further details concerning subsurface materials and conditions encountered can be obtained from the Log of Boring sheets provided in the Appendix.

6.0 PAVEMENT DESIGN RECOMMENDATIONS

The following design recommendations were developed on the basis of the previously described Project Characteristics (Section 2.0) and General Subsurface Conditions (Section 5.0). If project criteria should change, including the street alignments on the site, our office should conduct a review to determine if modifications to the recommendations are required. Further, it is recommended our office be provided with a copy of the final plans and specifications for review prior to construction.

Calculations used to determine the required pavement recommendations are based only on the physical and engineering properties of the materials used and conventional thickness determination procedures. Related civil design factors such as subgrade drainage, shoulder support, cross-sectional configurations, surface elevations, reinforcing steel, joint design and environmental factors will significantly affect the service life and must be included in preparation of the construction drawings and specifications, but all were not included in the scope of this study.

Normal periodic maintenance will be required for all pavement to achieve the design life of the pavement system.

Design criteria were developed assuming the new pavement is constructed within final grades as depicted in the referenced preliminary grading plans. Cutting and filling other than discussed can alter the recommended pavement design parameters. Therefore, it is recommended our office be contacted before performing other cutting and filling on site to verify appropriate design parameters are utilized for final pavement design.

6.1 Pavement Subgrade Preparation

To permit correlation between information from test borings and actual subgrade conditions exposed during construction, a qualified Geotechnical Engineer should be retained to provide subgrade monitoring and testing during construction. If there is any change in project criteria, the recommendations contained in this report should be reviewed by our office. Based on review of the boring logs and the referenced grading plans, we expect the pavement subgrade could consist of onsite or similar clay and sandy clay soils used for grading the site. Since the subgrade conditions and required treatments could vary along the proposed road alignment, ALPHA should be retained to observe construction to verify conditions are as expected. Also, we should be provided with the final grading plans for review prior to construction to verify or modify in writing the recommendations contained in this report.

Lime series tests indicate where clay soils are encountered at the final pavement subgrade elevation, the exposed clayey surface soils should be scarified to a depth 6 inches and mixed with a minimum of 8 percent hydrated lime (by dry soil weight) in conformance with TxDOT Standard Specifications Item 260. Using an in-place dry unit weight of 100 pcf for the pavement subgrade soils, this percentage of lime equates to about 36 lbs of lime per sq yard of treated area. The results of lime series tests performed on a representative clay sample are attached to this report (see Figures 4A and 4B).

We recommend lime stabilization procedures extend at least 1 ft beyond the edge of the pavement to reduce effects of seasonal shrinking and swelling upon the extreme edges of pavement. The soil-lime mixture should be compacted to at least 95 percent of standard Proctor maximum dry density (ASTM D 698) and within the range of 0 to 4 percentage points above the mixture's optimum moisture content. In all areas where hydrated lime is used to stabilize subgrade soil, routine Atterberg-limit tests should be performed to verify the resulting plasticity index of the soil-lime mixture is at/or below 15.

Mechanical lime stabilization of the pavement subgrade soil will not prevent normal seasonal movement of the underlying untreated materials. We expect pavement and other flat work constructed according to the referenced grading plans could experience soil-related potential seasonal movements of about 3 to 6 inches. Our office should be contacted if a more detailed analysis of potential movements is desired. A more detailed analysis would require deeper borings to evaluate the active depth of moisture content change, estimated to be about 15 ft at this site.

California Bearing Ratio (CBR) tests (Figures 3A and 3B) indicate the CBR value for the natural clay soils at this site would be about 2.6 to 3.4. Following improvement with lime, the CBR value for the lime stabilized clayey soils is expected to be at least 10.

6.2 Portland Cement Concrete Pavement Section

Using the 1993 AASHTO pavement design procedures (WinPAS computer program distributed by American Concrete Pavement Association), the following design parameters were used in analyses of the PCC pavement section.

- Compressive strength of concrete 3,500 psi at 28 days
- Modulus of Elasticity 4,200,000 psi
- Modulus of Rupture 620 psi
- Modulus of Subgrade Reaction* 200 pci
- Load Transfer Co-efficient 3.1
- Drainage Coefficient 1.0
- Initial PSI 4.5
- Terminal PSI for 2.5
- Standard Deviation 0.35
- Reliability 90 percent

*The modulus of subgrade reaction is based on a lime stabilized subgrade prepared as recommended in Section 6.1.

As required in the referenced code of ordinances, pavement for Arterial classified streets should consist of at least 10 inches of PCC supported on at least 6 inches of lime stabilized subgrade. PCC should have a minimum 3,500 psi compressive strength at 28 days. Concrete should be designed with 5 ± 1 percent entrained air. Joints in concrete paving should not exceed 15 ft. Reinforcing steel for concrete pavement could consist of No. 4 bars at 18 inches on center in each direction.

Based on our analyses, the recommended pavement section is suitable to support up to about 9,900,000 equivalent single axle loads (ESALs) over the service life of the pavement. The design life and requirements and traffic volumes were not available for this study. If more ESALs than estimated are expected over the service life of the pavement, our office should be contacted to re-evaluate the recommended pavement section.

6.3 Drainage and Other Considerations

Adequate drainage should be provided to reduce seasonal variations in the moisture content of subgrade soils. Final grades within 5 ft of the pavement should be adjusted to slope away from the pavement at a minimum slope of 2 percent. Drainage should also be provided across the surface of pavement and should be diverted off the pavement or into storm sewers. **Maintaining positive surface drainage throughout the life of the pavement is essential.**

6.4 Soluble Sulfates

A total of two (2) samples obtained from the borings were tested for soluble sulfate concentrations. Results of the laboratory testing (TxDOT Test Method TEX-145-E Part II) are tabulated below.

TABLE B
Soluble Sulfate Content

Sample No.	Boring No.	Depth, ft	Material Type	Soluble Sulfate, mg/Kg (ppm)
1	2	0-2	Dark Brown CLAY	71
2	9	0-2	Dark Brown CLAY	54
3	21	2-4	Brown CLAY	3,062
4	27	2-4	Brown CLAY	74

Based on the results of laboratory testing, the soluble sulfate content measured in the samples tested is considered relatively low (<2,000 ppm) to relatively high (>2,000 ppm). It should be noted that concentrations of soluble sulfates in soil are typically very localized and concentrations in other areas of the site could vary significantly. Hence, it is recommended sulfate sampling/testing be performed along the pavement subgrade alignment during construction. During construction, experienced geotechnical personnel should make close observations for possible sulfate reactions.

If soluble sulfate results occur in the pavement subgrade at levels above 2,000 ppm, it may be necessary to perform a double lime application.

Where lime is installed in a double application, 60 percent of the recommended application amount from Section 6.1 should be initially mixed into the subgrade soils with excess water (at least 5 percentage points over optimum). The mixture should be thoroughly blended and kept continually wet. The surface should then be sealed with a drum roller or other suitable equipment, and allowed to mellow for two (2) weeks. During this curing period, the surface should be wet cured using a water truck and observations should be made to determine if any heaving is taking place. After the 2-week mellowing period, the remaining 40 percent of lime the recommended lime application should be mixed in with the subgrade soils. This material should be thoroughly mixed with additional water so that the soils are above optimum moisture, and then the surface should be sealed again. The soils should be allowed to mellow for 72 hours or as indicated on the mix design while the surface is kept continually moist and observed for signs of distress. An ALPHA representative should be retained to verify there is no additional heaving before final mixing and compacting.

The final soil-lime mixture should be compacted to at least 95 percent of standard Proctor maximum dry density (ASTM D 698) and within the range of 0 to 4 percentage points above the mixture's optimum moisture content. In all areas where hydrated lime is used to stabilize subgrade soil, routine Atterberg-limit tests should be performed to verify the resulting plasticity index of the soil-lime mixture is at or below 15.

7.0 GENERAL CONSTRUCTION PROCEDURES AND GUIDELINES

Variations in subsurface conditions could be encountered during construction. To permit correlation between test boring data and actual subsurface conditions encountered during construction, it is recommended a registered Professional Engineering firm be retained to observe construction procedures and materials.

Some construction problems, particularly degree or magnitude, cannot be anticipated until the course of construction. The recommendations offered in the following paragraphs are intended not to limit or preclude other conceivable solutions, but rather to provide our observations based on our experience and understanding of the project characteristics and subsurface conditions encountered in the borings.

7.1 Site Preparation and Grading

All areas supporting pavement, flatwork or areas to receive new fill should be properly prepared.

- After completion of the necessary stripping, clearing, and excavating and prior to placing any required fill, the exposed soil subgrade should be carefully evaluated by probing and testing. Any undesirable material (organic material, wet, soft, or loose soil) still in place should be removed.

- The exposed soil subgrade should be further evaluated by proof-rolling with a heavy pneumatic tired roller, loaded dump truck or similar equipment weighing approximately 25 tons to check for pockets of soft or loose material hidden beneath a thin crust of possibly better soil.

- Proof-rolling procedures should be observed routinely by a Professional Engineer, or his designated representative. Any undesirable material (organic material, wet, soft, or loose soil) exposed during the proof-roll should be removed and replaced with well-compacted material as outlined in Section 7.3.

- Prior to placement of any fill, the exposed soil subgrade should then be scarified to a minimum depth of 6 inches and recompacted as outlined in Section 7.2.

If fill is to be placed on existing slopes (natural or constructed) steeper than six horizontal to one vertical (6:1), the fill materials should be benched into the existing slopes in such a manner as to provide a minimum bench-key width of five (5) ft. This should provide a good contact between the existing soils and new fill materials, reduce potential sliding planes, and allow relatively horizontal lift placements.

Even if fill is properly compacted as recommended in this report, fills in excess of about 10 ft are still subject to settlements over time of up to about 1 to 2 percent of the total fill thickness. This should be considered when designing utility lines under pavement or placing other deep fills.

Slope stability analysis of embankments (natural or constructed) was not within the scope of this study.

The contractor is responsible for designing any excavation slopes, temporary sheeting or shoring. Design of these structures should include any imposed surface surcharges. Construction site safety is the sole responsibility of the contractor, who shall also be solely responsible for the means, methods and sequencing of construction operations. The contractor should also be aware that slope height, slope inclination or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state and/or federal safety regulations, such as OSHA Health and Safety Standard for Excavations, 29 CFR Part 1926, or successor regulations. Stockpiles should be placed well away from the edge of the excavation and their heights should be controlled so they do not surcharge the sides of the excavation. Surface drainage should be carefully controlled to prevent flow of water over the slopes and/or into the excavations. Construction slopes should be closely observed for signs of mass movement, including tension cracks near the crest or bulging at the toe. If potential stability problems are observed, a geotechnical engineer should be contacted immediately. Shoring, bracing or underpinning required for the project (if any) should be designed by a professional engineer registered in the State of Texas.

Due to the nature of the clay soils found near the surface at the borings, traffic of heavy equipment (including heavy compaction equipment) may create pumping and general deterioration of shallow soils. Therefore, some construction difficulties should be anticipated during periods when these soils are saturated.

7.2 Fill Compaction

Fill placed for general grading purposes should be placed and compacted as outlined in this section. Compaction of pavement subgrade material should be performed as described in Section 6.1.

Clay soils with a plasticity index equal to or greater than 25 should be compacted to a dry density between 95 and 100 percent of standard Proctor maximum dry density (ASTM D 698). The compacted moisture content of the clays during placement should be within the range of 0 to 4 percentage points above optimum. Clay fill should be processed so the maximum particle or clod size is less than 6 inches in diameter.

In cases where either mass fills or utility lines are more than 10 ft deep, the fill/backfill below 10 ft should be compacted to at least 98 percent of standard Proctor maximum dry density (ASTM D-698) and within 2 percentage points of the material's optimum moisture content. The portion of the fill/backfill shallower than 10 ft should be compacted as outlined above.

Compaction should be accomplished by placing fill in about 8-inch thick loose lifts and compacting each lift to at least the specified minimum dry density.

7.3 Groundwater

Groundwater was encountered on drilling tools during drilling in Borings 1 through 6, 8, and 10 at depths of about 20 ft to 31 ft below the ground surface. However, from our experience with similar soils, shallower groundwater seepage could be encountered in excavations for pavement, utility conduits and other general excavations. The risk of encountering seepage increases with depth of excavation and during or after periods of precipitation. Standard sump pits and pumping may be adequate to control minor seepage on a local basis.

Where groundwater is encountered in granular soils, sump pits may not be adequate to control seepage and supplemental dewatering measures may be necessary to control groundwater seepage. Supplemental dewatering measures include (but are not limited to) submersible pumps in slotted casings and well points.

In any areas where cuts are made, attention should be given to possible seasonal water seepage that could occur through natural cracks and fissures in the newly exposed stratigraphy. In these areas, subsurface drains may be required to intercept seasonal groundwater seepage. The need for these or other de-watering devices should be carefully addressed during construction. Our office could be contacted to visually observe the final grades to evaluate the need for such drains.

8.0 LIMITATIONS

Professional services provided in this geotechnical exploration were performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. The scope of services provided herein does not include an environmental assessment of the site or investigation for the presence or absence of hazardous materials in the soil, surface water or groundwater. ALPHA, upon written request, can be retained to provide same.

ALPHA TESTING, INC. is not responsible for conclusions, opinions or recommendations made by others based on this data. Information contained in this report is intended for the exclusive use of the Client (and their designated design representatives), and is related solely to design of the specific structures outlined in Section 2.0. No party other than the Client (and their designated design representatives) shall use or rely upon this report in any manner whatsoever unless such party shall have obtained ALPHA's written acceptance of such intended use. Any such third party using this report after obtaining ALPHA's written acceptance shall be bound by the limitations and limitations of liability contained herein, including ALPHA's liability being limited to the fee paid to it for this report. Recommendations presented in this report should not be used for design of any other structures except those specifically described in this report. In all areas of this report in which ALPHA may provide additional services if requested to do so in writing, it is presumed that such requests have not been made if not evidenced by a written document accepted by ALPHA. Further, subsurface conditions can change with passage of time. Recommendations contained herein are not considered applicable for an extended period of time after the completion date of this report. It is recommended our office be contacted for a review of the contents of this report for construction commencing more than one (1) year after completion of this report. Non-compliance with any of these requirements by the Client or anyone else shall release ALPHA from any liability resulting from the use of, or reliance upon, this report.

Recommendations provided in this report are based on our understanding of information provided by the Client about characteristics of the project. If the Client notes any deviation from the facts about project characteristics, our office should be contacted immediately since this may materially alter the recommendations. Further, ALPHA TESTING, INC. is not responsible for damages resulting from workmanship of designers or contractors and it is recommended the Owner retain qualified personnel, such as a Geotechnical Engineering firm, to verify construction is performed in accordance with plans and specifications.

APPENDIX

A-1 METHODS OF FIELD EXPLORATION

Using standard rotary drilling equipment, a total of 31 test borings were performed for this geotechnical exploration at the approximate locations shown on the Boring Location Plan, Figure 1. The boring locations were staked by using a handheld GPS device or by pacing/taping and estimating right angles from landmarks which could be identified in the field and as shown on the site plan provided during this study. The locations of the test borings shown on the Boring Location Plan are considered accurate only to the degree implied by the methods used to define them.

Relatively undisturbed samples of the cohesive subsurface materials were obtained by hydraulically pressing 3-inch O.D. thin-wall sampling tubes into the underlying soils at selected depths (ASTM D 1587). These samples were removed from the sampling tubes in the field and evaluated visually. One representative portion of each sample was sealed in a plastic bag for use in future visual evaluation and possible testing in the laboratory.

Some soil samples were obtained using split-spoon sampling procedures in accordance with ASTM Standard D 1586. Disturbed samples were obtained at selected depths in the borings by driving a standard 2-inch O.D. split-spoon sampler 18 inches into the subsurface material using a 140-pound hammer falling 30 inches. The number of blows required to drive the split-spoon sampler the final 12 inches of penetration (N-value) is recorded in the appropriate column on the Log of Boring sheets.

Texas Department of Transportation Texas Cone Penetration (TCP) tests were completed in the field to determine the apparent in-place strength characteristics of the rock type materials. A 3-inch diameter steel cone driven by a 170-pound hammer dropped 24 inches is the basis for TxDOT strength correlations. Depending on the resistance (strength) of the materials, either the number of blows of the hammer required to provide 12 inches of penetration, or the inches of penetration of the cone due to 100 blows of the hammer are recorded on the field logs and are shown on the Log of Boring sheets as "TX Cone" (reference: TxDOT Test Method TEX 132-E).

Logs of the borings are included in the Appendix. The logs show visual descriptions of subsurface strata encountered using the Unified Soil Classification System. Sampling information, pertinent field data, and field observations are also included. Samples not consumed by testing will be retained in our laboratory for at least 14 days and then discarded unless the Client requests otherwise.

GEOTECHNICAL EXPLORATION
CORPORATE DRIVE EXTENSION
BETWEEN EAST OF HOLFORDS PRAIRIE ROAD
AND SOUTH RAILROAD STREET
LEWISVILLE, TEXAS
ALPHA PROJECT NO. W151710-C

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FIGURE 1

BORING LOCATION PLAN

APPROXIMATE BORING LOCATION

BORING INACCESSIBLE

B-1 METHODS OF LABORATORY TESTING

Representative samples were evaluated and classified by a qualified member of the Geotechnical Division and the boring logs were edited as necessary. To aid in classifying the subsurface materials and to determine the general engineering characteristics, natural moisture content tests (ASTM D 2216), Atterberg-limit tests (ASTM D 4318), percent material passing the No. 200 sieve tests (ASTM D 1140) and dry unit weight determinations were performed on selected samples. In addition, unconfined compressive strength tests (ASTM D 2166) and pocket-penetrometer tests were conducted on selected soil samples to evaluate soil shear strength. Results of the laboratory tests described above are provided on the Log of Boring sheets.

In addition to the Atterberg-limit tests, the expansive properties of the clay soils were further analyzed by absorption swell tests. The swell test is performed by placing a selected sample in a consolidation machine and applying either the approximate current or expected overburden pressure and then allowing the sample to absorb water. When the sample exhibits very little tendency for further expansion, the height increase is recorded and the percent free swell and total moisture gain calculated. Results of the absorption swell tests are provided on the Swell Test Data sheet, Figure 2 included in this Appendix.

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REPORT OF MOISTURE DENSITY RELATIONSHIP RESULTS (ASTM D698-A)

Project No: W151710-C	**Date:** 04/06/16

Material Description:	Dark Brown Clay		
Classification:	(CH)		**LL:** 67
Sample Location:	B-24		**PL:** 21
Maximum Dry Unit Weight (pcf):	**91.3**		**PI :** 46
Optimum Moistuire Content (%):	**26.6**	**% Passing #200:**	85.4%

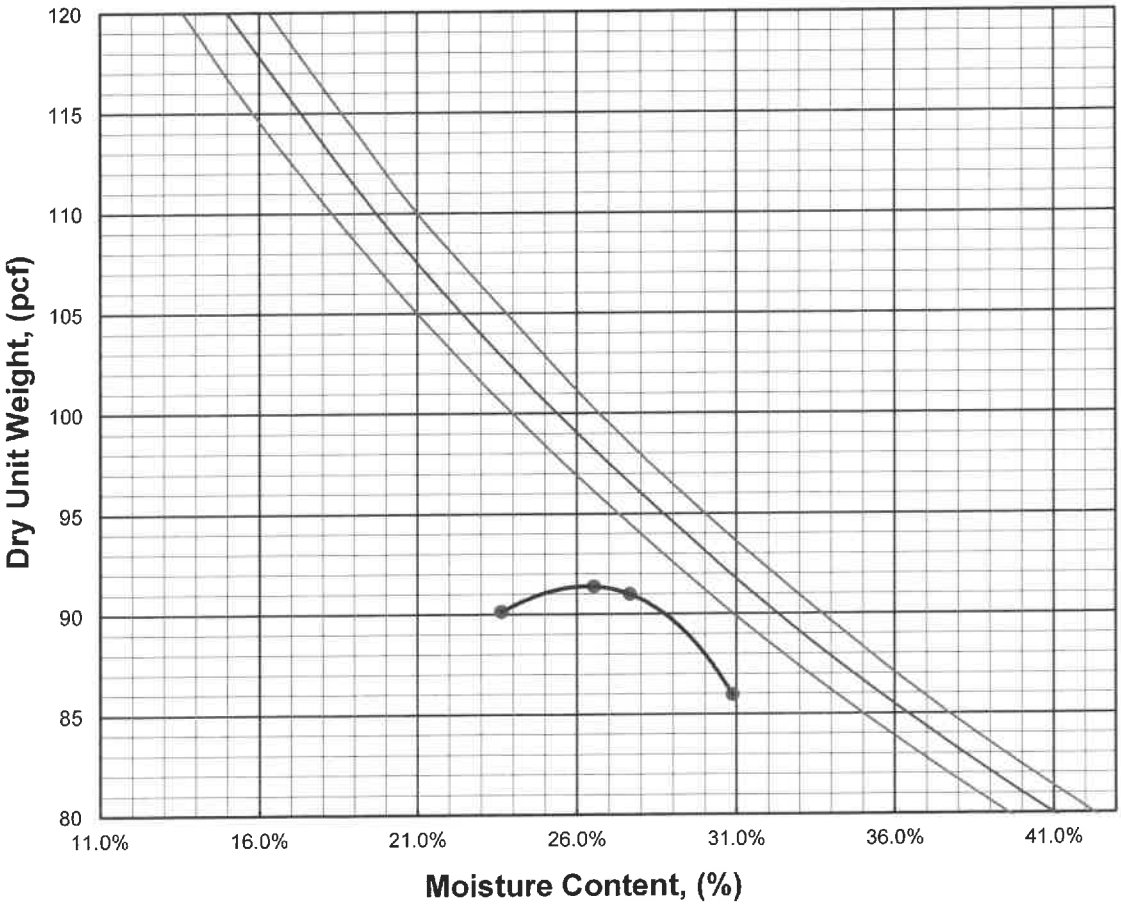

FIGURE 2A

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REPORT OF MOISTURE DENSITY RELATIONSHIP RESULTS (ASTM D698-A)

Project No: W151710-C	**Date:** 04/06/16

Material Description:	Light Brown Sandy Clay		
Classification:	(CL)		**LL:** 37
Sample Location:	B-11		**PL:** 14
Maximum Dry Unit Weight (pcf):	**111.9**		**PI :** 23
Optimum Moistuire Content (%):	**13.8**		**% Passing #200:** 70.4%

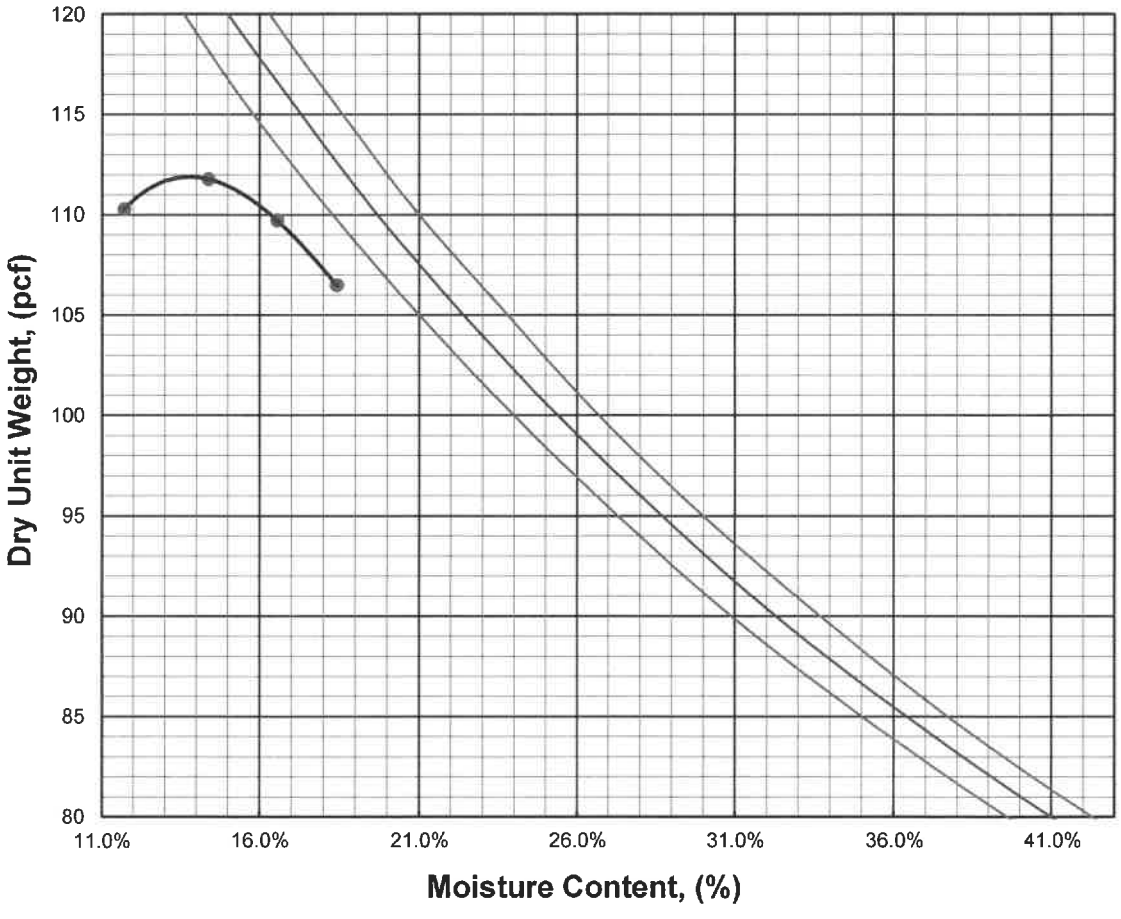

FIGURE 2B

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REPORT OF CALIFORNIA BEARING RATIO RESULTS (ASTM D1883)

Project No: W151710-C	**Date:** 04/14/16

Material Description:	Dark Brown Clay
Sample Location:	B-24
CBR @ 0.10 Inches =	3.4%
CBR @ 0.20 Inches =	2.6%

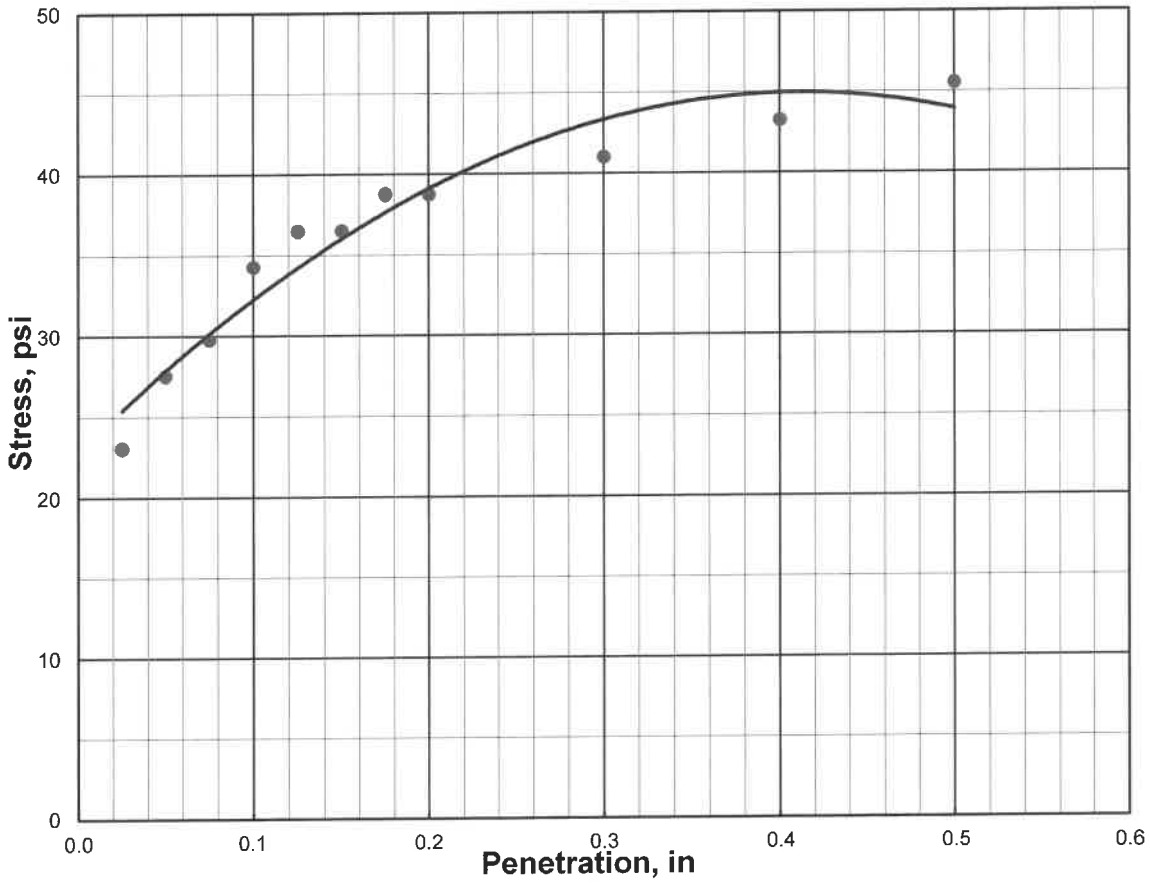

FIGURE 3A

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REPORT OF CALIFORNIA BEARING RATIO RESULTS (ASTM D1883)

Project No: W151710-C	**Date:** 04/14/16

Material Description:	Light Brown Sandy Clay
Sample Location:	B-11
CBR @ 0.10 Inches =	3.0%
CBR @ 0.20 Inches =	2.6%

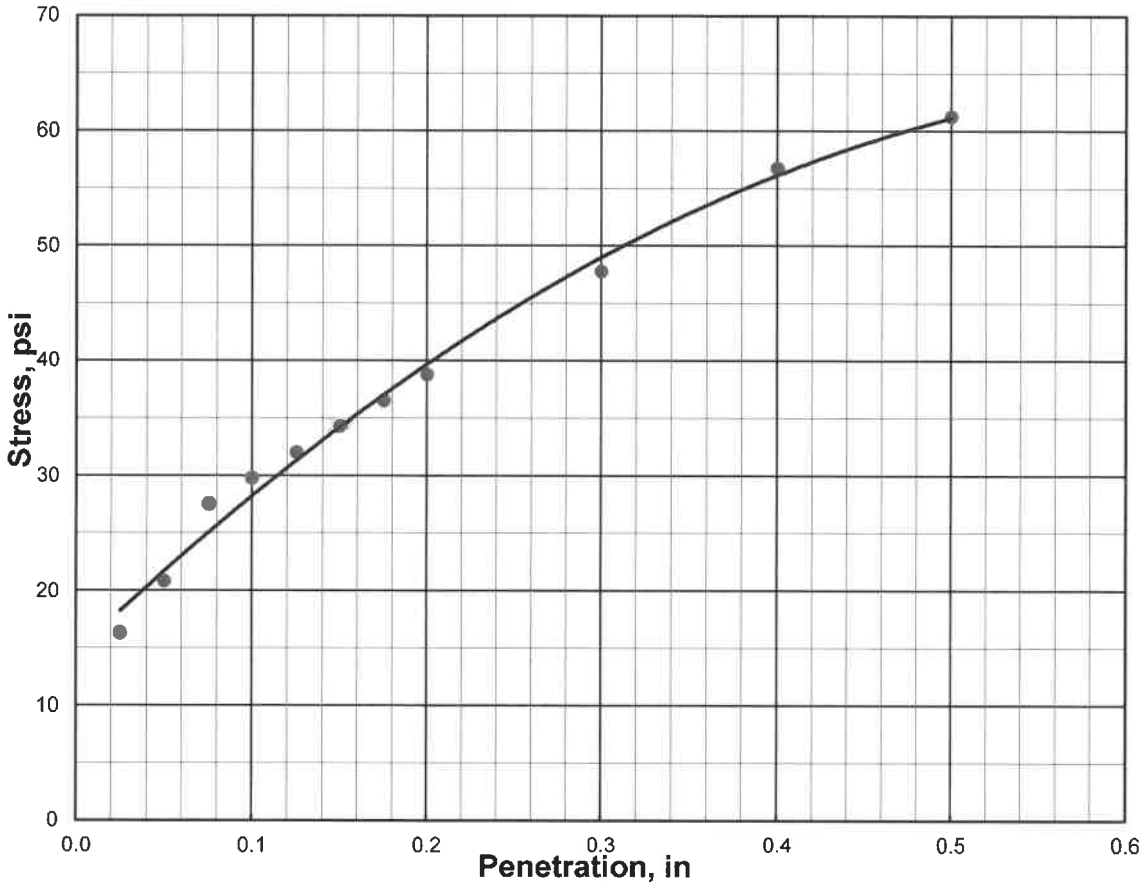

FIGURE 3B

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REPORT OF MECHANICAL LIME SERIES RESULTS

Project No: W151710-C | **Date:** 04/14/16

Sample Location: B-24

% Lime	0%	2%	4%	6%	8%
PI	46	36	26	18	11

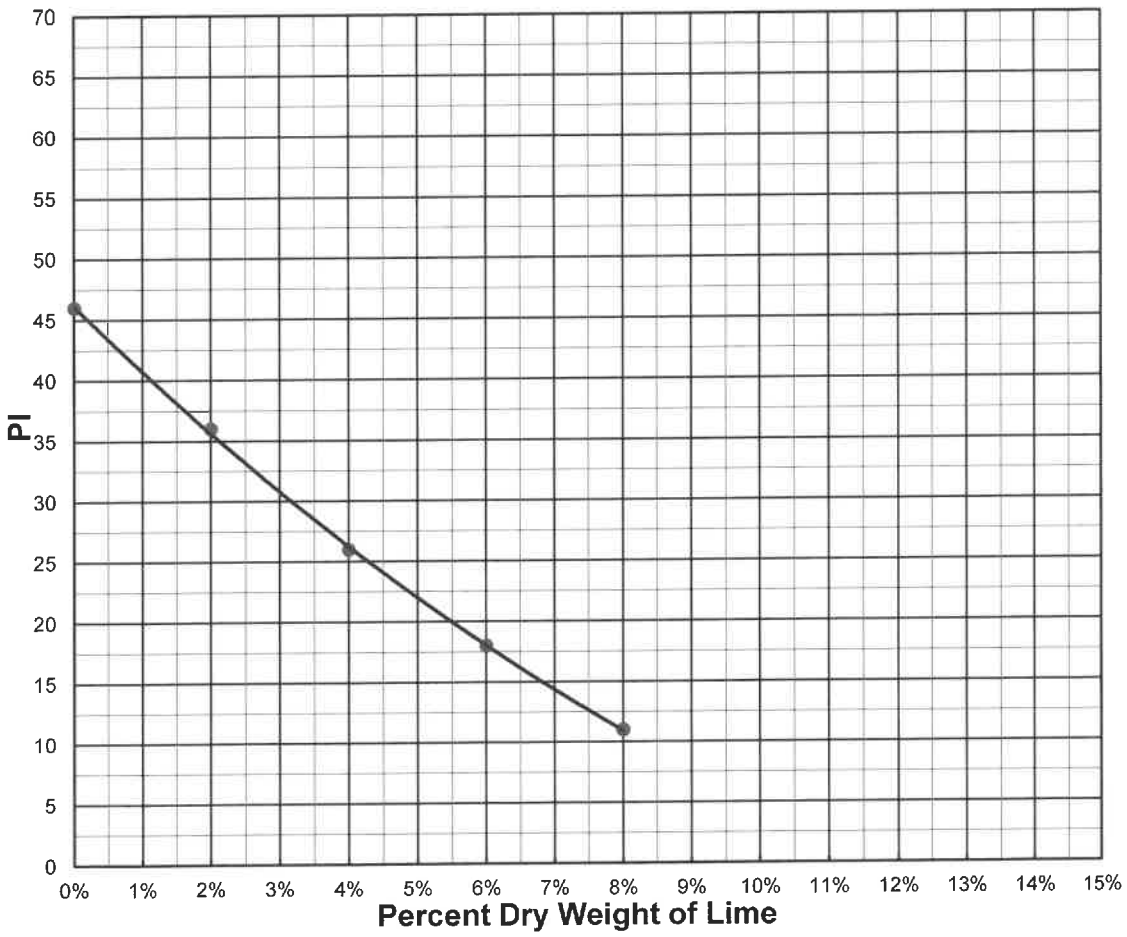

FIGURE 4A

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Geotechnical • *Construction Materials* • *Environmental* • TBPE Firm No. 813

REPORT OF MECHANICAL LIME SERIES RESULTS

Project No: W151710-C | **Date:** 04/15/16

Sample Location: B-11

% Lime	0%	2%	4%	6%	8%
PI	23	18	14	13	12

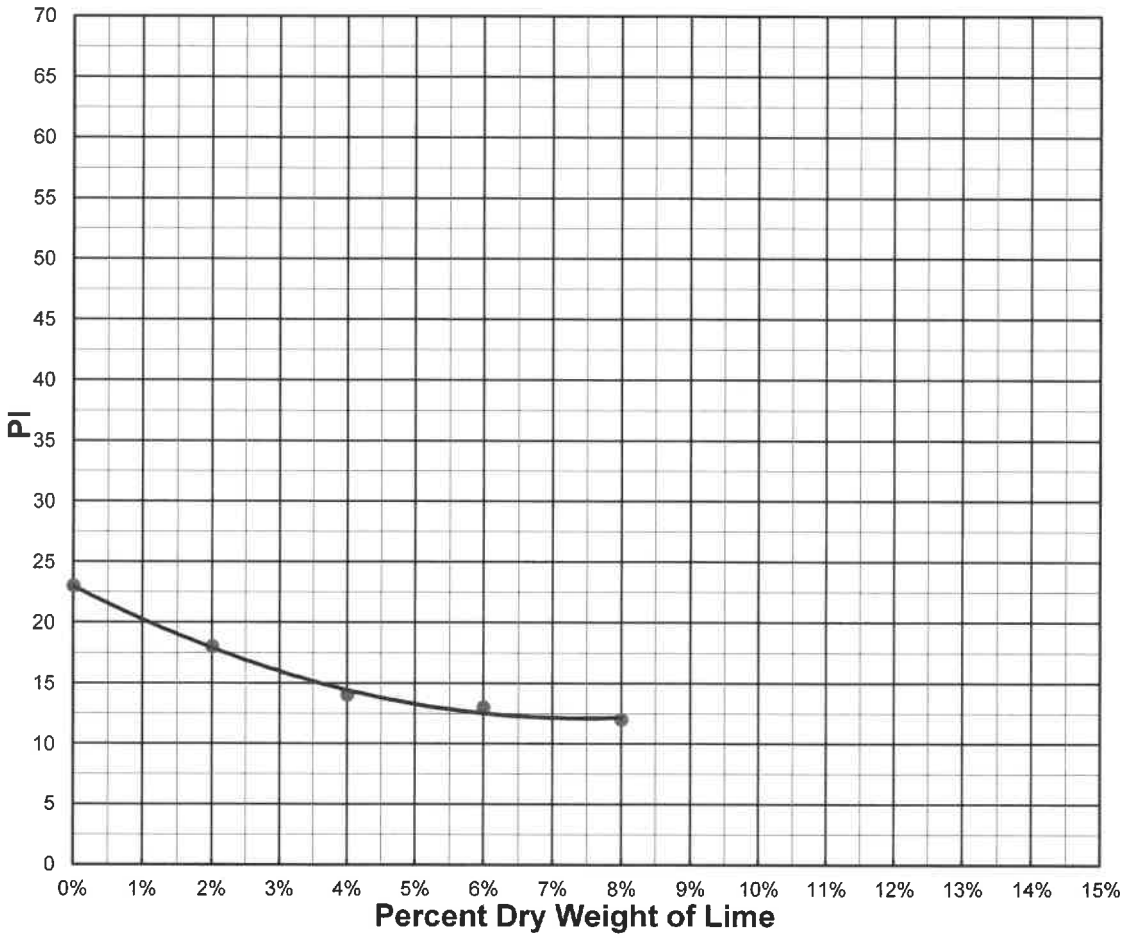

FIGURE 4B

WinPAS

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Rigid Design Inputs

Project Name: Non-Arterial Commercial
Route: Corporate Drive
Location: Lewisville, Texas
Owner/Agency:
Design Engineer:

Rigid Pavement Design/Evaluation

Concrete Thickness	8.00	**inches**	**Load Transfer Coefficient**	3.10	
Total Rigid ESALs	2,577,600		**Modulus of Subgrade Reaction**	200	**psi/in.**
Reliability	90.00	**percent**	**Drainage Coefficient**	1.00	
Overall Standard Deviation	0.35		**Initial Serviceability**	4.50	
Flexural Strength	620	**psi**	**Terminal Serviceability**	2.50	
Modulus of Elasticity	4,200,000	**psi**			

Modulus of Subgrade Reaction (k-value) Determination

Resilient Modulus of the Subgrade	0.0
Unadjusted Modulus of Subgrade Reaction	0
Depth to Rigid Foundation	0.00
Loss of Support Value (0,1,2,3)	0.0

Modulus of Subgrade Reaction	200	**psi/in.**

WinPAS

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Rigid Design Inputs

Project Name: Arterial
Route: Corporate Drive
Location: Lewisville, Texas
Owner/Agency:
Design Engineer:

Rigid Pavement Design/Evaluation

Concrete Thickness	10.00	**inches**	**Load Transfer Coefficient**	3.10	
Total Rigid ESALs	9,997,100		**Modulus of Subgrade Reaction**	200	**psi/in.**
Reliability	90.00	**percent**	**Drainage Coefficient**	1.00	
Overall Standard Deviation	0.35		**Initial Serviceability**	4.50	
Flexural Strength	620	**psi**	**Terminal Serviceability**	2.50	
Modulus of Elasticity	4,200,000	**psi**			

Modulus of Subgrade Reaction (k-value) Determination

Resilient Modulus of the Subgrade	0.0
Unadjusted Modulus of Subgrade Reaction	0
Depth to Rigid Foundation	0.00
Loss of Support Value (0,1,2,3)	0.0

Modulus of Subgrade Reaction	200	**psi/in.**

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BORING NO.: 1
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/2/2015 **End Date:** 11/15/2017
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 23
▼ After Drilling (ft): N/A
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
5		Brown CLAY				4.5+				11			
						4.5+				17			
						2.25				24	58	21	37
						2.0				26			
10						2.25				27			
		12.0											
15		Light Brown CLAY				2.25				21	45	18	27
20						2.25				20			
		22.0											
25		▽ Light Brown CLAYEY SAND with sandy clay seams and layers				0.25				20			
30						0.75		33		19	24	13	11
35					3					30			
40					3					24			
45					4					33			
		47.0											
50		Gray SAND with gravel and shale seams			20					19			
		52.0											
55		Gray CLAY SHALE with cemented sand seams			100/ 6"					23			
60					100/ 2"					17			
65					100/ 0.75"					20			
70					100/ 0.5"					22			
75		75.0			100/ 0.75"								
		Gray CEMENTED SAND with shale seams											
80					100/ 0.5"								
85					100/ 0.5"								
90		90.0			100/ 0.75"								
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 2 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/3/2015 **End Date:** 11/17/2017
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 31
▼ After Drilling (ft): N/A
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
5		Dark Brown CLAY				4.5+				14			
						4.5+				15			
						4.5+				20			
						4.5+				21	67	25	42
10						4.5+				20			
		12.0											
15		Brown CLAY with sand				2.5				25			
20						3.0				25			
25						2.0		87		22	58	21	37
30		▽				3.25				20			
		32.0											
35		Light Brown SANDY CLAY				1.25				19			
40						0.5				22			
		41.0											
45		Brown CLAYEY SAND			3					26			
50		- with some gravel below 50 ft			4			38		27	24	14	10
55					29					23			
60					27					24			
		63.0											
65		Gray CLAYEY SAND with shale seams			50/ 5.5"					25			
		67.0											
70		Tan and Gray SAND			50/ 5.5"					25			
		74.0											
75		Tan and Gray CEMENTED SAND with shale seams			100/ 0.75"					24			
80					100/ 0.5"					32			
85					100/ 0.5"					23			
		88.0											
90		Light Gray SHALE			100/ 1.5"					31			
		90.0											
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 3 (Sheet 1 of 1)

PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/3/2015 **End Date:** 11/20/2017
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 22
▼ After Drilling (ft): N/A
▽ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY - FILL				4.5+				12			
						4.5+				19	60	23	37
5		Dark Brown CLAY				2.75				19			
						4.5+				19			
10						4.5+				16			
		11.0											
		Light Brown CLAY											
15						2.5		91		26	70	25	45
20		▽				2.75				24			
25						2.5				21			
30					3					27			
35					3					20			
40		41.0			5					24			
		Light Brown CLAYEY SAND											
45					4			46		24	30	13	17
50		- with some gravel below 50 ft			11					30			
55		56.0			21					19			
		Gray CLAY SHALE											
60		60.0			100/ 11"					22			
		Gray CEMENTED SAND with clay seams											
65					50/ 4.5"								
70		72.0			50/ 5"								
		Gary CEMENTED SAND with shale seams											
75					100/ 1"								
80					100/ 0.75"								
85					100/ 0.5"								
90		90.0			100/ 1"								
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 4 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/4/2015 **End Date:** 11/20/2017
Drilling Method: WASH ROTARY
Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 20
▼ After Drilling (ft): N/A
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Dark Brown CLAY				1.5				28			
										19			
5						3.25				17	61	19	42
						4.5+				22			
10						4.5+				12			
		11.0											
		Brown SANDY CLAY											
15						2.0				27			
20		▽				2.25				26			
25		26.0			4					23			
		Light Brown SANDY CLAY											
30						2.0		69		18	36	13	23
35						2.0				20			
40					2					24			
		- with clayey sand seams and layers below 40 ft											
45					3			62		26	33	14	19
50					3					29			
		- with some gravel below 50 ft											
55					22					15			
		57.0											
60		Gray CLAY SHALE			10/ 10.5"					22			
		62.0											
65		Gray SHALE with cemented sand seams			100/ 1.25"					24			
70					100/ 0.75"					24			
		73.0											
75		Gray CEMENTED SAND with shale seams			100/ 0.25"								
80					100/ 0.75"								
85					100/ 0.75"								
90		90.0			100/ 0.5"								
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 5 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 11/21/2017
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 20
▼ After Drilling (ft): N/A
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Dark Brown SANDY CLAY				4.5+				8			
						4.5+				7			
5						4.5+		69		13	43	18	25
						4.5+				14			
10						4.5+				16			
		11.0											
		Brown SANDY CLAY											
15						3.5				17			
20		▽				3.75				17	43	18	25
25						1.5				20			
		27.0											
30		Brown CLAYEY SAND				0.5				24			
		31.0											
35		Brown SANDY CLAY				2.0				22			
		37.0											
40		Light Brown CLAYEY SAND				1.25				21			
45										24			
50								39		22	32	15	17
55					11					19			
		58.0											
60		Gray CLAY SHALE			50					18			
65					100/ 9"					24			
70					100/ 5.5"					23			
75		75.0			100/ 0.75"								
		Gray CEMENTED SAND											
80					100/ 0.5"								
85					100/ 1"								
90		90.0			100/ 0.5"								
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 6 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/6/2018 **End Date:** 8/6/2018
Drilling Method: WASH ROTARY
Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 28
▼ After Drilling (ft): N/A
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY				4.5+				17			
										17	55	23	32
5		- with sand seams from 4 ft to 8 ft								17	47	22	25
						4.5+				16			
10						4.5+				13			
		- with sand seams from 12 ft to 19 ft											
15						4.5+				8			
		19.0											
20		Brown and Gray SANDY CLAY								17	37	16	21
						3.0				17			
25		▽											
						3.75				19			
30													
						3.75				19			
35													
40													
45		45.0				1.0				23			
		Brown CLAYEY SAND											
50					22					19			
		- with gravel from 53 ft to 57 ft											
55					24					11			
		57.0											
60		Gray SHALY CLAY with sand seams			25					22			
65		65.0			74					20			
		Gray CLAY SHALE											
		69.0											
70		Gray SHALE with sand seams			100/ 0.75"								
					100/ 1"					16			
75													
					100/ 0.75"					22			
80													
					100/ 0.75"					21			
85		86.0											
		Gray CEMENTED SAND											
90		90.0			100/ 0.75"					24			
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 7 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/7/2018 **End Date:** 8/7/2018
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 170 / 24

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): N/A
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY with sand - possible fill				4.5+				15			
						4.5+				10			
5		Dark Brown CLAY				4.5+	7.5		106	18	68	24	44
						4.5+				16			
10		10.0				4.5+				19			
		Brown SANDY CLAY											
15						4.5+	4.1		112	16	34	18	16
20						2.75				16			
25						3.0				14			
30						2.5				16			
35						3.5				22			
40						3.0	1.0		103	20	35	16	19
		43.0											
45		Brown CLAYEY SAND			23					19			
50		50.0			21					16			
		Tan SAND with gravel and clay seams											
55					38					17			
60					21					19			
65					50/ 5.5"					22			
70					50/ 3.25"					19			
		73.0											
75		Gray CEMENTED SAND with sandstone layers			100/ 1.25"					23			
80					100/ 1.5"								
85					100/ 1.25"								
90		90.0			100/ 1"								
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 8
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/20/2018 **End Date:** 8/20/2018
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 170 / 24

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 22
▼ After Drilling (ft): N/A
▽ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Dark Brown CLAY				4.5+				18			
5						4.5+	12.0		106	16			
						4.5+				18			
						4.5+				15			
10						4.5+				15			
		10.0											
		Brown SANDY CLAY											
15						4.5+				17			
20						3.0				17			
	▽												
25						2.0				18			
		27.0											
30		Brown SAND			9					19			
35					5					19			
40					7					21			
45					23					19			
50					46					20			
		53.0											
55		Gray CLAY SHALE			61					9			
60					70					19			
		64.0											
65		Gray SHALE			100/ 5.5"					19			
		67.0											
70		Gray CEMENTED SAND with sandstone seams and layers			50/ 5"					25			
75					50/ 5"					21			
80					50/ 4"					23			
85					50/ 5.25"					20			
90					50/ 3"					21			
		90.0											
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 9 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/22/2018 **End Date:** 8/22/2018
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 170 / 24

