ENGINEERING SERVICES DEPARTMENT

CITY OF FRISCO

GEORGE A. PUREFOY MUNICIPAL CENTER
6101 FRISCO SQUARE BLVD · 3RD FLOOR
FRISCO, TEXAS 75034
TEL 972.292.5400 · FAX 972.292.5016
WWW.FRISCOTEXAS.GOV

# ADDENDUM 1
# 24-INCH AND 12-INCH DALLAS NORTH TOLLWAY WATERLINE (MAIN STREET TO STALLION LANE)

STATE OF TEXAS
ERIK COTTER
105521
LICENSED
PROFESSIONAL ENGINEER
08- 28- 2015

**TO: PROSPECT CONTRACTORS**

**CC:** FILE

**FROM:** ENGINEERING SERVICES

**DATE:** AUGUST 28, 2015

**SUBJECT:** PROJECT ADDENDUM #1 CIP 06-0020 BID NO. 1505-071

---

The following is a summary of the revisions that have been made to the Construction Documents:

1. Changes to Plans
    a. C-10: moved labels for better positioning to read
    b. C-13: 12" pipe stub length changed to 20 feet
        i. This stub will be horizontal coming out of the waterline with a minimum of 4 feet of cover.
    c. C-15: reference to auto-flusher detail corrected
    d. C-20: added sheet with RFID Markers Location Table
2. Changes to Project Manual
    a. Changes to Bid Form
        i. Added RFID Marker bid items
        ii. Revised/clarified various items (including, but not limited to, those described in #4 below)
        iii. Added Ductile Iron C151, PC 150 as acceptable material for 24" and 36" pipe (bid form now includes alternative bid items for PVC and DIP)
        iv. Added Automatic Flushing Device System bid item
    b. Added RFID Marker specification
    c. Added Ductile Iron Pipe and Fittings Specification
    d. Added geotechnical reports as an attachment (Geotechnical data for the soil borings shown on the drawings which are not included in the attached geotechnical reports are not available).
    e. Added BNSF License/Permit Language as an attachment (for information only)

i. See also Special Condition 10 which now also refers to the attachment in addition to already stating compliance with specific conditions.

3. Clarifications/Other Notes (see also, Pre-Bid Meeting Notes)
    a. Agenda item 3.a.viii.6 question: For the 36"x30" MJxMJ tee to 30" MJxMJ BFV and 30" MJ cap called out (sheet C-6), there would need to be pipe between the tee and BFV and between the BFV and cap but there is no 30" pipe listed as a bid item.
        i. Resolution: added "Piping, Joints, and other associated items" to bid item 31: Install 30" Butterfly Valve
    b. 36" AWWA C905 DR 18 PVC pipe availability: this pipe, with pressure rating 235psi, is available from manufacturers such as Diamond Plastics Corporation (DPC) which is a major PVC producer in North America with facilities in Texas.
    c. Agenda item 3.a.viii.8 question: Confirm/correct sizing of air release and vacuum valves/vault type 2 (bid item 33)
        i. Resolution: split bid item into three items, one each for sizes 2", 3", and 4"
    d. Question: Is HDPE pipe size (for HDD) in ductile iron size (DIPS) or iron pipe size (IPS)?
        i. Resolution: Refer to Specification 333300 High Density Polyethylene Pipe and Fittings (Pressure Pipe) 2.01.B.1. , which specifies IPS.
    e. Question regarding Drawing G-2, General Notes Water System, Note #10, whether both Corten brand steel and Cor-Blue brand coating are required for bolts and nuts used with mechanical joints.
        i. The Note reads "or approved equal." Therefore, high-strength corrosion-resistant weathering steel bolts are acceptable if they meet the same ASTM other applicable standards, regardless of whether they use the tradename "Corten." Similarly, xylan 1424 coating on zinc plating is acceptable, regardless of whether the tradename "Cor-Blue" is used for the product provided the same standards are met. For example, Cor-Blue brand bolts and nuts are constructed of corrosion-resistant high-strength low-allow steel, and are acceptable.
    f. Question: Plan sheet C-15 calls for the installation of an Auto Flush Device but there is no bid item for this.
        i. Resolution: Bid item added

# Attachments

**Revised Plan Sheets**

C-10 (revised)

C-13 (revised)

C-15 (revised)

C-20 (added)

**Revised Project Manual Sections**

Special Condition 10 (revised)

Bid Form (revised)

RFID Marker Specification (added)

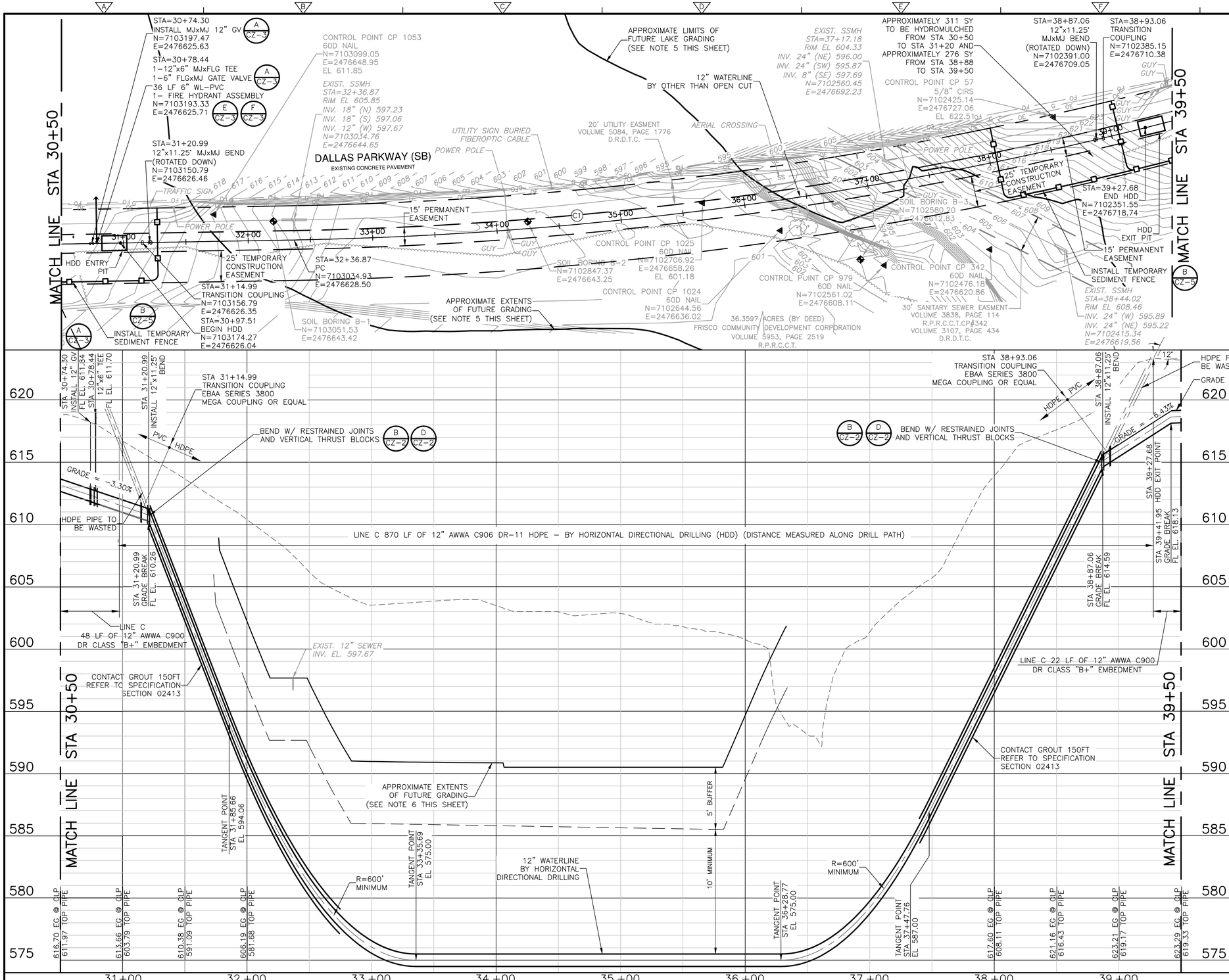
Ductile Iron Pipe and Fittings Specification (added)

Section 4 - Attachment 1 - Geotechnical Reports (added)

Section 5 - Attachment 2 – BNSF Railroad Work Requirements (FIO) (added)

**Pre-Bid Meeting Agenda**

**Pre-Bid Meeting Minutes and Sign In Sheet**




N

20 0 40
HORIZ. SCALE IN FEET

2 0 4
VERT. SCALE IN FEET

## WARNING TO CONTRACTOR

CALL 1-800-344-8377 (DIG TESS) OR OTHER UTILITY LOCATING SERVICES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY.

## NOTES:

1. ALL BENDS, CAPS, AND FITTINGS SHALL HAVE RESTRAINED MECHANICAL JOINTS WITH RETAINER GLANDS/LUGS. ALSO, PROVIDE THRUST BLOCKING AT ALL BENDS AND FITTINGS PER CITY OF FRISCO STANDARD REQUIREMENT. UNLESS OTHERWISE NOTED, THRUST BLOCKS SHALL BE PROVIDED PER SCHEDULE ON SHEET CZ-2.
2. REFER TO GENERAL NOTES ON SHEET G-2.
3. ANY REMOVAL PAY ITEM NOT SPECIFICALLY IDENTIFIED AS A SEPARATE PAY ITEM IN THE CONTRACT BID SCHEDULE SHALL BE PAID FOR UNDER "GENERAL SITE PREPARATION" PAY ITEM.
4. REMOVE TREES WITHIN THE PERMANENT EASEMENT, REMOVE TREES WITHIN THE TEMPORARY CONSTRUCTION EASEMENTS ONLY AS NECESSARY TO ACCOMPLISH THE WORK. PAYMENT FOR TREE REMOVAL IS UNDER THE "GENERAL SITE PREPARATION" PAY ITEM. PROTECT TREES AS SHOWN IN THE PLANS.
5. THE TOPOGRAPHY OF THE AREAS SURROUNDING THE PROPOSED PIPELINE, AND THE PROPOSED LAKE GRADING WAS PROVIDED TO CDM Smith BY THE CITY OF FRISCO IN CAD FORMAT.
6. ELEVATIONS SHOWN ARE BASED ON BEST AVAILABLE SURVEY DATA.
7. PROVIDE RESTRAINED MECHANICAL JOINTS WITH RETAINER GLANDS/LUGS FOR ALL VALVES UNLESS NOTED OTHERWISE. VALVES SHALL BE SUITABLE FOR DEAD END SERVICE.
8. REFER TO SPECIFICATION SECTION 330527 FOR HORIZONTAL DIRECTIONAL DRILLING REQUIREMENTS.
9. REFER TO SPECIFICATIONS SPECIAL CONDITION 12 FOR INFORMATION PERTAINING TO POTENTIALLY CONTAMINATED AREA. STAKING TO DEFINE POTENTIALLY CONTAMINATED AREA WILL BE PERFORMED BY OTHERS. CONTRACTOR SHALL NOTIFY CITY BEFORE COMMENCING WORK ON STA 30+50 TO STA 39+50.

## CURVE DATA

(C1)

Δ = 20°58'18.5"
R = 3042.29'
C = 1107.35'
T = 563.08'
L = 1113.56'

STATE OF TEXAS
ERIC COTTER
105521
LICENSED
PROFESSIONAL ENGINEER
08-28-2015

| REV. NO. | DATE | DRWN | CHKD | REMARKS |
|---|---|---|---|---|

DESIGNED BY: E. BOOTH
DRAWN BY: D. AUST
SHEET CHK'D BY: C. SCOTT
CROSS CHK'D BY: S. KHOLE
APPROVED BY: E. COTTER
DATE: JULY 2015

CDM Smith
100 Throckmorton Street, Suite 600
Fort Worth, TX 76102
Tel: (817) 332-8727
TBPE Firm Registration No. F-3043

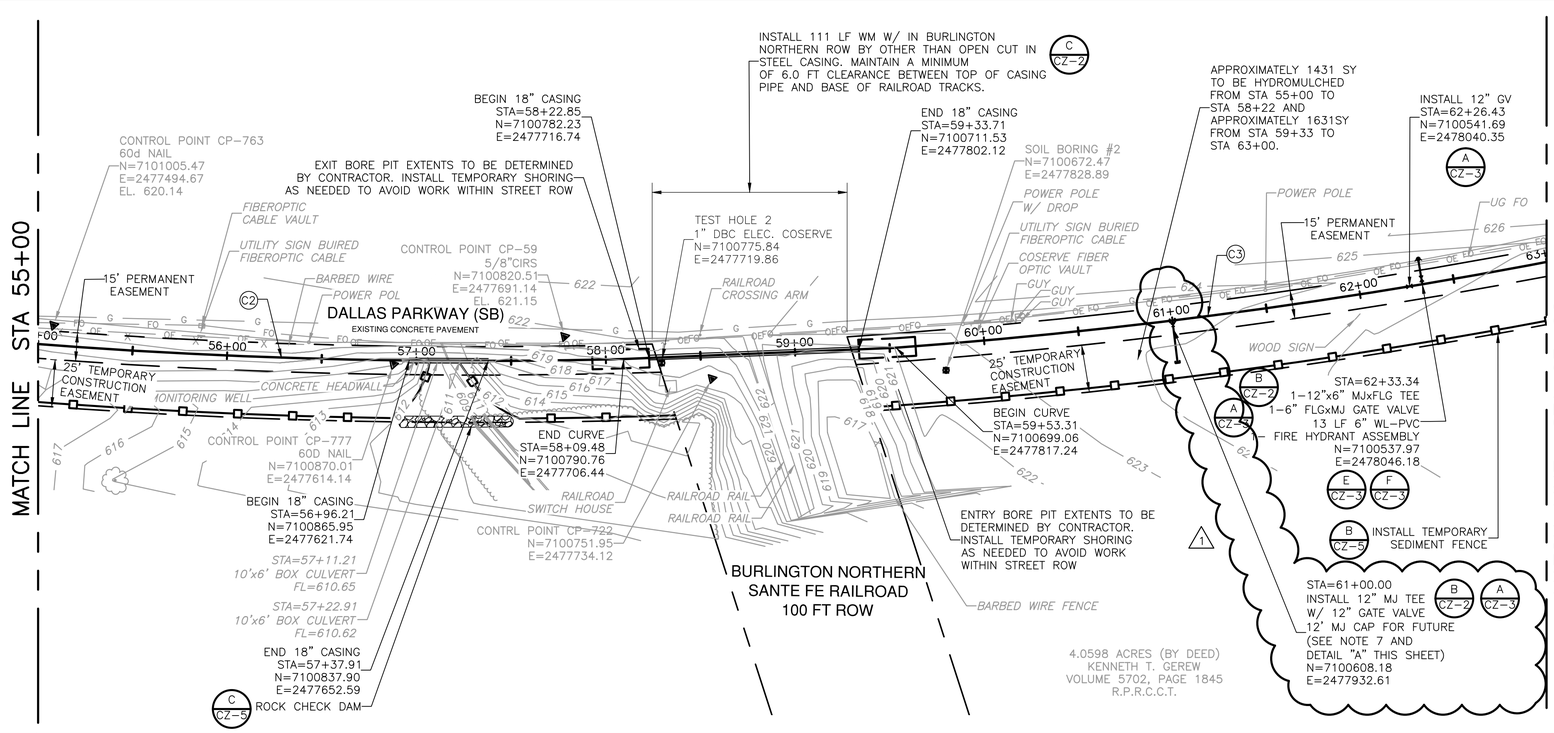
CITY OF FRISCO, TEXAS

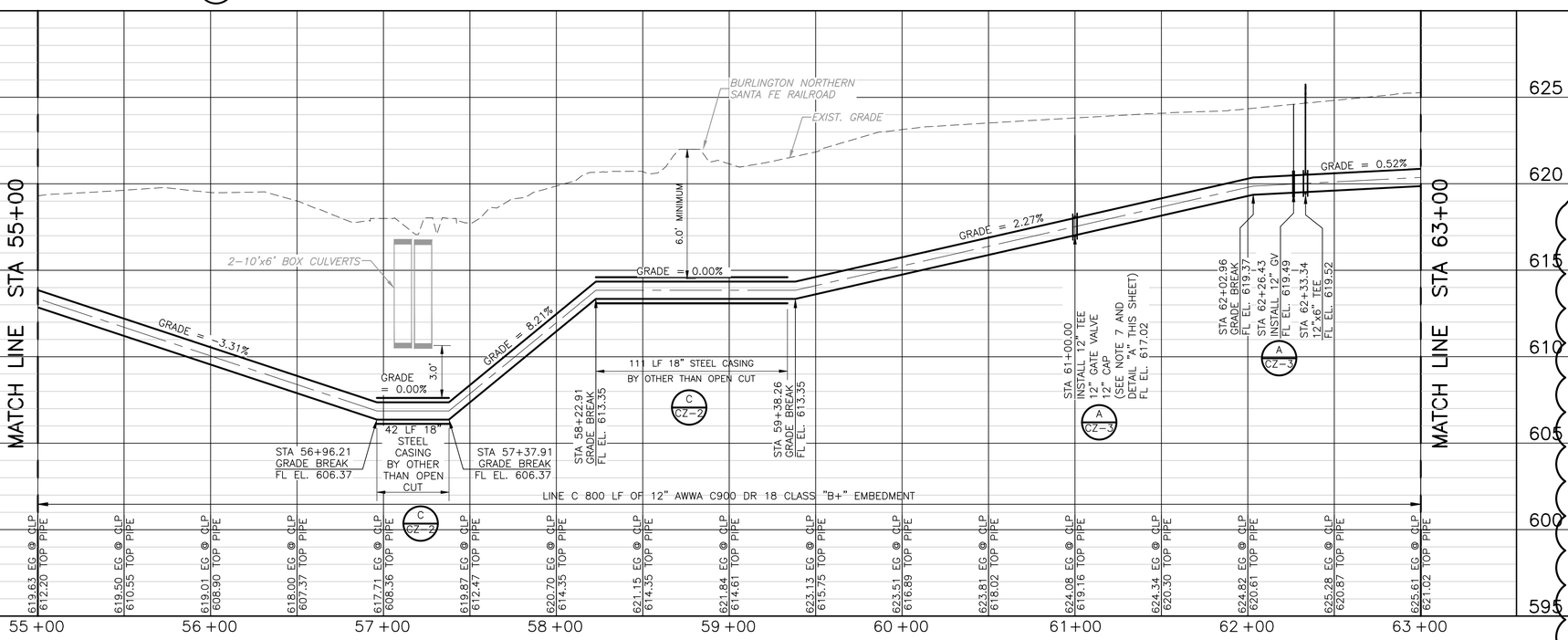
24-INCH AND 12-INCH
DALLAS NORTH TOLLWAY WATERLINE

LINE C 12-INCH WATER LINE
STA 30+50 TO STA 39+50
PLAN AND PROFILE

PROJECT NO. 45206-100657
FILE NAME: C01OYPPP.DWG
SHEET NO.
C-10

xREFs: [C_BASE_PROFILE, CDMS_2234, COTTER-E_INT, C-LAKE-DESN, 0910-3836_FRISCO_WL_01P_R00, C-base, CE_BASE] Images: []
Last saved by: SCOTTWC Time: 8/27/2015 1:06:01 PM
pw:\\bdcpwpp1.PW_AM1\45206\100657\04 Design Services NM_100%\02 Civil\10 CADD\C01OYPPP.dwg
©2015 CDM SMITH ALL RIGHTS RESERVED.
REUSE OF DOCUMENTS: THESE DOCUMENTS AND DESIGNS PROVIDED BY PROFESSIONAL SERVICE, INCORPORATED HEREIN, ARE THE PROPERTY OF CDM SMITH AND ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CDM SMITH.




## WARNING TO CONTRACTOR

CALL 1-800-344-8377 (DIG TESS) OR OTHER UTILITY LOCATING SERVICES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY.

