NORTH RICHLAND HILLS

NRH

THE CITY OF CHOICE

PURCHASING DEPARTMENT

REQUEST FOR BID

20-020 NORTHEAST PARKWAY EXTENSION

BIDS DUE WEDNESDAY, MAY 13, 2020

BY 2:00 P.M. CDT

Contents

CONTRACT DOCUMENTS / SPECIFICATIONS ATTACHED

INVITATION TO BID

The City of North Richland Hills is accepting sealed bids from all interested parties for:

- Bid Number: 20-020
- Bid Type: REQUEST FOR BID
- Bid Name: NORTHEAST PARKWAY EXTENSION
- Bid Due Date: Wednesday, May 13, 2020
- Bid Due Time: 2:00 P.M.Central Daylight Time
- Deadline for questions:
  Date: Friday, May 01, 2020
  Time: 12:00 P.M. Central Daylight Time

DOCUMENTS MAY BE SUBMITTED ELECTRONICALLY VIA:

www.publicpurchase.com

DOCUMENTS MAY BE MAILED TO:

City of North Richland Hills
Purchasing, Attn: 20-020 NORTHEAST PARKWAY EXTENSION
4301 City Point Drive
North Richland Hills, TX 76180

If mailing a bid packet please include ***One (1) hard copy and One (1) soft copy on Flash drive.*** Submit documents in a sealed envelope with the following information marked plainly on the front:

ATTN: PURCHASING DEPARTMENT
20-020 NORTHEAST PARKWAY EXTENSION

No oral explanation in regard to the meaning of the specifications will be made, and no oral instructions will be given after the pre-bid meeting and before the award of the contract. Requests from interested vendors for additional information or interpretation of the information included in the specifications should be directed in writing as a question related to this bid on Public Purchase and the question will be answered on Public Purchase. All addendums will also be posted to Public Purchase. It will be the vendor's responsibility to check all information related to this bid on Public Purchase before submitting a response.

The City of North Richland Hills reserves the right to reject in part or in whole all bids submitted, and to waive any technicalities for the best interest of the City of North Richland Hills.

GENERAL CONDITIONS

In submitting this bid, the Bidder understands and agrees to be bound by the following terms and conditions. These terms and conditions shall become a part of the purchase order or contract and will consist of the invitation to bid, specifications, the responsive bid and the contract with attachments, together with any additional documents identified in the contract and any written change orders approved and signed by a city official with authority to do so. All shall have equal weight and be deemed a part of the entire contract. If there is a conflict between contract documents, the provision more favorable to the City shall prevail.

1. BID TIME

It shall be the responsibility of each Bidder to ensure his/her bid is turned in to the City of North Richland Hills on or before **2:00 P.M.Wednesday, May 13, 2020**. The official time shall be determined by the clock located in the North Richland Hills City Hall Purchasing Department. Bids received after the time stated above will be considered ineligible and returned unopened.

All attached bid documents are to be returned completely filled out, totaled, and signed. Envelopes containing bids must be ***sealed***. The City of North Richland Hills will not accept any bid documents other than the attached.

2. WITHDRAWING BIDS/PROPOSALS/QUOTES

Bids may be withdrawn at any time prior to the official opening; request for non-consideration of bids must be made in writing to the Purchasing Manager and received prior to the time set for opening bids. The bidder warrants and guarantees that his/her bid has been carefully reviewed and checked and that it is in all things true and accurate and free of mistakes. Bidder agrees that a bid price may not be withdrawn or canceled by the bidder for a period of ninety (90) days following the date designated for the receipt of bids.

3. **BID SECURITY**

A certified check or cashier's check or acceptable bidder's bond made payable to the City of North Richland Hills, Texas, in an amount of five percent (5%) of the bid submitted must accompany each bid as a guarantee that if awarded the contract, the bidder will promptly enter into a contract and execute such bonds as are required.

4. IRREGULAR BIDS/PROPOSALS/QUOTES

Bids will be considered irregular if they show any omissions, alterations of form, additions, or conditions not called for, unauthorized alternate bids, or irregularities of any kind. However, the City of North Richland Hills reserves the right to waive any irregularities and to make the award in the best interest of the City.

5. REJECTION/DISQUALIFICATION

Bidders will be disqualified and/or their bids rejected, among other reasons, for any of the specific reasons listed below:

a) Bid received after the time set for receiving bids as stated in the advertisement;
b) Reason for believing collusion exists among the Bidders;

c) Bid containing unbalanced value of any item; bid offering used or reconditioned equipment;
d) Where the bidder, sub-contractor or supplier is in litigation with the City of North Richland Hills or where such litigation is contemplated or imminent;
e) Uncompleted work which in the judgment of the City will prevent or hinder the prompt completion of additional work, or having defaulted on a previous contract;
f) Lack of competency as revealed by reference checks, financial statement, experience and equipment, questionnaires, or qualification statement;
g) Bid containing special conditions, clauses, alterations, items not called for or irregularities of any kind, which in the Owner's opinion may disqualify the Bidder.

However, the City of North Richland Hills reserves the right to waive any irregularities and to make the award in the best interest of the City of North Richland Hills.

6. BID EVALUATION

Award of bid, if it be awarded, will be made to the lowest responsible bidder or may be awarded to the bidder that offers the goods and/or services at the *best value* for the City (Texas Local Government Code, 252.043). In determining the best value the City will consider the following:

a) The purchase price; terms and discounts; delivery schedule;
b) The reputation of the bidder and of the bidder's goods or services;
c) The quality of the bidders' goods or services;
d) The extent to which the bidder's goods or services meet the City specifications and needs;
e) The bidder's past relationship with the City;
f) Total long term cost to the city to acquire the bidder's goods or services;
g) Any relevant criteria specifically listed in the specifications;
h) Compliance with all State and local laws, General Conditions and Specifications;
i) Results of testing, if required;
j) Warranty and/or guarantee, maintenance requirements and performance data of the product requested;
k) City's evaluation of the bidder's ability to perform to specifications.

7. AWARD OF BID

The bid award will be made within sixty (60) days after the opening of bids. No award will be made until after investigations are made as to the responsibilities of the best bidder.

The City of North Richland Hills reserves the right to award bids whole or in part when deemed to be in the best interest of the City. Bidder shall state on bid form if their bid is "all or none", otherwise it shall be considered as agreeing to this section.

Information contained in submitted bid documents shall not be available for inspection until after the award has been made by the City Council. Requests for this information must be submitted in writing.

8. SALES TAX

The City of North Richland Hills is exempt from Federal Excise and State sales tax; therefore tax must not be added to bid.

9. TIE BIDS

In the event of a tie bid, State Law provides the bid or contract shall be awarded to the local bidder. In cases where a local bidder is not involved, tie bids shall be awarded by drawing lots at the City Council meeting, or as otherwise directed by the Mayor.

10. REFERENCES

A minimum of three (3) references, preferably located within the Dallas/Fort Worth Metroplex, must be submitted with each bid. Company name, contact and phone number must be included with each reference.

11. PROHIBITION AGAINST PERSONAL FINANCIAL INTEREST IN CONTRACTS

No employee of the City of North Richland Hills shall have a direct or indirect financial interest in any proposed or existing contract, purchase, work, sale or service to or by the City (CMA-074, Standards of Conduct, Section IV).

12. ELECTRONIC PROCUREMENT

The City of North Richland Hills has adopted policies and procedures complying with Local Government Code Section 252.0415, Section 271.906 and Section 2155.062. The City of North Richland Hills may receive submittals in electronic form in response to procurement requests. However, a bid that is submitted non-electronically by the due date and time will be accepted and then entered electronically by Purchasing after the bid opening.

13. COMPLIANCE WITH SB 89:

Vendor agrees per HB 89 of the 85th Texas Legislative Session, and in accordance with Chapter 2270 of the Texas Government Code, vendor has not and shall not boycott Israel at any time while providing products or services to the City of North Richland Hills.

[ ] Yes, we agree [ ] No, we do not agree

14. COMPLIANCE WITH SB 252:

Vendor agrees per SB 252 of the 85th Texas Legislative Session, and in accordance with Chapter 2252 of the Texas Government Code, vendor shall not do business with Iran, Sudan or a foreign terrorist organization while providing products or services to the City of North Richland Hills.

[ ] Yes, we agree [ ] No, we do not agree *

* By selecting no, vendor certifies that it is affirmatively excluded from the federal sanctions regime by the United States government and is not subject to the contract prohibition under Section 2252.154 of the Texas Government Code. Vendor shall provide sufficient documentation to the City of such exclusion prior to award of any contract for goods or services.

15. ETHICS AND COMPLIANCE POLICY

The City's Ethics and Compliance Policy can be found at The City of North Richland Hills Purchasing Division webpage - Or you may request a copy from the Purchasing Division. Acknowledgment - The City of North Richland Hills' Internal Ethics and Compliance Policy has been made available to me. I understand the expectations of ethical behavior and compliance with the law, and agree to adhere to the City's ethics policies.

https://www.nrhtx.com/DocumentCenter/View/389/Code-of-Ethics---PDF?bidId

[ ] I agree
[ ] I do not agree

16. DEPARTMENT OF TRANSPORTATION (TXDOT) RELATED BIDS

"The City of North Richland Hills, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award." Due care and diligence has been used in preparation of this information, and it is believed to be substantially correct. However, the responsibility for determining the full extent of the exposure and the verification of all information presented herein shall rest solely with the bidder. The City of North Richland Hills and its representatives will not be responsible for any errors or omissions in these specifications, nor for the failure on the part of the proposer to determine the full extent of the exposures.

INSURANCE REQUIREMENTS

Contractors performing work on City property or public right-of-way for the City of North Richland Hills shall provide the City a certificate of insurance evidencing the coverages and coverage provisions identified herein. Contractors shall provide the City evidence that all subcontractors performing work on the project have the same types and amounts of coverages as required herein or that the subcontractors are included under the contractor's policy. The City, at its own discretion, may require a certified copy of the policy.

All insurance companies and coverages must be authorized by the Texas Department of Insurance to transact business in the State of Texas and must be acceptable to the City of North Richland Hills.

Listed below are the types and amounts of insurance generally required. The City reserves the right to amend the insurance requirements or require additional types and amounts of coverages or provisions depending on the nature of the work or services to be performed.

Type of Insurance	Amount of Insurance	Provision
1. Commercial General Liability to include coverage for: a) Premises/Operations b) Products/Completed Operations c) Independent Contractors d) Personal Injury e) Contractual Liability f) Personal/Advertising Injury g) Medial Expense h) Fire Legal Liability i) Underground Hazard j) Explosion/Collapse Hazard k) Patent Infringement l) Copyright Law Violations	$1,000,000 each occurrence, $1,000,000 general aggregate; Or $1,000,000 combined single limits	City to be listed as additional insured and provided 30 day-notice of cancellation or material change in coverage City prefers that insurer be rated B+V1 or higher by A. M. Best or A or higher by Standard & Poor's
2. Consultants, architects, engineers, Landscape design specialist, other professional services	$500,000 Professional Liability with proof that aggregate is still available.	
3. Workers' Compensation & Employers' Liability	Statutory Limits $500,000 each accident	Alternate employer endorsement required
4. Comprehensive Automobile Liability Insurance, including coverage for loading and unloading hazards, for a) Owned/Leased Vehicles b) Non-Owned Vehicles c) Hired Vehicles	$500,000 Combined single limit for bodily injury and property damage	

A PURCHASE ORDER WILL NOT BE ISSUED WITHOUT EVIDENCE OF INSURANCE.

NON-COLLUSION AFFIDAVIT OF BIDDER

State of _____ County of _____

_____ verifies that:
(Name)

(1) He/She is owner, partner, officer, representative, or agent of

_____, has submitted the attached bid: (Company Name)

(2) He/She is fully informed in respect to the preparation, contents and circumstances in regard to attached bid;

(3) Neither said bidder nor any of its officers, partners, agents or employees has in any way colluded, conspired or agreed, directly or indirectly with any other bidder, firm or person to submit a collusive or sham bid in connection with attached bid and the price or prices quoted herein are fair and proper.

_____
SIGNATURE

_____
PRINTED NAME

Subscribed and sworn to before me this

_____ Day of _____ 2019.

_____
NOTARY PUBLIC in and for

_____ County, Texas.

My commission expires: _____

THIS FORM MUST BE COMPLETED, NOTARIZED AND SUBMITTED WITH BID

BID CERTIFICATION

The Undersigned, in submitting this bid, represents and certifies:

a. He/she is fully informed regarding the preparation, contents and circumstances of the attached bid;

b. He/she proposes to furnish all equipment/service at the prices quoted herein and bid is in strict accordance with the conditions and specifications stated herein;

c. There will be at no time a misunderstanding as to the intent of the specifications or conditions to be overcome or pleaded after the bids are opened;

d. He/she is an equal opportunity employer, and will not discriminate with regard to race, color, national origin, age or sex in the performance of this contract.

e. The undersigned hereby certifies that he/she has read, understands and agrees that acceptance by the City of North Richland Hills of the bidder's offer by issuance of a purchase order will create a binding contract. Further, he/she agrees to fully comply with documentary forms herewith made a part of this specific procurement.

COMPANY: _____

ADDRESS: _____

CITY, STATE & ZIP: _____

TELEPHONE: _____

FAX _____

EMAIL: _____

SIGNATURE: _____

PRINTED NAME: _____

DATE: _____

COMPLIANCE WITH HOUSE BILL 1295

In 2015, the Texas Legislature adopted House Bill 1295, which added section 2252.908 of the Government Code. The law states that a governmental entity may not enter into certain contracts with a business entity unless the business entity submits a disclosure of interested parties to the governmental entity at the time the business entity submits the signed contract to the governmental entity.

The law applies only to a contract of a governmental entity that either (1) requires an action or vote by the governing body of the entity or agency before the contract may be signed or (2) has a value of at least $1 million. The disclosure requirement applies to a contract entered into on or after January 1, 2016.

The Texas Ethics Commission has adopted rules necessary to implement the law, prescribed the disclosure of interested parties form, and posted a copy of the form on the commission's website.

Filing Process:
The commission has made available on its website a new filing application that must be used to file Form 1295. A business entity must:

1) Use the application to enter the required information on Form 1295,
2) Print a copy of the completed form, which will include a certification of filing that will contain a unique certification number.
3) Contract Number should be the Bid/RFP Number and Bid Title.
4) Sign the printed copy of the form (an authorized agent of the business entity must sign),
5) Either include your personal information or have the form notarized,
6) File the completed Form 1295 with the certification of filing with the governmental body with which the business entity is entering into the contract.

The governmental entity must notify the commission, using the commission's filing application, of the receipt of the filed Form 1295 with the certification of filing not later than the 30th day after the date the contract binds all parties to the contract. The commission will post the completed Form 1295 to its website within seven business days after receiving notice from the governmental entity.

Information regarding how to use the filing application may be found at https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm.

FOR DISADVANTAGED BUSINESS ENTERPRISES ONLY

Disadvantaged Business Enterprises (DBE) are encouraged to participate in the City of North Richland Hills bid process. Representatives from DBE Companies should identify themselves as such and submit a copy of their Certification.

The City of North Richland Hills recognizes the certifications of both the State of Texas Building and Procurement Commission HUB Program and the North Central Texas Regional Certification Agency. All companies seeking information concerning DBE certification are urged to contact:

Texas Building and Procurement Commission
Statewide HUB Program
1711 San Jacinto Blvd., Austin TX 78701-1416
P O Box 13186, Austin, TX 78711-3186
(512) 463-5872
http://www.window.state.tx.us/procurement/prog/hub/hub-certification/

North Central Texas
Regional Certification Agency
624 Six Flags Drive, Suite 216
Arlington, Texas 76011
(817) 640-0606
http://www.nctrca.org/certification.html

If your company is already certified, attach a copy of your certification to this form and return as part of your packet.

Company Names: _____

Representative: _____

Address: _____

City, State, Zip: _____

Telephone No. _____ **Fax No.** _____

Email address: _____

INDICATE ALL THAT APPLY:

_____**Minority-Owned Business Enterprise**
_____**Women-Owned Business Enterprise**
_____**Disadvantaged Business Enterprise**

CONFLICT OF INTEREST QUESTIONNAIRE

Pursuant to Chapter 176 of the Texas Local Government Code, a person, or agent of a person, who contracts or seeks to contract for the sale or purchase of property, goods, or services with the City of North Richland Hills must file a completed conflict of interest questionnaire. The conflict of interest questionnaire must be filed with the City Secretary of the City of North Richland Hills no later than the seventh business day after the person or agent begins contract discussions or negotiations with the City of North Richland Hills or submits to the City of North Richland Hills an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of North Richland Hills. 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.

The Conflict of Interest Questionnaire is included as part of this document and can be found at:

https://www.ethics.state.tx.us/forms/CIQ.pdf

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY
Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information is being disclosed.**

_____
Name of Officer

4 **Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

5 **Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

_____ _____
Signature of vendor doing business with the governmental entity Date

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

***

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

CONTRACT DOCUMENTS
AND
CONSTRUCTION SPECIFICATIONS
FOR

NORTHEAST PARKWAY EXTENSION FROM DAVIS BOULEVARD TO SMITHFIELD ROAD

FOR THE

CITY OF NORTH RICHLAND HILLS

April 2020

City of North Richland Hills
Public Works Department

Project RFB 20-020

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SECTION I

BIDDING DOCUMENTS

NOTICE TO BIDDERS

SEALED BIDS on forms prepared by the Engineer will be received by the office of the Purchasing Manager of the City of North Richland Hills at City Hall until 02:00PM CDT on Wednesday, May 13, 2020 for furnishing all labor, material, equipment and the performance of all work required for:

NORTHEAST PARKWAY EXTENSION
FROM DAVIS BOULEVARD TO SMITHFIELD ROAD

at which time and place the bids will be publicly opened, read aloud and retained by the Public Works Department for tabulation, checking and evaluation.

BIDS MAY BE DELIVERED TO:

City of North Richland Hills
Logistics Department
4301 City Point Drive,
North Richland Hills, TX 76180

BIDS MAY ALSO BE UPLOADED TO: www.publicpurchase.com

COMPLETED BID FORMS shall be submitted in sealed envelopes upon the blank Bid Form furnished in the Construction Specifications. Sealed envelopes shall be marked: "NORTHEAST PARKWAY EXTENSION FROM DAVIS BLVD TO SMITHFIELD ROAD" – DO NOT OPEN UNTIL 02:00PM, Wednesday, May 13, 2020.

COMPLETED BID FORMS shall be accompanied by a Bid Guaranty consisting of either a cashier's check or a Bid Bond on the form included or similar form of Surety Company (FACISIMILES WILL NOT BE CONSIDERED RESPONSIVE) made payable to The City of North Richland Hills, and in the amount of five percent (5%) of the total amount of the largest amount bid as a guarantee that if the bid is accepted, the bidder will execute the Contract and furnish the required Bonds, within the time-frame indicated in the Bid Form, to the City of North Richland Hills.

BIDDERS should carefully examine the plans, specifications and other documents; visit the site of the work; fully inform themselves as to all conditions and matters that can in any way affect the work or the costs thereof. Should a bidder find discrepancies or omissions from the plans, specifications or any other documents or should he/she be in doubt as to the meaning, he/she should at once notify the Purchasing Manager and obtain clarification prior to submitting any bid.

PLANS AND SPECIFICATIONS can be downloaded from ***Public Purchase*** (see below).

A NON-MANDATORY PRE-BID CONFERENCE will not be held for this project in light of current shelter-in-place restrictions.
PUBLIC PURCHASE: Bidders are encouraged to register with the City of North Richland Hills Purchasing Manager, Scott Kendall, via email at purchasing@nrhtx.com. All Bidders who have registered with Public Purchase (http://www.publicpurchase.com) will receive automatic email notifications pertaining to this Bid, such as addendums and other related information released subsequent to the initial release of plans, specifications, bid forms, and contract documents. **It is the sole responsibility of the Bidder to register as a planholder with the City of North Richland Hills. Questions pertaining to this project should be submitted via Public Purchase where the bid is advertised.**

Minimum wage rates to all laborers and mechanics on the project must not be less than as provided in the Contract Documents and Wage Provisions must particularly comply with all other applicable wage laws of the State of Texas.

The right is reserved, as the interest of the City of North Richland Hills may require, to reject any and all bids, to waive any informality in the bids received, and to select a bid best suited to the City of North Richland Hills' best interest.

In case of ambiguity or lack of clearness in stating bid prices, the City of North Richland Hills reserves the right to adopt the most advantageous construction thereof, or to reject any or all bids. No bid may be withdrawn within sixty (60) days after the date on which bids are opened.

CITY OF NORTH RICHLAND HILLS

Scott Kendall
Purchasing Manager

ADVERTISEMENT DATES:

- **April 17, 2020**
- **April 19, 2020**

SPECIAL INSTRUCTIONS TO BIDDERS

1. BID SECURITY:

A certified check or cashier's check or acceptable bidder's bond made payable to the City of North Richland Hills, Texas, in an amount of five percent (5%) of the bid submitted must accompany each bid as a guarantee that if awarded the contract, the bidder will promptly enter into a contract and execute such bonds as are required.

2. QUALIFICATION OF BIDDERS:

No pre-qualification of bidders is required. However, in consideration of the bids, the City of North Richland Hills may require bidders to furnish a written experience record and a financial statement or the most recent audited financial statement of the firm. The City of North Richland Hills reserves the right to use these items of data to influence a decision as to the award of the contract. Bidders need not submit a statement of experience and financial condition unless requested to do so by the City of North Richland Hills.

3. CONFLICT OF INTEREST QUESTIONNAIRE:

Bidders are required to complete the Conflict of Interest Questionnaire and to submit this completed form along with their bid form documents.

4. WAGE RATES:

Attention is called to the fact that not less than the prevailing wage rates as hereinafter set forth in the Special Provisions of these Contract Documents, which are made a part hereof, must be paid on this project.

5. PRE-BID CONFERENCE:

No pre-bid meeting is planned at this time.

6. BONDS:

A performance bond and a payment bond, each in the amount of not less than one hundred percent (100%) of the contract price, conditioned upon the faithful performance of the contract and upon payment of all persons supplying labor or furnishing materials, will be required on this project. Additionally, a two (2) year maintenance bond, in the amount of not less than twenty percent (20%) of the final contract price, will be required on this project.

7. POWER OF ATTORNEY:

Attorneys-in-Fact who sign bid bonds or contract bonds must file with each bond a certified and current copy of their power of attorney.

8. STANDARD SPECIFICATIONS:

All work required by this project shall be in accordance with the “Public Works Design Manual” adopted by the City of North Richland Hills and the “Public Works Construction Standards - North Central Texas” adopted by the North Central Texas Council of Governments (NCTCOG), Fifth Edition (November 2017), except as modified in the Contract Documents. Where a conflict exists between the “Public Works Design Manual” and the “Public Works Construction Standards - North Central Texas”, the “Public Works Design Manual” shall govern. Copies of both of these standards are included in the Contract Documents by reference and are made a part thereof. Omission of any section from this project's Contract Documents does not mean that such section is not applicable to this project.

9. UNIT PRICE CONTRACT:

The contract for this project is a "Unit Price" Contract. As such, the City of North Richland Hills reserves the right to add and/or delete quantities to specific pay items. The City of North Richland Hills may further delete an entire unit price pay item if the City of North Richland Hills desires. The City of North Richland Hills reserves the right to increase or decrease the amount of work to be done by any amount not to be exceeded by twenty-five percent (25%) of the original contract amount. In the event the increase pertains to items not originally bid, the Contractor shall submit a bid in writing to the City of North Richland Hills for approval.

It is further agreed that lump sum prices may be increased to cover additional work ordered by the City of North Richland Hills but not shown on the plans or required by the specifications, in accordance with the provisions of the general conditions; similarly, lump sum prices may be decreased to cover deletion of work so ordered.

The City of North Richland Hills reserves the right to reject the Contractor's bid on such extra work and secure such work to be done other than by said Contractor.

10. MEASUREMENT AND PAYMENT:

The basis of payment for the pay items noted in the proceeding pages shall be full compensation for furnishing all labor, materials, equipment and incidentals required to complete the work as specified and as shown in the project plans/drawings. Any item of work not specifically listed for payment but required by the project documents shall be considered an incidental item of the project and no specific payment will be made.

11. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT:

The successful bidder, upon his/her failure or refusal to execute and deliver the contract and bonds required within ten (10) days after he/she has received notice of the acceptance of his/her bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his/her bond.

12. CONDITIONS OF WORK / OBLIGATION OF BIDDER:

Each bidder must inform himself/herself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his/her obligation(s) to furnish all material, labor, equipment and incidentals necessary to carry out the provisions of this contract. Insofar as possible, the Contractor, in carrying out his/her work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor or City of North Richland Hills public employees.

At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and Contract Documents (including all addenda). The failure or omission of any bidder to examine any form, instrument, or documents shall in no way relieve the bidder from any obligation in respect to his/her bid.

13. ADDENDA AND INTERPRETATIONS:

Bidders wanting further information, interpretation or clarification of the Contract Documents must make their request in writing to Scott Kendall, Purchasing Manager by 12:00pm (noon) CST on Friday, May 01, 2020. Answers to all such requests will be made a part of the Contract Documents. No other explanation or interpretation will be considered official or binding.

Should a bidder find discrepancies in, or omission from the Contract Documents, or should he/she be in doubt as to their meaning, he/she should at once notify Scott Kendall, Purchasing Manager in order that a written addendum may be sent to all bidders. Any addenda issued will be mailed or be delivered to each prospective bidder. The bid form as submitted by the bidder must be so constructed as to include any addenda issued by the City prior to 24 hours of the opening bids, with the appropriate recognition of addenda so noted in the bid form.

No interpretation of the meaning of plans, specifications or other pre-bid documents will be made to any bidder orally. Every request for such interpretation shall be in writing, addressed to Scott Kendall, Purchasing Manager or directly through Public Purchase and to be given consideration, must be received by 12:00PM (noon) on Friday, May 01, 2020. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications and plans which, if issued, will be published on Public Purchase, not later than three (3) days prior to the date fixed for opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve the bidder from any obligation under his/her bid submitted. All addenda shall become part of the Contract Documents.

14. LAWS AND REGULATIONS:

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

15. SUBMITTALS:

Prior to any construction commencing on this project the Contractor shall submit the required submittals to the City Engineer and have his approval for all such submittals as required in the Technical Specifications.

FINANCIAL STATEMENT

Condition of Bidder at close of Business month, _____, 20__

		ASSETS	LIABILITIES
1.	Cash on Hand	$ _____	$ _____
	Cash in Bank	$ _____	$ _____
	Cash Elsewhere	$ _____	$ _____
2.	Accounts receivable from completed contracts (exclusive of claims not approved for payment)	$ _____	$ _____
3.	Accounts receivable from other sources than above	$ _____	$ _____
4.	Amounts earned on uncompleted contracts (not included in Item 3) (Contract price on completed portion of uncompleted contracts less total cost of completed portion)	$ _____	$ _____
5.	Deposits for bids on other guarantees		$ _____
6.	Notes Receivable Past Due	$ _____	
	Due 90 days	$ _____	
	Due Later	$ _____	
7.	Interest Earned	$ _____	
8.	Real Estate, Business Property, present value	$ _____	
	Other property, present value	$ _____	$ _____
9.	Stocks and Bonds, Listed on Exchange	$ _____	$ _____
	Unlisted	$ _____	$ _____
10.	Equipment, Machinery, Fixtures	$ _____	$ _____
	Less Depreciation	$ _____	$ _____
11.	Other Assets	$ _____	
	TOTAL ASSETS	$ _____	$ _____

LIABILITIES AND NET WORTH

		ASSETS	LIABILITIES
1.	Notes Payable to Banks Regular	$ _____	
	(For Certified Checks)	$ _____	
	Equipment Obligations	$ _____	
	Others	$ _____	$ _____
2.	Accounts Payable Current	$ _____	
	Past Due	$ _____	
3.	Real Estate Mortgages	$ _____	$ _____
4.	Other Liabilities		$ _____
5.	Reserves	$ _____	
6.	Capital Stock Paid Up		
	Common	$ _____	
	Preferred	$ _____	
7.	Surplus	$ _____	
	TOTAL LIABILITIES	$ _____	$ _____

EXPERIENCE RECORD

List of Projects your Organization has successfully completed:

Amount of Contract Award	Type of Work	Date Accepted	Name and Address of Owner

List of Projects your Organization is now engaged in completing:

Amount of Contract Award	Type of Work	Anticipated Date of Completion	Name and Address of Owner

List of Surety Bonds in Force on above Uncompleted Work:

Date of Contract Award	Type of Bond	Amount of Bond[1]	Name and Address of Surety

1 List every type of bond separately. If one project has more than one type of bond, list each and every bond for that project on a separate line.