GROUND WATER OBSERVATIONS
On Rods (ft): NONE
After Drilling (ft): N/A
After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Dark Brown CLAY				4.5+				28			
						4.5+	7.9	57	99	19			
5						4.5+				18	66	24	42
						4.5+				18			
10						4.5+				15			
		13.0											
15		Brown SANDY CLAY				4.5+				14			
20						1.25	1.0	91	109	25	71	23	48
25						4.5+				18			
30						1.75				20			
35						2.0				17			
		37.0											
40		Tan SAND								21			
45					60					17			
50		50.0			59								
		Gray CLAY SHALE											
55					83					22			
60					50/ 3"					19			
65					50/ 2"					16			
70										16			
75					96/ 11.5"					28			
		77.0											
80		Gray SHALE with sand seams			50/ 3"					30			
85					50/ 2"					23			
90		90.0			50/ 2"					20			
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 10
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/22/2018 **End Date:** 8/22/2018
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 170 / 24

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 28
▼ After Drilling (ft): N/A
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Dark Brown CLAY				4.5+				20			
						4.5+				16			
5						4.5+	7.8	92	93	15	54	20	34
						4.5+				14			
10						4.5+	12.4		95	16	31	17	14
		13.0											
15		Brown and Gray SANDY CLAY				4.5+				15			
20						3.75				17			
25						4.5				17			
	▽												
30						3.0				25			
35						2.0		70		21	33	15	18
40		40.0				2.0				18			
		Brown and Gray CLAYEY SAND											
45					33					21			
50		50.0			33					20			
		Tan SAND											
		53.0											
55		Gray SAND with gravel			50/ 3.5"					13			
		55.0											
		Gray SHALE with clay shale seams and layers											
60					50/ 2.75"					17			
65					50/ 2"					27			
70					50/ 2"					20			
75					67					18			
80					50/ 4.5"					14			
85					50/ 3.25"					24			
90		90.0			50/ 3.75"					22			
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 11 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 9/7/2015
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown SANDY CLAY				4.5+				4			
		2.0											
		Brown and Dark Brown CLAY with sandy clay seams				4.5+	3.3		109	17	49	20	29
5						4.5+				23			
						4.5+				18			
						4.5+				10			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 12
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 9/7/2015
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft.in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Dark Brown CLAY with sandy clay seams and layers - **FILL**				4.5+				8			
						2.0				6			
5						1.5				9			
						2.0	2.0		106	20	59	21	38
		8.0											
		Dark Brown CLAY				4.25				19			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 13 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 9/7/2015
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft.in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Dark Brown CLAY - FILL				4.5+				10			
						4.5+				12			
5						4.5+	3.8		102	17	71	22	49
		6.0											
		Dark Brown CLAY				2.75				31			
						3.25				22			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 14
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 9/7/2015
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Dark Brown CLAY with sandy clay seams- FILL				4.5+				10			
						4.5+				15	47	18	29
5						4.5+				15			
						4.0				23			
		8.0											
		Dark Brown CLAY				3.75				22			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 15 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 9/7/2015
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Dark Brown CLAY with sandy clay seams- FILL				4.5+				11			
						4.5+				22			
5						4.5+				17			
		6.0											
		Dark Brown CLAY				3.75				23	58	20	38
						3.25				21			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 16
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 9/7/2015
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Dark Brown CLAY with some sandy clay - FILL				4.5+				11			
						4.5+				13			
5						3.75				20	55	20	35
		6.0											
		Dark Brown CLAY				3.0				25			
						2.5				24			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 17 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 9/7/2015
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Dark Brown CLAY - FILL				4.5+				13			
						4.5+	7.6		117	17	57	20	37
5						4.5+				13			
						4.5+				9			
		8.0											
		Dark Brown CLAY				4.5+				16			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 18 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 9/7/2015
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Dark Brown CLAY with sandy clay seams- FILL				4.5+				12			
						4.5+				13			
		4.0											
5		Dark Brown CLAY				4.5+				16	63	22	41
						4.5+				21			
		8.0											
		Brown CLAY				2.5				23			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 19
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 9/7/2015
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Dark Brown CLAY - FILL				4.5+				12			
						4.5+				13			
5						4.5+				16			
		6.0											
		Brown SANDY CLAY - FILL				4.0				12			
		8.0											
		Dark Brown CLAY				3.5				23	63	24	39
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 20
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 6/20/2018 **End Date:** 6/20/2018
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
On Rods (ft): NONE
After Drilling (ft): DRY
After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Dark Brown CLAY				4.5+				18			
						4.5+				16			
5						4.5+	7.5		108	15	60	23	37
						4.5+				17			
		- with calcareous nodules from 8 ft to 10 ft											
						4.5+				19			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 21 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 11/15/2017 **End Date:** 11/15/2017
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY				1.0				31			
						4.25	3.0		105	20			
		4.0											
		Brown and Tan CLAY				1.25				28			
5													
						3.75				22	57	22	35
						2.75				22			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 22
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 11/15/2017 **End Date:** 11/15/2017
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown SANDY CLAY				4.5+	10.1	91	100	33			
		2.0											
		Brown CLAY				4.5+				17			
5						3.25				23	76	27	49
						4.5+				17			
						4.5				22			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 23
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 11/15/2017 **End Date:** 11/15/2017
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY				4.5+				18			
						4.5+				19			
		4.0											
5		Brown SANDY CLAY				3.25	6.5	93	106	19			
		6.0											
		Brown CLAY				4.5+				17	68	25	43
						4.5+				21			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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WHERE IT ALL BEGINS

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BORING NO.: 24
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 11/15/2017 **End Date:** 11/15/2017
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY				1.5				14			
						2.5	2.6		104	23			
5						3.5				22	71	24	47
		6.0											
		Brown SANDY CLAY				4.5+		75		18			
		8.0											
		Brown CLAY				4.5+				23			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 25
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 11/15/2017 **End Date:** 11/15/2017
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY				2.0	2.1		95	27			
						2.75				22			
5						4.5+				20			
						3.0		88		20	63	21	42
						3.0				24			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

ALPHA TESTING
WHERE IT ALL BEGINS

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BORING NO.: 26
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 11/15/2017 **End Date:** 11/15/2017
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Tan SANDY CLAY				4.5+		30		11			
						4.5+				5			
		4.0											
5		Brown CLAY				4.5+				25			
		6.0											
		Brown and Tan SANDY CLAY				4.5+		58		12			
		8.0											
		Brown CLAY				4.5+	4.2		106	19	62	25	37
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

ALPHA TESTING
WHERE IT ALL BEGINS

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BORING NO.: 27
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 11/15/2017 **End Date:** 11/15/2017
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY				4.5+				17			
						4.5+				16			
5						4.5+	2.7		101	19			
						3.0				24	57	23	34
						3.25				25			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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WHERE IT ALL BEGINS

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BORING NO.: 28
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 5/24/2016 **End Date:** 5/24/2016
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY				1.5				28			
						3.0	1.3		97	25			
5						4.5+		73		17	57	21	36
		6.0											
		Light Brown CLAY				4.5+				17			
						4.5+				18			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 31
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 6/19/2018 **End Date:** 6/19/2018
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
On Rods (ft): NONE
After Drilling (ft): DRY
After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft.in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY with sand				4.5+				17			
						3.75				23	63	23	40
5						3.75				25			
						3.25				21			
						4.25				18			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

ALPHA TESTING
WHERE IT ALL BEGINS

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BORING NO.: 32
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 6/19/2018 **End Date:** 6/19/2018
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown SANDY CLAY				1.25				20			
						1.25				24			
5						2.25	1.3	67	129	20	46	20	26
						3.0				22			
						2.75				21			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

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BORING NO.: 33
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 11/15/2017 **End Date:** 11/15/2017
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Tan SANDY CLAY with calcareous nodules				4.5+				15			
						4.5+				7			
5						4.5+	14.8	64	123	11			
						4.5+				13	51	22	29
		8.0											
		Tan CLAYEY SAND						27		12			
10		10.0											
		TEST BORING TERMINATED AT 10 FT											

ALPHA TESTING

WHERE IT ALL BEGINS

KEY TO SOIL SYMBOLS AND CLASSIFICATIONS

SOIL & ROCK SYMBOLS


(CH), High Plasticity CLAY


(CL), Low Plasticity CLAY


(SC), CLAYEY SAND


(SP), Poorly Graded SAND


(SW), Well Graded SAND


(SM), SILTY SAND


(ML), SILT


(MH), Elastic SILT


LIMESTONE


SHALE / MARL


SANDSTONE


(GP), Poorly Graded GRAVEL


(GW), Well Graded GRAVEL


(GC), CLAYEY GRAVEL


(GM), SILTY GRAVEL


(OL), ORGANIC SILT


(OH), ORGANIC CLAY


FILL

SAMPLING SYMBOLS


SHELBY TUBE (3" OD except where noted otherwise)


SPLIT SPOON (2" OD except where noted otherwise)


AUGER SAMPLE


TEXAS CONE PENETRATION


ROCK CORE (2" ID except where noted otherwise)

RELATIVE DENSITY OF COHESIONLESS SOILS (blows/ft)

VERY LOOSE	0 TO 4
LOOSE	5 TO 10
MEDIUM	11 TO 30
DENSE	31 TO 50
VERY DENSE	OVER 50

SHEAR STRENGTH OF COHESIVE SOILS (tsf)

VERY SOFT	LESS THAN 0.25
SOFT	0.25 TO 0.50
FIRM	0.50 TO 1.00
STIFF	1.00 TO 2.00
VERY STIFF	2.00 TO 4.00
HARD	OVER 4.00

RELATIVE DEGREE OF PLASTICITY (PI)

LOW	4 TO 15
MEDIUM	16 TO 25
HIGH	26 TO 35
VERY HIGH	OVER 35

RELATIVE PROPORTIONS (%)

TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	36 TO 50

PARTICLE SIZE IDENTIFICATION (DIAMETER)

BOULDERS	8.0" OR LARGER
COBBLES	3.0" TO 8.0"
COARSE GRAVEL	0.75" TO 3.0"
FINE GRAVEL	5.0 mm TO 3.0"
COURSE SAND	2.0 mm TO 5.0 mm
MEDIUM SAND	0.4 mm TO 5.0 mm
FINE SAND	0.07 mm TO 0.4 mm
SILT	0.002 mm TO 0.07 mm
CLAY	LESS THAN 0.002 mm

GEOTECHNICAL EXPLORATION

CORPORATE DRIVE EXTENSION – BRIDGE FOUNDATIONS AND ABUTMENTS

Between Old Denton Road and Holfords Prairie Road
Lewisville, Texas
ALPHA Report No. W151710-D
January 28, 2019

Prepared for:

HALFF ASSOCIATES, INC.
4000 Fossil Creek Boulevard
Fort Worth, Texas 76137
Attention: Mr. Benjamin McGahey, P.E.

Prepared By:

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Geotechnical
Construction Materials
Environmental
TBPE Firm No. 813

5058 Brush Creek Road
Fort Worth, Texas 76119

Tel: 817-496-5600
Fax: 817-496-5608
www.alphatesting.com

January 28, 2019

Halff Associates, Inc.
4000 Fossil Creek Boulevard
Fort Worth, Texas 76137

Attention: Mr. Benjamin McGahey, P.E.

Re: Geotechnical Exploration
Corporate Drive Extension – Bridge Foundations and Abutments
Between Old Denton Road and Holfords Prairie Road
Lewisville, Texas
ALPHA Report No. W151710-D

Attached is the report of the geotechnical exploration performed for the project referenced above. This study was authorized by Mr. David Smith, P.E. using the Standard Subcontract for Subsurface/Underground Services between Halff Associates, Inc. and ALPHA TESTING, Inc. and performed in accordance with ALPHA Proposal No.43607-1-rev1, dated October 11, 2017.

This report contains results of field explorations and laboratory testing and an engineering interpretation of these with respect to available project characteristics. The results and analyses were used to develop recommendations to aid design and construction of bridge foundations and abutments. Recommendations for the pavement associated with the bridges are provided in ALPHA Report No. W151710-C, dated November 6, 2018. Recommendations for global stability of the bridge abutments and proposed retaining walls will be issued under a separate cover.

ALPHA TESTING, INC. appreciates the opportunity to be of service on this project. If we can be of further assistance, such as providing materials testing services during construction, please contact our office.

Sincerely,

ALPHA TESTING, INC.

STATE OF TEXAS
MAHSA HEDAYATI
120507
LICENSED
PROFESSIONAL ENGINEER

January 28, 2019

Mahsa Hedayati, Ph.D., P.E.
Geotechnical Project Manager

Brian J. Hoyt, P.E.
Geotechnical Department Manager

MH/BJH/mh
Copies: (1-PDF) Client

TABLE OF CONTENTS

ALPHA REPORT NO. W151710-D

1.0 PURPOSE AND SCOPE

The purpose of this geotechnical exploration is for ALPHA TESTING, INC. ("ALPHA") to evaluate for the "Client" some of the physical and engineering properties of subsurface materials at selected locations on the subject site with respect to formulation of geotechnical design parameters for proposed bridge foundations. The field exploration was accomplished by securing subsurface samples from widely spaced test borings performed across the project site. Engineering analyses were performed from results of the field exploration and results of laboratory tests performed on representative samples.

Also included are general comments pertaining to reasonably anticipated construction problems and recommendations concerning quality control testing during construction. This information can be used to evaluate subsurface conditions and to aid in ascertaining whether construction meets project specifications.

Recommendations provided in this report were developed from information obtained from test borings depicting subsurface conditions only at the specific boring locations and at the particular time designated on the logs. Subsurface conditions at other locations may differ from those observed at the boring locations, and subsurface conditions at boring locations may vary at different times of the year. The scope of work may not fully define the variability of subsurface materials and conditions that are present on the site. The nature and extent of variations from conditions encountered at the borings may not become evident until construction. If significant variations then appear evident, our office should be contacted to re-evaluate our recommendations after performing on-site observations and possibly other tests.

2.0 PROJECT CHARACTERISTICS

It is proposed to construct two (2) bridges on the planned extension of Corporate Drive in Lewisville, Texas. A site plan illustrating the general outline of the site is provided as Figure 1, the "Boring Location Plan", in the Appendix of this report. A summary of the proposed bridges, their approximate locations and the borings drilled for each bridge is provided in Table A.

Table A
Summary of Bridge Description and Drilled Borings

Bridge Description	Location	Description	Boring Nos. (and Depth)
Southern Bridge	About 350 ft east of South Railroad Street	The bridge will cross a low laying area and will be about 60 ft long and up to 18 ft high.	Borings 1 through 4 (90 ft)
Northern Bridge	About 2,100 ft east of Holfords Prairie Road	The bridge will cross the Elm Fork Trinity River and will be about 1,320 ft long and up to 19 ft high	Borings 5 through 10 (90 ft)

Based on the information provided to us, we understand maximum pier loads will be up to about 175 tons. It is intended to support the bridges with drilled straight shaft pier foundations. Review of the preliminary grading plans prepared by Halff Associates (Project Nos. G1122, G1123 and G1124, dated November 2018) indicate maximum fills of about 6 ft and 14 ft are expected in the vicinity of the southern and northern bridges, respectively. The side embankments along the shoulders of the pavement and in front of the bridge abutments will be sloped from four (4) horizontal to one (1) vertical (4H:1V) and six (6) horizontal to one (1) vertical (6H:1V).

3.0 FIELD EXPLORATION

Subsurface conditions for the project were explored by drilling a total of ten (10) test borings to a depth of about 90 ft each, as summarized in Table A. The borings were performed using standard rotary drilling equipment in general accordance with ASTM Standard D 420. The approximate locations of the test borings are shown on the Boring Location Plan, Figure 1 in the Appendix of this report. Details of drilling and sampling operations are briefly summarized in Methods of Field Exploration, Section A-1 of the Appendix.

Subsurface types encountered during the field exploration are presented on Log of Boring sheets (boring logs) enclosed in the Appendix. The logs contain our Field Technician's and Engineer's interpretations of conditions believed to exist between actual samples retrieved. Therefore, the boring logs contain both factual and interpretive information. Lines delineating subsurface strata on the boring logs are approximate and the actual transition between strata may be gradual.

4.0 LABORATORY TESTS

Selected samples of the subsurface materials were tested in the laboratory to evaluate their engineering properties as a basis in providing recommendations for foundation design and earthwork construction. A brief description of testing procedures used in the laboratory can be found in Methods of Laboratory Testing, Section B-1 of the Appendix. Individual test results are presented on the Log of Boring and summary data sheets enclosed in the Appendix.

5.0 GENERAL SUBSURFACE CONDITIONS

Based on the Geologic Atlas of Texas from the Texas Bureau of Economic Geology, published by the University of Texas at Austin, the site lies within the Alluvium and Terrace deposits underlain by the Eagle Ford formation. The Terrace and Alluvium deposits generally consist of sand, gravel and clay soils. The clay soils associated with these formations are generally characterized by low to moderate shrink/swell potential. The Eagle Ford formation is composed predominantly of shale with occasional platy beds of sandstone and limestone. Residual overburden soils associated with the Eagle Ford formation generally consist of clay and shaly clay with very high shrink/swell potential.

Subsurface conditions encountered in the borings generally consisted of clay and/or sandy clay to depths of about 22 ft to 57 ft below the ground surface. The clay and sandy clay in Borings 1, 2, 3 and 5 through 10 were underlain by clayey sand and/or sand to depths of about 50 ft to 74 ft. Clay shale, shale and/or cemented sand were then encountered which extended to the 90 ft termination depth of the borings. The upper 4 ft of clay in encountered in Boring 3 was visually classified as fill material. More detailed stratigraphic information is presented on the Drilling Log sheets attached to this report.

The granular soils (sand, clayey sand and cemented sand) encountered in the borings are considered relatively permeable and are expected to have a relatively rapid response to water movement. However, the clay, sandy clay, clay shale and shale encountered in the borings are considered relatively impermeable and are anticipated to have a relatively slow response to water movement. Therefore, several days of observation would be required to evaluate actual groundwater levels within the depths explored. Also, the groundwater level at the site is anticipated to fluctuate seasonally depending on the amount of rainfall, prevailing weather conditions and subsurface drainage characteristics.

Wash rotary drilling methods were used to drill the borings. This drilling technique requires introduction of water into the borehole to facilitate drilling. Therefore, initial seepage observations were made where possible, prior to introduction of external drilling water. Groundwater levels after completion of drilling could not be assessed. Groundwater was encountered on drilling tools during drilling in Borings 1 through 6, 8, and 10 at depths of about 20 ft to 31 ft below the ground surface. No free groundwater was encountered in Borings 7 and 9 prior to introducing external drilling water. It is common to detect seasonal groundwater in fill and granular soils, from natural fractures within the clayey matrix, at the soil/rock (shale) interface or from fractures in the rock, particularly during or after periods of precipitation. If more detailed groundwater information is required, monitoring wells or piezometers can be installed.

Further details concerning subsurface materials and conditions encountered can be obtained from the Log of Boring sheets provided in the Appendix.

6.0 DESIGN RECOMMENDATIONS

The following design recommendations were developed on the basis of the previously described Project Characteristics (Section 2.0) and General Subsurface Conditions (Section 5.0). If project criteria should change, our office should conduct a review to determine if modifications to the recommendations are required. Further, it is recommended our office be provided with a copy of the final plans and specifications for review prior to construction.

The following design criteria given in this report were developed assuming grading and project dimensions are as indicated on preliminary plans provided by the Client. Different grading and geometry than indicated on the referenced plans can alter the recommended geotechnical design parameters and global stability analysis conclusions. Therefore, it is recommended our office be contacted once final plans are available to verify appropriate design parameters are utilized for final foundation design.

6.1 Drilled, Straight-Shaft Piers – Bridge Structure

Our findings indicate the bridge structures could be supported using a system of drilled, straight-shaft piers bearing at a depth of at least 65 ft below existing grade into clay shale, shale or cemented sand (the bearing stratum). Deeper penetrations will be required to develop skin friction and/or uplift resistance.

Groundwater was encountered at depths of about 20 ft to 31 ft below the ground surface in the Borings 1 through 6, 8, and 10. *Sand and cemented sand were also encountered in the borings. We expect groundwater and granular materials will be encountered during construction. These materials are prone to caving. Therefore casing will likely be required for drilled piers at this site. It may not be possible to control groundwater in the sands and cemented sands, even with the use of casing. Underwater placement of concrete will be required if groundwater seepage cannot be controlled with casing. Test piers should be performed outside of the planned pier locations prior to construction to verify constructability of drilled piers and groundwater levels.*

Piers bearing in the bearing stratum at a depth of at least 65 ft below existing grade can be dimensioned using net allowable end-bearing pressure and skin friction values as summarized in Table B.

TABLE B
Recommended Design Values for Drilled Straight Shaft Piers

Bridge	Bearing Stratum Depth (ft)	End Bearing (ksf)	Allowable Skin Friction in Compression (ksf)	Allowable Skin Friction in Uplift Resistance (ksf)
Southern Bridge	Between 65 ft and up to 75 ft below existing grade	12	2.0	1.7
	Between 75 ft and 90 ft below existing grade	40[1]	6.5	5.5
Northern Bridge	Between 65 ft and 90 ft below existing grade	12[1]	2.0	1.7

[1] The recommended bearing pressures should only be used for computing pier capacity if at least two (2) pier shaft diameters remain between the bottom of the pier and the bottom of our deepest boring (90 ft). If the minimum clearance is not provided, the pier should be designed as a friction pier, neglecting end bearing. Even friction piers should not extend past the depth of our deepest boring. If piers extend past our deepest boring, our office should be contacted to deepen the borings in order to verify the underlying strata.

The skin friction component should be applied only to the portion of the shaft located in the bearing stratum. The minimum clear spacing between piers should be at least two (2) pier shaft diameters, based on the larger pier, to develop the full load carrying capacity from skin friction. The recommended bearing pressures contain a factor of safety of at least three (3) considering a general bearing capacity failure and the skin friction values have a factor of safety of at least two (2). Normal elastic settlement of piers under loading is estimated at less than about 1 inch.

Skin friction should be neglected above the bottom of temporary casing in the clay shale and shale materials. It is not required to neglect skin friction above the bottom of temporary casing in cemented sand.

Each pier should be designed to resist the uplift pressure (soil-to-pier adhesion) due to potential soil swell along the shaft from post construction heave and other uplift forces applied by structural loadings. The magnitude of uplift adhesion due to soil swell along the pier shaft cannot be defined accurately and can vary according to the actual in-place moisture content of the soils during construction. It is estimated this uplift adhesion will not exceed about 2.0 kips per sq ft. This soil adhesion is approximated to act uniformly over the portion of the pier shaft in contact with clay

soils to a maximum depth of 12 ft. The uplift adhesion due to soil swell can be neglected over the portion of the shaft in contact with any non-expansive material used in the building pad areas and any limestone.

The uplift resistance of each pier can be computed using allowable skin friction values provided in Table B. Negative skin friction acting on the pier due to settlement of placed fill and the underlying native soils is estimated to be negligible relative to the available resistance provided by the pier bearing in the bearing stratum.

Lateral analysis for drilled piers constructed at the site can be performed using the following design parameters (L-Pile) provided for the site soils in Table C. The lateral resistance of the top portion of the pier shafts (the portion within 8 ft of final grade) should be neglected due to disturbance and potential soil shrinkage.

TABLE C
Design Parameters For L-PILE

Material	Clays Deeper than 8 ft Below Final Grade	Sand and Clayey Sand Deeper than 8 ft Below Final Grade	Cemented Sand	Clay Shale	Gray Shale
L-Pile p-y Model	Stiff clay	Sand	Sand	Stiff Clay	Weak rock
Effective Unit Weight (γ), pci	0.072	0.072	0.076	0.075	0.078
Undrained Cohesion (c), psi	5	--	--	30	--
Friction Angle, degrees	--	25	35	--	--
Rock Uniaxial Compressive Strength (q_u), psi	--	--	--	--	100
Rock Mass Modulus (E_r), psi	--	--	--	--	10,000
Rock Quality Designation (RQD)[1], %	--	--	--	--	70-90
Rock Strain Factor (k_{rm})	--	--	--	--	0.0005

[1] Rock Quality Designation (RQD) is based on our area experience and the results of the field exploration.

6.2 Pier Caps and Grade Beams

All pier caps/grade beams connecting piers should be formed and not cast in earthen trenches. Pier caps/grade beams should be formed with a nominal 12-inch void at the bottom. Commercially available cardboard box forms (cartons) are made for this purpose. The cardboard cartons should extend the full length and width of the grade beams. Prior to concrete placement, the cartons

should be inspected to verify they are firm, properly placed, and capable of supporting wet concrete. Some type of permanent soil retainer, such as pre-cast concrete panels, must be provided to prevent soils adjacent to pier caps/grade beams from sloughing into the void space at the bottom of the grade beams. Additionally, backfill soils placed adjacent to grade beams must be compacted as outlined in Section 7.3 of this report.

6.3 Embankment Fill and Potential Movements

As discussed, up to 14 ft of fill will be placed in the bridge approaches. We expect near-surface, on-site or similar clayey soil will constitute most of the embankment fill. Clayey fill placed within 10 ft of final grade should be compacted to at least 95 percent of the material's maximum dry density as determined by standard Proctor (ASTM D 698) moisture-density tests. Clay fill placed at depths below 10 ft of final grade should be compacted to at least 100 percent of the materials maximum dry density. Further recommendations for fill compaction are presented in Section 7.3 of this report.

Even when fill is properly placed and compacted as recommended herein, relatively deep fills (in excess of about 10 ft) are subject to settlement due to compression of the fill from self-weight. The portion of fill placed as recommended in the upper 10 ft could be subject to settlement of about 1 percent of the fill thickness and the portion below 10 ft of final grade could be subject to settlement of up to about 2 percent. The total estimated settlement of the maximum 14 ft depth of fill could be as much as 2 to 3 inches. This settlement could cause differential movement between the pavement and the bridge deck. We expect the embankment fill will have achieved about 70 percent settlement (about 2 inches) after about 3 months with about 1 inch settlement remaining.

In addition to settlement from embankment fill, consolidation tests indicate the native underlying soil beneath the 14 ft embankment could experience settlements of up to about 3 inches. We estimate it could take up to about 1½ years for the underlying native soil to experience 70 percent of its expected settlement (about 1 inch settlement remaining). To expedite the settlement process, we recommend placing a 6 inch thick drainage blanket atop the native soils prior to placing the embankment fill. The drainage blanket should extend below any part of the embankment taller than 10 ft. By placing the drainage blanket we estimate it will take about 2 months to achieve 30 percent settlement (about 1 inch) with about 2 inches of settlement remaining and about 8 months to achieve 70 percent settlement (about 2 inches) with about 1 inch settlement remaining.

The drainage blanket can consist of a sand, gravel or a sand and gravel mixture, with less than 5 percent finer than the No. 200 sieve size. The blanket should extend the entire width of the embankment and provide a drainage path to the outside limits of the embankment parallel to the pavement.

In addition to settlement of new fill material, active clay soils which could compose the majority of the new fill are subject to changes in volume due to seasonal changes in moisture content. We estimate potential seasonal movements could be up to about 6 inches. Potential seasonal movements can also cause differential movement between the pavement and the bridge deck.

Potential seasonal movements were estimated using results of absorption swell tests, methods outlined by the Texas Department of Transportation (TxDOT) Test Method Tex-124-E, and engineering judgment and experience. The estimated movements were calculated assuming the moisture content of the in-situ soil within the normal zone of seasonal moisture content change

varies between a "dry" condition and a "wet" condition as defined by methods outlined in Texas Department of Transportation Test Method Tex-124-E. Movements exceeding our estimates could also occur if positive drainage of surface water is not maintained or if soils are subject to an outside water source (generally within the upper 10 ft to 15 ft of the soil mass), such as leakage from a utility line or subsurface moisture migration from off-site locations.

6.4 Seismic Considerations

The Site Class for seismic design is based on several factors that include soil profile (soil or rock), shear wave velocity, and strength, averaged over a depth of 100 ft. Since our borings did not extend to 100-foot depths, we based our determinations on the assumption that the subsurface materials below the bottom of the boring were similar to those encountered at the termination depth. Based on Section 1613.3.2 of the 2012 International Building Code and Table 20.3-1 in the 2010 ASCE-7, we recommend using Site Class D (stiff soil profile) for seismic design at this site.

6.5 Associated Pavement

Recommendations for adjoining pavement are provided in ALPHA Report No. W151710-C dated November 6, 2018.

6.6 Drainage and Other Considerations

Adequate drainage should be provided to reduce seasonal variations in the moisture content of subgrade soils. Final grades within 10 ft of the bride structures should be adjusted to slope away from the pavement at a minimum slope of 2 percent. **Maintaining positive surface drainage throughout the life of the pavement is essential.**

7.0 GENERAL CONSTRUCTION PROCEDURES AND GUIDELINES

Variations in subsurface conditions could be encountered during construction. To permit correlation between test boring data and actual subsurface conditions encountered during construction, it is recommended a registered Professional Engineering firm be retained to observe construction procedures and materials.

Some construction problems, particularly degree or magnitude, cannot be reasonably anticipated until the course of construction. The recommendations offered in the following paragraphs are intended not to limit or preclude other conceivable solutions, but rather to provide our observations based on our experience and understanding of the project characteristics and subsurface conditions encountered at the borings.

7.1 Site Preparation and Grading

All areas supporting pavement, flatwork and areas to receive new fill should be properly prepared.

- After completion of the necessary stripping, clearing, and excavating and prior to placing any required fill, the exposed soil subgrade should be carefully evaluated by probing and testing. Any undesirable material (organic material, wet, soft, or loose soil) still in place should be removed.

- The exposed soil subgrade should be further evaluated by proof rolling with a heavy pneumatic tired roller, loaded dump truck or similar equipment weighing approximately 25 tons to check for pockets of soft or loose material hidden beneath a thin crust of possibly better soil. Proof-rolling procedures should be observed routinely by a Professional Engineer or his designated representative. Any undesirable material exposed during the proof-roll (organic material, wet, soft, or loose soil) exposed from the proof roll should be removed and replaced with well-compacted material as outlined in Section 7.3.

- Prior to placement of any fill, the exposed soil subgrade should then be scarified to a minimum depth of 6 inches and recompacted as outlined in Section 7.3.

- If fill is to be placed on existing slopes (natural or constructed) steeper than six horizontal to one vertical (6:1), the fill materials should be benched into the existing slopes in such a manner as to provide a minimum bench width of five (5) feet. This should provide a good contact between the existing soils and new fill materials, reduce potential sliding planes and allow relatively horizontal lift placements.

The contractor is responsible for designing any excavation slopes, temporary sheeting or shoring. Design of these structures should include any imposed surface surcharges. Construction site safety is the sole responsibility of the contractor, who shall also be solely responsible for the means, methods and sequencing of construction operations. The contractor should also be aware that slope height, slope inclination or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state and/or federal safety regulations, such as OSHA Health and Safety Standard for Excavations, 29 CFR Part 1926, or successor regulations. Stockpiles should be placed well away from the edge of the excavation and their heights should be controlled so they do not surcharge the sides of the excavation. Surface drainage should be carefully controlled to prevent flow of water over the slopes and/or into the excavations. Construction slopes should be closely observed for signs of mass movement, including tension cracks near the crest or bulging at the toe. If potential stability problems are observed, a geotechnical engineer should be contacted immediately. Shoring, bracing or underpinning required for the project (if any) should be designed by a professional engineer registered in the State of Texas.

Due to the nature of the clay soils found near the surface at some of the borings, traffic of heavy equipment (including heavy compaction equipment) may create pumping and general deterioration of shallow soils. Therefore, some construction difficulties should be anticipated during periods when these soils are saturated.

7.2 Foundation Excavations

All foundation excavations should be monitored to verify foundations bear on suitable material. The bearing stratum exposed in the base of all foundation excavations should be protected against any detrimental change in conditions. Surface runoff water should be drained away from excavations and not allowed to collect. All concrete for foundations should be placed as soon as practical after the excavation is made. Drilled piers should be excavated and concrete placed within 8 hours after the design penetration into the bearing stratum is begun.

Prolonged exposure of the bearing surface to air or water will result in changes in strength and compressibility of the bearing stratum. Therefore, if delays occur, straight shaft pier excavations should be slightly widened, deepened and cleaned, or a new (deeper) design penetration should be constructed in order to provide a fresh bearing surface.

All pier shafts should have a minimum diameter of 1/30th of the length of the pier or 2 ft, whichever is greater, to facilitate clean-out of the base and proper monitoring. Concrete placed in pier holes should be directed through a tremie, hopper, or equivalent. Placement of concrete should be vertical through the center of the shaft without hitting the sides of the pier or reinforcement to reduce the possibility of segregation of aggregates. Concrete placed in piers should have a minimum slump of 5 inches (but not greater than 7 inches) to avoid potential honey-combing.

Observations during pier drilling should include, but not necessarily be limited to, the following items:

- Verification of proper bearing strata and consistency of subsurface stratification with regard to boring logs,
- Confirmation the minimum required penetration into the bearing strata is achieved,
- Complete removal of cuttings from bottom of pier holes,
- Proper handling of any observed water seepage and sloughing of subsurface materials,
- No more than 2 inches of standing water should be permitted in the bottom of pier holes prior to placing concrete, and
- Verification of pier diameter and steel reinforcement.

Groundwater was encountered Borings 1 through 6, 8, and 10 at depths of about 20 ft to 31 ft and could be encountered during construction. We expect casing will be required to prevent sloughing of granular soils during pier drilling. However, casing will not likely control groundwater from seeping through the bottom of the pier excavation. After the casing is seated, all loose material should be removed. As casing is extracted, care should be taken to maintain a positive head of plastic concrete and minimize the potential for intrusion of water seepage or sloughing of sandy soils. In addition, it may be necessary to use drilling fluids and/or process the pier shaft excavations through the wet granular soils.

We expect underwater placement of pier concrete will be required. Special mix designs are usually required for tremied or pumped concrete. Proper concreting procedures should include placement of concrete from the bottom to the top of the pier using a sealed tremie or pumped concrete. The tremie should be maintained at least 5 ft into the wet concrete during placement. It is recommended a separate bid item be provided for casing and underwater concrete placement on the contractor's bid schedule. Pier drilling contractors experienced in similar soil and groundwater conditions should be utilized for this project.

Slurry drilling could be considered it aid in pier where groundwater is encountered. Slurry drilling is a process that involves using "heavy" water to keep the pier hole open during drilling. The heavy water is made by suspending particles of bentonite or polymers in solution. Details for slurry drilling procedures should be provided by the contractor. ALPHA would be happy to review slurry drilling plans for this project.

7.3 Fill Compaction

Clayey soils should be compacted to a dry density of at least 95 percent of standard Proctor maximum dry density (ASTM D 698) and within the range of 1 percentage point below to 3 percentage points above the material's optimum moisture content. Clayey materials used as fill should be processed and the largest particle or clod should be less than 6 inches prior to compaction.

Non-plastic granular materials (sand, possibly from pier spoils) should be compacted to at least 95 percent of standard Proctor maximum dry density (ASTM D 698) and within the range of 2 percent below to 1 percentage points above the material's optimum moisture content. Compaction of these soils is very sensitive to moisture content and these soils are prone to pumping when too wet and rutting when too dry.

In cases where either mass fills or utility lines are more than 10 ft deep, the fill/backfill below 10 ft should be compacted to at least 98 percent of standard Proctor maximum dry density (ASTM D-698) and within 2 percentage points of the material's optimum moisture content. The portion of the fill/backfill shallower than 10 ft should be compacted as outlined above.

Compaction should be accomplished by placing fill in about 8-inch thick loose lifts and compacting each lift to at least the specified minimum dry density. Field density and moisture content tests should be performed on each lift.

7.4 Groundwater

Groundwater was encountered on drilling tools during drilling in Borings 1 through 6, 8, and 10 at depths of about 20 ft to 31 ft below the ground surface. However, from our experience with similar soils, shallower groundwater seepage could be encountered in excavations for foundations, pavement, utility conduits and other general excavations. The risk of encountering seepage increases with depth of excavation and during or after periods of precipitation. Standard sump pits and pumping may be adequate to control minor seepage on a local basis.

Where groundwater is encountered in granular soils, sump pits may not be adequate to control seepage and supplemental dewatering measures may be necessary to control groundwater seepage. Supplemental dewatering measures include (but are not limited to) submersible pumps in slotted casings and well points.

In any areas where cuts are made, attention should be given to possible seasonal water seepage that could occur through natural cracks and fissures in the newly exposed stratigraphy. In these areas, subsurface drains may be required to intercept seasonal groundwater seepage. The need for these or other de-watering devices should be carefully addressed during construction. Our office could be contacted to visually observe the final grades to evaluate the need for such drains.

8.0 LIMITATIONS

Professional services provided in this geotechnical exploration were performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. The scope of services provided herein does not include an environmental assessment of the site or investigation for the presence or absence of hazardous materials in the soil, surface water or groundwater. ALPHA, upon written request, can be retained to provide these services.

ALPHA is not responsible for conclusions, opinions or recommendations made by others based on this data. Information contained in this report is intended for the exclusive use of the Client (and their designated design representatives), and is related solely to design of the specific structures outlined in Section 2.0. No party other than the Client (and their designated design representatives) shall use or rely upon this report in any manner whatsoever unless such party shall have obtained ALPHA's written acceptance of such intended use. Any such third party using this report after obtaining ALPHA's written acceptance shall be bound by the limitations and limitations of liability contained herein, including ALPHA's liability being limited to the fee paid to it for this report. Recommendations presented in this report should not be used for design of any other structures except those specifically described in this report. In all areas of this report in which ALPHA may provide additional services if requested to do so in writing, it is presumed that such requests have not been made if not evidenced by a written document accepted by ALPHA. Further, subsurface conditions can change with passage of time. Recommendations contained herein are not considered applicable for an extended period of time after the completion date of this report. It is recommended our office be contacted for a review of the contents of this report for construction commencing more than one (1) year after completion of this report. Non-compliance with any of these requirements by the Client or anyone else shall release ALPHA from any liability resulting from the use of, or reliance upon, this report.

Recommendations provided in this report are based on our understanding of information provided by the Client about characteristics of the project. If the Client notes any deviation from the facts about project characteristics, our office should be contacted immediately since this may materially alter the recommendations. Further, ALPHA is not responsible for damages resulting from workmanship of designers or contractors. It is recommended the Owner retain qualified personnel, such as a Geotechnical Engineering firm, to verify construction is performed in accordance with plans and specifications.

APPENDIX

A-1 METHODS OF FIELD EXPLORATION

Using standard rotary drilling equipment, a total of ten (10) test borings were performed for this geotechnical exploration at the approximate locations shown on the Boring Location Plan, Figure 1. The boring locations were staked by using a handheld GPS device or by pacing or taping and estimating right angles from landmarks which could be identified in the field and as shown on the site plan provided during this study. The locations of the test borings shown on the Boring Location Plan are considered accurate only to the degree implied by the methods used to define them.

Relatively undisturbed samples of the cohesive subsurface materials were obtained by hydraulically pressing 3-inch O.D. thin-wall sampling tubes into the underlying soils at selected depths (ASTM D 1587). These samples were removed from the sampling tubes in the field and evaluated visually. One representative portion of each sample was sealed in a plastic bag for use in future visual evaluation and possible testing in the laboratory.

Some soil samples were obtained using split-spoon sampling procedures in accordance with ASTM Standard D 1586. Disturbed samples were obtained at selected depths in the borings by driving a standard 2-inch O.D. split-spoon sampler 18 inches into the subsurface material using a 140-pound hammer falling 30 inches. The number of blows required to drive the split-spoon sampler the final 12 inches of penetration (N-value) is recorded in the appropriate column on the Log of Boring sheets.

A modified version of the Texas Cone Penetration (TCP) test was completed in the field to determine the apparent in-place strength characteristics of the rock type materials. A 3-inch diameter steel cone driven by a 170-pound hammer dropped 24 inches is the basis for TxDOT strength correlations. In this case, ALPHA TESTING, INC. has modified the procedure by using a 140-pound hammer dropping 30-inches for completion of the field test. Depending on the resistance (strength) of the materials, either the number of blows of the hammer required to provide 12 inches of penetration, or the inches of penetration of the cone due to 100 blows of the hammer are recorded on the field log and are shown on the Log of Boring sheets as "TX Cone" (reference TxDOT Test Method TEX 132-E, as modified).

Logs of the borings are included in the Appendix of this report. The logs show visual descriptions of subsurface strata encountered using the Unified Soil Classification System. Sampling information, pertinent field data, and field observations are also included. Samples not consumed by testing will be retained in our laboratory for at least 14 days and then discarded unless the Client requests otherwise.

GEOTECHNICAL EXPLORATION
CORPORATE DRIVE EXTENSION -
BRIDGE FOUNDATIONS AND ABUTMENTS
BETWEEN OLD DENTON ROAD AND HOLFORDS PRAIRIE ROAD
LEWSIVILLE, TEXAS
ALPHA PROJECT NO. W151710-D

ALPHA TESTING
WHERE IT ALL BEGINS

FIGURE 1

BORING LOCATION PLAN

APPROXIMATE BORING LOCATION

B-1 METHODS OF LABORATORY TESTING

Representative samples were evaluated and classified by a qualified member of the Geotechnical Division and the boring logs were edited as necessary. To aid in classifying the subsurface materials and to determine the general engineering characteristics, natural moisture content tests (ASTM D 2216), Atterberg-limit tests (ASTM D 4318), percent material passing sieve #200 (ASTM D 422) and dry unit weight determinations were performed on selected samples. In addition, an unconfined compressive strength test (ASTM D 2166) and pocket-penetrometer tests were conducted on selected soil samples to evaluate the soil shear strength. Results of the laboratory tests described above are provided on the Log of Boring sheets.

ALPHA TESTING
WHERE IT ALL BEGINS

5058 Brush Creek Rd.
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76119
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Fax: 817-496-5608
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BORING NO.: 1
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/2/2015 **End Date:** 11/15/2017
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 23
▼ After Drilling (ft): N/A
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Brown CLAY				4.5+				11			
						4.5+				17			
5						2.25				24	58	21	37
						2.0				26			
10						2.25				27			
		12.0											
15		Light Brown CLAY				2.25				21	45	18	27
20						2.25				20			
		22.0											
25		▽ Light Brown CLAYEY SAND with sandy clay seams and layers				0.25				20			
30						0.75		33		19	24	13	11
35					3					30			
40					3					24			
45					4					33			
		47.0											
50		Gray SAND with gravel and shale seams			20					19			
		52.0											
55		Gray CLAY SHALE with cemented sand seams			100/ 6"					23			
60					100/ 2"					17			
65					100/ 0.75"					20			
70					100/ 0.5"					22			
75		75.0			100/ 0.75"								
		Gray CEMENTED SAND with shale seams											
80					100/ 0.5"								
85					100/ 0.5"								
90		90.0			100/ 0.75"								
		TEST BORING TERMINATED AT 90 FT											

ALPHA TESTING
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BORING NO.: 2 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/3/2015 **End Date:** 11/17/2017
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 31
▼ After Drilling (ft): N/A
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
5		Dark Brown CLAY				4.5+				14			
						4.5+				15			
						4.5+				20			
						4.5+				21	67	25	42
10						4.5+				20			
		12.0											
15		Brown CLAY with sand				2.5				25			
20						3.0				25			
25						2.0		87		22	58	21	37
30		▽				3.25				20			
		32.0											
35		Light Brown SANDY CLAY				1.25				19			
40						0.5				22			
		41.0											
45		Brown CLAYEY SAND			3					26			
50		- with some gravel below 50 ft			4			38		27	24	14	10
55					29					23			
60					27					24			
		63.0											
65		Gray CLAYEY SAND with shale seams			50/ 5.5"					25			
		67.0											
70		Tan and Gray SAND			50/ 5.5"					25			
		74.0											
75		Tan and Gray CEMENTED SAND with shale seams			100/ 0.75"					24			
80					100/ 0.5"					32			
85					100/ 0.5"					23			
		88.0											
90		Light Gray SHALE			100/ 1.5"					31			
		90.0											
		TEST BORING TERMINATED AT 90 FT											

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BORING NO.: 3 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/3/2015 **End Date:** 11/20/2017
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 22
▼ After Drilling (ft): N/A
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY - FILL				4.5+				12			
		4.0				4.5+				19	60	23	37
5		Dark Brown CLAY				2.75				19			
						4.5+				19			
10						4.5+				16			
		11.0											
		Light Brown CLAY											
15						2.5		91		26	70	25	45
20						2.75				24			
	▽												
25						2.5				21			
30					3					27			
35					3					20			
40					5					24			
		41.0											
		Light Brown CLAYEY SAND											
45					4			46		24	30	13	17
50					11					30			
		- with some gravel below 50 ft											
55					21					19			
		56.0											
		Gray CLAY SHALE											
60		60.0			100/ 11"					22			
		Gray CEMENTED SAND with clay seams											
65					50/ 4.5"								
70					50/ 5"								
		72.0											
75		Gary CEMENTED SAND with shale seams			100/ 1"								
80					100/ 0.75"								
85					100/ 0.5"								
90		90.0			100/ 1"								
		TEST BORING TERMINATED AT 90 FT											

ALPHA TESTING
WHERE IT ALL BEGINS

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BORING NO.: 4
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/4/2015 **End Date:** 11/20/2017
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 20
▼ After Drilling (ft): N/A
▼ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
5		Dark Brown CLAY				1.5				28			
										19			
						3.25				17	61	19	42
10						4.5+				22			
						4.5+				12			
		11.0											
15		Brown SANDY CLAY				2.0				27			
20		▽				2.25				26			
25		26.0			4					23			
30		Light Brown SANDY CLAY				2.0		69		18	36	13	23
35						2.0				20			
40					2					24			
		- with clayey sand seams and layers below 40 ft											
45					3			62		26	33	14	19
50					3					29			
		- with some gravel below 50 ft											
55					22					15			
		57.0											
60		Gray CLAY SHALE			10/ 10.5"					22			
		62.0											
65		Gray SHALE with cemented sand seams			100/ 1.25"					24			
70					100/ 0.75"					24			
		73.0											
75		Gray CEMENTED SAND with shale seams			100/ 0.25"								
80					100/ 0.75"								
85					100/ 0.75"								
90					100/ 0.5"								
		90.0											
		TEST BORING TERMINATED AT 90 FT											

ALPHA TESTING
WHERE IT ALL BEGINS

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BORING NO.: 5 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 9/7/2015 **End Date:** 11/21/2017
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 20
▼ After Drilling (ft): N/A
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
5		Dark Brown SANDY CLAY				4.5+				8			
						4.5+				7			
						4.5+		69		13	43	18	25
						4.5+				14			
10						4.5+				16			
		11.0											
		Brown SANDY CLAY											
15						3.5				17			
20	▽					3.75				17	43	18	25
25						1.5				20			
		27.0											
30		Brown CLAYEY SAND				0.5				24			
		31.0											
35		Brown SANDY CLAY				2.0				22			
		37.0											
40		Light Brown CLAYEY SAND				1.25				21			
45										24			
50								39		22	32	15	17
55					11					19			
		58.0											
60		Gray CLAY SHALE			50					18			
65					100/ 9"					24			
70					100/ 5.5"					23			
75		75.0			100/ 0.75"								
		Gray CEMENTED SAND											
80					100/ 0.5"								
85					100/ 1"								
90		90.0			100/ 0.5"								
		TEST BORING TERMINATED AT 90 FT											

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WHERE IT ALL BEGINS

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BORING NO.: 6
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/6/2018 **End Date:** 8/6/2018
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 28
▼ After Drilling (ft): N/A
▽ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft.in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Brown CLAY				4.5+				17			
5										17	55	23	32
		- with sand seams from 4 ft to 8 ft								17	47	22	25
						4.5+				16			
10						4.5+				13			
		- with sand seams from 12 ft to 19 ft											
15						4.5+				8			
		19.0											
20		Brown and Gray SANDY CLAY								17	37	16	21
25						3.0				17			
	▽												
30						3.75				19			
35						3.75				19			
40													
45		45.0				1.0				23			
		Brown CLAYEY SAND											
50					22					19			
55		- with gravel from 53 ft to 57 ft			24					11			
		57.0											
60		Gray SHALY CLAY with sand seams			25					22			
65		65.0			74					20			
		Gray CLAY SHALE											
		69.0											
70		Gray SHALE with sand seams			100/ 0.75"								
75					100/ 1"					16			
80					100/ 0.75"					22			
85		86.0			100/ 0.75"					21			
		Gray CEMENTED SAND											
90		90.0			100/ 0.75"					24			
		TEST BORING TERMINATED AT 90 FT											

ALPHA TESTING

WHERE IT ALL BEGINS

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BORING NO.: 7 (Sheet 1 of 1)

PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/7/2018 **End Date:** 8/7/2018
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 170 / 24

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): N/A
▽ After ____ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY with sand - possible fill				4.5+				15			
						4.5+				10			
5		Dark Brown CLAY				4.5+	7.5		106	18	68	24	44
						4.5+				16			
10		10.0				4.5+				19			
		Brown SANDY CLAY											
15						4.5+	4.1		112	16	34	18	16
20						2.75				16			
25						3.0				14			
30						2.5				16			
35						3.5				22			
40						3.0	1.0		103	20	35	16	19
		43.0											
45		Brown CLAYEY SAND			23					19			
50		50.0			21					16			
		Tan SAND with gravel and clay seams											
55					38					17			
60					21					19			
65					50/ 5.5"					22			
70					50/ 3.25"					19			
		73.0											
75		Gray CEMENTED SAND with sandstone layers			100/ 1.25"					23			
80					100/ 1.5"								
85					100/ 1.25"								
90		90.0			100/ 1"								
		TEST BORING TERMINATED AT 90 FT											

ALPHA TESTING
WHERE IT ALL BEGINS

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BORING NO.: 8
Sheet 1 of 1
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/20/2018 **End Date:** 8/20/2018
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 170 / 24

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 22
▼ After Drilling (ft): N/A
▽ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Dark Brown CLAY				4.5+				18			
5						4.5+	12.0		106	16			
						4.5+				18			
						4.5+				15			
10						4.5+				15			
		10.0											
		Brown SANDY CLAY											
15						4.5+				17			
20		▽				3.0				17			
25						2.0				18			
		27.0											
30		Brown SAND			9					19			
35					5					19			
40					7					21			
45					23					19			
50					46					20			
		53.0											
55		Gray CLAY SHALE			61					9			
60					70					19			
		64.0											
65		Gray SHALE			100/ 5.5"					19			
		67.0											
70		Gray CEMENTED SAND with sandstone seams and layers			50/ 5"					25			
75					50/ 5"					21			
80					50/ 4"					23			
85					50/ 5.25"					20			
90		90.0			50/ 3"					21			
		TEST BORING TERMINATED AT 90 FT											

ALPHA TESTING
WHERE IT ALL BEGINS

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BORING NO.: 9 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/22/2018 **End Date:** 8/22/2018
Drilling Method: WASH ROTARY

Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 170 / 24

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): N/A
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Dark Brown CLAY				4.5+				28			
						4.5+	7.9	57	99	19			
5						4.5+				18	66	24	42
						4.5+				18			
10						4.5+				15			
		13.0											
15		Brown SANDY CLAY				4.5+				14			
20						1.25	1.0	91	109	25	71	23	48
25						4.5+				18			
30						1.75				20			
35						2.0				17			
		37.0											
40		Tan SAND								21			
45					60					17			
50		50.0			59								
		Gray CLAY SHALE											
55					83					22			
60					50/ 3"					19			
65					50/ 2"					16			
70										16			
75					96/ 11.5"					28			
		77.0											
80		Gray SHALE with sand seams			50/ 3"					30			
85					50/ 2"					23			
90		90.0			50/ 2"					20			
		TEST BORING TERMINATED AT 90 FT											

ALPHA TESTING
WHERE IT ALL BEGINS

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BORING NO.: 10 (Sheet 1 of 1)
PROJECT NO.: W151710

Client: Halff Associates - Fort Worth
Project: Corporate Drive Extension
Start Date: 8/22/2018 **End Date:** 8/22/2018
Drilling Method: WASH ROTARY
Location: Lewisville, Texas
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 170 / 24

GROUND WATER OBSERVATIONS
▽ On Rods (ft): 28
▼ After Drilling (ft): N/A
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Dark Brown CLAY				4.5+				20			
						4.5+				16			
5						4.5+	7.8	92	93	15	54	20	34
						4.5+				14			
10						4.5+	12.4		95	16	31	17	14
		13.0											
15		Brown and Gray SANDY CLAY				4.5+				15			
20						3.75				17			
25						4.5				17			
		▽											
30						3.0				25			
35						2.0		70		21	33	15	18
40		40.0				2.0				18			
		Brown and Gray CLAYEY SAND											
45					33					21			
50		50.0			33					20			
		Tan SAND											
		53.0											
55		Gray SAND with gravel 55.0			50/ 3.5"					13			
		Gray SHALE with clay shale seams and layers											
60					50/ 2.75"					17			
65					50/ 2"					27			
70					50/ 2"					20			
75					67					18			
80					50/ 4.5"					14			
85					50/ 3.25"					24			
90		90.0			50/ 3.75"					22			
		TEST BORING TERMINATED AT 90 FT											

ALPHA TESTING

WHERE IT ALL BEGINS

KEY TO SOIL SYMBOLS AND CLASSIFICATIONS

SOIL & ROCK SYMBOLS


(CH), High Plasticity CLAY


(CL), Low Plasticity CLAY


(SC), CLAYEY SAND


(SP), Poorly Graded SAND


(SW), Well Graded SAND


(SM), SILTY SAND


(ML), SILT


(MH), Elastic SILT


LIMESTONE


SHALE / MARL


SANDSTONE


(GP), Poorly Graded GRAVEL


(GW), Well Graded GRAVEL


(GC), CLAYEY GRAVEL


(GM), SILTY GRAVEL


(OL), ORGANIC SILT


(OH), ORGANIC CLAY


FILL

SAMPLING SYMBOLS


SHELBY TUBE (3" OD except where noted otherwise)


SPLIT SPOON (2" OD except where noted otherwise)


AUGER SAMPLE


TEXAS CONE PENETRATION


ROCK CORE (2" ID except where noted otherwise)

RELATIVE DENSITY OF COHESIONLESS SOILS (blows/ft)

VERY LOOSE	0 TO 4
LOOSE	5 TO 10
MEDIUM	11 TO 30
DENSE	31 TO 50
VERY DENSE	OVER 50

SHEAR STRENGTH OF COHESIVE SOILS (tsf)

VERY SOFT	LESS THAN 0.25
SOFT	0.25 TO 0.50
FIRM	0.50 TO 1.00
STIFF	1.00 TO 2.00
VERY STIFF	2.00 TO 4.00
HARD	OVER 4.00

RELATIVE DEGREE OF PLASTICITY (PI)

LOW	4 TO 15
MEDIUM	16 TO 25
HIGH	26 TO 35
VERY HIGH	OVER 35

RELATIVE PROPORTIONS (%)

TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	36 TO 50

PARTICLE SIZE IDENTIFICATION (DIAMETER)

BOULDERS	8.0" OR LARGER
COBBLES	3.0" TO 8.0"
COARSE GRAVEL	0.75" TO 3.0"
FINE GRAVEL	5.0 mm TO 3.0"
COURSE SAND	2.0 mm TO 5.0 mm
MEDIUM SAND	0.4 mm TO 5.0 mm
FINE SAND	0.07 mm TO 0.4 mm
SILT	0.002 mm TO 0.07 mm
CLAY	LESS THAN 0.002 mm

ALPHA TESTING
WHERE IT ALL BEGINS

Geotechnical
Construction Materials
Environmental
TBPE Firm No. 813

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June 13, 2019

Halff Associates, Inc.
4000 Fossil Creek Boulevard
Fort Worth, Texas 76137

Attention: Mr. Ben McGahey, P.E.