## NOTES:

1. ALL BENDS, CAPS, AND FITTINGS SHALL HAVE RESTRAINED MECHANICAL JOINTS WITH RETAINER GLANDS/LUGS. ALSO, PROVIDE THRUST BLOCKING AT ALL BENDS AND FITTINGS PER CITY OF FRISCO STANDARD REQUIREMENT. UNLESS OTHERWISE NOTED, THRUST BLOCKS SHALL BE PROVIDED PER SCHEDULE ON SHEET CZ-2.
2. REFER TO GENERAL NOTES ON SHEET G-2.
3. ANY REMOVAL PAY ITEM NOT SPECIFICALLY IDENTIFIED AS A SEPARATE PAY ITEM IN THE CONTRACT BID SCHEDULE SHALL BE PAID FOR UNDER "GENERAL SITE PREPARATION" PAY ITEM.
4. REMOVE TREES WITHIN THE PERMANENT EASEMENT, REMOVE TREES WITHIN THE TEMPORARY CONSTRUCTION EASEMENTS ONLY AS NECESSARY TO ACCOMPLISH THE WORK. PAYMENT FOR TREE REMOVAL IS UNDER THE "GENERAL SITE PREPARATION" PAY ITEM. PROTECT TREES AS SHOWN IN THE PLANS.
5. ELEVATIONS SHOWN ARE BASED ON BEST AVAILABLE SURVEY DATA.
6. PROVIDE RESTRAINED MECHANICAL JOINTS WITH RETAINER GLANDS/LUGS FOR ALL VALVES UNLESS NOTED OTHERWISE. VALVES SHALL BE SUITABLE FOR DEAD END SERVICE.
7. ROTATE 12" TEE 20' SO THAT THE PIPE STUB EXTENDS BETWEEN 1 FOOT BELOW GRADE AND INSTALL CAP ON END OF STUB.

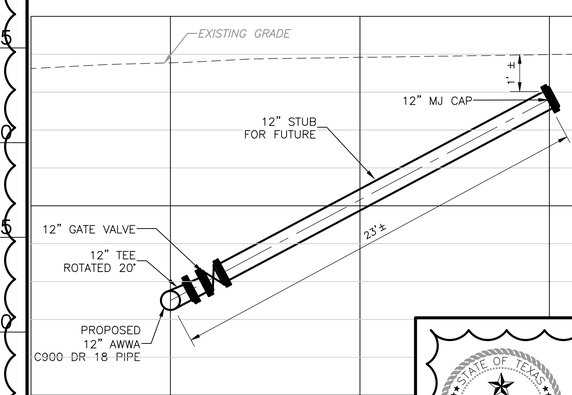
## CURVE DATA

| C2 | C3 |
|---|---|
| Δ = 27°06'38" | Δ = 07°48'51" |
| R = 3022.29' | R = 3022.29' |
| C = 1414.75' | C = 394.65' |
| T = 728.67' | T = 197.60' |
| L = 1430.05' | L = 394.37' |

| ENCASEMENT REQUIREMENTS | | |
|---|---|---|
| CROSSING | BNSF RAILROAD BY OTHER THAN OPEN CUT | BOX CULVERTS BY OTHER THAN OPEN CUT |
| LENGTH | 111 LF | 42 LF |
| INSIDE DIAMETER | 18 INCH | 18 INCH |
| WALL THICKNESS | 1/4 INCH (MIN) | 1/4 INCH (MIN) |
| DEPTH | 6 FT (MIN) | 3 FT BELOW CULVERTS |

ENCASEMENT NOTES:

1. REFER TO THE FRISCO STANDARD SPECIFICATION SECTION 330523 TRENCHLESS UTILITY INSTALLATION FOR ADDITIONAL CASING PIPE AND BORING REQUIREMENTS.
2. WALL THICKNESS SHALL MEET THE BNSF RAILROAD UTILITY ACCOMODATION MANUAL FOR COATED STEEL CASING PIPE.




61+00
12" TEE /STUB CONNECTION
DETAIL A
N.T.S.

STATE OF TEXAS
ERIC COTTER
105521
LICENSED PROFESSIONAL ENGINEER
08-28-2015

| REV. NO. | DATE | DRWN | CHKD | REMARKS |
|---|---|---|---|---|
| 1 | 08/15 | VCS | EAB | REVISED 12" STUB LENGTH AND ANGLE |

DESIGNED BY: E. BOOTH
DRAWN BY: D. AUST
SHEET CHK'D BY: C. SCOTT
CROSS CHK'D BY: S. KHOLE
APPROVED BY: E. COTTER
DATE: JULY 2015

CDM Smith
100 Throckmorton Street, Suite 600
Fort Worth, TX 76102
Tel: (817) 332-8727
TBPE Firm Registration No. F-3043

CITY OF FRISCO, TEXAS

24-INCH AND 12-INCH
DALLAS NORTH TOLLWAY WATERLINE

LINE C 12-INCH WATER LINE
STA 55+00 TO STA 63+00
PLAN AND PROFILE

PROJECT NO. 45206-100657
FILE NAME: C013YPPP.DWG
SHEET NO.
C-13

XREFs: [C_BASE_PROFILE, CDMS_2234, COTTER-E_INT, C-base, CE_BASE, 0910-3836_FRISCO_WL_01P_R00] Images: []
Last saved by: SCOTTVC Time: 8/17/2015 2:57:37 PM
pw:\\bdcpwpp1.PW_AM1\45206\100657\04 Design Services NM_100%\02 Civil\10 CADD\C013YPPP.dwg
©2015 CDM SMITH ALL RIGHTS RESERVED.
REUSE OF DOCUMENTS: THESE DOCUMENTS AND DESIGNS PROVIDED BY PROFESSIONAL SERVICE, INCORPORATED HEREIN, ARE THE PROPERTY OF CDM SMITH AND ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CDM SMITH.

N

1" = 40'

20 0 40

STATE OF TEXAS
EDWARD COTTER
105521
LICENSED
PROFESSIONAL ENGINEER

08-28-2015

| REV. NO. | DATE | DRWN | CHKD | REMARKS |
|---|---|---|---|---|
| 1 | 8/15 | SD | EAB | REVISED AUTO FLUSH DETAIL NOTE |

DESIGNED BY: E. BOOTH
DRAWN BY: D. AUST
SHEET CHK'D BY: C. SCOTT
CROSS CHK'D BY: S. KHOLE
APPROVED BY: E. COTTER
DATE: JULY 2015

CDM Smith
100 Throckmorton Street, Suite 600
Fort Worth, TX 76102
Tel: (817) 332-8727
TBPE Firm Registration No. F-3043

CITY OF FRISCO, TEXAS

24-INCH AND 12-INCH
DALLAS NORTH TOLLWAY WATERLINE

EXISTING WATERLINE MODIFICATIONS

PROJECT NO. 45206-100657
FILE NAME: C015EWLM.DWG

SHEET NO.
C-15

XREFs: [CDMS_2234 COTTER-E_INIT] Images: []
Last saved by: DELAHAYESA Time: 8/19/2015 7:50:51 AM
pw:\\dccpwpp1:PW_XM1\45206\100657\04 Design Services NM_1005\02 Civil\10 CADD\C015EWLM.dwg
©2015 CDM SMITH ALL RIGHTS RESERVED.
REUSE OF DOCUMENTS: THESE DOCUMENTS AND DESIGNS PROVIDED BY PROFESSIONAL SERVICE, INCORPORATED HEREIN, ARE THE PROPERTY OF CDM SMITH. AND ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CDM SMITH.

## RFID Marker Locations 24 Inch and 12 Inch Dallas North Tollway Waterline

| Sheet/LINE | # | STA | Marker Type | Utility | **Owner[1]** | Description | Status | Material | Size | Approx. Depth to Top of Pipe (ft) | Marker Bury Depth (ft) | Approx. Depth from Marker to Top of Pipe (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LINE A 36-INCH WATER LINE STA 0+00 TO STA 0+61.28 PLAN AND PROFILE AND LINE B 24-INCH WATER LINE STA 0+61.28 TO STA 7+00 PLAN | 1 | 0+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 36" | 7.2 | 3 | 4.2 |
| | 2 | 0+22.83 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | 45 BEND | ACTIVE | PVC | 36" | 7.4 | 3 | 4.4 |
| | 3 | 0+51.51 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | 45 BEND | ACTIVE | PVC | 36" | 7.3 | 3 | 4.3 |
| | 4 | 4+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 6.3 | 3 | 3.3 |
| | 5 | 6+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 5.9 | 3 | 2.9 |
| LINE B 24-INCH WATER LINE STA 7+00 TO STA 15+00 PLAN AND PROFILE | 6 | 8+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 6.4 | 3 | 3.4 |
| | 7 | 10+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 6.4 | 3 | 3.4 |
| | 8 | 12+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 6.3 | 3 | 3.3 |
| | 9 | 14+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 6.8 | 3 | 3.8 |
| LINE B 24-INCH WATER LINE STA 15+00 TO STA 23+00 PLAN AND PROFILE | 10 | 16+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 6.1 | 3 | 3.1 |
| | 11 | 18+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 5.8 | 3 | 2.8 |
| | 12 | 20+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 6.4 | 3 | 3.4 |
| | 13 | 22+00.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 6.1 | 3 | 3.1 |
| LINE B 24-INCH WATER LINE STA 23+00 TO STA 27+09.97 PLAN AND PROFILE AND LINE C 12-INCH WATER LINE STA 27+09.97 TO STA 30+50 PLAN AND PROFILE LINE C 12-INCH WATER LINE STA 30+50 TO STA 39+50 PLAN AND PROFILE | 14 | 23+06.70 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | 11.25 BEND | ACTIVE | PVC | 24" | 6.2 | 3 | 3.2 |
| | 15 | 25+27.00 | Ball Gas (Yellow) 1425-XR-iD | Gas | Atmos | CROSSING | ACTIVE | Steel | 6" | TBD | 3 | TBD |
| | 16 | 25+40.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 24" | 6.8 | 3 | 3.8 |
| | 17 | 27+09.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | REDUCER | ACTIVE | PVC | 12" | 7.4 | 3 | 4.4 |
| | 18 | 28+45.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 4.2 | 3 | 1.2 |
| | 19 | 29+98.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 4.0 | 3 | 1.0 |
| | 20 | 31+20.99 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | 11.25 BEND V | ACTIVE | PVC | 12" | 4.2 | 3 | 1.2 |
| | 21 | 38+87.06 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | 11.25 BEND V | ACTIVE | PVC | 12" | 9.6 | 3 | 6.6 |
| | 22 | 39+41.95 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 4.1 | 3 | 1.1 |
| LINE C 12-INCH WATER LINE STA 39+50 TO STA 47+00 PLAN AND PROFILE | 23 | 39+95.83 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 3.8 | 3 | 0.8 |
| | 24 | 41+40.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 4.2 | 3 | 1.2 |
| | 25 | 43+50.43 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | 45 BEND H | ACTIVE | PVC | 12" | 4.3 | 3 | 1.3 |
| | 26 | 43+78.60 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | 45 BEND H | ACTIVE | PVC | 12" | 5.0 | 3 | 2.0 |
| | 27 | 45+75.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PATHWAY | ACTIVE | PVC | 12" | 4.7 | 3 | 1.7 |
| LINE C 12-INCH WATER LINE STA 47+00 TO STA 55+00 PLAN AND PROFILE | 28 | 47+50.00 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 4.6 | 3 | 1.6 |
| | 29 | 48+50.93 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 3.9 | 3 | 0.9 |
| | 30 | 51+88.05 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 4.1 | 3 | 1.1 |
| | 31 | 54+66.55 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 4.0 | 3 | 1.0 |
| LINE C 12-INCH WATER LINE STA 55+00 TO STA 63+00 PLAN AND PROFILE | 32 | 56+96.21 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 10.6 | 3 | 7.6 |
| | 33 | 57+37.91 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 10.6 | 3 | 7.6 |
| | 34 | 58+22.91 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 6.5 | 3 | 3.5 |
| | 35 | 59+38.26 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 7.2 | 3 | 4.2 |
| | 36 | 62+02.96 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | PVI | ACTIVE | PVC | 12" | 3.9 | 3 | 0.9 |
| LINE C 12-INCH WATER LINE STA 63+00 TO STA 63+68.29 PLAN AND PROFILE | 37 | 63+64.76 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | 33.75 BEND | ACTIVE | PVC | 12" | 4.9 | 3 | 1.9 |
| | 38 | 64+01.40 | Ball Water (Blue) 1423-XR-iD | Water | City of Frisco | 45 BEND | ACTIVE | PVC | 12" | 4.9 | 3 | 1.9 |

**TBD = To Be Determined by the Contractor**
**HPI = Horizontal Point of Inflection, but no Bend installed**
**PVI = Point of Vertical Inflection, but no Bend installed**
**[1] Contractor to verify Utility Owner**

## Contractor Added RFID Marker Locations 24-Inch and 24-Inch Dallas North Tollway Waterline

| | | | | | | | Question 1 | Question 2 | Question 3 | Question 4 | Question 5 | | | Question 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | STA | Latitude | Longitude | Serial No. | Marker Type | Utility | Owner | Description | Status | Material | Size | Approx. Depth to Top of Pipe (ft) | Marker Bury Depth (ft) | Approx. Depth from Marker to Top of Pipe (ft) |
| 1 | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | | |
| 33 | | | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | | | |
| 37 | | | | | | | | | | | | | | |
| 38 | | | | | | | | | | | | | | |
| 39 | | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | |
| 41 | | | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | | | |
| 43 | | | | | | | | | | | | | | |
| 44 | | | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | | | |
| 46 | | | | | | | | | | | | | | |
| 47 | | | | | | | | | | | | | | |
| 48 | | | | | | | | | | | | | | |
| 49 | | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | |
| 51 | | | | | | | | | | | | | | |
| 52 | | | | | | | | | | | | | | |
| 53 | | | | | | | | | | | | | | |
| 54 | | | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | | | |
| 56 | | | | | | | | | | | | | | |
| 57 | | | | | | | | | | | | | | |
| 58 | | | | | | | | | | | | | | |
| 59 | | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | | |
| 61 | | | | | | | | | | | | | | |
| 62 | | | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | | | |
| 64 | | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | | |
| 66 | | | | | | | | | | | | | | |
| 67 | | | | | | | | | | | | | | |
| 68 | | | | | | | | | | | | | | |
| 69 | | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | | |
| 71 | | | | | | | | | | | | | | |
| 72 | | | | | | | | | | | | | | |
| 73 | | | | | | | | | | | | | | |
| 74 | | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | | |
| 76 | | | | | | | | | | | | | | |

STATE OF TEXAS
ERIC COTTER
105521
LICENSED
PROFESSIONAL ENGINEER
08-28-2015

| REV. NO. | DATE | DRWN | CHKD | REMARKS |
|---|---|---|---|---|
| 1 | 08/20 | SD | VCS | ADDED C-20 RFID MARKER SHEET |

DESIGNED BY: E. BOOTH
DRAWN BY: D. AUST
SHEET CHK'D BY: C. SCOTT
CROSS CHK'D BY: S. KHOLE
APPROVED BY: E. COTTER
DATE: JULY 2015

CDM Smith
100 Throckmorton Street, Suite 600
Fort Worth, TX 76102
Tel: (817) 332-8727
TBPE Firm Registration No. F-3043

CITY OF FRISCO, TEXAS

24-INCH AND 12-INCH
DALLAS NORTH TOLLWAY WATERLINE

RFID MARKER TABLE

PROJECT NO. 45206-100657
FILE NAME: C020RFMT.DWG
SHEET NO. C-20 (1)

XREFs: [CDMS_2234] Images: []
Last saved by: DEL4HAYESA1 Time: 8/24/2015 10:13:08 AM
pw:\\dccpwpp1.PW_XM1\45206\100657\04 Design Services NM_100%\02 Civil\10 CADD\C020RFMT.dwg
©2015 CDM SMITH ALL RIGHTS RESERVED.
REUSE OF DOCUMENTS: THESE DOCUMENTS AND DESIGNS PROVIDED BY PROFESSIONAL SERVICE, INCORPORATED HEREIN, ARE THE PROPERTY OF CDM SMITH. CDM SMITH AND ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CDM SMITH.

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. The CONTRACTOR shall leave the site in a neat and orderly condition with an appearance satisfactory to the OWNER. Method and location of disposal of surplus and waste materials shall be subject to the approval of the OWNER.

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

No extra payment will be made for any clean-up required on the project.

**SC 9 – LIQUIDATED DAMAGES:**

**Liquidated damages are set at $500.00 per calendar day in accordance with Item 7.8 in the General Conditions.**

**SC 10 - BNSF WORK:**

The contractor shall comply with the following conditions for work crossing the BNSF

1) Prior to commencing any work on the Premises the contractor shall complete the safety-training program at the following website: http://www.contractororientation.com. This training must be completed no more than one year in advance of the contractor's entry on the Premises. This responsibility and cost is solely the contractor's.
2) Contractor shall notify the Roadmaster at 1200 Frisco Road, Sherman, TX 75090, telephone (817) 352-2548 or cell phone (901) 619-9461, at least ten (10) business days prior to installation of the PIPELINE and prior to entering the Premises for any subsequent maintenance thereon.
3) Contractor on-site supervision shall retain/maintain a fully executed copy of this License at all times while on the Premises.
4) Highlighted language in the License as provided in Addendum 1.

**SC 11 –CERTIFICATES OF INSURANCE:**

The contractor shall submit copies of the certificates of insurance (COI) to City for distribution in accordance with the land owner's requirements (no separate pay item). COI requirement for property owner listed below

Zarky Development, LLC
TPMC Realty Services Group, Inc.
Wells Fargo Bank, N.A.

And all subsidiaries, related or affiliated companies are additional insureds with waiver of subrogation. Such policies are primary and non-contributory as respects to any other insurance available to the above entities.