EQUIPMENT SCHEDULE

List of Equipment owned by bidder that is in serviceable condition and available for use:

Portions of work Bidder proposes to sublet if Awarded the Contract including amount and type:

BID FORM

FOR

NORTHEAST PARKWAY EXTENSION FROM DAVIS BOULEVARD TO SMITHFIELD ROAD

FOR THE

CITY OF NORTH RICHLAND HILLS, TEXAS

(THIS BID FORM MUST BE COMPLETED IN ITS ENTIRETY, SUBMITTED IN ITS ENTIRETY AND NOT REMOVED FROM THE CONTRACT DOCUMENTS)

Bid Opening Date: 02:00PM (CDT), May 13, 2020

TO: City of North Richland Hills
4301 City Point Drive
North Richland Hills, Texas 76180

FOR: Northeast Parkway Extension from Davis Boulevard to Smithfield Road

Pursuant to the foregoing "Notice to Bidders", the undersigned bidder, having thoroughly examined the Contract Documents, the site of the project and understanding the amount of work to be done and the prevailing conditions, hereby proposes to fully complete all of the work and requirements as provided in the plans and Contract Documents and binds himself/herself upon acceptance of this bid form to execute a contract and furnish such bonds as required and proposes to complete the work within the time stated and for the following prices:

BID SCHEDULE

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION I – EROSION CONTROL

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
1.	1	LS	Traffic Control @ _____ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

SUB-TOTAL AMOUNT BID – Base Bid SECTION I – TRAFFIC CONTROL

$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION II – DEMOLITION

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
2.	2	EA	Tree Removal (Various Sizes) _____ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
3.	250	LF	Full Depth Sawcut @ _____ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
4.	140	SY	Pavement Removal @ _____ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

SUB-TOTAL AMOUNT BID – Base Bid SECTION II – DEMOLITION

$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION III – PAVING AND DRAINAGE

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
5.	1	LS	Mobilization and General Site Preparation @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
6.	1	LS	Construction Staking @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
7.	4	EA	10' Curb Inlet @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
8.	729	LF	Trench Safety for Storm Drain Lines @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
9.	1	EA	Storm Sewer Manhole (NRH Std 12D-1, 12D-2) @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION III – PAVING AND DRAINAGE

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
10.	59	LF	18-inch Class III Reinforced Concrete Storm Drain Pipe @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
11.	224	LF	24-inch Class III Reinforced Concrete Storm Drain Pipe @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
12.	413	LF	27-inch Class III Reinforced Concrete Storm Drain Pipe @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
13.	33	LF	30-inch Class III Reinforced Concrete Storm Drain Pipe @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION III – PAVING AND DRAINAGE

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
14.	1	EA	Single Barrel TxDOT Headwall (CH-FW-0) @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
15.	1	EA	Project Sign (NRH Std 12D-1, 12D-2) @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
16.	115	SY	4" 3000psi Reinforced Concrete Sidewalk Pavement @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
17.	336	SY	6" Integral Color and Stamped 4000psi Concrete Pavement @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION III – PAVING AND DRAINAGE

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
18a.	5,504	SY	7" 4000psi Reinforced Concrete Pavement with Monolithic Curb @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
18b.	249	LF	2" Curb and Gutter in Roundabout @ _____ Dollars and _____ Cents Per Unit	$ _____	$
19.	144	TON	Hydrated Lime @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
20.	5,964	SY	8" Lime Stabilized Subgrade @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION III – PAVING AND DRAINAGE

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
21.	196	SY	10" Continuously Reinforced Concrete Pavement with Monolithic Curb @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
22.	196	SY	4" Asphalt Type "B" Base Course HMAC @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
23a.	700	CY	Unclassified Excavation @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
23b.	4,515	CY	Fill @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
24.	2	EA	NRH Barrier Free Ramp (Type 1) @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION III – PAVING AND DRAINAGE

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
25.	4	EA	NRH Barrier Free Ramp (Type 3) @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
26.	3	EA	TxDOT Barrier Free Ramp (Type 7) @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
27.	1	EA	MUTCD R1-1 Stop Sign @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
28.	2	EA	MUTCD W2-6 Sign with W13-1 20mph Sign @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
29.	2	EA	MUTCD R1-2 Yield Sign @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION III – PAVING AND DRAINAGE

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
30.	2	EA	MUTCD W1-8 Sign @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
31.	2	EA	18" Stop Bar @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
32.	175	LF	10' Crosswalk @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
33.	5	EA	Solid Directional Arrows @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
34.	50	LF	Double Yellow Type Y and Type IIAA Buttons @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION III – PAVING AND DRAINAGE

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
35.	132	LF	Continuous Turn Lane Type Y and Type IIAA Buttons @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
36.	363	LF	4" Solid White Parking Stripe @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
37.	5	EA	Adjust Water Valves @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
38.	2	EA	Adjust Existing Sanitary Sewer Manhole to Grade @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
39.	250	LF	4" SCH40 PVC Conduit @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION III – PAVING AND DRAINAGE

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
40.	1	LS	Miscellaneous Paving Improvements @ Eight thousand Dollars And 00/100 Cents Per Unit	$ 8,000.00	$ 8,000.00
41.	1	LS	Miscellaneous Drainage Improvements @ Three thousand Dollars And 00/100 Cents Per Unit	$ 3,000.00	$ 3,000.00
42.	1	LS	Miscellaneous Landscape Improvements @ Two thousand Dollars and Cents Per Unit	$ 2,000.00	$ 2,000.00

SUB-TOTAL AMOUNT BID – Base Bid SECTION III – PAVING AND DRAINAGE

$ _____

BASE BID – NORTHEAST PARKWAY FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
SECTION IV – EROSION CONTROL

Item No.	Estim. Quantity	Unit	Name of Pay Item with Unit Price in Words	Unit Bid Price	Amount Bid
43.	1	LS	Storm Water Pollution Prevention Plan @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
44.	6,690	SY	Hydromulch @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
45.	400	SY	Solid Sodding @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____
46.	800	SF	Rip Rap (TxDOT Item 432) @ _____ Dollars and _____ Cents Per Unit	$ _____	$ _____

SUB-TOTAL AMOUNT BID – Base Bid SECTION IV – EROSION CONTROL

$ _____

Total Amount Bid: Base Bid:

Section I – Traffic Control **$**_____

Section II – Demolition **$**_____

Section III – Paving & Drainage **$**_____

Section IV – Erosion Control **$**_____

$_____

(Total Amount Bid, Numerical Value)

The undersigned bidder acknowledges receipt of the following Addenda: **(If none is received, then write NONE across the blanks.)**

Addendum No. 1 - Date Received _____

Addendum No. 2 - Date Received _____

Addendum No. 3 - Date Received _____

Addendum No. 4 - Date Received _____

The undersigned bidder agrees to execute and file with the Owner a contract and bonds on the forms provided within ten (10) days after written notification of award of the contract to him and to begin the work to be performed under the contract within ten (10) days after written authorization to begin the work (Work Order) and to complete the Phase I work in full within **180 Consecutive Calendar Days** after the date specified in the "Phase I Notice to Proceed/Work Order". See contract for additional schedule / time requirements to include Phase II.

Enclosed with this bid form is a certified check or cashier's check or bid bond payable to the City of North Richland Hills in the amount of five percent (5%) of the total bid, which is to become the property of the City of North Richland Hills, or the attached Bidder's Bond is to be forfeited in the event the contract and bond are not executed within the time set forth, as liquidated damages for delay and additional work caused thereby.

Respectfully Submitted,

Signed: _____

Company: _____

Address: _____

_____

_____ SEAL
(If Bidder is a Corporation)

Telephone: _____

Fax: _____

Submitted by: _____ an individual
A partnership
A corporation

Doing Business As: _____

SECTION II

CONTRACTUAL DOCUMENTS

STANDARD FORM OF CONSTRUCTION AGREEMENT

THE STATE OF TEXAS §
§
COUNTY OF TARRANT §

THIS AGREEMENT is entered into this the ___ day of _____, 20__, by and between the CITY NORTH RICHLAND HILLLS, a municipal corporation, of the County of Tarrant and State of Texas, hereinafter called "OWNER" and _____of the City of _____, County of _____ and State of _____ hereinafter called "CONTRACTOR."

OWNER and CONTRACTOR in consideration of the mutual covenants contained in this Agreement, agree as follows:

ARTICLE 1. WORK.

CONTRACTOR covenants and agrees to perform the Work in every detail, in a good and first-class workmanlike manner as specified and indicated in the Contract Documents, of which are incorporated in this Agreement in their entirety as if they were herein set out at length written word for word. The CONTRACTOR shall furnish all labor, materials, tools and equipment required to perform and complete the Work in strict accordance with these Contract Documents. The Work is described as follows:

NORTHEAST PARKWAY EXTENSION PROJECT
FROM DAVIS BOULEVARD TO SMITHFIELD ROAD

ARTICLE 2. CONTRACT PRICE.

OWNER agrees to pay CONTRACTOR for completion of the Work in accordance with the Contract Documents, the price or prices shown in the bidder's proposal, which total the following amount:

_____ DOLLARS AND CENTS ($XXX,XXX.00) (“Contract Price”).

ARTICLE 3. CONTRACT TIME / TERMINATION / LIQUIDATED DAMAGES.

Unless otherwise stated in this agreement, **time shall be considered of the essence.**

a. When **time is of** the essence, the CONTRACTOR shall be liable for failure to deliver or delay in delivery occasioned by and including without limitation strikes, lock-outs, inability of obtaining material or shopping space, breakdowns, delays of carriers or suppliers, and preexisting governmental acts and regulations of the Federal and State governments or any subdivision thereof, unless such governmental acts and regulations affecting delivery could not be found, recognized, or discovered by due diligence on the part of the CONTRACTOR prior to submission of his/her bid and City Council's acceptance thereof.

b. When **time is not of** the essence, this agreement shall be inoperative during such period of time that aforesaid delivery or acceptance may be rendered impossible by reason of fire, strike, Acts of God, or government regulation. Provided, however, to the extent that the CONTRACTOR has any commercially reasonable alternative method of performing this contract by purchase on the market or otherwise, he/she shall not be freed of his/her obligation hereunder by this clause, even though the goods intended for this contract were destroyed or their delivery delayed because of any event described above.

c. **As time is of the essence on this contract**, CONTRACTOR agrees to commence work under this contract within ten (10) days from the date specified in the "Notice to Proceed" and to totally complete Phase I Work within **180** consecutive calendar days after the date specified in the "Notice to Proceed," subject to such extensions of time as are indicated in the Special Provisions. Additionally, CONTRACTOR agrees to complete Phase II Work within **120** consecutive calendar days after the Phase II "Notice to Proceed," subject to such extensions of time as are indicated in the Special Provisions. Phase II Notice to Proceed date will be coordinated with the CONTRACTOR, with at least 60 days advance notice provided prior to available Phase II start time.

Milestone	Duration	Anticipated Start Date
Storm Drain	60 cal. days	7/15/2020
Phase I Paving	180 cal. days	7/15/2020
Phase II Paving	120 cal. days	6/15/2021

d. Milestones included in this contract are as follows:

(1) **Completion of Storm Drain Lines A2 & B within 60 calendar days of the Phase I Notice to Proceed date (subject to such extensions of time as are indicated in the Special Provisions), but no later than October 1, 2020.** The 'Notice to Proceed' date will be no later than July 1, 2020. For purposes of this section, to considered completed, Storm Drain Lines A2 & B must:

a. be in place;

b. be functional;
c. all surfaces must be backfilled and brought to grade for paving, AND
d. outfall headwall and/or receiving inlet connections complete as determined by OWNER.

In the event that this milestone is not met, OWNER shall have the right to terminate the contract upon thirty (30) days' written notice to CONTRACTOR, if CONTRACTOR does not complete the storm drain the milestone to the OWNER's satisfaction within the 30-day cure period.

(2) **Completion of Phase I pavement within 180 calendar days of the Phase I Notice to Proceed date (subject to such extensions of time as are indicated in the Special Provisions).** The Phase I 'Notice to Proceed' date will be no later than July 1, 2020. For purposes of this section, to considered completed, Phase I paving as identified on sheet C1.01 of the construction plans must:

a. be in place;
b. be functional (available for traffic);
c. have passed all required strength tests, AND
d. the concrete finish must be accepted by the OWNER.

In the event that this milestone is not met, the City shall have the option to terminate the contract upon thirty (30) day's written notice to CONTRACTOR, if CONTRACTOR does not complete the Phase I paving and meet the milestone to the City's satisfaction within the 30 day cure period.

(3) **Completion of Phase II pavement within 120 calendar days of the Phase II Notice to Proceed date (subject to such extensions of time as are indicated in the Special Provisions).** All Phase II paving as identified on sheet C1.01 of the construction plans shall be in place, tested, and accepted by the City, with all travel lanes open to traffic. In the event this milestone is not met, the City shall have the option to terminate the contract upon thirty (30) day's written notice to CONTRACTOR, if CONTRACTOR does not complete the Phase II paving and meet the milestone to the City's satisfaction within the 30 day cure period.

Calendar Days is defined as any day of the week or month; no days being excepted, such as, Saturdays, Sundays, holidays and inclement weather days. Counting of contract time will only be stopped when the Owner issues a written notice stating this fact, or when the project is noted as substantially complete by written notice from the Owner. OWNER shall determine when such action is necessary.

Extensions of time due to weather delays shall be determined in accordance with the following formula:

$E = R - P$ where P is greater than or equal to R, and

E = Extra Precipitation Days
P = Average Precipitation Days
R = Total Precipitation Days

Average Precipitation Days (P) is defined as a day of rain, sleet, hail, snow or any combination thereof, and shall be based upon the average precipitation for each month of the year as defined in the Local Climatological Data summaries issued by the National Climatic Data Center in Asheville, North Carolina, and for this contract shall be as follows:

Average Precipitation

Month	Jan	Feb	Mar	Apr	May	June
Number of Days	6	6	7	7	8	6
Month	July	Aug	Sept	Oct	Nov	Dec
Number of Days	4	4	6	6	6	6

Partial months shall be prorated uniformly for the entire month and the sum of all the months used will be rounded to the nearest whole number. This number shall be P.

Total Precipitation Days (R) is defined as a day of rain, sleet, hail, snow or any combination thereof, if determined by the Owner's Project Representative that the Contractor's construction cannot progress substantially due to precipitation and thus be put in the Daily Inspection Logs as a precipitation day. The sum of all precipitation says shall be R.

The total number of Extra Precipitation Days (E) shall be granted to the Contractor as extension of time due to weather delays, and no additional time due to drying time for saturated soil will be allowed. This contract time is both multi-tiered and cumulative.

e. **Liquidated Damages.** The CONTRACTOR further agrees to pay the following as liquidated damages:

(1) $500 per Calendar Day for any unfinished work beyond 180 consecutive calendar days after the “Phase I Notice to Proceed” issuance date. This rate shall continue until such time that the Project is complete and accepted by the OWNER

(2) It is understood between the parties hereto that these sums shall be treated as liquidated damages and not as a penalty, and the OWNER may withhold

from the CONTRACTOR's compensation such sums as liquidated damages.

The parties consider the CONTRACTOR's failure to complete performance of the entire contract within the 210th calendar day after the "Phase I Notice to Proceed" date a substantial breach of this agreement, and the amount of liquidated damages set forth herein is a reasonable and fair estimate of just compensation for CONTRACTOR's failure to timely perform the contract.

If there is any conflict between any provision of this Article 3, and any other provision in this agreement, or in any attachment hereto or any other Contract Document, this Article 3 shall control.

ARTICLE 4. PARTIAL PAYMENT.

OWNER shall make payments to the CONTRACTOR in the following manner. On or about the first of each month, the OWNER, or the OWNER's Authorized Representative, will make accurate estimates of the value, based on contract prices, of the work done and materials incorporated in the work and of materials suitably stored at the site during the preceding calendar month. The CONTRACTOR shall furnish to the OWNER, or the OWNER's Representative, such detailed information as the OWNER may request to aid OWNER as a guide in the preparation of the monthly estimate.

Within the following thirty (30) days, OWNER shall make partial payments to the CONTRACTOR for work performed during the preceding calendar month as estimated by the OWNER or OWNER's Representative. Ten percent (10%) of each estimate shall be retained by the OWNER until final completion and acceptance of all work covered by the Contract for contracts less than four hundred thousand dollars ($ 400,000). Five percent (5%) of each estimate shall be retained by the OWNER until final completion and acceptance of all work covered by the Contract for contracts greater than four hundred thousand dollars ($ 400,000). Upon completion and acceptance of all work in compliance with the Contract, the OWNER shall, within thirty (30) days, pay the CONTRACTOR the balance due under the terms and conditions of the Contract.

It is understood that the monthly estimates shall be approximate only, and all monthly estimates and partial payments shall be subject to correction in the estimate rendered following the discovery of an error in any previous estimate, and such estimate shall not in any respect be taken as an admission of the OWNER of the amount of work done or of its quality or sufficiency nor as an acceptance of the work or the release of the CONTRACTOR of any of its responsibility under the Contract.

ARTICLE 5. DISCRIMINATION.

The CONTRACTOR agrees, in connection with the performance of work under this contract as follows:

a. The CONTRACTOR will not discriminate against any employee or applicant for employment because of race, creed, color, sex, religion, national origin or ancestry. Such actions shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruiting or recruitment, advertising, layoff, termination, rates of pay or other forms of compensation and selection for training, including apprenticeship.

b. The CONTRACTOR agrees to include this non-discrimination clause in any subcontracts connected with the performance of this agreement.

c. In the event of the CONTRACTOR's non-compliance with the above non-discrimination clause, the contract may be canceled or terminated by the OWNER. The CONTRACTOR may be declared by the OWNER to be ineligible for future contracts with the OWNER, until satisfactory proof of intent to comply shall be made by the CONTRACTOR.

d. The OWNER shall be provided a list of subcontractors who are to be paid $10,000 or more. The CONTRACTOR must ensure that such subcontractors meet the requirements as outlined in Title VI of the Civil Rights Act of 1964 (42 USC 2000d et seq), execute required assurances and provide the OWNER a copy of the signed assurance of all such subcontractors prior to final payment. In the event of a claim of $10,000 or more against the CONTRACTOR by a subcontractor under this section, no further payment shall be processed unless and until each required subcontractor assurance is provided the OWNER.

ARTICLE 6. ENTIRE CONTRACT.

This Contract and Agreement contains the entire understanding and agreement of the parties upon the subject matter hereof. There is no agreement, oral or otherwise, which is not set forth in writing as part of this Agreement or the Contract Documents.

ARTICLE 7. MODIFICATION.

This contract cannot be modified except by a writing signed by both parties.

ARTICLE 8. VARIABLES IN COST.

The parties hereto assume and understand that the variables in the CONTRACTOR's cost of performance may fluctuate; consequently, the parties hereto agree that any fluctuations in the CONTRACTOR's costs will in no way alter the CONTRACTOR's obligations under this contract nor excuse nonperformance or delay on his/her part.

ARTICLE 10. VENUE.

This contract shall be governed by the laws of the State of Texas. Venue for any court proceedings shall be in Tarrant County, Texas.

ARTICLE 11. CONTRACT DOCUMENTS.

Documents Listed. The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR for the performance of and payment for the Work, consist of the following:

(1) This Agreement
(2) Addendum(s)
(3) "Notice to Bidders" advertisement
(4) Bidder's Proposal
(5) Special Instruction to Bidders
(6) Performance, Payment and Maintenance Bonds
(7) Certification of Insurance
(8) Notice to Proceed
(9) Technical Specifications
(10) City of North Richland Hills' Public Works Design Manual
(11) Special Provisions
(12) Project Construction Plans/Drawings
(13) Special Material and/or Equipment Specifications
(14) Special Material and/or Equipment Drawings
(15) "Public Works Construction Standards - North Central Texas" adopted by the North Central Texas Council of Governments (NCTCOG), October 2004 Edition
(16) North Central Texas Council of Government references

ARTICLE 11. DEFAULT

OWNER may declare CONTRACTOR in default of this Contract in the event Contractor fails to comply with the terms and conditions set forth in this Contract or any of the Contract Documents.

ARTICLE 12. SUBCONTRACTORS

Any subcontractor who furnishes labor or materials to fulfill an obligation to CONTRACTOR under this Contract or who performs all or part of the work required by this Contract, must comply with all notice and filing requirements of Texas Property Code, Chapter 53 in order to perfect a mechanic's, contractor's or materialman's lien. If a subcontractor complies with Chapter 53 of the Texas Property Code, Owner shall be authorized to withhold payment from the CONTRACTOR for payment of the claim. Owner shall release any such payment to the CONTRACTOR upon written notice and sufficient documentation to Owner from subcontractor that the claim has been paid or otherwise settled.

IN TESTIMONY WHEREOF, the CITY OF NORTH RICHLAND HILLS has caused this instrument to be signed in its corporate name, and on its behalf by the Mayor or City Manager, duly authorized to execute this instrument by action of the City Council and_____ a corporation, partnership, individual
(Name of Contractor) ***("X" out the inappropriate wording)***
acting by and through its duly authorized officials, thereby binding themselves for the faithful and full performance of the terms and provisions of this Agreement.

CITY OF NORTH RICHLAND HILLS:

By: _____
Mark Hindman
City Manager
Date: _____

CONTRACTOR:

By: _____
Name: _____
Title: _____
Date: _____

ATTEST:

By: _____
Alicia Richardson
City Secretary

ATTEST:

By: _____
Name: _____
Title: _____

APPROVED TO FORM AND LEGALITY:

By: _____
Maleshia B. McGinnis, City Attorney

Bond No. _____

PERFORMANCE BOND

STATE OF TEXAS §
§ **KNOW ALL MEN BY THESE PRESENTS:**
COUNTY OF TARRANT §

THAT _____, a corporation organized and existing under the laws of the State of _____, and fully authorized to transact business in the State of Texas, whose address is _____of the City of _____, County of _____, and State of _____, (hereinafter referred to as "Principal"), and_____ (hereinafter referred to as "Surety"), a corporation organized under the laws of the State of_____ and authorized under the laws of the State of Texas to act as surety on bonds for principals, are held and firmly bound unto THE CITY OF NORTH RICHLAND HILLS (hereinafter referred to as "Owner") in the penal sum _____ DOLLARS AND CENTS ($XXX,XXX.00) [not less than 100% of the approximate total amount of the contract as evidenced in the bid proposal] in lawful money of the United States, for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents:

WHEREAS, the Principal has entered into a certain written Contract with the Owner, dated the _____ day of _____, 20___, to which said Contract is hereby referred to and made a part hereof and as fully and to the same extent as if copied at length herein for the construction of:

NORTHEAST PARKWAY EXTENSION FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
Dated as of _____, 2020

NOW, THEREFORE, the condition of this obligation is such, that if the said Principal fully and faithfully executes the work and performance of the Contract in accordance with the plans, specifications and Contract Documents, including any extensions thereof which may be granted with our without notice to Surety, during the original term thereof, and during the life of any guaranty required under the Contract, and according to the true intent and meaning of said Contract and the plans and specifications hereto annexed, if the Principal shall repair and/or replace all defects due to faulty materials or workmanship that appear within a period of two years from the date of final completion and final acceptance of the work by owner; and if the Principal shall fully indemnify and save harmless the Owner from all costs and damages which Owner may suffer by reason of failure to so perform herein and shall fully reimburse and repay Owner all outlay and expense which the Owner may incur in making good any default or deficiency, then this obligation shall be void; otherwise, to remain in full force and effect; and in case said contractor shall fail to do so, it is agreed that the Owner may do said work and supply such materials and charge the same against said contractor and Surety on this obligation.

In the event that the Principal is declared in default under the said Contract by Owner, the Surety will within fifteen (15) days of Owner’s declaration of such default take all action necessary to take over the project from Contractor and assume completion of said Contract. The Surety shall become entitled to the payment of the balance of the Contract Price upon the Surety's faithful performance of its obligations under this bond.

The Surety agrees to pay to Owner, upon demand, all loss and expense, including reasonable attorney's fees, incurred by Owner by reason of or on account of any breach of this obligation by the Surety.

Provided further, that if any legal action be filed on this Bond, venue shall lie in Tarrant County, Texas.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Texas Government Code, Chapter 2253, as amended, and Article 7.19-1 of the Insurance Code, as amended, and all liabilities on this Bond shall be determined in accordance with the provisions of said articles to the same extent as if they were fully copied at length herein.

Surety, for value received, stipulates and agrees that the Bond shall automatically be increased by the amount of any Change Order or supplemental agreement with increases the Contract price with or without notice to the Surety, but in no event shall a Change Order or supplemental agreement which reduces the Contract price decrease the penal sum of this Bond. And further 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 any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time alteration, or addition to the terms of the Contract or to the work to be performed thereunder.

Surety agrees that this Bond provides for the repairs and/or replacement of all defects due to faulty materials and workmanship that appear within a period of two (2) years from the date of completion and acceptance of the improvement by the Owner.

The undersigned and designated agent is hereby designated by Surety herein as the agent resident to whom any requisite notice may be delivered and on whom service of process may be had in matters arising out of such suretyship.

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

(Company Name of Principal)	*(Company Name of Surety)*
(Signature)	*(Signature)*
(Printed Name)	*(Printed Name)*
(Title)	*(Title)*
(Address Line 1)	*(Address Line 1)*

(Address Line 2)	*(Address Line 2)*
(City, State and Zip Code)	*(City, State and Zip Code)*
(Witness)	*(Witness)*

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

(Name)

(Address Line 1)

(Address Line 2)

(City, State and Zip Code)

(Telephone Number)	*(Fax Number)*

Bond No. _____

PAYMENT BOND

STATE OF TEXAS §
§ **KNOW ALL MEN BY THESE PRESENTS:**
COUNTY OF TARRANT §

THAT _____, a corporation organized and existing under the laws of the State of _____, and fully authorized to transact business in the State of Texas, whose address is _____of the City of _____ _____, County of _____, and State of _____, (hereinafter referred to as "Principal"), and_____(hereinafter referred to as "Surety"), a corporation organized under the laws of the State of_____ _____ and authorized under the laws of the State of Texas to act as surety on bonds for principals, are held and firmly bound unto THE CITY OF NORTH RICHLAND HILLS (hereinafter referred to as "Owner") and unto all persons, firms and corporations who may furnish materials for or perform labor upon the buildings, structures or improvements referred to in the attached Contract, in the penal sum _____ DOLLARS AND CENTS ($XXX,XXX.00) [not less than 100% of the approximate total amount of the Contract as evidenced in the bid proposal] in lawful money of the United States, for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents:

WHEREAS, the Principal has entered into a certain written Contract with the Owner, dated the _____ day of _____, 20___, to which said Contract is hereby referred to and made a part hereof and as fully and to the same extent as if copied at length herein for the construction of:

NORTHEAST PARKWAY EXTENSION FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
Dated as of _____, 2020

NOW, THEREFORE, the condition of this obligation is such, that the Bond guarantees the full and proper protection of all claimants supplying labor and material in the prosecution of the work provided for in said Contract and for the use of each claimant, and that conversely should the Principal faithfully perform said Contract and in all respects duly and faithfully observe and perform all and singular the covenants, conditions, and agreements in and by said Contract, agreed to by the Principal, and according to the true intent and meaning of said Contract and the claims and specifications hereto annexed, and any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modification to Surety being hereby waived, then this obligation shall be void; otherwise, to remain in full force and effect. Provided further, that if any legal action be filed on this Bond, venue shall lie in Tarrant County, Texas.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Texas Government Code, Chapter 2253, as amended, and Article 7.19-1 of the Insurance Code, as amended, and all liabilities on this Bond shall be determined in accordance with the provisions of said articles to the same extent as if they were fully copied at length herein.

Surety, for value received, stipulates and agrees that the Bond shall automatically be increased by the amount of any Change Order or supplemental agreement with increases to the Contract price with or without notice to the Surety and 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 any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work to be performed thereunder.