Re: Geotechnical Investigation
Corporate Drive Extension – Global Stability Analysis
East of Old Denton Road
Lewisville, Texas
ALPHA Report No. W151710-E

Attached is the report of the geotechnical exploration performed for the project referenced above. This study was authorized by Mr. David Smith, P.E. using the Standard Subcontract for Subsurface/Underground Services between Halff Associates, Inc. and ALPHA TESTING, Inc. and performed in accordance with ALPHA Proposal No.43607-1-rev1, dated October 11, 2017. ALPHA submitted a report with bridge foundation recommendations issued under Report No. W151710-D dated January 28, 2019. This report should not be considered separately from that referenced bridge foundation report.

Review of the Corporate Drive plan and profile segments 2-4 provided by the Client (Job No. G1122, G1123, and G1124 dated November 2018, Sheets 26 through 56, and 59 through 91) indicate abutments, wing walls and embankments are planned for a southern bridge located about 350 ft east of South Railroad Street and a northern bridge located about 2,100 ft east of Holfords Prairie Road. We understand the abutments and wing walls will be pier supported.

The southern bridge will have abutments and wing walls up to 6 ft tall at each end of the bridge. The embankments leading up to the abutments in front of the southern bridge are sloped at an angle of 3 horizontal to 1 vertical. The embankments extending from the wing walls and the shoulders of the road are sloped at an angle of 4 horizontal to 1 vertical.

The northern bridge will have abutments up to 5 ft tall on the west end and about 8 ft tall on the east end. The planned embankments all around each abutment are planned at an angle of 4 horizontal to 1 vertical. The Elm Fork Trinity River passes below the northern bridge, near the western abutment. The existing river bank has an average slope angle in front of the western abutment of about 2 horizontal to 1 vertical.

This letter presents supplemental design information for global stability of bridge abutments and roadway embankments. The design recommendations provided herein are based on information developed during the referenced Geotechnical Exploration. All other comments and recommendations contained in previous geotechnical reports remain unchanged.

Global Stability – Method of Analysis

Stability analyses for the abutment walls and embankments were performed for this study using the SLIDE™ 6.0 computer program, distributed by Rocscience™. The modified Bishop method of analysis was used. SLIDE™ 6.0 generates numerous trial failure surfaces (within specified geometric limits), computes a factor of safety for each trial surface, and reports the lowest safety factors for stability. The factor of safety against global stability failure is defined as the ratio of resisting forces (or moments) to driving forces. A minimum acceptable factor of safety of 1.5 was used to evaluate global stability of both bridge abutments and roadway embankments. A distributed load of 200 psf was used to model pavement loads.

Six (6) representative cross sections (A through F) were chosen to develop geometric parameters for our slope stability analyses. The cross-section locations are shown on the Boring Location and Cross Section Plan, Figure 1, attached to this letter. The cross-sections were chosen based on several factors, including wall/slope height, slope gradient, and subsurface conditions at the respective boring locations.

Total stress conditions (undrained conditions) and effective stress (drained conditions) were evaluated for this study. The undrained and undrained shear strength of fill material, native clay, sandy clay, and clayey sand soils were estimated based on laboratory results and on historical testing by ALPHA on similar soils, and on our experience.

Findings and Recommendations for Embankments

As discussed, we understand the abutments will be pier supported. Results of the global stability analysis indicate the planned slopes along the shoulders of the road and around the abutments will have a safety factor of at least 1.5 considering global stability.

Results of typical stability analyses performed during this study are presented as Cross Sections A through F.

Lateral Earth Pressures for Abutment and Wing Walls

Abutment and wing walls should be designed to resist the expected lateral earth pressures. The magnitude of lateral earth pressure against the walls is dependent on the method of backfill placement, type of backfill soil, drainage provisions, and type of wall (rigid or yielding) after placement of the backfill. Experience demonstrates when a wall is held rigidly against horizontal movement (restrained at the top); the lateral pressure (at-rest lateral earth pressure) against the wall is greater than the normally assumed active pressure. Yielding walls (rotation at the top of at least 0.1 percent of the wall height) and walls not sensitive to some movements can be designed for active earth pressures (k_a). Rigid walls should be designed using the higher at-rest lateral earth pressures (k_o). Walls should be designed using the equivalent fluid pressures provided in Table A, considering a triangular distribution and assuming a horizontal ground surface extending back from the top of the wall. The equivalent fluid pressures provided do not include a factor of safety.

TABLE A
Lateral Earth Pressures
Horizontal Ground Surface Extending Back from the Top of Wall

Material	Condition	Equivalent Fluid Pressure, pcf	
		Drained	Undrained including Hydrostatic Pressure
Free Draining Granular Soil	At-Rest, k_o=0.42	53	89
Φ=35°, γ_T =125 pcf	Active, k_a=0.27	34	79
Site Clay Soil,	At-Rest, k_o=0.74	---	105
Φ=15°, γ_T =120 pcf	Active, k_a=0.59	---	96

Free draining granular backfill should consist of a clean, non-plastic, relatively well-graded granular soil consisting of sand, gravel or a sand and gravel mixture, with less than 5 percent finer than the No. 200 sieve size. To reduce surface water seepage into the free draining backfill, the top 1-ft of the backfill should consist of on-site clay soil with a plasticity index of at least 25.

The free draining backfill should extend outward at least 2 ft from the base of clay then extend upward on a 1 (horizontal) to 2 (vertical) slope away from the wall. The free draining granular backfill should be separated from the adjacent native soils using a filter fabric (Mirafi 140N, or equivalent) to prevent intrusion of native soils into the free draining granular backfill.

Complete drainage of the free draining granular backfill could be provided to prevent the development of hydrostatic pressures behind the wall. A typical drainage system could consist of perforated plastic PVC pipes placed in filter trenches excavated parallel to the base of the walls for their entire length. The drain pipes should be positioned at a depth lower than the bottom elevation of the wall and should also be wrapped with filter fabric (Mirafi 140N, or equivalent). A drainage system is beneficial regardless of the type of backfill used behind the wall. At a minimum, weep holes should be provided. However, weep holes alone will not prevent occasional build-up of hydrostatic pressures.

Lightweight, hand-controlled vibrating plate compactors are recommended for compaction of backfill adjacent to walls to reduce the possibility of increases in lateral pressures due to over-compaction. Heavy compaction equipment should not be operated near the walls. Also, compaction of backfill soils behind walls should not exceed 100 percent standard Proctor maximum dry density (ASTM D 698) to further limit lateral earth pressures against walls.

The recommended lateral earth pressures do not include the effects of surcharge loading on the wall due to sloping backfill or from other loads near the walls. Surcharge loads should be multiplied by the appropriate lateral earth pressure coefficient from Table A and applied as a uniform lateral load over the full height of the wall.

Elm Fork Trinity River Bank – Special Considerations for Slope Stability

The existing west bank of the Elm Fork Trinity River (near station 61+00, Cross-Section D-1) has an average slope in front of the western abutment of the northern bridge of about 2 horizontal to 1 vertical. As part of our global stability evaluation we have analyzed the western river bank. Based on our analysis, it appears the river bank is only marginally stable (see Cross-Section D-2). We expect this slope could be subject to failure in high water or flood conditions, or from gradual erosion. Embankment failure and/or erosion could propagate toward the western bridge abutment, creating an unstable condition for the abutment in the absence of additional reinforcement.

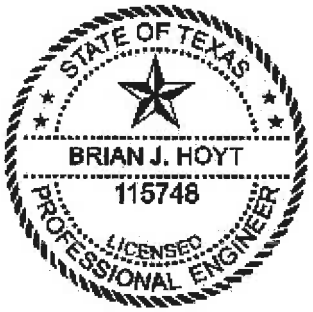
The embankment should be regularly monitored for signs of failures or distress. Shallow skin slides should be repaired immediately to reduce the risk of larger propagated failures. The river bank could also be protected from erosion using rip rap or other suitable means of erosion protection. This protection should be designed by a professional engineer qualified for such erosion protection design. Our office should be contacted for further evaluation if slope failures, erosion, skin slides or other distress cause significant changes in the existing embankment geometry.

Closure

All recommendations in the referenced report remain unchanged. ALPHA appreciates the opportunity to be of service on this project. If we can be of further assistance, please contact our office.

Sincerely,

ALPHA TESTING, INC.



June 13, 2019

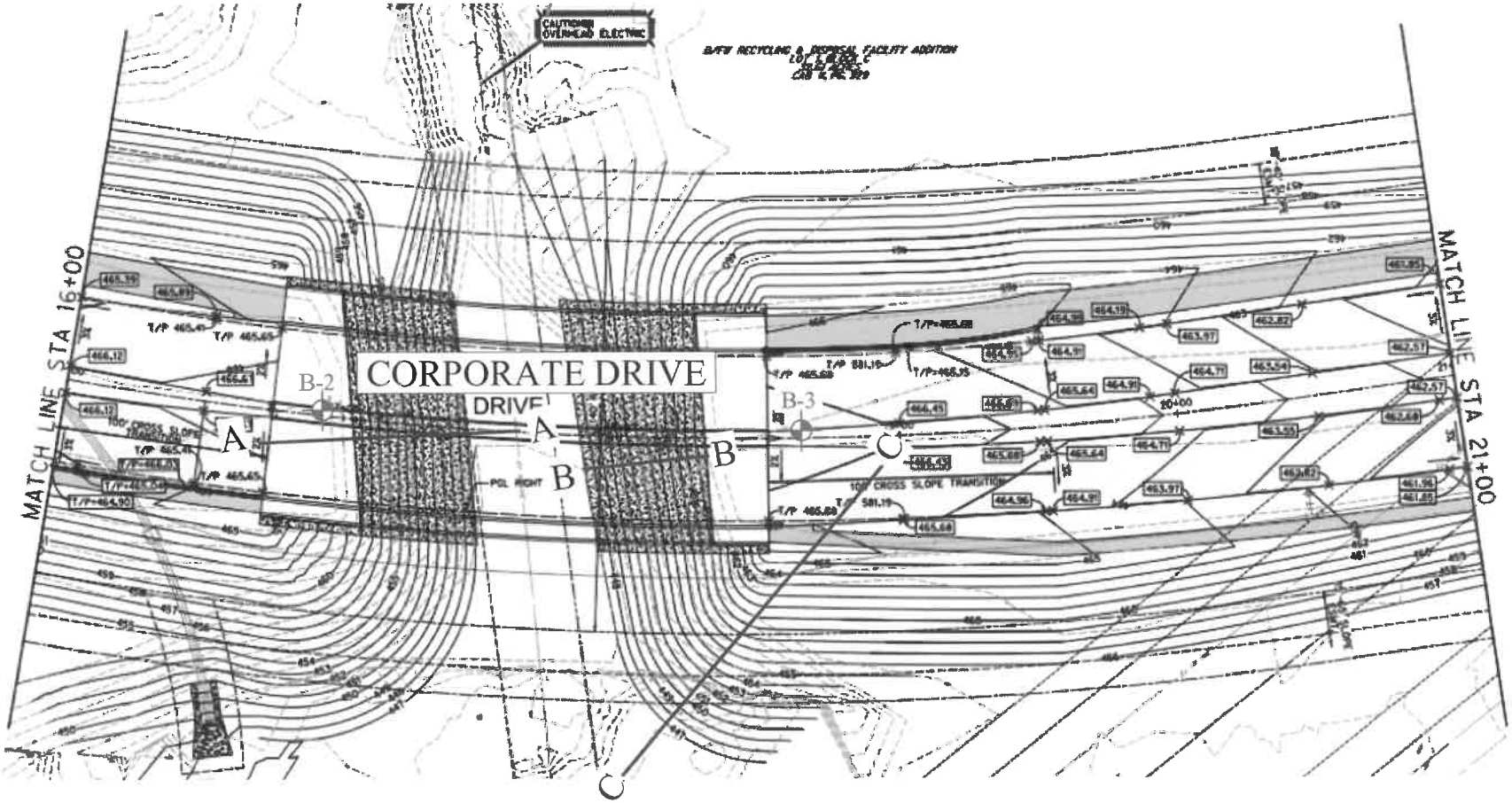
Theodore A. (Tony) Janish, P.E.
Principal

Brian J. Hoyt, P.E.
Geotechnical Department Manager

TAJ/BJH

Copies: (1-PDF) Client

Attachements :
Cross Section Plan (Figure 1)
Global Stability Cross Sections (A through F)



GEOTECHNICAL EXPLORATION
CORPORATE DRIVE
GLOBAL STABILITY ANAYLYSIS
BETWEEN OLD DENTON ROAD AND
HOLFORDS PRAIRIE ROAD
GRAND PRAIRIE ETJ, ELLIS COUNTY, TEXAS
ALPHA PROJECT NO. W151710-E

ALPHA TESTING

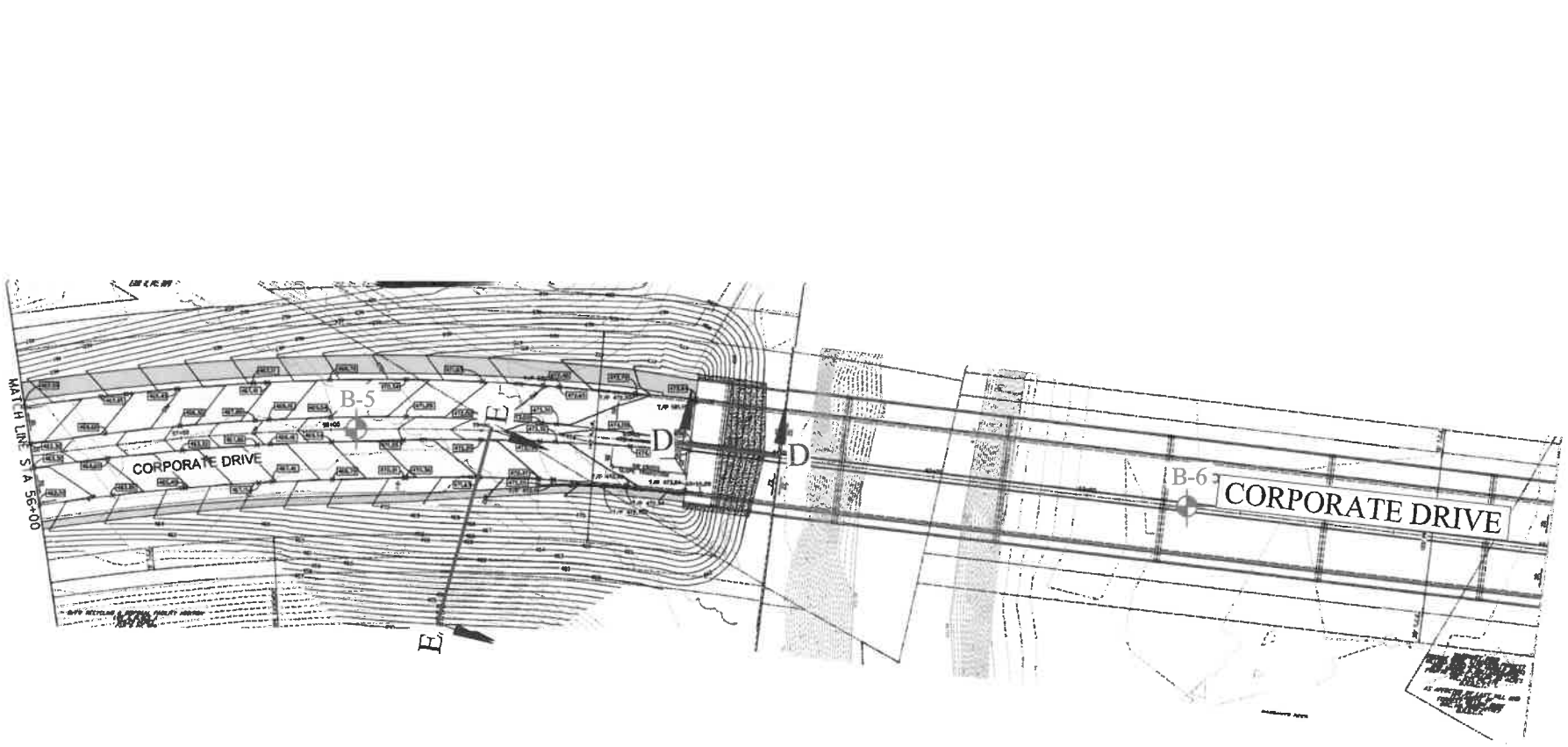
WHERE IT ALL BEGINS

FIGURE 1A

BORING LOCATION PLAN

CROSS SECTION

APPROXIMATE BORING LOCATION



GEOTECHNICAL EXPLORATION
CORPORATE DRIVE
GLOBAL STABILITY ANAYLYSIS
BETWEEN OLD DENTON ROAD AND
HOLFORDS PRAIRIE ROAD
GRAND PRAIRIE ETJ, ELLIS COUNTY, TEXAS
ALPHA PROJECT NO. W151710-E

ALPHA TESTING

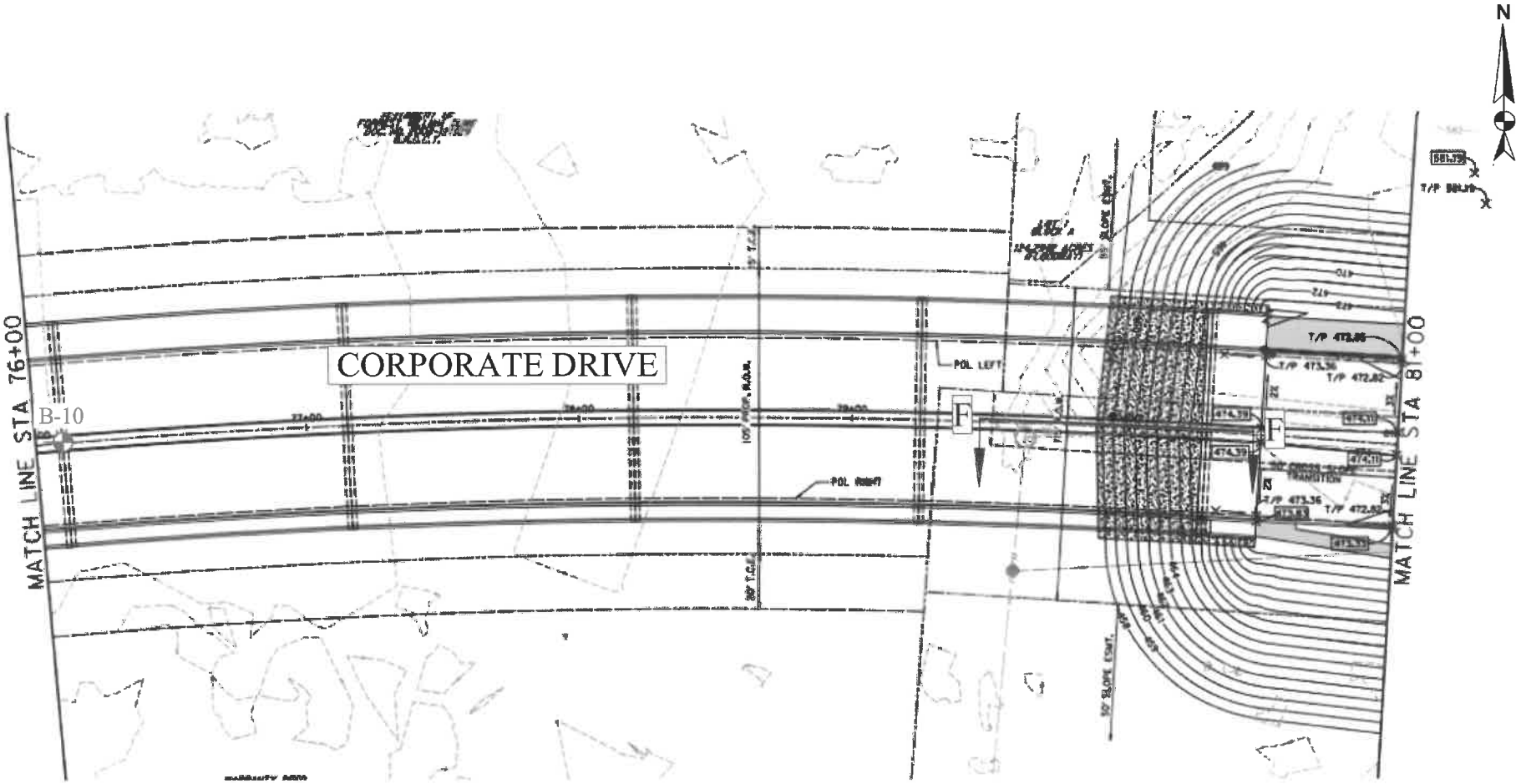
WHERE IT ALL BEGINS

FIGURE 1B

BORING LOCATION PLAN

CROSS SECTION

APPROXIMATE BORING LOCATION



GEOTECHNICAL EXPLORATION
CORPORATE DRIVE
GLOBAL STABILITY ANAYLYSIS
BETWEEN OLD DENTON ROAD AND
HOLFORDS PRAIRIE ROAD
GRAND PRAIRIE ETJ, ELLIS COUNTY, TEXAS
ALPHA PROJECT NO. W151710-E

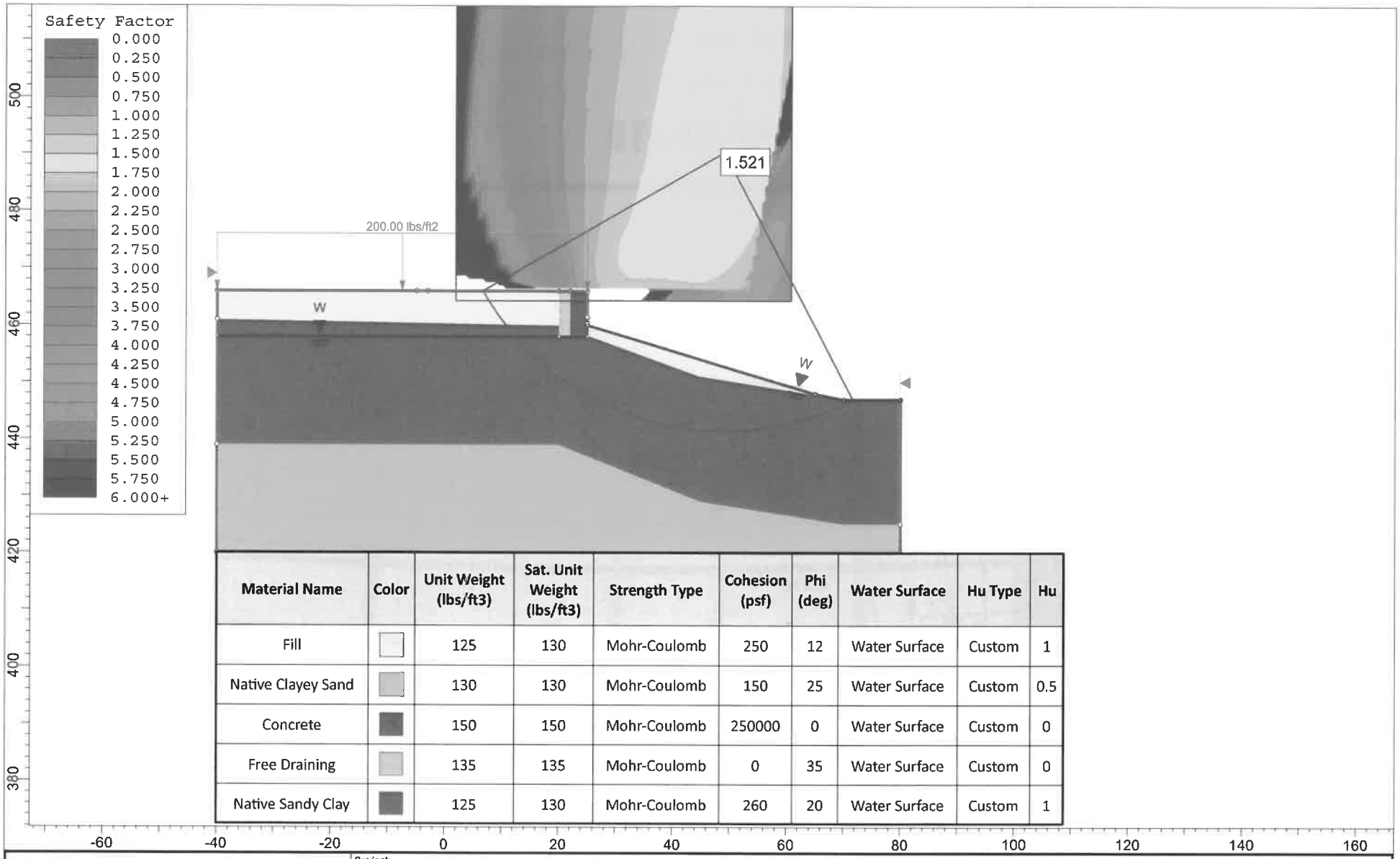
ALPHA TESTING
WHERE IT ALL BEGINS

FIGURE 1C

BORING LOCATION PLAN

CROSS SECTION

APPROXIMATE BORING LOCATION



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Fill		125	130	Mohr-Coulomb	250	12	Water Surface	Custom	1
Native Clayey Sand		130	130	Mohr-Coulomb	150	25	Water Surface	Custom	0.5
Concrete		150	150	Mohr-Coulomb	250000	0	Water Surface	Custom	0
Free Draining		135	135	Mohr-Coulomb	0	35	Water Surface	Custom	0
Native Sandy Clay		125	130	Mohr-Coulomb	260	20	Water Surface	Custom	1

ALPHA TESTING
WHERE IT ALL BEGINS

Project	Corporate Drive Extension Global Stability		
	Section A		
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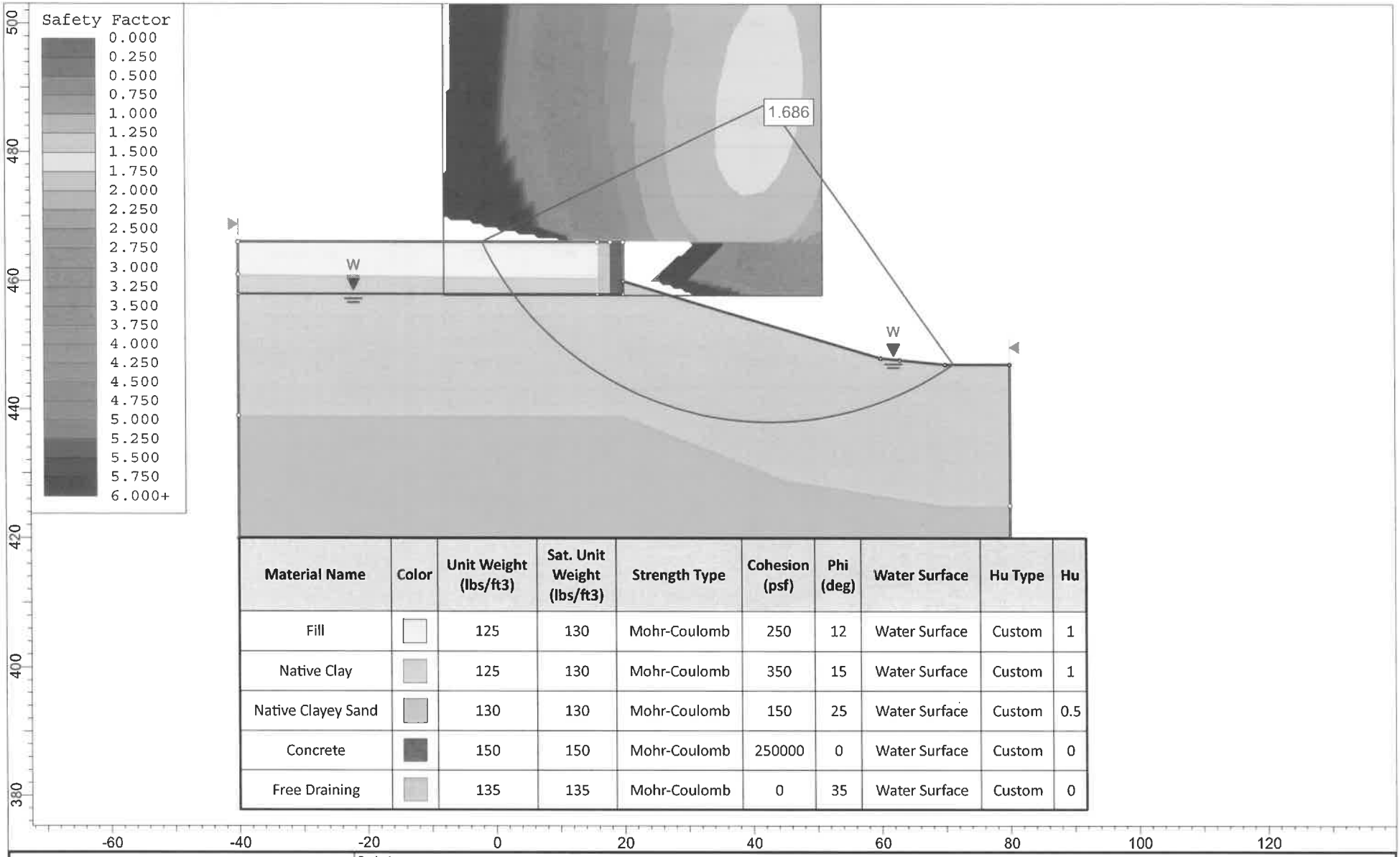
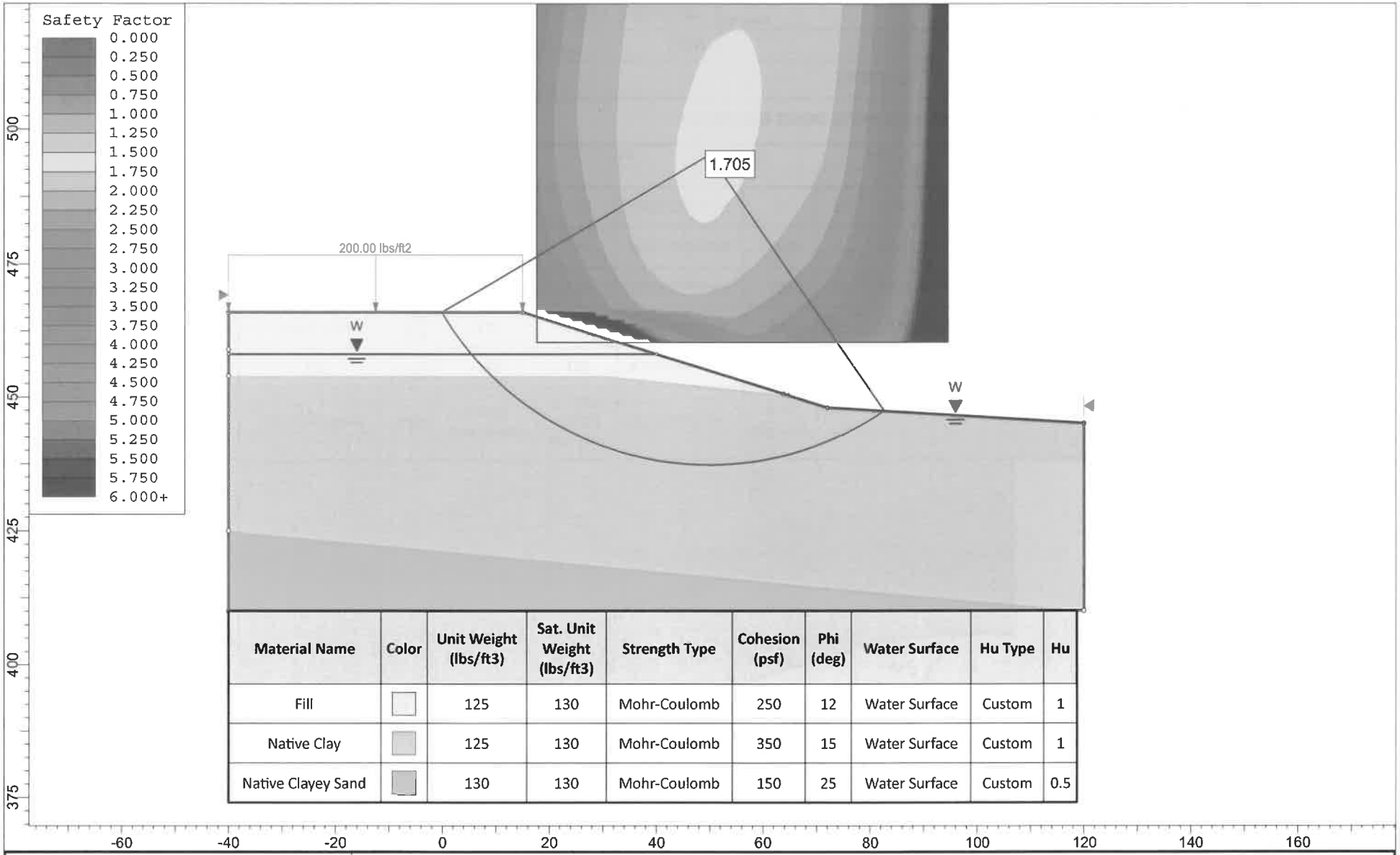
	(Near STA 17+00)		
Date	6/7/2019 1:19:38 PM	File Name	Section A.rev1.slim



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Fill		125	130	Mohr-Coulomb	250	12	Water Surface	Custom	1
Native Clay		125	130	Mohr-Coulomb	350	15	Water Surface	Custom	1
Native Clayey Sand		130	130	Mohr-Coulomb	150	25	Water Surface	Custom	0.5
Concrete		150	150	Mohr-Coulomb	250000	0	Water Surface	Custom	0
Free Draining		135	135	Mohr-Coulomb	0	35	Water Surface	Custom	0

ALPHA TESTING
WHERE IT ALL BEGINS

Project	**Corporate Drive Extension Global Stability**		
	Section B		
Analyzed By	O.N	Scale	1:247
	(Near STA 18+50)		
Date	6/3/2019 3:03:08 PM	File Name	Section B.slim



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Fill		125	130	Mohr-Coulomb	250	12	Water Surface	Custom	1
Native Clay		125	130	Mohr-Coulomb	350	15	Water Surface	Custom	1
Native Clayey Sand		130	130	Mohr-Coulomb	150	25	Water Surface	Custom	0.5

ALPHA TESTING
WHERE IT ALL BEGINS

Project	**Corporate Drive Extension Global Stability**		
	Section C		
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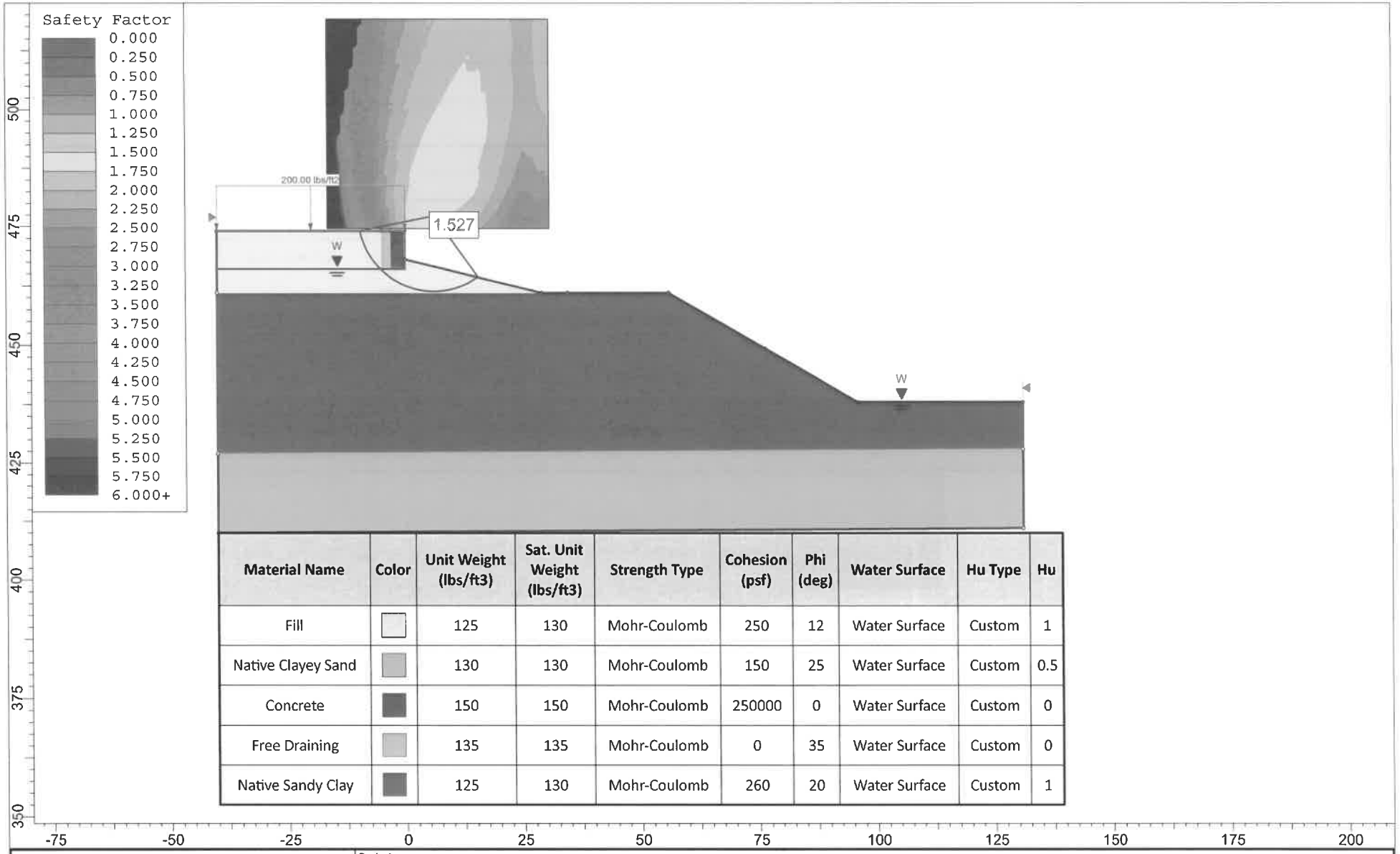
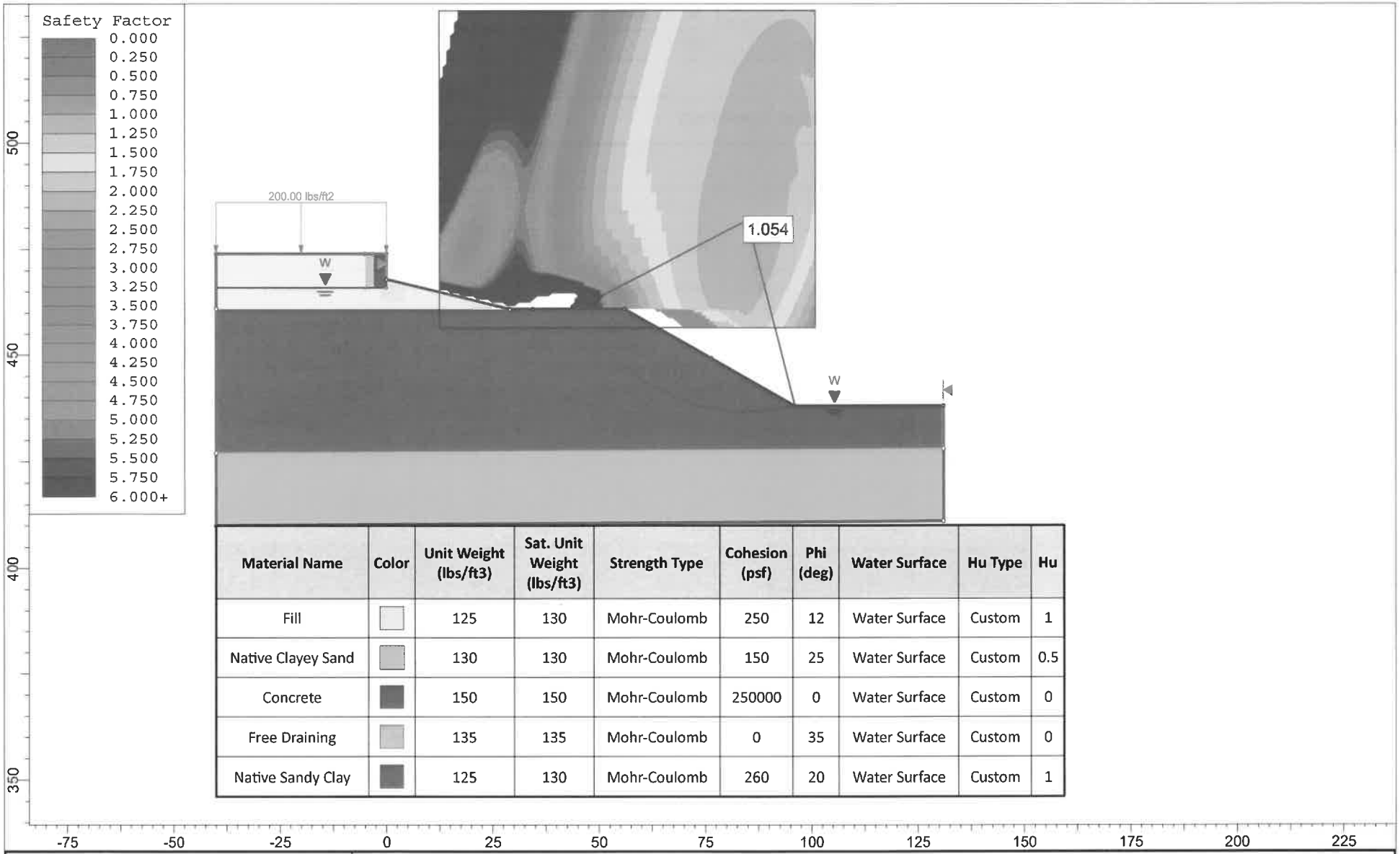
	(Near STA 18+00)		
Date	4/29/2019 2:33:50 PM	File Name	Section C.slim



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Fill		125	130	Mohr-Coulomb	250	12	Water Surface	Custom	1
Native Clayey Sand		130	130	Mohr-Coulomb	150	25	Water Surface	Custom	0.5
Concrete		150	150	Mohr-Coulomb	250000	0	Water Surface	Custom	0
Free Draining		135	135	Mohr-Coulomb	0	35	Water Surface	Custom	0
Native Sandy Clay		125	130	Mohr-Coulomb	260	20	Water Surface	Custom	1

ALPHA TESTING
WHERE IT ALL BEGINS

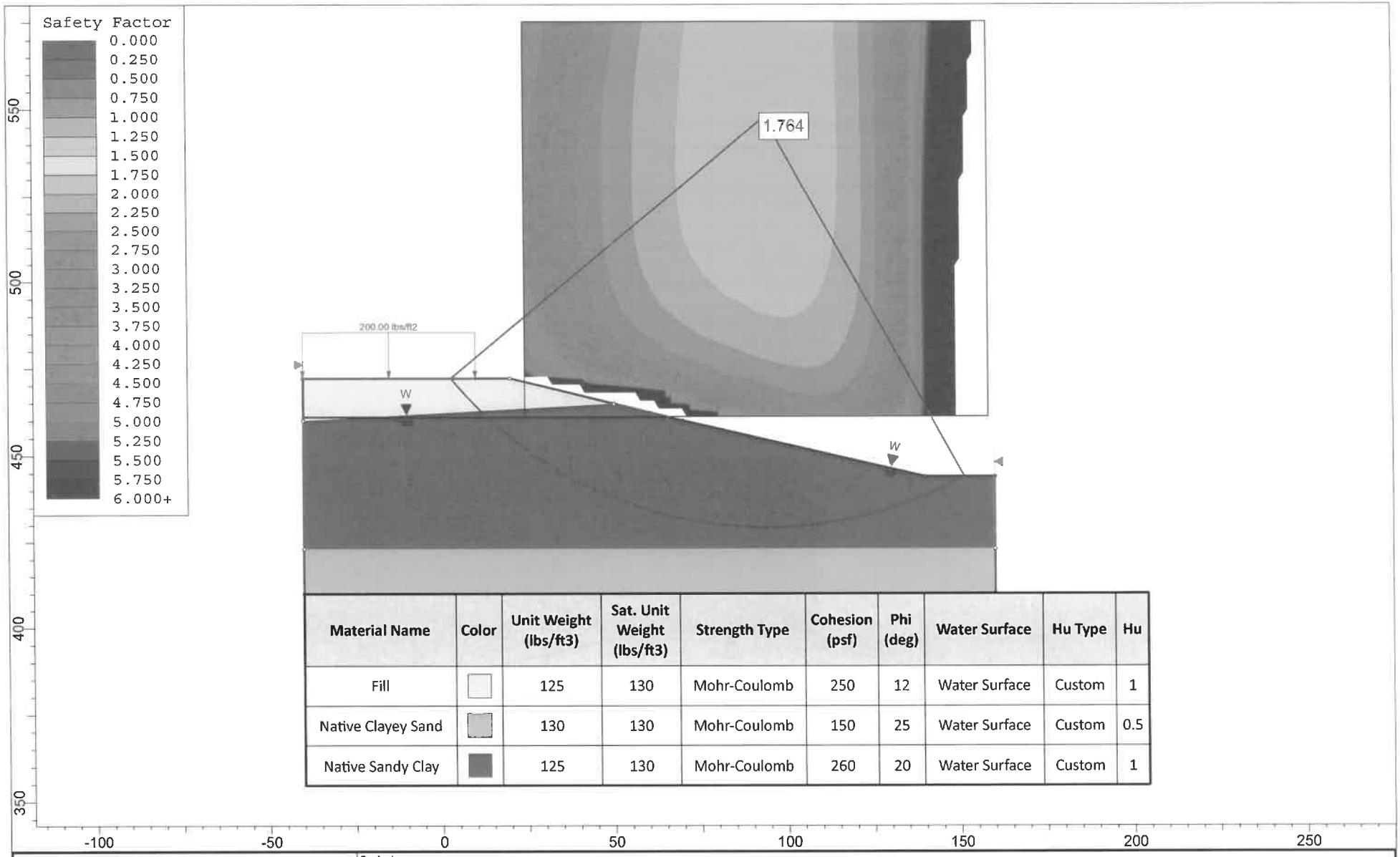
Project	**Corporate Drive Extension Global Stability**		
	Section D-1		
Analyzed By	O.N	Scale	1:336
(Near STA 61+00) Potential Factor of Safety of Hypothetical Slope Development			
Date	6/6/2019 3:03:05 PM	File Name	Section D Local Bridge Abutment Stability.slim