**SC 12 – WORK IN VOLUNTARY CLEANUP AREA OF PARK PROPERTY:**

When City of Frisco contractors are trenching, drilling, or excavating within City limits of the voluntary cleanup area; the equipment operator, site foreman, or a competent observer should monitor the excavation or drill cuttings for waste materials. If waste materials are observed or contamination is identified visually or through a strong odor, the contractor should initiate the following procedure:

1) Immediately Stop Work
2) Immediately Contact the City

**Base Bid**

| Item No. | Spec. Item | Name of Pay Item with Unit Price in Words | Est. Quantity | Unit | Unit Bid Price | Amount Bid |
|---|---|---|---|---|---|---|
| 1 | | **Mobilization** | 1 | LS | | |
| | 017113 | Complete in Place, for the Sum of<br>_____<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 2 | | **Trench Safety** | 1 | LS | | |
| | 330510 | Complete in Place, for the Sum of<br>_____<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 3 | | **Project Signs** | 1 | LS | | |
| | 015813 | Complete in Place, for the Sum of<br>_____<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 4 | | **General Site Preparation** | 1 | LS | | |
| | 024100 | Complete in Place, for the Sum of<br>_____<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 5 | | **Gravel Construction Entrance** | 1 | LS | | |
| | 017416<br>024100 | Complete in Place, for the Sum of<br>_____<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 6 | | **Erosion and Sediment Control** | 1 | LS | | |
| | 312500 | Complete in Place, for the Sum of<br>_____<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 7 | | **SWPPP** | 1 | LS | | |
| | 312500 | Complete in Place, for the Sum of<br>_____<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 8 | | **Traffic Control** | 1 | LS | | |
| | 347113 | Complete in Place, for the Sum of<br>_____<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 9 | | **Cut and Plug Existing 12" Water Mains, Cap Existing Lines to Remain and Install Thrust Restraints at Main Street, Cotton Gin Road, and Stallion Lane** | 1 | LS | | |
| | 024100 | Complete in Place, for the Sum of<br>_____<br>_____<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |

| Item No. | Spec. Item | Name of Pay Item with Unit Price in Words | Est. Quantity | Unit | Unit Bid Price | Amount Bid |
|---|---|---|---|---|---|---|
| 10 | | **Remove Existing Pressure Reducing Valve** | 1 | LS | | |
| | 330510 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 11 | | **Repair or Replace Existing Barrier Free Sidewalk Ramp at Cotton Gin Road, and Main Street Pavement Impacted by Construction** | 100 | SY | | |
| | 024100<br>321313 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 12 | | **Connect Proposed Pipeline to Existing 12" Waterlines** | 3 | EA | | |
| | 331114<br>331113 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 13 | | **Install 12" AWWA C900 DR 18 and Associated Joints, Tees, Bends, etc. by Open-Cut** | 2,861 | LF | | |
| | 331114 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 14 | | **Install 12" AWWA C906 DR-11 HDPE and Associated Joints, Casing, Contact Grout, etc. by Horizontal Directional Drilling (766 LF)** | 870 | LF | | |
| | 330527<br>333300 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 15 | | **Install 12" PVC AWWA C900 DR 18 and Associated Joints, Casing, Contact Grout, etc. by Means Other Than Open-Cut (Under Box Culverts and Burlington Northern ROW)** | 153 | LF | | |
| | 330523<br>331114<br>331240 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 16 | | **Install 18" Steel Casing by Other than Open-Cut (excludes Carrier Pipe)** | 153 | LF | | |
| | 330523<br>331114<br>331240 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 17 | | **Install 36" Steel Casing by Other than Open-Cut (excludes Carrier Pipe)** | 143 | LF | | |
| | 330523<br>331240<br>331113<br>331114 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |

| Item No. | Spec. Item | Name of Pay Item with Unit Price in Words | Est. Quantity | Unit | Unit Bid Price | Amount Bid |
|---|---|---|---|---|---|---|
| 18 | | **Remove Valve Box and Fill with Concrete** | 2 | EA | | |
| | | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 19 | | **Cap and Plug 8" Pipe** | 2 | EA | | |
| | | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 20 | | **Install 12" Cut-in Valve with Restrained Joints, Piping, Fittings, and Other Associated Items** | 1 | EA | | |
| | | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 21 | | **Install Automatic Flushing Device System** | 1 | EA | | |
| | | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 22 | | **Install Hydrant Assemblies, Piping, Fittings, and Other Associated Items** | 6 | EA | | |
| | 331219 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 23 | | **Install 6" Gate Valve and Valve Box, Piping, Fittings, and Other Associated Items** | 6 | EA | | |
| | 331218 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 24 | | **Install 6" PVC Pipe AWWA C900 DR 14, Fittings, and Other Associated Items** | 6 | EA | | |
| | 331114 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 25 | | **Furnish Receiver/Transmitter - 2550-ID/U12 Dynatel** | 1 | EA | | |
| | 017001 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |

| Item No. | Spec. Item | Name of Pay Item with Unit Price in Words | Est. Quantity | Unit | Unit Bid Price | Amount Bid |
|---|---|---|---|---|---|---|
| 26 | | **Furnish Near Surface Markers** | 1 | EA | | |
| | 017001 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 27 | | **Furnish Ball Markers (37-blue, 1-yellow)** | 38 | EA | | |
| | 017001 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 28 | | **Install 12" Gate Valves, Piping, Fittings, and Other Associated Items** | 9 | EA | | |
| | 331217 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 29 | | **Install 30" Butterfly Valve, Piping, Fittings, and Other Associated Items** | 1 | EA | | |
| | 331218 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 30 | | **Install 24" Butterfly Valves, Piping, Fittings, and Other Associated Items** | 4 | EA | | |
| | 331218 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 31 | | **Install 2" Air Release and Vacuum Valves/Vault Type 2** | 3 | EA | | |
| | 331216 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 32 | | **Install 3" Air Release and Vacuum Valves/Vault Type 2** | 2 | EA | | |
| | 331216 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 33 | | **Install 4" Air Release and Vacuum Valves/Vault Type 2** | 1 | EA | | |
| | 331216 | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |
| 34 | | **Type 1 Gate** | 1 | EA | | |
| | | Complete in Place, for the Sum of<br>_____ Dollars and<br>_____ Cents per unit | | | $ | $ |

| Item No. | Spec. Item | Name of Pay Item with Unit Price in Words | Est. Quantity | Unit | Unit Bid Price | Amount Bid |
|---|---|---|---|---|---|---|
| 35 | | **Hydromulch** | 21,259 | SY | | |
| | 329600 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |

**TOTAL AMOUNT BID - BASE BID**

$ _____
(Total Amount Bid, Numerical Value)

_____ Dollars

(Total Amount Bid in Words)

## Alternative Bid Items PVC Pipe

| Item No. | Spec. Item | Name of Pay Item with Unit Price in Words | Est. Quantity | Unit | Unit Bid Price | Amount Bid |
|---|---|---|---|---|---|---|
| 1 | | **Install 36" AWWA C905 DR 18 and Associated Joints, Reducer, Caps, etc. by Open-Cut** | 61 | LF | | |
| | 331114 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 2 | | **Install 24" AWWA C905 DR 18 and Associated Joints, Reducer, Bends, Tees and Casing Spacers, etc by Open-Cut** | 2,529 | LF | | |
| | 331114 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 3 | | **Install 24" AWWA C905 DR 18, Fittings, and Other Associated Items by other than Open-Cut** | 143 | LF | | |
| | 330523<br>331114<br>331240 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |

$ _____
(Total Amount Bid, Numerical Value)

_____ Dollars

(Total Amount Bid in Words)

## Alternative Bid Items Ductile Iron Pipe

| Item No. | Spec. Item | Name of Pay Item with Unit Price in Words | Est. Quantity | Unit | Unit Bid Price | Amount Bid |
|---|---|---|---|---|---|---|
| 1 | | **Install 36" C151, PC150 Ductile Iron Pipe and Associated Joints, Reducer, Caps, etc. by Open-Cut** | 61 | LF | | |
| | 331113 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |

| Item No. | Spec. Item | Name of Pay Item with Unit Price in Words | Est. Quantity | Unit | Unit Bid Price | Amount Bid |
|---|---|---|---|---|---|---|
| 2 | | **Install 24" C151, PC150 Ductile Iron Pipe and Associated Joints, Reducer, Bends, Tees and Casing Spacers, etc by Open-Cut** | 2,529 | LF | | |
| | 331113 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |
| 3 | | **Install 24" C151, PC150 Ductile Iron Pipe, Fittings, and Other Associated Items by other than Open-Cut** | 143 | LF | | |
| | 330523<br>331113<br>331240 | Complete in Place, for the Sum of _____ Dollars and _____ Cents per unit | | | $ | $ |

$ _____
(Total Amount Bid, Numerical Value)

_____ Dollars
(Total Amount Bid in Words)

SECTION 017001

RADIO FREQUENCY IDENTIFICATION (RFID) MARKERS

## PART 1 - GENERAL

1.01 DESCRIPTION

A. All material, labor, equipment, tools and superintendence necessary to furnish and install RFID marker technology in near surface, ball and full range variations buried above key underground elements during construction and maintenance.

1.02 REFERENCES

B. Markers are available in seven standard frequencies, color coded to American Public Works Association (APWA) standards to quickly signify the application.

C. See plans for marker locations at: http://solutions.3m.com/wps/portal/3M/en_US/Locating-Marking-NA/Home/Resource-Directory/Manuals-Documentation/

## PART 2 - PRODUCTS

2.01 MATERIALS

A. The receiver\transmitter (locator):
The Locator shall have the capability to write template data into the markers, locate the electronic markers, read the template data from the electronic markers and be able to transmit data back to PC. The necessary software shall be included with each electronic marker locator. The electronic marker locator shall have 6 frequencies with a 12 Watt transmitter. If specified in special conditions, the locator will be relinquished to the City of Frisco as their property upon completion of the project.

B. RFID Markers: Ball Marker, Near Surface or Full Range shall be installed depending on depth of facility

a. RFiD Marker Telecommunications (orange) **,** 101.4khz shall be used for copper and fiber optic cable systems that connect to the telephone facilities

b. RFiD Marker Power (red), 169.8khz shall be used for all electrical power systems

c. RFiD Marker Water (blue), 145.7khz shall be used for all water mains and services

d. RFiD Marker Wastewater (green), 121.6khz shall be used for all mains and services

e. RFiD Marker Gas (yellow), 83khz shall be used for natural gas and liquefied petroleum mains and services

f. RFiD Marker Cable TV and communications (black/orange), 77khz shall be used for copper and fiber optic cable systems that are independent of the telephone system

g. RFiD Marker General purpose and reclaimed water (purple), 66.35khz shall be used to identify abandoned facilities and signs as well as other underground and/or above ground facilities that are to be mapped or inventoried

## PART 3 - PART 3-EXECUTION

3.01 TRAINING

A. Training on programming RFiD markers must be completed by contractor and\or consultant and documentation of training must be obtained and provided to the City of Frisco.

B. Installation

a. Refer to manufacturer's installation procedures. Contractor shall test each RFID Marker prior to installation to insure signals are received and transmitted.

b. The contractor shall be responsible for placing the appropriately colored RFiD Markers where indicated on the plans. Additional Markers may be required by the engineer at locations where:
   1. The utility line changes direction through an angle, bend or tee
   2. On tangents where the length between the points where the utility changes direction exceeds 200 Feet. Where this condition is present, additional markers shall be placed on the utility line at equal intervals not to exceed 200 feet.
   3. On horizontal curves having a radius greater than 100 feet, additional markers shall be placed on the utility line at the Point of Curvature (PC) and Point of Tangency (PT) and at points between the PC and PT at equal intervals not to exceed 100 feet.
   4. Points of crossing with other utilities. In these instances, the type of Marker used shall be consistent with the utility being placed and the utility being crossed will be noted in the data set number
   5. Significant underground utility structures affecting the network are placed, such as pipe reducers, termination points

c. Markers shall be installed by the contractor directly above the subject utility in accordance with the manufacturer's installation recommendations.
   1. The bury depth of the ball markers shall be no greater than five feet and no less than two feet below finish grade.
   2. The bury depth of the near surface markers shall be no greater than 2.5 feet and no less than 12 inches.
   3. The bury depth of the full range marker shall be no greater than 8 feet and no less than 4 feet below grade.

d. The contractor shall establish the GPS coordinates for placement of markers and input the coordinates to the spreadsheet to be furnished to the city upon the completion of the project.

e. Ball Markers shall be placed at least four inches above the utility and at least six inches above any metallic utilities.

f. Contractor shall hand fill at least six inches of soil over the Ball Marker and compact soil around the marker using means and methods recommended by the manufacturer.
   1. Contractor shall program each of the RFiD Markers as they are installed using the appropriate electronic marker locating device.

g. Contractor shall test and program each marker after the installation\projects are complete. In the event that a marker is damaged during the installation process and\or a signal from the marker cannot be obtained, the contractor shall replace the marker with a functional marker at no additional cost.

h. The contractor shall compile and maintain a spreadsheet of the data stored on the markers and include the GPS coordinates to the spreadsheet. Upon completion of the project contractor shall provide the spreadsheet to the City of Frisco.

i. The following input (2-7) shall be programmed onto each marker by the contractor:
   **1.** Marker Identification number = **"*Indicate 10 digit number*"**
   ***This number will self populate once information is downloaded from locator to spreadsheet through PC Dynatel Tools (training required as indicated in 2.01.C)***
   2. Question 1: Owner
   3. Question 2: Description
   4. Question 3: Status
   5. Question 4: Material
   6. Question 5: Size

7. Question 6: Depth from marker to pipe

j. GPS Coordinates must be documented during installation and manually entered into spreadsheet that will be provided to the City of Frisco upon completion of the project.

## PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. This Item shall be measured on a per Each (EA) basis for each RFiD marker, complete in place

4.02 PAYMENT

A. All work performed and materials furnished in accordance with this Item will be paid for at the unit bid price for "RFID Marker," of the type specified. This price is full compensation for all material, labor, equipment, instrumentation, training, data documentation, tools and superintendence necessary to complete the work, including installing the RFID Markers and providing the spreadsheet.

# SECTION 331113

# DUCTILE IRON PIPE AND FITTINGS

## PART 1 – GENERAL

1.01 DESCRIPTION

A. All material, labor, equipment, tools and superintendence necessary to furnish and install Ductile Iron Pipe and Fittings in accordance with *Public Works Construction Standards*, NCTCOG, 4th Edition, Item 501.7. and Item 506.

1.02 REFERENCES

A. ANSI/AWWA C104/A21.4 - American National Standard for Cement - Mortar Lining for Ductile-Iron Pipe and Fittings for Water, Latest Revision.

B. ANSI/AWWA C105/A21.5 - American National Standard for Polyethylene Encasement, Latest Revision.

C. ANSI/AWWA C110/A21.10, AWWA Standard for Ductile-Iron and Gray-Iron Fittings, Latest Revision.

D. ANSI/AWWA C111/A21.11, AWWA Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings, Latest Revision.

E. ANSI/AWWA C115/A21.15, AWWA Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges, Latest Revision.

F. ANSI/AWWA C150/A21.50,[8] American National Standard for the Thickness Design of Ductile-Iron Pipe, Latest Revision.

G. ANSI/AWWA C151/A21.51, AWWA Standard for Ductile Iron Pipe, Centrifugally Cast, Latest Revision.

H. ANSI/AWWA C153/A21.53, AWWA Standard for Ductile-Iron Compact Fittings for Water Service, Latest Revision.

I. AWWA C600, Installation of Ductile-Iron Water Mains and Their Appurtenances, Latest Revision.

J. AWWA C651, AWWA Standard for Disinfecting Water Mains, Latest Revision.

K. AWWA Manual of Practice M41 Ductile-Iron Pipe and Fittings, Latest Revision.

L. *Public Works Construction Standards*, NCTCOG, 4th Edition, Items 501.7 and 506.

1.03 RELATED SECTIONS

A. Section 330510 – Trenching, Backfilling and Compaction

B. Section 331240 – Polyethylene Encasement

C. Section 331245 – Tapping Sleeves for PVC and Ductile Iron Pipe

D. Section 331260 – Mechanical Restraint for Ductile Iron Pipe

1.04 SUBMITTALS:

Submittals shall be in accordance with the General Conditions and shall include the following:

A. Submittals required prior to fabrication

1. Pipe design calculations sealed by a Licensed Engineer in the State of Texas.

2. Pipe layout drawings including horizontal stations and locations and vertical elevations sealed by a Licensed Engineer in the State of Texas.

3. Thrust restraint calculations sealed by a Licensed Engineer in the State of Texas.

4. Certification with full compliance with the specifications

5. Complete materials specification for each part to be furnished.

6. Technical Bulletins and Brochures

7. Statement of Warranty.

8. An estimated delivery date for the equipment (which shall be stated in calendar days after the releases date to the manufacturer).

9. Name, address, phone number, and fax number of manufacturer's representative.

10. Test to be run during manufacturing process

B. Submittals required prior to Shipping

1. Certified copies of all test.

2. Lifting instructions

1.04 QUALITY ASSURANCE

A. Manufacturer: Finished pipe shall be the product of one (1) manufacturer. Pipe manufacturing operations (pipe, fittings, lining, coating) shall be performed at one (1) location.

1.05 DELIVERY AND STORAGE

A. Delivery and Storage shall be in accordance with AWWA C600 and AWWA Manual of Practice M41.

## PART 2 – PRODUCTS

2.01 DUCTILE IRON PIPE

A. Refer to *Public Works Construction Standards,* NCTCOG, 4th Edition, Item 501.7.

B. Buried ductile iron pipe may be mechanical joint, push-on joint, or restrained push-on joint.

C. All ductile iron pipe shall be cement mortar lined in accordance with AWWA C104.

D. All buried pipe shall be polyethylene encased in accordance with AWWA C105.

E. The pressure rating, thickness class, net weight of pipe without lining, length of pipe and name of manufacturer shall be clearly marked on each pipe.

2.02 DUCTILE IRON FITTINGS

A. Refer to *Public Works Construction Standards,* NCTCOG, 4th Edition, Item 501.7.

B. Mechanical joints shall be furnished complete with accessories. Bolts and nuts shall be stainless steel.

C. Fittings shall be provided with bituminous exterior coating and cement-mortar lining inside with seal coat in accordance with AWWA C104.

D. All buried fittings shall be polyethylene encased in accordance with AWWA C105.

E. Unless otherwise specified, all fittings shall be of the mechanical joint type with a minimum pressure rating of 250 psi.

## PART 3 – EXECUTION

3.01 PREPARATION

A. Refer to *Public Works Construction Standards,* NCTCOG, 4th Edition, Item 505.1. and 502.4.

3.02 INSTALLATION

A. Refer to *Public Works Construction Standards,* NCTCOG, 4th Edition, Item 506.

B. Jointing Push-On Pipe

1. Remove any foreign matter in the gasket seat of the socket, wipe gasket clean, flex gasket and place in socket with the large round end or bulb end entering first.
2. Seat gasket evenly around the inside of the socket with the groove fitted over the bead. Remove any bulges.
3. Apply a thin film of lubricant furnished by the pipe manufacturer to the inside surface of the gasket. No lubricant other than that furnished with the pipe by the pipe manufacturer will be allowed to be used.
4. Wipe plain end of pipe, to be entered; clean and place in approximate alignment with the bell of the pipe to which it is to be jointed.

5. Apply a thin film of the lubricant to the outside of the plain end about 1” back from the end.
6. Align the pipe and carefully enter the plain end into the socket until it just makes contact with the gasket.
7. Complete joint assembly by forcing the plain end of the entering pipe past the gasket until it makes contact with the bottom of the socket.
8. The maximum deflection at each joint shall not exceed 80% of manufacturer’s recommendation.

C. Jointing Mechanical Joint Pipe

1. After carefully cleaning both spigot and bell and after slipping the following ring and the gasket over the spigot end, the spigot shall be slipped into the bell.
2. A lubricant shall be applied to the spigot end to assist in the assembly as directed by the Inspector.
3. The gasket shall be carefully seated by hand so as to be even in the bell at all points.
4. After drawing up the follower ring to uniform bearing against the gasket the bolts shall be inserted and tightened by hand in pairs using bolts opposite each other.
5. The nuts are to be tightened to hold the required pressure. Extension wrenches or pipes over wrench handles will not be permitted. Ten-inch (10”) ratchet wrenches with a tension setting control shall be used to tighten the nuts unless other types of wrenches are approved by the Inspector.
6. The finished joint shall be neat and uniform and shall be watertight.

D. Concrete thrust blocks and mechanically restrained joints shall be required to resist thrust forces at all horizontal and vertical bends, tees and other fittings.

E. Water mains twelve inches (12”) and smaller in the right-of-way near storm inlets shall be constructed behind the inlet by pulling the pipe using longitudinal bending in accordance with the manufacturer’s requirements.

F. The maximum deflection angle of pipe joints shall be restricted to 80% of the manufacturers’ recommendation. Otherwise, horizontal bends will be required.

G. Potable water mains and wastewater mains must be installed in separate trenches.

H. New tracer wire shall be installed in the trench with all water mains with a terminal box located in each water main valve pad.

## 3.03 HYDROSTATIC TEST

A. Refer to *Public Works Construction Standards*, NCTCOG, 4th Edition, Item 506.5 alternative 2-hour testing in accordance with AWWA C600.

B. After the pipe has been laid and backfilled, but prior to replacement of pavement, each valved section of newly laid pipe shall be subjected to a hydrostatic pressure test.

C. Each valved section of pipe shall be slowly filled with water by means of a pump connected to the pipe in a satisfactory manner.

D. The pump, pipe connection, and all necessary apparatus including gauges and meters shall be furnished by the Contractor. The City will furnish water for filling lines and making tests through existing mains.

E. The test pressure shall be measured at the point of lowest elevation.

F. Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary, at the points of highest elevation and afterwards tightly plugged.

G. At intervals during the test the entire route of the pipe line shall be inspected to locate any leaks or breaks. Any defective joints, cracked or defective pipe, fittings or valves discovered in consequence of this pressure test shall be removed and replaced with sound material in the manner provided, and the test shall be repeated until satisfactory results are obtained.