The undersigned and designated agent is hereby designated by Surety herein as the agent resident to whom any requisite notice may be delivered and on whom service of process may be had in matters arising out of such suretyship.

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

(Company Name of Principal)	*(Company Name of Surety)*
(Signature)	*(Signature)*
(Printed Name)	*(Printed Name)*
(Title)	*(Title)*
(Address Line 1)	*(Address Line 1)*
(Address Line 2)	*(Address Line 2)*
(City, State and Zip Code)	*(City, State and Zip Code)*
(Witness)	*(Witness)*

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

(Name)

(Address Line 1)

(Address Line 2)

(City, State and Zip Code)

(Telephone Number)	*(Fax Number)*

Bond No. _____

MAINTENANCE BOND

STATE OF TEXAS §
§ **KNOW ALL MEN BY THESE PRESENTS:**
COUNTY OF TARRANT §

THAT _____, a corporation organized and existing under the laws of the State of _____, and fully authorized to transact business in the State of Texas, whose address is _____of the City of _____, County of _____, and State of _____, (hereinafter referred to as "Principal"), and_____ (hereinafter referred to as "Surety"), a corporation organized under the laws of the State of _____ and authorized under the laws of the State of Texas to act as surety on bonds for principals, are held and firmly bound unto THE CITY OF NORTH RICHLAND HILLS (hereinafter referred to as "Owner") in the penal sum of _____ DOLLARS AND /100 CENTS ($) in lawful money of the United States, for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents:

WHEREAS, the Principal has entered into a certain written Contract with the Owner, dated the _____ day of _____, 20___, to which said Contract is hereby referred to and made a part hereof and as fully and to the same extent as if copied at length herein for the construction of:

NORTHEAST PARKWAY EXTENSION FROM DAVIS BOULEVARD TO SMITHFIELD ROAD
Dated as of _____, 2020

The maintenance under this Bond contemplates the complete restoration of the work to a functional use if that should be necessary. It is the intended purpose of this bond to require the correction of all defective conditions resulting from materials furnished or work and labor performed by the Contractor under the Contract; and in case the Contractor or Surety shall fail or refuse to commence and actively pursue such corrections within ten (10) days after written notification has been furnished to them by the Owner, it is agreed that the Owner may do the work and supply such materials and the Contractor and Surety shall be liable for the payment of all costs thereby incurred, jointly and severally.

It is further understood and agreed that the obligation under this bond shall be a continuing one against the Contractor and Surety, and that successive recoveries may be had hereon for successive breaches until the full amount shall have been exhausted. It is further understood that the obligation to maintain the work shall continue throughout the maintenance period, and the same shall not be changed, diminished, or in any manner affected from any cause during that time.

NOW, THEREFORE, the condition of this obligation is such, that the Bond guarantees the full and proper maintenance and repair of the work herein contracted to be done and performed for a period of two (2) years from the date of acceptance and Principal will do all necessary backfilling that may arise on account of sunken conditions in ditches, or otherwise, and do and perform all necessary work and repair any defective condition growing out of or arising from the improper laying or construction of same, or on account of any breaking of same caused by said Contractor in construction of same, or account of any defect arising in any of said work laid or constructed by said Contractor or on account of improper excavation or backfilling, it being understood that the purpose of this section is to cover all defective conditions arising by reason of defective materials, work or labor performed by said Contractor, then this obligation shall be void; otherwise, to remain in full force and effect; and in case said Contractor shall fail to do so, it is agreed that the Owner may do said work and supply such materials and charge the same against said Contractor and Surety on this obligation. Provided further, that if any legal action be filed on this Bond, venue shall lie in Tarrant County, Texas.

The Owner shall be entitled to its reasonable attorneys' fees and costs in any legal proceeding to enforce the Owner's rights under this bond.

PROVIDED, HOWEVER, that said Surety, for value received, stipulates and agrees that the Bond shall automatically be increased by the amount of any Change Order or supplemental agreement with increases the Contract price with or without notice to the Surety and 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 any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work to be performed thereunder.

The undersigned and designated agent is hereby designated by Surety herein as the agent resident to whom any requisite notice may be delivered and on whom service of process may be had in matters arising out of such suretyship.

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

(Company Name of Principal)	*(Company Name of Surety)*
(Signature)	*(Signature)*
(Printed Name)	*(Printed Name)*
(Title)	*(Title)*
(Address Line 1)	*(Address Line 1)*
(Address Line 2)	*(Address Line 2)*
(City, State and Zip Code)	*(City, State and Zip Code)*
(Witness)	*(Witness)*

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

_____
(Name)

_____
(Address Line 1)

_____
(Address Line 2)

_____
(City, State and Zip Code)

_____ _____
(Telephone Number) *(Fax Number)*

NOTE: Date of Maintenance Bond must not be prior to date of Contract.
Power of Attorney must be attached.
Amount and Term of Maintenance Bond shall be as stated in the "Special Conditions".

CONTRACTOR'S RELEASE TO CITY

TO: CITY OF NORTH RICHLAND HILLS

RE: **NORTHEAST PARKWAY EXTENSION FROM DAVIS BOULEVARD TO SMITHFIELD ROAD**

This is to certify that _____, by acceptance
(NAME OF CONTRACTOR)
of this final payment, hereby releases the OWNER, the City of North Richland Hills, from all claims and all liabilities of the City of North Richland Hills for all things done or furnished in connection with work on this project and further releases the City of North Richland Hills from any and all liabilities arising from any act of the OWNER or his/her agent arising in connection with this project. This release in no way operates to release the CONTRACTOR or his/her Surety from any obligations under this contract or the bond tendered pursuant thereto.

_____
(NAME OF CORPORATION)

_____
(AUTHORIZED AGENT)

CORPORATION ACKNOWLEDGMENT

STATE OF TEXAS §
§
COUNTY OF _____ §

BEFORE ME, the undersigned authority in and for Tarrant County, Texas, on this day personally appeared _____ known to me to be the person and officer whose name is subscribed to the foregoing instrument and acknowledged to me that he/she is the _____ of the said _____, a corporation, and that he/she is authorized by said corporation to execute the foregoing instrument as the act of such corporation for the purposes and consideration therein expressed, and in the capacity therein stated.

CONTRACTOR'S RELEASE TO CITY *(Continued)*

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the _ day of _____, 20 _____.

_____ _____

(Notary Public in and for the State of Texas) *(Type or Print Notary's Name)*

My Commission Expires: _____

CONTRACTOR'S AFFIDAVIT OF FINAL PAYMENT

STATE OF TEXAS §
§
COUNTY OF TARRANT §

BEFORE ME, the undersigned authority, on this day personally appeared _____, (hereinafter referred to as "Affiant"), who, *(NAME)*

after being by me duly sworn, deposes and says that he/she is the _____ *(TITLE)* _____ of _____ (a *(NAME OF COMPANY)*

corporation, partnership, trade name) of _____ County, State of *("X" OUT THE INCORRECT)*

Texas (hereinafter referred to as "Contractor"), which said Contractor was awarded the contract dated the _____ day of _____, 2020, for the construction of the **NORTHEAST PARKWAY EXTENTION FROM DAVIS BOULEVARD TO SMITHFIELD ROAD** (hereinafter referred to as the "Work"), for a total consideration of _____ and XX/100 Dollars ($ XXX,XXX.00) to be paid to the said Contractor (the "Contract"), and that Affiant has full power of authority to make this affidavit.

That THE CITY OF NORTH RICHLAND HILLS, (hereinafter referred to as "Owner"), has approved the final estimate on said Work, and that the said Contractor has fully satisfied and paid any and all claims that may be covered by Texas Government Code, Chapter 2253, as amended, or any other applicable statutes or charter provisions, and that all just bills for labor and materials have been paid and discharged by said Contractor insofar as they pertain to the Work in question.

That in addition to any funds which may have been previously paid by the Owner, the Contractor hereby accepts the amount of _____ and ___/100 Dollars ($_____) as **FULL AND FINAL PAYMENT** under the aforementioned Contract resulting in a total revised contract amount Of and __/100 Dollars ($ _____), and hereby waives and releases any right Affiant and/or the Contractor may have to pursue claims of any nature against the Owner arising out of or in any manner connected with the performance of the Work and/or the Contract, including but not limited to claims of third parties that supplied material and/or labor for the Work for or through the Contractor (hereinafter referred to as "Subcontractors"), as well as claims for delay, additional compensation or for recovery of liquidated damages which may have been withheld by the Owner. The Contractor shall defend, hold harmless and indemnify the Owner from any such claims of such Subcontractors. The Contractor further releases the Owner from any claim or liability arising from any act of negligence of the Owner related to or connected with the Contract. This affidavit is given pursuant to the final payment provisions of the Contract, and shall not be deemed to alter or modify the terms and provisions of said Contract.

This affidavit is made in compliance with the law and in compliance especially with Chapter 2253 of the Texas Government Code, as amended, and that the undersigned, upon his/her oath, states that the facts indicated in the above instrument of writing are true and correct and that he/she is not incapacitated an any way from making this affidavit.

WITNESS my hand this the _____ day of _____, 20___.

_____
(Affiant)

_____
(Printed Name)

SUBSCRIBED AND SWORN TO BEFORE ME, this the ____ day of _____, 20 _____.

_____ _____
(Notary Public in and for the State of Texas) *(Type or Print Notary's Name)*

My Commission Expires: _____

SECTION III

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

For this contract, the Site Protection & Preparation (Division 200), Roadway Construction (Division 300), Roadway Maintenance & Rehabilitation (Division 400), Underground Construction & Appurtenances (Division 500), Conduit and Appurtenance Rehabilitation (Division 600), Structures (Division 700) and Miscellaneous Construction & Materials (Division 800) of the "Public Works Construction Standards – North Central Texas" adopted by the North Central Texas Council of Governments (NCTCOG), November 2017 Edition, with all amendments thereto, shall govern and shall constitute as the Technical Specifications except as herein amended, modified or supplemented. Omission of any section from the Project's Contract Documents does not mean that such section is not applicable to this Project. The NCTCOG Technical Specifications will be referred to as the Technical Specifications (TS) and will not be physically bound with the other contract documents. Copies may be obtained from the North Central Texas Council of Governments.

EXPLANATION OF BID ITEMS

In this section, NCTCOG Items refer to "Public Works Construction Standards - North Central Texas" adopted by the North Central Texas Council of Governments (NCTCOG), November 2017 Edition. TxDOT Standard Specification Item refers to Texas Department of Transportation's "Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges" 2014.

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

12.1.00 GENERAL

12.1.01 DESCRIPTION

This section covers the requirements for submittal data for equipment and material items to be furnished on this project.

12.2.00 MATERIAL

12.2.01 GENERAL EXECUTION

The CONTRACTOR shall submit to the Engineer, with such promptness as to cause no delay in his/her own work or in that of any other CONTRACTOR, five (5) copies of all shop drawings, manufacturer's catalog sheets, brochures, performance charts, diagrams, schedules and other standard descriptive data required for the work. The Engineer shall review these submittals with reasonable promptness, making any necessary corrections. If the submittals

indicate variances from the requirements of the contract, the CONTRACTOR shall make specific mention of such variation in his/her letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment. Otherwise, the CONTRACTOR shall not be relieved of the responsibility of executing the work in compliance with the contract even though the submittals have been reviewed.

12.2.02 FORM OF SUBMITTALS

The submittals shall be numbered consecutively and shall present the following data as applicable:

A. Name of project
B. Date of submittal
C. References to applicable section(s) of the specifications
D. Applicable standards
E. Identification of revisions on re-submittals
F. Kinds of materials and finishes
G. All working and erection dimensions and clearances
H. All arrangement and section views
I. Connections between functional parts

The Engineer may decline to consider any submittal that does not contain complete data on the work and full information on related matters.

12.2.03 SUBMITTAL PROCEDURE

The procedure for review of submittals shall be as follows:

A. **The CONTRACTOR shall submit <u>three (3) copies</u> of the submittal to the Engineer for his/her approval.** The submittal shall be accompanied by a letter of transmittal containing the following:
   1. Name of the project
   2. Name of the CONTRACTOR
   3. Name of the submittal
   4. References to applicable section(s) of the specifications
   5. Other pertinent information as indicated in Section 12.2.02: “Form of Submittals”

B. When the submittal is satisfactory to the Engineer, all three (3) copies will be stamped and/or marked "Approved" or "Approved as Noted", be dated, receive the signature of the Engineer and two (2) copies will be returned to the CONTRACTOR by separate letter.

C. Should a submittal be unsatisfactory to the Engineer, he/she will stamp and/or mark thereon "Revise and Resubmit" or "Rejected" and will send two (2) copies to the CONTRACTOR with necessary corrections and changes indicated. The CONTRACTOR must make such corrections and/or changes and submit at least three (3) copies of the re-submittal for approval to the Engineer. The CONTRACTOR shall review and resubmit as required by the Engineer until his/her approval is obtained.

D. The CONTRACTOR shall allow sufficient time for preliminary review, corrections, resubmission and final review of all submittals. The CONTRACTOR shall allow not less than fourteen (14) days for each review. Submittals critical to the progress of the project, when requested in writing by the CONTRACTOR, will be given priority review.

12.2.04 LIST OF REQUIRED SUBMITTALS

A. List of all subcontractors

B. Project Construction Schedule

C. Pipe manufacturer certification that the pipe meets specifications.

D. Proposed Concrete Mix Designs, including the documentation of all proposed concrete admixtures.

E. Stormwater Pollution Prevention Plan

F. Construction signing and traffic control plan

G. Trench Safety Plan

H. Proposed Concrete Placement Machine Information (slip-form required)

12.3.00 CONSTRUCTION

N/A

12.4.00 MEASUREMENT AND PAYMENT

TRAFFIC CONTROL - BARRICADES, WARNING, AND DETOUR SIGNS

Barriers, Warning and Detour Signs shall be performed in accordance with Item 801.1 of the COG Specifications and City Specifications.

Prior to construction, the CONTRACTOR will be required to submit a detailed construction sequencing and temporary traffic control plan to address all issues not covered by the construction plans. 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 CONTRACTOR shall follow the sequence of construction provided in these plans. Any deviations from the plans must be submitted in writing to the CITY for approval. Proper notification must be given to all affected property owners at least 48 hours in advance of all construction operations.

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

Access to adjacent properties must be maintained except for short periods of time when construction actually blocks the driveway. The CONTRACTOR shall place gravel or take other means to insure all-weather access to properties after working hours and during weekends and holidays.

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.

TREE REMOVAL (Various Sizes)

Removal of existing trees shall be paid for on a “per each” basis and shall include complete removal and disposal of tree, roots, and debris. All organic material shall be removed. Only trees designated on the plans or authorized by the OWNER shall be removed. The CONTRACTOR shall take precautions to avoid damage to trees within project limits unless the tree is designated to be removed. Any backfill necessary after stump removal is subsidiary to this bid item.

FULL DEPTH SAWCUT AND PAVEMENT REMOVAL

Pavement removal covered by this specification shall be only where designated on the Construction Plans or upon specific direction from the Owner’s Project Representative.

The CONTRACTOR shall make every effort to remove pavement along existing joints. The CONTRACTOR shall saw cut at no extra cost full-depth at the existing

joint or along straight, neat lines to remove the area of pavement specified in the Construction Plans. If the adjacent pavement is damaged during the removal process, the CONTRACTOR shall be responsible to saw cut the damaged portion of the pavement until a clean edge is achieved at no cost to the OWNER. The CONTRACTOR will not be compensated for the additional pavement removal or replacement if the damage was caused by the CONTRACTOR during the removal process. If the pavement is in poor condition prior to the CONTRACTOR beginning the removal process, the CONTRACTOR shall coordinate with the Owner's Project Representative to determine the limits of the concrete removal. In this case, the CONTRACTOR shall be compensated for the removal and replacement of the additional pavement; however, the CONTRACTOR will only be paid for the original length saw cut detailed in the construction plans.

The CONTRACTOR shall exercise appropriate care not to damage other improvements in the process, and the CONTRACTOR shall be responsible for correction of any such damage caused during the removal process. All material removed shall become the property of the CONTRACTOR and be disposed in accordance with local, state and federal guidelines. Item 402.2.1 of the COG Specifications shall govern the removal of existing concrete pavement.

MEASUREMENT AND PAYMENT: Payment for Remove Existing Concrete Pavement shall be by the square foot and shall include the cost of saw cutting.

MOBILIZATION AND GENERAL SITE PREPARATION

General Site Preparation shall be in accordance with 203.3 of the COG Specifications with the exception that payment for "General Site Preparation" shall be per 100-foot station as measured along the centerline of Northeast Parkway from beginning of street paving to end of street paving. This pay item will include removal of improvements or obstructions not specifically provided for in other pay items of the Bid Proposal to include removing gravel, riprap, stumps (all sizes), landscaping, planter boxes, shrubbery, plantings, fences, brick columns, and other items located within the right-of-way.

In addition, the work will consist of trimming, if required, removal of above ground foliage and tree formations, and complete removal of all root systems below grade. Any backfill necessary after stump removal is subsidiary to this bid item. Pavements and sidewalks shall be patched if necessary to allow for vehicular and pedestrian traffic. All excavated areas shall be backfilled and compacted to prevent additional damage to pavement or other structures. Any damage to yard areas shall be restored at no additional pay, including planters and landscape edging and irrigation systems. Irrigation systems shall be capped of prior to construction. This Item includes all safety measures and additional traffic control as needed to complete the work. All trees and plant materials shall be properly disposed of offsite.

Only trees, landscaping and plantings located within the right-of-way and designated for removal on the plans shall be removed. All other trees and landscaping shall be protected from damage as shown in the plan details. Cost of mobilization is subsidiary to this bid item.

The work under this item shall include establishment of facilities on the project site and the movement of personnel, construction equipment and supplies to the project site or to the vicinity of the project site in order to enable the CONTRACTOR to begin work on the contract. The cost of all bonds and insurance for the project will also be considered part of this specification.

Mobilization will be measured as a lump sum item as the work progresses. Partial payments for mobilization shall be paid for at the Total Unit Price as shown in the bid proposal with the regular monthly estimates as follows: The adjusted contract amount for construction items as used below is defined as the total contract amount less the lump sum for Mobilization.

a. When 1% and less than 5% of the adjusted contract amount for construction items is completed, 50% of the mobilization lump sum bid will be paid.

b. When 5% and less than 10% of the adjusted contract amount for construction items is completed, 75% of the mobilization lump sum bid will be paid. Previous payments under this section will be deducted from this amount.

c. When 10% or more of the adjusted contract amount for construction items is completed, 95% of the mobilization lump sum bid will be paid. Previous payments under this section will be deducted from this amount.

d. Payment for the remainder of the lump sum bid for “Mobilization” will be made on the final estimate.

CONSTRUCTION STAKING

The provisions of Item 105.4 of the COG Specifications are hereby revised to state that Construction Stakes shall be provided by the CONTRACTOR. Payment for “Construction Stakes” shall be on a lump sum basis. This item shall include all staking required to lay out the work and for providing field notes to the City for review. 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.

STANDARD CURB INLET

Storm drain inlets shall be constructed in accordance with Items 502.12 and 702 of the COG Specifications and City Specifications. Where applicable, the depth shall be adjusted per the Plan elevations at no additional cost. All inlets shall be cast-in-place. Concrete for inlet shall be Class "C" with a minimum 5 sacks per cubic yard of cement content and a 3,600 psi compressive strength when tested at 28 days. Payment for Standard Curb Inlets shall be on a "per each" basis and shall include excavation, backfill, form work, concrete, reinforcing steel, ring and lid, and labor to perform the work. Existing curb removal and replacement where applicable is incidental to this bid item.

TRENCH SAFETY FOR STORM DRAIN LINES

The provisions of Item 107.19.3 of the COG Specifications shall govern for "Trench Safety". A trench safety plan shall be submitted for approval as required under "**SHOP DRAWINGS, PRODUCT DATA AND SAMPLES"** of these technical specifications. All trenches must be backfilled at the end of the workday. No open trenches will be allowed outside of working hours.

STORM SEWER MANHOLE

Storm drain manholes shall be constructed in accordance with Items 502.12 and 702 of the COG Specifications and City Specifications. All manholes shall be cast-in-place. Concrete for storm drain manholes shall be Class "C" with a minimum of 5 sacks per cubic yard cement content and a 3,600 psi minimum compressive strength when tested at 28 days. Payment for storm drain manholes shall be on a "per each" basis and shall include excavation, form work, concrete, reinforcing steel, backfill, ring and lid.

CLASS III REINFORCED CONCRETE STORM DRAIN (OPEN CUT)

Storm drain line shall be furnished and installed in accordance with Items 501.6, 504 and 508 of the COG Specifications and City Specifications. All Storm drain pipe shall be ASTM C-76, Class III Reinforced Concrete Pipe. Pipe collars shall be installed at all pipe size changes, grade changes, and connections to existing storm drain lines at no additional cost. All proposed storm drain fittings and connections shall be pre-fabricated. Field connections can be used for connections to existing lines only. The cost of trench excavation, embedment, and backfill is incidental to this bid item.

The cost of trench excavation, embedment and backfill is incidental to this bid item. All ditchlines shall be mechanically tamped with the cost incidental to this bid item. Backfill should be placed in 6"-8" loose lifts (12" maximum) 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. Densities shall be taken every one (1) lift at staggered hundred foot increments.

Pipe joints shall be sealed at equal or no extra pay. This item shall include plugs, cutting and plugging existing lines, and connections to adjacent structures necessary for complete installation. If working in paved street and driveway areas open to traffic, the contractor shall provide for a temporary 3-inch hot mix asphalt surface material pavement Type “B” of the TxDOT Standard Specifications for Construction of Highways, Streets and Bridge, latest edition to be placed over the ditch area until the final improvements are made. This work shall be incidental to Mobilization and General Site Preparation.

Radius pipe shall be used where indicated on the plans. Payment for storm drain line shall be by the linear foot and shall include all excavation, embedment, backfill, fittings and pipe collars.

SINGLE BARREL TxDOT HEADWALL (CH-FW-0)

Single Barrel TxDOT Headwall shall be constructed as shown in the Drainage Plans and TxDOT Detail (CH-FW-0). Surfaces adjacent shall be graded to provide positive drainage. Measurement and payment shall be on a “per each” basis including excavation, form work, concrete, reinforcing steel, and labor to perform the work.

PROJECT SIGNS

The provisions of Item 107.20 of the COG Specifications and City Specifications shall govern for the erection of project signs. Payment for “Project Signs” shall be on a “per each” basis.

4-INCH REINFORCED CONCRETE FOR SIDEWALK

Four (4”) inch thick reinforced concrete sidewalks, including reinforcing steel, shall be constructed in accordance with the width and details shown on the Plans and with the applicable provisions of the COG Specifications Item 305.2. Reinforced concrete paving shall be constructed with 3,000 psi Class “A” Portland Cement Concrete. One (1”) inch thick layer of cushion sand under the sidewalk is subsidiary to the unit price of the sidewalk.

The Contractor shall be responsible to ensure all sidewalk construction is in accordance with the Americans with Disabilities Act (ADA) and Texas Accessibility Standards (TAS). Any portions of sidewalks which are constructed and do not meet the requirements of ADA and TAS will be required to be removed and replaced at the Contractor's Expense.

MEASUREMENT AND PAYMENT: Payment for this item shall be at the contract unit price per square foot including excavation, concrete, reinforcing steel, cushion sand, joint sealer, expansion joint material and elastomeric filler complete in place.

6" INTEGRAL COLOR AND STAMPED 4000PSI CONCRETE

Stained and Stamped Concrete, including reinforcing steel, shall be constructed in accordance with the details shown on the Plans and with the applicable provisions of COG Specification Item 303. A construction joint will be provided along the perimeter of the proposed roundabout. Reinforced concrete paving shall be constructed with 6" thick 4,000 psi Class "C" Portland Cement Concrete, and shall be furnished and placed in accordance with the applicable provisions of Specification Item 303 "Portland Cement Concrete Pavement." Admixtures containing fly ash will not be acceptable but shall otherwise adhere to the applicable provisions of Specification Item 303.2 "Portland Cement Concrete Pavement Materials." The reinforcing steel for the 6" thick concrete pavement section shall be #3 bars @ 18" o.c.e.w. as shown on the Roundabout Plan.

MEASUREMENT AND PAYMENT: Stained and Stamped Concrete shall be measured and paid for by the square yard including concrete, reinforcing steel, expansion joint material, stain, patterning, and labor to perform the work.

7-INCH REINFORCED CONCRETE PAVEMENT WITH MONOLITHIC CURB

This item shall include all necessary materials, labor, tools and incidentals required to construct 7" thick reinforced concrete paving on Northeast Parkway in conformance with the lines and grades shown on the Plans and in accordance with the Paving Plans. The reinforcing steel for the 7" thick concrete pavement section shall be #4 bars @ 18" o.c.e.w. as shown on the Paving Plan.

Reinforced concrete paving shall be constructed with 4,000 psi Class "C" Portland Cement Concrete, and shall be furnished and placed in accordance with the applicable provisions of Specification Item 303 "Portland Cement Concrete Pavement." Admixtures containing fly ash will not be acceptable but shall otherwise adhere to the applicable provisions of Specification Item 303.2 "Portland Cement Concrete Pavement Materials."

CONCRETE QUALITY AND WORKMANSHIP

The finished concrete pavement construction under these specifications is expected to meet certain quality standards for surface of the concrete including the durability, texture, riding surface and appearance.

For this project, the main lane pavement shall be slip-form machine placed concrete with a broom finish in accordance with the specifications below. The contractor shall complete the first 12 concrete panels in the presence of the City Inspector. The quality of the broom finish shall be acceptable to the City Inspector prior to proceeding with additional panels.

The surface must be durable, firm, dense and well bonded to the aggregate to maintain an appearance and texture that is satisfactory to the Owner. Concrete pavement having a poor surface that has spalled (exposed aggregate) due to poor quality paste, high water-cement ratio, over-vibration, improper curing, extreme weather or any other reason, or does not have a satisfactory riding surface shall be removed and replaced at the Contractor's expense. It is extremely important that the pavement have a good riding surface, free from undulations and rough joints. The City Engineer shall determine the acceptability of the pavement.

Broom Finish

If the surface texture is to be a broom finish, it shall be applied when the water sheen has practically disappeared. The broom shall be drawn from the center to the edge of the pavement with adjacent strokes slightly overlapping in the direction of vehicular travel. The broom operation shall be so executed that the corrugation produced in the surface shall be uniform in appearance and not more than 1/16-inch in depth. Brooming shall be completed before the concrete is in such condition that the surface will be torn or unduly roughened by the operation. The surface thus finished shall be free from rough and porous areas, irregularities, and depressions resulting from improper handling of the broom. Brooms shall be the quality, size, and construction and shall be operated to produce a surface finish meeting the approval of the Owner. Subject to the approval of the Owner, the Contractor may be permitted to substitute mechanical brooming in lieu of the manual brooming as herein described.

Hand Finishing

Hand finishing of concrete pavement will be permitted in areas where it is not practical or possible to construct with finishing machines. These areas include, but are not limited to, intersections, left turn lanes, crossovers, transition areas and where the pavement width is not uniform. In hand finished areas, the concrete shall be struck off with an approved strike-off

screed to such elevation that when consolidated and finished the surface of the pavement shall conform to the required section and grade. The strike template shall be moved forward with a combined transverse and longitudinal motion in the direction the work is progressing, maintaining a slight excess of material in front of the cutting edge. The concrete shall then be tamped with an approved tamping template to compact the concrete thoroughly and eliminate surface voids and the surface screeded to required section. After completion of a strike-off, consolidation and transverse screeding; a hand-operated longitudinal float shall be operated to test and level the surface to the required grade.

Workmen shall operate the float from approved bridges riding on the forms and spanning the pavement. The longitudinal float shall be held in contact with the surface and parallel to the centerline and operated with short longitudinal strokes while being passed from one side of the pavement to the other. If contact with the pavement is not made at all points, additional concrete shall be placed, if required, and-screeded, and the float shall be used to produce a satisfactory surface. Care shall be exercised to keep the ends of the float from digging into the surface of the pavement. After a section has been smoothed so that the float maintains contact with the surface at all points in being passed from one side to the other, the bridges may be moved forward half the length of the float and the operation repeated. Other operations and surface tests shall be as required for machine finishing.