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Fill		125	130	Mohr-Coulomb	250	12	Water Surface	Custom	1
Native Clayey Sand		130	130	Mohr-Coulomb	150	25	Water Surface	Custom	0.5
Concrete		150	150	Mohr-Coulomb	250000	0	Water Surface	Custom	0
Free Draining		135	135	Mohr-Coulomb	0	35	Water Surface	Custom	0
Native Sandy Clay		125	130	Mohr-Coulomb	260	20	Water Surface	Custom	1

ALPHA TESTING
WHERE IT ALL BEGINS

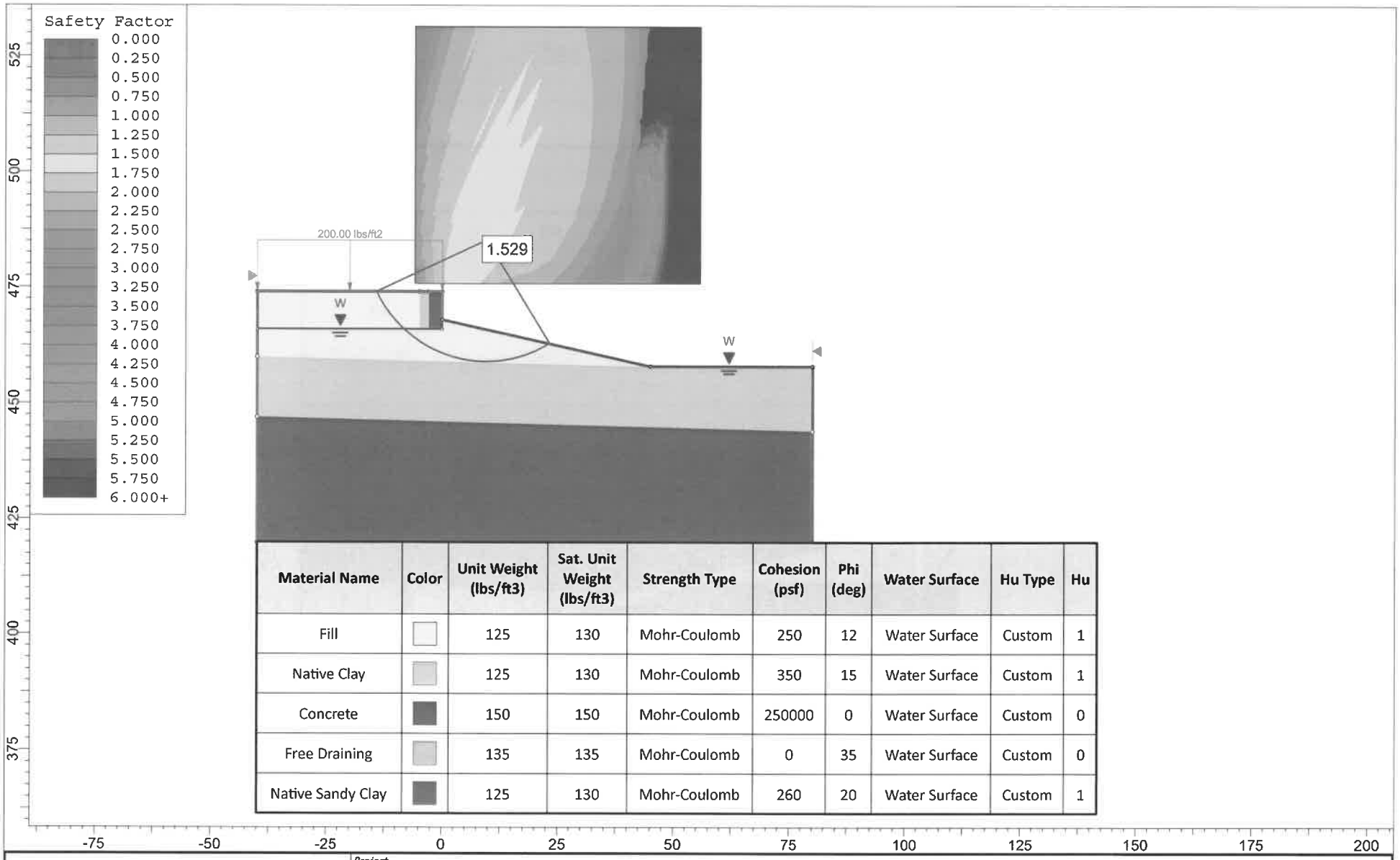
Project	**Corporate Drive Extension Global Stability**		
	Section D-2		
Analyzed By	O.N	Scale	1:374
	(Near STA 61+00) Local Creek Bank Stability		
Date	6/6/2019 3:05:04 PM	File Name	Section D Local Existing River Bank Stability.slim



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Fill		125	130	Mohr-Coulomb	250	12	Water Surface	Custom	1
Native Clayey Sand		130	130	Mohr-Coulomb	150	25	Water Surface	Custom	0.5
Native Sandy Clay		125	130	Mohr-Coulomb	260	20	Water Surface	Custom	1

ALPHA TESTING
WHERE IT ALL BEGINS

Project	**Corporate Drive Extension Global Stability**			
	Section E			
Analyzed By	O.N	Scale	1:458	(Near STA 59+00)
Date	6/6/2019 3:06:25 PM	File Name	Section E.slim	



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Fill		125	130	Mohr-Coulomb	250	12	Water Surface	Custom	1
Native Clay		125	130	Mohr-Coulomb	350	15	Water Surface	Custom	1
Concrete		150	150	Mohr-Coulomb	250000	0	Water Surface	Custom	0
Free Draining		135	135	Mohr-Coulomb	0	35	Water Surface	Custom	0
Native Sandy Clay		125	130	Mohr-Coulomb	260	20	Water Surface	Custom	1

ALPHA TESTING
WHERE IT ALL BEGINS

Project	**Corporate Drive Extension Global Stability**		
	Section F		
Analyzed By	O.N	Scale	1:343
	(Near STA 85+00) Bridge Abutment		
Date	6/6/2019 3:08:16 PM	File Name	Section F.slim

Geotechnical Engineering Report

Lewisville Corporate Drive Segment 4
August 12, 2022
Terracon Project No. 94225080

Prepared for:
Halff Associates, Inc.
Fort Worth, TX

Prepared by:
Terracon Consultants, Inc.
Dallas, TX

August 12, 2022

Halff Associates, Inc.
4000 Fossil Creek Blvd.
Fort Worth, TX 76137-2720

Attn: Mr. David Smith, P.E.
P: (817) 764-7486
E: dSmith@Halff.com

Re: Geotechnical Engineering Report
Lewisville Corporate Drive Segment 4
Terracon Project No. 94225080

Dear Mr. Smith:

This report presents the results of our geotechnical investigation and recommendations for the design of the planned MSE Wall R-1 at the east abutment of the Corporate Drive Bridge over the Trinity River. Design recommendations are also provided for Wall R-2, a cast-in-place cantilevered retaining wall on the south side of the planned Corporate Drive at its intersection with Huffines Boulevard.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Mani Saladhi
Project Manager

Tim G. Abrams, P.E.
Senior Geotechnical Engineer

REPORT TOPICS

ATTACHMENTS

Geotechnical Engineering Report
Lewisville Corporate Drive Segment 4

Terracon Project No. 94225080
August 12, 2022

INTRODUCTION

Two retaining walls are planned in Segment 4 west of Huffines Boulevard. Wall R-1 is planned as an MSE wall and Wall R-2 is planned as a cast-in-place cantilevered retaining wall.

MSE Wall R-1 is planned at the east abutment of the Corporate Drive bridge over the Elm Fork of the Trinity River. The wall is planned on the south side of the planned Corporate Drive Extension. This wall will have a length of about 411-feet from STA. 79+88.01 to STA 83+99.95 with a height varying from about 10 to 18 feet. The wall can be inundated during flood stages of the Elm Fork of the Trinity River. The 100-year flood elevation is estimated to be El. 459.16. The top of the wall will be paved with sidewalk and pavement. The ground at the base of the wall will be relatively level. The wall plan and profile drawings indicate the wall is embedded a nominal 2 feet below final grades. The MSE wall retains high plasticity clays.

A cast-in-place (CIP) Wall R-2 is planned on the south side of future Corporate Drive on the west side of Huffines Boulevard. The wall will have height ranging from about 7.5 to 9.5 feet and length of about 290 feet from STA. 114+51.18 to STA 117+40.97. The ground at the base of the wall is expected to be relatively level. The wall is subject to inundation when river is at flood stage. The top of the wall will be paved with sidewalk and pavement. Strip footings are planned for the wall foundation. The top wall footing is planned to be about one foot below finished grades.

SUBSURFACE CONDITIONS

BORINGS AND LABORATORY TESTS

Subsurface conditions were evaluated based on four borings by Terracon. Boring locations are shown on Exhibit 1 and Exhibit 2. Boring designations are listed in the following table

TABLE 1 – BORINGS DRILLED FOR MSE Wall R-1 & CIP Wall R-2

Wall	Borings
MSE Wall No. 1	R-1 and R-2
CIP Wall No. 2	R-3 and R-4

Laboratory tests to evaluate soil engineering characteristics included classification tests, moisture contents, unconfined compression tests and consolidated undrained triaxial tests. Laboratory test

results for soil classification, moisture contents, Atterberg limits, unit weights, and compressive strength test results are presented on the boring logs in Appendix A. Consolidated undrained triaxial tests with pore water pressure measurements are presented in Appendix B.

SUBSURFACE CONDITIONS

The near surface soils consist of typically of expansive clays. These clays are underlain by lean clays at depths ranging from 10 to 11 feet thick. Groundwater was observed in Boring R-1 at a depth of about 18 feet below the existing ground surface.

MECHANICALLY STABILIZED EARTH RETAINING WALL R-1

SOIL STRENGTH PARAMETERS

Total stress and effective stress soil strength parameters selected for evaluating wall bearing, sliding, overturning and global stability are presented in Table 3. MSE Wall R-1 is recommended to retain TxDOT 423 Type DS crushed stone select fill due to the risk of wall inundation. The wall select fill should extend at least two feet beyond the wall anchors. The 423 Type DS crushed stone is also recommended within a 45-degree wedge that begins at least two feet beyond the wall anchors.

The wall select fill lower unit weight was used in sliding stability analyses and the higher select fill unit weight was used for bearing and global stability analyses. The retained wedge of select fill was assumed to have the same unit weight as the select fill placed around the wall anchors.

TABLE 2 – SOIL AND SHALE STRENGTH PARAMETERS FOR MSE WALL R-1

Material Type	Unit Weight, pcf	Effective Stress Strength		Total Stress Strength
		Cohesion c', psf	Friction Angle, ϕ' degrees	Shear Strength S_u, psf
Select Fill in Reinforced Zone (TXDOT Item 423 Type DS)	100 to 125	-	34	-
Embankment Select Fill in Retained Zone (TXDOT Item 423 Type DS)	100 to 125	-	34	-
Native High Plasticity Clays - Sliding	125	-	20	-
Native High Plasticity Clays - Bearing Capacity and Global Stability	125	100	20	2,000
Embankment High Plasticity Clays - Global Stability	125	50	20	1,000
Lean Clay - Bearing Capacity and Global Stability	125	50	25	1,000

TABLE 2 – SOIL AND SHALE STRENGTH PARAMETERS FOR MSE WALL R-1				
Material Type	Unit Weight, pcf	Effective Stress Strength		Total Stress Strength
		Cohesion c', psf	Friction Angle, ϕ' degrees	Shear Strength S_u, psf
Foundation Replacement Layer TxDOT Item 247 crushed stone or crushed concrete flexible base	125	-	30	-

ALLOWABLE BEARING CAPACITY

The recommended allowable bearing resistance provided in Table 3 are based on undrained soil shear strength and effective strength friction angle and cohesion values presented in Table 2. The allowable values include a factor of safety of 2.0. The terms “L” and “e” in the effective strength equation are the anchor length and eccentricity, respectively. The allowable bearing resistance includes the effects of wall inundation.

TABLE 3 - ALLOWABLE WALL SOIL BEARING RESISTANCE MSE WALL R-1	
Design Parameter	Allowable Bearing Resistance
Total Stress Undrained Soil Shear Strength, S_u	5,150 psf
Effective Stress Soil Shear Strength, c’ and ϕ'	740 + 85 (L – 2e), psf

If the storm drains or other utilities are installed after Wall R-1 is constructed, shoring will be required and must be designed to support the retaining wall. Utility trenches within the wall height should be backfilled with cement treated sand or flowable fill.

MSE WALL R-1 EXTERNAL AND GLOBAL STABILITY EVALUATION

The external stability factors of safeties for sliding, bearing and overturning were computed for MSE Wall R-1. These calculations are based on the recommended design soil parameters presented in Table 2. MSE wall select fill Item 423 Type DS with unit weight of 100 pcf was used in sliding and overturning analyses and unit weight of 125 pcf was used in bearing capacity and global stability analyses.

We evaluated the external stability to either confirm the wall section would have either a computed sliding factors of safety 1.5, overturning factors of safety 2.0, and bearing factors of safety 2.0 or further modifications to the wall foundation would be required to provide a computed global factor of safety.

The minimum anchor lengths required, computed shearing resistance, overturning, and bearing factor of safety (FS) variation with respect to wall height are presented in the following table. The external stability calculation results for sliding, overturning and bearing capacity are for wall inundation with flood level at El. 459.16. If the flood elevation is later determined to be greater than El. 459.16, additional stability analyses will be required to confirm wall has adequate factors of safety.

TABLE 4 - DESIGN ANCHOR LENGTHS AND FACTOR OF SAFETY FOR WALL R-1

Wall Sta.	Wall Ht. (feet)	Minimum Anchor Length (feet)	Sliding FS	Overturning FS	Bearing Resistance FS	
					Effective	Total
1+40 to 3+10	18 to 16	1.30H	3.32	11.82	2.34	4.62
3+10 to 3+75	16 to 14	1.25H	3.28	10.45	2.36	5.24
3+75 to 4+30	14 to 12	1.20H	3.27	9.10	2.42	6.05
4+30 to 5+30	<12	1.0H	3.29	5.88	2.29	7.19

Global stability analyses were performed to evaluate a global factor of safety of at least 1.5 for total and effective stress conditions and 1.3 for 100-Year flood level condition. A lower factor of safety was selected for the flood case, because the flood event was assumed to have a relatively short duration of less than one month. An MSE wall select fill Type DS crushed stone unit weight of 125 pcf was used in the global stability analyses.

The results of global stability analyses for an 18-foot-tall section of MSE Wall R-1 based on the effective strength, total strength soil, wall anchor lengths presented in Table 4, and 100-Year flood level are presented in the following table. We used the 100-Year flood elevation at about 459.16 in our analyses.

TABLE 5 - GLOBAL STABILITY RESULTS FOR MSE WALL R-1

Condition	Factors of Safety	Exhibit
Sta. 1+40 Total Stress Condition	3.27	Exhibit 3
Sta. 1+40 Effective Stress Condition	1.59	Exhibit 4
Sta. 1+40 100-Yr Flood Level El. 459.16	1.31	Exhibit 5

The wall must be well drained to prevent the development of hydrostatic pressures. Poor drainage can lead to an increase in excess pore water pressures leading to increased deformation, reduced stability, and an increase in corrosion and/or degradation of the soil reinforcements. The wall drainage details presented in Texas Department of Transportation (TxDOT) MSE retaining wall sheet "RW(MSE)" is recommended for the MSE Wall R-1. Clean outs should be provided to allow the drain lines to be observed and to allow cleaning clogs out of the drain line.

CAST-IN-PLACE RETAINING WALL 2

SOIL STRENGTH PARAMETERS

Total stress and effective stress soil strength parameters recommended for evaluating wall bearing, sliding, overturning and global stability are presented in Table 6.

TABLE 6 – SOIL AND SHALE STRENGTH PARAMETERS FOR CIP WALL R-2

Material Type	Unit Weight, pcf	Effective Stress Strength		Total Stress Strength
		Cohesion c', psf	Friction Angle, ϕ' degrees	Shear Strength S_u, psf
Select Fill in Retained Zone (TXDOT 132 Type A)	125	-	30	-
Embankment Clay Fill	125	50	20	1,000
Native Fat Clays – Sliding	125	-	20	-
Native Fat Clays - Bearing Capacity and Global Stability	125	100	20	2000
Lean Clay Layer	125	50	25	1000

ALLOWABLE BEARING PRESSURES

The recommended allowable bearing resistance based on undrained soil shear strength and effective strength friction angle and cohesion values are presented in Table 7. A factor of safety of 3.0 was used to compute the allowable bearing pressures. CIP Wall R-2 is recommended to retain TxDOT 132 Type A select fill within a 45-degree wedge beyond the heel. The allowable bearing resistance includes the effects of flood water inundation.

TABLE 7 - ALLOWABLE WALL SOIL BEARING RESISTANCE FOR CIP WALL R-2

Design Parameter	Allowable Bearing Resistance
Total Stress Undrained Soil Shear Strength, S_u	3,430 psf

TABLE 7 – ALLOWABLE WALL SOIL BEARING RESISTANCE FOR CIP WALL R-2	
Design Parameter	**Allowable Bearing Resistance**
Effective Stress Soil Shear Strength, c' and ϕ'	500 + 135 Df + 55 (L-2e) psf

The term 'Df' is the footing embedment depth in feet, and 'L' and 'e' are the wall strip footing width and eccentricity in feet, respectively. The embedment depth 'Df' is the depth below finished grade above the wall footing toe and requires that compacted fill be placed over the toe of the wall footing before the wall is backfilled. The allowable bearing pressure calculations are based on level ground in front of the wall.

If the storm drains or other utilities are installed after Wall R-2 is constructed, shoring will be required and must be designed to support the retaining wall. Utility trenches within the wall height should be backfilled with cement treated sand or flowable fill.

SLIDING STABILITY

Ultimate sliding resistances recommended for walls bearing in clays are shown in Table 8. The walls should have a factor of safety of at least 1.5 with respect to sliding. A key at the bottom of the CIP walls may be required to resist lateral earth pressures. A soil total unit weight of 63 pcf is recommended for computing passive resistance for design of the wall key. Base sliding resistance should only be included on the retained earth side of the key and on the base of the key. The coefficients for sliding resistance include a factor of 2/3 to account from reduced friction between the soil and concrete of the footing.

TABLE 8 – CIP WALL R-2 ULTIMATE SLIDING RESISTANCES	
Ultimate coefficient for sliding footing supported on native clay soils	0.24
Ultimate passive pressure coefficient footing key	0.66

LATERAL EARTH PRESSURE

Lateral earth pressures acting on the wall will depend on the type of backfill material used and drainage conditions behind the wall. Recommended lateral earth pressures expressed as equivalent fluid pressures is presented in Table 9 for use in wall sliding, overturning, and bearing capacity calculations. The recommended CIP wall backfill is TxDOT Item 132 Type A. The CIP wall backfill must also be placed behind the heel of the CIP wall. The use of on-site clays is not recommended to be placed as backfill within a 45 degree sloping retained zone behind the wall based on global stability calculations.

Lateral earth pressures coefficients and equivalent fluid pressures are provided in Table 8. Lateral earth pressures are provided for drained wall conditions.

TABLE 9 - EQUIVALENT FLUID PRESSURES AND ACTIVE EARTH PRESSURE COEFFICIENTS	
Active Earth Pressure Coefficient for TxDOT Item 132 Type A	0.33
Lateral Earth Pressure for TxDOT Item 132 Type A with maximum moist unit weight of 125 pcf.	42 pcf

The lateral earth pressure values provided in the above table do not include surcharge loads due to overburden, traffic, equipment, etc. These surcharge loads are expected from traffic loads. AASHTO surcharge loads for traffic are recommended for design.

Over compaction of the wall back fill can increase lateral earth pressures above the design values provided in Table 9 that could exceed the structural design of the wall. The wall should be monitored as fill is being placed and compacted to avoid over stressing the wall as indicated by wall stem lateral deflections. Heavy compaction equipment should be maintained at least one roller width from the wall, unless field observations indicate the heavy compaction equipment must be operated at a greater distance from the wall.

The walls must be well drained to prevent the development of hydrostatic pressures. Drainage could be provided by using a collector pipe or weep holes near the base of the wall. Drains or weep holes should be properly filtered to reduce the potential for erosion through these drains and/or plugging of drain lines. The wall drainage details presented in Texas Department of Transportation (TxDOT) spread footing retaining wall miscellaneous details sheet “RW(SC)”, June 2022 is recommended for the CIP wall.

A differential water level between the retained side of the wall and outside of the wall of equal to the difference in height between the 100-year flood elevation and finished grade is recommended to be included the wall design analyses. The higher water level is on the retained earth side of the wall.

CIP WALL GLOBAL STABILITY ANALYSES

Global stability analyses were performed for a 9.5-foot CIP Wall. The wall base width for the respective wall heights were selected from Texas Department of Transportation (TxDOT) spread footing retaining walls sheet “RW (SFC)”, dated June 2022 for initial stability analyses. However, our global stability analyses indicated that a longer wall heel is necessary to satisfy global stability. An increase in the length of the wall heel by 1.5 feet, was required based on global stability considerations. Should the footing key need to be increased for sliding stability, the heel length for global stability should be reevaluated because the deeper key could increase the global stability factor of safety to acceptable values.

The global stability analyses for the CIP wall were performed using Rocscience' s Slide2 software. Soil strength parameters presented in Table 7 was used in the analyses. The results of the global stability analyses are presented in the following table.

TABLE 10 - GLOBAL STABILITY RESULTS AND RECOMMENDATIONS FOR CIP WALL R-2

Condition	Factors of Safety	Exhibit
Sta. 4+10 Total Stress Condition	6.21	Exhibit 6
Sta. 4+10 Effective Stress Condition	1.54	Exhibit 7
Sta. 4+10 100-Yr Flood Level El. 459.16	1.30	Exhibit 8

We could not obtain a global factor of safety of 1.5 based on TxDOT retaining wall standard drawings. Alternative retaining wall footing designs were evaluated to find footing design that have computed a global stability of at least 1.5 for non-flood conditions and 1.3 for 100-year flood conditions. These alternative footing designs included a lengthening the wall heel of 1.5-ft to that recommended for TXDOT standard heel length throughout the wall length.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client.

Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

EXHIBITS

SOURCE: GOOGLE EARTH, IMAGERY DATE: 12/10/2017.

THIS DRAWING SHOULD NOT BE USED SEPARATELY FROM ORIGINAL REPORT.

R-# **RETAINING WALL BORING LOCATION**

NOTE: BORING LOCATIONS ARE APPROXIMATE.

Project Mngr:	MS
Drawn By:	DG
Checked By:	TGA
Approved By:	TGA

Project No.	94225080
Scale:	AS SHOWN
Date:	8.12.2022

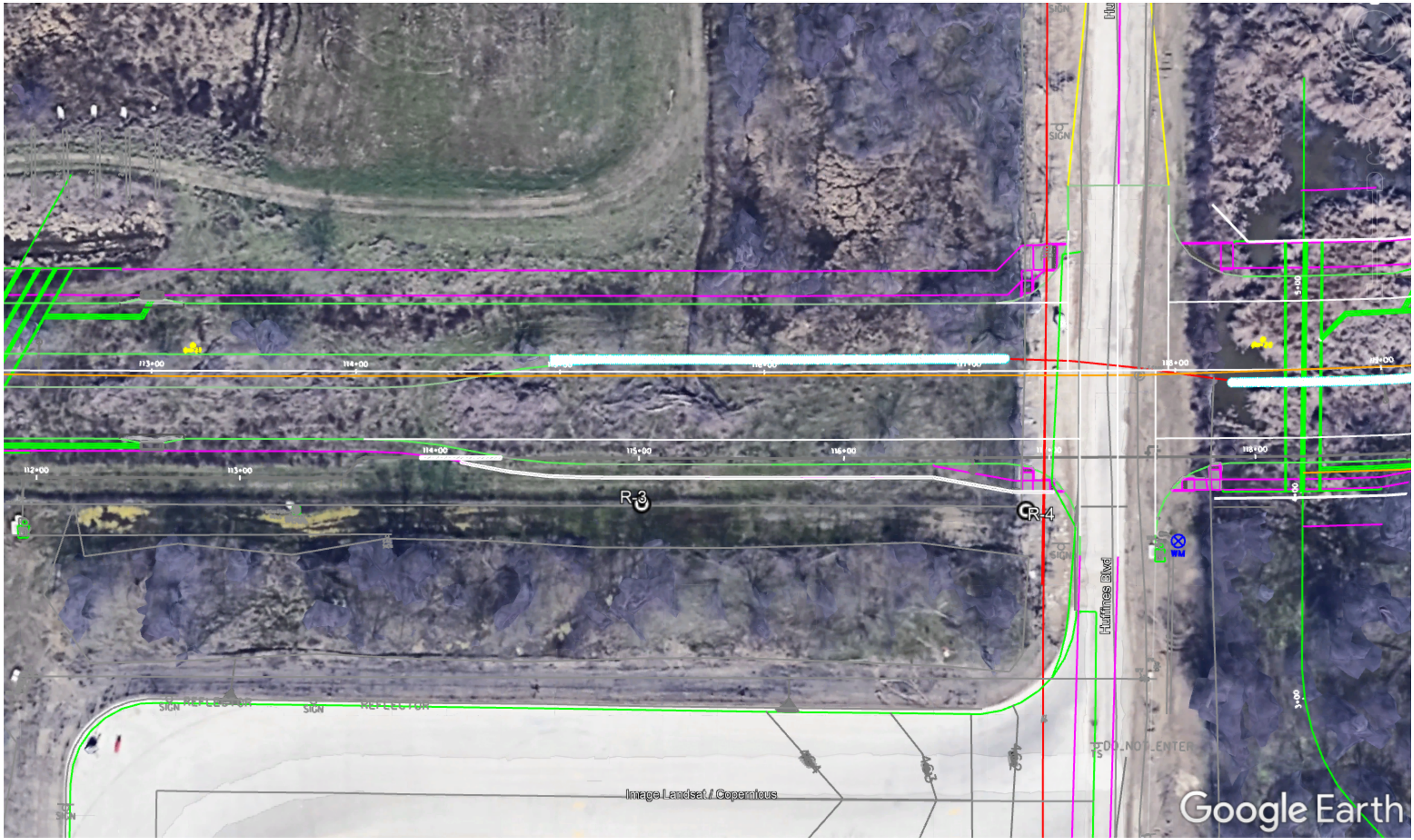
Terracon
Consulting Engineers and Scientists
(Registration No.: F-3272)
8901 CARPENTER FREEWAY DALLAS, TEXAS 75247
PH. (214) 630-1010 FAX. (214) 630-7070

MSE WALL R-1 BORING LOCATION PLAN

CORPORATE DRIVE EXTENSION SEG 2, 3, & 4

LEWISVILLE, TEXAS

EXHIBIT 1



R-# **RETAINING WALL BORING LOCATION**

THIS DRAWING SHOULD NOT BE USED SEPARATELY FROM ORIGINAL REPORT.

NOTE: BORING LOCATIONS ARE APPROXIMATE.

Project Mngr:	MS
Drawn By:	DG
Checked By:	TGA
Approved By:	TGA

Project No.	94225080
Scale:	AS SHOWN
Date:	8.12.2022

Terracon
Consulting Engineers and Scientists
(Registration No.: F-3272)
8901 CARPENTER FREEWAY DALLAS, TEXAS 75247
PH. (214) 630-1010 FAX. (214) 630-7070

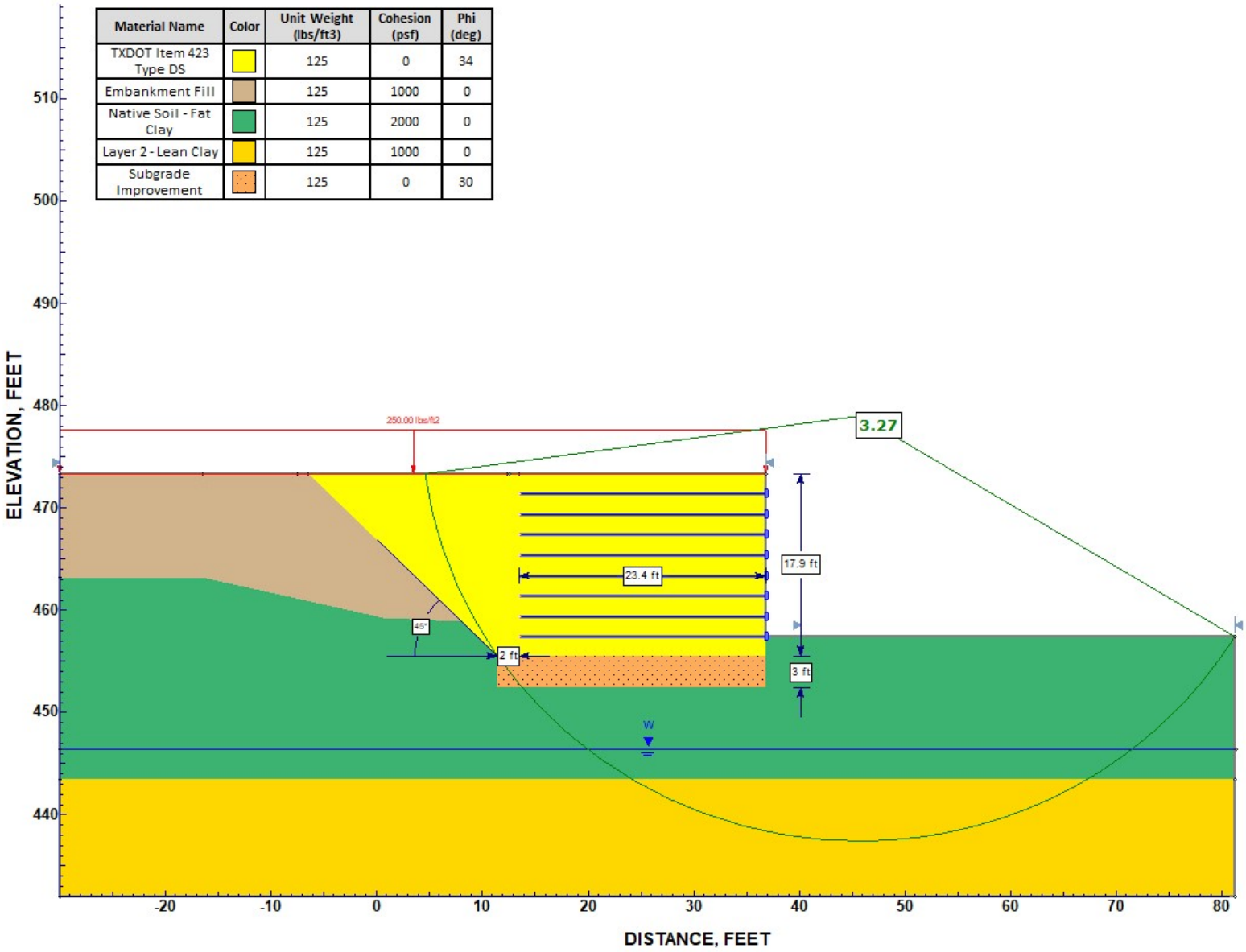
CIP WALL R-2 BORING LOCATION PLAN

CORPORATE DRIVE EXTENSION SEG 2, 3, & 4

LEWISVILLE, TEXAS

EXHIBIT 2

Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
TXDOT Item 423 Type DS		125	0	34
Embankment Fill		125	1000	0
Native Soil - Fat Clay		125	2000	0
Layer 2 - Lean Clay		125	1000	0
Subgrade Improvement		125	0	30



Project Mgr:	MS
Prepared by:	MS
Checked by:	
Approved by:	

Project No.	94225080
Scale:	NA
Date:	08.10.2022

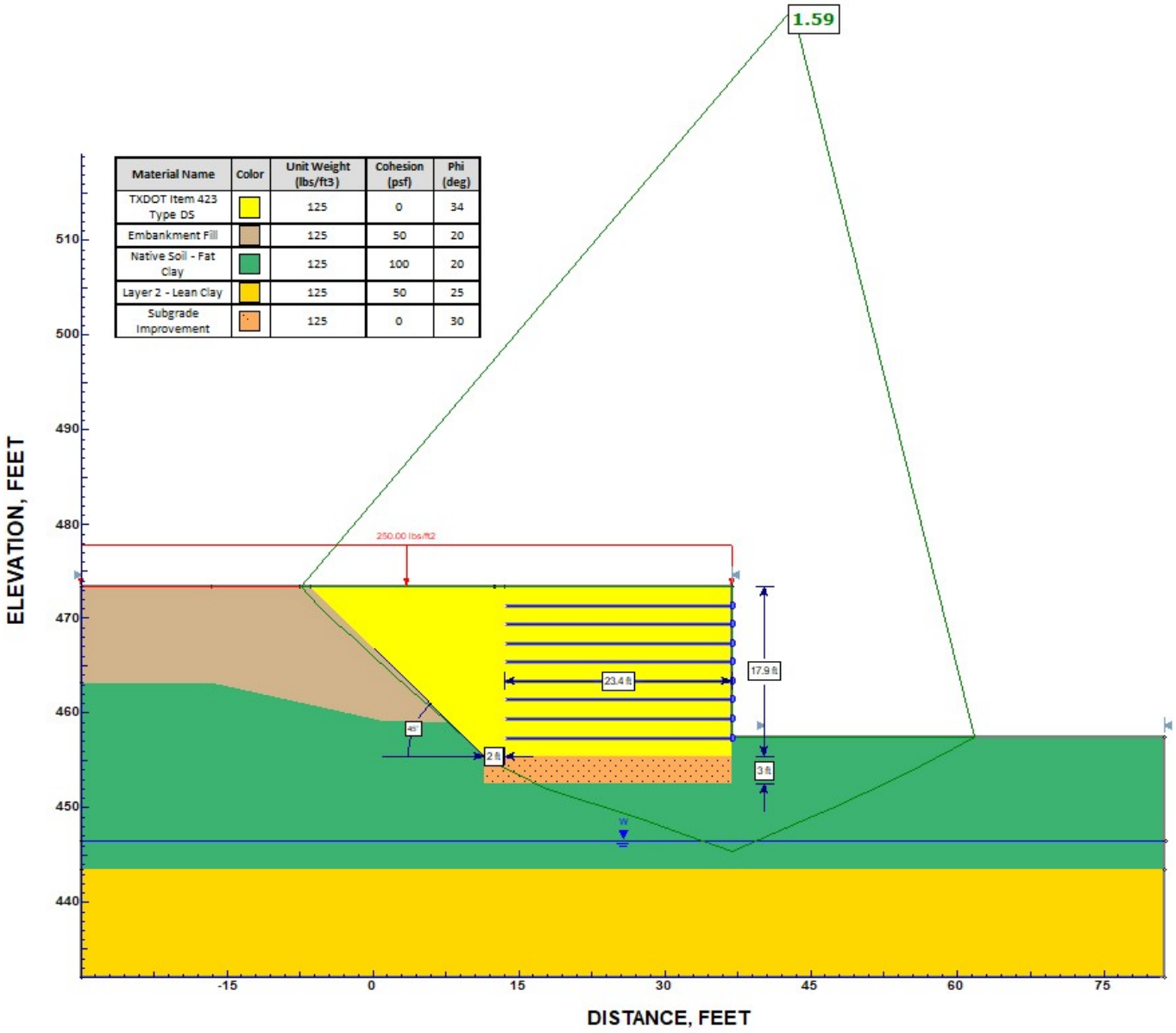
Terracon
Consulting Engineers and Scientists
Texas Registration 3272
8901 CARPENTER FRWY. DALLAS, TX 75247
PH: (214) 630-1010 Fax. (214) 630-7070

GLOBAL STABILTY RESULTS - Short Term
MSE RETAINING WALL 1

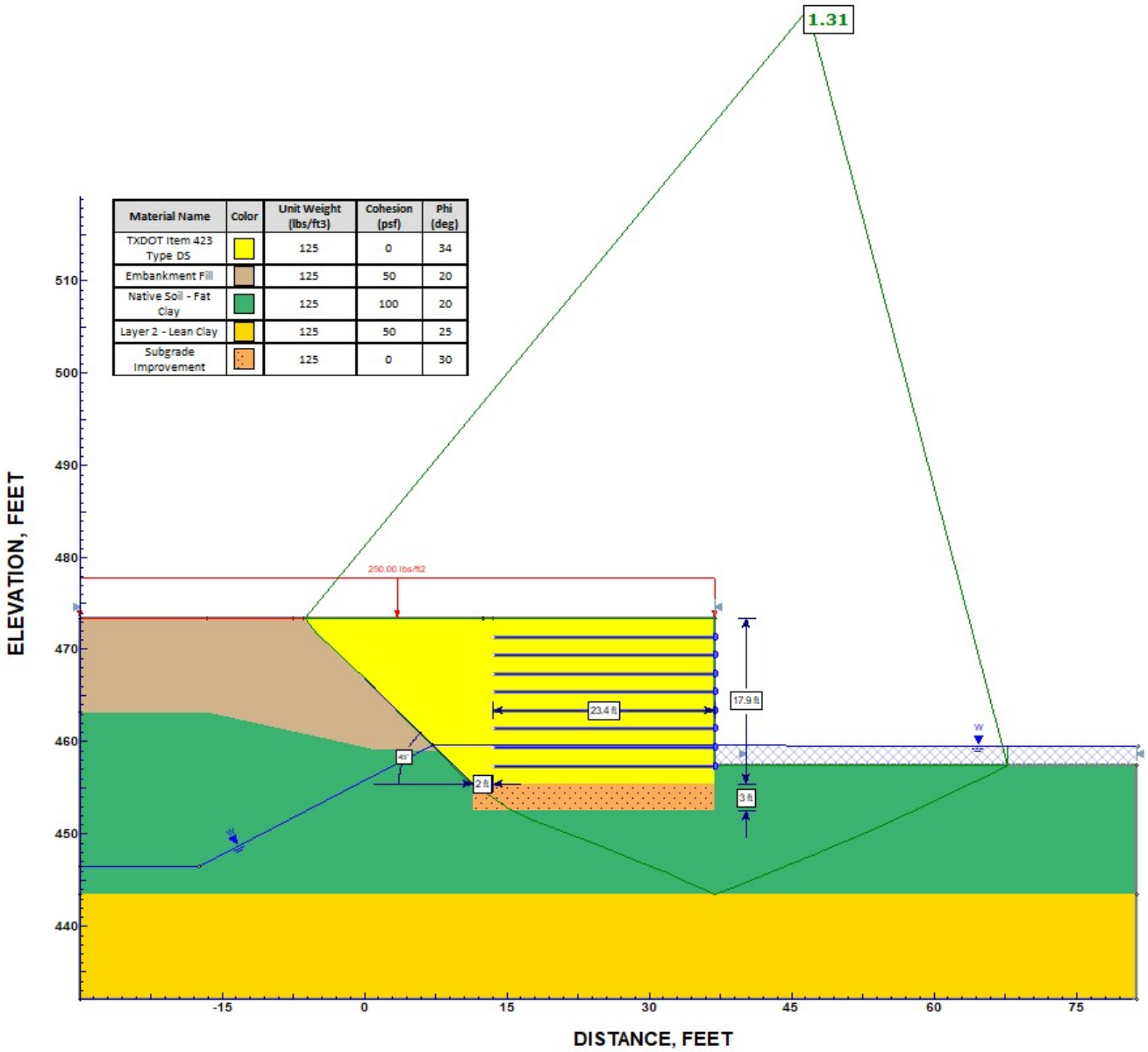
LEWISVILLE CORPORATE DRIVE EXTENSION
LEWISVILLE, TEXAS

EXHIBIT

3

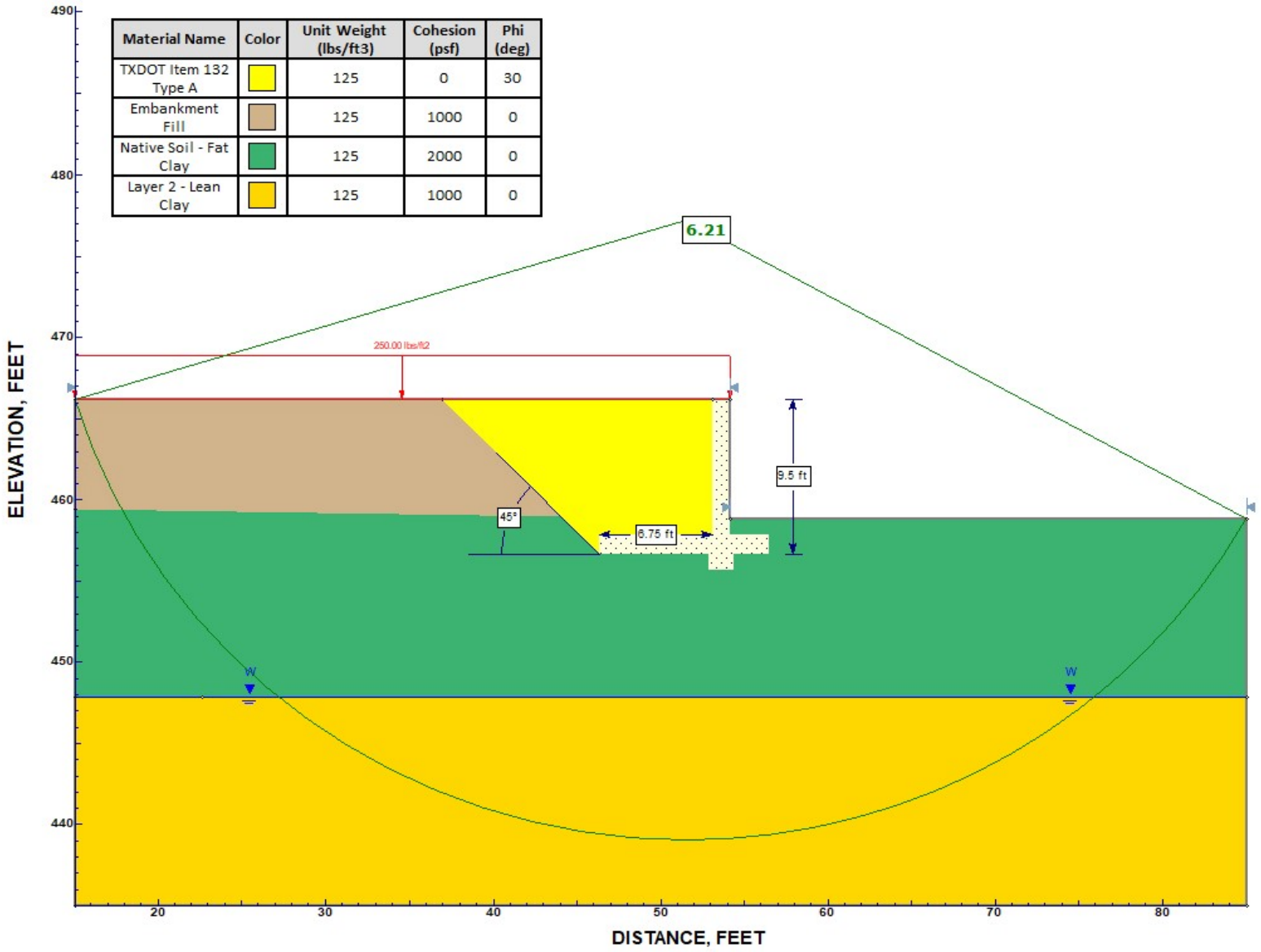


Project Mgr: MS	Project No. 94225080	Terracon Consulting Engineers and Scientists Texas Registration 3272 8901 CARPENTER FRWY. DALLAS, TX 75247 PH: (214) 630-1010 Fax. (214) 630-7070	**GLOBAL STABILTY RESULTS - Long Term** **MSE RETAINING WALL 1** **LEWISVILLE CORPORATE DRIVE EXTENSION** **LEWISVILLE, TEXAS**	**EXHIBIT** **4**
Prepared by: MS	Scale: NA			
Checked by:	Date: 08.10.2022			
Approved by:				



Project Mgr: MS	Project No. 94225080	Terracon Consulting Engineers and Scientists Texas Registration 3272 8901 CARPENTER FRWY. DALLAS, TX 75247 PH: (214) 630-1010 Fax. (214) 630-7070	**GLOBAL STABILTY RESULTS - 100-Yr Flood El.** **MSE RETAINING WALL 1** **LEWISVILLE CORPORATE DRIVE EXTENSION** **LEWISVILLE, TEXAS**	**EXHIBIT** **5**
Prepared by: MS				
Checked by:	Scale: NA			
Approved by:	Date: 08.10.2022			

Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
TXDOT Item 132 Type A		125	0	30
Embankment Fill		125	1000	0
Native Soil - Fat Clay		125	2000	0
Layer 2 - Lean Clay		125	1000	0



Project Mgr:	MS
Prepared by:	MS
Checked by:	
Approved by:	

Project No.	94225080
Scale:	NA
Date:	08.10.2022

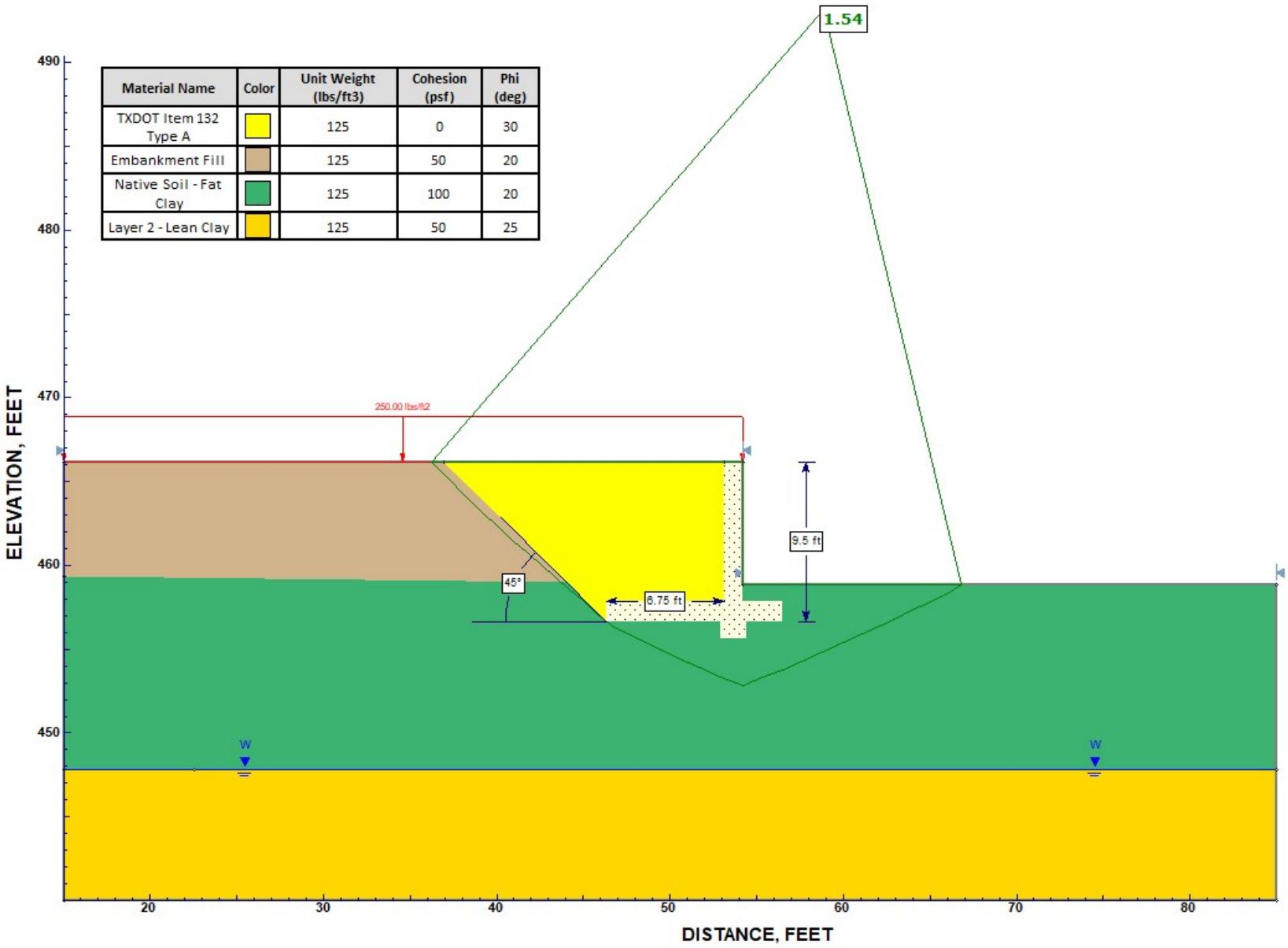
Terracon
Consulting Engineers and Scientists
Texas Registration 3272
8901 CARPENTER FRWY. DALLAS, TX 75247
PH: (214) 630-1010 Fax. (214) 630-7070

GLOBAL STABILTY RESULTS - Short Term
CIP RETAINING WALL 2

LEWISVILLE CORPORATE DRIVE EXTENSION
LEWISVILLE, TEXAS

EXHIBIT

6



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
TXDOT Item 132 Type A		125	0	30
Embankment Fill		125	50	20
Native Soil - Fat Clay		125	100	20
Layer 2 - Lean Clay		125	50	25

Project Mgr:	MS
Prepared by:	MS
Checked by:	
Approved by:	