3.04 PURGING AND DISINFECTION

A. Refer to *Public Works Construction Standards,* NCTCOG, 4th Edition, Item 506.7.

**PART 4 – MEASUREMENT AND PAYMENT**

4.01 MEASUREMENT

A. Refer to *Public Works Construction Standards,* NCTCOG, 4th Edition, Item 506.9.1.

4.02 PAYMENT

A. Refer to *Public Works Construction Standards,* NCTCOG, 4th Edition, Item 506.9.2.

END OF SECTION

SECTION 4 - ATTACHMENT 1 - GEOTECHNICAL REPORTS

Terracon

January 22, 2010

CDM
777 Taylor Street, Suite 1050
Fort Worth, Texas 76102

Regarding: Geotechnical Report
Pipeline at NW of Westchester Lane and Saxony Court
Frisco, Texas
Terracon Project Number: 94095182

Gentlemen:

In accordance with your authorization, Terracon has completed the geotechnical engineering report at the referenced site. The work was accomplished in accordance with the general scope outlined in Terracon's Proposal No. P94090924 dated August 26, 2009.

The project site is located in Frisco, Texas. Our scope of services included drilling and sampling one boring, laboratory testing, and a letter report. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- subsurface soil conditions
- groundwater conditions along with its effect on construction
- laboratory data
- recommendations for trench backfill materials

## 1.0 PROJECT INFORMATION

The City of Frisco plans to install a 12 inch diameter PVC pipeline at the northwest corner of Westchester Lane and Saxony Court. The invert depth of the pipes varies from 10 to 13 feet beneath the existing grade. The pipelines are expected to be installed using cut and cover methods.

## 2.0 SUBSURFACE CONDITIONS

Subsurface conditions were explored by drilling one requested boring at the approximate location indicated on Exhibit A-1 in Appendix A. Due to utility and accessibility concerns, the boring was not drilled at the exact location where the pipeline is planned. Therefore, the subsurface conditions and characteristics may vary during excavation. The results of the field investigation are presented on the log of boring, Exhibit A-2 in Appendix A.

## 2.1 Field Exploration

One boring was drilled on January 13, 2010. The boring was located in the field by a representative with Terracon Consultants, Inc. The City of Frisco and one call locater service cleared the underground utilities. The approximate boring location is shown on the Boring Location Diagram, Exhibit A-1, in Appendix A.

A truck-mounted drilling rig and continuous flight augers were used to advance the boring. Samples of the soils encountered in the boring were obtained using thin-walled tube sampling procedures. The samples were tagged for identification, sealed to reduce moisture loss, and taken to the laboratory for further examination, testing, and classification.

The field log of the boring was prepared by the drill crew. The log included visual classifications of the materials encountered as well as interpretation of the subsurface conditions between samples. The boring log included with this report represents the engineer's interpretation of the field log and include modifications based on laboratory evaluation of the samples. The log of the boring is presented on Exhibit A-2 in Appendix A. General notes to log terms and symbols are presented on Exhibit A-3.

## 2.2 Laboratory Testing

The Log of Boring and samples were reviewed by a geotechnical engineer who selected samples for testing. Tests were performed by technicians working under the direction of the engineer. A brief description of the tests performed follows.

Moisture contents were performed on selected soil samples. Hand penetrometer tests and unconfined compression tests were performed on samples of the cohesive soils to evaluate the consistency and strength of these materials. The results of the laboratory tests are provided on the log of boring presented on Exhibit A-2 in the Appendix. The USCS is summarized on Exhibit A-4 in the Appendix A.

## 2.3 Typical Profile

Conditions encountered at the boring location are indicated on the boring log. Stratification boundaries on the boring log represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. Details for the boring location can be found on the boring log in Appendix A of this report.

Based on the results of the boring, subsurface conditions on the project site can be generalized as follows:

| Description | Approximate Depth to Bottom of Stratum | Material Encountered | Classification/ Consistency |
|---|---|---|---|
| Stratum 1 | Surface to about 4 feet | Fill – dark gray clay | Fat Clay (CH) / Very Stiff |
| Stratum 2 | Underlying Stratum 1 to about 6 feet | Gray clay | Fat Clay (CH) / Hard |
| Stratum 3 | Below Stratum 2 to a depth of about 13.5 feet | Tan and gray clay | Shaley Clay (CH) / Very stiff to Hard |
| Stratum 4 | Underlying Stratum 3 to the boring termination depth of 15 feet | Gray Shale | Hard |

### 2.4 Groundwater

The borings were advanced in the dry using auger drilling techniques, which allows short-term groundwater observations to be made while drilling. Groundwater was not observed during or upon completion of drilling.

These groundwater level observations provide an indication of the groundwater conditions present at the time the boring was drilled. Groundwater conditions may be different at the time of construction. Groundwater conditions can change with varying seasonal conditions, creek water levels, landscape irrigation and other factors.

## 3.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

### 3.1 Excavation

Due to utility and accessibility concerns, the boring was not drilled at the exact location where the pipeline is planned. The boring was drilled at an accessible location at the client's approval. Thus, the subsurface conditions and characteristics may vary during excavation.

Based on the invert depth, soil stratigraphy expected and their consistency in cohesive soils is presented in the following table. The clay soils and shale (if encountered) must be sloped or braced in the interest of safety. Applicable OSHA standards should be followed.

| Depth Range (feet below grade) | Anticipated Soil/Rock Condition | Clay Consistency | OSHA Soil Type |
|---|---|---|---|
| 0 – 4 | Fill – Clay | Very stiff | B |
| 4 – 6 | Clay | Hard | A |
| 6 – 13.5 | Shaley Clay | Very Stiff to Hard | A |
| 13.5 – 15 | Shale | Hard | A |

Groundwater was not observed in the boring; however, it may be encountered during construction. Depending on the construction methods used, dewatering methods could be required. Sloughing or caving of the trench sidewalls could be anticipated. The sloughing/ caving of the trench sidewalls may require the trench be benched or sloped.

### 3.2 Backfill

Backfill above the top of the pipe bedding backfill can be onsite soils. Embedment material around the water line should conform to City of Frisco requirements. The backfill materials should be spread in loose lifts, less than 6 inches thick or thinner depending on the compaction equipment used. Each lift should be uniformly compacted to a minimum of 95 percent of ASTM D698. If granular materials are used to backfill trench excavations, a minimum 2-foot thick clay layer should be placed to cap the granular backfill to reduce water infiltration.

Fills compacted to 95 percent of standard proctor density are anticipated to settle on the order of one to two percent of the total fill depth. Where trench backfill settlement is not a concern, 9-inch loose lifts at 90 percent compaction is recommended. If settlements must be limited to less than about one inch, the trench should be backfilled with ASTM - C 33 No. 57 stone, cement treated sand or flowable fill.

## 4.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide testing and observation during excavation, grading, foundation and construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be

immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

Sincerely,
**Terracon Consultants, Inc.**
Texas Firm Registration F-3272

STATE OF TEXAS
1/22/10
SIVA P. PATHIVADA
103698
LICENSED
PROFESSIONAL ENGINEER

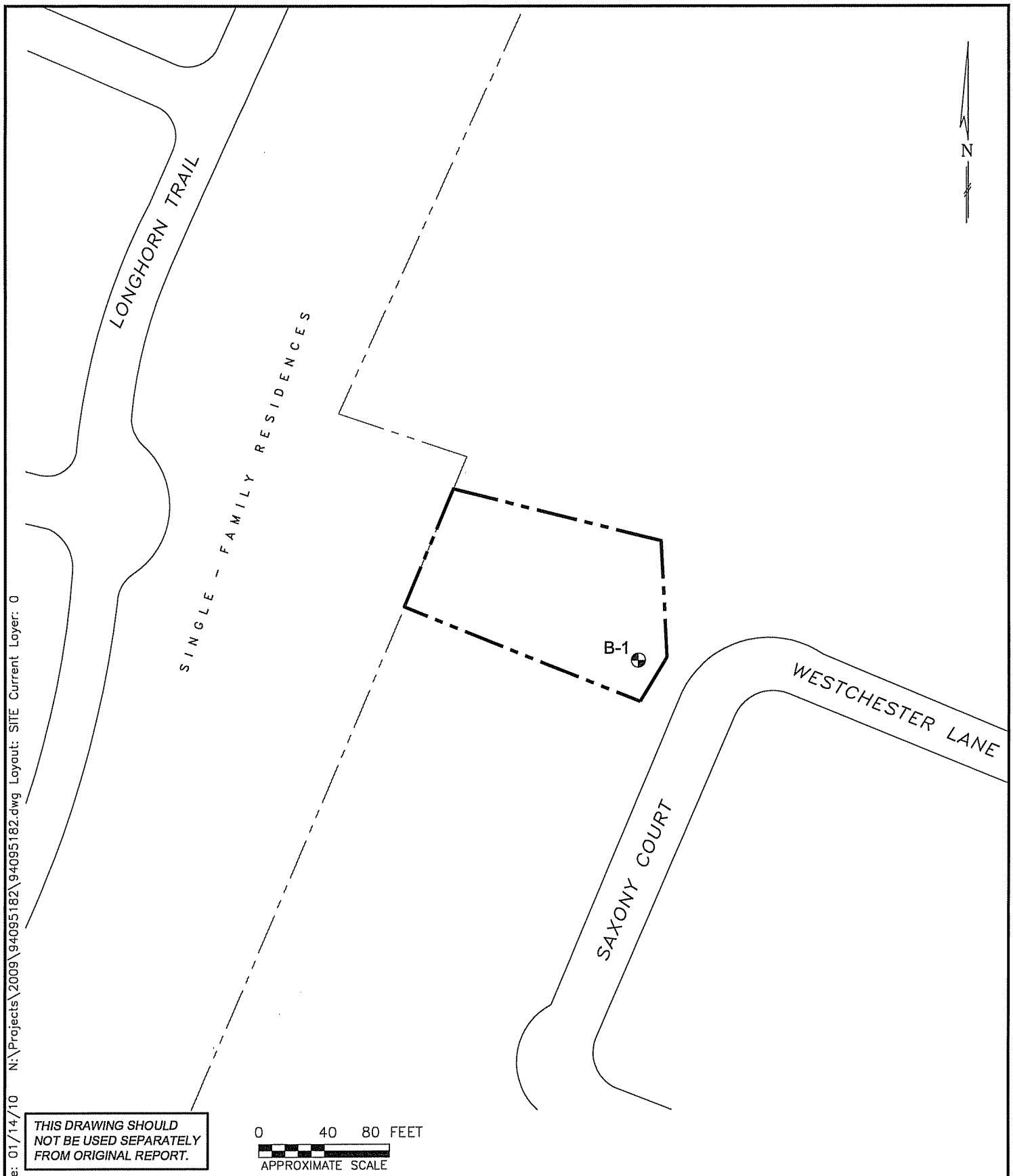
Siva P. Pathivada, P.E.
Project Manager

Daniel L. Franklin, Jr., P.E.
Senior Associate

Enclosures

Copies Submitted: Addressee: (1) Bound & (1) Electronic

# APPENDIX A




Date: 01/14/10 N:\Projects\2009\94095182\94095182.dwg Layout: SITE Current Layer: 0

*THIS DRAWING SHOULD NOT BE USED SEPARATELY FROM ORIGINAL REPORT.*

NOTE: BORING LOCATIONS ARE APPROXIMATE.

| | | | |
|---|---|---|---|
| Project Mngr: TGA | Project No. 94095182 | Terracon Consulting Engineers and Scientists (Registration No.: F-3272) 8901 CARPENTER FREEWAY DALLAS, TEXAS 75247 PH. (214) 630-1010 FAX. (214) 630-7070 | **BORING LOCATION PLAN** |
| Drawn By: JJD | Scale: AS SHOWN | | PIPELINE AT NW OF WESTCHESTER LANE AND SAXONY COURT FRISCO, TEXAS |
| Checked By: SP | Date: 01/14/10 | | EXHIBIT A-1 |
| Approved By: TGA | | | |

# LOG OF BORING NO. B- 1

CLIENT: **CDM**
**Fort Worth, Texas**

PROJECT: **Pipeline at NW of Westchester Lane & Saxony Court**

BORING LOCATION: **See Exhibit A-1**

SITE: **Frisco, Texas**

**Approx. Surface Elevation: 651.0 ft**

| Graphic Log | DESCRIPTION | DEPTH, FEET | USCS SYMBOL | TYPE | SPT OR TXDOT CPT BLOWS/INCH | CALIBRATED HAND PENETROM., TSF | RECOVERY, % / RQD, % | MOISTURE CONTENT, % | DRY DENSITY, PCF | LIQUID LIMIT, % | PLASTICITY INDEX | MINUS #200 SIEVE, % | COMPRESSIVE STRENGTH, KSF | FAILURE STRAIN, % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **FILL, FAT CLAY,** Dark gray | | CH | ST | | 2.5 | | | | | | | | |
| | | | CH | ST | | 4.0 | | 25 | | | | | | |
| | 4.0 — 647.0 | | | | | | | | | | | | | |
| | **FAT CLAY,** Gray | 5 | CH | ST | | 4.5+ | | 19 | 111 | | | | 21.9 | 8.7 |
| | 6.0 — 645.0 | | | | | | | | | | | | | |
| | **SHALEY FAT CLAY,** Tan and gray | | CH | ST | | 4.5+ | | 24 | | | | | | |
| | | | CH | ST | | 4.5+ | | 27 | 97 | | | | 7.5 | 2.4 |
| | | 10 | | CF | | | | | | | | | | |
| | 13.5 — 637.5 | | | | | | | | | | | | | |
| | **SHALE,** Gray | | | ST | | 4.5+ | | | | | | | | |
| | 15.0 — 636.0 | 15 | | | | | | | | | | | | |
| | B.H. at 15.0' | | | | | | | | | | | | | |

STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN SOIL AND ROCK TYPES. IN SITU, THE TRANSITION BETWEEN STRATA MAY BE MORE GRADUAL.

REMARKS: Approximate ground elevation from NCTCOG Maps.

| WATER LEVEL OBSERVATIONS, FEET | |
|---|---|
| ▽ | ▼ |
| ▼ | ▼ |
| **No seepage observed.** | |

Terracon

DATE DRILLED 1/13/2010

PROJECT NUMBER 94095182



**EXHIBIT A-2**

LOBEA 94095182.GPJ 1/15/10

# GENERAL NOTES

**DRILLING & SAMPLING SYMBOLS:**

| | | | |
|---|---|---|---|
| SS: | Split Spoon – 1-3/8" I.D., 2" O.D., unless otherwise noted | HS: | Hollow Stem Auger |
| ST: | Thin-Walled Tube - 2" O.D., unless otherwise noted | PA: | Power Auger |
| TC: | TxDOT Cone Penetrometer Test | HA: | Hand Auger |
| DB: | Diamond Bit Coring - 4", N, B | RB: | Rock Bit |
| BS: | Bulk Sample or Auger Sample | WB: | Wash Boring or Mud Rotary |

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". For TxDOT cone penetrometer (TC) the penetration value is reported as the number of blows required to advance the sampler 12 inches or penetration in inches after 100 blows using a 170-pound hammer falling 24 inches, reported as "blows per foot" or inches per 100 blows, and is not considered equivalent to the "Standard Penetration" or "N-value".

**WATER LEVEL MEASUREMENT SYMBOLS:**

| | | | | | |
|---|---|---|---|---|---|
| WL: | Water Level | WS: | While Sampling | N/E: | Not Encountered |
| WCI: | Wet Cave in | WD: | While Drilling | | |
| DCI: | Dry Cave in | BCR: | Before Casing Removal | | |
| AB: | After Boring | ACR: | After Casing Removal | | |

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

**DESCRIPTIVE SOIL CLASSIFICATION:** Soil classification is based on the Unified Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

**CONSISTENCY OF FINE-GRAINED SOILS**

| Unconfined Compressive Strength, Qu, psf | Standard Penetration or N-value (SS) Blows/Ft. | Consistency |
|---|---|---|
| < 500 | 0 - 1 | Very Soft |
| 500 – 1,000 | 2 - 4 | Soft |
| 1,001 – 2,000 | 4 - 8 | Medium Stiff |
| 2,001 – 4,000 | 8 -15 | Stiff |
| 4,001 – 8,000 | 15 - 30 | Very Stiff |
| 8,000+ | > 30 | Hard |

**RELATIVE DENSITY OF COARSE-GRAINED SOILS**

| Standard Penetration or N-value (SS) Blows/Ft. | TxDOT Cone Penetrometer (TC) Blows/Ft. | Relative Density |
|---|---|---|
| 0 – 3 | 0-8 | Very Loose |
| 4 – 9 | 8-20 | Loose |
| 10 – 29 | 20-80 | Medium Dense |
| 30 – 49 | 80-5"/100 | Dense |
| > 50 | 5"/100 to 0"/100 | Very Dense |

**RELATIVE PROPORTIONS OF SAND AND GRAVEL**

| Descriptive Term(s) of other Constituents | Percent of Dry Weight |
|---|---|
| Trace | < 15 |
| With | 15 – 29 |
| Modifier | > 30 |

**GRAIN SIZE TERMINOLOGY**

| Major Component of Sample | Particle Size |
|---|---|
| Boulders | Over 12 in. (300mm) |
| Cobbles | 12 in. to 3 in. (300mm to 75 mm) |
| Gravel | 3 in. to #4 sieve (75mm to 4.75 mm) |
| Sand | #4 to #200 sieve (4.75mm to 0.075mm) |
| Silt or Clay | Passing #200 Sieve (0.075mm) |

**RELATIVE PROPORTIONS OF FINES**

| Descriptive Term(s) of other Constituents | Percent of Dry Weight |
|---|---|
| Trace | < 5 |
| With | 5 – 12 |
| Modifiers | > 12 |

**PLASTICITY DESCRIPTION**

| Term | Plasticity Index |
|---|---|
| Non-plastic | 0 |
| Low | 1-10 |
| Medium | 11-30 |
| High | 30+ |

# UNIFIED SOIL CLASSIFICATION SYSTEM

| Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A] | | | | | Soil Classification | |
|---|---|---|---|---|---|---|
| | | | | | Group Symbol | Group Name [B] |
| Coarse Grained Soils: More than 50% retained on No. 200 sieve | Gravels: More than 50% of coarse fraction retained on No. 4 sieve | Clean Gravels: Less than 5% fines [C] | $Cu \geq 4$ and $1 \leq Cc \leq 3$ [E] | | GW | Well-graded gravel [F] |
| | | | $Cu < 4$ and/or $1 > Cc > 3$ [E] | | GP | Poorly graded gravel [F] |
| | | Gravels with Fines: More than 12% fines [C] | Fines classify as ML or MH | | GM | Silty gravel [F,G,H] |
| | | | Fines classify as CL or CH | | GC | Clayey gravel [F,G,H] |
| | Sands: 50% or more of coarse fraction passes No. 4 sieve | Clean Sands: Less than 5% fines [D] | $Cu \geq 6$ and $1 \leq Cc \leq 3$ [E] | | SW | Well-graded sand [I] |
| | | | $Cu < 6$ and/or $1 > Cc > 3$ [E] | | SP | Poorly graded sand [I] |
| | | Sands with Fines: More than 12% fines [D] | Fines classify as ML or MH | | SM | Silty sand [G,H,I] |
| | | | Fines Classify as CL or CH | | SC | Clayey sand [G,H,I] |
| Fine-Grained Soils: 50% or more passes the No. 200 sieve | Silts and Clays: Liquid limit less than 50 | Inorganic: | PI > 7 and plots on or above "A" line [J] | | CL | Lean clay [K,L,M] |
| | | | PI < 4 or plots below "A" line [J] | | ML | Silt [K,L,M] |
| | | Organic: | Liquid limit - oven dried | < 0.75 | OL | Organic clay [K,L,M,N] |
| | | | Liquid limit - not dried | | | Organic silt [K,L,M,O] |
| | Silts and Clays: Liquid limit 50 or more | Inorganic: | PI plots on or above "A" line | | CH | Fat clay [K,L,M] |
| | | | PI plots below "A" line | | MH | Elastic Silt [K,L,M] |
| | | Organic: | Liquid limit - oven dried | < 0.75 | OH | Organic clay [K,L,M,P] |
| | | | Liquid limit - not dried | | | Organic silt [K,L,M,Q] |
| Highly organic soils: | Primarily organic matter, dark in color, and organic odor | | | | PT | Peat |

[A] Based on the material passing the 3-in. (75-mm) sieve
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[O] PI plots below "A" line.