Edging at Forms and Joints

After the final finish, but before the concrete has taken its initial set, the edges of the pavement along each side of each slab, and on each side of transverse expansion joints, formed joints, transverse construction joints, and emergency construction joints shall be worked with an approved tool and rounded to the radius required by the plans. A well-defined and continuous radius shall be produced and a smooth, dense, mortar finish obtained. The surface of the slab shall not be unduly disturbed by tilting of the tool during use.

At all joints, any tool marks appearing on the slap adjacent to the joints shall be eliminated by brooming the surface. In doing this, the rounding of the edge shall not be disturbed. All concrete on top of the joint filler shall be completely removed.

All joints shall be tested with a straightedge before the concrete has set, and correction shall be made if one side of the joint is higher than the other or if they are higher or lower than the adjacent slabs.

MEASUREMENT AND PAYMENT: Measurement and Payment for this item shall be at the contract unit price per square yard, complete in place and include all

concrete, monolithic curb, reinforcing steel, required joint work, expansion material, approved elastomeric joint seal material, and other incidentals. Measurement and payment by the square yard for concrete pavement shall be made to the gutter line. Payment shall be based on Plan dimensions and no separate payment shall be provided for monolithic curb or extra thickness of concrete pavement placed.

2-INCH CURB AND GUTTER IN ROUNDABOUT

Two (2") inch curb and gutter will be constructed at the roundabout as shown on the Vertical Curb Detail in the Roundabout Plan with reinforcing steel consisting of#5 bars at 18"on center and in accordance with Item 305.1 of COG Specifications. The construction joint will be sealed with a silicon joint sealant.

MEASUREMENT AND PAYMENT: Measurement and Payment for this item shall be at the contract unit price per linear foot, complete in place and include all concrete, reinforcing steel, form work, required joint work, expansion material, approved elastomeric joint seal material, and other incidentals.

HYDRATED LIME

Hydrated lime for subgrade stabilization shall be furnished in accordance with the provisions of Specification Item 301.2, "Lime Treatment."

MEASUREMENT AND PAYMENT: Lime will be measured by the ton and paid for at the price bid per ton after its incorporation into the subgrade. The actual amount of lime ordered by the Owner's Project Representative for stabilization and incorporation into the project will be paid for at the price bid per ton. Quantities were computed on the basis of 6 lbs. per square yard per inch of stabilized subgrade.

8-INCH LIME STABILIZED SUBGRADE

The subgrade shall be stabilized with lime in accordance with the applicable provisions of Specification Item 301, "Subgrade, Subbase and Base Preparation."

This item provides for the treating of the subgrade by pulverizing, addition of lime in slurry form, mixing and compacting the mixed material to the required density in conformity with the typical section, lines and grades as shown in the Plans or as established by the Owner's Project Representative. The Contractor will not be required to expose the secondary subgrade except in unstable areas. Estimated quantities for lime stabilized subgrade are based on 6 lbs per square yard per inch of subgrade as detailed in the table below (unless a higher rate has been specified by the Geotechnical Report or within the plans):

Subgrade Thickness	Lime Application Rate
6”	36 lbs/SY
8”	48 lbs/SY
10”	60 lbs/SY

Once the final subgrade elevations are achieved during construction and all utilities are in place, the subgrade shall be sampled to determine the required lime application rate at a cost subsidiary to this bid item. Any offsite fill brought in for use on the project is subject to geotechnical evaluation to determine lime application rate at a cost subsidiary to this bid item.

MEASUREMENT AND PAYMENT: Payment for this item shall be at the contract unit price per each square yard of subgrade thickness as specified in the construction plans from a point 12” behind the backs of the proposed curbs or edges of proposed HMAC transition pavement.

10-INCH CONTINUOUSLY REINFORCED CONCRETE PAVEMENT WITH MONOLITHIC CURB

This item shall include all necessary materials, labor, tools and incidentals required to construct 10” thick continuously reinforced concrete paving for the TxDOT section at the intersection of Northeast Parkway and Davis Boulevard in conformance with the lines and grades shown on the Plans and in accordance with TxDOT standard details. The reinforcing steel for the 10” thick continuously reinforced concrete pavement section shall be #6 bars @ 7’ o.c. and #6 traverse bars spaced at a max of 1’ o.c. per standard details.

Reinforced concrete paving shall be constructed with 3,500 psi Class “C” Portland Cement Concrete, and shall be furnished and placed in accordance with the applicable provisions of Specification Item 303 “Portland Cement Concrete Pavement.” Admixtures containing fly ash will not be acceptable but shall otherwise adhere to the applicable provisions of Specification Item 303.2 “Portland Cement Concrete Pavement Materials.”

MEASUREMENT AND PAYMENT: Measurement and Payment for this item shall be at the contract unit price per square yard, complete in place and include all concrete, monolithic curb (TxDOT Type II curb and gutter), reinforcing steel, required joint work, expansion material, approved elastomeric joint seal material, and other incidentals. Cost for dowels, and ties to existing pavement is subsidiary to this bid item. Measurement and payment by the square yard for concrete pavement shall be made to the back of curbs. Payment shall be based on Plan dimensions and no separate payment shall be provided for monolithic curb or extra thickness of concrete pavement placed.

ASPHALT TYPE “B” BASE COURSE HMAC

Asphaltic concrete shall meet the requirements for Type “B” of Item 340 of Standard Specifications for Construction of Highways, Streets and Bridge, latest edition. Asphalt Type “B” Base Course HMAC shall be either 3-inch or 4-inch thick as specified in City standard details. A prime coat shall be applied to the prepared subgrade before placing the first lift. Measurement and payment shall per square yard in place. Prime Coat shall be subsidiary to this line item.

UNCLASSIFIED EXCAVATION

Unclassified Excavation shall consist of all the required excavation within the project limits as shown on the Construction Plans and all necessary excavation from the location of the borrow pit and swale for Phase I, the removal, proper utilization or disposal of all excavated material, and the shaping and finishing of all earthwork in conformity with the lines and grades as shown on the Construction Plans or as established by the Owner. Any usable material from excavation shall be compacted in the areas of the project limits needing fill, and the required compaction testing of this excess material shall be included in this bid item and be completed in accordance with City standards. Unclassified Street Excavation shall meet the requirements of Item 203.4 of the COG Specifications.

MEASUREMENT AND PAYMENT: Unclassified Street Excavation shall be measured and paid for by the cubic yard for excavation from its original position, and shall include all materials excavated without regard to the materials encountered. **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.**

FILL

Furnish, place, and compact materials for construction of roadway. Furnish approved materials from required excavation in the areas shown on the plans or from sources outside the right of way. Material must be free from vegetation or other objectionable material. Notify the OWNER or Owner’s Representative before opening a material sources to allow for required testing. Backfill excavations with approved material and tamp before soil stabilization. Plans show acceptable area for cut to fulfill this item. The areas cut will need to be filled in on Phase II of construction from spoils produced from School construction in conjunction with Phase II if need be.

Scarify and loosen the unpaved surface areas, except rock, to a depth shown in the plans. Construct subgrade in successive layers, evenly distributing materials in lengths suited for sprinkling and rolling and to the grades shown. Treat material in accordance with lime treatment as shown in the plans.

Apply water free of industrial wastes and other objectionable matter to achieve uniform moisture content specified for compaction.

MEASUREMENT AND PAYMENT: Fill will be measured by the cubic yard. The volume will be computed between the original ground surface or the surface upon which the subgrade is to be constructed and the lines, grades, and slopes of the fill. Shrinkage or swell factors will not be considered in determining the calculated quantities. The work performed and materials furnished in accordance with this item and measured as provided under "Measurement and Payment" will be paid for at the unit price bid for "Fill" of the compaction method and type specified. The price is full compensation for furnishing material, placing, finishing, and reworking; disposal of waste material; and equipment, labor, tools and incidentals. All sprinkling and rolling will not be paid for directly but will be considered subsidiary to this Item. Where subgrade is constructed under this Contract, correction of soft spots in the subgrade will be at the Contractor's expense.

BARRIER-FREE RAMP

This item shall govern the installation of Barrier Free Ramps in accordance with the details provided in the Plans and Item 305.2 of the COG Specifications.

Concrete for curb ramps shall be constructed with 3,000 psi Class "A" Portland Cement Concrete with 5 sacks of cement per cubic yard, with a maximum slump of 5 inches. Rebar shall be #3 bars spaced at 18" o.c.e.w. Concrete shall meet the requirements of Item 303.

The Contractor shall be responsible to ensure all barrier free ramp construction is in accordance with the Americans with Disabilities Act (ADA) and Texas Accessibility Standards (TAS). Any portions of the barrier free ramp which are constructed and do not meet the requirements of ADA and TAS will be required to be removed and replaced at the Contractor's Expense.

Please note Figures 10P-1 thru 10P-6 reference meeting current requirements of the Texas Accessibility Standards. Per Texas Accessibility Standards Technical Memorandum TM 08-01 Issues: June 30, 2008, "The ONLY surface texture TDLR is currently aware of that meets the intent of both the Texas Accessibility Standards and the currently enforceable federal Americans with Disabilities Act Accessibility Guidelines are detectable warnings (aka truncated domes) meeting the technical specifications of TAS 4.29.2." Truncated dome surface shall be provided by using precast detectable warning plates or approved equal in a color approved by the City representative. Truncated dome pavers will not be allowed.

"In accordance with Administrative Rules 68.102 and TAS 2.2, the Department is allowing the detectable warning surface to be a minimum of 24" in depth (in the direction of pedestrian travel) in lieu of the full depth of the curb ramp. The deviation from this particular technical requirement does not require a variance. The

truncated domes must still extend the full width of the curb ramp (or landing as applicable at parallel curb ramps) and comply with TAS 4.29.2."

MEASUREMENT AND PAYMENT: Payment for this item shall be on a "per-each" basis furnished and installed and shall include all concrete, reinforcement, formwork, truncated domes, monolithic curb, labor, materials, and incidentals necessary to complete the work per provided details.

PAVEMENT MARKINGS AND SIGNAGE

Pavement markings shall be performed in accordance with TxDOT Standard Specifications and the Manufacturer recommendations. Signage shall be installed in accordance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD), latest revision.

Pavement markings include paint striping, thermoplastic striping and markings, and raised pavement markers. Signage includes removing and re-installing existing signs to their permanent location, removing and salvaging existing signs, installation of new signs, temporary relocation of existing signs and replacement of existing damaged signs. The City of North Richland Hills reserves the salvage rights on surplus/replaced signage.

New Street signs will be provided by the CONTRACTOR to be mounted and installed by the CONTRACTOR.

All pavement markings shall be measures and paid on a LF basis to the limits of construction shown on the plans. Signage shall be measured and paid for on a per each basis to the limits of construction shown on the plans. Both items shall be full compensation for all labor, materials, equipment, and incidentals necessary to complete the work, including removal of existing signage, markings, surface preparations, sealing, etc. as called for on the plans and in the TxDOT specifications. Any damage to existing facilities, markings, sod, etc. as a result of this work will be subsidiary to the cost of this bid item.

ADJUST WATER VALVE TO GRADE

This item shall govern adjusting the valve stack on water valves such that the finished elevation of the rim is flush with the grade of the proposed pavement. See NRH Detail 1W.
The OWNER reserves the right to delete this item from the Contract if not needed.

Payment for this item shall be at the contract unit price "per each" water valve adjusted and shall include all materials including extension stems if necessary, equipment, labor, tools, and incidentals necessary to complete the work.

ADJUST EXISTING SANITARY SEWER MANHOLE TO GRADE

This item shall govern only for adjusting existing manholes to grade on existing sewer lines to remain under street construction. The cost of adjusting proposed manholes to grade is on a per each basis.

The OWNER reserves the right to delete this item from the Contract if not needed.

Adjustments shall be made with grade rings. Rings and lids shall be salvaged and reused. Measurement and payment shall be on a “per each” basis for those manholes actually adjusted.

4” SCH40 PVC CONDUIT

This item shall be installed either by boring or open cut depending on field conditions. Bed all conduit placed by open cut in field sand as approved. All elbows and connections to be of the same schedule rating as the conduit to which it is connected.

The OWNER reserves the right to delete this item from the Contract if not needed.

Measurement and payment shall be on a “linear foot” basis for conduit.

MISCELLANEOUS PAVING, DRAINAGE, AND LANDSCAPE IMPROVEMENTS

The scope of work for these bid items will be determined in the field during the course of construction.

These items are provided to cover the cost of miscellaneous adjustments and other work ordered by the OWNER, Inspector or Engineer but not included in any other Bid Schedule Item. A maximum allowance is indicated in the Bid Schedule for each of these items.

The OWNER reserves the right to delete any or all of these items from the Contract if not needed.

There will not be a measurement for this item. CONTRACTOR shall furnish all invoices and other documentation required by ONWER in order to determine the “actual field cost” of miscellaneous work covered under these items.

Miscellaneous Allowance Items will be paid for based on the “actual field cost” of the work provided plus fifteen percent (15%). The fifteen percent (15%) of the “actual field cost” to be paid to the CONTRACTOR shall cover and compensate him/her for his/her profit, overhead, and all other elements of cost and expense not

embraced within the “actual field cost” or covered elsewhere by these specifications.

JOINT STORMWATER POLLUTION PREVENTION PLAN

This item shall govern the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Texas Commission on Environmental Quality’s (TCEQ) Texas Pollution Discharge Elimination System (TPDES) General Permit Number TXR150000. Implementation of the SWPPP, installation of erosion control devices, maintenance of such devices, removal of the devices after completion of the project and vegetation has been re-established in all disturbed areas, and all required documentation, and any required application fees as outlined in the TPDES General Permit TXR150000 shall be included in the price of this item. The Contractor shall submit to the City a copy of TPDES documents, as appropriate, prior to commencing construction. See NCTCOG Item 201 for erosion control devices. Cost for furnishing and installing any and all BMP’s specified in the SWPPP including but not limited to silt fence, inlet protection, rock berms, curlex and stabilized construction entrances shall be subsidiary to this bid item.
If the OWNER or Owner’s Representative including the Engineer or City Inspector deems the SWPPP devices deficient, CONTRACTOR will make necessary adjustments to adhere to the SWPPP plan at CONTRACTOR’S expense. No additional payment will be made for repair to erosions control devices.

MEASUREMENT AND PAYMENT: Payment for this item shall be at the contract unit price of lump sum for the preparation of the SWPPP and its implementation. Payment will be made on a monthly basis by dividing the lump sum contract price by the total contract time (months) for the project and shall include all materials, labor, equipment and incidentals necessary to prepare the SWPPP documents and install the recommended erosion control devices.

HYDROMULCH SEEDING

“Hydromulch Seeding” shall be installed under the provisions of Item 202.6 of the COG Specifications. The type of seed used shall be specified unless otherwise approved by the OWNER. All seed used must carry a Texas Testing Seed Label showing purity and germination, name and type of seed and that the seed meets all requirements of the Texas Seed Law. Seed furnished shall be of the previous season’s crop and the date of analysis shown on each tag shall be within nine (9) months of the time of delivery to the project. Each variety of seed shall be furnished and delivered in separate bags or containers. A sample of each variety of seed shall be furnished for analysis and testing when directed by the OWNER. The Bermuda Grass shall equal or exceed 95% purity and 90% germination. Seed densities shall be as follows:

Type I Bermuda Grass-hulled – 45 pounds per acre

Type II Perennial Rye grass – 15 pounds per acre
Type III Bermuda Grass-unhulled – 45 pounds per acre

Planting hulled Bermuda Grass (Type I) shall be done between the months of April through September. Planting of combination unhulled Bermuda Grass seed (Type III) and Perennial Rye (Type II) shall be done between the months of September through February.

A 4-inch layer of topsoil, furnished in accordance with Item 202.2, shall be placed on all areas to be seeded. The cost of topsoil is incidental to the unit cost of hydromulch seeding. Fertilizer shall be furnished in accordance with Item 202.4 and applied at the rate specified in Item 202.4.3.1. The cost of fertilizer is incidental to the unit cost of hydromulch seeding. Seeding shall be watered at least 30 days following placement and as directed by OWNER until completion and acceptance of the project by OWNER at no additional cost. The CONTRACTOR shall mow and protect the seeded areas until acceptance of the project by the OWNER, and the costs will be incidental to the unit cost of hydromulch seeding.

SOLID SODDING

"Sodding" shall be installed under the provisions of Item 202.5 of the COG Specifications. The type of sod placed shall match the type of grass in the adjacent lawn area. A 4-inch layer of topsoil, furnished in accordance with Item 202.2, shall be placed on all areas to be sodded. Suitable on-site topsoil may be utilized or topsoil shall be imported to achieve 4-inches. The cost of topsoil is incidental to the unit price of solid sodding. Fertilizer shall be furnished in accordance with Item 202.4 and applied at time of initial sodding only, and at the rate specified in Item 202.4.3.2.

The topsoil shall be uniformly distributed on the designated area(s) and it shall be a minimum of 4 inches (75 mm) deep after firming. Spreading shall be performed in such a manner that sod installation can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading or proposed for turfgrass sod installation.

After the topsoil has been spread and the final grade approved, it shall be cleared of all grade stakes, surface trash or other objects that would hinder installation and/or maintenance of turfgrass sod and other plantings. Paved areas over which hauling operations are conducted shall be kept clean and any soil which may be brought upon the surfacing shall be promptly removed. The wheels of all vehicles shall be kept clean to avoid tracking soil on the surfacing of roads, walks or other paved areas.

The first row of turfgrass sod shall be laid in a straight line, with subsequent rows placed parallel to and tightly against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Care shall be exercised to insure that the pieces are not stretched or overlapped and that all joints are butted tightly to prevent voids that would cause air drying of the roots.

The installation contractor shall water the turfgrass sod immediately after transplanting to prevent drying. As sodding is completed in any one section, the entire area shall be lightly rolled. It shall then be thoroughly watered to a depth sufficient to ensure the underside of the new sod pad and soil immediately below the pad are thoroughly wet. The general contractor shall be responsible for having adequate water available at the site prior to and during installation.

The general contractor shall supply adequate water to the site. The single-most important factor in the successful rooting of newly installed turfgrass sod is adequate, regular watering. Watering should begin immediately after installation. The amount of water required will vary depending upon season, weather, temperature, wind, slope and turfgrass variety. The general contractor shall designate the party responsible to ensure adequate water supply and application.

The square yard unit price shall include 4-inches of topsoil and all labor, equipment and materials necessary to complete the work including preparation of topsoil, watering, fertilizing and maintenance until accepted by the property owner and the City.

MEASUREMENT AND PAYMENT: The square yard unit price shall include 4-inches of topsoil and all labor, equipment and materials necessary to complete the work including preparation of topsoil, watering, fertilizing and maintenance until accepted by the property owner and the City. The cost of fertilizer is incidental to the unit price of sodding.

RIPRAP (TxDOT Item 432)

Stone riprap shall consist of specifications listed within the TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges 2014 Standard Specifications Book and constructed as shown in the drainage plans unless specified otherwise. Dress slopes and protected areas to the line and grade shown on the plans before the placement of riprap. Place riprap and toe walls according to details and dimensions shown on the plans or as directed. Ensure that the slopes do not exceed 4:1 maximum.

MEASUREMENT AND PAYMENT: This Item will be measured by the square foot of material complete in place. 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.

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 bid per square foot of riprap.

This price is full compensation for furnishing, hauling, placing, and maintaining the bedding material until placement of the riprap cover is completed and accepted; excavation required for placement of bedding material; and equipment, scales, test weights, labor, tools, and incidentals. No payment will be made for excess thickness of bedding nor for material required to replace embankment material lost by rain wash, wind erosion, or otherwise.

SECTION IV

SPECIAL PROVISIONS

SPECIAL PROVISIONS

INDEX

SPECIAL PROVISIONS

SP-1: GENERAL

For this contract, the General Provisions (Division 100) of the "Public Works Construction Standards - North Central Texas" adopted by the North Central Texas Council of Governments (NCTCOG), October 2004 Edition, with all amendments thereto, shall govern and shall constitute as the Special Provisions except as herein amended, modified or supplemented. Omission of any section from this Project's Contract Documents does not mean that such section is not applicable to this Project. The NCTCOG General Provisions will be referred to as the General Provisions (GP) and will not be physically bound with the other contract documents. Copies may be obtained from the North Central Texas Council of Governments.

The following Special Provisions shall take precedence over all other contract conditions, specifications and agreements.

SP-2: PROJECT DESCRIPTION

The work associated with this Project includes, but is not limited to, the following tasks:

1. Construction staking
2. Erosion control
3. General site preparation, grading
4. Lime stabilized subgrade
5. Reinforced concrete pavement
6. Sidewalk construction
7. Storm drain construction
8. Trench safety
9. Cleanup and removal of erosion control

SP-3: DEFINITIONS

Modify GP Item 101.1 Definitions as follows:

The word "City" or "OWNER" in these documents shall be understood as referring to:

The City of North Richland Hills, Texas
4301 City Point Drive
North Richland Hills, Texas 76180

The word "Engineer" in these documents shall be understood as referring to a professional engineer employed by the City of North Richland Hills.

The word "Inspector" in these documents shall be understood as referring to the technical construction inspector within the OWNER's Public Works Department.

The word "OWNER's Representative" in these documents shall be understood as referring to the OWNER's Director of Public Works, Public Works Technical Construction Inspector(s), Engineer of the OWNER, or such other Engineer or Supervisor as may be authorized by the OWNER to act in any particular position.

Any reference to "Special Conditions" or "Supplemental Special Conditions" shall be understood as referring to these Special Provisions.

SP-4: INFORMATION CONCERNING CONDITIONS

Add the following to GP Item 102.3. Examination of Plans, Specifications and Site of the Work:

Prospective bidders shall make a careful examination of the entire site of the project and shall make such explorations as may be necessary to determine the subsoil and water conditions to be encountered; improvements and obstructions which may be encountered, especially those to be protected; methods of providing ingress and egress to private as well as public property; methods of handling traffic during construction and maintenance of the entire project as well as any section thereof; protection of all existing structures both above and below ground; and how the plans fit the proposed project and especially if any discrepancies exist.

The accuracy of the information furnished by the Engineer or the plans and specifications as to underground structures and surface structures, foundation conditions, character of soil, position and quality of ground and subsoil water, etc., are not guaranteed by the OWNER.

Subsurface exploration, to ascertain the nature of the soils at the project site, including the amount of rock, if any, is to be the responsibility of any and all prospective bidders. Whether prospective bidders perform this subsurface exploration jointly or independently, it shall be left to the discretion of such prospective bidders. Subsurface exploration shall not be attempted without the approval of the Engineer.

SP-5: ADDENDA

Bidders wanting further information, interpretation or clarification of the Contract Documents must make their request in writing to the Engineer **at least seven (7) days prior to the Bid Opening.** Answers to all such requests will be made a part of the Contract Documents. No other explanation or interpretation will be considered official or binding.

Should a bidder find discrepancies in, or omission from the Contract Documents, or should he/she be in doubt as to their meaning, he/she should at once notify the Engineer in order that a written addendum may be sent to all bidders. Any addenda issued will be mailed or be delivered to each prospective bidder who has requested and received a bid packet. The bid proposal as submitted by the bidder must be so constructed as to include any addenda issued by the Engineer prior to 24 hours of the bid opening, with the appropriate recognition of addenda so noted in the bid proposal.

SP-6: PROPOSED GUARANTY

Modify GP Item 102.5. Proposal Guaranty to include:

The five percent (5%) proposal guaranty shall be five percent (5%) of the largest possible total for the bid submitted.

SP-7: FILING OF PROPOSAL

Add the following to GP Item 102.6. Filing of Proposals:

Bids, affidavits and proposed construction schedules must be submitted in sealed envelopes within the time limit for receiving proposals, as stated in the "NOTICE TO BIDDERS", which envelopes bear a legible notation, "PROPOSAL", and the name of the project. The original copy shall be filed with the City of North Richland Hills in the office of the City Secretary at City Hall.

SP-8: REJECTION OF PROPOSALS

Add the following reasons to GP Item 102.11. Rejection of Proposals:

(7) Proposals that are incomplete insofar as the required signatures, proposal guaranty, or containing any material irregularities.

SP-9: DISQUALIFICATION OF BIDDERS

Add the following reason to GP Item 102.12. Disqualification of Bidders:

(9) where more than one proposal for an individual firm, partnership, or corporation is filed under the same or different names and where such proposals are not identical in every respect.

SP-10: QUALIFICATION TO PERFORM

The OWNER may make such investigations as he/she deems necessary to determine the bidder's ability to perform the work, and the bidder shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any bid if the evidence submitted fails to satisfy the OWNER that such bidder can properly carry out the obligations of the contract and to complete the work contemplated therein.

SP-11: AWARD OF CONTRACT

Add the following to GP Item 103.2. Award of Contract and Commencement of Work:

The award, if made, shall be on the basis of the lowest acceptable bid submitted by a qualified responsible bidder, as determined by the OWNER, within 60 days after the opening of proposals. In determining the lowest acceptable bid, the OWNER will consider all relative factors such as: efficiency of a single contractor in the project area, increase in public safety due to a single contractor's operations, length of construction, coordination of construction activities, previous experience the OWNER may have had with the bidder, effects on area traffic due to construction detours and efficient use of City funds. The right is reserved, as the interest of the OWNER may require, to reject any and all bids and to waive any formality in bids received. It is the intention of the OWNER to award a single contract for this work.

SP-12: BONDS - AMOUNT AND TERMS

In addition to GP Item 103.3. Surety Bonds, add the following:

With the execution and delivery of the contract, the CONTRACTOR shall furnish and file with the City in the amount herein required, the following surety bonds:

(1) A good and sufficient Performance Bond in an amount equal to one hundred percent (100%) of the total awarded contract price, guaranteeing the full and faithful execution of the work and performance of the contract and for the protection of the City against any improper execution of the work or the use of inferior materials.

(2) A good and sufficient Payment Bond in an amount equal to one hundred percent (100%) of the total awarded contract price, guaranteeing payment for all labor, materials and equipment used in the construction of the project.

(3) A good and sufficient Maintenance Bond in an amount equal to twenty percent (20%) of the final contract price, guaranteeing the maintenance in good condition of such project for a period of two (2) years from and after the time of its completion and acceptance by the City.

General conditions for bonds are as follows:

1. The surety on each bond must be a responsible surety company which is licensed and qualified to do business in the State of Texas (surplus lines carriers are not acceptable) and satisfactory to the City. No surety will be accepted who is in default or delinquent on any bond or who is interested in any litigation against the City. Should any surety on the contract be determined unsatisfactory at any time by the City, notice will be given to the CONTRACTOR to the effect, and the CONTRACTOR shall forthwith substitute a new Surety or Sureties satisfactory to the City. (Texas Lloyd's Plan carriers are not acceptable.) No payment will be made under the contract until the new Surety or Sureties, as required, have qualified and have been accepted by the City. The contract shall not be operative nor shall any payments be due until approval of the bonds has been made by the City.

2. The surety company should be listed in the current circular of the "Federal Register - Department of the Treasury - Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsurance Companies".

3. The surety shall/must have an underwriting limitation (as shown in the Federal Register) to cover 110% of the project cost. Exceptions to a requirement may be made in unusual circumstances, subject to approval by the Office of Risk Management and the City Attorney's Office.

4. All bonds shall be made on forms furnished by the City and shall conform to the requirements as set forth herein.

5. Each Bond shall be executed by the CONTRACTOR and the Surety. The name and residence of each individual party to the bond shall be inserted in the body thereof, and each such party shall sign the bond with his/her usual signature on the line opposite the scroll seal, and if signed in the States of Main, Massachusetts, or New Hampshire, an adhesive seal shall be fixed opposite the signature.

6. If the principals are partners, their individual names will appear in the body of the bond or on proceeding pages to be included with said bond with the recital that they are partners composing a firm, naming it, and all the members of the firm shall execute the bond as individuals.

7. The signature of a witness shall appear in the appropriate place, attesting the signature of each individual party to the bond.

8. The principal or surety shall be a corporate surety; the name of the state in which incorporated shall be inserted in the appropriate place in the body of the bond or on proceeding pages to be included with said bond, and said instrument shall be executed and attested under the corporate seal, the fact shall be stated, in which case a scroll or adhesive seal shall appear following the corporate name.