Project No.	94225080
Scale:	NA
Date:	08.10.2022

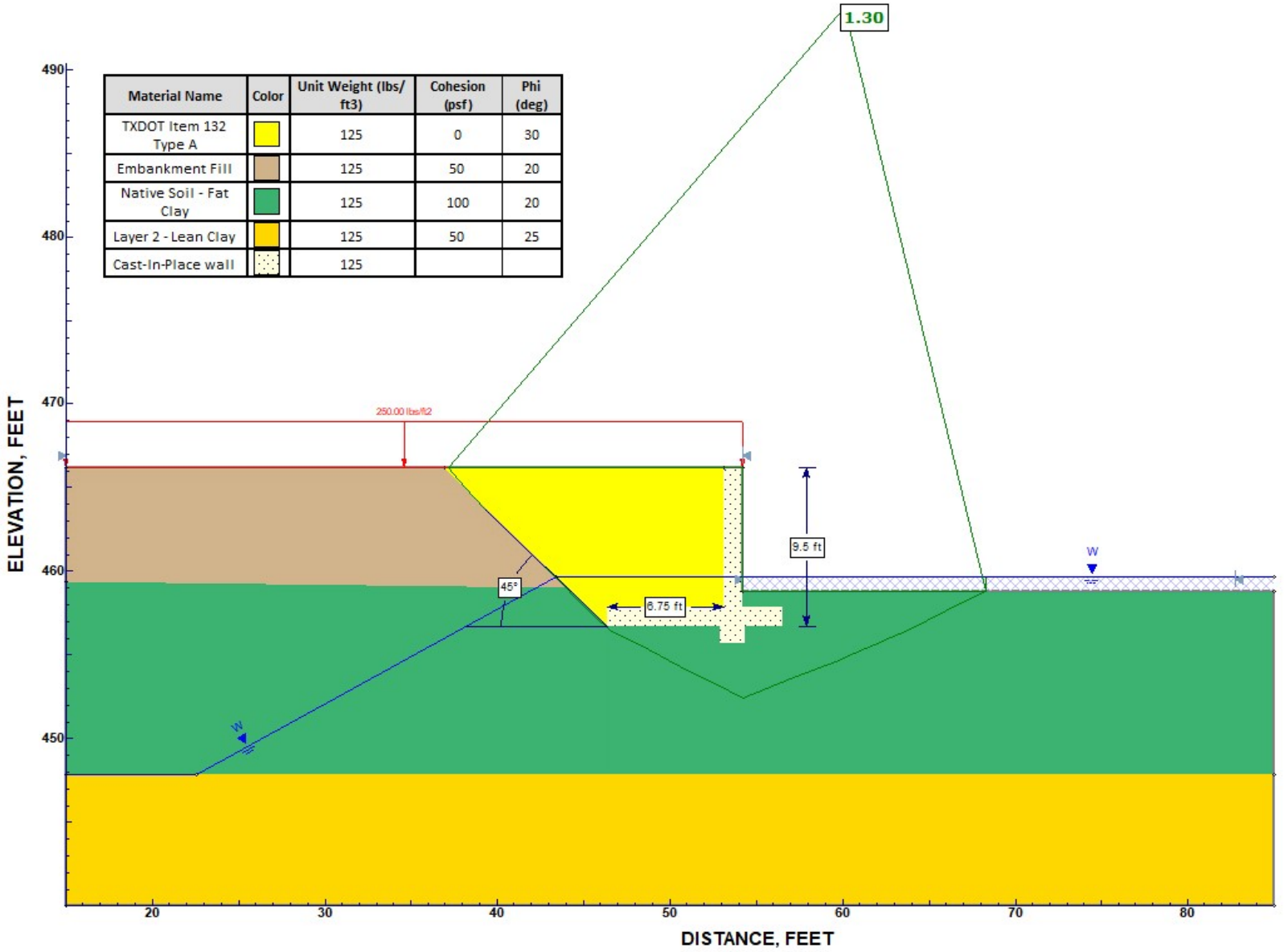
Terracon
Consulting Engineers and Scientists
Texas Registration 3272
8901 CARPENTER FRWY. DALLAS, TX 75247
PH: (214) 630-1010 Fax. (214) 630-7070

GLOBAL STABILTY RESULTS - Long Term
CIP RETAINING WALL 2

LEWISVILLE CORPORATE DRIVE EXTENSION
LEWISVILLE, TEXAS

EXHIBIT
7

Material Name	Color	Unit Weight (lbs/ ft3)	Cohesion (psf)	Phi (deg)
TXDOT Item 132 Type A		125	0	30
Embankment Fill		125	50	20
Native Soil - Fat Clay		125	100	20
Layer 2 - Lean Clay		125	50	25
Cast-In-Place wall		125		



Project Mgr:	MS
Prepared by:	MS
Checked by:	
Approved by:	

Project No.	94225080
Scale:	NA
Date:	08.10.2022

Terracon
Consulting Engineers and Scientists
Texas Registration 3272
8901 CARPENTER FRWY. DALLAS, TX 75247
PH: (214) 630-1010 Fax. (214) 630-7070

GLOBAL STABILTY RESULTS - 100-Yr Flood El.
CIP RETAINING WALL 2

LEWISVILLE CORPORATE DRIVE EXTENSION
LEWISVILLE, TEXAS

EXHIBIT

8

APPENDIX A

BORING LOG NO. R-1

PROJECT: Lewisvilled Corporate Drive Extension

CLIENT: Halff Associates Inc
Fort Worth, TX

SITE: Corporate Drive
Lewisville, TX

LOCATION See Exhibit A-2

Latitude: 1.0000° Longitude: 1.0000°

DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI	PERCENT FINES
FAT CLAY (CH), dark brown				4.5 (HP)							
				3.5 (HP)				21.4			
	5			3.5 (HP)	UC						
				1.5 (HP)	CU			25.5	98	61-26-35	94
				2.0 (HP)	CU			25.9	92		
	10	▽		2.0 (HP)	UC	2.44	2.6	23.7	102	69-19-50	
				2.0 (HP)							
- with light gray clay at 14'				1.0 (HP)	UC	2.39	5.5	24.6	97		
	15										
18.0		▽									
SANDY LEAN CLAY (CL), brown				0.5 (HP)				18.2			
	20										
				0.5 (HP)							
25.0	25										
Boring Terminated at 25 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

▽ *At completion of drilling*

Terracon
8901 John W Carpenter Fwy Ste 100
Dallas, TX

Boring Started: 06-29-2022 | Boring Completed: 06-29-2022

Drill Rig: | Driller: Total Depth

Project No.: 94225080 | Exhibit: A-1

BORING LOG NO. R-2

PROJECT: Lewisvilled Corporate Drive Extension

CLIENT: Halff Associates Inc
Fort Worth, TX

SITE: Corporate Drive
Lewisville, TX

LOCATION See Exhibit A-2

Latitude: 1.0000° Longitude: 1.0000°

DEPTH	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI	PERCENT FINES
FAT CLAY (CH), dark brown, with limestone nodules			4.5 (HP)							
			4.5 (HP)	UC	6.67	2.2	20.2	107	72-22-50	
	5		4.5 (HP)				18.9			
			3.0 (HP)	UC	4.71	2	23.4	103		
			4.5 (HP)	UC	5.33	2.4	21.6	109	77-21-56	
	10		4.5 (HP)				18.8			
- with calcite crystals at 12'			3.5 (HP)							
14.0										
FAT CLAY (CH), brown, with limestone nodules			2.5 (HP)							
	15									
- with light gray clay at 18'			2.0 (HP)				24.7		61-22-39	
	20									
- with occasional sand seams at 23'			0.5 (HP)							
25.0										
Boring Terminated at 25 Feet	25									

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No seepage encountered
Dry at completion

Terracon
8901 John W Carpenter Fwy Ste 100
Dallas, TX

Boring Started: 06-29-2022 | Boring Completed: 06-29-2022
Drill Rig: | Driller: Total Depth
Project No.: 94225080 | Exhibit: A-2

BORING LOG NO. R-3

PROJECT: Lewisvilled Corporate Drive Extension

CLIENT: Halff Associates Inc
Fort Worth, TX

SITE: Corporate Drive
Lewisville, TX

LOCATION See Exhibit A-2

Latitude: 33.0391° Longitude: -96.9490°

GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI	PERCENT FINES
	FAT CLAY (CH), brown				4.5 (HP)		3.34	1.7	18.2	97		
									26.3	94	65-21-44	
					4.5 (HP)							
									25.4	96	69-26-43	
		5			3.5 (HP)							
					3.5 (HP)		2.53	15	21.8	106		
					3.0 (HP)		2.54	15	21.9	105		
	11.0	10										
	LEAN CLAY (CL), light brown											
					3.0 (HP)		2.27	5	22.4	104		
		15										
					2.0 (HP)							
	20.0	20										
	Boring Terminated at 20 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
8901 John W Carpenter Fwy Ste 100
Dallas, TX

Boring Started: 04-02-2022 | Boring Completed: 04-02-2022

Drill Rig: | Driller: Terra Testing

Project No.: 94225080 | Exhibit: A-3

BORING LOG NO. R-4

PROJECT: Lewisvilled Corporate Drive Extension

CLIENT: Halff Associates Inc
Fort Worth, TX

SITE: Corporate Drive
Lewisville, TX

LOCATION See Exhibit A-2

Latitude: 33.0391° Longitude: -96.9490°

DEPTH	GRAPHIC LOG	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI	PERCENT FINES
FAT CLAY (CH), dark brown to light brown				1.5 (HP)		1.29	8.8	28.7	92		
								24.4		68-23-45	
				4-4-7 N=11							
5				7-7-7 N=14				22.1			
				8-8-6 N=14						65-21-44	
				1.5 (HP)							
10											
11.0											
LEAN CLAY (CL), light brown to light tan											
				2.0 (HP)		1.90	8	21.8	106		
15											
20.0				2.0 (HP)							
20											
Boring Terminated at 20 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
8901 John W Carpenter Fwy Ste 100
Dallas, TX

Boring Started: 04-02-2022 | Boring Completed: 04-02-2022

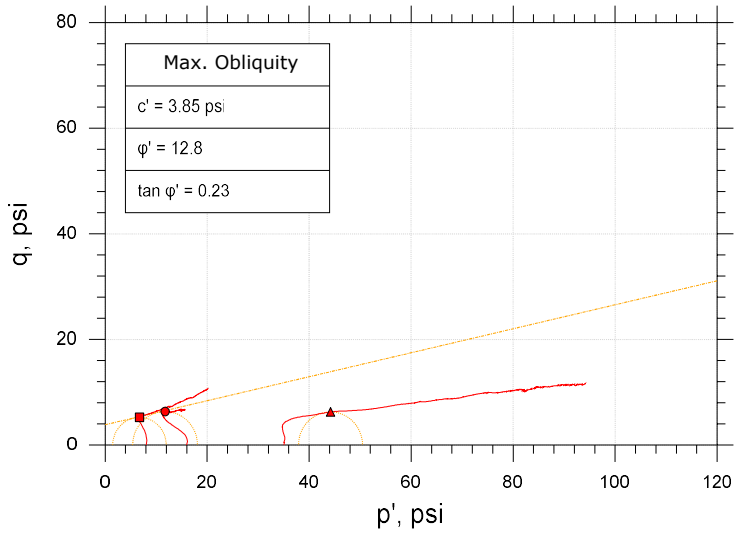
Drill Rig: | Driller: Terra Testing

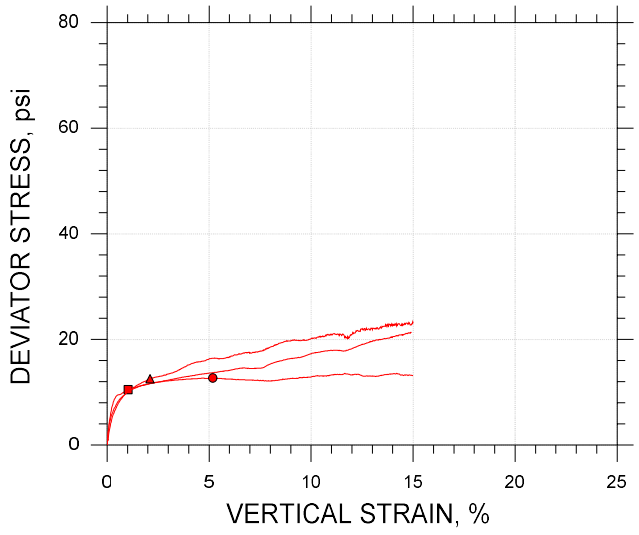
Project No.: 94225080 | Exhibit: A-4

APPENDIX B

Client: Terracon Consultants, Inc.	
Project Name: Lewisville Corporate Drive Ext	
Project Location: Fort Worth, TX	
Project Number: GTX-315486	
Tested By: trm	Checked By: njh
Boring ID: ---	
Preparation: intact	
Description: Moist, dark gray clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 61	Plastic Limit: 26
Plasticity Index: 35	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





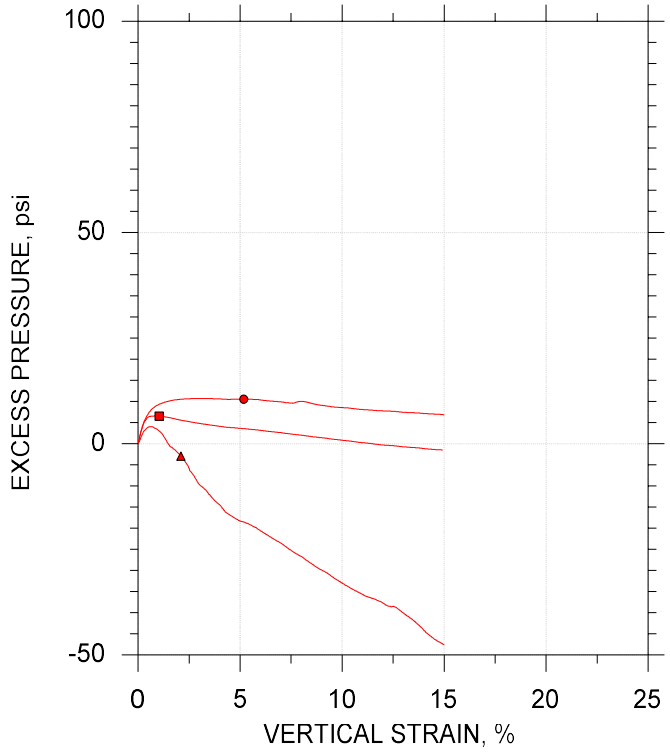
Symbol		■	●	▲	
Sample ID		R-1	R-1	R-1	
Depth, ft		6.5-10	6.5-10	6.5-10	
Test Number		CU-2-1	CU-2-2	CU-2-3	
Initial	Height, in	4.550	4.600	4.610	
	Diameter, in	2.030	2.010	2.030	
	Moisture Content (from Cuttings), %	25.5	26.9	25.9	
	Dry Density, pcf	97.7	91.7	131.	
	Saturation (Wet Method), %	95.0	86.6	245.8	
	Void Ratio	0.725	0.838	0.284	
Before Shear	Moisture Content, %	25.8	29.9	9.8	
	Dry Density, pcf	99.3	93.2	133.	
	Cross-sectional Area (Method A), in²	3.204	3.144	3.218	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.697	0.808	0.264	
	Back Pressure, psi	160.9	160.9	151.1	
Vertical Effective Consolidation Stress, psi		8.041	15.95	34.95	
Horizontal Effective Consolidation Stress, psi		8.044	15.97	35.00	
Vertical Strain after Consolidation, %		0.1262	0.4519	0.8660	
Volumetric Strain after Consolidation, %		0.1324	0.8127	1.181	
Time to 50% Consolidation, min		---	---	0.6400	
Shear Strength, psi		5.243	6.352	6.276	
Strain at Failure, %		1.03	5.18	2.10	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		10.49	12.70	12.55	
Effective Minor Principal Stress at Failure, psi		1.488	5.402	37.91	
Effective Major Principal Stress at Failure, psi		11.97	18.11	50.46	
B-Value		1.00	0.96	1.00	

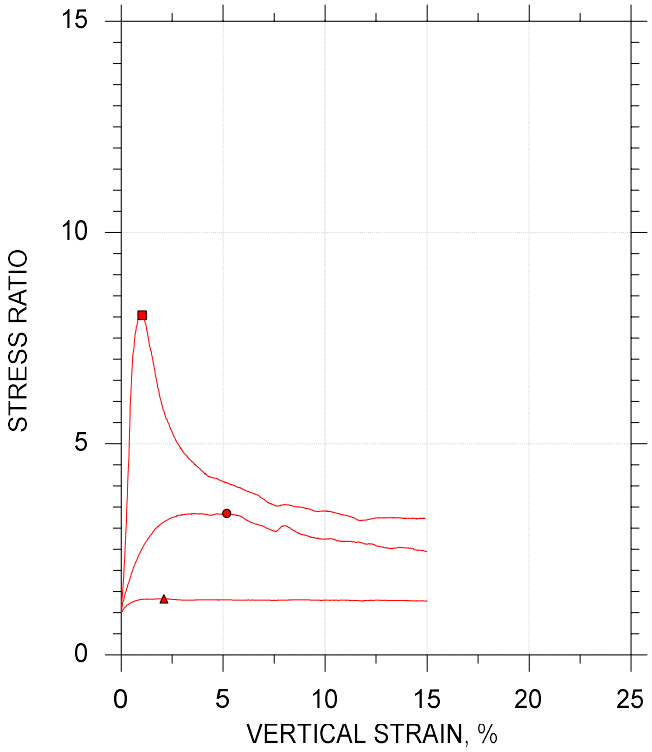
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

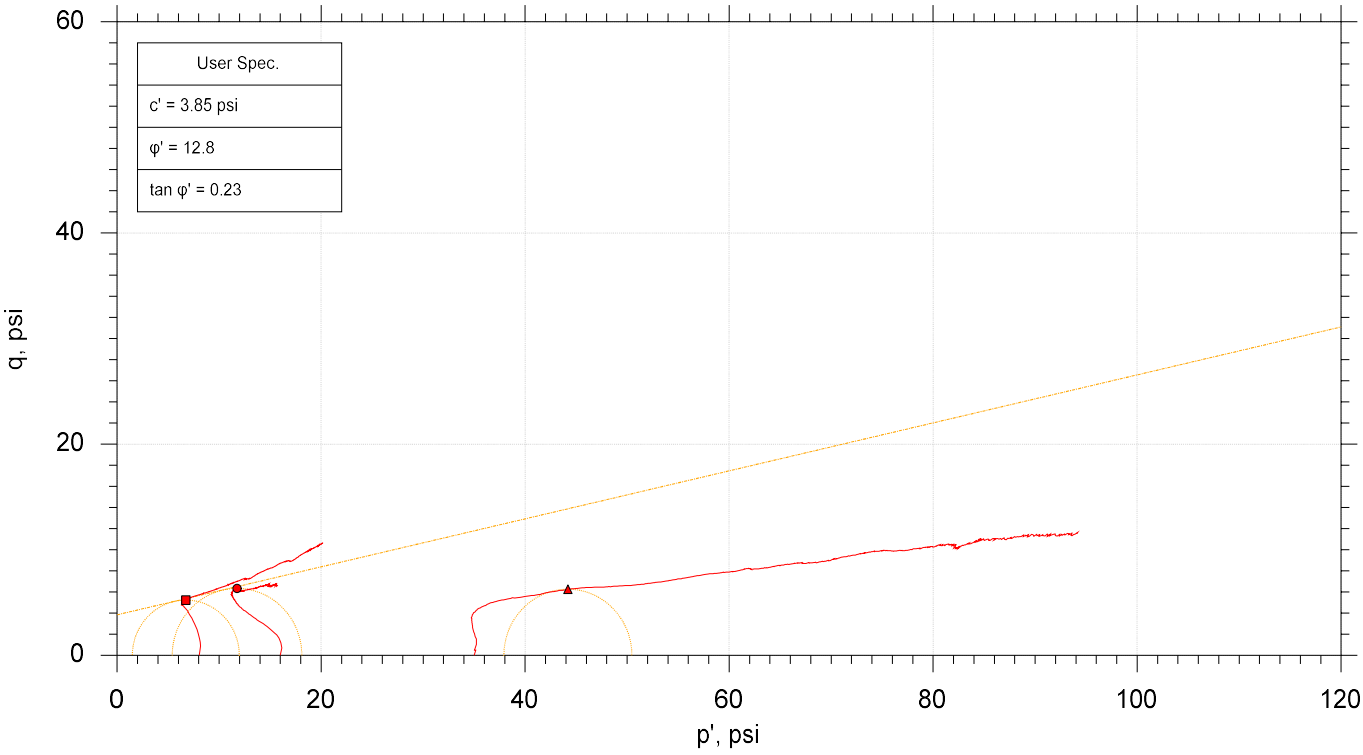
Remarks:

TX-007, Test Specimen CU-2-3 was not used in determining cohesion and friction values

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







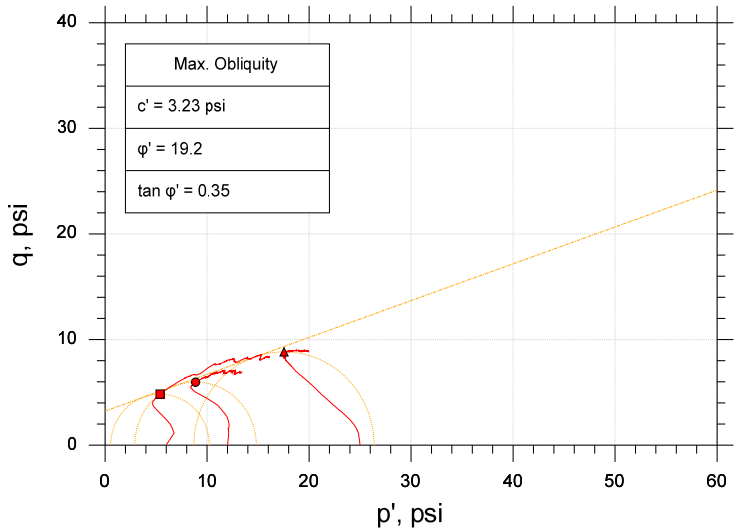
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	R-1	CU-2-1	6.5-10	trm	7/27/22	njh	8/9/22	315486-CU-2-1n.dat
●	R-1	CU-2-2	6.5-10	trm	7/27/22	njh	8/9/22	315486-CU-2-2n.dat
▲	R-1	CU-2-3	6.5-10	trm	7/27/22	njh	8/9/22	315486-CU-2-3n.dat

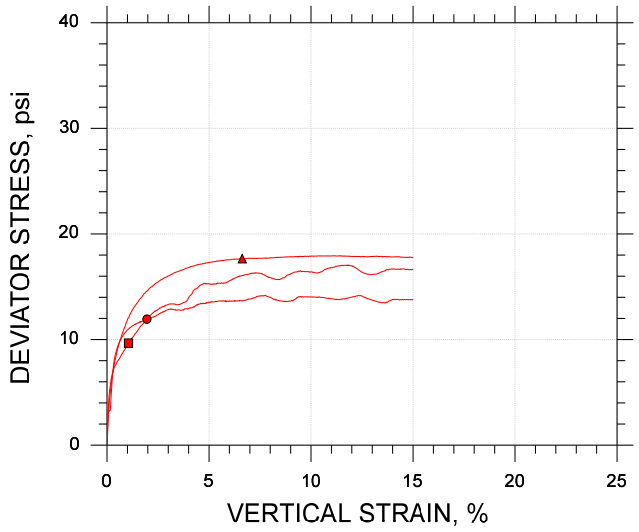
GeoTesting EXPRESS

Project: Lewisville Corporate Drive Ext	Location: Fort Worth, TX	Project No.: GTX-315486
Boring No.: ---	Sample Type: intact	
Description: Moist, dark gray clay		
Remarks: TX-007, Test Specimen CU-2-3 was not used in determining cohesion and friction values		

Client: Terracon Consultants	
Project Name: Lewisville Corporate Drive	
Project Location: Fort Worth, TX	
Project Number: GTX-315486	
Tested By: trm	Checked By: anm
Boring ID: B-3	
Preparation: core	
Description: Moist, brown clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

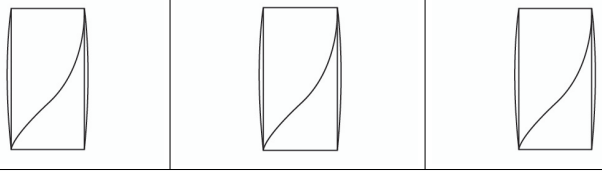




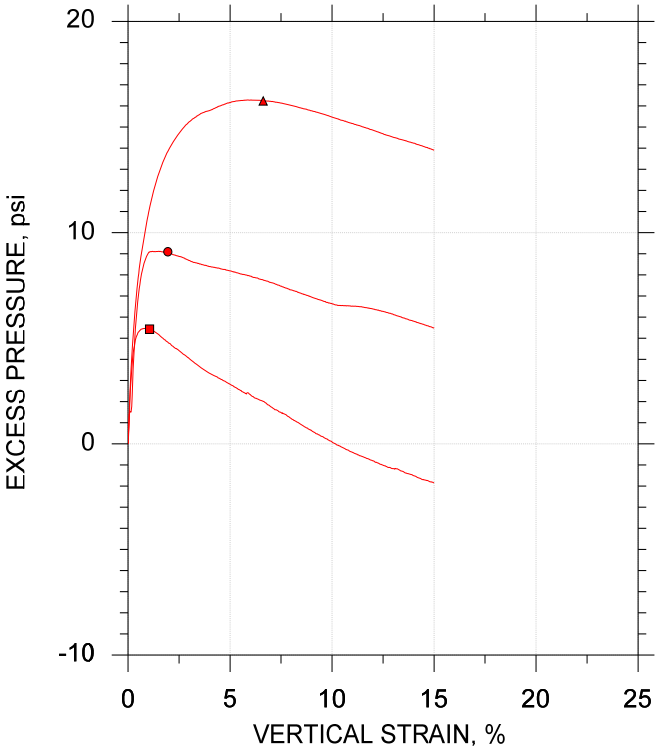
Symbol		■	●	▲	
Sample ID		---	---	---	
Depth, ft		2.5-4.0,4.5-6.0	2.5-4.0,4.5-6.0	2.5-4.0,4.5-6.0	
Test Number		CU-1-1	CU-1-2	CU-1-3	
Initial	Height, in	4.350	4.250	4.210	
	Diameter, in	2.030	2.030	2.030	
	Moisture Content (from Cuttings), %	26.3	23.9	25.4	
	Dry Density, pcf	94.1	94.7	96.2	
	Saturation (Wet Method), %	89.9	82.8	91.1	
	Void Ratio	0.790	0.779	0.752	
Before Shear	Moisture Content, %	29.3	28.1	25.4	
	Dry Density, pcf	94.1	95.9	100.	
	Cross-sectional Area (Method A), in²	3.245	3.219	3.178	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.790	0.758	0.686	
	Back Pressure, psi	150.9	150.9	150.9	
Vertical Effective Consolidation Stress, psi		5.980	11.95	24.89	
Horizontal Effective Consolidation Stress, psi		5.989	12.00	24.99	
Vertical Strain after Consolidation, %		0.3428	0.6701	1.381	
Volumetric Strain after Consolidation, %		0.2159	1.156	1.993	
Time to 50% Consolidation, min		---	---	25.30	
Shear Strength, psi		4.831	5.966	8.831	
Strain at Failure, %		1.05	1.95	6.63	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		9.662	11.93	17.66	
Effective Minor Principal Stress at Failure, psi		0.5576	2.904	8.718	
Effective Major Principal Stress at Failure, psi		10.22	14.84	26.38	
B-Value		0.95	0.96	0.97	

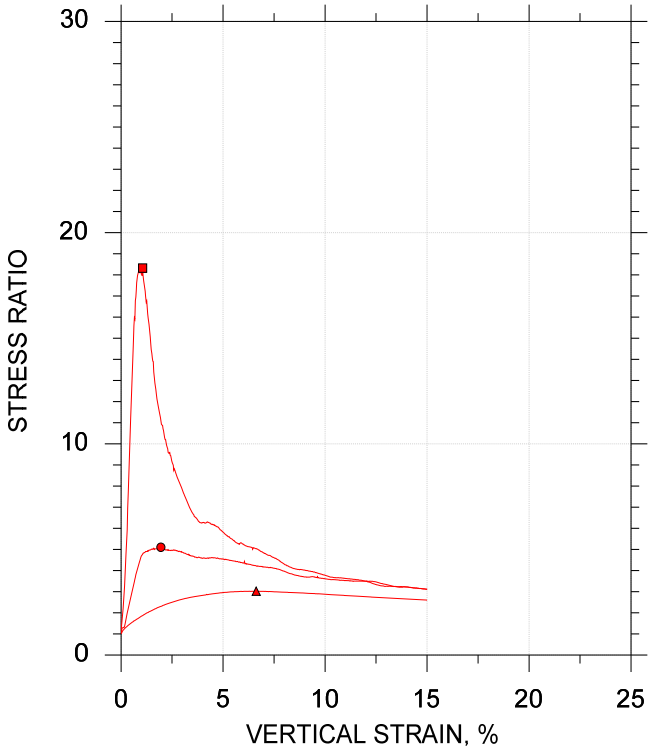
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

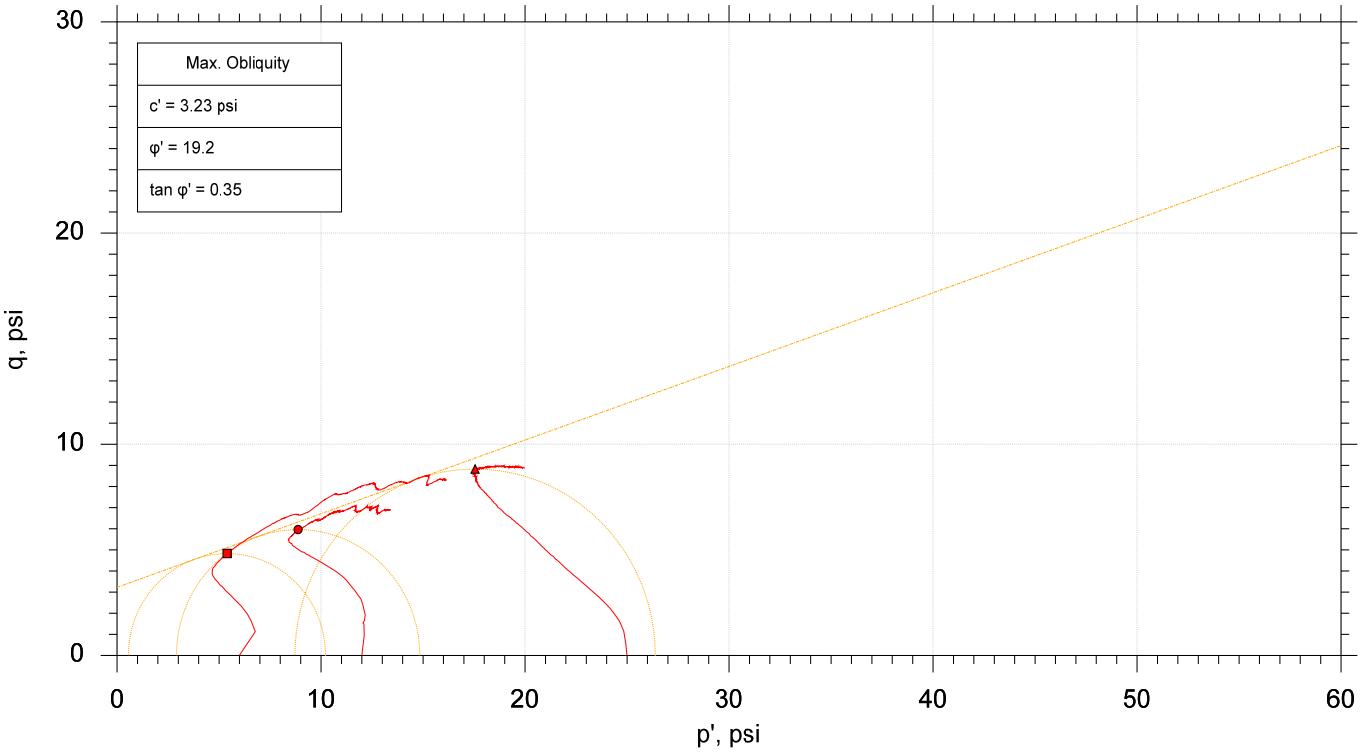
Remarks:



CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	---	CU-1-1	2.5-4.0,4.5-6.0	trm	5/19/22	anm	5/26/22	315486-CU-1-1v.dat
●	---	CU-1-2	2.5-4.0,4.5-6.0	trm	5/19/22	anm	5/26/22	315486-CU-1-2v.dat
▲	---	CU-1-3	2.5-4.0,4.5-6.0	trm	5/19/22	anm	5/26/22	315486-CU-1-3v.dat

GeoTesting EXPRESS

Project: Lewisville Corporate Drive	Location: Fort Worth, TX	Project No.: GTX-315486
Boring No.: B-3	Sample Type: core	
Description: Moist, brown clay		
Remarks: TX-001		

DEPARTMENT OF THE ARMY PERMIT

Permittee: Ms. Mary Zackary (City of Lewisville)

Permit No: SWF-2018-00485

Issuing Office: Fort Worth District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: The applicant proposes to discharge approximately 8,450 total cubic yards of dredged and fill material into approximately 6.02 acres of non-forested wetland, 0.06 acre of forested wetland, and 495 linear feet (0.05 acre) of streams in conjunction with the extension of Corporate Drive from the Railroad Street intersection eastward to Carrollton Parkway, and the expansion of Carrollton Parkway between Sam Rayburn Tollway and Windhaven Parkway in the City of Lewisville, Denton County, Texas. Total proposed permanent impacts would include 5.94 acres / 336 linear feet of wetlands and streams. Total proposed temporary impacts would include 1.11 acres / 159 linear feet of wetlands and streams.

Project Location: The project would extend from the Railroad Street terminus through existing undeveloped right-of-way and adjacent to a Waste Management Landfill, crossing the Elm Fork Trinity River, proceeding east to the western terminus of the developed Carrollton Parkway. The proposed project would also include the expansion of Carrollton Parkway between the Sam Rayburn Tollway and Windhaven Parkway. (33.024106; -96.969401)

Permit Conditions: In accordance with the general conditions, the special conditions below, and attached Exhibits 1-12, dated October 13, 2020, and Texas Commission on Environmental Quality Section 401 Water Quality Certification, Pages 6-10, dated October 8, 2020.

General Conditions:

1. The time limit for completing the work authorized ends on Dec. 31, 2030. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the

authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archaeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions: SEE PAGE 5 (Special Conditions)

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(x) Section 404 of the Clean Water Act of 1972 (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

10-14-2020

(PERMITTEE)
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

WALKER.JENNIFER.RILEY.1027696925 Digitally signed by WALKER.JENNIFER.RILEY.1027696925 Date: 2020.10.15 10:46:38 -05'00'

(DISTRICT ENGINEER) *(DATE)*
(FOR)
Kenneth N. Reed, PMP
Colonel, U.S. Army
District Engineer

Colonel, Corps of Engineers

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) *(DATE)*

Special Conditions
Permit Number SWF-2018-00485

1. The permittee shall implement and abide by the "Section 404 Compensatory Mitigation Plan" (Attachment J of the permit application submittal), received July 22, 2019, and prepared by Halff Associates, Inc., dated July 2019. The permittee shall implement the plan prior to ground disturbing activities in waters of the United States. Completion of all elements of this mitigation plan is a requirement of this permit.

2. The permittee shall debit 44.3 in-channel ephemeral stream credits, and 42.1 in-channel intermittent stream credits from the Mill Branch Mitigation Bank in compliance with the provisions of the "Mill Branch Mitigation Bank Mitigation Banking Instrument" dated March 2012. This debit shall compensate off-site for unavoidable adverse project impacts that would not be compensated for by on-site mitigation. The permittee shall complete the mitigation bank transaction and provide documentation to the USACE that the transaction has occurred prior to commencing any ground-disturbing activity within waters of the United States.

3. The permittee shall debit 66.5 ephemeral legacy stream credits, and 63.2 intermittent legacy stream credits from the Red Oak Umbrella Mitigation Bank Palmer Tract in compliance with the provisions of the "Mitigation Banking Instrument and Site Development Plan for the Palmer Tract portion of the Red Oak Umbrella Mitigation Bank" dated June 7, 2013. This debit shall compensate off-site for unavoidable adverse project impacts that would not be compensated for by on-site mitigation. The permittee shall complete the mitigation bank transaction and provide documentation to the USACE that the transaction has occurred prior to commencing any ground-disturbing activity within waters of the United States.

4. The permittee shall debit 6.2 emergent wetland credits, and 0.1 forested wetland credits from the Bunker Sands Mitigation Bank in compliance with the provisions of the "Mitigation Banking Instrument, Bunker Sands Mitigation Bank, Kaufman County, Texas," dated April 30, 2008. This debit shall compensate off-site for unavoidable adverse project impacts that would not be compensated for by on-site mitigation. The permittee shall complete the mitigation bank transaction and provide documentation to the USACE that the transaction has occurred prior to commencing any ground-disturbing activity within waters of the United States.

5. The permittee shall use clean fill materials, free of toxic pollutants, in waters of the United States and shall not use unsuitable materials such as trash, debris, car bodies, asphalt, etc.

6. The permittee shall utilize appropriate BMP's in all aspects of construction in waters of the United States, until such time that all fill materials have been permanently stabilized.

October 8, 2020

Mr. Brandon W. Mobley, Division Chief
U.S. Army Corps of Engineers
Regulatory Division CESWF-EV-R
P.O. Box 17300
Fort Worth, Texas 76102-0300

Re: USACE Permit Application No. SWF-2018-00485

Dear Mr. Shelnutt:

This letter is in response to the Statement of Findings (SOF) dated September 10, 2020 for the Joint Public Notice dated May 7, 2019, on the City of Lewisville's proposed construction of a four-lane median-divided roadway with sidewalks. The proposed project is located in Lewisville, Denton County Texas.

The Texas Commission on Environmental Quality (TCEQ) has reviewed the public notice and related application information along with the SOF. On behalf of the Executive Director and based on our evaluation of the information contained in these documents, the TCEQ certifies that there is reasonable assurance that the project will be conducted in a way that will not violate water quality standards. General information regarding this water quality certification, including standard provisions of the certification, is included as an attachment to this letter.

The project proposed the loss of 6.02 acres of non-forested (emergent) wetlands, 0.06 acre of forested wetland, 159 linear feet of intermittent stream, and 336 linear feet of ephemeral stream.

A compensatory mitigation plan was developed according to the USACE Compensatory Mitigation for Losses of Aquatic Resources Final Rule (40 CFR Part 230 and 33 CFR 332) for the proposed unavoidable adverse impacts. The applicant proposes to purchase 44.33 in-channel ephemeral stream credits and 42.13 in-channel intermittent stream credits from Mill Branch Mitigation Bank (MBMB), 129.7 stream legacy credits (riparian buffer credits) from Red Oak Umbrella Mitigation Bank (ROMB), and a total of 0.09 Forested wetland credits and 6.22 non-forested wetland credits from Bunker Sands Mitigation Bank (BSMB). The following explains how the credits were determined. BSMB requires a determination of low, medium, or high quality to arrive at debit ratios for compensatory mitigation for permanent wetland impacts. TXRAM scores for forested wetland features and non-forested wetlands classified as scrub/shrub support mitigation compensation at high quality. Non-forested wetlands classified as emergent cattail wetlands support mitigation compensation at low quality. According to the BSMB Mitigation Banking Instrument (MBI), high quality wetlands should be debited at a rate of 2.0 credits per acre of loss while low quality wetlands should be debited at a rate of 1.0 credits per acre of loss. Furthermore, debit ratios for compensatory mitigation of temporary wetland impacts according to the BSMB MBI should be debited at a rate of 1.0 credit per acre of

impact independent of wetland quality classification. Total required wetland credits would be rounded to 6.3 credits. In accordance with the stream mitigation rule, 50% of TXRAM in-channel ephemeral stream credits and in-channel intermittent stream credits would be required to mitigate for the proposed impacts. These credits would be purchased from MBMB primary service area. The remaining required credits would be purchased from the ROMB in the form of legacy credits with a secondary service area multiplier of 1.5. Rounded required stream credits would be 44.3 in-channel ephemeral stream credits and 42.1 in-channel intermittent stream credits from MBMB, and 66.5 ephemeral legacy credits and 63.2 intermittent legacy credits from ROMB.

No review of property rights, location of property lines, nor the distinction between public and private ownership has been made, and this certification may not be used in any way with regard to questions of ownership.

If you require additional information or further assistance, please Ms. Jenna R. Lueg, Water Quality Assessment Section, Water Quality Division (MC-150), at (512) 239-4590 or by email at jenna.lueg@tceq.texas.gov .

Sincerely,

David W Galindo

David W. Galindo
Water Quality Division Director (MC-148)
Texas Commission on Environmental Quality

DWG/JRL/cc

Attachment

cc: Mr. Joe Shelnutt, via email at Joseph.L.Shelnutt@usace.army.mil
Ms. Mary Zackary, via email at mzackary@cityoflewisville.com

WORK DESCRIPTION: As described in the public notice dated May 7, 2019, and the September 10, 2020, Environmental Assessment and Statement of Findings.

SPECIAL CONDITIONS: None

GENERAL: This certification, issued pursuant to the requirements of Title 30, Texas Administrative Code, Chapter 279, is restricted to the work described in the September 10, 2020, Environmental Assessment and Statement of Findings and shall be concurrent with the Corps of Engineers (COE) permit. This certification may be extended to any minor revision of the COE permit when such change(s) would not result in an impact on water quality. The Texas Commission on Environmental Quality (TCEQ) reserves the right to require full joint public notice on a request for minor revision.

STANDARD PROVISIONS: These following provisions attach to any permit issued by the COE and shall be followed by the permittee or any employee, agent, contractor, or subcontractor of the permittee during any phase of work authorized by a COE permit.

1. The water quality of wetlands shall be maintained in accordance with all applicable provisions of the Texas Surface Water Quality Standards including the General, Narrative, and Numerical Criteria.

2. The applicant shall not engage in any activity which will cause surface waters to be toxic to man, aquatic life, or terrestrial life.

3. Permittee shall employ measures to control spills of fuels, lubricants, or any other materials to prevent them from entering a watercourse. All spills shall be promptly reported to the TCEQ by calling the State of Texas Environmental Hotline at 1-800-832-8224.

4. Sanitary wastes shall be retained for disposal in some legal manner. Marinas and similar operations which harbor boats equipped with marine sanitation devices shall provide state/federal permitted treatment facilities or pump out facilities for ultimate transfer to a permitted treatment facility. Additionally, marinas shall display signs in appropriate locations advising boat owners that the discharge of sewage from a marine sanitation device to waters in the state is a violation of state and federal law.

5. Materials resulting from the destruction of existing structures shall be removed from the water or areas adjacent to the water and disposed of in some legal manner.

6. A discharge shall not cause substantial and persistent changes from ambient conditions of turbidity or color. The use of silt screens or other appropriate methods is encouraged to confine suspended particulates.

7. The placement of any material in a watercourse or wetlands shall be avoided and placed there only with the approval of the Corps when no other reasonable alternative is available. If work within a wetland is unavoidable, gouging or rutting of the substrate is prohibited. Heavy equipment shall be placed on mats to protect the substrate from gouging and rutting if necessary.

8. Dredged Material Placement: Dredged sediments shall be placed in such a manner as to prevent any sediment runoff onto any adjacent property not owned by the applicant. Liquid runoff from the disposal area shall be retained on-site or shall be filtered and returned to the watercourse from which the dredged materials were removed. Except for material placement authorized by this permit, sediments from the project shall be placed in such a manner as to prevent any sediment runoff into waters in the state, including wetlands.

9. If contaminated spoil that was not anticipated or provided for in the permit application is encountered during dredging, dredging operations shall be immediately terminated and the TCEQ shall be contacted by calling the State of Texas Environmental Hotline at 1-800-832-8224. Dredging activities shall not be resumed until authorized by the Commission.

10. Contaminated water, soil, or any other material shall not be allowed to enter a watercourse. Noncontaminated storm water from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.

11. Storm water runoff from construction activities that result in a disturbance of one or more acres, or are a part of a common plan of development that will result in the disturbance of one or more acres, must be controlled and authorized under Texas Pollutant Discharge Elimination System (TPDES) general permit TXR150000. A copy of the general permit, application (notice of intent), and additional information is available at: http://www.tceq.texas.gov/permitting/stormwater/wq_construction.html or by contacting the TCEQ Storm Water & Pretreatment Team at (512) 239-4671.

12. Upon completion of earthwork operations, all temporary fills shall be removed from the watercourse/wetland, and areas disturbed during construction shall be seeded, riprapped, or given some other type of protection to minimize subsequent soil erosion. Any fill material shall be clean and of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters.

13. Disturbance to vegetation will be limited to only what is absolutely necessary. After construction, all disturbed areas will be revegetated to approximate the pre-disturbance native plant assemblage.

14. Where the control of weeds, insects, and other undesirable species is deemed necessary by the permittee, control methods which are nontoxic to aquatic life or human health shall be employed when the activity is located in or in close proximity to water, including wetlands.

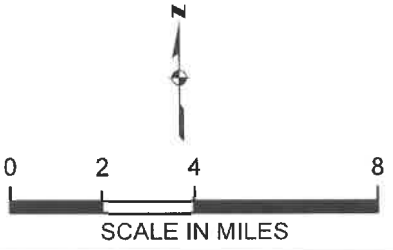
15. Concentrations of taste and odor producing substances shall not interfere with the production of potable water by reasonable water treatment methods, impart unpalatable flavor to food fish including shellfish, result in offensive odors arising from the water, or otherwise interfere with reasonable use of the water in the state.

16. Surface water shall be essentially free of floating debris and suspended solids that are conducive to producing adverse responses in aquatic organisms, putrescible sludge deposits, or sediment layers which adversely affect benthic biota or any lawful uses.

17. Surface waters shall be essentially free of settleable solids conducive to changes in flow characteristics of stream channels or the untimely filling of reservoirs, lakes, and bays.

18. The work of the applicant shall be conducted such that surface waters are maintained in an aesthetically attractive condition and foaming or frothing of a persistent nature is avoided. Surface waters shall be maintained so that oil, grease, or related residue will not produce a visible film of oil or globules of grease on the surface or coat the banks or bottoms of the watercourse.

19. This certification shall not be deemed as fulfilling the applicant's/permittee's responsibility to obtain additional authorization/approval from other local, state, or federal regulatory agencies having special/specific authority to preserve and/or protect resources within the area where the work will occur.