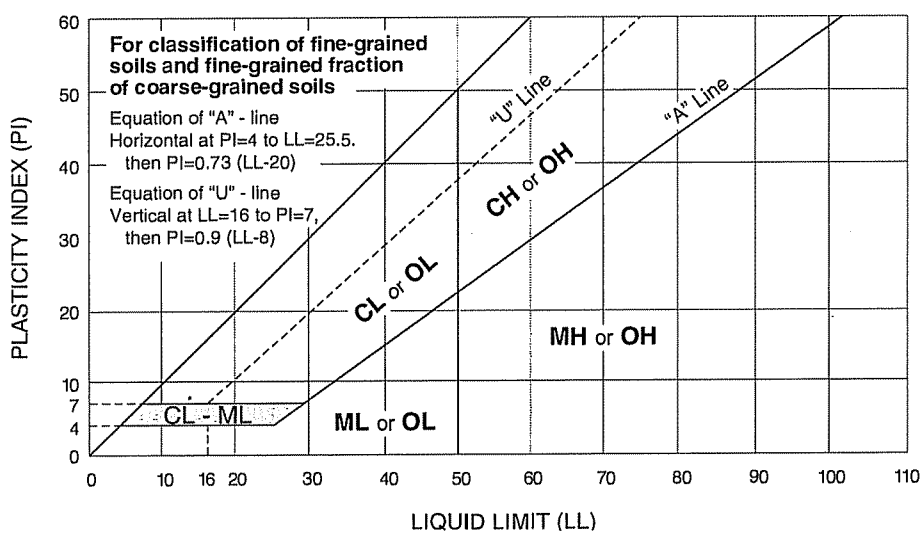



Exhibit A-4

January 22, 2014

CDM Smith
100 Throckmorton Street, Suite 600
Fort Worth, TX - 76102

Attn: Mr. CP Nawal
E: nawalcs@cdmsmith.com

Regarding: Geotechnical Report
Proposed Sewer Line
South of Cotton Gin Road and West of Dallas North Tollway (DNT)
Frisco, Texas
Terracon Project Number: 94135197

Dear Mr. Nawal:

In accordance with your authorization, Terracon has completed the geotechnical engineering report at the referenced site. The work was accomplished in accordance with the general scope outlined in Terracon's Proposal No. P94130569 dated July 9, 2013. We understand that the information provided below will be used for trenchless installation of a sewer line.

# 1.0 INTRODUCTION

A new sewer line is planned in Frisco, Texas. Our scope of services included drilling and sampling three (3) borings to depths of about 20 to 50 feet, laboratory testing and a report. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- subsurface soil conditions
- groundwater conditions encountered
- recommendations for backfill materials
- seismic considerations
- boring logs with soil classification and strength data

# 2.0 PROJECT INFORMATION

## 2.1 Project Description

| Item | Description |
|---|---|
| **Site layout** | See Appendix A, Exhibit A-1, Boring Location Plan. |
| **Planned Structures** | Sewer line will be installed along the DNT from Main street to the Stonebrook Parkway. |
| **Invert Depths** | Vary from 5 feet to 30 feet below existing grade |

## 2.2 Site Location and Description

| Item | Description |
|---|---|
| **Location** | South of Cotton Gin Road and West of DNT, Frisco, TX |
| **Nearby Features** | Bridges, Railroad crossing and DNT pavement |
| **Existing structures** | None |
| **Current ground cover** | Grass |

# 3.0 SUBSURFACE CONDITIONS

## 3.1 Typical Profile

Based on the results of the Borings B-1 and B-2 drilled on either side of the creek, subsurface conditions can be generalized as follows:

| Stratum | Approximate Depth to Bottom of Stratum | Material Encountered | Consistency |
|---|---|---|---|
| 1 | 3 feet in Boring B-2 | Fill – brown sandy lean clay (CL) with limestone fragments | Soft to hard |
| 2 | 15 to 16 feet | Brown, gray and tan sandy lean clay (CL) with occasional calcareous nodules | Soft to hard |
| 3 | Termination depth of 50 feet | Gray shale | hard |

Note: Stratum 1 was not encountered in Boring B-1

Based on the results of the Boring B-3 drilled just south of the railroad, subsurface conditions can be generalized as follows:

| Stratum | Approximate Depth to Bottom of Stratum | Material Encountered | Consistency |
|---|---|---|---|
| 1 | 4 feet | Fill – gray and tan fat clay (CH) | hard |
| 2 | Termination depth of 20 feet | Dark brown, gray and tan fat clay (CH) | Stiff to hard |

Conditions encountered at individual boring locations are indicated on the boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. Field exploration description is

presented in Exhibit A-2. Details for the boring locations can be found on the boring logs, Exhibits A-3 through A-5 in Appendix A of this report.

### 3.2 Groundwater

The borings were advanced using dry auger drilling techniques, which allows short-term groundwater observations to be made while drilling. Groundwater seepage was not observed in the borings during drilling and the borings were observed to be dry at completion of drilling and at the end of the day of drilling.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, landscape irrigation and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be different from the levels indicated on the boring logs. The possibility of groundwater level fluctuation should be considered when developing the design and construction plans for the project.

## 4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

### 4.1 Excavation

Based on the invert depth, the soil stratigraphy expected and its consistency is presented in the tables in Section 3.1. The soils and shale must be sloped or braced in the interest of safety. Applicable OSHA standards should be followed based on the soils and shale consistency provided in Section 3.1.

Groundwater was not observed in the borings. However, if groundwater is encountered during construction, dewatering methods could be required.

### 4.2 Backfill

Backfill above the top of the pipe bedding backfill can be onsite soils. Shale should not be used as backfill material. Embedment material around the pipe line should conform to City of Frisco requirements. The backfill materials should be spread in loose lifts, less than 6 inches thick or thinner depending on the compaction equipment used. Each lift should be uniformly compacted to a minimum of 95 percent of ASTM D698 at or above optimum moisture**.** If granular materials are used to backfill trench excavations, a minimum 2-foot thick clay layer should be placed to cap the granular backfill to reduce water infiltration.

Fills compacted to 95 percent of standard Proctor density are anticipated to settle on the order of one to two percent of the total fill depth. If settlement must be limited to less than about one

inch, the trench should be backfilled with compacted ASTM - C 33 No. 57 stone, cement treated sand or flowable fill.

## 4.3 Design Parameters

Horizontal directional drilling technique will be used for the installation of the sewer line. Design strength parameters for soil were estimated from soil classification. Design strength parameters for shale were developed from correlating field Texas Cone Penetration (TCP) values to charts in TxDOT Geotechnical Manual dated December 2012. Design parameters are recommended below.

| Borings | Stratum | Depth Range from Existing Ground (feet) | Design Total Stress Parameters | | Design Effective Stress Parameters | | Mohs Hardness for Rock |
|---|---|---|---|---|---|---|---|
| | | | Cohesion (psf) | Friction Angle (deg) | Cohesion (psf) | Friction Angle (deg) | |
| B-1 and B-2 | Fill – Sandy Lean Clay | 0 - 3 | 1,000 | 0 | 100 | 22 | - |
| | | 3 - 16 | 1,300 | 0 | 100 | 22 | - |
| | Gray Shale | 16 – 35 | 7,500 | 0 | 7,500 | 0 | 2.0 |
| | | 35 – 50 | 12,000 | 0 | 12,000 | 0 | 2.0 |

| Boring | Stratum | Depth Range from Existing Ground (feet) | Design Total Stress Parameters | | Design Effective Stress Parameters | |
|---|---|---|---|---|---|---|
| | | | Cohesion (psf) | Friction Angle (deg) | Cohesion (psf) | Friction Angle (deg) |
| B-3 | Fill – Fat Clay | 0 – 4 | 1,000 | 0 | 100 | 18 |
| | Fat Clay | 4 – 20 | 1,300 | 0 | 100 | 18 |

### 4.4 Seismic Considerations

| Code Used | Site Classification | $S_s$ | $S_1$ |
|---|---|---|---|
| 2012 International Building Code (IBC) [1] | C [2] | 0.11g | 0.055g |

1. In general accordance with the *2012 International Building Code,* Table 1613.5.2.
2. The 2012 International Building Code (IBC) requires a site soil profile determination extending a depth of 100 feet for seismic site classification. The current scope requested does not include the required 100 foot soil profile determination. The borings extended to a maximum depth of approximately 50 feet and this seismic site class definition considers that stiff soil and bedrock exists below the maximum depth of the subsurface exploration, which is consistent with the site geology. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration. Alternatively, a geophysical exploration could be utilized in order to attempt to justify a higher seismic site class.

## 5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are

planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

Sincerely,
**Terracon Consultants, Inc.**
Texas Firm Registration F-3272

STATE OF TEXAS
SIVA P. PATHIVADA
103698
LICENSED
PROFESSIONAL ENGINEER
1/22/2014

Siva P. Pathivada, P.E.
Project Manager

Ranasinghege (Jay) Jayatilaka, Ph.D., P.E.
Manager/ Geotechnical Services

Attachments

**APPENDIX A – FIELD EXPLORATION**

| | |
|---|---|
| Exhibit A-1 | Boring Location Plan |
| Exhibit A-2 | Field Exploration Description |
| Exhibits A-3 and A-5 | Boring Logs |

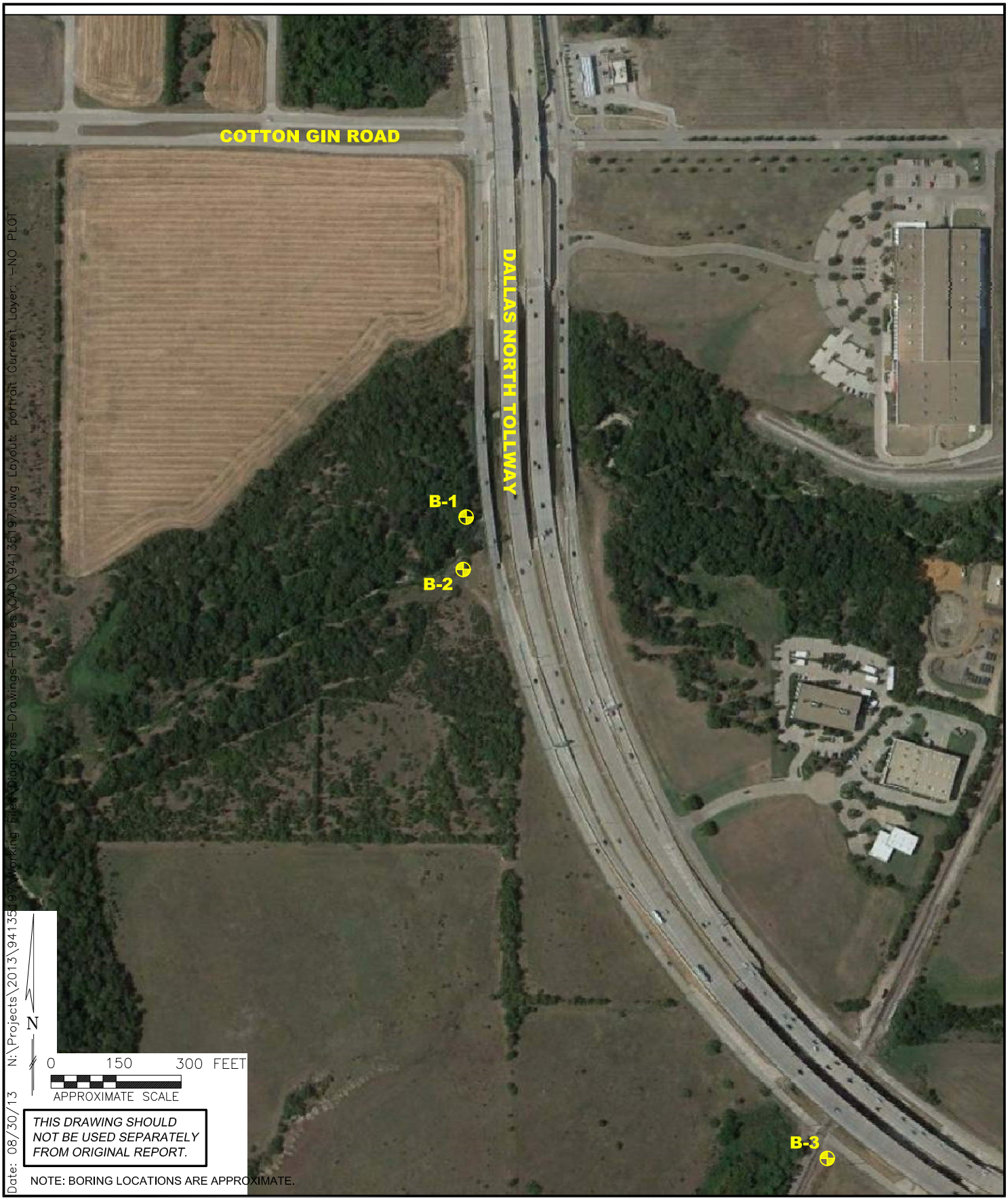
**APPENDIX B – LABORATORY TESTING**

| | |
|---|---|
| Exhibit B-1 | Laboratory Testing |
| Exhibits B-2 and B-5 | UU Triaxial Test Results |

**APPENDIX C – SUPPORTING DOCUMENTS**

| | |
|---|---|
| Exhibit C-1 | General Notes |
| Exhibit C-2 | Unified Soil Classification |

# APPENDIX A
# FIELD EXPLORATION




THIS DRAWING SHOULD NOT BE USED SEPARATELY FROM ORIGINAL REPORT.

NOTE: BORING LOCATIONS ARE APPROXIMATE.

Date: 08/30/13 N:\Projects\2013\94135197\Working Files\Diagrams-Drawings-Figures\CAD\94135197.dwg Layout: portrait Current Layer: 1-NO PLOT

| | |
|---|---|
| Project Mngr: | SPP |
| Drawn By: | CDD |
| Checked By: | SPP |
| Approved By: | RJ |

| | |
|---|---|
| Project No. | 94135197 |
| Scale: | AS SHOWN |
| Date: | 08/30/13 |

Terracon
Consulting Engineers and Scientists
(Registration No.: F-3272)
8901 CARPENTER FREEWAY DALLAS, TEXAS 75247
PH. (214) 630-1010 FAX. (214) 630-7070

# BORING LOCATION PLAN

PROPOSED SEWER LINE
SOUTH OF COTTON GIN ROAD AND WEST OF DALLAS NORTH TOLLWAY
FRISCO, TEXAS

EXHIBIT

A-1

## Field Exploration Description

Subsurface conditions were explored by drilling three borings at the approximate locations indicated on the Boring Location Plan on Exhibit A-1 in Appendix A. The field exploration was performed on August 15, 2013. The test locations were established in the field by a hand held global position system (GPS) device. The approximate GPS coordinates are presented on each boring log.

The borings were performed using a truck-mounted drill rig. Samples of the cohesive soils encountered in the borings were obtained using thin-walled tube sampling procedures. Standard Penetration Test (SPT) was performed in sandy clay fill materials in Boring B-2. The strength of the shale was tested in place by performance of the Texas Department of Transportation (TxDOT) cone penetration tests. Field tests including Pocket Penetrometer (PP) testing on clay soils were conducted during drilling.

Upon completion of drilling, the boreholes were backfilled with soil cuttings. The samples were tagged for identification, sealed to reduce moisture loss, and taken to the laboratory for further examination, testing, and classification.

Field logs of the borings were prepared by the drill crew. These logs include visual classifications of the materials encountered as well as interpretation of the subsurface conditions between samples. The boring logs included with this report represent the engineer's interpretation of the field logs and includes modifications based on visual evaluation of the samples and laboratory test results. The boring logs are presented on Exhibit A-3 through A-5 in Appendix A. General notes to log terms and symbols are presented on Exhibit C-1 in Appendix C.

# BORING LOG NO. B- 1



**PROJECT:** Proposed Sewer Line

**CLIENT:** CDM Smith
Fort Worth, Texas

**SITE:** S. of Cotton Gin Road and W. of DNT
Frisco, Texas

LOCATION See Exhibit A-1

| DEPTH | Description | DEPTH (Ft.) | FIELD TEST RESULTS | STRENGTH TEST: TEST TYPE | STRENGTH TEST: COMPRESSIVE STRENGTH (psf) | STRENGTH TEST: STRAIN (%) | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS: LL-PL-PI | PERCENT FINES |
|---|---|---|---|---|---|---|---|---|---|---|
| | **SANDY LEAN CLAY (CL)**, brown, hard | | 4.5+ (HP) | | | | | | | |
| | | | 4.5+ (HP) | | | | 14 | | 48-18-30 | |
| | | 5 | 4.5+ (HP) | | 22749 | 5.9 | 14 | 118 | | |
| 8.0 | | | 4.5+ (HP) | | 15003 | 4.8 | 15 | 111 | | |
| | **SANDY LEAN CLAY (CL)**, with calcareous nodules, gray and tan, very stiff | 10 | 2.5 (HP) | | | | | | | |
| 12.0 | | | | | | | | | | |
| | **SANDY LEAN CLAY (CL)**, with shale seams, gray, hard | | | | | | | | | |
| 15.0 | | 15 | 4.5+ (HP) | | | | | | | |
| | **SHALE**, gray, hard | | TC=100/10.25" | | | | | | | |
| | | 20 | TC=100/6.5" | | | | | | | |
| | | 25 | TC=100/7.0" | | | | | | | |
| | | 30 | TC=100/5.0" | | | | | | | |
| | | 35 | TC=100/4.5" | | | | | | | |
| | | 40 | TC=100/4.0" | | | | | | | |
| | | 45 | TC=100/4.25" | | | | | | | |
| 50.0 | | 50 | TC=100/3.75" | | | | | | | |
| | ***Boring Terminated at 50 Feet*** | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Augered

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-2 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Coordinates:
33° 8'33.83" N
96° 50'22.92" W

**WATER LEVEL OBSERVATIONS**

*No seepage encountered during drilling*
*Dry at completion*

Terracon
8901 Carpenter Freeway, Suite 100
Dallas, Texas

Boring Started: 8/15/2013
Boring Completed: 8/15/2013
Drill Rig:
Driller: StrataBore
Project No.: 94135197
Exhibit: A-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 94135197.GPJ

# BORING LOG NO. B- 2



**PROJECT:** Proposed Sewer Line

**CLIENT:** CDM Smith
Fort Worth, Texas

**SITE:** S. of Cotton Gin Road and W. of DNT
Frisco, Texas

LOCATION See Exhibit A-1

| DEPTH | Description | FIELD TEST RESULTS | STRENGTH TEST: TEST TYPE | STRENGTH TEST: COMPRESSIVE STRENGTH (psf) | STRENGTH TEST: STRAIN (%) | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS: LL-PL-PI | PERCENT FINES |
|---|---|---|---|---|---|---|---|---|---|
| 0.0–3.0 | **FILL - SANDY LEAN CLAY (CL)**, with limestone fragments, brown, soft to hard | 4.5+ (HP) | | | | | | | |
| | | 8-5-4 N=9 | | | | | | | |
| 3.0–8.0 | **SANDY LEAN CLAY (CL)**, brown, soft to hard | 4.5+ (HP) | | 25263 | 6.4 | 14 | 119 | | |
| | | 4.5+ (HP) | | | | 15 | | 32-16-16 | |
| 8.0–12.0 | **SANDY LEAN CLAY (CL)**, with calcareous nodules, tan and gray, hard | 4.5+ (HP) | | 10362 | 2.7 | 17 | 112 | | |
| 12.0–16.0 | **SANDY LEAN CLAY (CL)**, tan and gray, hard | 4.5+ (HP) | | | | | | | |
| 16.0–50.0 | **SHALE**, gray, hard | TC=100/11.5" | | | | | | | |
| | | TC=100/5.0" | | | | | | | |
| | | TC=100/4.75" | | | | | | | |
| | | TC=100/4.75" | | | | | | | |
| | | TC=100/4.0" | | | | | | | |
| | | TC=100/3.5" | | | | | | | |
| 50.0 | | TC=100/3.5" | | | | | | | |
| | ***Boring Terminated at 50 Feet*** | | | | | | | | |