9. The official character and authority of the person or persons executing the bond for the principal, if a corporation, shall be certified by the secretary or assistant secretary according to the form attached hereto. In lieu of such certificate, records of the corporation as will show the official character and authority of the officer signing, duly certified by the secretary or assistant secretary, under the corporate seal, to be true copies.

10. The date of any bond must not be prior to the date of the contract in connection with which it is given.

SP-13: INSURANCE REQUIREMENTS

In addition to the provisions of GP Item 1.03.4. Insurance, add the following:

Workmen's Compensation Insurance: Statutory requirements as specified by the Workmen's Compensation Law of the State of Texas and adopted by the Texas Workers' Compensation Commission per Title 28, TAC §110.110. Workers' Compensation Insurance Coverage:

A. Definitions:

(1) 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 (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees (including those subject to a coverage agreement) providing services on a project for the duration of the project.

(2) Building or construction - Has the meaning defined in the Texas Labor Code, §406.096(e)(1).

(3) Contractor - A Person bidding for or awarded a building or construction project by a governmental entity.

(4) Coverage - Workers' compensation insurance meeting the statutory requirements of the Texas Labor Code, §401.011(44).

(5) Coverage Agreement - A written agreement on form TWCC-81, form TWCC-82, form TWCC-83, or form TWCC-84, filed with the Texas Workers' Compensation Commission which establishes a relationship between the parties for purposes of the Workers' Compensation Act, pursuant to the Texas Labor Code, Chapter 406, Subchapters F and G, as one of employer/employee and establishes who will be responsible for providing workers' compensation coverage for persons providing services on the project.

(6) Duration of the project - Includes the time from the beginning of the work on the project until the work on the project has been completed and accepted by the governmental entity.

(7) 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.

(8) Project - Includes the provision of all services related to a building or construction contract for a governmental entity.

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 the 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 ten (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 Workers' Compensation Commission, 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 ten (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 (10) days after receipt of notice of breach from the governmental entity.

In accordance with statutory requirements, the CONTRACTOR shall:

(1) provide coverage for its employees providing services on the project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage showing workers' compensation coverage to the governmental entity prior to beginning work on the project;

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

(4) obtain from each person providing services on the project, and provide to the governmental entity:

(A) 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

(B) no later than seven (7) days after receipt by the contract, 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;

(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 ten (10) days after contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project;

(7) post a notice on each project site informing all persons providing services on the project that they are required to be covered, and stating how a person may verify current coverage and report failure to provide coverage. This notice does not satisfy other posting requirements imposed by the Act or other commission rules. This notice must be printed with a title in at least 30 point bold type and text in at least 19 point normal type, and shall be in both English and Spanish and any other language common to the worker population. The text for the notices shall be the following text in Figure 1 provided by the commission on the sample notice, without any additional words or changes:

Figure 1:

REQUIRED WORKERS' COMPENSATION COVERAGE

"The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee"

"Call the Texas Workers' Compensation Commission at (512) 440-3789 to receive information on the legal requirement for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."

In GP Item 103.4.1.2. Commercial General Liability, change the respective limits as follows:

Contractor's General Liability and Property Damage Insurance:

Bodily Injury (or Death)	$ 600,000 each occurrence
Property Damage	$ 600,000 each occurrence

SP-14: POLICY ENDORSEMENTS AND SPECIAL CONDITIONS

In addition to the provisions of GP Item 103.4.5. Policy Endorsements and Special Conditions, add the following:

(a) CONTRACTOR will not be issued a Work Order to commence work on this Contract until he/she has obtained all the insurance required under this section and such insurance has been approved by the OWNER or his representative.

(b) CONTRACTOR shall procure and shall maintain during the life of this Contract, insurance coverage as herein specified, and in case of any work sublet, shall require any subcontractor in like manner to secure and maintain such minimum limits of insurance coverage, also.

(c) The CONTRACTOR shall furnish the OWNER with certificates showing the type, amount, class of operations covered, effective dates, and dates of expiration of policies. Such certificates shall contain substantially the following statement: "The insurance covered by this certificate will not

be canceled or materially altered except after thirty (30) days written notice has been received by the OWNER."

SP-15: ORDER OF WORK

Add the following to GP Item 103.6. Notice to Proceed and Commencement of Work:

The CONTRACTOR shall be fully responsible for proper coordination for the relocation of utilities (i.e. power poles, electrical lines, gas lines, telephone lines, television (TV) cable lines, buried cables, etc.) public and private unless otherwise noted on the plans/drawings.

SP-16: PRIORITY OF CONTRACT DOCUMENTS

Delete GP Item 105.1.1. Priority of Contract Documents and substitute the following:

In case of conflict between contract documents, priority of interpretation shall be in the following order:

(1) This Agreement
(2) Addendum(s)
(3) “Notice to Bidders” advertisement
(4) Bidder’s Proposal
(5) Special Instruction to Bidders
(6) Performance, Payment and Maintenance Bonds
(7) Certification of Insurance
(8) Notice to Proceed
(9) Technical Specifications
(10) City of North Richland Hills’ Public Works Design Manual
(11) Special Provisions
(12) General Provisions
(13) Special Specifications
(14) Project Construction Plans/Drawings
(15) Special Material and/or Equipment Specifications
(16) Special Material and/or Equipment Drawings
(17) “Public Works Construction Standards - North Central Texas” adopted by the North Central Texas Council of Governments (NCTCOG), October 2004 Edition
(18) North Central Texas Council of Government references

SP-17: WARRANTY

In GP Item 105.2.2. Special Warranty, change all references from one year to two (2) years and add the following:

Notwithstanding any certificate which may have been given by the Engineer, if any materials, equipment or any workmanship which does not comply with the requirements of this contract shall be discovered within two (2) years after completion of construction of the project, and acceptance by the OWNER, the CONTRACTOR shall replace such defective materials or equipment, or remedy any such defective workmanship within ten (10) days after notice in writing of the existence thereof shall have been given by the OWNER or City Engineer. In the event of failure of the CONTRACTOR to replace any such defective materials or equipment or to remedy defective workmanship as herein provided, the OWNER may replace such defective materials or equipment or remedy such workmanship as the case may be and in such event the CONTRACTOR shall pay to the OWNER the cost and expense thereof.

SP-18: LINES AND GRADES

Add the following to GP Item 105.4. Construction Stakes:

The CONTRACTOR is responsible to provide all construction staking under this contract.

All work under this contract shall be constructed in accordance with the lines and grades shown on the plans/drawings. The full responsibility for the holding to alignment and grade shall rest upon the CONTRACTOR.

The CONTRACTOR shall protect all property corner markers, and when any such markers or monuments are in danger of being disturbed, they shall be properly referenced and if disturbed shall be reset at the expense of the CONTRACTOR.

SP-19: INSPECTION AND TESTING

Add the following to GP Item 106.5. Samples and Tests of Materials:

The CONTRACTOR shall be responsible for paying for all testing and testing related items (acquiring specimens, proper specimen control, etc.) on this Project.

During the progress of the work, all materials, equipment and workmanship shall be subjected to such inspections and tests as will assure conformance with the contract requirements.

The CONTRACTOR shall furnish at his/her expense all necessary specimens and samples for testing.

Sampling and testing of all materials or construction methods shall be performed by a commercial laboratory, approved by the City Engineer, and permitted with the City of North Richland Hills' Public Works Department.

When the CONTRACTOR's materials, construction items or products incorporated in the project fail to satisfy the minimum requirements of the initial test and he/she has to bear the cost of any retesting, he/she shall be responsible for any and all cost associated with such retesting. If in this situation, the CONTRACTOR utilizes the same testing laboratory as the OWNER, the CONTRACTOR shall pay said testing laboratory in full or the testing laboratory shall be able to gain recourse through the CONTRACTOR's Payment Bond.

In the event a conflict arises concerning the interpretation of A.S.T.M., A.C.I., A.W.W.A., etc., specifications/standards, the City Engineer shall make his/her determination of the interpretation and his/her determination shall be final.

SP-20: INDEMNIFICATION

The CONTRACTOR shall familiarize himself/herself with GP Item 107.2. Indemnification and GP Item 107.19.3.2. Indemnification. Additionally, the following shall be added to both Indemnification items:

This agreement, however, does not waive any governmental immunity available to the OWNER under Texas law and nor 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.

SP-21: SALES TAX

Add the following to GP Item 107.14. State and Local Sales and Use Taxes:

The OWNER qualifies for exemption from state and local sales and use taxes, pursuant to the provisions of Section 151.309 of the Texas Limited Sales, Excise and Use Tax Act, as amended. Therefore, the OWNER shall not be liable for, or pay the CONTRACTOR's cost of such sales and use taxes which would otherwise be payable in connection with the performance of this contract.

SP-22: TRAFFIC CONTROL

Add the following to GP Item 107.19.2. Protection of Persons and Property:

The CONTRACTOR shall not remove any regulatory sign, instructional sign, street name sign, or other sign which has been erected by the City. If it is determined that a sign must be removed to permit required construction, the CONTRACTOR shall contact the City to remove the sign. In the case of regulatory signs, the CONTRACTOR must replace the permanent sign with a temporary sign meeting the requirements of the above referenced manual and such temporary sign must be installed prior to the removal of the permanent sign. If the temporary sign is not installed correctly or if it does not meet the required specifications, the permanent sign shall be left in place until the temporary sign requirements are met. When construction work is completed to the extent that the permanent sign can be reinstalled, the CONTRACTOR shall again contact the City to reinstall the permanent sign and shall leave his temporary sign in place until such installation is completed.

The CONTRACTOR shall prosecute his traffic control work in such a manner as to create a minimum of interruption to traffic and pedestrian facilities and to the flow of vehicular and pedestrian traffic within the project area.

Access to adjacent property shall be maintained at all times unless otherwise approved by the OWNER.

SP-23: TRENCH SAFETY

Add the following paragraph to GP Item 107.19.3. Trench Safety:

Per Chapter 756, Texas Health & Safety Code, it shall be the responsibility of the CONTRACTOR to provide and maintain a viable trench safety system at all times during construction activities. The CONTRACTOR is directed to become knowledgeable and familiar with the standards as set forth by the Occupational Safety and Heath Administration for trench safety that will be in effect during the period of construction of the project and the CONTRACTOR is responsible for conforming to such regulations as prescribed by Occupational Safety and Health Administration standards.

SP-24: WORK-SITE AREA AND CLEAN-UP

Add the following to GP Item 107.21. Working Area:

During construction the CONTRACTOR shall at all times keep the job site free from waste, debris and rubbish, and shall maintain a daily routine of clean-up.

The working operations of the CONTRACTOR shall at all times be conducted so as to create a minimum of inconvenience to the OWNER or to the public. Stringing of pipe, stockpiling of materials, etc., will be allowed only where no inconvenience is caused and only in amounts that can be readily used by the CONTRACTOR.

All trees, stumps, slashings, brush or other debris to be removed from the site, shall be disposed of in a manner consistent with Local Ordinances and all State Regulations. Burning of trash, etc., will only be permitted where allowed by Local Ordinances and State Pollution Regulations.

All excavated earth in excess of that required for project embankments and/or backfilling shall be removed from the job site and disposed of in a satisfactory manner. Disposal of excess material into area creeks and drainageways will not be allowed.

Any trees or other landscape features scarred or damaged by the CONTRACTOR's operations shall be restored or replaced at the CONTRACTOR's expense. Trimming or pruning to facilitate the work will be permitted only by experienced workmen in an approved manner. Pruned limbs of one inch (1") diameter or larger, shall be thoroughly treated as soon as possible with a tree wound dressing.

The CONTRACTOR shall take all precautions required to prevent soil erosion during construction. If, in the opinion of the City Engineer, excessive erosion occurs, the CONTRACTOR shall take immediate measure to prevent further erosion and restore the disturbed surface with topsoil at completion of the work.

All property along and adjacent to the CONTRACTOR's operations including lawns, yards, shrubs, trees, etc., shall be preserved or restored after completion of the work, to a condition equal to or better than existed prior to start of work.

Upon completion of the work as a whole and prior to final acceptance, the CONTRACTOR shall clean and remove from the site all surplus and discarded materials, temporary structures and all debris. He/She shall leave the site in a neat and orderly condition with an appearance satisfactory to the City Engineer and OWNER. Method and location of disposal or surplus and waste materials shall be satisfactory to the City Engineer.

The CONTRACTOR shall then thoroughly clean all equipment and materials installed by him/her and shall present for final inspection materials and equipment in a clean, bright and new condition.

No extra payment will be made for any of this type of work required on the project.

SP-25: EXISTING STRUCTURES, FACILITIES AND IMPROVEMENTS

Add the following to GP Item 107.23. Existing Structures, Facilities and Appurtenances:

The CONTRACTOR's attention is directed to the necessity of taking adequate measures to protect all existing structures, facilities, improvements and utilities, including sprinkler systems, encountered.

The plans show the locations of most known surface and subsurface structures. However, the OWNER assumes no responsibility for failure to show any or all of these structures on the plans or in their exact location. It is mutually agreed that such failure shall not be considered sufficient basis for claims for additional compensation for extra work, or for increasing the pay quantities in any manner, unless the obstruction encountered is such as to necessitate substantial changes in the lines or grades, or requires the building of special works not provided for in the Contract Documents.

Any non-City utilities (cable, electric, gas, telephone, etc.) damaged by the CONTRACTOR shall be the responsibility of the CONTRACTOR for relocation and/or repair as well as the costs associated with the relocation and/or repair of utilities. Any City utilities (sanitary sewer main and water distribution main) damaged by the non-negligent acts of the CONTRACTOR will not be the responsibility of the CONTRACTOR for repair. Any delays associated with the relocation and/or repair of utilities shall not be basis for a claim for extra pay.

In the progress of the work, the CONTRACTOR may have to relocate certain existing utility service lines. All relocation, repairs and replacement work shall be done at the expense of the CONTRACTOR to the satisfaction of the OWNER, except those for which specific pay items appear in the Bid Proposal.

Any utilities damaged during construction work shall be immediately repaired at the CONTRACTOR's expense.

The CONTRACTOR shall at all times maintain streets and drives in a condition which will provide easy ingress and egress and upon completion of the work, repair all damages to roads and streets used during construction, to a condition at least as good as existed prior to the start of work.

SP-26: PROSECUTION OF CONSTRUCTION

Add the following to GP Item 108.2. Prosecution of the Work:

The CONTRACTOR will, unless otherwise approved by the City Engineer, prosecute the construction of this project during normal working hours as defined below:

(a) Normal Work Day shall mean the normal eight (8) hour working day between the hours of 8:00am and 5:00pm

(b) Normal Work Week shall mean the forty (40) hour work week encompassing the five (5) eight-hour days, Monday through Friday.

(c) Holidays to be observed and to be included into the normal work week will be:

New Years Day	January 1st
Martin Luther King Day	Third Monday in January
Memorial Day	Last Monday in May
Independence Day	July 4th
Labor Day	First Monday in September
Thanksgiving Holiday	Fourth Thursday in November and the following Friday
Christmas Holiday	December 24th & December 25th

Any of the above dates falling on a Sunday shall be observed on the following Monday.

(d) All work contemplated to be done which will not be in accordance with the normal hours will require prior approval from the City Engineer. The CONTRACTOR shall request permission by the City Engineer 72 hours in advance of the time he/she intends to work.

Work which is of necessity performed at times other than normal working hours will not require prior approval unless construction scheduling can be arranged to prevent such conflict of time requirements.

All work performed other than the normal working hours, whether scheduled or required, will in no way increase the cost to the OWNER for the performance of such work. The CONTRACTOR shall pay the OWNER for inspection services, city administrative fees, etc. when work has been approved to be performed on Weekends, Holidays and outside any normal working hours. These services shall be charged at the rate of $75.00 per hour and shall include a four (4) hour minimum charge.

(e) Calendar Days is defined as any day of the week or month; no days being excepted, such as, Saturdays, Sundays, holidays and inclement weather days. Counting of contract time will only be stopped when the Owner issues a written notice stating this fact, or when the project is noted as substantially complete by written notice from the Owner. The Owner shall determine when such action is necessary.

Extensions of time due to weather delays shall be determined in accordance with the following formula:

E = R – P where P is greater than or equal to R, and

E = Extra Precipitation Days
P = Average Precipitation Days
R = Total Precipitation Days

Average Precipitation Days (P) is defined as a day of rain, sleet, hail, snow or any combination thereof, and shall be based upon the average precipitation for each month of the year as defined in the Local Climatological Data summaries issued by the National Climatic Data Center in Asheville, North Carolina, and for this contract shall be as follows:

Average Precipitation

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
No. of Days	6	6	7	7	8	6	4	4	6	6	6	6

Partial months shall be prorated uniformly for the entire month and the sum of all the months used will be rounded to the nearest whole number. This number shall be P.

Total Precipitation Days (R) is defined as a day of rain, sleet, hail, snow or any combination thereof, if determined by the Owner's Project Representative that the Contractor's construction cannot progress substantially due to precipitation and thus be put in the Daily Inspection Logs as a precipitation day. The sum of all precipitation says shall be R.

The total number of Extra Precipitation Days (E) shall be granted to the Contractor as extension of time due to weather delays, and no additional time due to drying time for saturated soil will be allowed.

SP-27: LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE ON TIME

Delete the Table [Schedule 108.8.1.(a) Liquidated Damages] within GP Item 108.8.1. Priority of Contract Documents and substitute the following:

The contract time for the entire project is based on two project phases. The contract time for Phase I from the "Phase I Notice to Proceed" issuance date through substantial completion of Phase I is 180 consecutive calendar days. The contract time for Phase II from the "Phase II Notice to Proceed" issuance date through final completion of Phase II is 120 consecutive calendar days.

Liquidated damages are based on the completion of Phase I and will be assessed at the rate of $150 per calendar day for any unfinished work for the first 30 days beyond the 180th day. This $150 rate will start on the 181st consecutive calendar day after the "Notice to Proceed" issuance date and continue through the 210th consecutive calendar day after the "Notice to Proceed" issuance date.

Liquidated damages will be assessed at the rate of $300 per consecutive calendar day for any unfinished work beyond the 210th calendar day after the "Notice to Proceed" issuance date. This rate shall continue until such time that the Project is complete and accepted by the OWNER.

SP-28: OCCUPATIONAL SAFETY AND HEALTH ACT

All work performed under this contract shall meet the requirements of the Occupational Safety and Health Act. It is the responsibility of the CONTRACTOR to familiarize himself/herself with the latest provisions of regulations published by the Occupational Safety and Health Administration in the Federal Register and to perform all of his/her responsibilities thereunder.

The CONTRACTOR shall comply with the provisions of the Occupational Safety and Health Act and the standards and regulations issued thereunder and warrant that all work, materials and products furnished under this contract will conform to and comply with said standards and regulations which are in existence on the date of this contract. The CONTRACTOR further agrees to indemnify, defend, and hold harmless the OWNER for all damages suffered by the OWNER as a result of the CONTRACTOR's failure to comply with the Act and the Standards issued thereunder and for the failure of any material and/or equipment furnished under this contract to so comply.

The CONTRACTOR shall also comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., if not in conflict with those of the Occupational Safety

and Health Act and shall maintain an accurate record of all cases of death, occupational disease and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment or work under the contract.

The CONTRACTOR alone shall be responsible for the safety, efficiency and adequacy of his/her equipment and employees and for any damage which may result from their failure or their improper construction, maintenance or operation.

SP-29: EASEMENTS/RIGHTS-OF-WAY

Without cost to the CONTRACTOR, the OWNER will provide the necessary easements or rights-of-way required for the project. However, the CONTRACTOR may desire additional temporary easements for the duration of the work for his/her construction, storage or access. All such temporary easements shall be obtained by the CONTRACTOR at no additional cost to the contract or the OWNER.

Unless specifically provided otherwise, the CONTRACTOR, as part of his/her work, shall clear all easements or rights-of-way of all obstructions to the work. On conclusion of his/her operations, he/she shall replace, repair or restore any improvements which may have been removed or damaged, as directed by the City Engineer.

SP-30: RIGHT OF ENTRY

The OWNER reserves the right to enter the property or location on which the works herein contracted for are to be constructed or installed, by such agent or agents as he/she may elect, for the purpose of inspecting the work, or for the purchase of constructing or installing such collateral work as said OWNER may desire.

SP-31: AUTHORITY AND DUTIES OF INSPECTOR

Inspectors, designated by and acting under the direction of the OWNER, shall have the authority to inspect all work done and all materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication or manufacture of the materials to be used. He/She is authorized to call to the attention of the CONTRACTOR any failure of the work or materials to conform to the plans, specifications and contract documents. He/She shall have the authority to reject materials or suspend the work until any situation at issue can be referred to and decided by the OWNER.

The Inspector is not authorized to revoke, alter or waive any requirements of the plans and specifications. He/She shall in no case act as foreman or perform other duties for the CONTRACTOR, interfere with the management of the work by the latter. Any advice which the Inspector may give the CONTRACTOR shall

otherwise not be construed as binding the City Engineer in any way, or releasing the CONTRACTOR from fulfilling all of the terms of the Contract.

If the CONTRACTOR refuses to suspend operations on verbal order of the Inspector, a written order will be presented to the CONTRACTOR by the Inspector giving the reason for suspension of work. After placing the order in the hand of the "man-in-charge", the Inspector shall immediately leave the job. Work performed during the absence of the Inspector will not be accepted nor paid for, and shall be removed and replaced.

Notwithstanding any other provision of this agreement or any other Contract Documents, the Inspector shall not be in any way responsible or liable for any act, errors, omissions or negligence of the CONTRACTOR, any subcontractor or any of the CONTRACTOR's or subcontractor's agents, servants or employees or any other person, firm or corporation performing or attempting to perform any of the work.

SP-32: OWNER-ENGINEER RELATIONSHIP

The Engineer will be the OWNER's representative during construction. The duties, responsibilities and limitations of authority of the Engineer as the OWNER's Representative during construction are as set forth in the Contract Documents and shall not be extended or limited without written consent of the OWNER and Engineer. The Engineer will advise and consult with the OWNER, and all of OWNER's instructions to the CONTRACTOR shall be issued through the Engineer.

SP-33: PROFESSIONAL INSPECTION BY ENGINEER

The Engineer shall make periodic visits to the Site to familiarize himself/herself 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 Documents, 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 subcontractor's agents, servants or employees or any

other person, firm or corporation performing or attempting to perform any of the work.

SP-34: COPIES OF PLANS AND SPECIFICATIONS FURNISHED

Four (4) sets of plans and specifications (not including the General Provisions) shall be furnished to the CONTRACTOR at no charge for construction purposes. Additional sets may be obtained from the Engineer at **$ 50.00 per set.**

SP-35: VERIFICATION OF MEASUREMENTS

Before ordering any material or doing any work, the CONTRACTOR shall verify all measurements involved and shall be responsible for the correctness of these measurements. No extra charge or compensation will be allowed because of differences between actual dimensions and the dimensions shown on the drawings; any difference which may be found shall be called to the attention of the Engineer for consideration before proceeding with the work.

SP-36: PAY ITEMS - INCIDENTAL CONSTRUCTION

The CONTRACTOR shall be paid only for those items which are listed in the proposal or which are added to the job through a change order. All construction or removal considerations which are not listed as a separate pay item shall be considered as incidental construction. Cost for these items shall be considered in the most appropriate item listed in the schedule(s) of pay items.

SP-37: OMISSIONS

(a) In the event that the specifications inadvertently omit some of the usual and customary work, auxiliary equipment or material required for the satisfactory installation and operation of all work, equipment or material, the CONTRACTOR shall provide these items as directed by the Engineer at his/her own expense. The CONTRACTOR will be assumed to be an experienced and qualified CONTRACTOR in this type of work, and to have studied the purpose of operation of the equipment and the results to be obtained, and is to furnish equipment suitable for the work to be done.

(b) In the event that the specifications inadvertently fail to contain a specification for work to be done and material to be furnished, then the Standard Current Specification or Requirements of the A.W.W.A., A.S.T.M., A.S.C.E., A.S.E.E., A.S.M.E., N.B.F.U., N.E.C., N.E.M.A., O.S.H.A., NCTCOG “Standard Specifications for Public Works Construction” or TxDOT “Standard Specifications for Construction of Highways, Streets and Bridges” shall apply. Should the above specifications not apply, then the

work done, equipment or material furnished shall be as directed by the Engineer.

SP-38: MINIMUM WAGE RATES

For the work required of this project, the CONTRACTOR and all sub-contractors shall pay his/her employees the prevailing wage rates in accordance with the Texas Government Code, Chapter 2258. The prevailing wage rates determined applicable for this project are the current prevailing wage rate schedules of the United States Department of Labor adopted in accordance with the Davis-Bacon Act (40 U.S.C. Section 276a, et. seq.) and its subsequent amendments. These prevailing wage rates can be obtained from the following web page: **www.access.gpo.gov/davisbacon/tx.html** (Tarrant County).

A CONTRACTOR or sub-contractor who does not pay his/her employees in accordance with these prevailing wages shall pay $ 60.00 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 these prevailing wage rates to the CITY.

SP-39: LOSSES FROM NATURAL CAUSES

Unless otherwise specified, all loss or damage to the CONTRACTOR arising out of the nature of the work to be done, or from the action of the elements, or from any unforeseen circumstance in the prosecution of same, or from unusual obstructions or difficulties which may be encountered in the prosecution of the work, shall be sustained and borne by the CONTRACTOR at his/her own cost and expense.

SP-40: EXPLOSIVES, BLASTING, ETC.

Neither explosives nor blasting shall be allowed or used on this project.

SP-41: WORK WITH OWN FORCES

The CONTRACTOR shall perform with his own forces work of a value of not less than fifty percent (50%) of the contract amount.

SP-42: PROJECT NAME CONSTRUCTION SIGNS

The CONTRACTOR shall install two (2) Project Name Construction Signs on Northeast Parkway. One sign shall be at or near the intersection of Smithfield Road and Northeast Parkway and one sign shall be at or near the proposed intersection of Davis Boulevard and Northeast Parkway. The exact locations shall be approved by the OWNER prior to installation.

These signs shall be in general accordance with Figure 2M (R 02-26-2007) of the City of North Richland Hills' Public Works Design Manual, but the sign verbiage must be approved by the OWNER prior to fabrication. These signs shall be installed within 15 calendar days from the date the OWNER awards the contract and shall remain in place during the entire construction period. These Signs shall be removed within 15 calendar days after the OWNER's acceptance of the project improvements.

Sign Data:

Project Name: **Northeast Parkway Extension**
Projected Completion: *To Be Determined After Contract Award*

SP-43: WATER FOR CONSTRUCTION

The CONTRACTOR shall make the necessary arrangements for securing and transporting all water required in the construction, including water required for mixing of concrete, sprinkling, testing, flushing or jetting.

The CONTRACTOR may remit the City a deposit for a fire hydrant water meter; additionally, the CONTRACTOR will be billed for the water used on the construction of this contract and measured by such fire hydrant meter. Additionally, the cost of any temporary pipe line, metering or other equipment which may be necessary to make use of such fire hydrant water meter and water, shall be considered as incidental to the work and payment therefore shall be included in the various bid items of the proposal. If the CONTRACTOR chooses to use such fire hydrant water meter, he/she shall assume full responsibility for it and return it in the same or similar condition as received otherwise the CONTRACTOR will not be returned his/her deposit.

SP-44: OWNER'S RIGHT TO SUSPEND WORK AND ANNUL CONTRACT

Delete GP Item 108.9.(2) and replace it with the following:

(2) failure of the CONTRACTOR to make the progress set out in the Progress Schedule;

SP-45: OWNERSHIP OF DRAWINGS

All drawings, specifications and copies thereof furnished by the Engineer shall not be reused on other work, and, with the exception of the signed contract sets, are to be returned to him on request, at the completion of the work. All models are the property of the OWNER.

SP-46: ADEQUACY OF DESIGN

It is understood that the OWNER believes it has employed competent engineers and designers. It is, therefore, agreed that the Engineer shall be responsible for the adequacy of the design, sufficiency of the Contract Documents, the safety of the structure and the practicability of the operations of the completed project; provided the CONTRACTOR has complied with the requirements of the Contract Documents, all approved modifications thereof, and additions and alterations thereto approved in writing by the OWNER. The burden of proof of such compliance shall be upon the CONTRACTOR to show that he/she has complied with the requirements of the Contract Documents, approved modifications thereof and all approved additions and alternations thereto.