October 13, 2020

Exhibit 1 of 12

SWF-2018-00485

Legend

Study Area

Notes:
1. Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 04/2018 AVO: 30619

Project Location Map

Sheet 1

HALFF

0 2,000 4,000 8,000

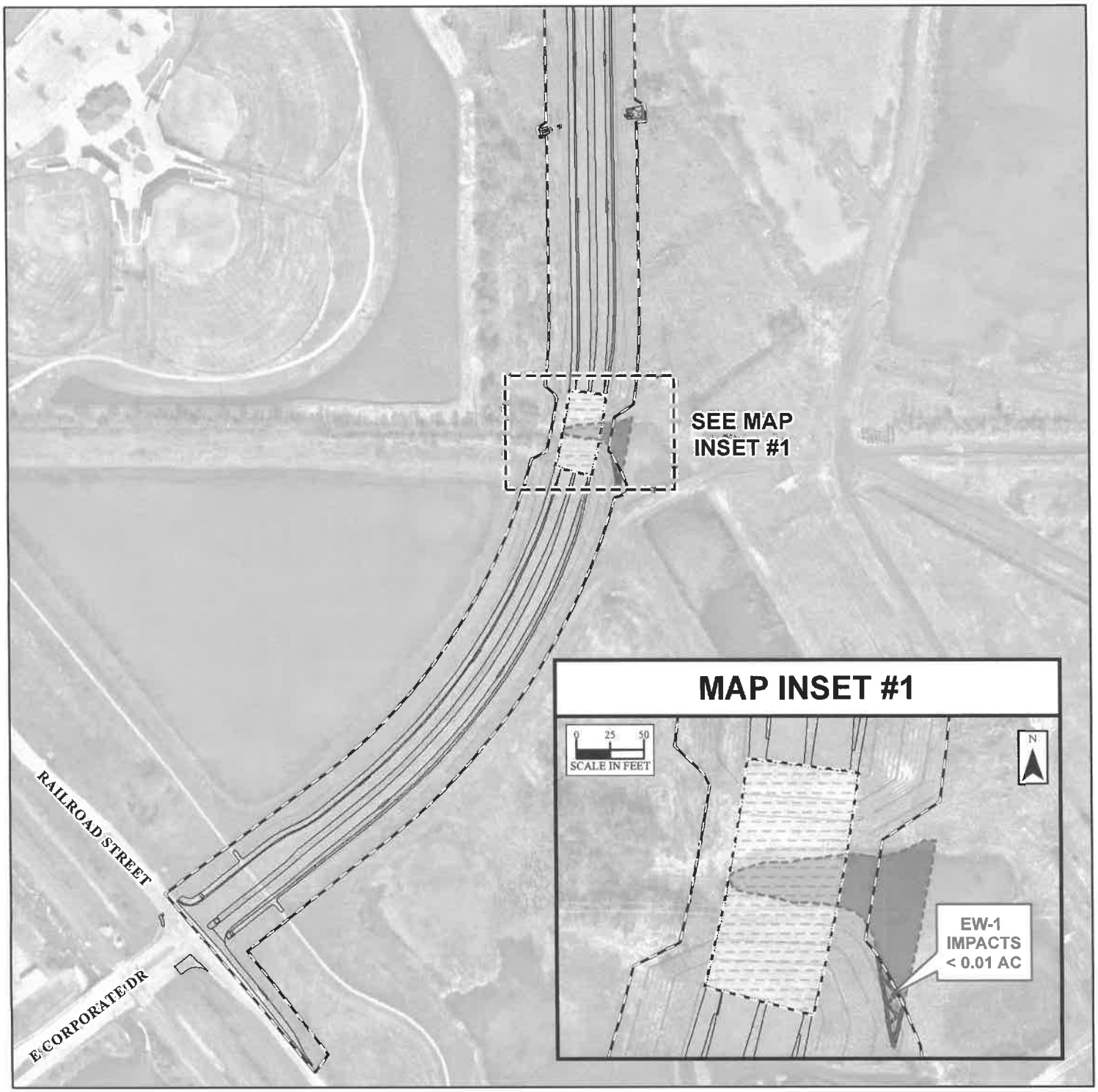
SCALE IN FEET

Legend

Study Area

Notes:
1. Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the

Lewisville Corporate Drive Extension
Project Number: SWF-2018-00485
Date: 04/2018 AVO: 30619
Project Vicinity Map
Sheet 2
HALFF



MAP INSET #1

N

0 150 300 600

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

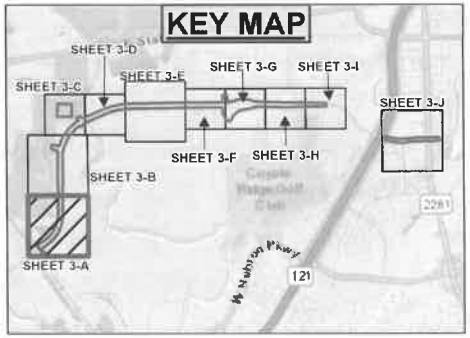
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

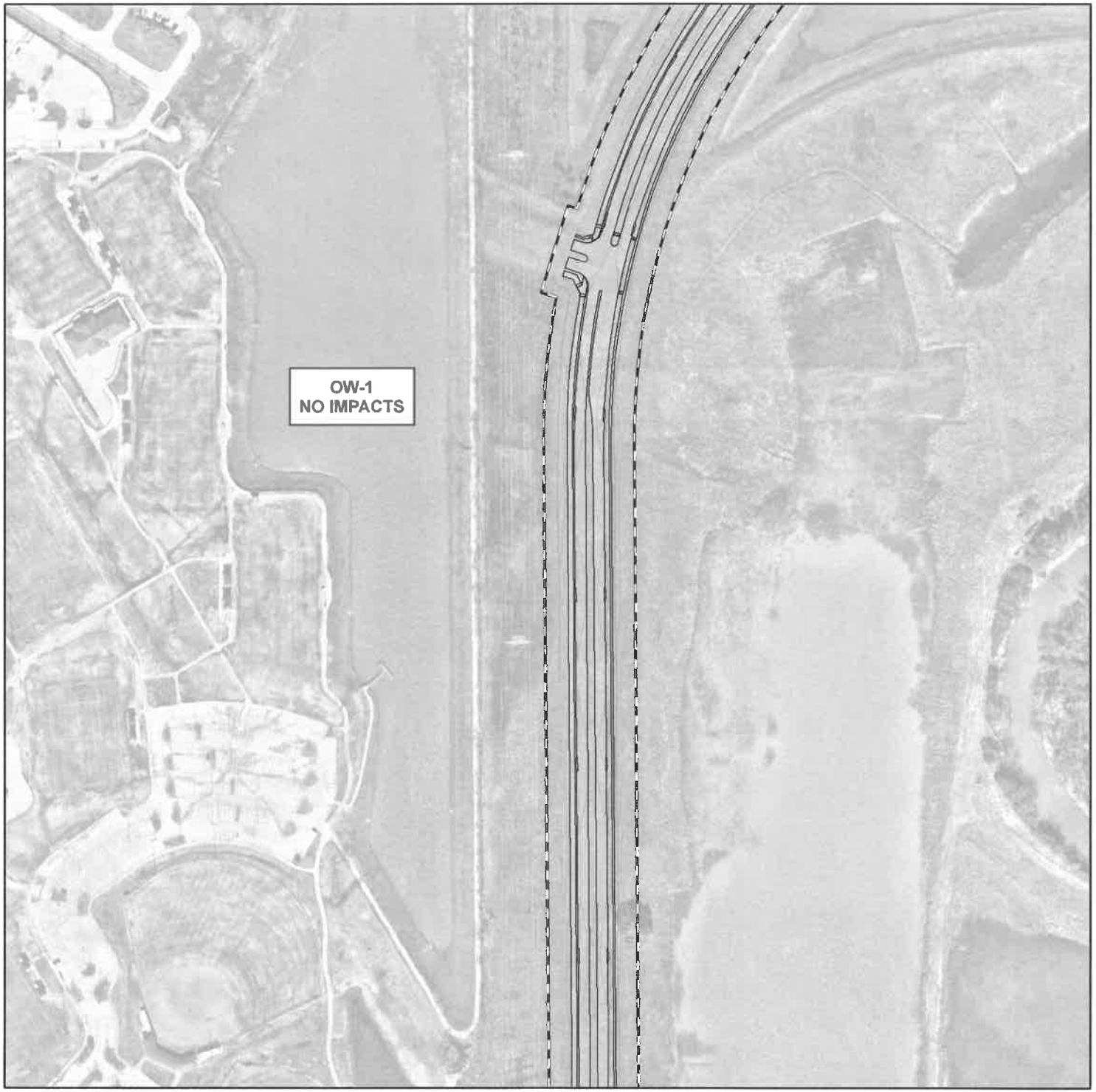
Sheet 3-A

HALFF

October 13, 2020

Exhibit 3 of 12

SWF-2018-00485



N

0 150 300 600

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

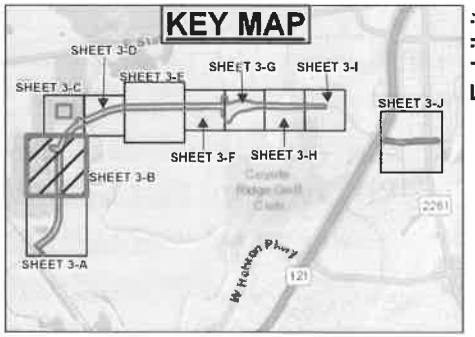
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

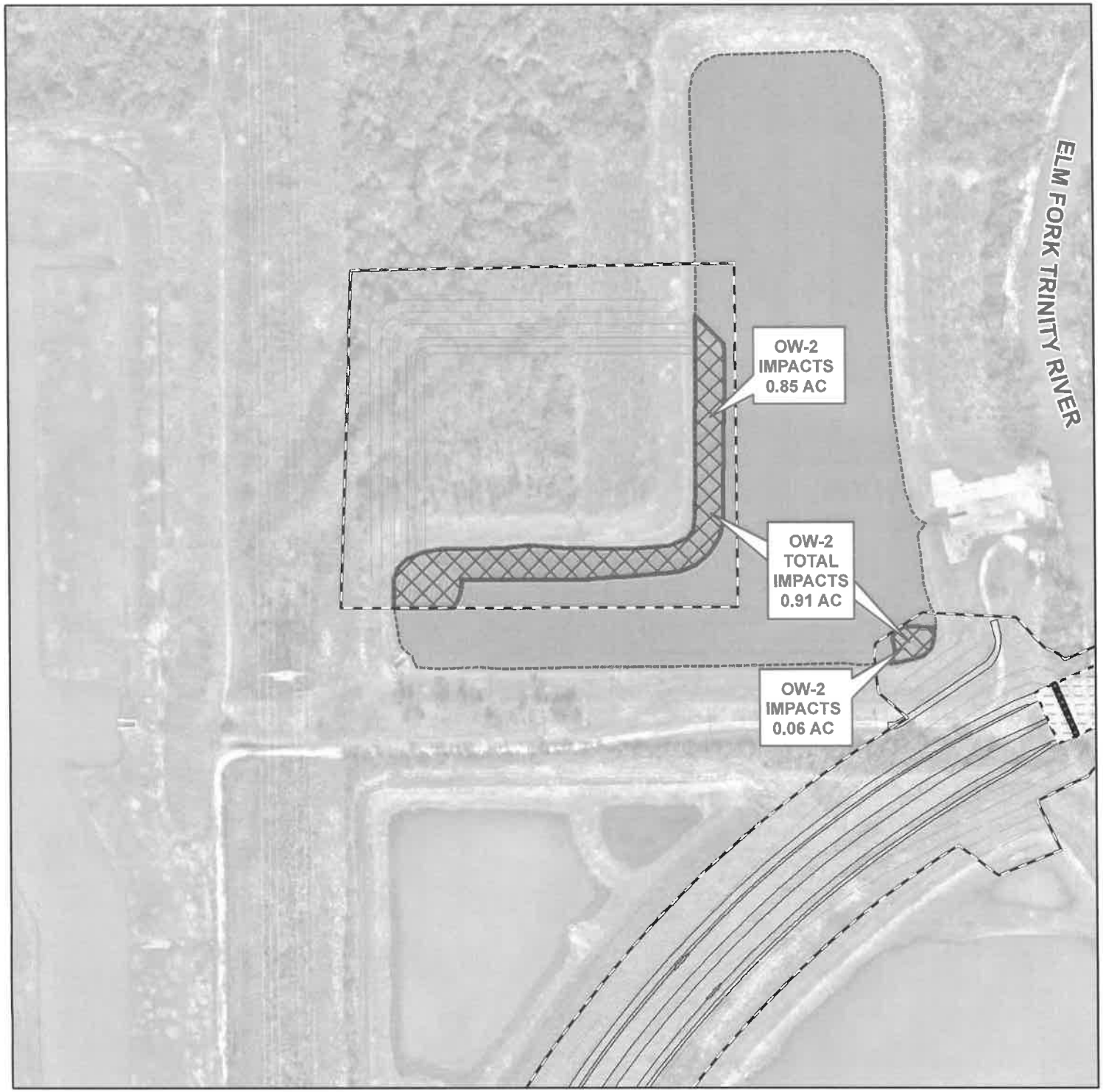
Sheet 3-B

HALFF

October 13, 2020

Exhibit 4 of 12

SWF-2018-00485



N

0 100 200 400

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

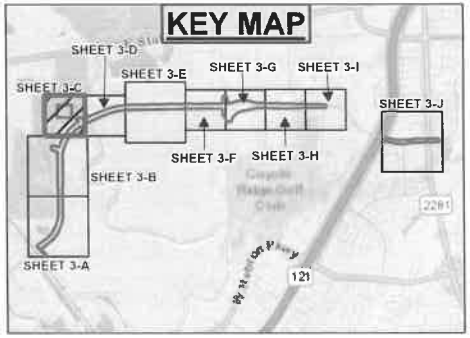
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

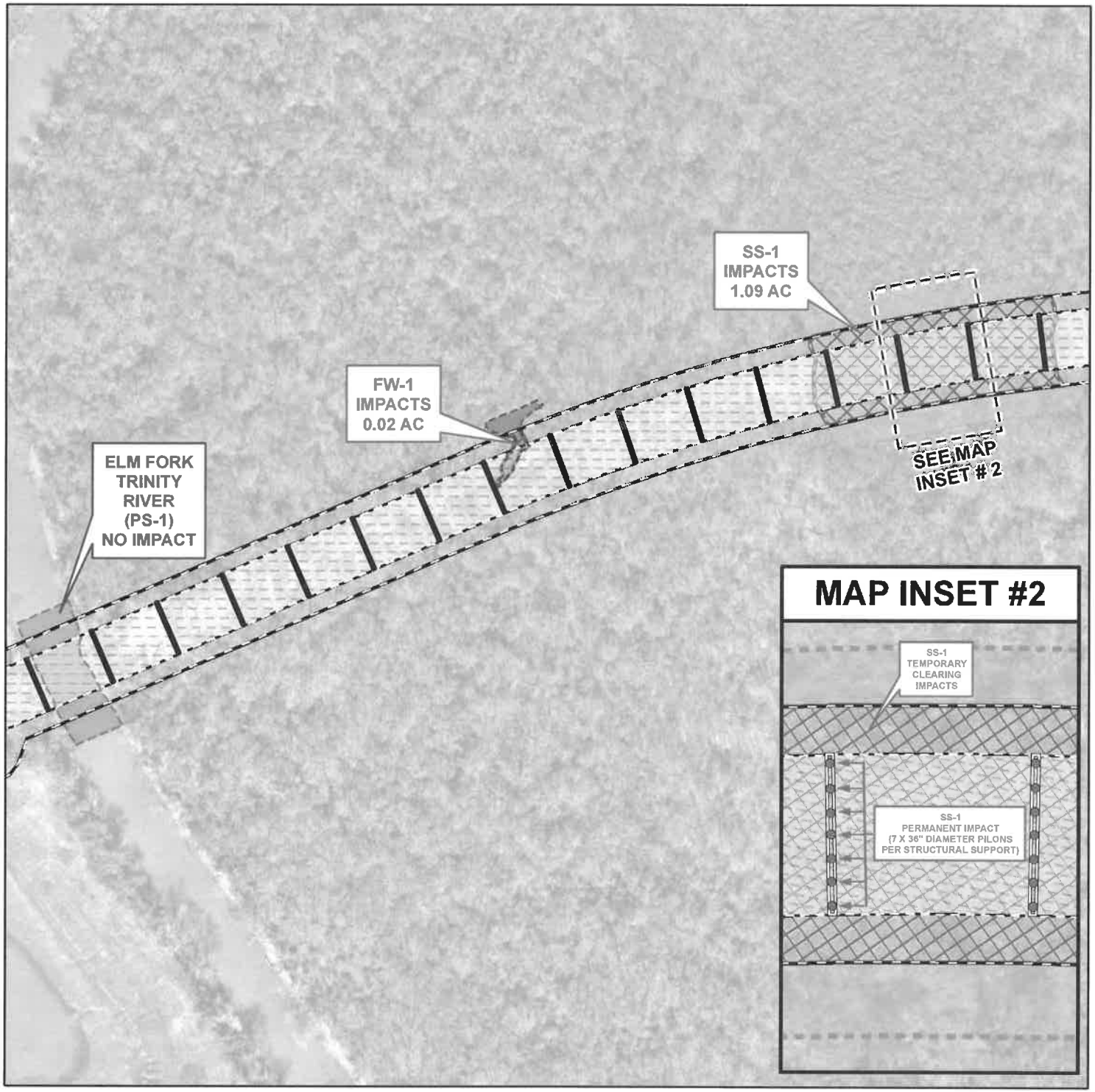
Sheet 3-C

HALFF

October 13, 2020

Exhibit 5 of 12

SWF-2018-00485



MAP INSET #2

N

0 100 200 400

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

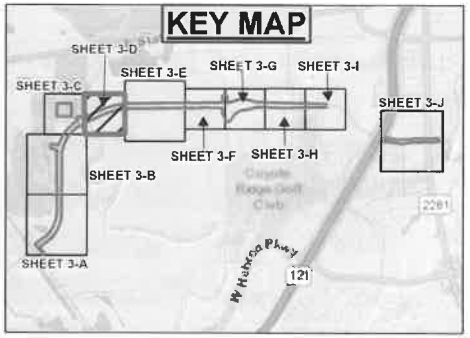
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

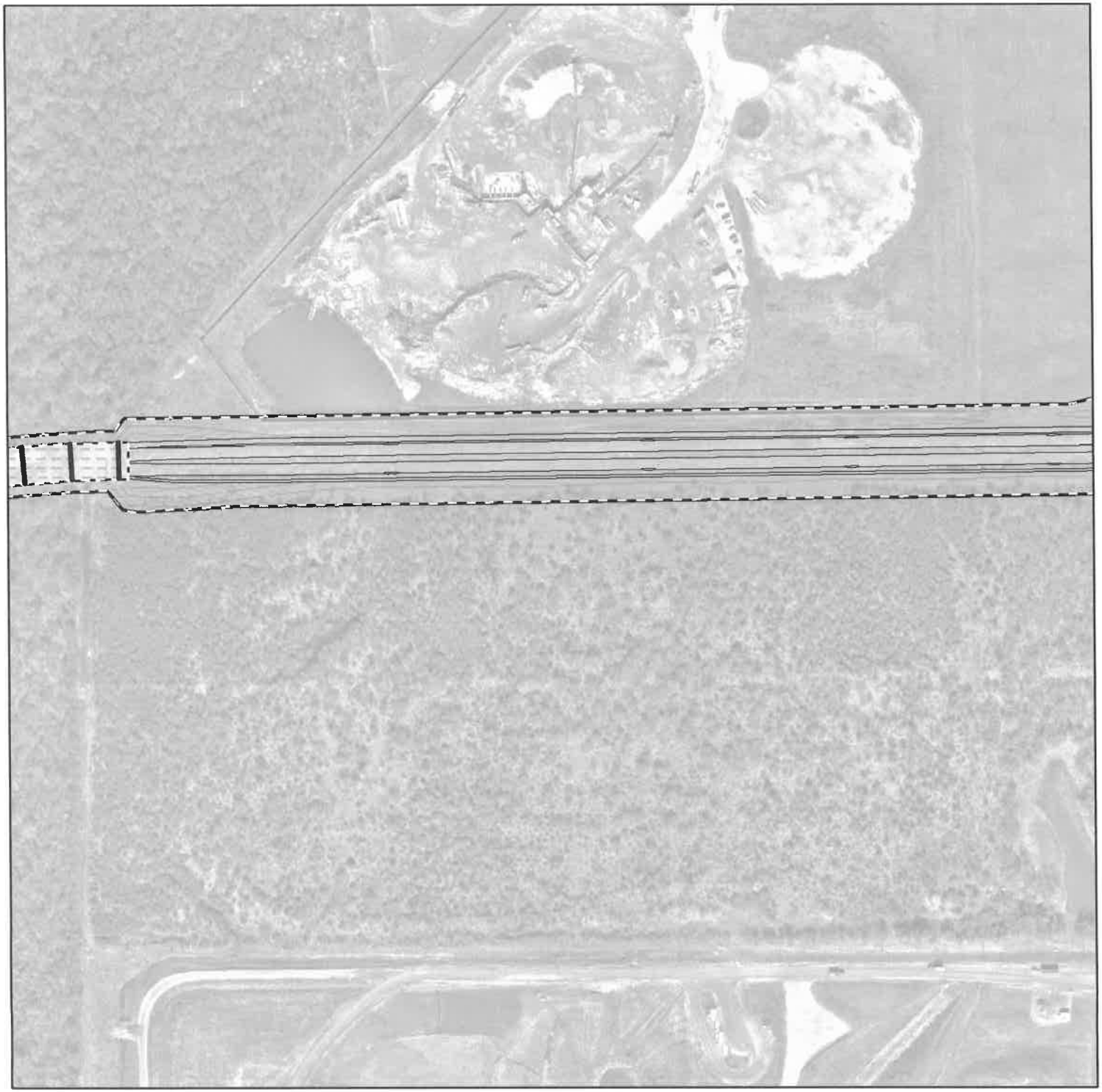
Sheet 3-D

HALFF

October 13, 2020

Exhibit 6 of 12

SWF-2018-00485



N

0 150 300 600

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

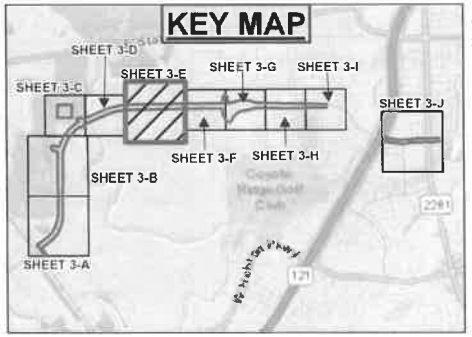
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

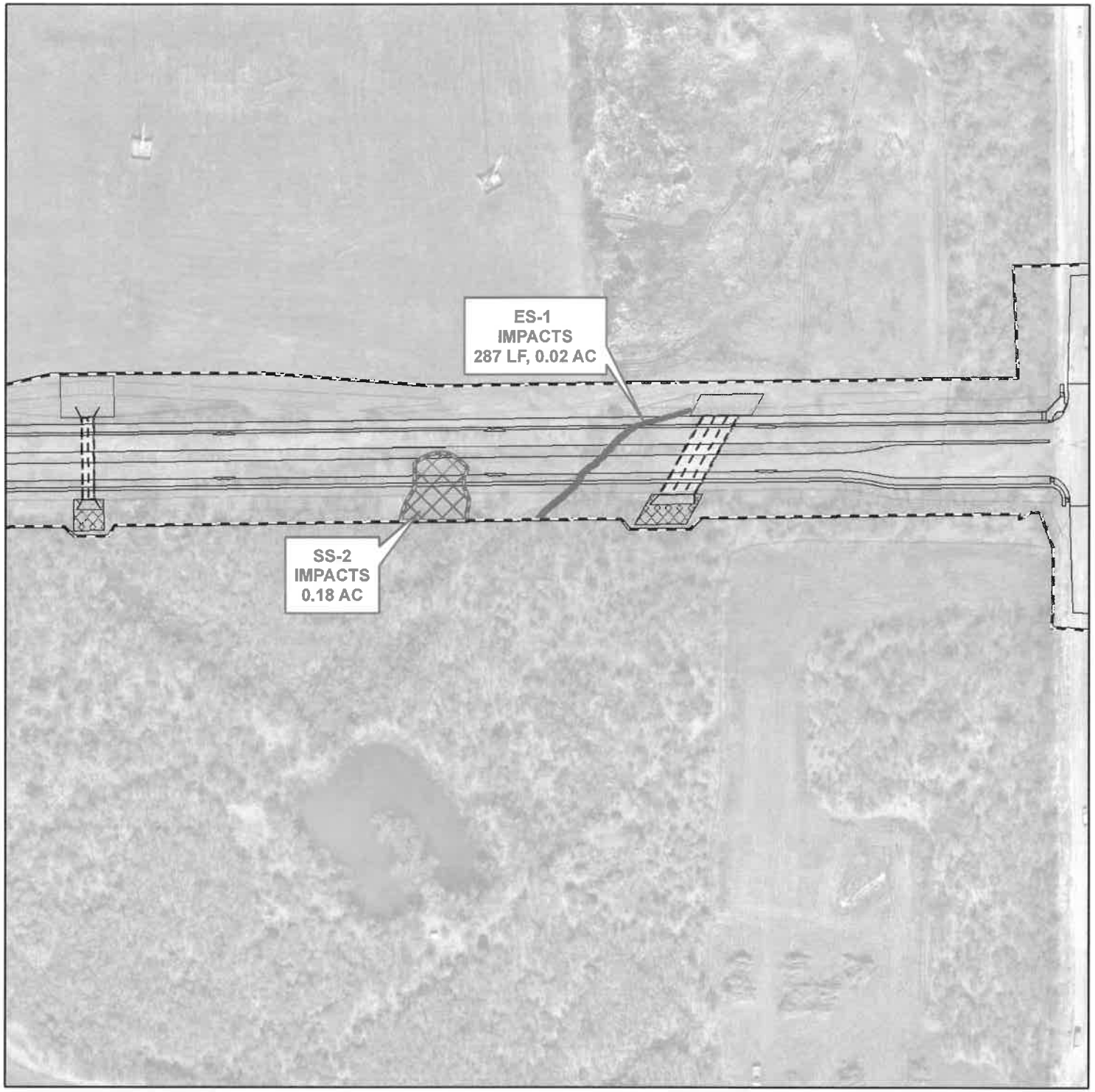
Sheet 3-E

HALFF

October 13, 2020

Exhibit 7 of 12

SWF-2018-00485



N

0 100 200 400

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

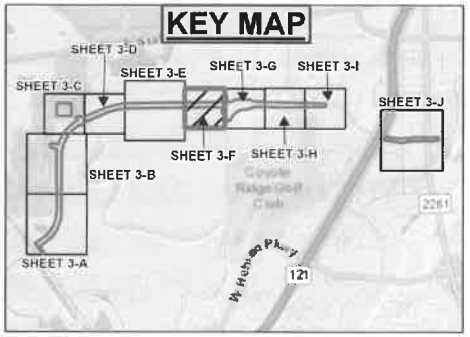
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

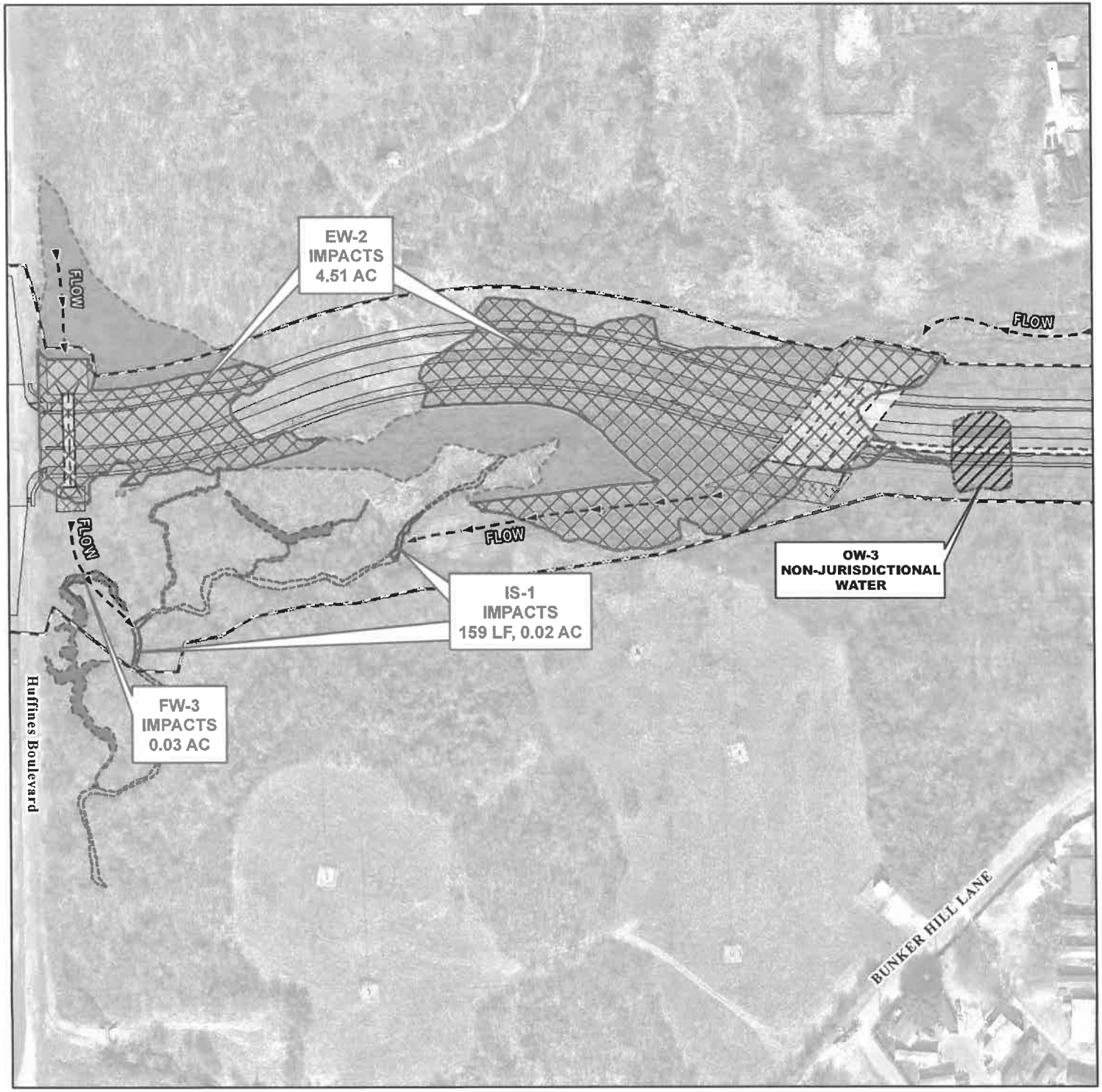
Sheet 3-F

HALFF

October 13, 2020

Exhibit 8 of 12

SWF-2018-00485



N

0 100 200 400

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

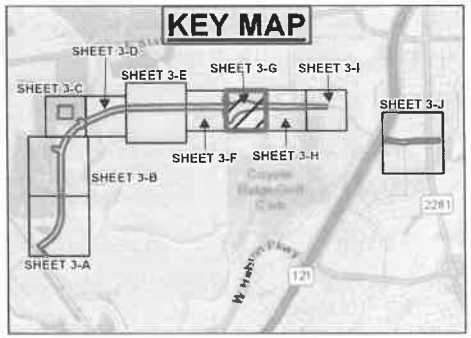
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- INTERMITTENT STREAM (IS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

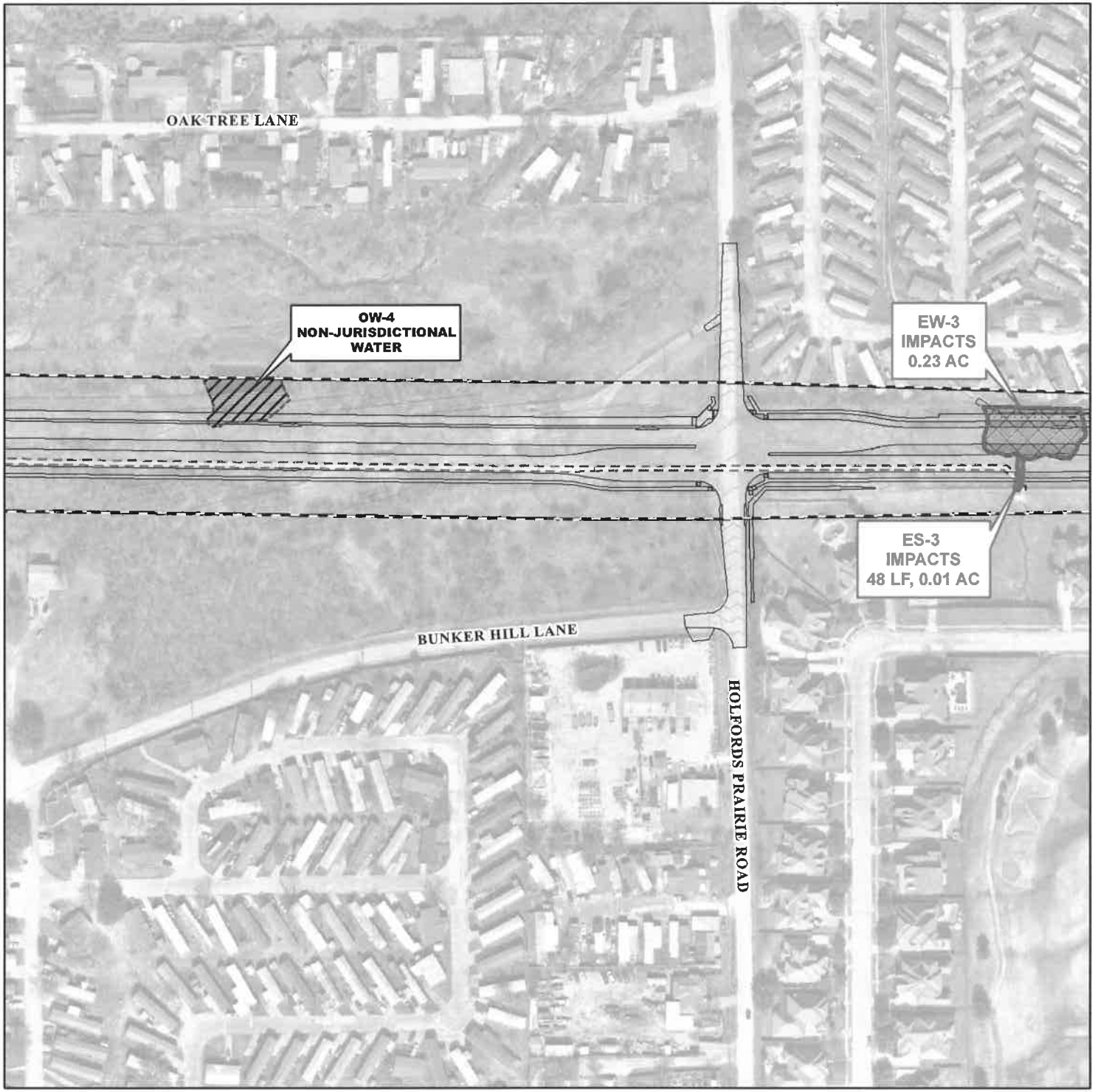
Sheet 3-G

HALFF

October 13, 2020

Exhibit 9 of 12

SWF-2018-00485



N

0 100 200 400

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

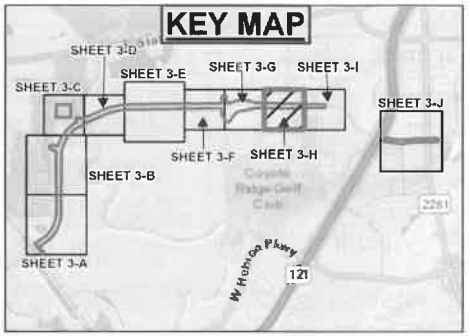
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

Sheet 3-H

HALFF

October 13, 2020

Exhibit 10 of 12

SWF-2018-00485

N

0 100 200 400

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

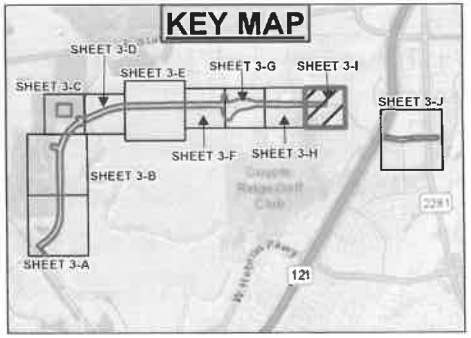
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

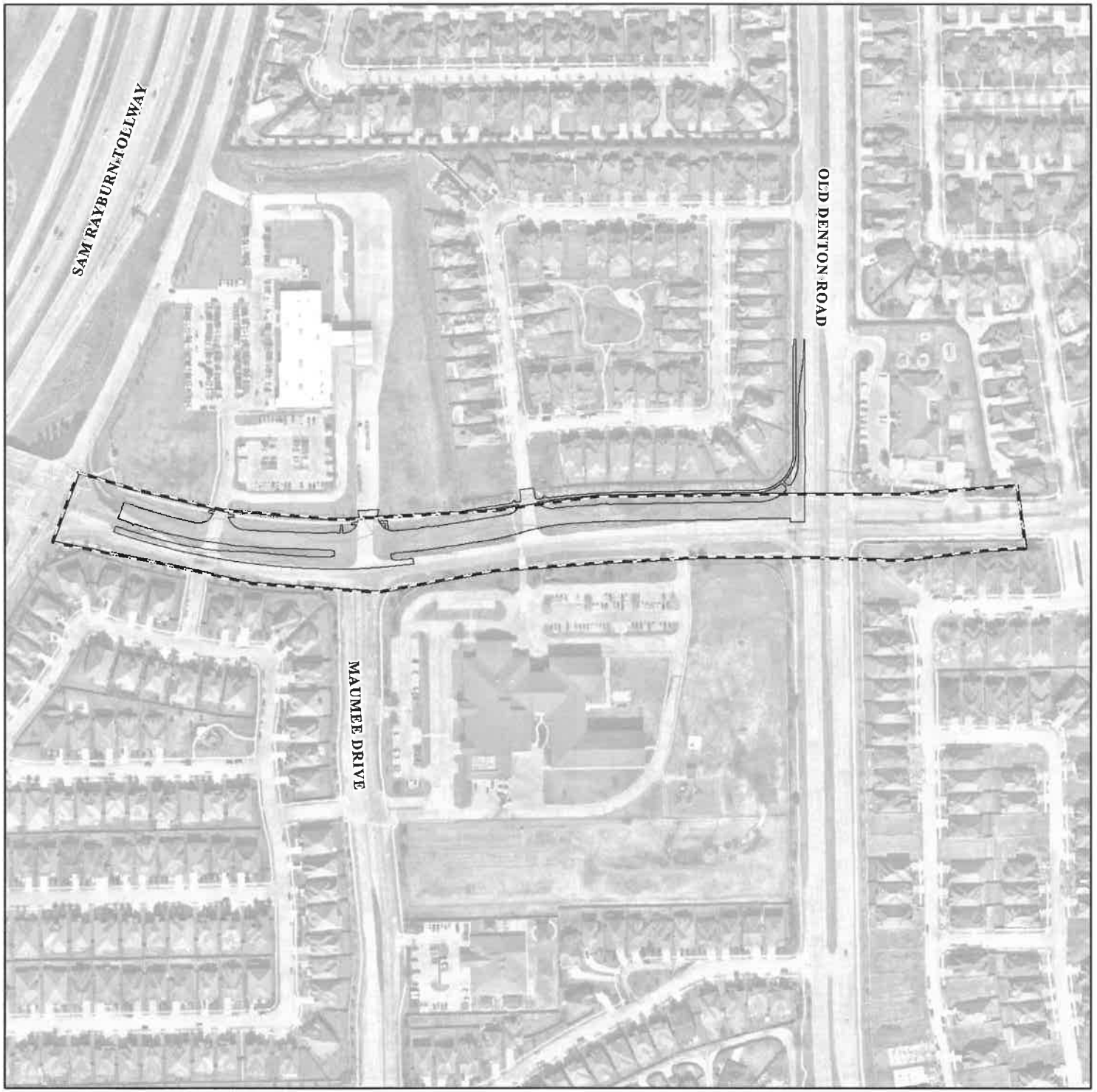
Sheet 3-I

HALFF

October 13, 2020

Exhibit 11 of 12

SWF-2018-00485



N

0 150 300 600

SCALE IN FEET

LEGEND

- PROJECT IMPACTS TO WOUS
- NON-JURISDICTIONAL FEATURE

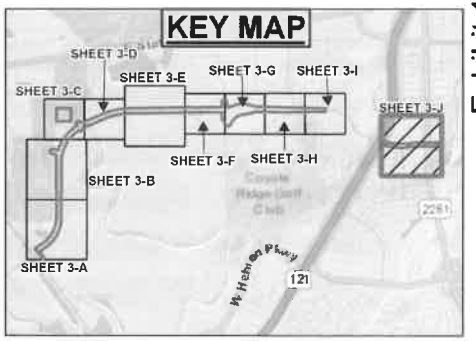
WOUS

- EMERGENT WETLAND (EW)
- FORESTED WETLAND (FW)
- SCRUB/SHRUB WETLAND (SS)
- EPHEMERAL STREAM (ES)
- PERENNIAL STREAM (PS)
- OPEN WATER (OW)

PROJECT DESIGN

- PROJECT LIMITS
- PAVEMENT LIMITS
- BRIDGE LIMITS
- BRIDGE STRUCTURAL MEMBER
- BOX CULVERT
- CONCRETE CULVERT INTAKE/OUTFALL
- ROCK RIP/RAP CULVERT OUTFALL
- GRADING CONTOUR (MINOR)
- GRADING CONTOUR (MINOR)

KEY MAP



Notes:
1. Service Layer Credits: NearMap 2018

Lewisville Corporate Drive Extension

Project Number: SWF-2018-00485

Date: 05/2018 AVO: 30619

Waters of the United States Impacts Map

Sheet 3-J

HALFF

October 13, 2020

Exhibit 12 of 12

SWF-2018-00485

8'

NOT TO SCALE

4'

12"

3"

CORPORATE DRIVE (SEGMENTS 2 & 3) CONSTRUCTION PROJECT NO. G1122 & G1123

3"

3"

6"

1"

CITY COUNCIL
MAYOR: T.J. GILMORE
MAYOR PRO TEM PLACE NO. 2: WILLIAM J. MERIDITH
DEPUTY MAYOR PRO TEM PLACE NO. 6: PATRICK KELLY
COUNCILMEMBER PLACE NO. 1: BOB TROYER
COUNCILMEMBER PLACE NO. 5: KRISTIN GREEN
COUNCILMEMBER PLACE NO. 3: RONNI CADE
COUNCILMEMBER PLACE NO. 4: BRANDON JONES

CONTRACTOR

3"

"YOUR BOND MONEY AT WORK"

PROPOSER'S ACCEPTANCE OF EVALUATION METHODOLOGY

WAIVER OF CLAIMS: EACH PROPOSER BY SUBMISSION OF A RESPONSE TO THIS COMPETITIVE SEALED PROPOSAL ("CSP") WAIVES ANY CLAIMS IT HAS OR MAY HAVE AGAINST THE OWNER, ITS EMPLOYEES, OFFICERS, AGENTS, REPRESENTATIVES, AND THE MEMBERS OF OWNER'S GOVERNING BODY, CONNECTED WITH OR ARISING OUT OF THIS RFP, INCLUDING THE ADMINISTRATION OF THE RFP AND THE RFP EVALUATION. SUBMISSION OF A PROPOSAL INDICATES PROPOSER'S ACCEPTANCE OF THE EVALUATION TECHNIQUE AND PROPOSER'S RECOGNITION THAT SOME SUBJECTIVE JUDGMENTS MUST BE MADE BY THE OWNER DURING THE EVALUATION OF PROPOSALS. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, EACH PROPOSER ACKNOWLEDGES THAT THE BASIS OF SELECTION AND THE EVALUATIONS SHALL BE MADE PUBLIC AFTER THE CONTRACT IS AWARDED AND WAIVES ANY CLAIM IT HAS OR MAY HAVE AGAINST THE ABOVE-NAMED PERSONS, DUE TO INFORMATION CONTAINED IN SUCH EVALUATIONS.

Firm Name: _____ Date: _____

Authorized Signature:

_____

Printed Name:

_____

CITY OF LEWISVILLE
PURCHASING DIVISION

EXCEPTIONS

Bid _____

On the lines below, please list any exceptions taken to this bid invitation

ITEM #	**DESCRIPTION**

Signature: _____

Company: _____

Date: _____

No exceptions taken to this bid invitation.

Signature: _____

Company: _____

Date: _____

CITY OF LEWISVILLE
CSP Corporate Drive Segments 2 & 3
BID NUMBER 24-08-C

ADDENDUM NO. 1
November 3, 2023

The bid documents for CSP Corporate Drive Segments 2 & 3., for which bids are due **Wednesday**, **November 15, 2023 @ 2pm**, is amended as follows:

Clarifications

In the Standard Specifications Section A. 22 Item 108.8 on page SS-11 states that no work will be performed on City holidays or on Sundays. In addition, work hours are from 7:00 am to sunset on weekdays and 8:00 am to 6:00 pm on Saturdays. It also states the inspection overtime rate as $118.80 per hour and a minimum of four (4) hours will be charged for each occurrence of such service.

Standard Specifications Section C Special Specifications Item #36 Storm Water Prevention Pollution Plan (SWPPP) l and m (on page SS-41) have been modified to utilize electronic submittals of the Notice of Intent and Completed SWPPP, see updated Standard Specifications attached.

Bid Table Item #13 Heavy Tree Clearing and Grubbing has been updated, see updated Bid Table in Bonfire.

Questions from Pre-Bid Meeting:

1. Are there minority goals for this project?
   Answer: No.

2. What is the engineers estimate for this project?
   Answer: $47 million.

3. Will the pre-proposal sign-in sheet be provided?
   Answer: See attached.

4. Is there a schedule for this project?
   Answer: See specifications.

Questions from Bonfire:

1. What is the engineer's estimate for this project?
   Answer: $47 million.

2. There are multiple forms listed as required on Bonfire that are not listed in the CSP Specifications (i.e. Vendor Supplemental Information, Qualification Statement, Subcontractor

breakdown). Please confirm these forms are required and if they should be included with the Proposer's Other Required Forms.
Answer: Yes, these forms are required and should be included with the Proposer's other required forms.

3. Bid Item #1-117 6-Foot Sanitary Sewer Manhole has a QTY of 4,527 EA, please confirm the correct QTY.
Answer: The quantity of Bid Item #1-117 "6- Foot Sanitary Sewer Manholes has been corrected to 3, see updated Bid Table in Bonfire.

4. Per City of Lewisville General Notes No. 10, the use of fly ash is not allowed in the concrete mix design, please confirm which type of concrete mixes for which this is a requirement.
Answer: No fly ash shall be allowed in the concrete street pavement mix designs.

5. Profile is missing on Sheet 33 of 328, please provide.
Answer: See revised sheet 33 of 328 attached.

6. CSP Specifications Section 2.1.C.3.e requests "Proof that Contractor has reconstructed a principal arterial roadway in a commercial area successfully within the DFW area." Please confirm this is an applicable experience for this project.
Answer: The following sections have been modified: Section 2.1 table, Section 2.1.C.2 (deleted and everything else moved upwards), Section 2.1.C.2 (new description of similar projects), Section 2.1.C.2.a (new description of work), Section 2.1.C.2.b (new description of requested information), Sections 2.1.C.2 c – e, (requested information moved positions), Section 2.1.C.2.f (modified this description), Section 2.1.C.3 (moved upwards). Also added additional clarifications to items under Section 2.1.D.1 & .2., see updated CSP Specifications attached.

7. Please confirm the QTY for bid Items #1-41, #1-42, and #1-43. It appears the QTY for 24-Inch Drill Shaft should be 657LF, 42-Inch Drill Shaft should be 1,088LF and 36-Inch Drill Shaft should be 13,356 LF.
Answer: The size and quantities are now placed in increasing order of drill shaft size with the correct linear feet associated with that drill shaft size as stated above, see updated Bid Table in Bonfire.

8. CSP Specification Section 3.11 requires the proposals to be firm for 120 days after the opening date and Instructions to Bidders requires the bids to be held firm for 90 days. Please confirm the days bids/proposals are the be held firm.
Answer: The CSP Specification Section 3.11 has been modified from 120 days to 90 days, see attached.

9. Sediment Control Fence is not shown to be installed east of STA 85+75. Please confirm if Sediment Control Fence is necessary for work activities including clearing, waterline installation, and Flexbase access within these limits.
Answer: Sediment Control Fence and other erosion control measures will be required for the area east of STA 85+75. Please see revised Sheets 254-261 of 328 attached for minimum erosion control BMPs for this area.

10. Per General Notes No. 13 and Special Specifications C.34 no onsite materials shall be used as topsoil. Per NCTCOG Item 204 excavated material which is suitable for topsoil shall be used before any topsoil is obtained from a borrow source. Please confirm the requirement for the project.
    Answer: Onsite material may be utilized for topsoil provided it meets the physical requirements of Special Specifications C.34.

11. Paving Details Sheet 1 of 8, includes plan of pavement joints. The plan calls for a contraction joint spaced at 40' max, however, there is no detail provided for this type of joint. Could you provide the contraction joint detail?
    Answer: See revised Sheet 264 of 328 attached.

12. Typical Sections on Sheet 9 of 328 call for the 10" Reinforced Concrete Pavement to be 3,500 PSI @ 28 days. However, the project standard specifications, under special specification #35 state: "Concrete Paving streets, alleys and driveways shall have a minimum compressive strength of 4,000 PSI at 28 days, except at intersection and areas requiring hand finishing, where a minimum compressive strength of 4,500 psi is required. Please confirm the strength of concrete to be used for the 10" Reinforced Concrete Pavement.
    Answer: Concrete Paving for streets, alleys and driveways shall have a minimum compressive strength of 3,500 PSI at 28 days, except at intersection and areas requiring hand finishing, where a minimum compressive strength of 3,750 psi is required.

13. Project standard specifications, special specification #35 states: "Maximum joint spacing shall be 15 feet" However, the NCTCOG specs standard drawing 2060 state "Sawed transverse contraction joint shall be spaced 20' in pavement > 8" thick. Please clarify the joint maximum spacing for this project.
    Answer: Maximum joint spacing shall be 20 feet. See revised Sheet 264 of 328 attached.

14. Sheet 9 & 10 - Typical section says concrete is 3500 psi however the special specifications on sheet SS-39 says should me minimum of 4000 psi for machine and 4500 psi for hand placement. Please verify and confirm the requirements.
    Answer: See response to question #12 above.

15. Please provide the engineer's estimate for the job.
    Answer: See response to question #1 above.

16. Please provide the time determination schedule for the job.
    Answer: 915 Calendar days, this is stated in the draft Construction Agreement Section 2.

17. Bid form item # 1-117 shows 4,527 each of 6-Foot Sanitary Sewer Manhole - Please clarify the bid quantity and unit.
    Answer: See response to question #3 above.

18. Will the question deadline be pushed? Due to the question deadline being today and several bridge companies are looking a TxDot projects this week, it does not allow time for questions to be asked that will be generated over the next week. If the question deadline is not pushed, we will not be interested in bidding this project with a lot of unknowns.
    Answer: No, the questions deadline will not be extended.

19. Item 416 Drill shaft (24 In) bid form qty of 13356 LF is incorrect based on the plans please advise?
Answer: This has been corrected, see response to question #7 above.

20. Item 416 Drill shaft (36 In) bid form qty of 1088 LF is incorrect based on the plans please advise?
Answer: This has been corrected, see response to question #7 above.

21. Item 416 Drill shaft (42 In) bid form qty of 657 LF is incorrect based on the plans please advise?
Answer: This has been corrected, see response to question #7 above.

22. Please add a pay item for the Bridge Approach slabs as shown on the plans.
Answer: This has been corrected, see item #47 in the updated Bid Table in Bonfire.

23. Please add a pay item for the Class S conc Medians as shown on the plans.
Answer: This has been corrected, see item #48 in the updated Bid Table in Bonfire.

24. TX Dot no longer uses Concrete Surf Treatment (CL II) on Bridge Decks Please remove.
Answer: Former Item #52 CONC SURF TREAT (CL II) has been removed and replaced with another item. See updated Bid Table in Bonfire.

25. Item 420 Class C Conc (Abut)(HPC) bid form qty is incorrect based on the information shown on the plans please advise?
Answer: The total quantity for Item #44 CL C CONC (ABUT) (HPC) should be 211.0 CY. This includes 115.1 CY for the Channel Bridge and 95.9 CY for the Trinity Bridge. See updated Bid Table in Bonfire.

26. Please add a pay item for the Cem Stab Backfill at the bridge abutments.
Answer: The plans do not propose the use of any cement stabilized backfill at the bridge abutments. This item is not needed.

27. Sheet 65 of 328 Note 4 Test Piers, Please indicate the number and location the Test Piers and the specification for the requirements for the type of tests required, also please add a pay item for this work.
Answer: Two 36” DIA x 85 LF deep test piers will be required for the project. One test pier will be located at STA 16+80.00, 60.00’ LT. The second test pier will be located at STA 60+50.00, 50.00’ RT. The total quantity for Item 416 DRILL SHAFT (36 IN) is increased by 170 LF to account for these test piers. See updated Bid Table in Bonfire.

28. Please add a pay item for the BS EJCP shown on the bridge Layout sheets.
Answer: A pay for Item 442 Structural Steel (Misc Non-Bridge) with a total quantity of 3,040 LB for BS-EJCP on both bridges has been added see new item #52, in the updated Bid Table in Bonfire.

29. I wanted to point out that the bid bond form that was prefilled has a project name of "Corporate Drive Drive Segments 2 & 3"; have additional Drive in there. We do not like to amend owner forms without permission - Would you please revise the bid bond form and upload on the site?
Answer: The change has been made. See revised document in Bonfire.

30. The allotted time to develop a quality proposal and pricing component on a $47M project is inadequate.
Will the City of Lewisville consider extending the questions and bid due date?
Answer: The City of Lewisville cannot extend the bid date as the project has to be awarded in December.