DEPTH (Ft.): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Augered

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-2 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Coordinates:
33° 8'31.81" N
96° 50'22.96" W

**WATER LEVEL OBSERVATIONS**

*No seepage encountered during drilling*

*Dry at completion*

Terracon
8901 Carpenter Freeway, Suite 100
Dallas, Texas

Boring Started: 8/15/2013
Boring Completed: 8/15/2013
Drill Rig:
Driller: StrataBore
Project No.: 94135197
Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 94135197.GPJ

# BORING LOG NO. B- 3



**PROJECT:** Proposed Sewer Line

**CLIENT:** CDM Smith
Fort Worth, Texas

**SITE:** S. of Cotton Gin Road and W. of DNT
Frisco, Texas

LOCATION See Exhibit A-1

| GRAPHIC LOG | DEPTH | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | FIELD TEST RESULTS | STRENGTH TEST: TEST TYPE | STRENGTH TEST: COMPRESSIVE STRENGTH (psf) | STRENGTH TEST: STRAIN (%) | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS: LL-PL-PI | PERCENT FINES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **FILL - FAT CLAY (CH)**, gray and tan, hard | | | | 4.5+ (HP) | | | | | | | |
| | | | | | 4.5+ (HP) | | | | | | | |
| | 4.0 **FAT CLAY (CH)**, dark brown, hard | 5 | | | 4.5+ (HP) | | 10484 | 7.6 | 21 | 103 | | |
| | | | | | 4.5+ (HP) | | | | 21 | | 54-20-34 | |
| | 8.0 **FAT CLAY (CH)**, tan and gray, very stiff to hard | 10 | | | 2.75 (HP) | | 8247 | 10.4 | 21 | 106 | | |
| | 12.0 **FAT CLAY (CH)**, tan, stiff to very stiff | | | | | | | | | | | |
| | | 15 | | | 2.5 (HP) | | 3721 | 4.7 | 22 | 106 | | |
| | 20.0 | 20 | | | 2.5 (HP) | | | | | | | |
| | ***Boring Terminated at 20 Feet*** | | | | | | | | | | | |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Dry Augered

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-2 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Coordinates:
33° 8'13.67" N
96° 50'9.74" W

**WATER LEVEL OBSERVATIONS**

*No seepage encountered during drilling*
*Dry at completion*

Terracon
8901 Carpenter Freeway, Suite 100
Dallas, Texas

Boring Started: 8/15/2013
Boring Completed: 8/15/2013
Drill Rig:
Driller: StrataBore
Project No.: 94135197
Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 94135197.GPJ

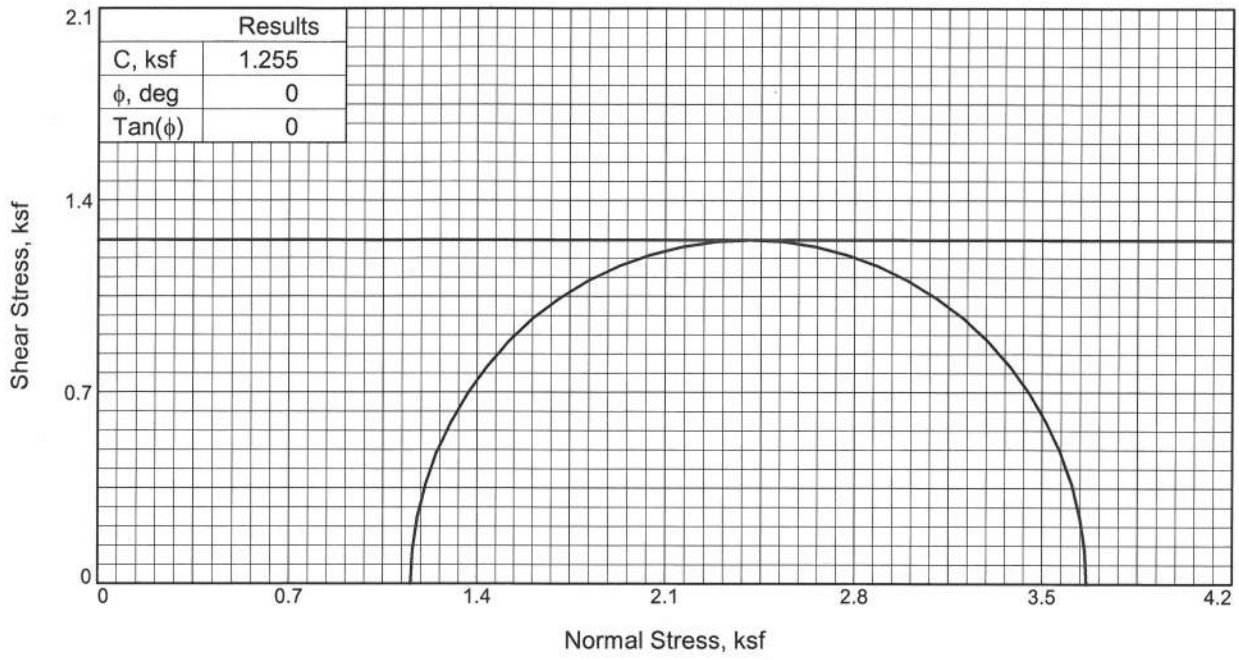
# APPENDIX B
# LABORATORY TESTING

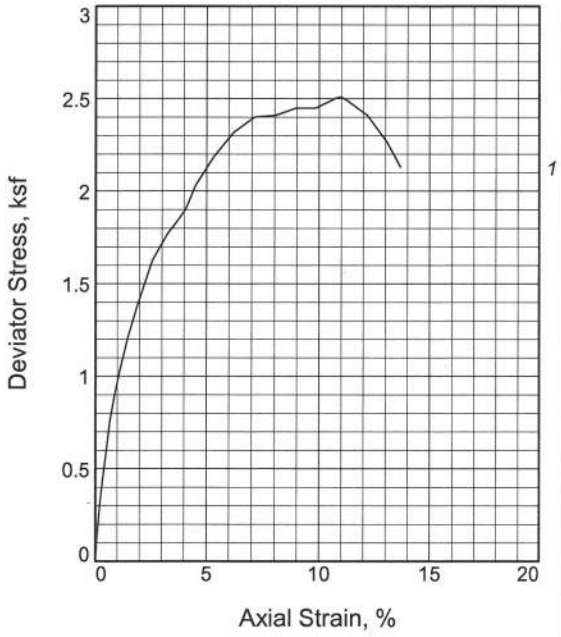
## Laboratory Testing

The Logs of Boring and samples were reviewed by a geotechnical engineer who selected soil samples for testing. Tests were performed by technicians working under the direction of the engineer. A brief description of the tests performed follows.

Liquid limit and plastic limit tests and moisture content measurements were performed to aid in classifying the soils in accordance with the Unified Soil Classification System (USCS). The USCS is summarized on Exhibit C-2 in Appendix C. Strengths of cohesive soils were measured by the unconfined compressive (UC) strength tests and unconsolidated undrained (UU) triaxial tests.

The results of the UU triaxial tests are presented in Exhibits B-2 through B-5. The results of the other laboratory tests are presented on the boring logs in Appendix A.




| | | |
|---|---|---|
| Sample No. | | 1 |
| Initial | Water Content, % | 20.6 |
| | Dry Density, pcf | 109.3 |
| | Saturation, % | 99.5 |
| | Void Ratio | 0.5702 |
| | Diameter, in. | 2.710 |
| | Height, in. | 6.040 |
| At Test | Water Content, % | 20.7 |
| | Dry Density, pcf | 109.3 |
| | Saturation, % | 100.0 |
| | Void Ratio | 0.5702 |
| | Diameter, in. | 2.710 |
| | Height, in. | 6.040 |
| Strain rate, in./min. | | 0.055 |
| Back Pressure, psi | | 0.000 |
| Cell Pressure, psi | | 8.010 |
| Fail. Stress, ksf | | 2.510 |
| Ult. Stress, ksf | | |
| $\sigma_1$ Failure, ksf | | 3.663 |
| $\sigma_3$ Failure, ksf | | 1.153 |

**Type of Test:**
Unconsolidated Undrained

**Sample Type:** Undisturbed

**Description:** Gray and Tan Sandy Lean Clay

**Assumed Specific Gravity=** 2.75

**Remarks:** ASTM D2850

**Client:** CDM Smith

**Project:** Proposed Sewer Line

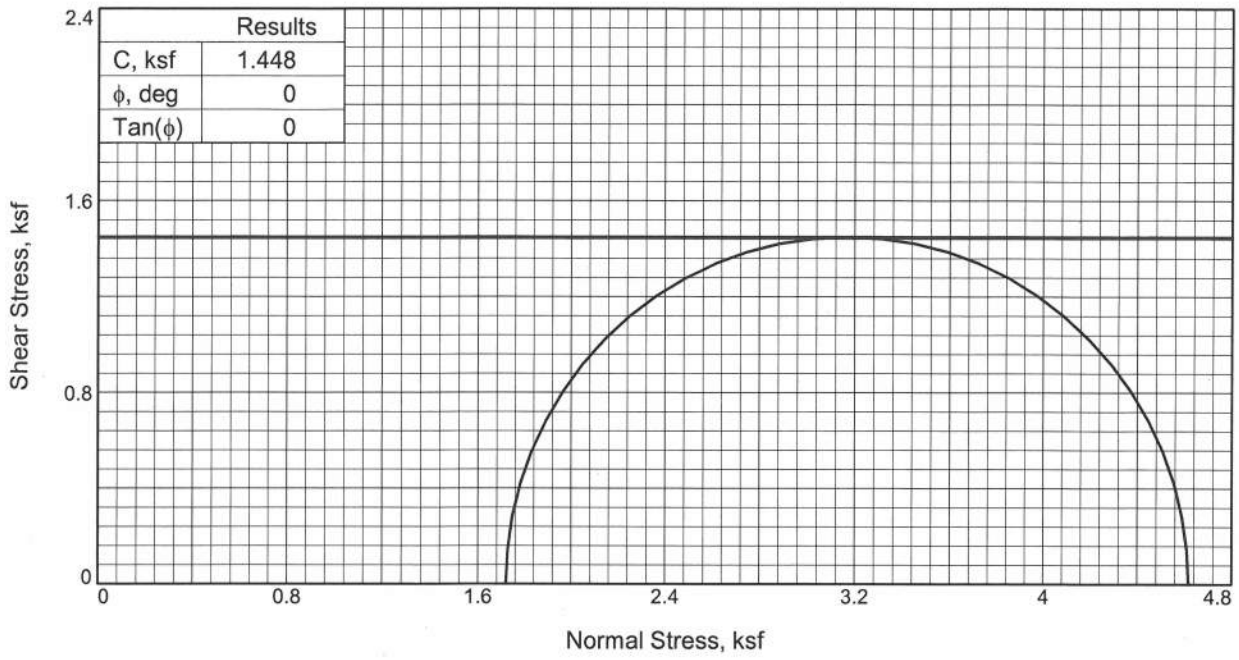
**Location:** B-1

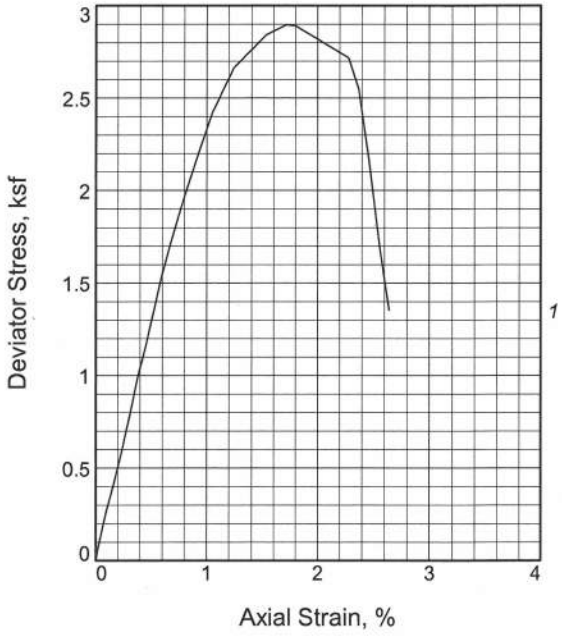
**Depth:** 8-10

**Proj. No.:** 94135197 **Date Sampled:** 8/15/2013

TRIAXIAL SHEAR TEST REPORT
Terracon Consultants, Inc.
Houston, TX

**EXHIBIT B-2**




| | | |
|---|---|---|
| Sample No. | | 1 |
| Initial | Water Content, % | 17.6 |
| | Dry Density, pcf | 109.1 |
| | Saturation, % | 84.4 |
| | Void Ratio | 0.5734 |
| | Diameter, in. | 2.790 |
| | Height, in. | 5.900 |
| At Test | Water Content, % | 20.9 |
| | Dry Density, pcf | 109.1 |
| | Saturation, % | 100.0 |
| | Void Ratio | 0.5734 |
| | Diameter, in. | 2.790 |
| | Height, in. | 5.900 |
| Strain rate, in./min. | | 0.055 |
| Back Pressure, psi | | 0.000 |
| Cell Pressure, psi | | 11.950 |
| Fail. Stress, ksf | | 2.897 |
| Ult. Stress, ksf | | |
| $\sigma_1$ Failure, ksf | | 4.617 |
| $\sigma_3$ Failure, ksf | | 1.721 |

**Type of Test:**
Unconsolidated Undrained

**Sample Type:** Undisturbed

**Description:** Gray and Tan Sandy Lean Clay w/ Shale

**Assumed Specific Gravity=** 2.75

**Remarks:** ASTM D2850

**Client:** CDM Smith

**Project:** Proposed Sewer Line

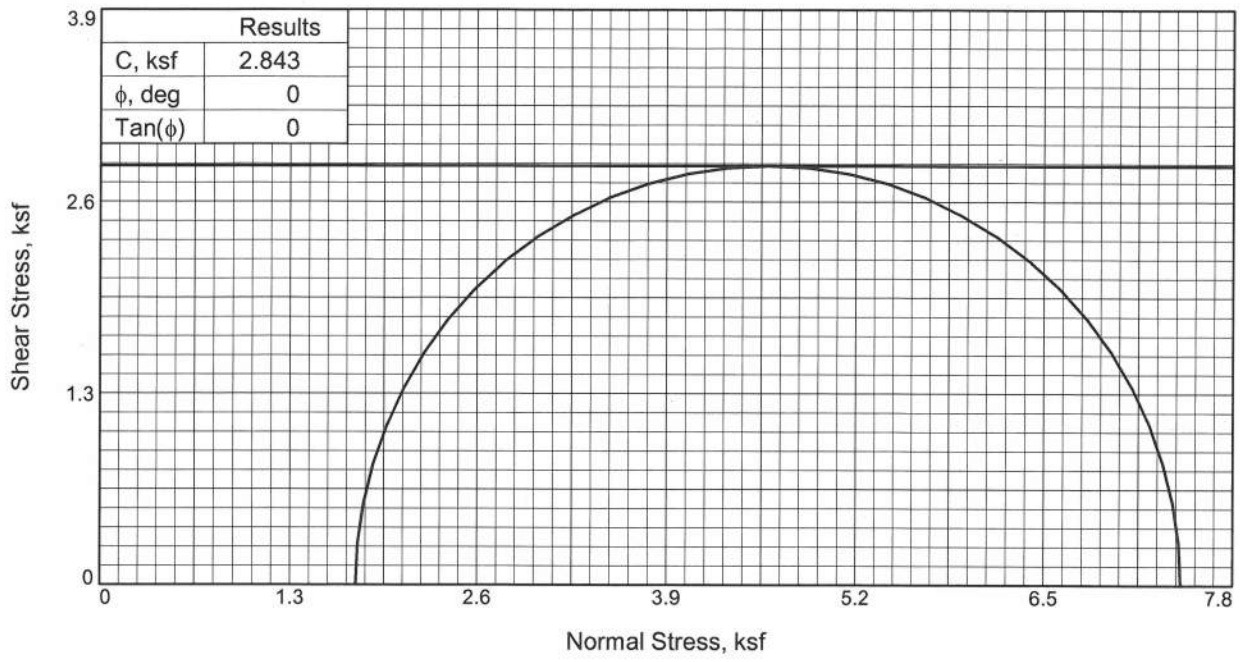
**Location:** B-1

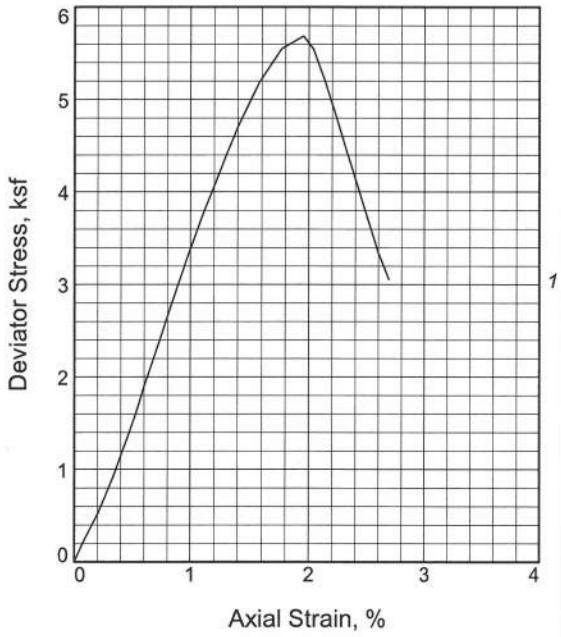
**Depth:** 14-15 ft.