SECTION V

GEOTECHNICAL REPORT

Fugro USA Land, Inc.

GEOTECHNICAL ENGINEERING REPORT

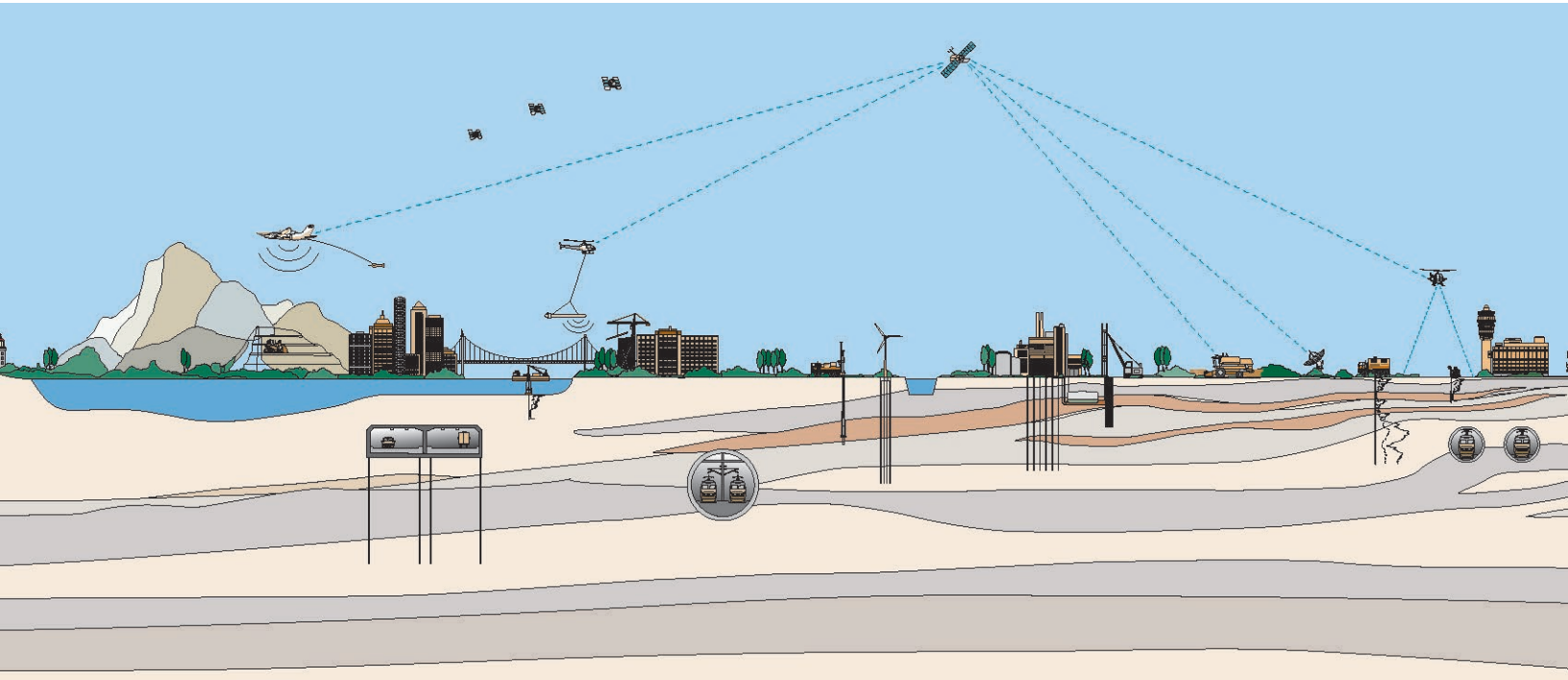
SMITHFIELD ELEMENTARY SCHOOL IMPROVEMENTS
6724 SMITHFIELD ROAD
NORTH RICHLAND HILLS, TEXAS

PROJECT NO. 04.40191063

Report to:

BIRDVILLE INDEPENSENT SCHOOL DISTRICT
HALTOM CITY, TEXAS

AUGUST 20, 2019



FUGRO USA LAND, INC.
2880 Virgo Lane
Dallas, Texas 75229
T +1 972 484 8301
F +1 972 620 7328

Project No. 04.40191063
August 20, 2019

Birdville Independent School District
Bond and Capital Improvements
6119 East Belknap Street
Haltom City, Texas 76117

Attention: Mr. Conan Mathson

GEOTECHNICAL ENGINEERING REPORT
SMITHFIELD ELEMENTARY SCHOOL IMPROVEMENTS
6724 SMITHFIELD ROAD
NORTH RICHLAND HILLS, TEXAS

Dear Mr. Mathson:

Fugro USA Land, Inc. (Fugro) is pleased to present this geotechnical engineering report for the above referenced project. This study was performed in accordance with Fugro Proposal No. 04.40191063, dated June 12, 2019.

This report presents the results of our geotechnical engineering analyses and recommendations for the proposed structures.

We appreciate the opportunity to be of assistance on this project. Please feel free to contact us if you have any questions or whenever we can be of service.

Very truly yours,

FUGRO USA LAND, INC.
TBPE Firm Registration No. F-299

Che-Hung (Chris) Tsai, Ph.D., P.E.
Senior Project Manager

Segu I. Ifham, P.E.
Geotechnical Engineering Manager

CONTENTS

APPENDIX

EXECUTIVE SUMMARY

This report presents the results of a geotechnical engineering study performed for the proposed Smithfield Elementary School Improvements in North Richland Hills, Texas. The subsurface conditions of the site were explored by drilling and sampling 19 soils borings, and laboratory testing on selected samples. The results of the study indicate the site is suitable for the proposed development.

The proposed structures will be subjected to movements due to volume changes of the underlying soils. The most positive foundation approach for the proposed structures would consist of deep foundation systems with a structurally suspended floor system. With the risk of experiencing some soil-related movements, a ground supported floor slab could be considered as an alternate. For this alternate approach, the subgrade soils may be improved beneath the foundation to limit soil-related movements to within tolerable levels.

Based on the subsurface conditions encountered in the test borings, the deep foundation systems may consist of cast-in-place concrete straight drilled shafts or auger-in-place concrete (ACIP) piles. However, foundation system for any of the proposed structures should not be designed with a combination of different types of foundations.

The subsurface conditions encountered at the site consist of thick sandy soil layers and shallow groundwater in the overburden soils. This site subsurface conditions are considered one of the most challenging formations for pier construction because of the possibility of groundwater seepage and sloughing soils during the excavation. Therefore, special construction techniques will be required to keep the excavation open. We recommend that the pier drilling contractor must have considerable experience with pier installation in this site subsurface conditions.

We also recommend at least one test hole be drilled by the contractor prior to the construction of the drilled shafts to understand the soil caving and groundwater issues.

Seismic site class C is appropriate for the design of foundation. Grade beams and pier caps should be physically isolated from the underlying soil surface by a minimum void space of 8 inches and be structurally supported by the drilled pier or ACIP foundations.

Structural slab is recommended if floor slab movements are to be limited to ¾ inch. Carton forms of at least 8-inch thick are recommended for structural slabs. A ground supported floor

slab system could be considered as an alternate to suspended floor slab. For this alternate approach, the underlying soils should be improved to reduce the PVM to 1-inch. The improvement should include excavation of 8 feet of onsite soils and replacement with 2 feet of select fill over 6 feet of moisture conditioned on-site fill.

We include this executive summary to provide a very brief presentation of some of the key recommendations of this report. It is by no means intended to be a comprehensive or stand-alone representation of the findings of our study. The full text of the report and the attached appendices contain important information which the reader should use to come to more informed conclusions about the information presented herein.

INTRODUCTION

This report presents the results of a geotechnical study performed for the proposed Smithfield Elementary School Improvements in Arlington, Texas.

Project Description

The project site is located within the existing Smithfield Elementary School Situated at 6724 Smithfield Road in North Richland Hills, Texas. The general location of the site is shown on Plate 1, Vicinity Map, in Appendix A.

We understand this project will consist of the design and construction of the following structures:

- A one- to two- story school building (about 64,000 square feet);
- A playground (about 32,000 square feet);
- A playfield (about 57,600 square feet);
- Paved roadway extension (about 1,300 liner feet); and,
- Parking lot, drive, and sidewalk.

We understand that the proposed roadway will be aligned along the south side of the school campus. The roadway will extend from Northeast Parkway and connect Davis Boulevard and Smithfield Road.

We further understand that the proposed school building will be constructed with a steel-frame superstructure and deep foundation system. The maximum column load of the buildings is estimated to be on the order of 250 kips.

Scope of Service

The purpose of this study is to evaluate the subsurface conditions encountered in the borings at selected locations and to develop geotechnical recommendations for the proposed project. This report addresses and provides geotechnical recommendations for:

1. soil swell potential;
2. foundation design and construction;
3. floor slab design and construction;

4. floor subgrade preparation;
5. IBC Seismic Site Class;
6. pavement sections; and,
7. earthwork.

The project plans were updated after we submitted the proposal. Based on the plans as of August 15, 2019, amphitheatre was removed and a parking lot is added. Therefore, this report will not provide recommendations for the amphitheatre.

SUBSURFACE CONDITIONS

Geology

According to the published geologic maps, the site is situated on an outcrop of the Woodbine Formation. The Woodbine is a series of ferruginous, argillaceous sands, laminated clays (some of which are bituminous), ironstone, and some gravel. Historically, the Woodbine is a member of the "upper" or Gulf Series of Cretaceous age. The depositional pattern of soils is characteristic of a high-destructive deltaic system. The Woodbine Formation is a heterogeneous admixture of materials ranging from highly active clays, through sandy clays and silts, to sand and gravel. Large masses of very hard sandstone occur locally and are commonly referred to as boulders. Relatively firm shales are often encountered at varying depths below the surface. Additionally, the type material encountered may vary widely over very short distances both laterally and vertically. Sand layers and lenses which are found throughout the formation tend to serve as aquifers for subsurface runoff. Therefore, groundwater may be encountered on a seasonal basis.

Stratigraphy

Based on our interpretation of the borings drilled for this study, the subsurface stratigraphy generally consists of lean to fat clays, sandy lean to sandy fat clays, and clayey sand underlain by gray shale. Gray shale was generally encountered at depths of 27 to 33 feet below the existing grades. The depths to gray shale at each boring location within building footprints is summarized below.

Table 1: Depths to Bedrock

Boring No.	Boring Depth (ft.)	Depth to Gray Shale (ft.)
B-1	50	32
B-2	40	27
B-3	40	28
B-4	45	29
B-5	40	31
B-6	40	31
B-7	50	33
B-8	45	31

The subsurface materials encountered in each of the boring are described in the boring logs. The stratification boundaries shown on the boring logs represent the approximate locations of the changes in the soil and rock types; in situ, the transition between material types may be gradual and indistinct.

Groundwater

The borings were drilled using dry auger procedures to observe the depths of groundwater seepage at the time of the exploration. Groundwater seepage elevations were measured at each boring location during drilling and upon completion of drilling. Groundwater readings taken from Borings B-1 through B-9 are summarized in the table below. Groundwater was not encountered in the remaining borings.

Table 2: Groundwater Observations

Boring No.	Groundwater Measurements (ft.)	
	Seepage During Drilling	Upon Completion of Drilling
B-1	17.5	18.5
B-2	16.5	13.5
B-3	12	17.5
B-4	12	17
B-5	16.5	14
B-6	13	11.5
B-7	12.5	11

Boring No.	Groundwater Measurements (ft.)	
	Seepage During Drilling	Upon Completion of Drilling
B-8	13	6
B-9	16	16.5

It is not possible to accurately predict the magnitude of subsurface water fluctuations that might occur based upon short-term observations. The groundwater levels depend on permeability, rainfall conditions, and other factors. Future construction activities may also alter the surface and subsurface drainage characteristics of the site. If a noticeable change in the conditions is observed during construction, then we should be notified immediately to review its effect on the design recommendations.

ENGINEERING ANALYSIS AND RECOMMENDATIONS

Expansive Soils

The near surface soils encountered in the borings exhibited plasticity indices ranging between 7 and 52. Swell tests performed on selected soil samples indicated potential swell up to 5.5 percent when permitted free access to water at the current moisture conditions and under the approximate existing overburden pressure. The on-site clay can be considered as expansive soil.

Potential vertical movement (PVM) of the soils were estimated using swell test results and Texas Department of Transpiration (TxDOT) Method Tex-124-E. Swell test results are based on the in-situ moisture profile of the subsurface soils at the time soil sampling. TxDOT method Tex-124-E is empirical and the estimate is based on index test results. The calculated swell potentials using different methods are tabulated below.

Table 3: Maximum Swell Potential Estimate

Method	Maximum Swell Potential
Laboratory swell test	1½ to 2½ inches
Tex-124-E	3 to 4 inches

Note: It is assumed the depth to active zone is 10 feet

The PVM will depend on the moisture content and depth to active soils within the zone of moisture changes. The drier and the deeper the expansive soil is, the higher PVM will be. Considerably more movements greater than the estimation will occur in areas where ponding of water is allowed to occur at the ground surface. For this reason, water should not be allowed to pond adjacent to the building during or after construction.

For the purpose of the design of soil supported slabs and utility lines a design PVM of 4 inches can be considered for the dry soil conditions without any subgrade improvements.

The likelihood and severity of distress caused by PVM to the structural elements are difficult to predict. Generally, PVM in the range of ¾ to 1 inch is considered tolerable to buildings. We recommend a maximum allowable PVM of ¾ inch for the proposed buildings.

The likelihood and severity of distress in buried utility lines are dependent upon the type of pipes and joints. Ductility of pipes and flexibility of joints will determine how much of movement a pipeline can tolerate before exhibiting distress. Generally, soil movement up to 2 inches is considered acceptable for many types of utility lines. However, some pipelines may have stringent requirements. For each type of pipeline, the pipe supplier should be consulted for allowable movement.

Foundation Systems

Based on the subsurface conditions encountered in the borings, the proposed structures will be subjected to some movement due to volume changes of the underlying soils. In our experience, the most positive foundation approach for the proposed buildings would consist of deep foundation system with a structurally suspended floor system. The deep foundation system may consist of cast-in-place concrete straight shaft drilled piers or auger-in-place concrete (ACIP) piles. However, foundation system for any of the proposed structures should not be designed with a combination of different types of foundations.

With the risk of experiencing some soil-related movements, a ground supported floor slab could be considered as an alternate. For this alternate approach, the subgrade soils beneath the foundation should be improved to limit soil-related movements to within tolerable levels. Flatwork adjacent to the building may also be supported on improved subgrade.

Straight Shaft Drilled Piers

In general, straight drilled shafts are cost effective foundation system in relatively shallow bedrock sites. However, the presence of sandy soil layers and groundwater in the overburden soils may require special construction techniques such as slurry method or temporary casing with underwater placement of concrete. There is a good chance that the construction will require slurry method of construction and underwater placement of concrete. If slurry method is used, the end bearing resistance of the shale should not be incorporated in the design. Similarly, if concrete is placed underwater, the end bearing resistance of the shale should not be incorporated in the design. Design parameters and recommendations for straight drilled shafts are discussed in the following sections.

Axial Load Design

The axial capacity of straight shaft drilled piers will be derived from a combination of end bearing and skin friction. Recommendations for these design parameters are tabulated below.

Table 4: Straight Shaft Drilled Pier Design Parameters

Parameter	Recommendation	
Bearing stratum	Gray shale	
Minimum penetration into bearing stratum	5 feet into bearing stratum	
Allowable skin friction in compression [1]	2,500 psf at depths deeper than 5 feet into bearing stratum	
Allowable skin friction in tension [1, 2]	2,000 psf at depths deeper than 5 feet into bearing stratum	
Allowable end bearing capacity[3]	20,000 psf	
Uplift force due to swelling of the clay [2]	1,000 psf acting over the upper 10 feet of the shaft	
Minimum shaft diameter	18 inches	
Reduction in skin friction due to closely located shafts	Center-to-Center Spacing	Allowable Skin Friction
	Greater than 3 shaft diameters	100%
	2 to 3 shaft diameters	75%
	Less than 2 shaft diameters	50%
Settlement[4]	¾ inch	

Notes: 1 - The allowable skin friction should be applied to that portion of the drilled shaft in direct contact with the gray shale below any temporary casing (if used) and below the minimum penetration length (5 feet).

2 - The allowable skin friction in tension can be utilized to resist the uplift forces in straight drilled shafts. The drilled shafts should be reinforced with sufficient, full-depth, vertical reinforcing steel to resist potential tensile forces.

3 - The allowable end bearing capacity should not be included in the design of shafts, if slurry method is utilized for construction, or concrete is placed underwater.

4 - Settlement will primarily be within the elastic range with a portion of settlement occurring during construction.

Construction of Drilled Piers

The subsurface conditions encountered at the site consist of thick sandy soil layers and shallow groundwater in the overburden soils. This site subsurface conditions are considered one of the most challenging formations for pier construction because of the possibility of groundwater seepage and sloughing soils during the excavation. Therefore, special construction techniques will be required to keep the excavation open. We recommend that the pier drilling contractor must have considerable experience with pier installation in this site subsurface conditions.

The drilled piers should be installed in accordance with American Concrete Institute's "Standard Specification for the Construction of Drilled Piers" (ACI 336). Axial capacity recommendations provided in this report are based on proper construction procedures. The construction of drilled piers should be observed by experienced geotechnical personnel during construction to help assure compliance with design assumptions. Observations should include:

1. identification of the bearing stratum;
2. minimum penetration depth;
3. removal of all smear zones and cuttings;
4. correct handling of groundwater seepage;
5. piers are within acceptable vertical tolerance; and
6. other related items

We recommend that the pier-drilling equipment be equipped with suitable rock drilling teeth and the rig should have sufficient torque and weight to drill through the rock strata.

Groundwater was encountered in the borings, and it is expected that the groundwater will be encountered during the construction of drilled piers. Because of the presence sandy soil layers, caving or sloughing conditions should be expected in the overburden soils. Temporary casing or slurry processing of excavation will be required to keep the shafts open.

If temporary casing is sufficient to stop the water intrusion and keep the shaft open, excavation for the piers should be maintained in a dry condition. Casings should be installed to sufficient

depths to ensure that an adequate seal is obtained. Typically, a casing penetration of 3 to 5 feet into bedrock will provide a satisfactory seal. After the satisfactory installation of the temporary casing, the required penetration into the bearing material may be excavated through the casing. Reinforcing steel and concrete should be placed immediately after the excavation has been completed, dewatered, cleaned and observed. Dewatering could consist of using a bailing bucket, pumping, mixing the water with dry soil, etc. Water and loose materials in the cased pier excavations should be removed prior to the concrete placement.

If temporary casing does not stop the water, underwater placement of concrete can be considered. If underwater placement is performed, the end bearing should be ignored, and the shaft should be deepened to a penetration determined by the structural engineer.

If the shaft cannot be kept open during the excavation, slurry processing of excavation will be required to keep the shafts open. In this method, concrete should be placed using a tremie as continuously as possible until the concrete placement is complete. Before concrete is poured, care should be taken to ensure that the water is at a stabilized level. The tremie should be plugged while being lowered into the shaft until it rests on the bottom of the shaft excavation. The tremie should be filled with concrete and then lifted off the bottom about 1 foot. The concrete should then be placed in a continuous operation until all water or slurry is forced out of the shaft. The bottom of the discharge pipe should always be kept at least 5 feet below the surface of the concrete. For this method, the end bearing should be neglected. The shaft should be deigned based on only skin friction.

For dry method, concrete should have a slump of 5 to 7 inches. However, for wet method (underwater placement or slurry method) concrete should have a slump of 7 to 9 inches.

A completed shaft excavation should not be allowed to remain open for more than 4 hours. Concrete placed in an excavation in excess of 10 feet should be placed in such a manner (using a tremie, centralizing chute, or by similar means) to prevent segregation of aggregates or to prevent concrete from striking the reinforcing steel. Care should be taken to avoid creating an oversized cap ("mushroom"), particularly near the ground surface. A "mushroom" at the top of the drilled shaft could be lifted by heave of the expansive soils.

If the shafts are constructed by slurry method, we recommend nondestructive testing such as cross-hole sonic logging (CSL) be performed on at least two randomly selected piers to check

the structural integrity of the shafts after construction. Single-hole sonic logging (SSL) may be used on shaft diameters up to 24 inches.

We also recommend at least one test hole be drilled by the contractor prior to the construction of the drilled shafts to understand the soil caving and groundwater issues.

Auger Cast in Place Piles

Auger cast in place (ACIP) piles are suitable to support the proposed structures at the project site. ACIP plies are also referred to as continuous flight auger (CFA) piles. Design parameters and recommendations for ACIP piles are discussed in the following sections.

Axial Load Design

Design parameters for ACIP piles are tabulated below.

Table 5: ACIP Pile Design Parameters

Parameter	Recommendation		
Depth below existing grade	5 to 20 feet	20 to 35 feet	Below 35 feet
Allowable skin friction in compression[1]	700 psf	1,600 psf	2,500 psf
Allowable skin friction in tension[1, 2]	500 psf	1,000 psf	2,000 psf
Allowable end bearing capacity	Neglect		
Uplift force due to swelling of the clay[2]	1,000 psf acting over the upper 10 feet of the pile		
Reduction in skin friction due to closely located shafts	Center-to-Center Spacing	Allowable Skin Friction	
	Greater than 3 shaft diameters	100%	
	2 to 3 shaft diameters	75%	
	Less than 2 shaft diameters	50%	
Settlement[3]	¾ inch		

Notes:

1. *The allowable skin friction of the upper 5 feet of the pile should be neglected in the design.*
2. *The allowable skin friction in tension can be utilized to resist the uplift forces. The ACIP pile should be reinforced with sufficient, full-depth, vertical reinforcing steel to resist potential tensile forces.*
3. *Settlement will primarily be within the elastic range with a portion of settlement occurring during construction.*

Construction of ACIP Piles

The ACIP piles should be installed in accordance with the recommendations provided in Federal Highway Administration's Report No. FHWA-HIF-07-03. Axial capacity recommendations provided in this report are based on proper construction procedures. The construction of ACIP piles should be observed by experienced geotechnical personnel during construction to help assure compliance with design assumptions. Observations should include:

1. pump calibration (stroke vs volume);
2. penetration depth;
3. grout volume;
4. grout testing;
5. piers are within acceptable vertical tolerance; and
6. other related items

We recommend that the pile-drilling equipment be equipped with suitable drilling teeth and the rig should have sufficient torque and weight to drill through the hard strata.

Care should be taken to avoid creating an oversized cap ("mushroom"), particularly near the ground surface.

Proper installation of ACIP piles is dependent on the contractor's experience, construction procedures, and equipment. Detail pile installation specifications addressing the ACIP piles should be prepared as part of the construction package.

We recommend nondestructive testing such as single-hole sonic logging (SSL) be performed on at least two randomly selected piles to check the structural integrity of the piles after construction. In additional, we also recommend on site axial load test should be performed on a sacrificial pile at the beginning of construction to verify the design parameters provided in this report.

Grade Beams and Pier Caps

Grade beams and pier caps (if required) should be physically isolated from the underlying soil surface by a void space and be structurally supported by the drilled shaft or ACIP pile foundations. A minimum void space of 8 inches should be provided beneath the grade beams. The purpose of the void is to provide space for swelling of expansive subsurface materials without resulting in structural distress to the grade beam. Structural cardboard carton forms are

often used to provide this void beneath grade beams. Soil retainers (void form skirt) are further recommended to minimize the potential for infilling of the void space over time after carton forms deteriorate.

Excavation for the void boxes must remain dry. Our experience indicates that major distress in grade beams will occur if the integrity of the void box is not maintained during construction. Therefore, cardboard void forms must have sufficient strength to support the weight of the grade beam during construction. Backfill material must not be allowed to enter the void carton area below the grade beams, since this reduces the void space.

The exterior grade beams or foundation walls should be backfilled with a well-compacted, on-site clay or clay cover with a minimum thickness of at least 2 feet to retard migration of surface water into any drainage layer or into the void space. The backfill should be placed in loose lifts less than 8 inches thick and uniformly compacted to the specifications presented in "***Earthwork***" section of the report.

Floor Slab Systems

The maximum potential vertical movement at the site is estimated to be about 4 inches. If floor movements are to be limited to ¾ inch, a structural (suspended) floor system is regarded as the most positive approach to limit the potential for post-construction movements. With the risk of experiencing some soil-related movements, a slab-on-grade floor system can be considered as an alternate. For this alternative approach, the soils must be improved beneath the building addition footprints to reduce the PVM.

Suspended Floor Slabs

If floor slab movement cannot be tolerated, we recommend a suspended floor slab system be constructed. Two methods are available for constructing a suspended floor slab system:

1. Cardboard carton forms to create a void; and,
2. Raising the floor slab above the underlying soils with a crawl space.

Carton forms should be at least 8 inches thick. If these forms are used, care must be taken to preserve their structural integrity and ability to create a consistent void. A rigid material layer (such as masonite) should be placed directly on the forms to prevent puncture by personnel during placement of concrete. This rigid layer would also help reduce the potential for concrete to

leak down between the cardboard forms. A qualified inspector should be present during floor-slab concrete placement to assure the void is maintained.

If crawl space is utilized, we recommend that the floor slab be suspended at least 12 inches above final subgrade elevations. If utility lines are suspended beneath the slab, the crawl space clearance should be increased to a minimum of 2 feet to provide access to these lines. Future movements of soil supported utility lines must be considered when designing connections, especially where these lines approach or enter the stationary structure. The subgrade beneath the crawl space must be graded to remove water from beneath the structure. If gravity drainage cannot adequately remove the water from beneath the structure, it may be necessary to direct the underfloor drainage ditches to a sump pump. Construction must also contain sufficient ventilation to limit corrosion of the metal components.

Ground-Supported Floor Slabs

It should be understood by all parties that a soil-supported floor system will likely experience some movement with time. The subgrade should be prepared as discussed in the following paragraphs.

To improve subgrade and to limit the PVM to one inch, we recommend the subgrade conditions beneath the slab be prepared by providing 2 feet of select fill underlain by 8 feet of moisture-conditioned on-site clay soils. Flexible base material may be used instead of select fill, if desired.

we recommend excavation of soils to a depth of 10 feet below the bottom of floor slab. The excavated should be mixed with water and placed back in lifts not exceeding 8 inches in loose thickness and compacted to the specification presented for floor slab backfill in "***Earthwork***" section of the report. The on-site backfill placement should be stopped at two feet below the bottom of floor slab elevation, and the upper two feet should be backfilled with flexible base material and compacted to the criteria presented in "***Earthwork***" section of the report. Additional fill placed to raise the grades should be imported select fill or similar to on-site sandy soil and should be moisture adjusted.

The ground modification process should be extended at least 5 feet beyond the building lines, building entrances, abutting sidewalks, and flatwork areas sensitive to movement. Select fill (or Flexible base material) is not required outside building lines.

The select fill (or flexible base material) and moisture conditioned subgrade should be kept in a moist condition until the floor slab is constructed. This could be achieved by regularly sprinkling water during dry and windy days. We recommend that a vapor barrier of polyethylene sheeting or similar material be placed between the floor slab and the subgrade soils to retard moisture or vapor migration through the slab.

Seismic Design Parameters

Based on the results of the field and laboratory tests conducted for this investigation and site class definitions shown in 2015 International Building Code (2015 IBC), it is our opinion that the subject site be classified as Site Class C with a soil profile name of "Very Dense Soil and Soft Rock". We also recommend a design spectral acceleration of 0.075 g for short period (S_{DS}) and 0.057 g for 1 second period (S_{D1}).

Flatwork Considerations

We recommend that all access and entryway slabs and areas of flatwork be constructed on a subgrade prepared in accordance with the recommendations for the building pads, as described in ***Ground-Supported Floor Slabs*** section. Sidewalks should not be structurally tied to the buildings. To prevent potential tripping hazards, the slabs should be elevated noticeably above the adjacent, relatively non-modified, ground-supported sidewalks and pavement slabs. Differential upward movement of all ground-supported flatwork should be anticipated and considered during final grading design.

Pavement

Subgrade Preparation

Pavement subgrade is expected to have clayey soils that can lose its support with increase in moisture content. We recommend the subgrade soils beneath the pavement sections be lime stabilized to a depth of 6 inches and compacted to the specifications presented in "**Earthwork**" section of the report.