31. What are the requirements for Concrete surface finish on all elements of the bridge Structure?
Answer: Finish concrete structures as noted in Surface Area I per Item 427 Surface Finishes for Concrete with an opaque sealer of a color or colors approved by the City. Ensure that surfaces are free of weak surface material, curing compounds, and other surface contaminants prior to coating.

32. Item 420 Class S Concrete (COL) (HPC) is this correct or should the item be Class C concrete?
Answer: Concrete for columns should be Class C. Item #46 description has been updated to CL C CONC (COL)(HPC) in the updated Bid Table in Bonfire

33. Will you provided a description for Item #2-1 Added Cost for Delayed Start by City with a quantity of 3 Months? What all does this item intel?
Answer: The intent of this item is to allow a little additional time for the City of Lewisville to complete the process of obtaining the access easement from the City of Farmers Branch as they own the driveway on Huffines Blvd. south of Stonewall Drive. This potentially means a delay to the start of the whole project or at least access into the project on the east side of up to three months.

34. There does not appear to be a Bid item for Bridge Approach Slabs. Can you please confirm if this should be added?
Answer: This has been corrected, see response to question #22 above.

35. There does not appear to be a Bid item for Bridge Raised Median. Can you please confirm if this should be added?
Answer: This has been corrected, see response to question #23 above.

36. Bid Item #1-69 Wingwall For 4 Feet By 3 Feet RCB (SET-TY 1) Unit is LF, should this be EA?
Answer: This has been corrected, see item #69 in the updated Bid Table in Bonfire.

37. Please provide Light Pole and Luminaire details for both the street and bridge.
Answer: See attached revised Sheet 287 of 328 for light pole, luminaire, and foundation details. The same style light pole shall be used for the street and bridge.

38. Will Waste Management for Texas allow a Batch Plant on their property?
Answer: The City did not negotiate for the placement of a batch plant to be located on any of the easements. This does not stop the contractor from negotiating this right with them.

39. Sediment Control Fence is not shown to be installed for the Offsite Mitigation. Please confirm if Sediment Control Fence is necessary for work activities including clearing and excavation within this area?
Answer: Yes, Sediment Control Fence will be necessary for the Offsite Mitigation area. See attached revised Sheet 263 of 328.

40. Bid Item #1-47 Irrigation System Mod and Repair. Please provide location and details for the 354.2 CY. We are not sure what we are building in this item.
Answer: Bid Item #47 was mislabeled as Irrigation System Mod and Repair, see the corrected bid item #47 in the corrected bid table in Bonfire.

41. Bid Item #1-47 Irrigation System Mod and Repair. Please provide location and details for the 354.2 CY. We are not sure what we are building in this item.
Answer: This has been corrected, see response to question #40 above.

42. Sheet 44 section A-A and Section B-B call for 3' Thick Flexbase Pad under the wall. Table on Sheet 274 call for 4' ground improvements. Please clarify which is correct.
Answer: The Flexbase Pad under the MSE wall shall be 4’ thick. See attached revised Sheet 44 of 328.

43. Please confirm the Flexbase Pad under the wall is subsidiary to the MSE Wall Item.
Answer: Yes, Flexbase Pad under the wall is subsidiary to the MSE Wall Item. See attached revised Sheet 44 of 328.

44. Document "24-08-C Corporate Drive Segments 2 3 (BT-12AG)" has Bid Item number #1-117 " 6-Foot Sanitary Sewer Manhole" at a quantity of 4,527 Each. Please confirm this quantity is correct and provide revised bidform if this quantity is incorrect.
Answer: This has been corrected, see response to question #3 above.

45. On "14-16- Corporate Drive Seg 2-3 Plans 2023-10-13- 11X17" Sheet 14 of 328 the Right-of-way map states "Future ROW dedication by separate plat" at the bridge section. When does Lewisville plan on having the ROW for this section of the project?
Answer: The City of Lewisville owns the ROW for Corporate and has already had it dedicated by a separate plat. Therefore, it is currently available for construction.

46. Can the C402 Rail rebar be drill/epoxied in the bridge decks?
Answer: We are recommending the C402 rails be connected to the bridge deck using rebar cast into the deck. The Contractor may consider using drilled and epoxied dowels to connect the rails to the deck using guidance from TxDOT Retrofit Guide for Concrete Rails C-RAIL-R, but any details and calculations will need to meet the requirements of Note 2 on Sheet 2 of 4 from the Guide mentioned above. Final approval for this modification will require City approval.

47. SPLIT-AWARD: Bidders may furnish pricing for all or any portion of the bid invitation. Unless the bidder specifies otherwise in his bid, the City may award the contract for any item or group of items shown on the bid invitation. Is it the City's intention to award to multiple GCs (I.E. Bridge GC, Grading GC, Paving GC, Etc)?

Answer: The City of Lewisville's intention with this CSP is to award the whole project to one contractor based on items stated in the Bid Table in Bonfire. The instructions to bidders document is a general document that provides information regarding all types of bidding and other information that may not have been provided elsewhere.

48. Page 1 of 6, "BID" mentions multiple bids may be made to indicate price break quantities, but page 2 of 6, PRICING states "Bids should be firm". These contradict each other. Will the City allow multiple bids from a Contractor?
Answer: The City of Lewisville's intention with this CSP is to award the whole project to one contractor based on items stated in the Bid Table in Bonfire. The instructions to bidders document is a general document that provides information regarding all types of bidding and other information that may not have been provided elsewhere.

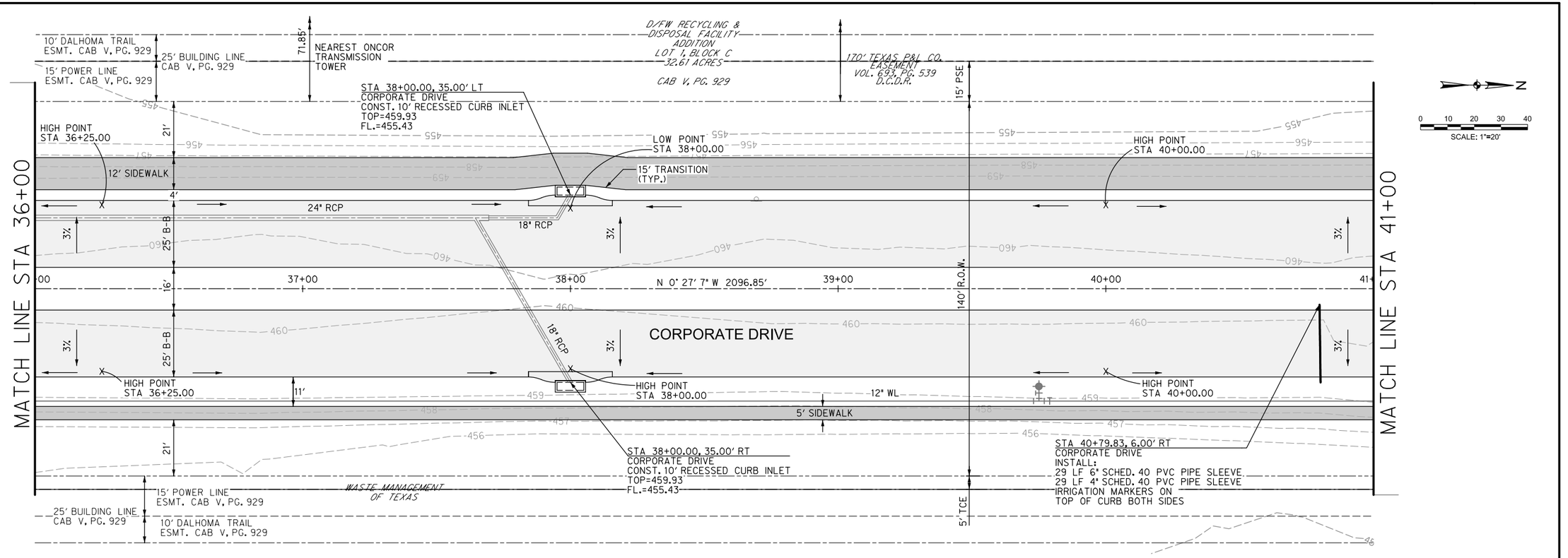
49. 2.1 (page 3 of 12) lists evaluating criteria and weighting factors. Please define how the points will be allocated to the 2nd low bidder, 3rd low bidder, etc.
Answer: The lowest price receives the highest score per allocated points. The 2nd lowest price receives the 2nd highest score and so forth.

50. Section 3.13 A., (page 8 of 12), describes tabs, page size, minimum font. Are there page limits for any sections? Please provide allowable page count for each category.
Answer: The CSP instructions have been updated to include **relevant** information and projects of at least 3 and no more than 5, see Section 2.1.C and Section 2.1.D. The City's intent is to not restrict the number of pages, but for the contractors to include the requested information regarding past projects and proposed project personnel. For example, if key person's resume is one page or 3 pages both items will work, but do not include staff that is not directly involved.

51. 2.1.G. Owner-Contractor Agreement & General Conditions. It appears that the Agreement is document 8-13 - Construction Agreement - Corp. Which document is the General Conditions? If not provided, please provide.
Answer: The term general conditions has been removed from the Competitive Sealed Proposal document which has been updated see attached.

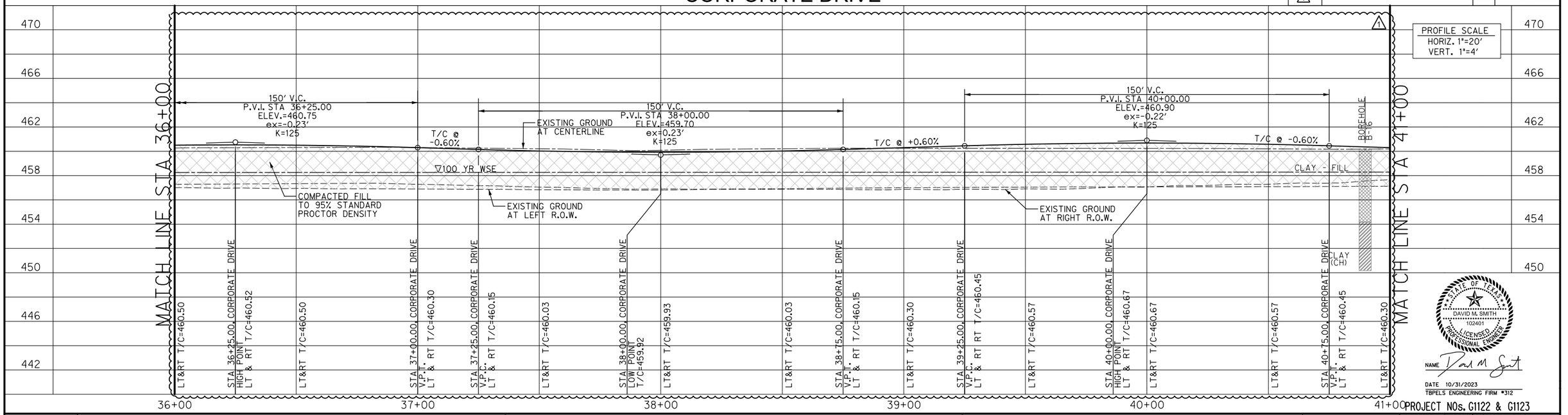
52. Will galvanized steel soil reinforcements be allowed for the MSE retaining wall?
Answer: Galvanized or epoxy coated steel components shall be used for the MSE retaining wall in accordance with TxDOT Item 423.

Bidders are advised to acknowledge receipt of Addendum No. 1 by filling in the appropriate blanks contained in the Proposal and the outer envelope of their bid.



CORPORATE DRIVE

NO.	REVISION	BY	DATE
1	ADDED PROFILE	DMS	10/31/2023



STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M. Smith

DATE 10/31/2023

TBPELS ENGINEERING FIRM #312

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots, Broad Wings, Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE
PROJECT TITLE

CORPORATE DRIVE
PAVING PLAN AND PROFILE
STA 36+00 TO STA 41+00
SHEET TITLE

halff
TBPELS ENGINEERING FIRM #312

OCTOBER 2023
DATE

SHEET 33 OF 328

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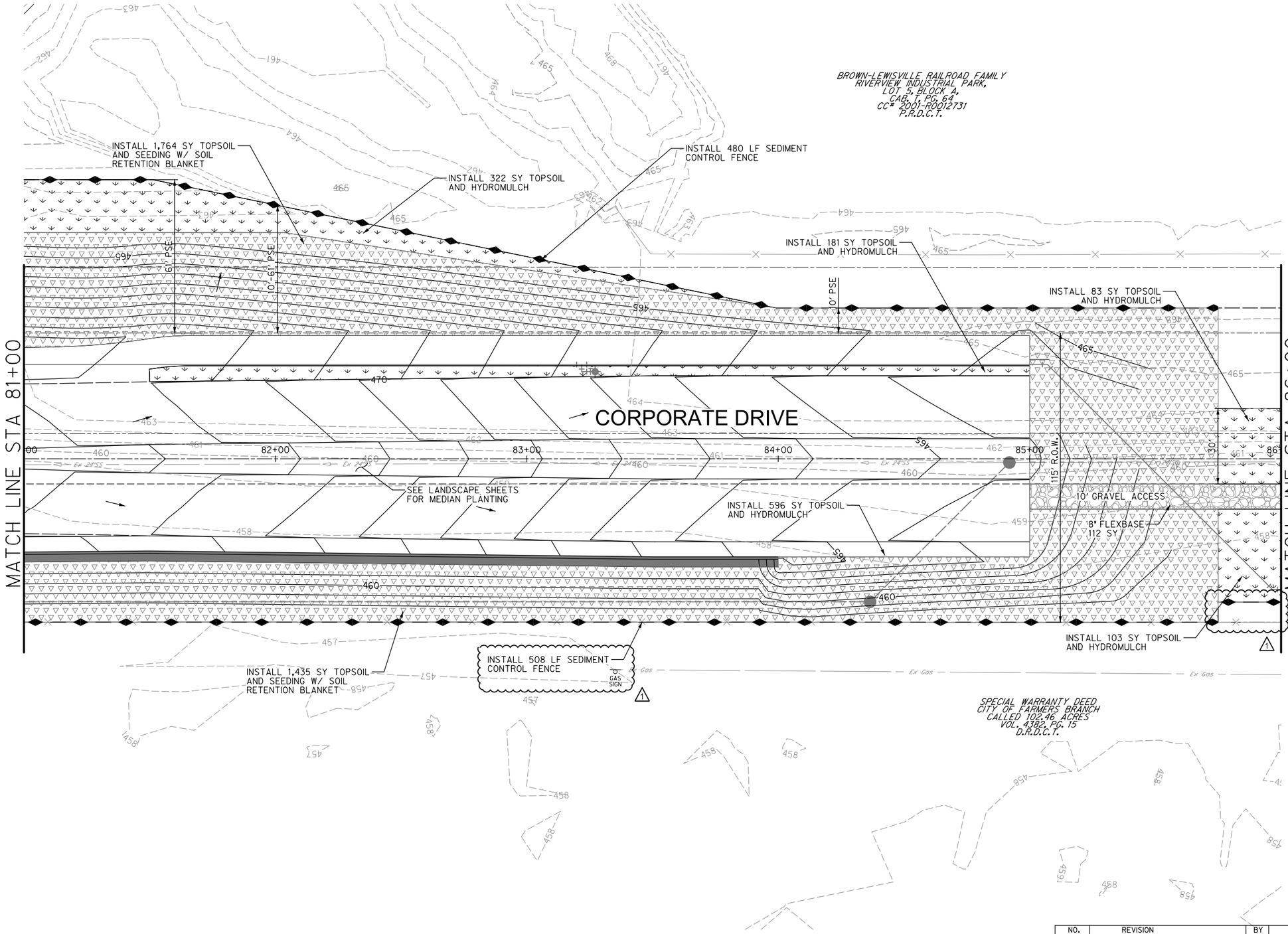

NO.	REVISION	BY	DATE
1	ADDED S.C.F.	DMS	10/31/2023

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M Smith

DATE 10/31/2023

TBPELS ENGINEERING FIRM #312

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots, Broad Wings, Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

PROJECT TITLE: CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE

SHEET TITLE: EROSION CONTROL PLAN
STA 81+00 TO STA 86+00

halff
TBPELS ENGINEERING FIRM #312

DATE: OCTOBER 2023

SHEET 254 OF 328

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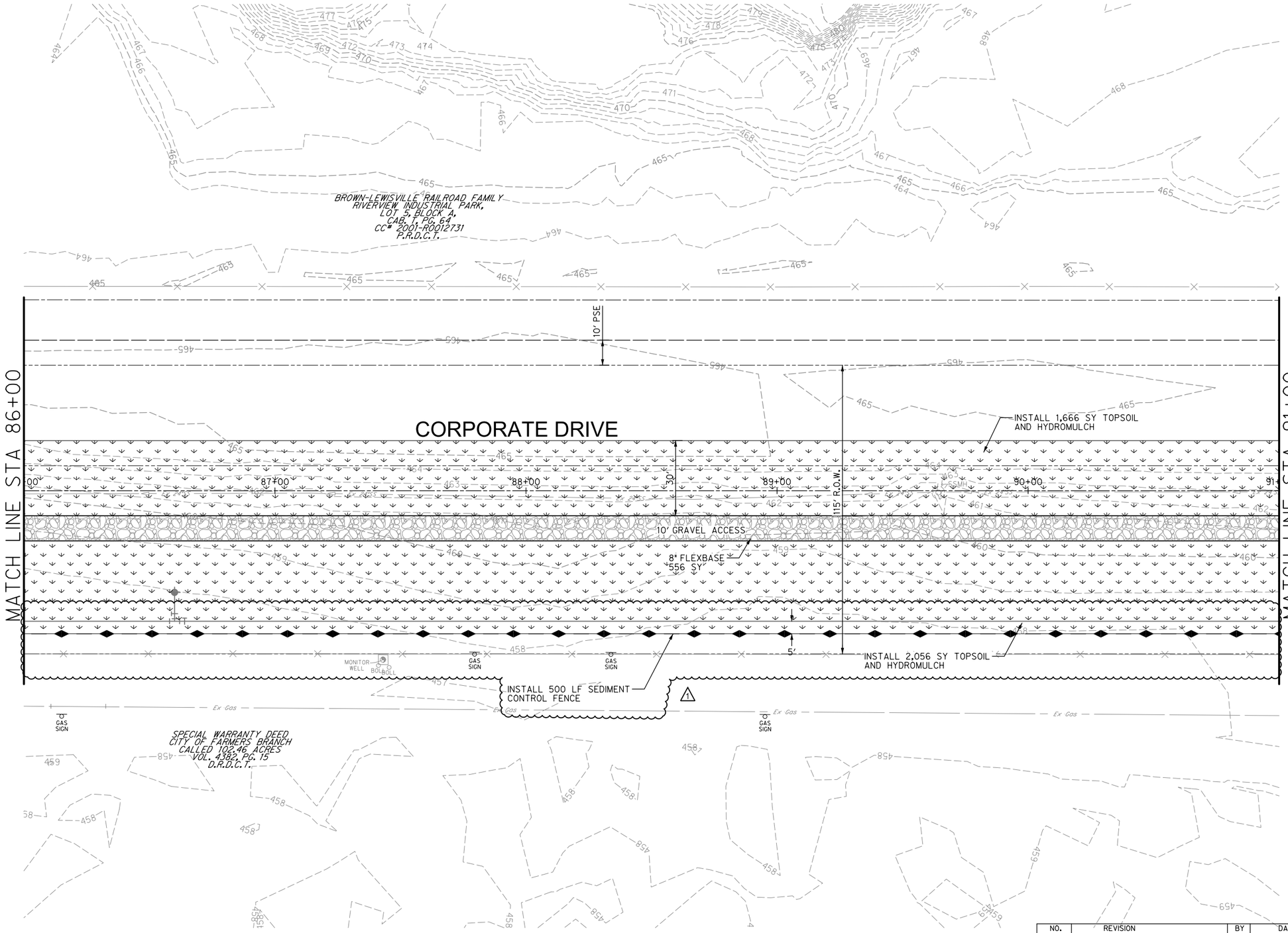

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0 10 20 30 40
SCALE: 1"=20'

LEGEND

- INLET PROTECTION
- TOPSOIL AND HYDROMULCH
- TOPSOIL AND SEEDING W/ SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM

NO.	REVISION	BY	DATE
1	ADDED S.C.F.	DMS	10/31/2023

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M Smith

DATE 10/31/2023
TBPELS ENGINEERING FIRM #312

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

PROJECT TITLE
CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE

SHEET TITLE
EROSION CONTROL PLAN
STA 86+00 TO STA 91+00

halff
TBPELS ENGINEERING FIRM #312

DATE
OCTOBER
2023

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255
OF
328

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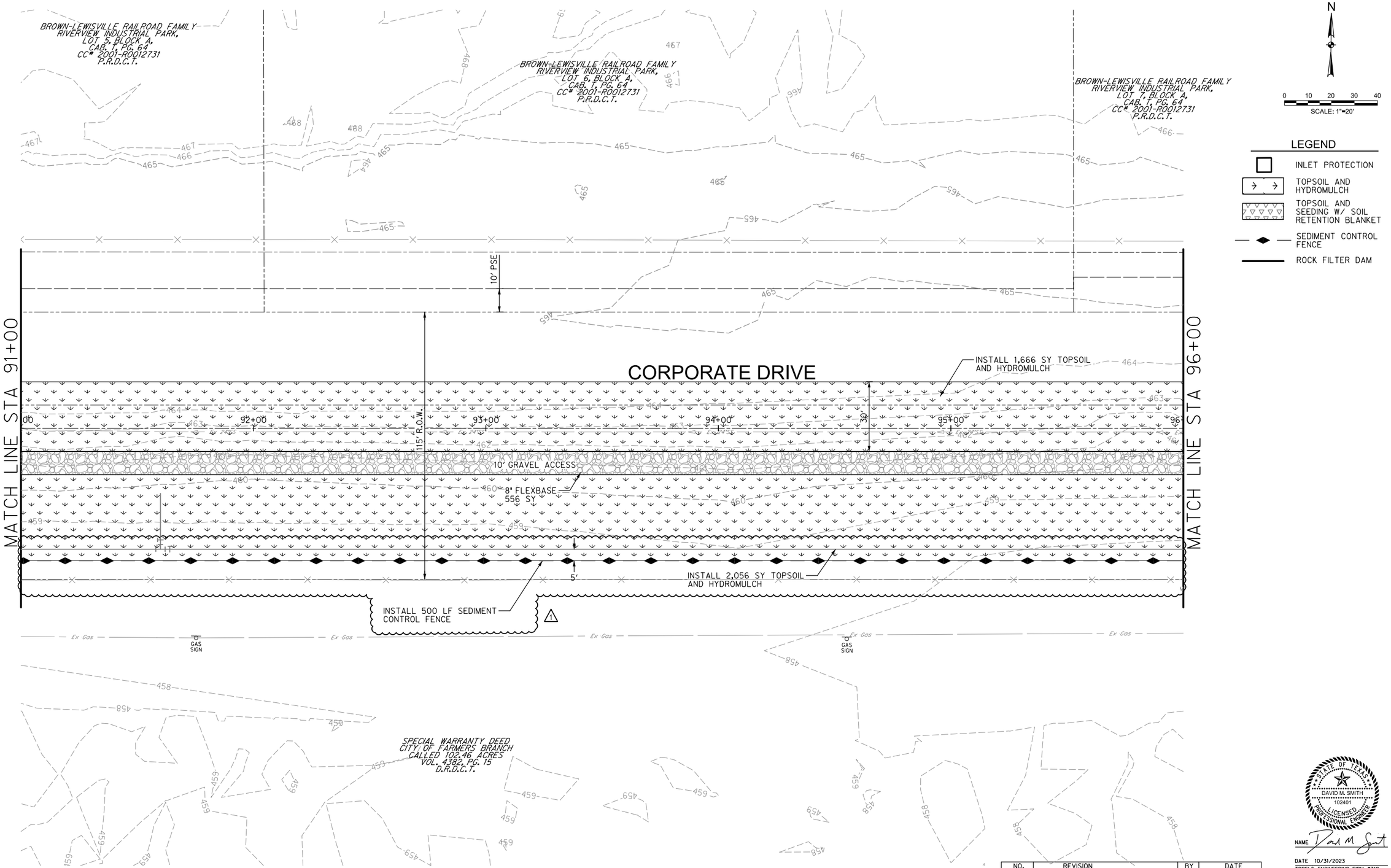

NO.	REVISION	BY	DATE
1	ADDED S.C.F.	DMS	10/31/2023

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M. Smith

DATE 10/31/2023

TBPELS ENGINEERING FIRM #312

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots, Broad Wings, Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

PROJECT TITLE
CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE

SHEET TITLE
EROSION CONTROL PLAN
STA 91+00 TO STA 96+00

halff
TBPELS ENGINEERING FIRM #312

DATE
OCTOBER
2023

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OF
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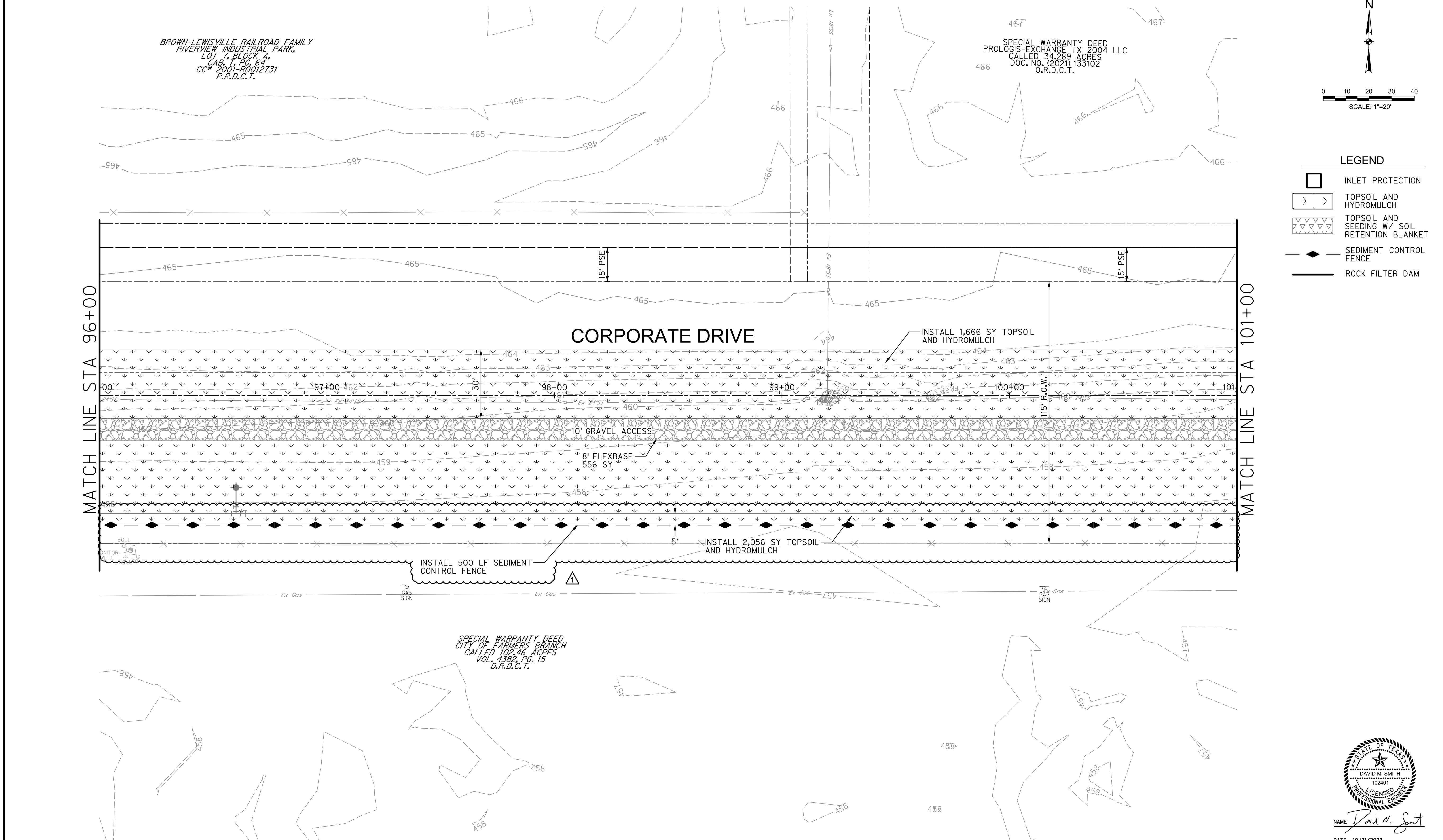

BROWN-LEWISVILLE RAILROAD FAMILY
RIVERVIEW INDUSTRIAL PARK,
LOT 7, BLOCK A,
CAB. T, PG. 64
CC# 2001-R0012731
P.R.D.C.T.
SPECIAL WARRANTY DEED
PROLOGIS-EXCHANGE TX 2004 LLC
CALLED 34.289 ACRES
DOC. NO. (2021) 133102
O.R.D.C.T.
N
0 10 20 30 40
SCALE: 1"=20'
LEGEND
INLET PROTECTION
TOPSOIL AND HYDROMULCH
TOPSOIL AND SEEDING W/ SOIL RETENTION BLANKET
SEDIMENT CONTROL FENCE
ROCK FILTER DAM
15' PSE
CORPORATE DRIVE
INSTALL 1,666 SY TOPSOIL AND HYDROMULCH
97+00
98+00
99+00
100+00
30'
115' R.O.W.
10' GRAVEL ACCESS
8" FLEXBASE 556 SY
MATCH LINE STA 96+00
MATCH LINE STA 101+00
5'
INSTALL 2,056 SY TOPSOIL AND HYDROMULCH
INSTALL 500 LF SEDIMENT CONTROL FENCE
GAS SIGN
Ex Gas
SPECIAL WARRANTY DEED
CITY OF FARMERS BRANCH
CALLED 102.46 ACRES
VOL. 4382, PG. 15
D.R.D.C.T.

NO.	REVISION	BY	DATE
1	ADDED S.C.F.	DMS	10/31/2023

STATE OF TEXAS — DAVID M. SMITH — 102401 — LICENSED PROFESSIONAL ENGINEER

NAME David M Smith
DATE 10/31/2023
TBPELS ENGINEERING FIRM #312

PROJECT NOs. G1122 & G1123

LEWISVILLE — Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

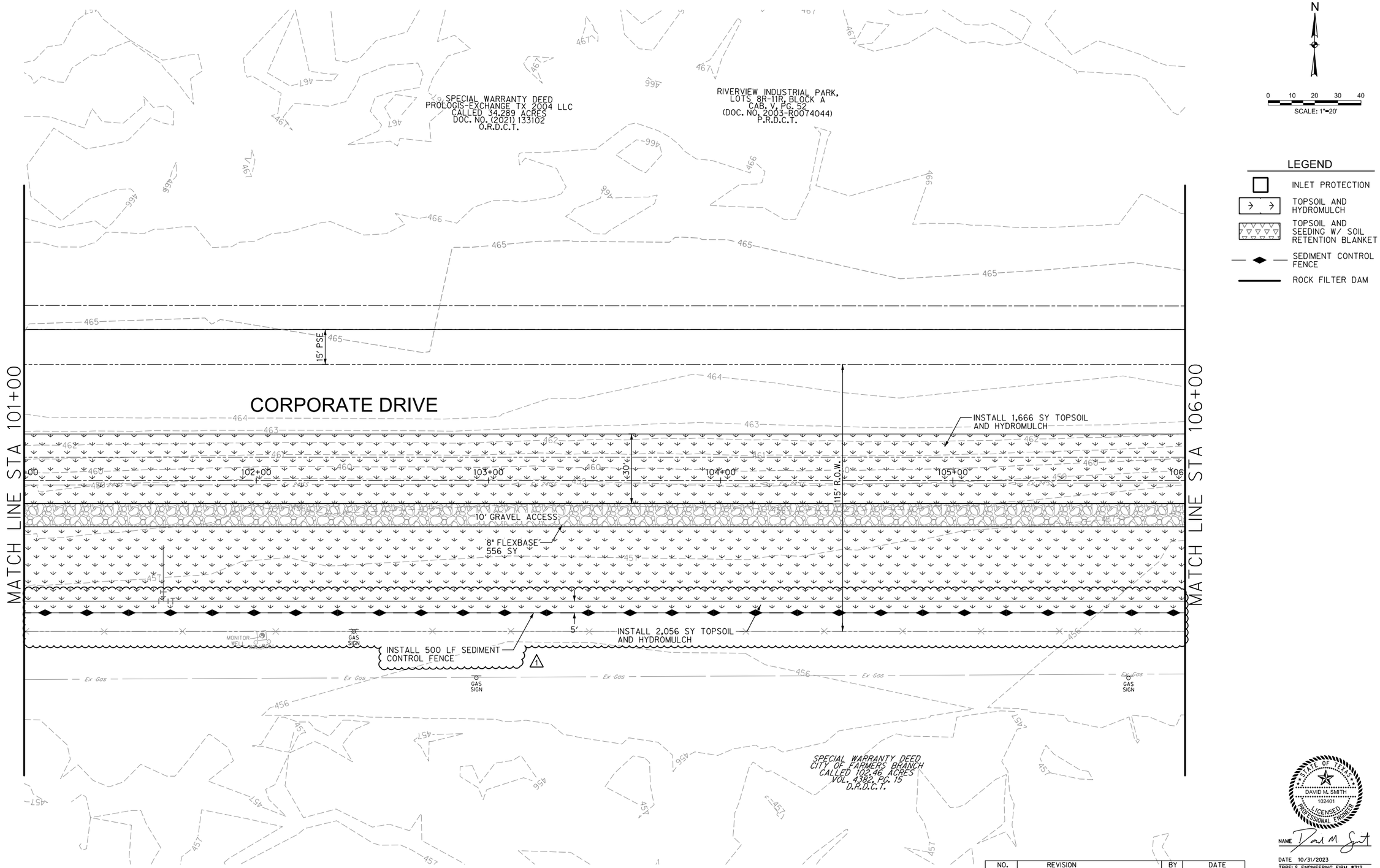
CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE
PROJECT TITLE

EROSION CONTROL PLAN
STA 96+00 TO STA 101+00
SHEET TITLE

halff
TBPELS ENGINEERING FIRM #312

OCTOBER 2023
DATE

SHEET 257 OF 328



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LEGEND

- INLET PROTECTION
- TOPSOIL AND HYDROMULCH
- TOPSOIL AND SEEDING W/ SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM

NO.	REVISION	BY	DATE
1	ADDED S.C.F.	DMS	10/31/2023

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M Smith

DATE 10/31/2023

TBPELS ENGINEERING FIRM #312

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

PROJECT TITLE
CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE

SHEET TITLE
EROSION CONTROL PLAN
STA 101+00 TO STA 106+00

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TBPELS ENGINEERING FIRM #312

DATE
OCTOBER
2023

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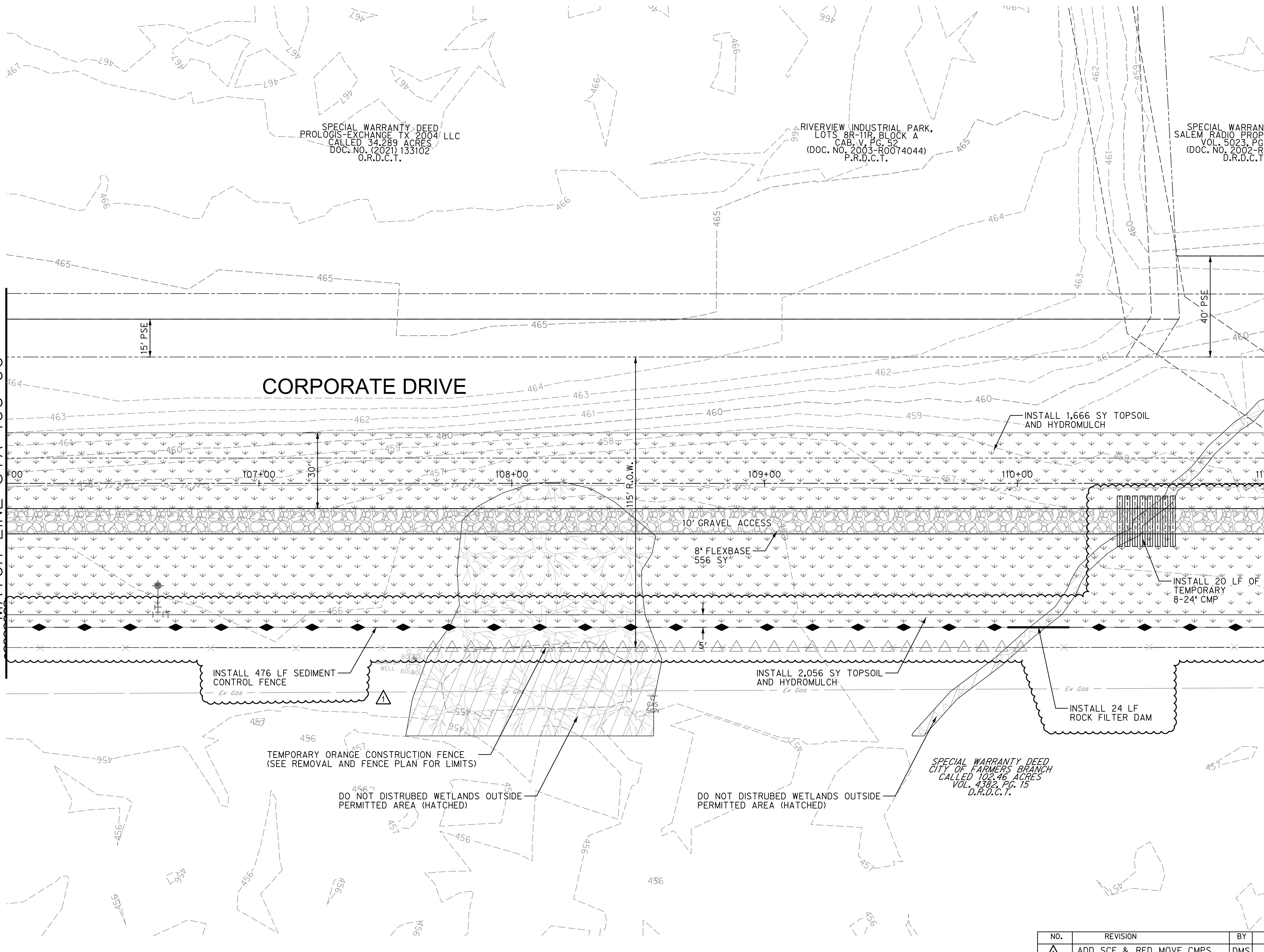
SPECIAL WARRANTY DEED
PROLOGIS-EXCHANGE TX 2004 LLC
CALLED 34.289 ACRES
DOC. NO. (2021) 133102
O.R.D.C.T.
RIVERVIEW INDUSTRIAL PARK,
LOTS 8R-11R, BLOCK A
CAB. V, PG. 52
(DOC. NO. 2003-R0074044)
P.R.D.C.T.
SPECIAL WARRANTY DEED
SALEM RADIO PROPERTIES, INC.
VOL. 5023, PG. 2614
(DOC. NO. 2002-R0019433)
D.R.D.C.T.
15' PSE
40' PSE
CORPORATE DRIVE
MATCH LINE STA 106+00
MATCH LINE STA 111+00
107+00
108+00
109+00
110+00
30'
115' R.O.W.
5'
INSTALL 1,666 SY TOPSOIL AND HYDROMULCH
10' GRAVEL ACCESS
8" FLEXBASE 556 SY
INSTALL 20 LF OF TEMPORARY 8-24" CMP
INSTALL 476 LF SEDIMENT CONTROL FENCE
INSTALL 2,056 SY TOPSOIL AND HYDROMULCH
INSTALL 24 LF ROCK FILTER DAM
TEMPORARY ORANGE CONSTRUCTION FENCE (SEE REMOVAL AND FENCE PLAN FOR LIMITS)
DO NOT DISTRUBED WETLANDS OUTSIDE PERMITTED AREA (HATCHED)
DO NOT DISTRUBED WETLANDS OUTSIDE PERMITTED AREA (HATCHED)
SPECIAL WARRANTY DEED
CITY OF FARMERS BRANCH
CALLED 102.46 ACRES
VOL. 4382, PG. 15
D.R.D.C.T.
Ex Gas
GAS SIGN

N

0 10 20 30 40
SCALE: 1"=20'

LEGEND

- INLET PROTECTION
- TOPSOIL AND HYDROMULCH
- TOPSOIL AND SEEDING W/ SOIL RETENTION BLANKET
- SEDIMENT CONTROL FENCE
- ROCK FILTER DAM

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M. Smith
DATE 10/31/2023
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE
1	ADD SCF & RFD, MOVE CMPS	DMS	10/31/2023

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE
PROJECT TITLE

EROSION CONTROL PLAN
STA 106+00 TO STA 111+00
SHEET TITLE

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TBPELS ENGINEERING FIRM #312

OCTOBER 2023
DATE

SHEET 259 OF 328

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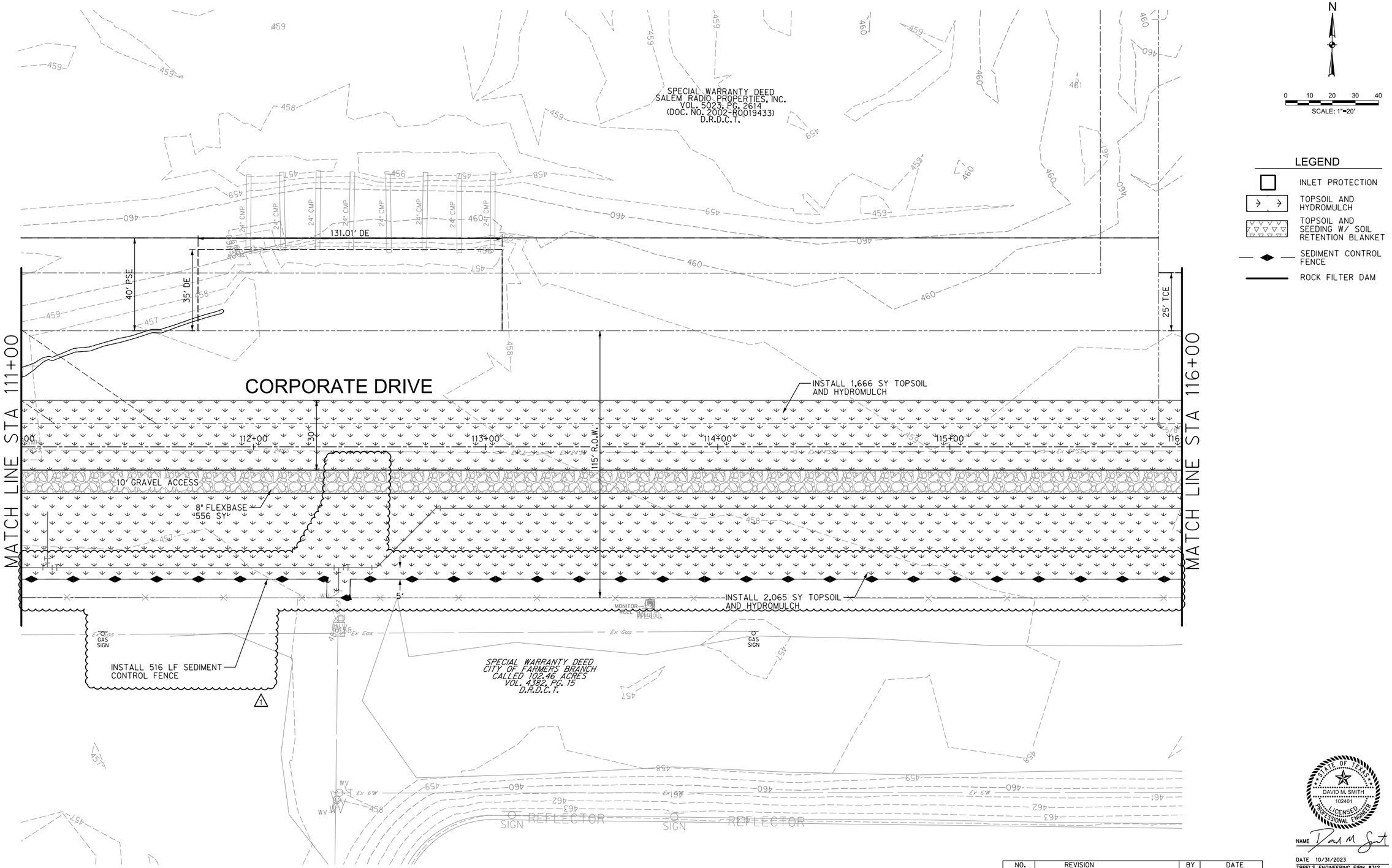

NO.	REVISION	BY	DATE
1	ADDED S.C.F. & MOVED CMPS	DMS	10/31/2023

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M. Smith

DATE 10/31/2023

TBPELS ENGINEERING FIRM #312

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots, Broad Wings, Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

PROJECT TITLE
CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE

SHEET TITLE
EROSION CONTROL PLAN
STA 111+00 TO STA 116+00

halff
TBPELS ENGINEERING FIRM #312

DATE
OCTOBER
2023

SHEET
260
OF
328

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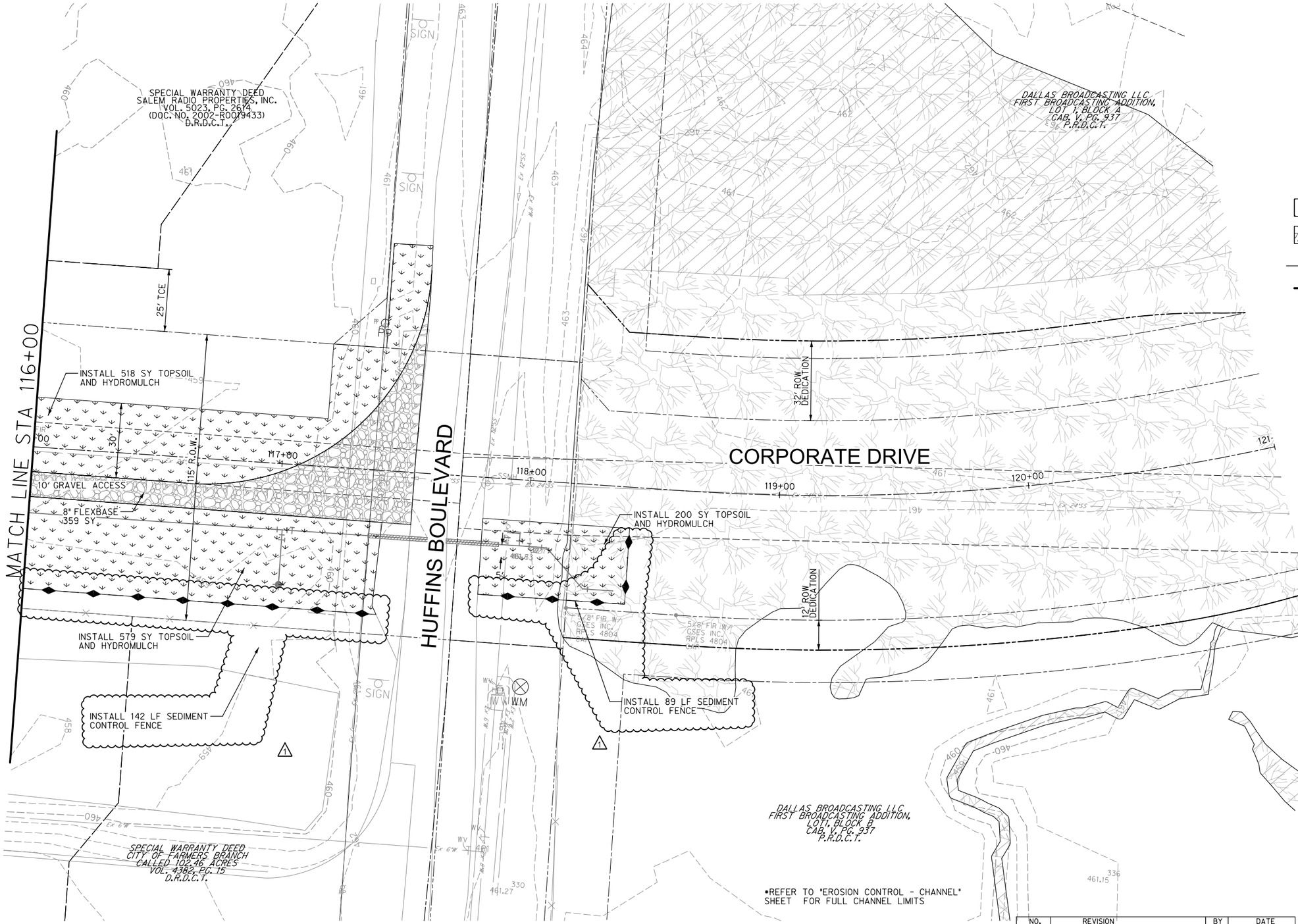

NO.	REVISION	BY	DATE
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STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M Smith

DATE 10/31/2023

TBPELS ENGINEERING FIRM #312

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots, Broad Wings, Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE
PROJECT TITLE

EROSION CONTROL PLAN
STA 116+00 TO STA 121+00
SHEET TITLE

halff
TBPELS ENGINEERING FIRM #312

OCTOBER 2023
DATE

SHEET 261 OF 328

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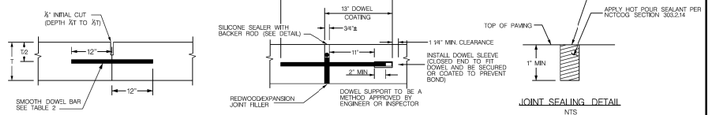
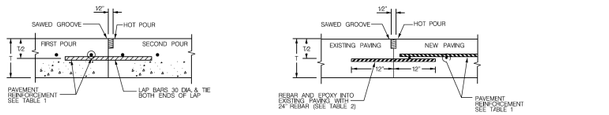


SAWED TRANSVERSE CONTRACTION JOINT
SPACED AT 40 FOOT MAXIMUM

EXPANSION JOINT
SPACED AT 500 FOOT MAXIMUM, LOCATE AT STRUCTURES, AND AT INTERSECTION PCs AND PTs

JOINT SEALING DETAIL
NTS

NOTE: DO NOT USE WOOD TO SUPPORT OR SECURE REDWOOD EXPANSION JOINT FILLER, STEEL REINFORCEMENT, OR FORMS

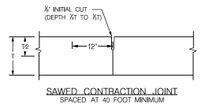


CONSTRUCTION JOINT – NEW CONSTRUCTION

CONSTRUCTION JOINT – PAVING REPAIR

TABLE 1 REBAR SIZING	
CONCRETE THICKNESS (T)	REBAR SIZE
6"–9"	#4

TABLE 2 DOWEL SIZING	
CONCRETE THICKNESS (T)	DOWEL SIZE
6"	#5
8"	#6
10" & 12"	#8



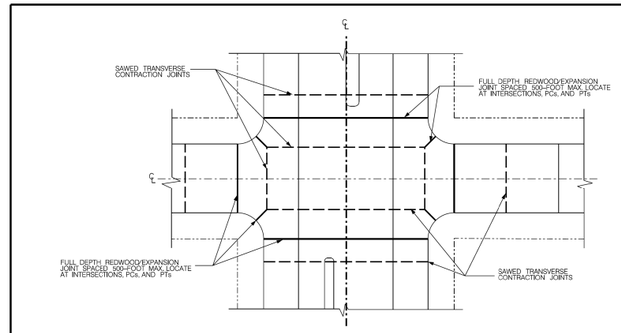
SAWED CONTRACTION JOINT
SPACED AT 40 FOOT MINIMUM

NOTES:

FOR JOINT SPACING, SEE STANDARD DRAWING 2.2

NOTE: DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

LEWISVILLE	Standard Details	Revisions: No. / Description / Date	Engineering Department	Dated: 01/13/2022
	REINFORCED CONCRETE JOINTS CONTRACTION, EXPANSION & CONSTRUCTION		Office No. 972-219-3490 www.cityoflewisville.com	Sheet: 2.1



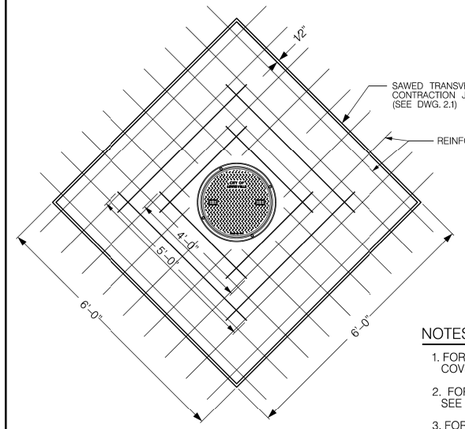
SPACING DIAGRAM FOR TRANSVERSE JOINTS
NTS

NOTES:

1. SPACE SAWED TRANSVERSE CONTRACTION JOINTS AT 20 FEET MAXIMUM INTERVALS IN PAVEMENT.
2. REFER TO TYPICAL PAVEMENT SECTION FOR LONGITUDINAL JOINT SPACING (DETAIL DRAWINGS 2.5).
3. USE APPROVED SEALANT FOR ALL JOINTS IN ACCORDANCE WITH NCTCOG SECTION 303.2.14.
4. FOR JOINT DETAILS, SEE STANDARD DRAWING 2.1.
5. CONSTRUCTION JOINTS REQUIRED TO CONNECT TO EXISTING PAVEMENT.