**Proj. No.:** 94135197 **Date Sampled:** 8/15/2013

TRIAXIAL SHEAR TEST REPORT
Terracon Consultants, Inc.
Houston, TX

**EXHIBIT B-3**




| | | |
|---|---|---|
| Sample No. | | 1 |
| Initial | Water Content, % | 21.1 |
| | Dry Density, pcf | 104.6 |
| | Saturation, % | 90.4 |
| | Void Ratio | 0.6407 |
| | Diameter, in. | 2.770 |
| | Height, in. | 6.055 |
| At Test | Water Content, % | 23.3 |
| | Dry Density, pcf | 104.6 |
| | Saturation, % | 100.0 |
| | Void Ratio | 0.6407 |
| | Diameter, in. | 2.770 |
| | Height, in. | 6.055 |
| Strain rate, in./min. | | 0.055 |
| Back Pressure, psi | | 0.000 |
| Cell Pressure, psi | | 12.190 |
| Fail. Stress, ksf | | 5.686 |
| Ult. Stress, ksf | | |
| $\sigma_1$ Failure, ksf | | 7.442 |
| $\sigma_3$ Failure, ksf | | 1.755 |

**Type of Test:**
Unconsolidated Undrained

**Sample Type:** Undisturbed

**Description:** Gray and Tan Sandy Lean Clay

**Assumed Specific Gravity=** 2.75

**Remarks:** ASTM D2850

**Client:** CDM Smith

**Project:** Proposed Sewer Line

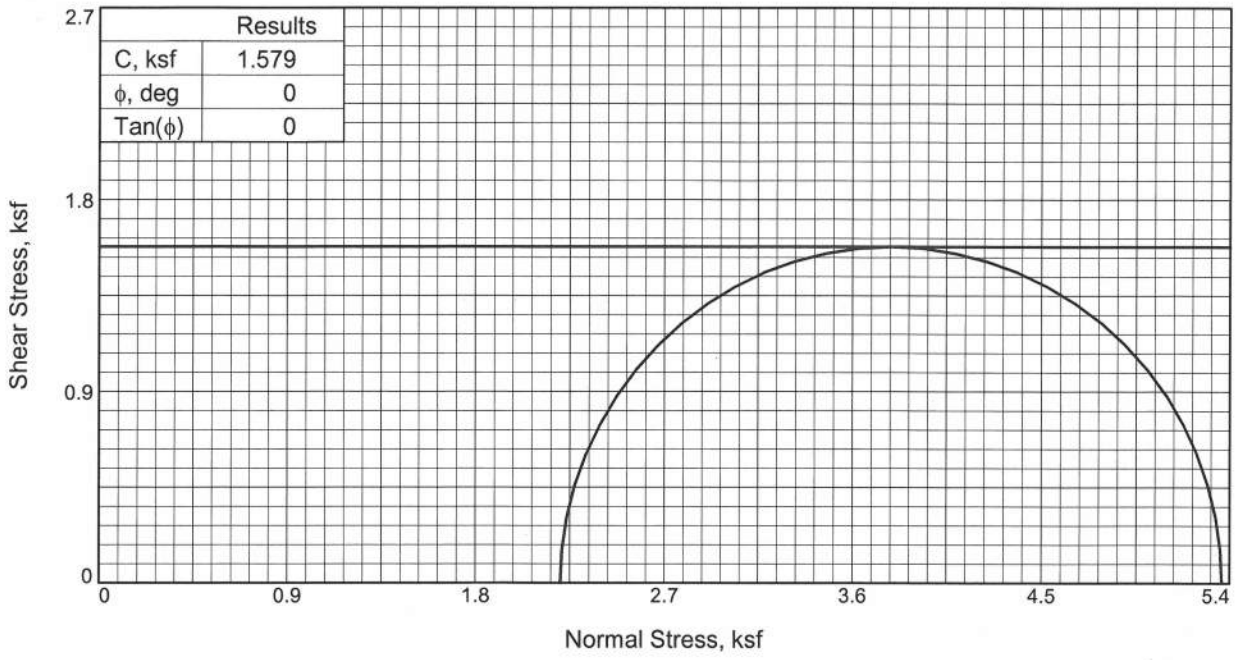
**Location:** B-2

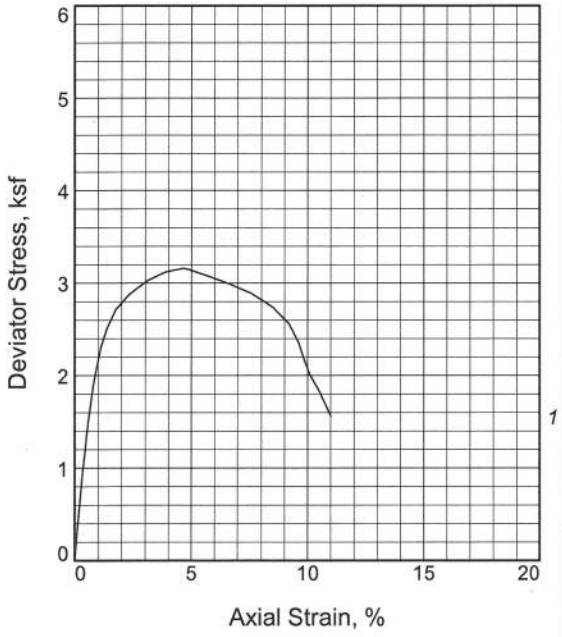
**Depth:** 14-15 ft.

**Proj. No.:** 94135197 **Date Sampled:** 8/15/2013

TRIAXIAL SHEAR TEST REPORT
Terracon Consultants, Inc.
Houston, TX

**EXHIBIT B-4**




| | | |
|---|---|---|
| Sample No. | | 1 |
| Initial | Water Content, % | 23.3 |
| | Dry Density, pcf | 104.3 |
| | Saturation, % | 99.1 |
| | Void Ratio | 0.6459 |
| | Diameter, in. | 2.730 |
| | Height, in. | 6.050 |
| At Test | Water Content, % | 23.5 |
| | Dry Density, pcf | 104.3 |
| | Saturation, % | 100.0 |
| | Void Ratio | 0.6459 |
| | Diameter, in. | 2.730 |
| | Height, in. | 6.050 |
| Strain rate, in./min. | | 0.055 |
| Back Pressure, psi | | 0.000 |
| Cell Pressure, psi | | 15.310 |
| Fail. Stress, ksf | | 3.158 |
| Ult. Stress, ksf | | |
| $\sigma_1$ Failure, ksf | | 5.362 |
| $\sigma_3$ Failure, ksf | | 2.205 |

**Type of Test:**
Unconsolidated Undrained

**Sample Type:** Undisturbed

**Description:** Tan and gray Fat Clay w/calc. nodules

**Assumed Specific Gravity=** 2.75

**Remarks:** ASTM D2850

**Client:** CDM Smith

**Project:** Proposed Sewer Line

**Location:** B-3

**Depth:** 19-20 ft

**Proj. No.:** 94135197 **Date Sampled:** 8/15/2013

TRIAXIAL SHEAR TEST REPORT
Terracon Consultants, Inc.
Houston, TX

**EXHIBIT B-5**

# APPENDIX C
# SUPPORTING DOCUMENTS

# GENERAL NOTES

**DRILLING & SAMPLING SYMBOLS:**

| | | | |
|---|---|---|---|
| SS: | Split Spoon – 1-$^{3}/_{8}$" I.D., 2" O.D., unless otherwise noted | HS: | Hollow Stem Auger |
| ST: | Thin-Walled Tube - 2" O.D., unless otherwise noted | PA: | Power Auger |
| TC: | TxDOT Cone Penetrometer Test | HA: | Hand Auger |
| DB: | Diamond Bit Coring - 4", N, B | RB: | Rock Bit |
| BS: | Bulk Sample or Auger Sample | WB: | Wash Boring or Mud Rotary |

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". For TxDOT cone penetrometer (TC) the penetration value is reported as the number of blows required to advance the sampler 12 inches or penetration in inches after 100 blows using a 170-pound hammer falling 24 inches, reported as "blows per foot" or inches per 100 blows, and is not considered equivalent to the "Standard Penetration" or "N-value".

**WATER LEVEL MEASUREMENT SYMBOLS:**

| | | | | | |
|---|---|---|---|---|---|
| WL: | Water Level | WS: | While Sampling | N/E: | Not Encountered |
| WCI: | Wet Cave in | WD: | While Drilling | | |
| DCI: | Dry Cave in | BCR: | Before Casing Removal | | |
| AB: | After Boring | ACR: | After Casing Removal | | |

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

**DESCRIPTIVE SOIL CLASSIFICATION:** Soil classification is based on the Unified Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

**CONSISTENCY OF FINE-GRAINED SOILS**

| Unconfined Compressive Strength, Qu, psf | Standard Penetration or N-value (SS) Blows/Ft. | Consistency |
|---|---|---|
| < 500 | 0 - 1 | Very Soft |
| 500 – 1,000 | 2 - 4 | Soft |
| 1,001 – 2,000 | 4 - 8 | Medium Stiff |
| 2,001 – 4,000 | 8 -15 | Stiff |
| 4,001 – 8,000 | 15 - 30 | Very Stiff |
| 8,000+ | > 30 | Hard |

**RELATIVE DENSITY OF COARSE-GRAINED SOILS**

| Standard Penetration or N-value (SS) Blows/Ft. | TxDOT Cone Penetrometer (TC) Blows/Ft. | Relative Density |
|---|---|---|
| 0 – 3 | 0-8 | Very Loose |
| 4 – 9 | 8-20 | Loose |
| 10 – 29 | 20-80 | Medium Dense |
| 30 – 49 | 80-5"/100 | Dense |
| > 50 | 5"/100 to 0"/100 | Very Dense |

**RELATIVE PROPORTIONS OF SAND AND GRAVEL**

| Descriptive Term(s) of other Constituents | Percent of Dry Weight |
|---|---|
| Trace | < 15 |
| With | 15 – 29 |
| Modifier | > 30 |

**GRAIN SIZE TERMINOLOGY**

| Major Component of Sample | Particle Size |
|---|---|
| Boulders | Over 12 in. (300mm) |
| Cobbles | 12 in. to 3 in. (300mm to 75 mm) |
| Gravel | 3 in. to #4 sieve (75mm to 4.75 mm) |
| Sand | #4 to #200 sieve (4.75mm to 0.075mm) |
| Silt or Clay | Passing #200 Sieve (0.075mm) |

**RELATIVE PROPORTIONS OF FINES**

| Descriptive Term(s) of other Constituents | Percent of Dry Weight |
|---|---|
| Trace | < 5 |
| With | 5 – 12 |
| Modifiers | > 12 |

**PLASTICITY DESCRIPTION**

| Term | Plasticity Index |
|---|---|
| Non-plastic | 0 |
| Low | 1-10 |
| Medium | 11-30 |
| High | 30+ |

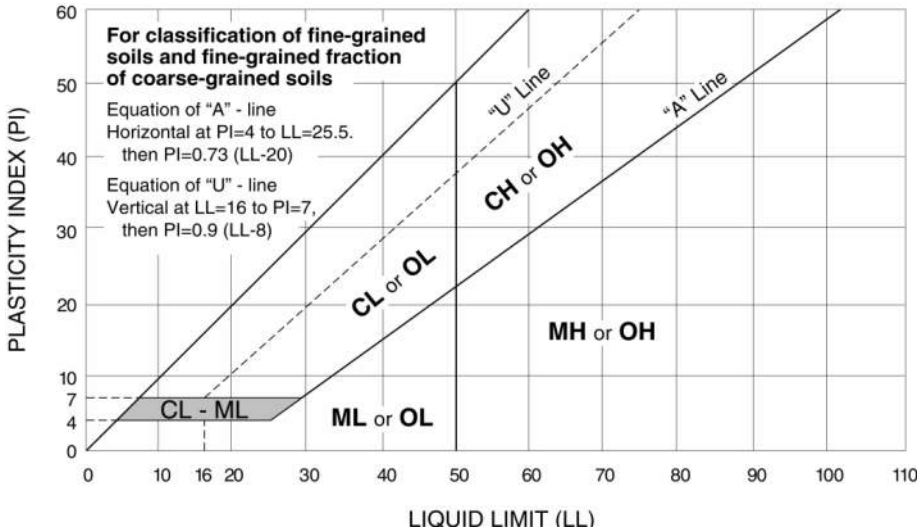
# UNIFIED SOIL CLASSIFICATION SYSTEM

| Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A] | | | | | Soil Classification | |
|---|---|---|---|---|---|---|
| | | | | | Group Symbol | Group Name [B] |
| **Coarse Grained Soils:** More than 50% retained on No. 200 sieve | **Gravels:** More than 50% of coarse fraction retained on No. 4 sieve | **Clean Gravels:** Less than 5% fines [C] | $Cu \geq 4$ and $1 \leq Cc \leq 3$ [E] | | GW | Well-graded gravel [F] |
| | | | $Cu < 4$ and/or $1 > Cc > 3$ [E] | | GP | Poorly graded gravel [F] |
| | | **Gravels with Fines:** More than 12% fines [C] | Fines classify as ML or MH | | GM | Silty gravel [F,G, H] |
| | | | Fines classify as CL or CH | | GC | Clayey gravel [F,G,H] |
| | **Sands:** 50% or more of coarse fraction passes No. 4 sieve | **Clean Sands:** Less than 5% fines [D] | $Cu \geq 6$ and $1 \leq Cc \leq 3$ [E] | | SW | Well-graded sand [I] |
| | | | $Cu < 6$ and/or $1 > Cc > 3$ [E] | | SP | Poorly graded sand [I] |
| | | **Sands with Fines:** More than 12% fines [D] | Fines classify as ML or MH | | SM | Silty sand [G,H,I] |
| | | | Fines Classify as CL or CH | | SC | Clayey sand [G,H,I] |
| **Fine-Grained Soils:** 50% or more passes the No. 200 sieve | **Silts and Clays:** Liquid limit less than 50 | **Inorganic:** | PI > 7 and plots on or above "A" line [J] | | CL | Lean clay [K,L,M] |
| | | | PI < 4 or plots below "A" line [J] | | ML | Silt [K,L,M] |
| | | **Organic:** | Liquid limit - oven dried | < 0.75 | OL | Organic clay [K,L,M,N] |
| | | | Liquid limit - not dried | | | Organic silt [K,L,M,O] |
| | **Silts and Clays:** Liquid limit 50 or more | **Inorganic:** | PI plots on or above "A" line | | CH | Fat clay [K,L,M] |
| | | | PI plots below "A" line | | MH | Elastic Silt [K,L,M] |
| | | **Organic:** | Liquid limit - oven dried | < 0.75 | OH | Organic clay [K,L,M,P] |
| | | | Liquid limit - not dried | | | Organic silt [K,L,M,Q] |
| **Highly organic soils:** | Primarily organic matter, dark in color, and organic odor | | | | PT | Peat |

[A] Based on the material passing the 3-in. (75-mm) sieve
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



SECTION 5 - ATTACHMENT 2 - BNSF Permit Language
For Information Only

JONES LANG LASALLE

Jones Lang LaSalle Brokerage, Inc.
4300 Amon Carter Blvd., Suite 100
Fort Worth, Texas 76155
tel +1 817-230-2600, fax +1 817 306-8265

FOR INFORMATION ONLY

August 3, 2015

highlighted language is contractor's responsibility

City of Frisco
Attention: Mr. David Davis
6101 Frisco Square Blvd.
Frisco, Texas 75034

**Tracking no. 15-53017**

Dear Mr. Davis:

Attached please find a copy of the requested contract for execution by an official authorized to execute contract agreements on behalf of your company. Please print two (2) copies execute and ***return both copies with original signature*** for completion on part of BNSF Railway Company ("BNSF") to this office, along with the following requirements:

*A check in the amount of $3,500.00*
*payable to BNSF Railway Company which covers the contract fee(s).*

Please note the agreements cannot be executed by BNSF without an approved insurance certificate. If there are any issues with your insurance, you will be contacted by a member of the Risk Management team of BNSF Railway.

1. A Certificate of Insurance as required in the agreement.

2. A **separate policy** for Railroad Protective Liability Insurance as required in the agreement (**ORIGINAL POLICY MUST BE PROVIDED**). BNSF Railway Company will be the only insured party; OR;

**In lieu of providing a separate policy for Railroad Protective Liability Insurance**, you may participate in the BNSF's Railroad Protective Policy by checking the appropriate box in the contract and including an additional $1150.00 with your check.

**PLEASE ADVISE IF THIS PROJECT IS ARRA FUNDED.**

Acceptance and deposit of any check by BNSF does not constitute an agreement between BNSF and Licensee for the requested license. BNSF shall not be obligated to hold the check in a separate fund, but may commingle the funds with other funds of BNSF, and in no event shall BNSF be responsible for interest on said funds.

The enclosed permit is not a binding agreement and shall become binding only when, and if, it is executed by you and fully approved and executed by BNSF Railway Company. Upon completion on behalf of BNSF, one fully executed counterpart will be returned for your records.

**The specifications/plans you provided may differ from BNSF's minimum specification requirements. Therefore, prior to your installation, please review the Exhibit A to determine the specifications necessary for your installation.**

We are in receipt of check no. 00324391 in the amount of $750 for payment of the processing fees. Please be informed that if contracts, fees, and insurance are not returned within sixty (60) days, the processing fee will increase to $750.00.

Sincerely,

Annette Jenkins
Sr. Manager Permits
Attachment

# PIPELINE LICENSE

THIS PIPELINE LICENSE ("**License**") is made to be effective _____, 2015, (the "**Effective Date**") by and between **BNSF RAILWAY COMPANY**, a Delaware corporation ("**Licensor**") and **CITY OF FRISCO**, a Texas corporation ("**Licensee**").

In consideration of the mutual covenants contained herein, the parties agree to the following:

## GENERAL

1. Grant of License. Licensor hereby grants Licensee a non-exclusive license, subject to all rights, interests, and estates of third parties, including, without limitation, any leases, use rights, easements, liens, or other encumbrances, and upon the terms and conditions set forth below, to construct and maintain, in strict accordance with the drawings and specifications approved by Licensor as part of Licensee's application process (the "**Drawings and Specifications**"), one (1) pipeline, 11.734 inches in diameter inside a 17.5 inch steel casing (collectively, the "**Pipeline**"), across or along Licensor's rail corridor at or near the station of Frisco, County of Collin, State of Texas, Line Segment 1046, Mile Post 686.79 as shown on the attached Drawing No. 64290, dated June 24, 2015, attached hereto as **Exhibit "A"** and incorporated herein by reference (the "**Premises**").

2. Term. This License shall commence on the Effective Date and shall continue for a period of twenty-five (25) years, subject to prior termination as hereinafter described.

3. Existing Improvements. Licensee shall not disturb any improvements of Licensor or Licensor's existing lessees, licensees, easement beneficiaries or lien holders, if any, or interfere with the use, repair, maintenance or replacement of such improvements.

4. Use of the Premises. Licensee shall use the Premises solely for construction, maintenance, and use of the Pipeline in accordance with the Drawings and Specifications. The Pipeline shall carry potable water, and Licensee shall not use the Pipeline to carry any other material or use the Premises for any other purpose.

5. Alterations. Except as set forth in this License, Licensee may not make any alterations to the Premises or permanently affix anything to the Premises or any buildings or other structures adjacent to the Premises without Licensor's prior written consent.

## COMPENSATION

6. License Fee. Licensee shall pay Licensor, prior to the Effective Date, the sum of Three Thousand Five Hundred and No/100 Dollars ($3,500.00) as compensation for the use of the Premises.

7. Costs and Expenses.

   7.1 For the purpose of this License, "cost" or "costs" and "expense" or "expenses" includes, but is not limited to, actual labor and material costs including all assignable additives, and material and supply costs at current value where used.

   7.2 Licensee agrees to reimburse Licensor (pursuant to the terms of **Section 8** below) for all costs and expenses incurred by Licensor in connection with Licensee's use of the Premises or the presence, construction and maintenance of the Pipeline, including but not limited to the furnishing of Licensor's flaggers and any vehicle rental costs incurred. Licensee shall bear the cost of flagger services and other safety measures provided by Licensor, when deemed necessary by Licensor's representative. Flagging costs shall include, but not be limited to, the following: pay for at least an eight (8) hour basic day with time and one-half or double time for overtime, rest days and holidays (as applicable); vacation allowance; paid

holidays (as applicable); railway and unemployment insurance; public liability and property damage insurance; health and welfare benefits; transportation; meals; lodging and supervision. Negotiations for railway labor or collective bargaining agreements and rate changes authorized by appropriate Federal authorities may increase flagging rates. Flagging rates in effect at the time of performance by the flaggers will be used to calculate the flagging costs pursuant to this **Section 7.**

8. Payment Terms. All invoices are due thirty (30) days after the date of invoice. If Licensee fails to pay any monies due to Licensor within thirty (30) days after the invoice date, then Licensee shall pay interest on such unpaid sum from the due date until paid at an annual rate equal to the lesser of (i) the prime rate last published in *The Wall Street Journal* in the preceding December plus two and one-half percent (2-1/2%), or (ii) the maximum rate permitted by law.

## LICENSOR'S RESERVED RIGHTS

9. Reserved Rights of Use. Licensor excepts and reserves the right, to be exercised by Licensor and any other parties who may obtain written permission or authority from Licensor:

9.1 to maintain, use, operate, repair, replace, modify and relocate any utility, power or communication pipe/lines/cables and appurtenances (other than the Pipeline) and other facilities or structures of like character upon, over, under or across the Premises existing as of the Effective Date;

9.2 to construct, maintain, renew, use, operate, change, modify and relocate any tracks or additional facilities, structures and related appurtenances upon, over, under or across the Premises; or

9.3 to use the Premises in any manner as Licensor in its sole discretion deems appropriate, provided Licensor uses all commercially reasonable efforts to avoid material interference with the use of the Premises by Licensee for the purpose specified in **Section 4** above.