For budgeting purposes, 7 percent hydrated lime by dry soil weight is estimated for the treatment. The actual percentage of lime should be verified during construction by sampling the finished subgrade soil and testing to determine the optimum lime content.

Pavement Sections

Both portland cement and asphaltic cement pavement systems can be considered for this site. The following Portland cement concrete and asphaltic cement pavement sections are recommended for consideration at this site:

Table 6: Pavement Section Thickness

Pavement Type	Thickness (inch)
Portland Cement Concrete Pavement	
Light Traffic (Automobile Parking Areas)	
TxDOT Item 360, Portland cement concrete	5
Compacted subgrade	6
Medium Heavy Traffic (Drives)	
TxDOT Item 360, Portland cement concrete	6
TxDOT Item 260, lime treated subgrade	6
Heavy Traffic (Dumpsters, Loading Docks, Fire Lanes, and Heavy Traffic Turning)	
TxDOT Item 360, Portland cement concrete	7
TxDOT Item 260, lime treated subgrade	6
Asphaltic Cement Pavement	
Light Traffic (Automobile Parking Areas)	
TxDOT Item 340 Type C or D, asphaltic concrete	2
TxDOT Item 340 Type A or B, asphaltic concrete	4
TxDOT Item 260, lime treated subgrade	6
Medium Heavy Traffic (Drives)	
TxDOT Item 340 Type C or D, asphaltic concrete	2
TxDOT Item 340 Type A or B, asphaltic concrete	5
TxDOT Item 260, lime treated subgrade	6

Note: Pavement section should be increased by one inch if lime treatment is omitted.

Design of the concrete pavements should specify a minimum 28-day concrete compressive strength of 3,600 psi. The concrete should be placed within one and one-half hours of batching. During hot weather, the concrete placement should follow ACI 305 Hot Weather concreting. Consideration should be given to limiting concrete placement to the time of day that will minimize large differences in the ambient and concrete temperate. Use of superplasticizer should be considered to improve the concrete workability without increasing water cement ratio.

The pavement should be reinforced, at a minimum, using at least No. 3 bars on a grid spacing of 18 inches on center, each way.

The concrete pavements should have adequately-spaced contraction joints to control shrinkage cracking. Past experience indicates that reinforced concrete pavements with sealed contraction joints on 12 to 15-foot spacing, cut to a depth of one-quarter to one-third of the pavement thickness, have generally exhibited less uncontrolled post-construction cracking than pavements with wider spacing. The contraction joint pattern should divide the pavement into panels that are approximately square where the panel length should not exceed 25 percent more than the panel width. Saw cut, post placement formed contraction joints should be saw cut as soon as the concrete can support the saw cutting equipment and personnel and before shrinkage cracks appear, on the order of 4 to 6 hours after concrete placement. Rubberized asphalt, silicone or other suitable flexible sealant could be used to seal the joints. Isolation joints should be used wherever the pavement will abut a structural element subject to a different magnitude of movement, e.g., light poles, retaining walls, existing pavement, stairways, entryway piers, building walls, or manholes.

The hot mix asphaltic concrete (HMAC) pavements should be constructed in accordance with Item 340 of TxDOT, 2004 Standard Specifications for Construction of Highways, Streets, and Bridges. It is important that the HMAC pavement be placed on a well-compacted base and subgrade. The HMAC should be compacted at the proper temperature and density. It has been our experience that asphaltic pavements that are not constantly subjected to traffic will experience some deterioration.

It is our opinion that minimizing subgrade saturation is an important factor in maintaining subgrade strength. Water allowed to pond on or adjacent to the pavement could saturate the pavement and cause premature pavement deterioration. We recommend sloping all pavement surfaces to provide rapid surface drainage. Positive surface drainage away from the edge of the paved areas should be maintained. Design measures that could reduce the risk of subgrade saturation and improve long-term pavement performance would include crowning the pavement subgrades to drain toward the edges of the pavement area, rather than to the center, and installing surface drains next to any area where surface water can pond. Thicker pavement sections will reduce the necessity for regular maintenance over the design life of the pavement.

Roadway Extension

The proposed roadway section will be extended from the existing Northeast Parkway and aligned along the south side of the school campus. The roadway will connect the existing Davis Boulevard and Smithfield Road in the west – east direction. Based on the North Richland Hill's Thoroughfare Plan dated November 12, 2007, Davis Boulevard was classified as Principal arterial and Smithfield Road was classified as major collector.

The street classification and design traffic data for the proposed roadway extension is not available at the time of this geotechnical investigation. We understand that the proposed roadway will be used mainly for the school traffic. It will be a two-lane undivided street with shoulders. We assume that the proposed roadway extension will be constructed as a minor collector. We also assume the total 18-kips ESAL for a design life of 25 year is about 3,000,000.

We recommend the subgrade soils beneath the pavement sections be lime stabilized to a depth of 8 inches and compacted to the specifications presented in "***Earthwork***" section of the report. Seven percent lime by dry soil weight is estimated for on-site soils. The actual percentage of lime should be based on results of additional laboratory tests on representative soil samples of the exposed subgrade obtained during construction.

Pavement Design Parameters and Section

The parameters used in our pavement analyses and results of the pavement section are summarized in the following tables. Parameters listed in the table are selected in accordance with the AASHTO Guide for Design of Pavement Structures (1993).

Table 7: Pavement Design Parameters

Parameter	Design Value
Street Type	Minor Collector
Pavement Type	Rigid
Reliability, %	85
Initial Serviceability	4.50
Terminal Serviceability	2.25
Overall Standard Deviation	0.39

Parameter	Design Value
Load Transfer Coefficient	3.0
Overall Drainage Coefficient (C_d)[1]	1.0
Modulus of Subgrade Reaction (k), psi/in	385
Concrete Elastic Modulus (28-Day), psi	4,000,000
Concrete Modulus of Rupture (28-Day), psi	620

Note: [1] - C_d of 1.0 if edge drains are provided or if the area adjacent to the pavement edges is not irrigated and is positively sloped away from the pavement structure.

Table 8: Pavement Section Thickness

Portland Cement Concrete Pavement	Thickness (inch)
Portland cement concrete	7
Lime treated subgrade (TxDOT Item 260)	8

Note: Design of Concrete pavements should specify a minimum 28-days concrete compressive strength of 4,000 psi.

Earthwork

The project involves excavation of on-site soils and placement and compaction of fill materials.

Site and Subgrade Preparation

The site should be stripped. Prior to placing any new fill, debris and similar unsuitable materials should be removed. After any cutting operations, the exposed subgrade should be proofrolled with a loaded, tandem-axle dump truck weighing a minimum of 25 tons or other heavy, rubber-tired construction vehicle to locate any zones that are soft or unstable. The proofrolling should consist of several overlapping passes in mutually perpendicular directions over a given area. In areas where rutting or pumping occurs during proofrolling, subgrade should be removed and replaced with suitable fill, if it cannot be compacted in place. Proofrolling is not required where structurally suspended floor slabs will be used.

Fill Material Requirements

On site soils if used as fill should be free of rock fragments greater than 4 inches in size, organic matter, and other deleterious materials. Excessive large-sized clay clods should be avoided.

Select fill should have a liquid limit 35 or less and plasticity index between 5 and 15. The fine content (percent passing a No. 200 sieve) of the material should be between 25 to 55.

Flexible base material should meet the requirements of TxDOT Item 247 Grade 1 or 2. Crushed concrete or processed limestone meeting the gradation-requirements of flexible base may also be used.

Placement and Compaction Process Controls

In general, all fill soils should be placed in consistent loose lift thickness and fully and uniformly compacted. The moisture content of lifts at the time of compaction should be wet of optimum moisture content as defined by the compaction curves. Each lift should be uniformly compacted with the minimum number of passes required for full compaction (i.e. when no further densification is achieved for subsequent compactor passes). Any moisture change must be achieved before compaction.

All completed lifts should be protected or preserved by subsequent lift coverage placed as quickly as practical. Completed lifts damaged by erosion, destructive disturbances during wet conditions, etc. should be scarified and re-compacted. Any lifts or finished fills to be exposed to weathering for longer than 5-day period should be covered and protected with sacrificial soil layers or wet matting. Process control specifications for each fill are provided below.

Table 9: Compaction Criteria

Fill Type	Requirement [1]		
	Loose Lift Thickness	Degree of Compaction	Moisture Content
Grade beam backfill and flatwork areas	6 to 8 inches	At least 95% of $\gamma_{dry\text{-}max}$	At least 3% points above m_{opt}
Select fill	6 to 8 inches	At least 95% of $\gamma_{dry\text{-}max}$	At or above m_{opt}
Flexible base	6 to 8 inches	At least 98% of $\gamma_{dry\text{-}max}$	At or above m_{opt}
Grade changes outside the building	8 to 10 inches	At least 95% of $\gamma_{dry\text{-}max}$	At or above m_{opt}

Note:

1. *Maximum dry density ($\gamma_{dry\text{-}max}$), and optimum moisture content (m_{opt}) should be determined from the results of standard Proctor method (ASTM D 698)*

Quality Control and Field Testing

The Geotechnical Engineer should perform field moisture-density tests at appropriate frequencies on compacted lifts to ensure that the compaction control specifications are achieved. Field testing volumes and frequencies will depend on confirmation of other process controls and fill soil ranges and variations. Typically for mass fills, such tests would be performed every 2,500 square feet of compacted lift or fraction thereof. For trench backfill and

small areas of filling, field moisture content and density testing should be performed for every 200 cubic yards of backfill placed for each lift or for every 200 lineal feet of trench, whichever represents the greater frequency of testing. The Geotechnical Engineer or his representative should determine the acceptability of each compacted lift based on this regime of field moisture content and density testing. Field density gauge probes must be deployed to measure the average properties of the compacted lift.

Site Grading, Drainage, and Landscaping

Cut and fill slopes should be gentle and preferably should not exceed about 4-horizontal to 1-vertical (4H:1V) in the overburden soil.

The exterior ground surface around the structure should be sloped at a 5 percent grade for a distance of at least 10 feet to provide for positive surface drainage away from the building. Excess water ponding on and beside slab-on-ground foundations, running track, or similar structures can cause unacceptable heave of these elements.

Roof drainage should be transmitted by pipe to a storm drainage system or to a paved surface where the water can drain away without entering the foundation soils beneath the building. A system of gutters and downspouts is recommended, with discharge at points at least 5 feet away from the perimeter of the foundation slab.

Backfill for utility lines or along the perimeter grade beams should consist of well-compacted, impermeable, on-site clays to minimize the potential for localized infiltration of surface water. The bottom of the trench excavation should slope away from the structure. If the backfill is too dense or too dry, swelling may form a mound over the backfilled utility line. If the backfill is too loose or too wet, settlement may form a low area along the line. Either case is undesirable since several inches of movement is possible and excessive movement or cracking of soil-supported flatwork are likely to result. The soils should be processed and moisture conditioned using the previously discussed compaction criteria. Where the utility lines pass beneath pavements, the top 6 inches should be compacted similarly to the remainder of the subgrade. It is also recommended that the utility ditches be visually inspected during the excavation process to help ensure that undesirable fill that was not detected by the test borings does not exist at the site. This office should be notified immediately if any such fill is detected.

Excess water ponding on and beside slabs and running track can cause unacceptable heave of these slabs. To reduce this potential heave, good surface drainage should be established in all

building, flatwork, and running track areas. Lawn irrigation systems should be designed and operated to minimize saturation of soil adjacent to structures. Sprinkler mains should not be placed next to the building.

Trees will remove water from the soil and, as a result, can cause the soil to shrink. Therefore, trees should either:

1. not be planted closer than the mature tree height from the building (if ground-supported slab is used) or pavement edge; or
2. have a controlled irrigation system; or
3. be planted in containers.

Bedding soils for plants may collect and direct water underneath the building and running track. Care should be taken to insure that water entering the bedding soils drains away from the building and running track perimeters. If positive drainage cannot be achieved, the use of an impermeable, synthetic geo-membrane moisture barrier should be considered to reduce the risk of free water migration. An 18-inch deep vertical water barrier along the flatwork edge fronting landscaped areas may be desirable to help prevent irrigation water from having ready access to the soils beneath the flatwork. Special attention should be given to provide good drainage from plantings inside any building courtyards and planter boxes.

The completed landscaping should be carefully inspected to verify that plantings properly drain. Soil in plantings may settle, which will tend to pond water, or plantings may block entrances to surface drains. Therefore, maintaining positive drainage from landscape irrigation will be an ongoing concern.

LIMITATIONS

Since some variation was found in subsurface conditions at the specific boring locations for this study, all readers should be aware that a greater variation could occur between the boring locations. Statements in the report as to subsurface variations across the site are intended only as estimations from the data obtained at specific boring locations.

Additionally, Fugro's scope of services does not include the investigation, detection, or recommendations related to the presence of any biological pollutants. The term "biological pollutants" includes, but is not limited to, mold, fungi, spores, bacteria, and viruses, and the by-products of any such biological organisms.

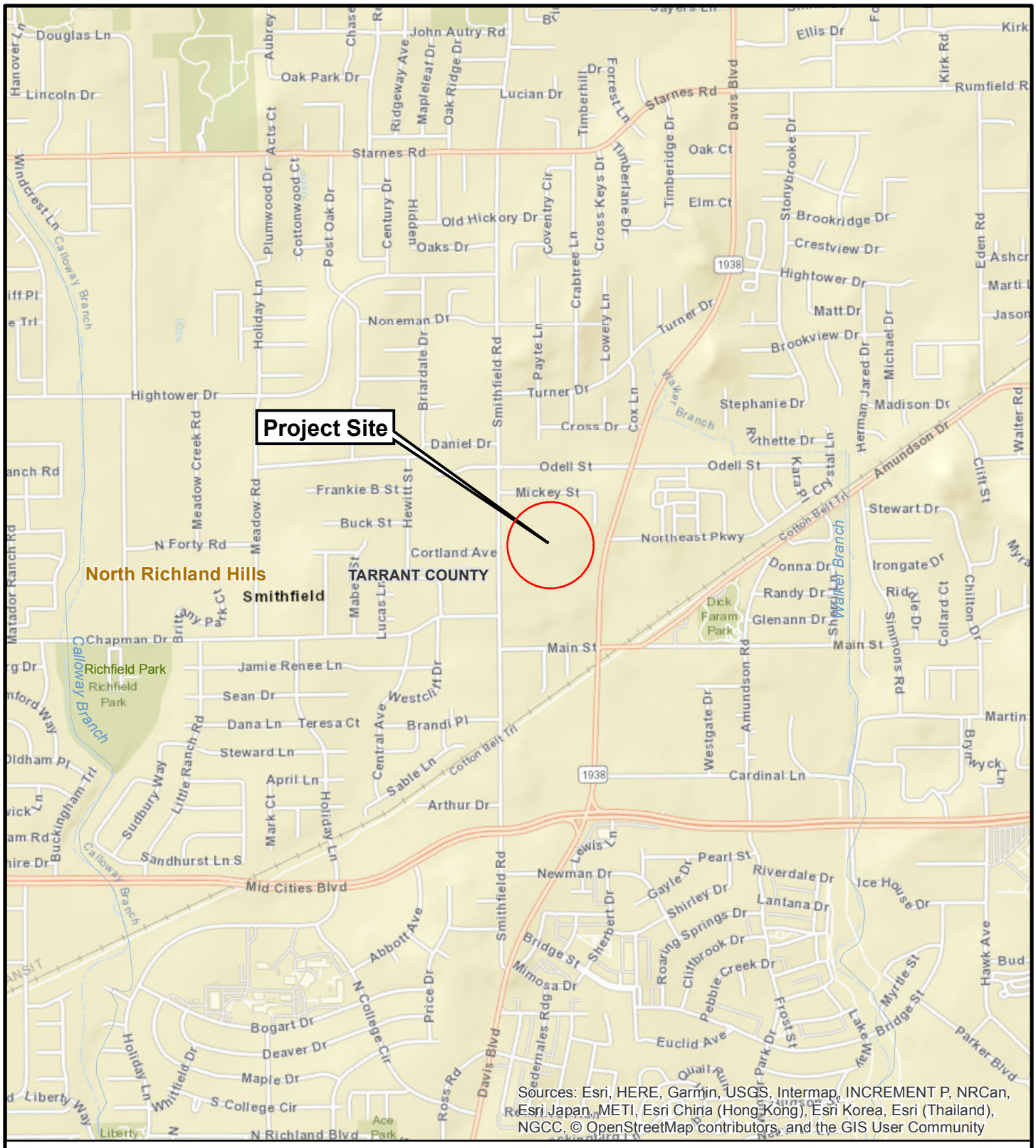
In preparation of this report, we have strived to perform our services in a manner consistent with that level of care and skill ordinarily exercised by other members of our profession currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended in this report, any addendum report, opinion, document, or other instrument of service.

The results, conclusions, and recommendations contained in this report are directed at, and intended to be utilized within, the scope of services contained in the agreement executed by Fugro and client. This report is not intended for any other purposes. Fugro makes no claim or representation concerning any activity or condition falling outside the specified purposes to which this report is directed, said purposes being specifically limited to the scope of services as defined in our agreement. Inquiries as to our scope of services or concerning any activity or condition not specifically contained therein should be directed to Fugro for evaluation and, if necessary, further investigation.

Boring and laboratory data presented were developed solely for the preparation of this report. We are not responsible for interpretation or use of these data for purposes beyond the stated scope of this report.

Subsurface conditions different than those found at our boring locations may be present because of, among other factors, soil moisture variations, fill placement, and naturally occurring variations in soil properties, and elevation of the top of the rock.

APPENDIX A – SITE PLANS



Scale: 1 inch = 1,500 feet

0 750 1,500 3,000 Feet

Coordinate System: State Plane Texas North Central FIPS 4202 Ft
Datum: D North American 1983

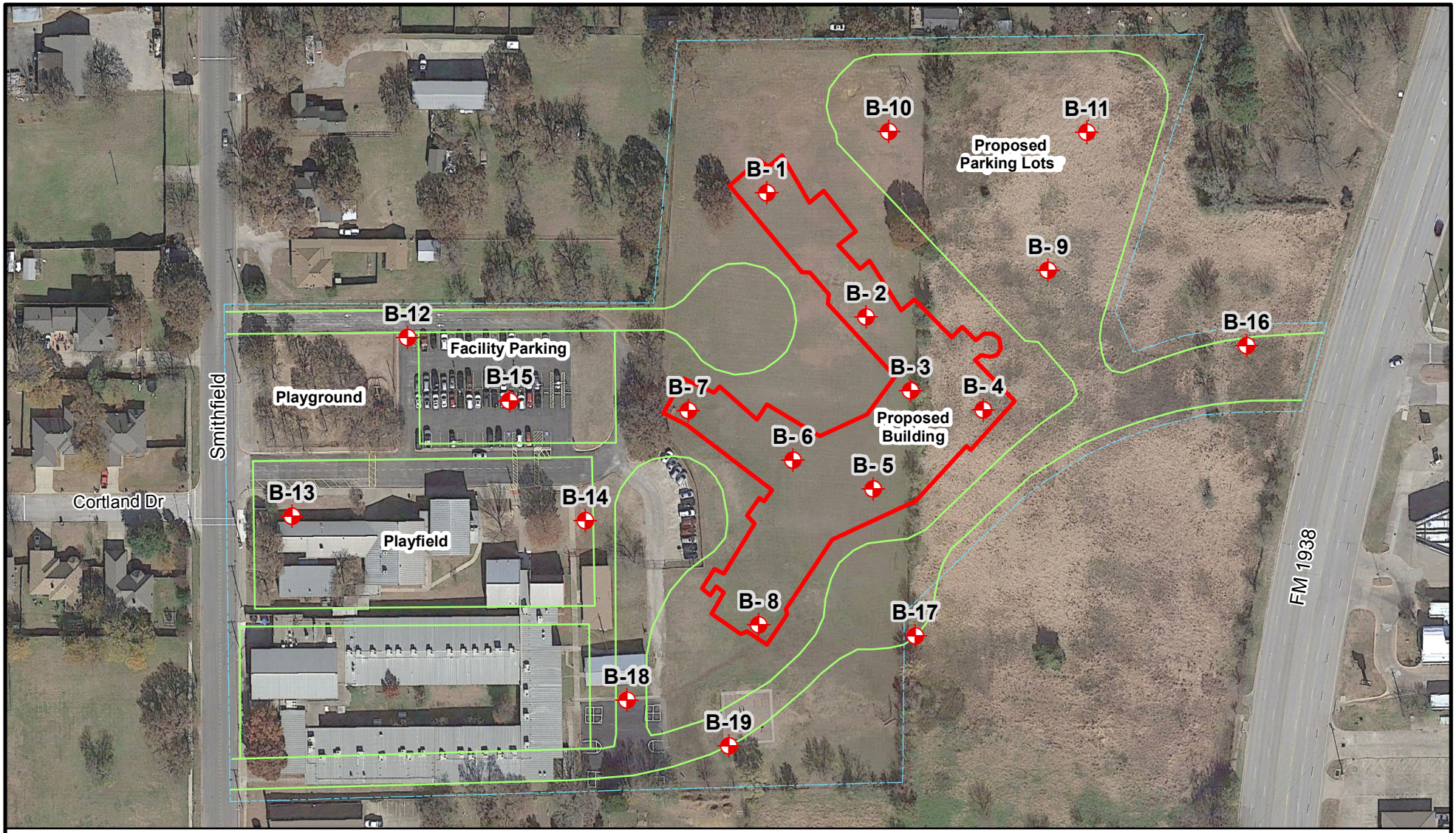
N

FUGRO

Smithfield Elementary School Improvements — **VICINITY MAP**

6724 Smithfield Road — **North Richland Hills, Texas**

Source:	Drawn By:	Date:	Project No.:	
Street map: ESRI ArcGIS Online, 2017	DG	July 18, 2019	04.40191063	**PLATE 1**



Legend

Approximate Boring Location

Scale: 1 inch = 150 feet

0 75 150 300 Feet

Coordinate System: State Plane Texas North Central FIPS 4202 Ft
Datum: D North American 1983

N

Smithfield Elementary School Improvements				**SITE AND BORING PLAN**
6724 Smithfield Road				**North Richland Hills, Texas**
Source: Orthophotography: Google Earth Pro, 2019	Drawn By: DG	Date: August 6, 2019	Project No.: 04.40191063	**PLATE 2**

APPENDIX B - FIELD EXPLORATION

The field exploration of the project was accomplished by advancing a total of 19 borings to depths of 5 to 50 feet below the existing grade. The latitude and longitude of the boring locations were measured using a handheld GPS unit. The approximate locations of the borings are shown on Plate 2, Site and Boring Location. The following is a summary of these borings and their locations.

Table B-1: Proposed Structures and Borings

Proposed Structure	Boring Depth	Boring No.
One to two-story school building	40 to 50 feet	B-1 through B-8
Parking lots	20 feet	B-9, B-10, B-11, B-15
Playground and playfield	10 feet	B-12, B-13, B-14
Drives, and sidewalk	5 feet	B-16, B-17, B-18, B-19

The borings were advanced using truck-mounted drilling rigs. Cohesive soil samples were obtained using 3-inch diameter tube samplers that were pushed into the soil. The consistency of cohesive soils was estimated in the field using a calibrated pocket penetrometer.

Hard material and granular soil sample were obtained with a 2-inch O.D. split-spoon sampler. The sampler is typically driven in three 6-inch intervals. The number of blows required for the last 12 inches of penetration or the penetration obtained from 50 blows of the hammer, whichever occurs first, is reported as the “N-value” on the boring logs. Bedrock was evaluated in situ using Texas Department of Transportation cone penetration tests.

Samples were extruded from the samplers in the field, visually classified, and sealed in plastic bags to prevent the loss of moisture or disturbance during their transfer to the laboratory. Upon completion of the field investigation, the borings were backfilled with soil cuttings and patched where applicable. Logs of the borings drilled for this study with descriptions of the subsurface materials encountered are presented on Plates 3 through 21. A key to the terms and symbols used on the boring logs is presented on Plates 22 and 23.