NOTE: DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

LEWISVILLE	Standard Details	Revisions: No. / Description / Date	Engineering Department	Dated: 1/13/2022
	REINFORCED CONCRETE PAVEMENT INTERSECTION JOINT SPACING		Office No. 972-219-3490 www.cityoflewisville.com	Sheet: 2.3

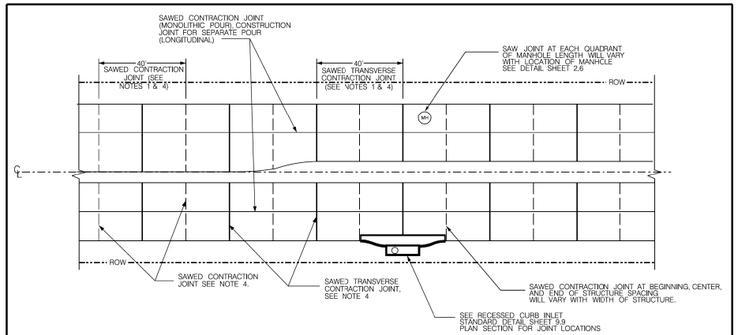


PAVEMENT THICKNESS (IN)	REINFORCEMENT
6"–12"	#4

NOTES

1. FOR SANITARY SEWER MANHOLE FRAME AND COVER, SEE DRAWINGS 7.17, OR 7.18.
2. FOR WATER MANHOLE FRAME AND COVER, SEE DRAWING 8.31.
3. FOR STORM SEWER MANHOLE FRAME AND COVER, SEE DRAWING 9.8.

LEWISVILLE	Standard Details	Revisions: No. / Description / Date	Engineering Department	Dated: 3-16-2022
	Concrete Pavement Manhole Joint Detail		Office No. 972-219-3490 www.cityoflewisville.com	Sheet: 2.6



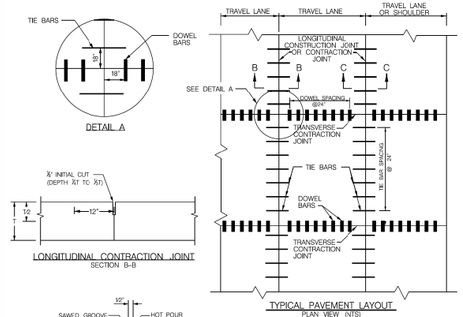
SPACING DIAGRAM FOR TRANSVERSE JOINTS
NTS

NOTES:

1. SPACE SAWED TRANSVERSE CONTRACTION JOINTS AND SAWED CONTRACTION JOINTS AT 20 FEET MAXIMUM INTERVALS.
2. REFER TO TYPICAL PAVEMENT SECTION FOR LONGITUDINAL JOINT SPACING (SEE STANDARD DRAWING 2.5).
3. USE APPROVED SEALANT FOR ALL JOINTS IN ACCORDANCE WITH NCTCOG SECTION 303.2.14.
4. FOR JOINT DETAILS, SEE STANDARD DRAWING 2.1.

NOTE: DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

LEWISVILLE	Standard Details	Revisions: No. / Description / Date	Engineering Department	Dated: 1/13/2022
	REINFORCED CONCRETE PAVEMENT TRANSVERSE JOINT SPACING		Office No. 972-219-3490 www.cityoflewisville.com	Sheet: 2.2



NOTES

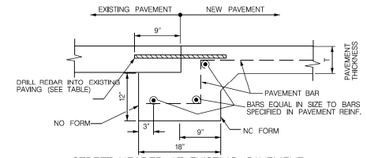
1. LONGITUDINAL CONSTRUCTION JOINT IS REQUIRED IF EACH TRAVEL LANE IS POURED SEPARATELY. LONGITUDINAL CONTRACTION JOINT IS ALLOWED IF TRAVEL LANES ARE POURED TOGETHER.
2. DETAILS FOR PAVEMENT WIDTH, THICKNESS AND CROWN CROSS SLOPE TO BE SHOWN ELSEWHERE IN PLANS. PAVEMENTS WIDER THAN 100 FEET WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
3. TRANSVERSE CONSTRUCTION JOINTS MAY BE FORMED BY USING METAL OR WOOD FORMS EQUAL IN DEPTH OF THE PAVEMENT OR BY OTHER METHODS AS APPROVED BY THE ENGINEER OR FIELD INSPECTOR.
4. USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
5. PAVEMENT WIDTHS GREATER THAN 15 FEET TO HAVE A LONGITUDINAL JOINT (SECTION BB OR CC). THESE JOINTS TO BE LOCATED WITHIN 6 (SIX) INCHES OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON PLANS.
6. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 (THREE) INCHES OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF THE TIE BAR.
7. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING A MINIMUM OF 10 (TEN) INCHES DEEP AND GROUTING THE TIE BARS WITH TYPE III CLASS "C" EPOXY. TIE BARS MUST MEET ASTM E488 AND TxDOT ITEM 361 "REPAIR OF CONCRETE" PULL OUT TEST REQUIREMENTS.
8. WHEN A MONOLITHIC CURB IS SPECIFIED, THE JOINT IN THE CURB MUST COINCIDE WITH THE PAVEMENT JOINTS AND MAY BE FORMED BY MEANS APPROVED BY THE ENGINEER OR INSPECTOR.
9. DOWEL BAR PLACEMENT TOLERANCE TO BE ±1/4 INCH HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE SHIPPING WIRES.
10. DETAILS FOR JOINT SEALANT IS SHOWN ON STANDARD DRAWINGS 2.1.

TABLE 1: REBARS		
SLAB THICKNESS T (IN)	BAR DIA. AND LENGTH	AVERAGE SPACING (IN.)
8"	X" X 24"	24"
10"	1" X 24"	24"

TABLE 2: TIE BARS (CEFORMED BARS)		
SLAB THICKNESS T (IN)	BAR DIA. AND LENGTH	AVERAGE SPACING (IN.)
6 TO 7.5	#4	24"
> 8	#4	24"

NOTE: DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

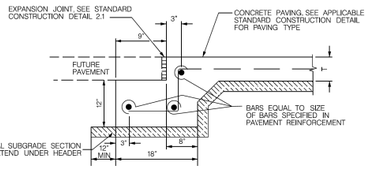
LEWISVILLE	Standard Details	Revisions: No. / Description / Date	Engineering Department	Dated: 07/14/2022
	REINFORCED CONCRETE PAVEMENT JOINT DETAILS LAYOUT		Office No. 972-219-3490 Fax No. 972-219-3497 www.cityoflewisville.com	Sheet: 2.5



STREET HEADER AT EXISTING PAVEMENT
NTS

DOWEL SIZING	
PAVEMENT THICKNESS	DOWEL SIZING
6"	#5
8"	#6
10" & 12"	#8

REBAR SIZING	
PAVEMENT THICKNESS	REBAR SIZING
6"–12"	#4



STREET HEADER FOR FUTURE PAVEMENT
NTS

NOTES:

1. BEND PAVEMENT BARS DOWN INTO HEADER.
2. HEADER AND PAVEMENT TO BE MONOLITHIC.

NOTE: DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

LEWISVILLE	Standard Details	Revisions: No. / Description / Date	Engineering Department	Dated: 03-16-2022
	REINFORCED CONCRETE PAVEMENT STREET HEADERS		Office No. 972-219-3490 Fax No. 972-219-3497 www.cityoflewisville.com	Sheet: 2.7

1

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M. Smith

DATE 10/31/2023

TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE
1	PAVING DETAILS UPDATED	DMS	10/31/2023

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots, Broad Wings, Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE
PROJECT TITLE

PAVING DETAILS
SHEET 1 OF 8
SHEET TITLE

halff
TBPELS ENGINEERING FIRM #312

OCTOBER 2023
DATE

SHEET 264 OF 328

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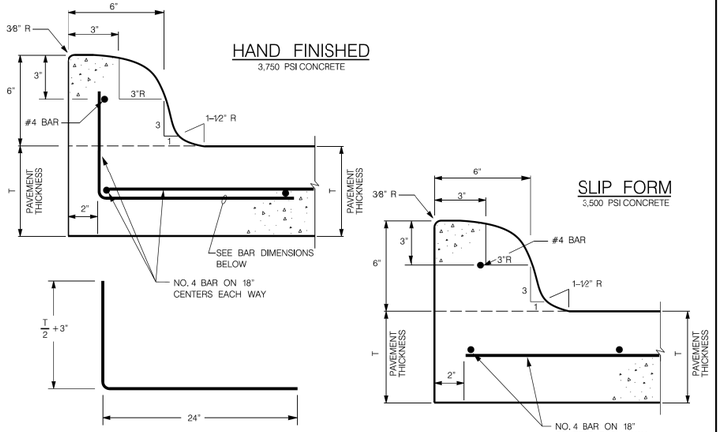


NOTE:
DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

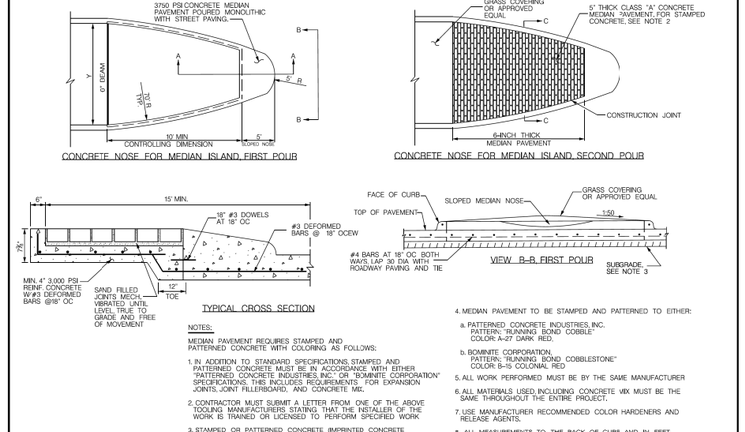
Standard Details
6" INTEGRAL CURB

Revisions:

No.	Description	Date

Engineering Department
Office No. 972-219-3400
www.cityoflewisville.com

Dated: 3-16-2022
Dated:
Sheet: 2.9



NOTES:

MEDIAN PAVEMENT REQUIRES STAMPED AND PATTERNED CONCRETE WITH COLORING AS FOLLOWS:

1. IN ADDITION TO STANDARD SPECIFICATIONS, STAMPED AND PATTERNED CONCRETE MUST BE IN ACCORDANCE WITH EITHER "PATTERNED CONCRETE INDUSTRIES INC." OR "BOMINITE CORPORATION" SPECIFICATIONS, THIS INCLUDES REQUIREMENTS FOR EXPANSION JOINTS, JOINT FILLERBOARD, AND CONCRETE MIX.
2. CONTRACTOR MUST SUBMIT A LETTER FROM ONE OF THE ABOVE TOOLING MANUFACTURERS STATING THAT THE INSTALLER OF THE WORK IS TRAINED OR LICENSED TO PERFORM SPECIFIED WORK.
3. STAMPED OR PATTERNED CONCRETE IMPRINTED CONCRETE PAVING TO BE INSTALLED IN ACCORDANCE WITH STANDARD SPECIFICATIONS OF THE ABOVE THE CONTRACTOR PERFORMING WORK MUST SUBMIT A LETTER FROM ONE OF THE ABOVE TOOLING MANUFACTURERS STATING THAT INSTALLER IS TRAINED OR LICENSED TO PERFORM SPECIFIED WORK.
4. MEDIAN PAVEMENT TO BE STAMPED AND PATTERNED TO EITHER:
   a. PATTERNED CONCRETE INDUSTRIES, INC. PATTERN: "RUNNING BOND COBBLE" COLOR: A-27 DARK RED.
   b. BOMINITE CORPORATION. PATTERN: "RUNNING BOND COBBLESTONE" COLORS: B-15 COLONIAL RED
5. ALL WORK PERFORMED MUST BE BY THE SAME MANUFACTURER
6. ALL MATERIALS USED, INCLUDING CONCRETE MIX MUST BE THE SAME THROUGHOUT THE ENTIRE PROJECT.
7. USE MANUFACTURER RECOMMENDED COLOR HARDENERS AND RELEASE AGENTS.
8. ALL MEASUREMENTS TO THE BACK OF CURB AND IN FEET, UNLESS OTHERWISE SHOWN.
9. COMPACT SUBGRADE AND SAND TO A DENSITY NOT LESS THAN 95% STANDARD PROCTOR.

NOTE:
DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

Standard Details
MEDIAN ISLAND PAVEMENT SLOPED END NOSE

Revisions:

No.	Description	Date

Engineering Department
Office No. 972-219-3400
www.cityoflewisville.com

Dated: 3-17-2022
Dated:
Sheet: 2.23

CONCRETE PAVING GENERAL NOTES

1. REINFORCED CONCRETE PLACEMENT:
   A. PLACE ALL CURBS INTEGRAL WITH PAVEMENT UNLESS OTHERWISE APPROVED BY THE CITY.
   B. CURBS TO MEET SAME COMPRESSIVE STRENGTH AS SPECIFIED FOR PAVEMENT.
   C. BAR LAPS TO BE 30 BAR DIAMETERS.
   D. REINFORCING BARS TO BE SUPPORTED BY CHAIRS OR OTHER DEVICES APPROVED BY THE CITY.
   E. DO NOT USE FLY ASH IN CONCRETE PAVEMENT.
2. SUBGRADE (MINIMUM REQUIREMENTS UNLESS APPROVED BY CITY ENGINEER). SUBGRADE UNDER ALL PAVEMENT TO BE INITIALLY MIXED WITH 9-INCH THICK AND REMIXED WITH 6-INCH THICK AND STABILIZED WITH 6% MINIMUM BY WEIGHT OF HYDRATED LIME (GENERALLY +/- 40 POUNDS PER SQUARE YARD), AND COMPACTED TO A DENSITY NOT LESS THAN 95% STANDARD PROCTOR DENSITY. ALTERNATIVE SUBGRADES SUPPORTED BY LABORATORY TESTS MAY BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.
3. HAND POURED CONCRETE TO BE 3,750 PSI AT 28 DAYS

TYPE OF CONCRETE [1]	MINIMUM CEMENTITOUS (LBS/CY)	7 DAY COMPRESSIVE STRENGTH (PSI)	28 DAY COMPRESSIVE STRENGTH (PSI)	MINIMUM WATER/ CEMENTITIOUS RATIO	COURSE AGGREGATE MAXIMUM SIZE [2]
SIDEWALK [4]	470	1,950	3,000	0.58	1 1/2"
STREET (MACHINE POUR)	517	2,350	3,500	0.53	1 1/2"
STREET (HAND POUR)	564	2,600	3,750	0.49	1 1/2"
	AS DIRECTED BY THE OWNER OR AS SHOWN ON THE PLANS				
HES [3]	752	4,200 [5]	6,500	0.40	1 1/2"

1. ALL EXPOSED, HORIZONTAL CONCRETE TO HAVE ENTRAINED AIR.
2. MINIMUM STRENGTH REQUIRED BY DESIGN.
3. HIGH EARLY STRENGTH CONCRETE MIX DESIGN MAY BE USED IF STRENGTH REQUIREMENT IS SATISFIED.
4. SIDEWALKS,SEPARATE CURB AND GUTTER AND HANDICAP RAMPS.
5. HIGH EARLY STRENGTH CONCRETE, COMPRESSIVE STRENGTH AT 3 DAYS

CONCRETE USE	AVG. SLUMP (IN)	MAX. SLUMP (IN)
SLIP FORM PAVING	3	4
SIDEWALK,SEPARATE CURB AND GUTTER, AND OTHER MISCELLANEOUS CONCRETE	AS SPECIFIED	

4. SOILS WITH A P.I. OF 20 OR LESS TO BE STABILIZED WITH A CEMENT SLURRY. THE APPLICATION RATE TO BE DETERMINED BY ENGINEER AND APPROVED BY THE CITY ENGINEER.
5. SOILS WITH A P.I. GREATER THAN 20 TO BE STABILIZED WITH LIME SLURRY. THE APPLICATION RATE TO BE DETERMINED BY ENGINEER AND APPROVED BY THE CITY ENGINEER.
6. ALL SOILS MUST BE TESTED BY A QUALIFIED TESTING LABORATORY TO DETERMINE THE SOLUBLE SULFATE LEVELS IN THE SOIL BEFORE APPLYING LIME OR CEMENT STABILIZATION. SOILS WITH ELEVATED SOLUBLE SULFATE CONTENT ARE NOT SUITABLE FOR LIME OR CEMENT TREATMENT BECAUSE OF INCREASED RISK OF SULFATE-INDUCED HEAVE.

SOLUBLE SULFATE	SUBGRADE TREATMENT
< 3,000 PPM	SUBGRADE COMPATIBLE WITH LIME OR CEMENT TREATMENT (SEE NOTE 4 & 5)
3,000 PPM TO 8,000 PPM	SUBGRADE IDENTIFIED AS COMPATIBLE WITH LIME OR CEMENT TREATMENT, DESIGN ENGINEER TO CONSULT WITH CITY FOR APPROVAL TO USE LIME TREATED SUBGRADE. REFER TO TxDOT "GUIDELINES FOR MODIFICATION AND STABILIZATION OF SOILS AND BASE FOR USE IN PAVEMENT STRUCTURES" AND "GUIDELINES FOR TREATMENT OF SULFATE-RICH SOILS AND BASES IN PAVEMENT STRUCTURES" FOR MORE INFORMATION.
> 8,000 PPM	SUBGRADE IS INCOMPATIBLE WITH LIME OR CEMENT TREATMENT. USE 4-INCH TYPE B HMAC OR 8-INCH FLEXIBLE BASE CRUSHED STONE (TxDOT ITEM 247 GRADE 1), CRUSHED CONCRETE IS NOT ACCEPTABLE

NOTE:
DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

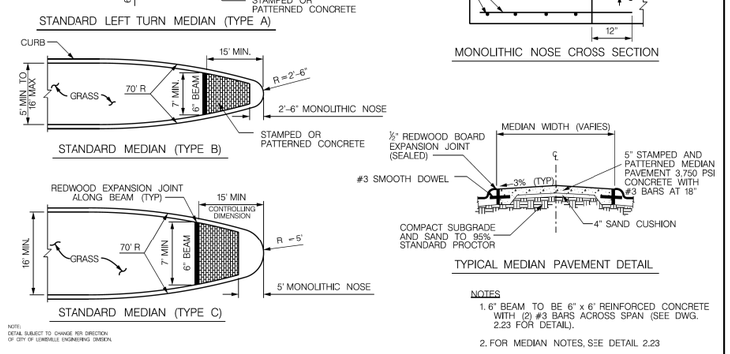
Standard Details
REINFORCED CONCRETE GENERAL NOTES

Revisions:

No.	Description	Date

Engineering Department
Office No. 972-219-3400
www.cityoflewisville.com

Dated: 07/25/2022
Dated:
Sheet: 2.30



NOTES

1. 6" BEAM TO BE 6" x 6" REINFORCED CONCRETE WITH (2) #3 BARS ACROSS SPAN (SEE DWG. 2.23 FOR DETAIL).
2. FOR MEDIAN NOTES, SEE DETAIL 2.23

NOTE:
DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

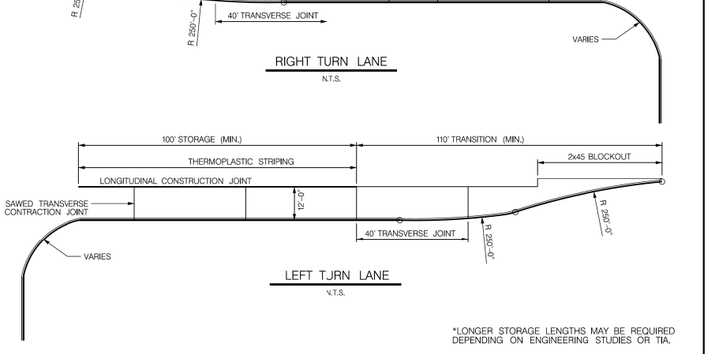
Standard Details
MEDIAN ISLAND PAVEMENT

Revisions:

No.	Description	Date

Engineering Department
Office No. 972-219-3400
www.cityoflewisville.com

Dated: 3-17-2022
Dated:
Sheet: 2.22



*LONGER STORAGE LENGTHS MAY BE REQUIRED DEPENDING ON ENGINEERING STUDIES OR TIA.

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

Standard Details
RIGHT & LEFT TURN LANE

Revisions:

No.	Description	Date

Engineering Department
Office No. 972-219-3400
www.cityoflewisville.com

Dated: 3-17-2022
Dated:
Sheet: 2.28

TESTING REQUIREMENTS (PER NCTCOG)

1. ALL TESTING ASSOCIATED WITH PUBLIC PAVING MUST BE CONDUCTED BY A CERTIFIED LABORATORY. THE CONTRACTOR IS RESPONSIBLE FOR PAYMENT OF ALL TESTING PERFORMED UNLESS OTHERWISE SPECIFIED.
   a. SULFATE TESTING TO CONFORM WITH ASTM C1580-20
   b. LIME SERIES TESTING TO CONFORM WITH ASTM D6276 AND NCTCOG SECTION 301.2.1.3
2. ALL TESTING ASSOCIATED WITH PRIVATE PAVING MUST BE CONDUCTED BY A CERTIFIED LABORATORY. THE CONTRACTOR IS RESPONSIBLE FOR PAYMENT OF ALL TESTING PERFORMED.
3. EMBANKMENT MATERIALS MUST BE TESTED AND CERTIFIED FOR DENSITY, MOISTURE, GRADATIONS, AND SUITABILITY AS SET FORTH IN THE NCTCOG SPECIFICATIONS FOLLOWING STANDARD TESTING PROCEDURES.
4. PERFORM DENSITY TESTING ON EACH LIFT OR PROPERLY PLACED AND COMPACTED MATERIAL. MINIMUM REQUIREMENTS FOR DENSITY IS 95% OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM D698.
5. MOISTURE CONTENT OF THE MATERIAL TO BE FROM OPTIMUM MOISTURE CONTENT UP TO FOUR (4) % ABOVE THE OPTIMUM MOISURE CONTENT AND NOT LESS THAN 2% UNDER OPTIMUM.
6. THE MINIMUM FREQUENCY OF DENSITY TESTING TO BE 3 (THREE) TESTS PER ONE (1) FOOT OF LOOSE LIFT PER 2,000 (TWO THOUSAND) SQUARE YARDS OF SURFACE AREA, IN ACCORDANCE WITH COG SECTION 203.7.2.
7. RETESTING OF ALL MATERIALS TO BE PERFORMED AT ORIGINAL TEST LOCATION AND AT THE CONTRACTOR'S EXPENSE.
8. GRADATIONS AFTER FINAL MIXING TO BE AS FOLLOWS:
   MINIMUM PASSING 1-INCH LABORATORY SIEVE: 100%
   MINIMUM PASSING NO. 4 LABORATORY SIEVE: 60%
   TESTS TO BE TAKEN EVERY 1,000 SQUARE YARDS.
9. UPON COMPLETING WORK AND BEFORE FINAL ACCEPTANCE AND PAYMENT, PAVEMENT THICKNESS TESTS MAY BE CONDUCTED AT THE REQUEST OF THE CONSTRUCTION INSPECTOR IF REQUIRED, THE NUMBER OF CORES FOR THICKNESS VERIFICATION WILL BE BASED ON 3 (THREE) CORES FOR EVERY 2,000 (TWO THOUSAND) SQUARE YARDS OF PAVEMENT SURFACE AREA.
10. DURING WORK PROGRESS, THE TESTING LABORATORY WILL CAST TEST CYLINDERS TO MAINTAIN A CHECK ON COMPRESSIVE STRENGTH ON THE CONCRETE PLACED. SAMPLING AND MOLDING OF TEST SPECIMENS MUST MEET APPLICABLE ASTM TESTING GUIDELINES. CONCRETE PAVEMENT TESTING REQUIRES 3 (THREE) INDIVIDUAL STRENGTH SAMPLES PER TEST, AT A FREQUENCY OF 1 (ONE) TEST PER 100 (ONE HUNDRED) CUBIC YARDS (OR FRACTION THEREOF) OR CONCRETE PLACED PER DAY. DELIVER A COPY OF THE TEST RESULTS TO THE ENGINEERING DEPARTMENT AND THE CONSTRUCTION INSPECTOR THAT INCLUDES THE DATE, AND TIME OF SAMPLING, EXACT PLACEMENT OF CONCRETE, TRUCK TICKET NUMBER, SLUMP, AIR CONTENT, AND CONCRETE TEMPERATURE.
11. ANY DEFICIENCIES IN CONCRETE THICKNESS OR STRENGTH TO BE HANDLED IN ACCORDANCE WITH NCTCOG ITEM 303.8.

NOTE:
DETAIL SUBJECT TO CHANGE PER DIRECTION OF CITY OF LEWISVILLE ENGINEERING DIVISION.

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

Standard Details
REINFORCED CONCRETE TESTING REQUIREMENTS

Revisions:

No.	Description	Date

Engineering Department
Office No. 972-219-3400
www.cityoflewisville.com

Dated: 9-13-2022
Dated:
Sheet: 2.31

1

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M. Smith
DATE 10/31/2023
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE
1	PAVING DETAILS UPDATED	DMS	10/31/2023

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

PROJECT TITLE
CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE

SHEET TITLE
PAVING DETAILS
SHEET 2 OF 8

halff
TBPELS ENGINEERING FIRM #312

DATE
OCTOBER 2023

SHEET 265 OF 328

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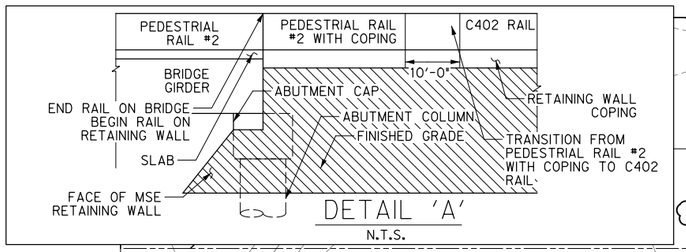
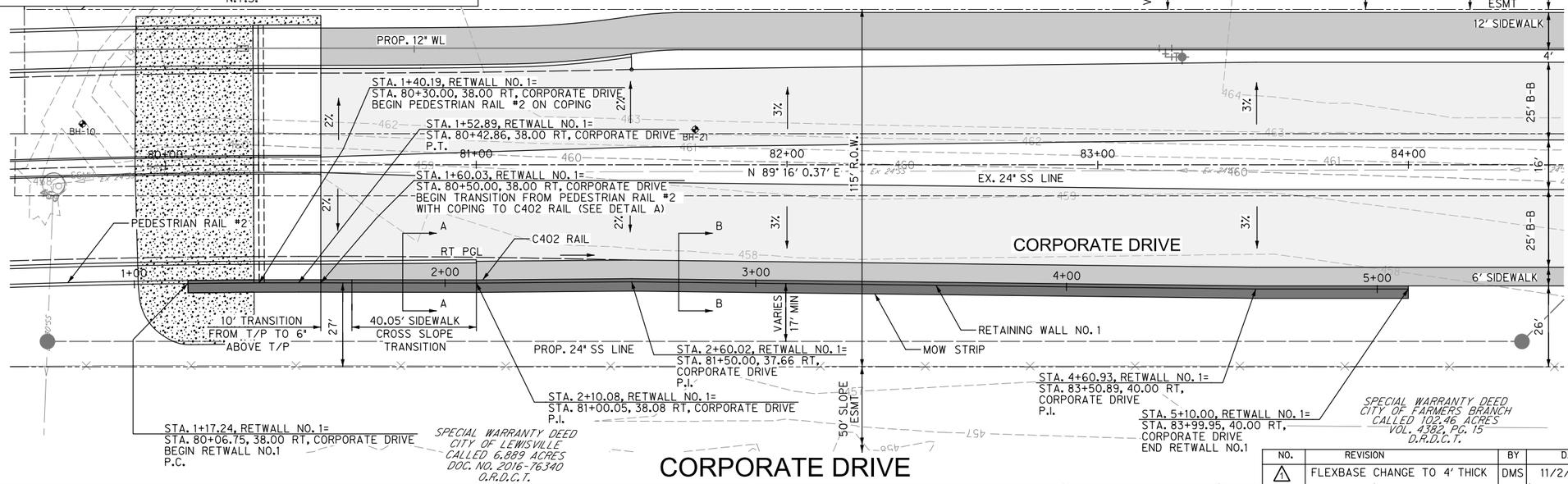


DETAIL 'A'
N.T.S.

NOTES:

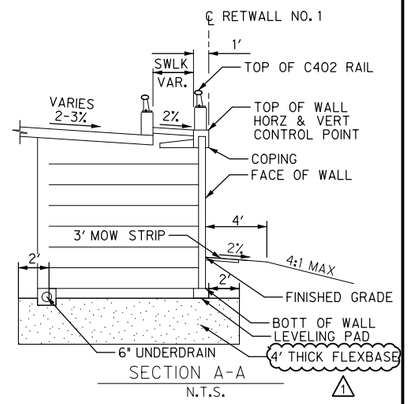
1. PRECAST MSE WALL PANELS SHALL INCLUDE AN ASHLAR STONE SURFACE FINISH CREATED USING FORMINER, WHICH SHALL BE APPROVED BY THE ENGINEER PRIOR TO WALL PANEL FABRICATION.
2. IN ACCORDANCE WITH TXDOT ITEM 427 AND SUBSIDIARY TO MSE WALL AND TRAFFIC RAIL ITEMS: PROVIDE THE FOLLOWING SURFACE FINISH FOR THE LISTED ELEMENTS: TRAFFIC RAIL TO BE FINISHED IN SURFACE AREA II. MSE RETAINING WALL TO BE FINISHED IN SURFACE AREA 1.
3. ANTI-GRAFFITI COATING (PERMANENT-TY III) SHALL BE APPLIED TO EXPOSED FACE OF MSE WALL AND COPING IN ACCORDANCE WITH TXDOT ITEM 740.
4. ESTIMATED QUANTITY FOR ANTI-GRAFFITI COATING (PERMANENT - TY III) IS 4,004 SF.
5. PROOF ROLLING AND FLEXBASE PAD SHALL BE SUBSIDIARY TO MSE WALL ITEM. ⚠1



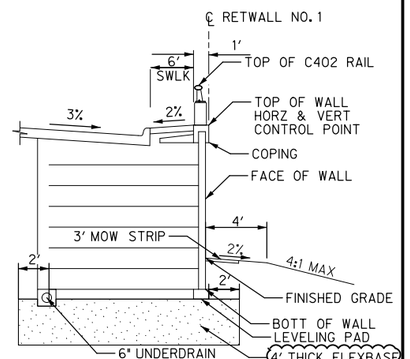
CORPORATE DRIVE

N

0 10 20 30 40
SCALE: 1"=20'

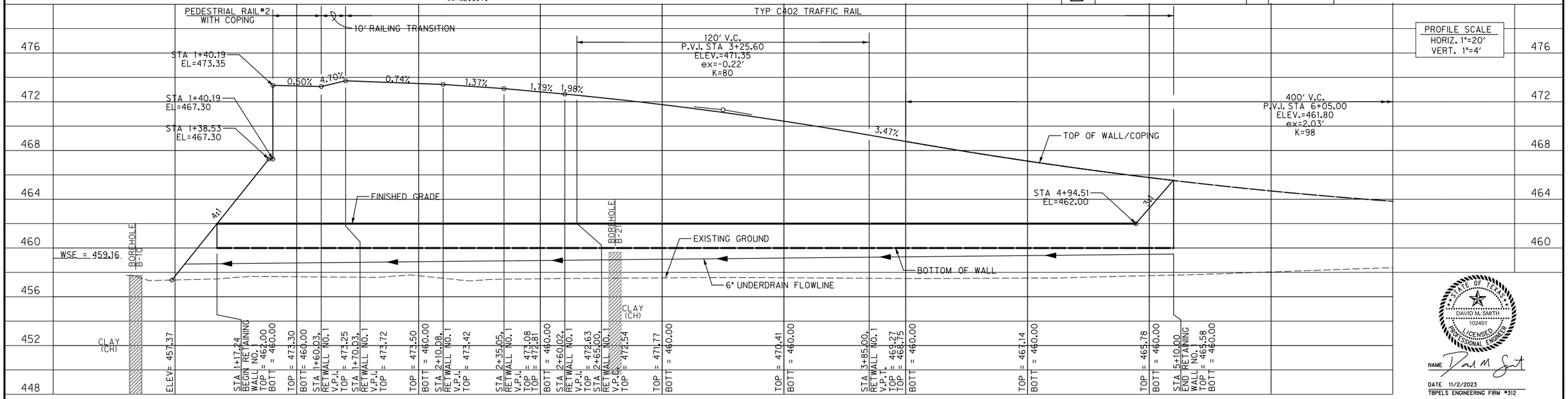


SECTION A-A
N.T.S.



SECTION B-B
N.T.S.

NO.	REVISION	BY	DATE
⚠1	FLEXBASE CHANGE TO 4' THICK	DMS	11/2/2023



PROJECT NOs. G1122 & G1123

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER
NAME David M Smith
DATE 11/2/2023
TBPELS ENGINEERING FIRM #312

LEWISVILLE
Deep Roots, Broad Wings, Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE
PROJECT TITLE

RETAINING WALL NO. 1
PLAN AND PROFILE
BEGINNING TO END
SHEET TITLE

halff
TBPELS ENGINEERING FIRM #312

OCTOBER 2023
DATE

SHEET 44 OF 328

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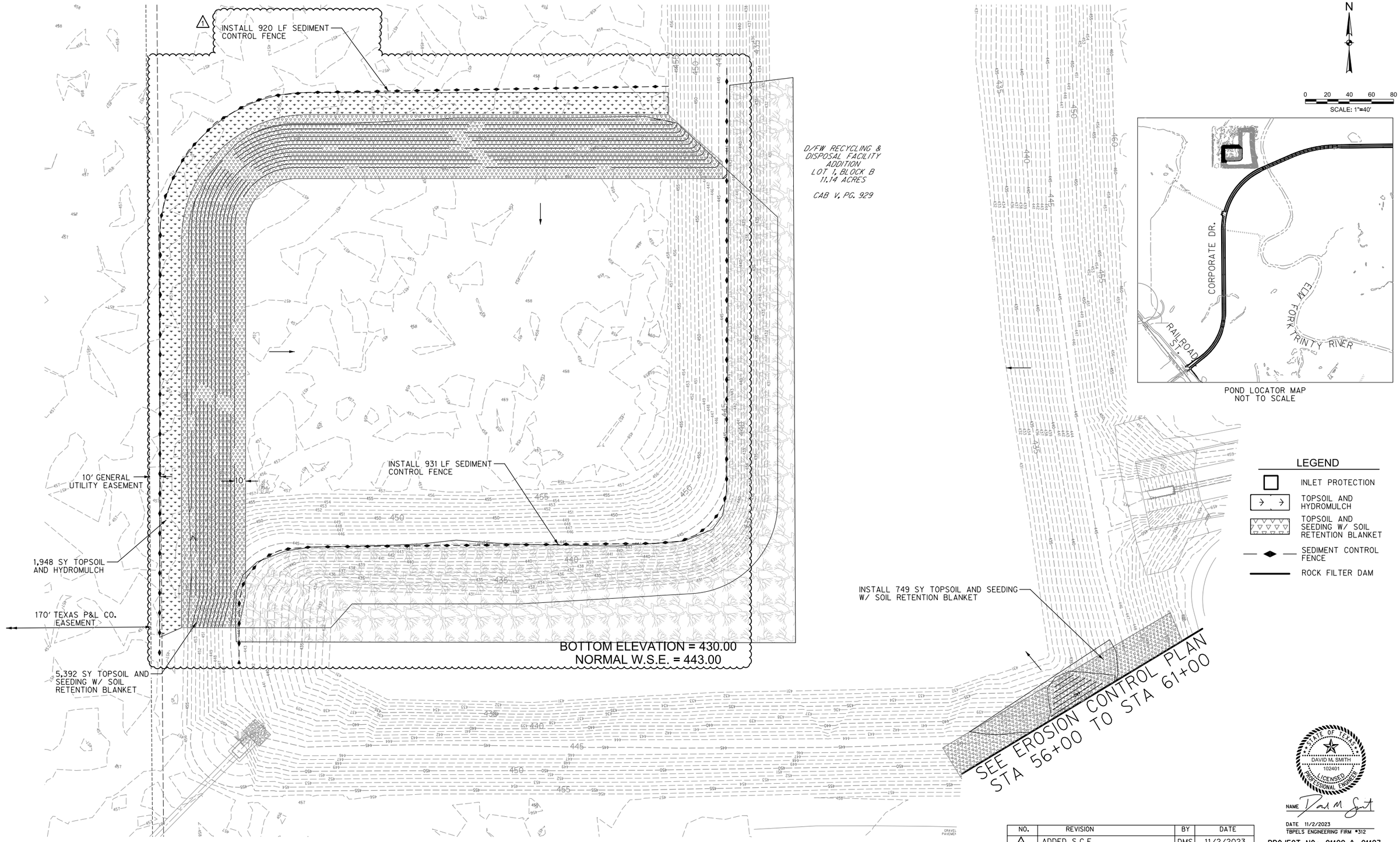

NO.	REVISION	BY	DATE
1	ADDED S.C.F.	DMS	11/2/2023

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M. Smith

DATE 11/2/2023

TBPELS ENGINEERING FIRM #312

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots, Broad Wings, Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

PROJECT TITLE
CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE

SHEET TITLE
EROSION CONTROL PLAN
OFFSITE MITIGATION

halff
TBPELS ENGINEERING FIRM #312

DATE
OCTOBER 2023

SHEET 263 OF 328

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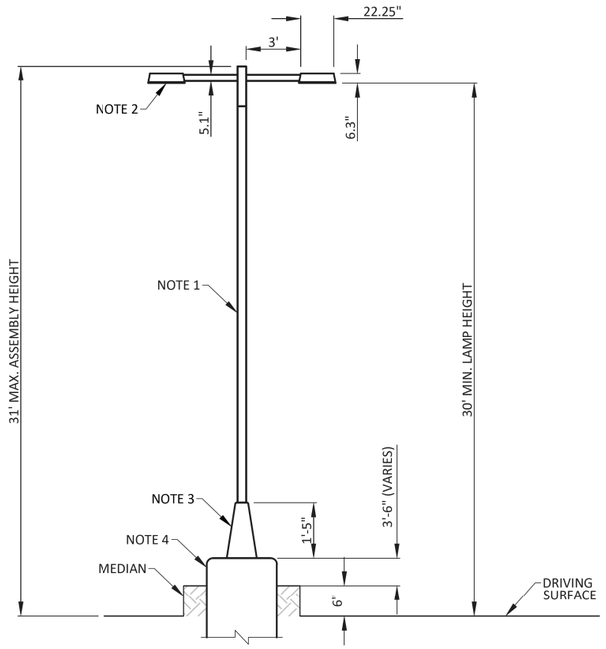
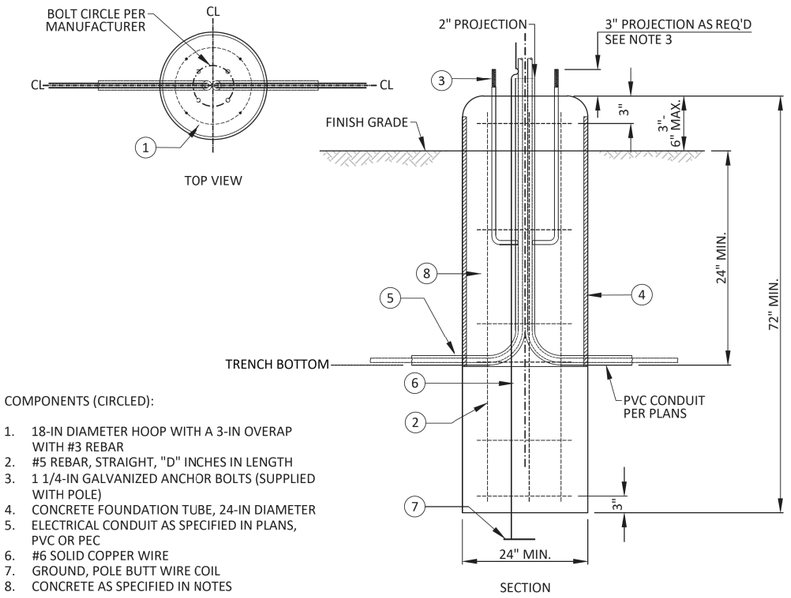


NOTES:

1. PREFERRED POLE MATERIAL SHALL BE STRAIGHT, SQUARE ALUMINUM ALLOY (SSA) WITH A MINIMUM WALL THICKNESS OF 0.188 INCHES FOR THE GEOMETRY SHOWN AND A MAXIMUM WIND LOAD OF 90 MPH. ALTERNATIVE POLE MATERIAL SHALL BE STRAIGHT, SQUARE STEEL (SSS) WITH A MINIMUM WALL THICKNESS OF 0.179 INCHES (7 GAUGE) FOR THE GEOMETRY SHOWN AND A MAXIMUM WIND LOAD OF 90 MPH.
2. LED LUMINARIE SHALL BE TRASTAR DURALIGHT JXM-ST SERIES INCLUDING ARM, MADE OF ALUMINUM ALLOY. A MAXIMUM TOTAL EFFECTIVE PROJECTED AREA (EPA) OF 6 SQUARE FEET SHALL BE ALLOWED FOR TWO LUMINARIES AND TWO ARMS. LED LIGHT ENGINE SHALL TYPICALLY BE 135 WATTS WITH A MINIMUM LUMEN OUTPUT OF 15,525, 480 VAC.
3. TRANSFORMER BASE SHALL BE ALUMINUM ALLOY (PREFERRED), AND STEEL AS AN ALTERNATIVE.
4. SEE SEPARATE DETAIL FOR 24" x 72" FOUNDATION.
5. THE POLE, LUMINAIRES, AND ARMS SHALL BE PAINTED DARK BRONZE.
6. PREFERRED SPACING IS 150 FEET TO 200 FEET.



COMPONENTS (CIRCLED):

1. 18-IN DIAMETER HOOP WITH A 3-IN OVERAP WITH #3 REBAR
2. #5 REBAR, STRAIGHT, "D" INCHES IN LENGTH
3. 1 1/4-IN GALVANIZED ANCHOR BOLTS (SUPPLIED WITH POLE)
4. CONCRETE FOUNDATION TUBE, 24-IN DIAMETER
5. ELECTRICAL CONDUIT AS SPECIFIED IN PLANS, PVC OR PEC
6. #6 SOLID COPPER WIRE
7. GROUND, POLE BUTT WIRE COIL
8. CONCRETE AS SPECIFIED IN NOTES

ARTERIAL STREET LIGHT FOUNDATION (FOR LONG ARM AND SHORT ARM SQUARE POLES)

FOUNDATION NOTES:

1. CONCRETE TO BE MINIMUM 3,000 PSI AT 28 DAYS. (5 SACK) MAXIMUM AGGREGATE 3/4". TOP OF FOUNDATION TO BE TROWELED TO A FLAT AND LEVEL SURFACE. AVOID EXCESSIVE TROWELING. CONCRETE TO SET A MINIMUM OF 72 HOURS BEFORE POLE INSTALLATION.
2. REBAR HOOPS ARE TIED BEGINNING 3" BELOW TOP OF CONCRETE FORM AND ARE REPEATED AT APPROXIMATE 1 FT. INTERVALS TO BOTTOM OF FOUNDATION.
3. ANCHOR BOLTS TO BE SUPPLIED WITH POLE. USE TEMPLATE FURNISHED BY POLE MANUFACTURER FOR ALIGNING ANCHOR BOLTS. PROJECTION OF 3 IN. OR AS REQUIRED BY MANUFACTURER.
4. CONCRETE FORM OF SONOTUBE TO EXTEND TO BOTTOM OF TRENCH OR AS NEEDED. THE FOUNDATION FORM MUST BE APPROVED BY THE CITY INSPECTOR PRIOR TO USE.
5. PROVIDE 24" PIGTAIL FOR CONNECTION OF GROUND WIRE TO POLE.
6. A MINIMUM OF 12' OF BARE #6 SD CU WIRE TO BE PLACED IN BOTTOM OF HOLE AND COVERED WITH 2" OF DIRT.
7. PRE-FABRICATED FOUNDATIONS SHALL NOT BE APPROVED.
8. PROVIDE MINIMUM 3" CLEAR COVER ON REBAR.
9. IF SOIL HAS BEEN DISTURBED, EXTEND FOUNDATION BY DEPTH OF DISTURBED SOIL.
10. FOUNDATION DEPTH BASED ON TEXAS CONE PENETROMETER AT 10 BLOWS/FOOT FOR SOIL. SOIL WORSE THAN THESE CONDITIONS REQUIRE FOUNDATION MODIFICATIONS APPROVED BY A LICENSED ENGINEER IN THE STATE OF TEXAS.

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

NAME David M. Smith

DATE 11/2/2023

TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE
1	DETAILS UPDATED	DMS	11/2/2023

PROJECT NOs. G1122 & G1123

LEWISVILLE
Deep Roots, Broad Wings, Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

PROJECT TITLE
CORPORATE DRIVE SEGMENTS 2&3
RAILROAD STREET TO
EAST OF ELM FORK TRINITY RIVER BRIDGE

SHEET TITLE
ILLUMINATION DETAILS

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TBPELS ENGINEERING FIRM #312

OCTOBER 2023
DATE

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LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

Corporate Seg 2 & 3 (Paving, Bridge, Drainage, Water & Sanitary Sewer)
Pre-Proposal Meeting – Tuesday, October 31, 2023, 10:00 am – 11:00 am

	NAME	COMPANY/TITLE	TELEPHONE	EMAIL ADDRESS	
1.	Mary Ayala, P.E.	City of Lewisville/Sr. Engineer	972-219-3493	mayala@cityoflewisville.com	
2.	Earl Whitaker	COL/ Purchasing Manager	972-219-3765	ewhitaker@cityoflewisville.com	
3.	David Smith	Halff Associates	817-764-7486	dsmith@halff.com	
4.	Rusell Marusak	Halff Associates	214-346-6367	rmarusak@halff.com	
5.	David Salmon	COL/City Engineer	972-219-3491	dsalmon@cityoflewisville.com	
6.	Christopher Johnson	McMahon Contracting, L.P.	(972)263-6907	estimating@mcmahoncontracting.com	
7.	BEN MIRON	SUNDT CONSTRUCTION	214-298-4461	bfmiron@sundt.com	
8.	KEVIN GRAF	SUNDT CONSTRUCTION	512-402-4916	KMGRAF@SUNDT.COM	
9.	CRAIG MORGAN	URBAN INFRACONSTRUCTION	512 659 1123	CMORGAN@URBANICONSTRUCTION	
10.	JACK WADKINS	REYES GROUP	214-260-3535	JWADKINS@REYESGROUP.COM	
11.	Esteban Chaveles	Rebcon, LLC	972-804-1063	esteban@rebcon.com	
12.	Danny Krieg	Rebcon, LLC	972-494-8230	estimating@rebcon.com	
13.	Victor Evazo	McCarthy	817-883-0990	vmevazo@mccarthy.com	

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Deep Roots. Broad Wings. Bright Future.

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	NAME	COMPANY/TITLE	TELEPHONE	EMAIL ADDRESS	
14.	Jayesh Magavi	Harper Brothers Construction	214-984-0891	BidsDFW@harperbro.com	
15.	RYAN THOMPSON	TISED PAVING	(972) 289-0723	RTHOMPSON@TISEDPAVING.COM	
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