LOG OF BORING NO. B- 1

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 4.5	**LEAN CLAY (CL)**, reddish brown, hard, with sand								
			P = 4.5			12						
			P = 4.0	**LEAN CLAY (CL)**, grayish brown and reddish brown, very stiff to hard	4.0	16	49	18	31	79		
5			P = 3.75									
			P = 3.75			19						
10												
			N = 47									
15												
			N = 50/5"	**CLAYEY SAND (SC)**, dark gray, very dense, cemented	18.0	20				22		
20												
			N = 50/5"									
25												
				SANDY FAT CLAY (CH), dark gray, hard	27.0							

COMPLETION DEPTH: 50.0
DATE DRILLED: 7-9-19
WATER LEVEL / SEEPAGE: 17.5
WATER LEVEL (UPON COMPLETION): 18.5

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 3a

LOG OF BORING NO. B- 1

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			91/12"	**SANDY FAT CLAY (CH)**, dark gray, hard *(continued)*								
				SHALE, gray	32.0							
35			100/5.5"									
40			100/1.25"									
45			100/1.25"									
50			100/0.75"		50.0							
55												

COMPLETION DEPTH: 50.0
DATE DRILLED: 7-9-19
WATER LEVEL / SEEPAGE: 17.5
WATER LEVEL (UPON COMPLETION): 18.5

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 3b

LOG OF BORING NO. B- 2

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 3.0	**LEAN CLAY (CL)**, reddish brown, very stiff								
						18						
			P = 4.5	**LEAN CLAY (CL)**, grayish brown and reddish brown, stiff to hard, with sand	2.0	13	36	15	21			
			P = 1.75									
5												
			P = 4.5			14						
			P = 4.5	**LEAN CLAY (CL)**, brown and orange, stiff to hard, with sand and ironic deposits	8.0							
10												
			P = 1.5			19	35	17	18			
15												
			N = 50/5"	**CLAYEY SAND (SC)**, dark gray, very dense, cemented	17.0							
20												
			N = 50/1"			21						
25												
				SHALE, gray	27.0							

COMPLETION DEPTH: 40.0
DATE DRILLED: 7-9-19
WATER LEVEL / SEEPAGE: 16.5
WATER LEVEL (UPON COMPLETION): 13.5

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 4a

LOG OF BORING NO. B- 2

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			100/4.5"	**SHALE**, gray *(continued)*								
35			100/0.75"									
			100/0.5"									
40					40.0							
45												
50												
55												

COMPLETION DEPTH: 40.0
DATE DRILLED: 7-9-19
WATER LEVEL / SEEPAGE: 16.5
WATER LEVEL (UPON COMPLETION): 13.5

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 4b

LOG OF BORING NO. B- 3

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 1.5	**LEAN CLAY (CL)**, brown, stiff								
			P = 1.5	**FAT CLAY (CH)**, reddish brown, stiff to hard	2.0	26						
			P = 1.25									
5			P = 4.5			18	62	21	41	95		
			P = 4.5			12						
10												
			N = 51	**CLAYEY SAND (SC)**, brown and reddish brown, very dense	12.0	17						
15				**FAT CLAY (CH)**, dark brown, hard	15.0							
			P = 4.5			29	50	19	31			
20												
25			100/7"									
				SHALE, gray	28.0							

COMPLETION DEPTH: 40.0
DATE DRILLED: 7-9-19
WATER LEVEL / SEEPAGE: 12.0
WATER LEVEL (UPON COMPLETION): 17.5

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 5a

FUGRO STD FUGRO DATA TEMPLATE 100610.GDT FUGRO LIBRARY 022717.GLB I:\PROJECT FILES\PROJECTS-2019\19-1063 SMITHFIELD ELEMENTARY SCHOOL IMPROVEMENTS\7. DRAFTING\GINT\0440191063.GPJ c.tsai 8/20/19

LOG OF BORING NO. B- 3

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			100/0.75"	**SHALE**, gray *(continued)*								
35			100/0.5"									
			100/0.75"									
40					40.0							
45												
50												
55												

COMPLETION DEPTH: 40.0
DATE DRILLED: 7-9-19
WATER LEVEL / SEEPAGE: 12.0
WATER LEVEL (UPON COMPLETION): 17.5

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 5b

LOG OF BORING NO. B- 4

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 2.25	**LEAN CLAY (CL)**, brown, very stiff		22						
			P = 2.25	**SANDY LEAN CLAY (CL)**, reddish brown, very stiff	2.0	19						
			P = 2.75									
5			P = 2.0			17	46	17	29	56		
			P = 2.75			18				65	111	1.3
10												
			N = 50/5"	**CLAYEY SAND (SC)**, light brown, cemented	12.0	22				19		
15												
			N = 28	**SANDY FAT CLAY (CH)**, dark gray, very stiff to hard	17.0							
20			N = 39			20	53	19	34			
25												
				SHALE, gray	29.0							

COMPLETION DEPTH: 45.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: 12.0
WATER LEVEL (UPON COMPLETION): 17.0

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 6a

LOG OF BORING NO. B- 4

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			100/5"	**SHALE**, gray *(continued)*								
35			100/1.5"									
40			100/0.75"									
45			100/0.5"		45.0							
50												
55												

COMPLETION DEPTH: 45.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: 12.0
WATER LEVEL (UPON COMPLETION): 17.0

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 6b

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LOG OF BORING NO. B- 5

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 0.5	**LEAN CLAY (CL)**, brown, medium stiff								
			P = 1.0	**LEAN CLAY (CL)**, reddish brown, medium stiff	2.0	17						
5			P = 3.5	**LEAN CLAY (CL)**, grayish brown and reddish brown, very stiff to hard	4.0	19						
			P = 4.5			15	40	17	23			
			P = 0.25	**SANDY LEAN CLAY (CL)**, grayish brown and brown, soft to stiff	8.0							
10												
			P = 2.0			20	29	15	14			
15												
			N = 23	**SANDY FAT CLAY (CH)**, dark gray, very stiff to hard	17.0							
20												
			N = 38			19						
25												

COMPLETION DEPTH: 40.0
DATE DRILLED: 7-8-19
WATER LEVEL / SEEPAGE: 16.5
WATER LEVEL (UPON COMPLETION): 14.0

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 7a

FUGRO STD FUGRO DATA TEMPLATE 100610.GDT FUGRO LIBRARY 022717.GLB I:\PROJECT FILES\PROJECTS-2019\19-1063 SMITHFIELD ELEMENTARY SCHOOL IMPROVEMENTS\7. DRAFTING\GINT\0440191063.GPJ c.tsai 8/20/19

LOG OF BORING NO. B- 5

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
				SURF. ELEVATION: Unknown								
			51/12"	**SANDY FAT CLAY (CH)**, dark gray, very stiff to hard *(continued)*								
					31.0							
				SHALE, gray								
35			100/1.5"									
40			100/0.75"		40.0							
45												
50												
55												

COMPLETION DEPTH: 40.0
DATE DRILLED: 7-8-19
WATER LEVEL / SEEPAGE: 16.5
WATER LEVEL (UPON COMPLETION): 14.0

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 7b

LOG OF BORING NO. B- 6

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
				SURF. ELEVATION: Unknown								
			P = 1.75	**LEAN CLAY (CL)**, brown, stiff to hard								
			P = 4.5			17	33	16	17			
			P = 2.0			18						
5												
			P = 4.5	**FAT CLAY (CH)**, reddish brown, stiff to hard	6.0	24	62	21	41	81		
			P = 1.75									
10												
				LEAN CLAY (CL), dark brown, stiff, with sand	12.0							
			P = 1.75			17	27	17	10			
15												
				CLAYEY SAND (SC), dark gray, very dense, cemented	16.0							
			N = 50/6"									
20												
			N = 50/5"			24				38		
25												
			N = 68									

COMPLETION DEPTH: 40.0
DATE DRILLED: 7-8-19
WATER LEVEL / SEEPAGE: 13.0
WATER LEVEL (UPON COMPLETION): 11.5

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 8a

LOG OF BORING NO. B- 6

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
				SHALE, gray	31.0							
35			100/2"									
			100/0.75"									
40					40.0							
45												
50												
55												

COMPLETION DEPTH: 40.0
DATE DRILLED: 7-8-19
WATER LEVEL / SEEPAGE: 13.0
WATER LEVEL (UPON COMPLETION): 11.5

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 8b

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LOG OF BORING NO. B- 7

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 0.5	**FAT CLAY (CH)**, dark brown, soft		21						
			P = 2.0	**LEAN CLAY (CL)**, brown, very stiff to hard	2.0	14						
			P = 3.5									
5			P = 2.5			15	37	15	22			
			P = 4.5+			16						
10												
			P = 4.5+			23					100	1.0
15												
			N = 50/4"	**SANDY FAT CLAY (CH)**, dark gray, hard	17.0							
20												
			N = 50/4"									
25												

COMPLETION DEPTH: 50.0
DATE DRILLED: 7-8-19
WATER LEVEL / SEEPAGE: 12.5
WATER LEVEL (UPON COMPLETION): 11.0

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 9a

LOG OF BORING NO. B- 7

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			55/12"	**SANDY FAT CLAY (CH)**, dark gray, hard *(continued)*								
				SHALE, gray	33.0							
35			100/5.25"									
40			100/0.5"									
45			100/0.75"									
50			100/0.5"		50.0							
55												

COMPLETION DEPTH: 50.0
DATE DRILLED: 7-8-19
WATER LEVEL / SEEPAGE: 12.5
WATER LEVEL (UPON COMPLETION): 11.0

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 9b

LOG OF BORING NO. B- 8

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 0.75	**FAT CLAY (CH)**, dark brown, medium stiff		16						
			P = 2.75	**SANDY LEAN CLAY (CL)**, grayish brown and reddish brown, very stiff	2.0	17						
			P = 3.0			18					111	3.1
5			P = 2.5			19	34	14	20	55		
			P = 3.0			16						
10												
			N = 27	**CLAYEY SAND (SC)**, brown and reddish brown, medium dense	13.0	22				29		
15												
			N = 50/4"	**SANDY LEAN CLAY (CL)**, dark gray, hard	17.0	23				71		
20												
			N = 59			19	42	18	24	61		
25												
			N = 50/4"									

COMPLETION DEPTH: 45.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: 13.0
WATER LEVEL (UPON COMPLETION): 6.0

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 10a

LOG OF BORING NO. B- 8

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
				SANDY LEAN CLAY (CL), dark gray, hard *(continued)*								
					31.0							
				SHALE, gray								
35			100/0.75"									
40			100/0.75"									
			100/0.5"									
45					45.0							
50												
55												

COMPLETION DEPTH: 45.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: 13.0
WATER LEVEL (UPON COMPLETION): 6.0

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 10b

LOG OF BORING NO. B- 9

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
				SURF. ELEVATION: Unknown								
			P = 2.75	**LEAN CLAY (CL)**, brown, very stiff		13						
			P = 4.5	**FAT CLAY (CH)**, reddish brown, very stiff to hard	2.0	21	73	23	50	80		
			P = 2.25									
5			P = 4.5			16						
			P = 4.5	**FAT CLAY (CH)**, grayish brown and reddish brown, hard	8.0	18	60	21	39			
10												
			N = 50/5"	**CLAYEY SAND (SC)**, light brown, very dense, cemented	12.0	15				19		
15												
			N = 75	**SANDY LEAN CLAY (CL)**, dark gray, hard	18.0	30	41	19	22	59		
20					20.0							
25												

COMPLETION DEPTH: 20.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: 16.0
WATER LEVEL (UPON COMPLETION): 16.5

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 11

LOG OF BORING NO. B-10

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
				SURF. ELEVATION: Unknown								
			P = 3.25	**FAT CLAY (CH)**, grayish brown and reddish brown, very stiff to hard								
			P = 4.5			20	64	22	42		111	3.7
			P = 3.0			23						
5					5.0							
			P = 3.0	**LEAN CLAY (CL)**, reddish brown, very stiff		18						
			P = 4.5	**FAT CLAY (CH)**, brown, very stiff to hard	8.0	24	73	25	48	100		
10												
			N = 27									
15												
			N = 50/5"	**CLAYEY SAND (SC)**, light brown, very dense, cemented	18.0	12				45		
20					20.0							
25												

COMPLETION DEPTH: 20.0
DATE DRILLED: 7-9-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 12

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LOG OF BORING NO. B-11

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 1.0	**LEAN CLAY (CL)**, brown, medium stiff								
			P = 4.5	**LEAN CLAY (CL)**, reddish brown, very stiff to hard	2.0	13						
			P = 4.5			13					117	5.0
5			P = 3.75			13						
			P = 4.5			16	44	18	26			
10												
			N = 50/5"	**CLAYEY SAND (SC)**, light brown, very dense, cemented	12.0							
15												
			N = 50/5"			14				28		
20					20.0							
25												

COMPLETION DEPTH: 20.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 13

FUGRO STD FUGRO DATA TEMPLATE 100610.GDT FUGRO LIBRARY 022717.GLB I:\PROJECT FILES\PROJECTS-2019\19-1063 SMITHFIELD ELEMENTARY SCHOOL IMPROVEMENTS\7. DRAFTING\GINT\04401910 63.GPJ c.tsai 8/20/19

LOG OF BORING NO. B-12

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 1.5	**ASPHALT (1.5")**, underlain by flexible base (2")	0.3	22						
				LEAN CLAY (CL), brown, stiff								
			P = 2.5	**FAT CLAY (CH)**, reddish brown, very stiff	2.0							
			P = 3.5			17	75	24	51	75		
5			P = 3.75			14						
			P = 3.5									
10					10.0							
15												
20												
25												

COMPLETION DEPTH: 10.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 14

LOG OF BORING NO. B-13

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 4.5	**LEAN CLAY (CL)**, brown, hard		12						
			P = 4.5	**SANDY LEAN CLAY (CL)**, reddish brown, hard, with sand and gravel	2.0							
			P = 4.5			10	38	17	21			
5			P = 4.5									
			P = 4.5									
			P = 4.5	**FAT CLAY (CH)**, grayish brown and reddish brown, hard	8.0	22	56	19	37			
10					10.0							
15												
20												
25												

COMPLETION DEPTH: 10.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 15

LOG OF BORING NO. B-14

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 2.0	**SANDY LEAN CLAY (CL)**, brown, very stiff, with sand								
			P = 2.0	- sand layers at 2'		11	20	13	7			
			P = 3.5	**SANDY FAT CLAY (CH)**, reddish brown, very stiff to hard	4.0							
5			P = 2.5			18	56	17	39	50		
			P = 4.5			14						
10					10.0							
15												
20												
25												

COMPLETION DEPTH: 10.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 16

LOG OF BORING NO. B-15

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
				ASPHALT (1.5"), underlain by flexible base (2")								
			P = 0.75	**SANDY LEAN CLAY (CL)**, brown, medium stiff	0.3							
			P = 4.5	**LEAN CLAY (CL)**, reddish brown, very stiff to hard	2.0	12						
			P = 3.5			21						
5					5.0							
10												
15												
20												
25												

COMPLETION DEPTH: 5.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 17

LOG OF BORING NO. B-16

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
				SURF. ELEVATION: Unknown								
			P = 4.5	**FAT CLAY (CH)**, dark brown, hard		19						
			P = 4.5	**FAT CLAY (CH)**, grayish brown and reddish brown, very stiff to hard	2.0	16	75	23	52	76		
			P = 3.25			33						
5					5.0							
10												
15												
20												
25												

COMPLETION DEPTH: 5.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 18

LOG OF BORING NO. B-17

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 2.5	**LEAN CLAY (CL)**, brown, very stiff		12						
			P = 4.5	**SANDY FAT CLAY (CH)**, reddish brown, stiff to hard	2.0	15	68	22	46	58		
			P = 1.0									
5					5.0							
10												
15												
20												
25												

COMPLETION DEPTH: 5.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 19

LOG OF BORING NO. B-18

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

SURF. ELEVATION: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
			P = 0.75	**SANDY LEAN CLAY (CL)**, brown, medium stiff to very stiff		18						
			P = 0.75			19	30	14	16	50		
			P = 3.0									
5					5.0							
10												
15												
20												
25												

COMPLETION DEPTH: 5.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

PLATE 20

LOG OF BORING NO. B-19

Smithfield Elementary School Improvements
6724 Smithfield Road
North Richland Hills, Texas
PROJECT NO. 04.40191063

NORTHING: Unknown
EASTING: Unknown

DEPTH, FT	SYMBOL	SAMPLES	POCKET PEN, tsf Blows/ft. REC./RQD, %	STRATUM DESCRIPTION	LAYER ELEV./ DEPTH	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX (PI), %	PASSING NO. 200 SIEVE, %	UNIT DRY WEIGHT, PCF	UNCONFINED STRENGTH TSF
				SURF. ELEVATION: Unknown								
			P = 1.5	**SANDY LEAN CLAY (CL)**, dark brown, stiff, with sand and gravel								
			P = 1.5			14	35	15	20	49		
			P = 1.5	**LEAN CLAY (CL)**, reddish brown, stiff	4.0	20						
5					5.0							
10												
15												
20												
25												

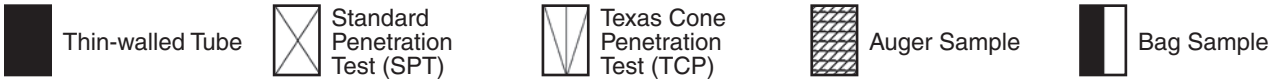
COMPLETION DEPTH: 5.0
DATE DRILLED: 7-10-19
WATER LEVEL / SEEPAGE: DRY
WATER LEVEL (UPON COMPLETION): DRY

KEY:
Note: All depths are measured in feet.
P = Pocket Penetrometer Value, (tsf)
N = Standard Penetration Resistance

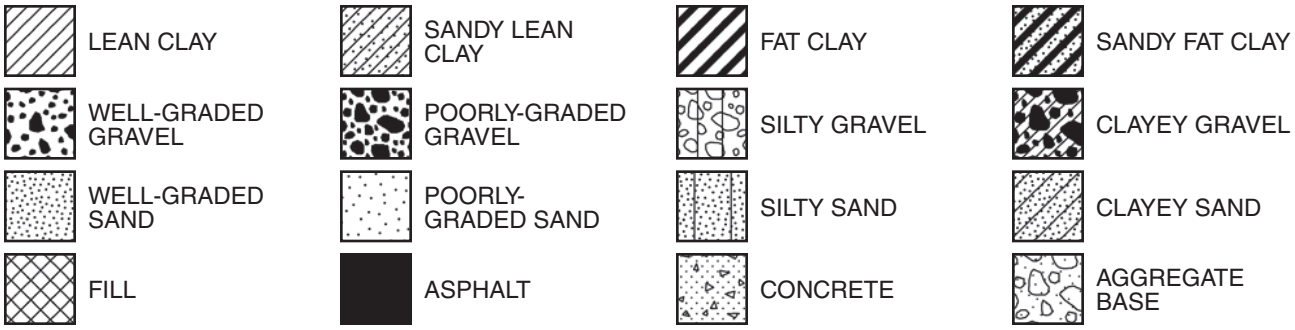
PLATE 21

TERMS AND SYMBOLS USED ON BORING LOGS FOR SOIL

Sampler Types



Material Types



Consistency

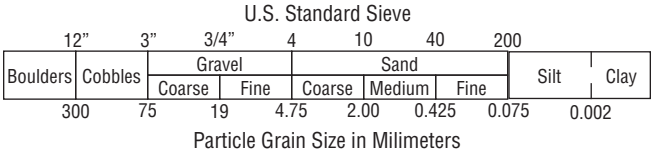
Strength of Fine Grained Soils		
Consistency	**SPT (# blows/ft)[1]**	**UCS (TSF)[1]**
Very Soft	< 2	< 0.25
Soft	2 - 4	0.25 - 0.5
Medium Stiff	4 - 8	0.5 - 1.0
Stiff	8 - 15	1.0 - 2.0
Very Stiff	15 - 30	2.0 - 4.0
Hard	> 30	> 4.0

Density of Coarse Grained Soils		
Apparent Density	**SPT (# blows/ft)**	**TCP (# blows/ft)[2]**
Very Loose	0 - 4	< 8
Loose	4 - 10	8 - 20
Medium Dense	10 - 30	20 - 60
Dense	30 - 50	60 - 100
Very Dense	> 50	> 100

Moisture

Moisture Content adapted from (3)	
Dry	No water evident in sample
Moist	Sample feels damp
Very Moist	Water visible on sample
Wet	Sample bears free water

Grain Size[3]



Structure[3]

Criteria for Describing Structure	
Description	**Criteria**
Stratified	Alternating layers of varying material or color with layers at least 6 mm thick; note thickness
Laminated	Alternating layers of varying material or color with the layers less than 6 mm thick; note thickness
Fissured	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided	Fracture planes appear polished or glossy, sometimes striated
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness
Homogeneous	Same color and appearance throughout

Secondary Components

Criteria for Describing Structure adapted from (3)	
Trace	< 5% of sample
Few	5% to 10% of sample
Little	10% to 25% of sample
Some	25% to 50% of sample

Size Modifiers for Inclusions	
Pocket	Inclusion of different material that is smaller than the diameter of the sample
Fragment	Pieces of a whole item - often used with shell and wood
Nodule	A concretion, a small, more or less rounded body that is usually harder than the surrounding soil (as in carbonate nodule) and was formed in the soil by a weathering process
Streak	A line or mark of contrasting color or texture. The mark or line should be paper thin, and it should be natural - not a smear caused by extruding or trimming the sample

FUGRO

Note: Information on each boring log is a compilation of subsurface conditions and soil and rock classificaitons obtained from the field as well as from laboratory testing of samples. Strata have been interpreted by commonly accepted procedures. The stratum lines on the logs may be transitional and approximate in nature. Water level measurements refer only to those observed at the times and places indicated, and may vary with time, geologic condition or construction activity.

References: [1] Peck, Hanson and Thornburn, (1974), Foundation Engineering.
[2] TxDOT, (1999), Tex-142-E, Laboratory Classification of Soils for Engineering Purposes.
[3] ASTM International, ASTM D 2488 Standard Practice for Description and Identification of Soils.

TERMS AND SYMBOLS USED ON BORING LOGS FOR ROCK

Sampler Types


Rock Core


Texas Cone Penetration Test (TCP)


Bag Sample

Notation for Rock Core Samples	
RC_	Rock Core sample + depth interval
Rec	Rock Core Sample Recovery (ASTM D2113)
RQD	Rock Quality Designation (ASTM D6032)

Material Types


LIMESTONE


SHALE


SANDSTONE


MARL


WEATHERED LIMESTONE


WEATHERED SHALE


WEATHERED SANDSTONE


WEATHERED MARL

Weathering[4]

Weathering Grades of Rock Mass	
Slightly	Discoloration indicates weathering of rock material and discontinuity surfaces
Moderately	Less than half of the rock material is decomposed or disintegrated to a soil
Highly	More than half of the rock material is decomposed or disintegrated to a soil
Completely	All rock material is cecomposed and/or disintegrated to a soil. The original mass structure is still largely intact
Residual Soil	All rock material is converted to soil. The mass structure and material fabric are destroyed

Hardness

Criteria for Field Hardness	
Very Soft	Can be carved with a knife. Can be excavated readily with point of pick. Pieces 1" or more in thickness can be broken by finger pressure. Readily scratched with fingernail
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows with the pick point. Small, thin pieces can be broken by finger pressure
Medium	Can be grooved or gouged ¼" deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1' maximum size by hard blows with the point of a pick
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach a hand specimen
Very Hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows from a hammer or pick

Grain Size[3]

U.S. Standard Sieve

3"	3/4"	4	10	40	200
Gravel		Sand			
Coarse	Fine	Coarse	Medium	Fine	
75	19	4.75	2.00	0.425	0.075

Particle Grain Size in Milimeters

Secondary Components[3]

Criteria for Describing Structure	
Trace	< 5% of sample
Few	5% to 10% of sample
Little	10% to 25% of sample
Some	25% to 50% of sample

Structure

Bedding Thickness and Spacing of Planar Features			
Type	**Spacing**	**Thickness**	**Fracture Spacing**
Parting	< 1/8 in.	Laminar	NA
Seam	1/8 to 3/4 in.	Extremely thin	Extremely close (< 3/4 in.)
	3/4 to 2 1/2 in.	Very thin	Very close
Layer	2 1/2 to 6 in.	Thin	Close
	6 to 24 in.	Medium	Moderate
Bed	2 to 7 ft.	Thick	Wide
	7 ft. to 20 ft.	Very thick	Very wide
	> 20 ft.	Extremely thick	Extremely wide
	Massive	No stratification observed	NA
	Occasional	Occurring once or less per foot	
	Frequently	Occurring more than once per foot	

Discontinuities	
Joint	A natural fracture along which no displacement has occurred. May occur in parallel groups called sets.
Fracture/ Shear	A natural fracture along which differential movement has occurred. May be slickensided or striated.
Fault	A natural fracture along which displacement has occurred. Usually lined with gouge and slickensides.

Surface Planarity	
Curved	A moderately undulating surface, with no sharp breaks or steps.
Planar	A flat surface
Stepped	A surface with asperities or steps. The height of the asperity should be estimated or measured.

Roughness	
Very Rough	Near vertical steps and ridges occur on the discontinuity
Rough	Some ridges and side-angle steps are evident; asperities are clearly visible, surface feels very abrasive.
Slightly Rough	Asperities on the discontinuity surfaces can be seen and felt.
Smooth	Surface appears smooth and feels smooth.
Slickensided	Evidence of polishing and movement are visible.

Aperture	
Tight	Core pieces on either side of fracture can be fitted together so that no visible void spaces remain.
Open	Core pieces on either side of fracture cannot be fitted tightly together and voids are visible.
Healed	A completely healed fracture or vein is not considered a discontinuity and should not be included when describing rock core fracturing or calculating RQD. This feature should be described including a record of dip, spacing, thickness, type of filling and any observed alteration.

FUGRO

Note: Information on each boring log is a compilation of subsurface conditions and soil and rock classificaitons obtained from the field as well as from laboratory testing of samples. Strata have been interpreted by commonly accepted procedures. The stratum lines on the logs may be transitional and approximate in nature. Water level measurements refer only to those observed at the times and places indicated, and may vary with time, geologic condition or construction activity.

References: [1] Peck, Hanson and Thornburn, (1974), Foundation Engineering.
[3] ASTM International, ASTM D 2488 Standard Practice for Description and Identification of Soils.
[4] British Standard (1981), Code of Practice for Site Investigation BS 5930.

APPENDIX C - LABORATORY TESTING

Laboratory tests were performed to help evaluate the engineering properties of the soils. The tests were performed in general accordance with applicable ASTM test procedures. The testing program included:

1. visual classification,
2. moisture content,
3. dry unit weight,
4. Atterberg limits,
5. passing No. 200 sieve,
6. overburden swell,
7. Lime/pH series,
8. unconfined compressive strength of soil, and,
9. soluble sulfate.

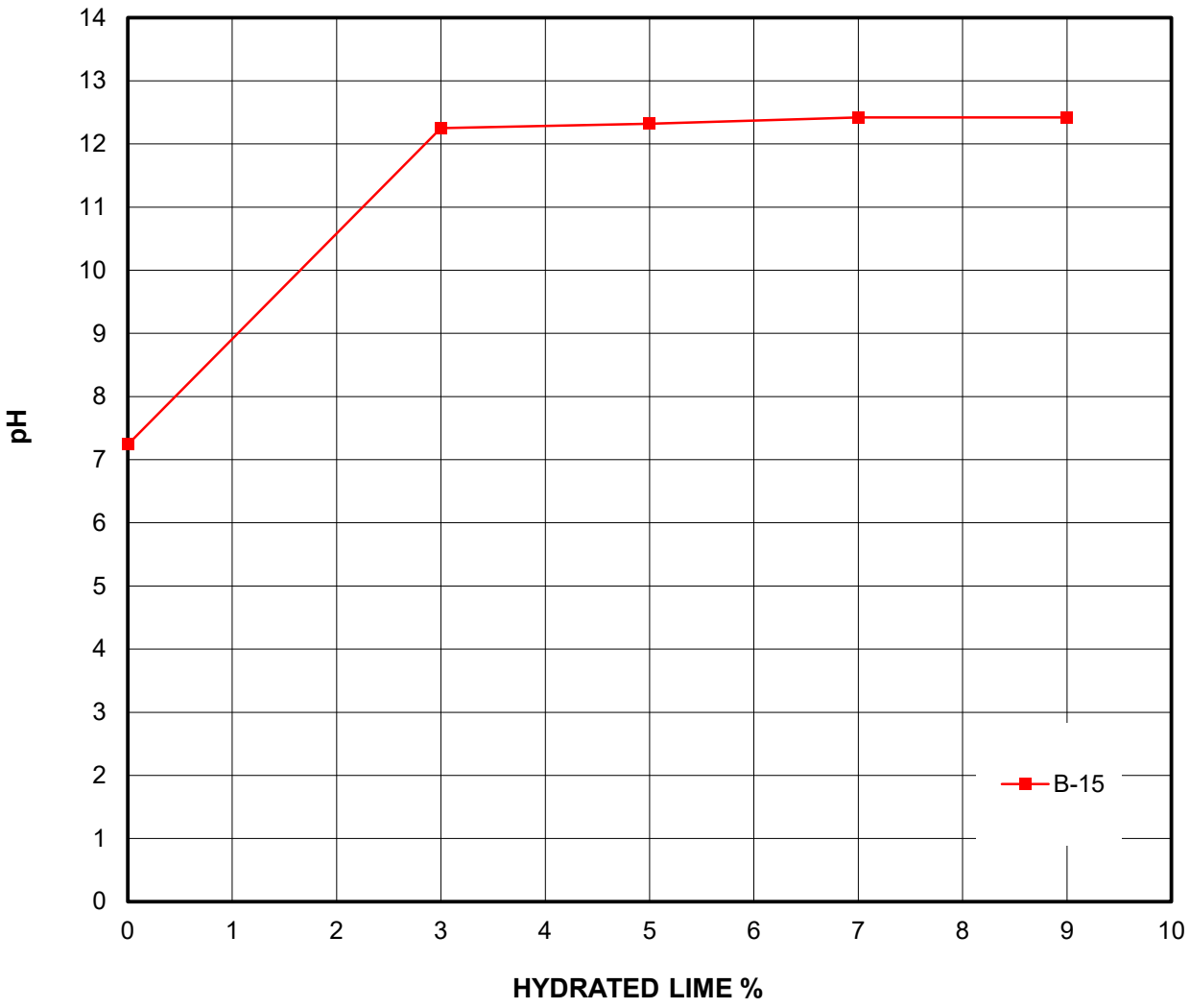
The soils were classified according to the Unified Soil Classification System based on visual observation of the samples and laboratory test results. The results of dry unit weight, moisture content, liquid limit, plastic limit, plasticity index, percent passing No. 200 sieve, and unconfined compressive strength tests are presented on the boring logs. The results of lime/pH series test are shown on Plate 24. The results of the overburden swell, soil resistivity, and soil soluble sulfate tests are presented in the following tables.

Table C-1: Swell Test Results

Boring Number	Sample Depth (ft.)	Liquid Limit	Plasticity Index	Initial Moisture Content	Final Moisture Content	Surcharge Pressure (psf)	Percent Vertical Swell
B-1	4-6	49	31	16	17	500	0.7
B-4	6-8	46	29	17	19	750	1.8
B-5	13-15	29	14	20	20	1,625	0.0
B-6	6-8	62	41	24	25	750	1.7
B-7	6-8	37	22	15	17	750	0.9
B-8	6-8	34	20	19	19	750	0.0
B-10	8-10	73	48	24	29	1,000	5.5
B-11	8-10	44	26	16	16	1,000	0.0

Table C-2: Soil Resistivity and Soluble Sulfate Testing Results

Boring Number	Sample Depth (ft.)	Resistivity (ohms-cm)	Sulfate (mg/kg)
B-8	2-4	2,180	160
B-15	2-4	-	40
B-17	2-4	-	240



Boring No.	Depth (ft.)	Hydrated Lime (%)				
		0	3	5	7	9
B-15	2 to 4	7.24	12.25	12.32	12.42	12.42

FUGRO USA LAND, INC.	SOIL LIME/PH TEST RESULTS	PLATE
2880 Virgo Lane, Dallas, TX	Smithfield ES Improvements	24
Project No. 04.40191001	6724 Smithfield Road	
Date: 08/05/2019	North Richland Hills, Texas