10. Right to Require Relocation. If at any time during the term of this License, Licensor desires the use of its rail corridor in such a manner as would, in Licensor's reasonable opinion, be interfered with by the Pipeline, Licensee shall, at its sole expense, within thirty (30) days after receiving written notice from Licensor to such effect, make such changes in the Pipeline as in the sole discretion of Licensor may be necessary to avoid interference with the proposed use of Licensor's rail corridor, including, without limitation, the relocation of the Pipeline, or the construction of a new pipeline to replace the Pipeline. Notwithstanding the foregoing, Licensee agrees to make all emergency changes and minor adjustments, as determined by Licensor in its sole discretion, to the Pipeline promptly upon Licensor's request.

## LICENSEE'S OPERATIONS

11. Construction and Maintenance of the Pipeline.

11.1 Licensee shall notify Licensor's Roadmaster, at 1200 Frisco Rd., Sherman, TX. 75090, telephone (817) 352-2548 or cell phone (806) 672-4561, or at least ten (10) business days prior to installation of the Pipeline and prior to entering the Premises for any subsequent maintenance thereon. In the event of emergency, Licensee shall notify Licensor of Licensee's entry onto the Premises at the telephone number above as soon as practicable and shall promptly thereafter follow up with written notice of such entry.

11.2 Licensee's on-site supervisors shall retain/maintain a fully executed copy of this License at all times while on the Premises.

11.3 While on the Premises, Licensee shall use only public roadways to cross from one side of Licensor's tracks to the other.

11.4 Any contractors or subcontractors performing work on the Pipeline or entering the Premises on behalf of Licensee shall be deemed servants and agents of Licensee for purposes of this License.

11.5 Under no conditions shall Licensee be permitted to conduct any tests, investigations or any other activity using mechanized equipment and/or machinery, or place or store any mechanized equipment, tools or other materials, within twenty-five (25) feet of the centerline of any railroad track on the Premises unless Licensee has obtained prior written approval from Licensor. Licensee shall, at its sole cost and expense, perform all activities on and about the Premises in such a manner as not at any time to endanger or interfere with (i) the existence or use of present or future tracks, roadbeds, or property of Licensor, (ii) the safe operation and activities of Licensor or existing third parties, or (iii) the rights or interests of third parties. If ordered to cease using the Premises at any time by Licensor's personnel due to any hazardous condition, Licensee shall immediately do so. Notwithstanding the foregoing right of Licensor, the parties agree that Licensor has no duty or obligation to monitor Licensee's use of the Premises to determine the safe nature thereof, it being solely Licensee's responsibility to ensure that Licensee's use of the Premises is safe. Neither the exercise nor the failure by Licensor to exercise any rights granted in this Section will alter the liability allocation provided by this License.

11.6 Licensee shall, at its sole cost and expense, construct and maintain the Pipeline in such a manner and of such material that the Pipeline will not at any time endanger or interfere with (i) the existence or use of present or future tracks, roadbeds, or property of Licensor, (ii) the safe operation and activities of Licensor or existing third parties, or (iii) the rights or interests of third parties. The construction of the Pipeline shall be completed within one (1) year of the Effective Date, and any subsequent maintenance shall be completed within one (1) year of initiation. Within fifteen (15) days after completion of the construction of the Pipeline or the performance of any subsequent maintenance thereon, Licensee shall, at Licensee's own cost and expense, restore the Premises to substantially their state as of the Effective Date, unless otherwise approved in advance by Licensor in writing. On or before expiration or termination of this License for any reason, Licensee shall, at its sole cost and expense, surrender the Premises to Licensor pursuant to the terms and conditions set forth in **Section 24** hereof.

11.7 Licensor may direct one or more of its field engineers to observe or inspect the construction and/or maintenance of the Pipeline at any time for compliance with the Drawings and Specifications and Legal Requirements (defined below). If ordered at any time to halt construction or maintenance of the Pipeline by Licensor's personnel due to non-compliance with the Drawings and Specifications or any other hazardous condition, Licensee shall immediately do so. Notwithstanding the foregoing right of Licensor, the parties agree that Licensor has no duty or obligation to observe or inspect, or to halt work on, the Pipeline, it being solely Licensee's responsibility to ensure that the Pipeline is constructed and maintained in strict accordance with the Drawings and Specifications and in a safe and workmanlike manner in compliance with all terms hereof. Neither the exercise of, nor the failure by Licensor to exercise, any right granted by this Section will alter in any way the liability allocation provided by this License. If at any time Licensee shall, in the sole judgment of Licensor, fail to properly perform its obligations under this **Section 11**, Licensor may, at its option and at Licensee's sole expense, arrange for the performance of such work as it deems necessary for the safety of its operations and activities. Licensee shall promptly reimburse Licensor for all costs and expenses of such work, pursuant to the terms of **Section 8**. Licensor's failure to perform any obligations of Licensee shall not alter the liability allocation hereunder.

12. Boring and Excavation.

12.1 Prior to Licensee conducting any boring, excavation, or similar work on or about any portion of the Premises, Licensee shall explore the proposed location for such work with hand tools to a depth of at least three (3) feet below the surface of the ground to determine whether pipelines or other structures exist below the surface, provided, however, that in lieu of the foregoing, Licensee shall have the right to use suitable detection equipment or other generally accepted industry practice (*e.g.*, consulting with the Underground Services Association) to determine the existence or location of pipelines and other subsurface structures prior to drilling or excavating with mechanized equipment. Licensee may request information from Licensor concerning the existence and approximate location of Licensor's underground lines, utilities, and pipelines at or near the vicinity of the proposed Pipeline by contacting Licensor's Telecommunications Helpdesk at least thirty (30) business days prior to installation of the Pipeline. Upon receiving Licensee's timely request, Licensor will provide Licensee with the information Licensor has in its possession regarding any existing underground lines, utilities, and pipelines at or near the vicinity of the proposed Pipeline and, if applicable, identify the location of such lines on the Premises pursuant to Licensor's standard procedures. Licensor does not warrant the accuracy or completeness of information relating to subsurface conditions of the Premises and Licensee's operations will be subject at all times to the liability provisions herein.

12.2 For all bores greater than 26-inch diameter and at a depth less than 10.0 feet below bottom of rail, a soil investigation must be performed by Licensee and reviewed by Licensor prior to construction. This study is to determine if granular material is present, and to prevent subsidence during the installation process. If the investigation determines in Licensor's reasonable opinion that granular material is present, Licensor may select a new location for Licensee's use, or may require Licensee to furnish for Licensor's review and approval, in Licensor's sole discretion, a remedial plan to deal with the granular material. Once Licensor has approved any such remedial plan in writing, Licensee shall, at Licensee's sole cost and expense, carry out the approved plan in accordance with all terms thereof and hereof.

12.3 Any open hole, boring, or well, constructed on the Premises by Licensee shall be safely covered and secured at all times when Licensee is not working in the actual vicinity thereof. Following completion of that portion of the work, all holes or borings constructed on the Premises by Licensee shall be:

12.3.1 filled in to surrounding ground level with compacted bentonite grout; or

12.3.2 otherwise secured or retired in accordance with any applicable Legal Requirement. No excavated materials may remain on Licensor's property for more than ten (10) days, but must be properly disposed of by Licensee in accordance with applicable Legal Requirements.

## LIABILITY AND INSURANCE

13. Liability and Indemnification.

13.1 For purposes of this License: (a) "**Indemnitees**" means Licensor and Licensor's affiliated companies, partners, successors, assigns, legal representatives, officers, directors, shareholders, employees, and agents; (b) "**Liabilities**" means all claims, liabilities, fines, penalties, costs, damages, losses, liens, causes of action, suits, demands, judgments, and expenses (including, without limitation, court costs, reasonable attorneys' fees, costs of investigation, removal and remediation, and governmental oversight costs) environmental or otherwise; and (c) "**Licensee Parties**" means Licensee or Licensee's officers, agents, invitees, licensees, employees, or contractors, or any party directly or indirectly employed by any of them, or any party they control or exercise control over.

13.2 **TO THE FULLEST EXTENT PERMITTED BY LAW, LICENSEE SHALL, AND SHALL CAUSE ITS CONTRACTOR TO, RELEASE, INDEMNIFY, DEFEND AND HOLD HARMLESS INDEMNITEES FOR, FROM, AND AGAINST ANY AND ALL LIABILITIES OF ANY NATURE, KIND, OR DESCRIPTION DIRECTLY OR INDIRECTLY ARISING OUT OF, RESULTING FROM, OR RELATED TO (IN WHOLE OR IN PART):**

13.2.1 **THIS LICENSE, INCLUDING, WITHOUT LIMITATION, ITS ENVIRONMENTAL PROVISIONS,**

13.2.2 **ANY RIGHTS OR INTERESTS GRANTED PURSUANT TO THIS LICENSE,**

13.2.3 **LICENSEE'S OCCUPATION AND USE OF THE PREMISES,**

13.2.4 **THE ENVIRONMENTAL CONDITION AND STATUS OF THE PREMISES CAUSED BY OR CONTRIBUTED TO BY LICENSEE, OR**

13.2.5 **ANY ACT OR OMISSION OF ANY LICENSEE PARTY.**

13.3 **TO THE FULLEST EXTENT PERMITTED BY LAW, LICENSEE NOW AND FOREVER WAIVES ANY AND ALL CLAIMS THAT BY VIRTUE OF ENTERING INTO THIS LICENSE, LICENSOR IS A GENERATOR, OWNER, OPERATOR, ARRANGER, OR TRANSPORTER FOR THE PURPOSES OF THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT, AS AMENDED ("CERCLA") OR OTHER ENVIRONMENTAL LAWS (DEFINED BELOW). LICENSEE WILL INDEMNIFY, DEFEND, AND HOLD THE INDEMNITEES HARMLESS FROM ANY AND ALL SUCH CLAIMS. NOTHING IN THIS LICENSE IS MEANT BY EITHER PARTY TO CONSTITUTE A WAIVER OF ANY INDEMNITEE'S COMMON CARRIER DEFENSES AND THIS LICENSE SHOULD NOT BE SO CONSTRUED. IF ANY AGENCY OR COURT CONSTRUES THIS LICENSE TO BE A WAIVER OF ANY INDEMNITEE'S COMMON CARRIER DEFENSES, LICENSEE AGREES TO INDEMNIFY, HOLD HARMLESS, AND DEFEND INDEMNITEES FOR ANY LIABILITIES RELATED TO THAT CONSTRUCTION OF THIS LICENSE. IN NO EVENT AS BETWEEN LICENSOR AND LICENSEE AS TO USE OF THE PREMISES AS CONTEMPLATED BY THIS LICENSE SHALL LICENSOR BE RESPONSIBLE TO LICENSEE FOR THE ENVIRONMENTAL CONDITION OF THE PREMISES.**

13.4 **IF ANY EMPLOYEE OF ANY LICENSEE PARTY ASSERTS THAT HE OR SHE IS AN EMPLOYEE OF ANY INDEMNITEE, TO THE FULLEST EXTENT PERMITTED BY LAW, LICENSEE SHALL, AND SHALL CAUSE ITS CONTRACTOR TO, RELEASE, INDEMNIFY, DEFEND, AND HOLD THE INDEMNITEES HARMLESS FROM AND AGAINST ANY LIABILITIES ARISING OUT OF OR RELATED TO (IN WHOLE OR IN PART) ANY SUCH ASSERTION INCLUDING, BUT NOT LIMITED TO, ASSERTIONS OF EMPLOYMENT BY AN INDEMNITEE RELATED TO THE FOLLOWING OR ANY PROCEEDINGS THEREUNDER: THE FEDERAL EMPLOYERS' LIABILITY ACT, THE SAFETY APPLIANCE ACT, THE LOCOMOTIVE INSPECTION ACT, THE OCCUPATIONAL SAFETY AND HEALTH ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, AND ANY SIMILAR STATE OR FEDERAL STATUTE.**

13.5 **THE FOREGOING OBLIGATIONS OF LICENSEE SHALL NOT APPLY TO THE EXTENT LIABILITIES ARE PROXIMATELY CAUSED BY THE GROSS NEGLIGENCE OR WILLFUL MISCONDUCT OF ANY INDEMNITEE, BUT SHALL APPLY TO ALL OTHER LIABILITIES, INCLUDING THOSE ARISING FROM OR ATTRIBUTED TO ANY OTHER ALLEGED OR ACTUAL NEGLIGENCE, INTENTIONAL ACTS, OR STRICT LIABILITY OF ANY INDEMNITEE.**

13.6 Upon written notice from Licensor, Licensee agrees to assume the defense of any lawsuit or other proceeding brought against any Indemnitee by any entity, relating to any matter covered by this License for which Licensee has an obligation to assume liability for and/or save and hold harmless any Indemnitee. Licensee shall pay all costs and expenses incident to such defense, including, but not limited to, reasonable attorneys' fees, investigators' fees, litigation and appeal expenses, settlement payments, and amounts paid in satisfaction of judgments.

14. Personal Property Risk of Loss. **ALL PERSONAL PROPERTY, INCLUDING, BUT NOT LIMITED TO, FIXTURES, EQUIPMENT, OR RELATED MATERIALS UPON THE PREMISES WILL BE AT THE RISK OF LICENSEE ONLY, AND NO INDEMNITEE WILL BE LIABLE FOR ANY DAMAGE THERETO OR THEFT THEREOF, WHETHER OR NOT DUE IN WHOLE OR IN PART TO THE NEGLIGENCE OF ANY INDEMNITEE.**

15. Insurance. Licensee shall, at its sole cost and expense, procure and maintain during the life of this License the following insurance coverage:

15.1 Commercial General Liability Insurance. This insurance shall contain broad form contractual liability with a combined single limit of a minimum of $5,000,000 each occurrence and an aggregate limit of at least $10,000,000 but in no event less than the amount otherwise carried by Licensee. Coverage must be purchased on a post 2004 ISO occurrence or equivalent and include coverage for, but not limited to, the following:

- Bodily Injury and Property Damage
- Personal Injury and Advertising Injury
- Fire legal liability
- Products and completed operations

This policy shall also contain the following endorsements or language, which shall be indicated on the certificate of insurance:

- The definition of insured contract shall be amended to remove any exclusion or other limitation for any work being done within 50 feet of railroad property.
- Waiver of subrogation in favor of and acceptable to Licensor.
- Additional insured endorsement in favor of and acceptable to Licensor and Jones Lang LaSalle Brokerage, Inc.
- Separation of insureds.
- The policy shall be primary and non-contributing with respect to any insurance carried by Licensor.

It is agreed that the workers' compensation and employers' liability related exclusions in the Commercial General Liability Insurance policy(s) required herein are intended to apply to employees of the policy holder and shall not apply to Licensor's employees.

No other endorsements limiting coverage may be included on the policy.

15.2 Business Automobile Insurance. This insurance shall contain a combined single limit of at least $1,000,000 per occurrence, and include coverage for, but not limited to the following:

- Bodily injury and property damage.
- Any and all vehicles owned, used or hired.

This policy shall also contain the following endorsements, which shall be indicated on the certificate of insurance:

- Waiver of subrogation in favor of and acceptable to Licensor.
- Additional insured endorsement in favor of and acceptable to Licensor.
- Separation of insureds.

- The policy shall be primary and non-contributing with respect to any insurance carried by Licensor.

15.3 Workers' Compensation and Employers' Liability Insurance. This insurance shall include coverage for, but not limited to:

- Licensee's statutory liability under the workers' compensation laws of the state(s) in which the services are to be performed. If optional under state laws, the insurance must cover all employees anyway.
- Employers' Liability (Part B) with limits of at least $500,000 each accident, $500,000 by disease policy limit, $500,000 by disease each employee.

This policy shall also contain the following endorsements or language, which shall be indicated on the certificate of insurance:

- Waiver of subrogation in favor of and acceptable to Licensor.

15.4 Railroad Protective Liability Insurance. This insurance shall name only Licensor as the Insured with coverage of at least $5,000,000 per occurrence and $10,000,000 in the aggregate. The coverage obtained under this policy shall only be effective during the initial installation and/or construction of the Pipeline. **THE CONSTRUCTION OF THE PIPELINE SHALL BE COMPLETED WITHIN ONE (1) YEAR OF THE EFFECTIVE DATE**. If further maintenance of the Pipeline is needed at a later date, an additional Railroad Protective Liability Insurance Policy shall be required. The policy shall be issued on a standard ISO form CG 00 35 12 03 and include the following:

- Endorsed to include the Pollution Exclusion Amendment.
- Endorsed to include the Limited Seepage and Pollution Endorsement.
- Endorsed to include Evacuation Expense Coverage Endorsement.
- No other endorsements restricting coverage may be added.
- The original policy must be provided to Licensor prior to performing any work or services under this License.
- Definition of "Physical Damage to Property" shall be endorsed to read: "means direct and accidental loss of or damage to all property owned by any named insured and all property in any named insured's care, custody and control arising out of the acts or omissions of the contractor named on the Declarations."

In lieu of providing a Railroad Protective Liability Policy, for a period of one (1) year from the Effective Date, Licensee may participate in Licensor's Blanket Railroad Protective Liability Insurance Policy available to Licensee or its contractor. The limits of coverage are the same as above. The cost is $1150.00.

☒ I **elect** to participate in Licensor's Blanket Policy;

☐ I **elect not** to participate in Licensor's Blanket Policy.

15.5 Pollution Legal Liability (PLL) Insurance. Intentionally deleted, not required for this permit.

15.6 Other Requirements:

15.6.1 Where allowable by law, all policies (applying to coverage listed above) shall contain no exclusion for punitive damages.

15.6.2 Licensee agrees to waive its right of recovery against Licensor for all claims and suits against Licensor. In addition, Licensee's insurers, through the terms of the policy or a policy endorsement, must waive their right of subrogation against Licensor for all claims and suits, and the certificate of insurance must reflect the waiver of subrogation endorsement. Licensee further waives its right of recovery, and its insurers must also waive their right of subrogation against Licensor for loss of

Licensee's owned or leased property, or property under Licensee's care, custody, or control.

15.6.3 Licensee is not allowed to self-insure without the prior written consent of Licensor. If granted by Licensor, any self-insured retention or other financial responsibility for claims shall be covered directly by Licensee in lieu of insurance. Any and all Licensor liabilities that would otherwise, in accordance with the provisions of this License, be covered by Licensee's insurance will be covered as if Licensee elected not to include a self-insured retention or other financial responsibility for claims.

15.6.4 Prior to entering the Premises, Licensee shall furnish to Licensor an acceptable certificate(s) of insurance including an original signature of the authorized representative evidencing the required coverage, endorsements, and amendments. Licensee shall notify Licensor in writing at least 30 days prior to any cancellation, non-renewal, substitution, or material alteration. In the event of a claim or lawsuit involving Licensor arising out of this License, Licensee will make available any required policy covering such claim or lawsuit.

15.6.5 Any insurance policy shall be written by a reputable insurance company acceptable to Licensor or with a current Best's Guide Rating of A- and Class VII or better, and authorized to do business in the state(s) in which the service is to be provided.

15.6.6 If coverage is purchased on a "claims made" basis, Licensee hereby agrees to maintain coverage in force for a minimum of three years after expiration or termination of this License. Annually, Licensee agrees to provide evidence of such coverage as required hereunder.

15.6.7 Licensee represents that this License has been thoroughly reviewed by Licensee's insurance agent(s)/broker(s), who have been instructed by Licensee to procure the insurance coverage required by this License. Allocated Loss Expense shall be in addition to all policy limits for coverages referenced above.

15.6.8 Not more frequently than once every five years, Licensor may reasonably modify the required insurance coverage to reflect then-current risk management practices in the railroad industry and underwriting practices in the insurance industry.

15.6.9 If any portion of the operation is to be subcontracted by Licensee, Licensee shall require that the subcontractor shall provide and maintain insurance coverages as set forth herein, naming Licensor as an additional insured, and shall require that the subcontractor shall release, defend and indemnify Licensor to the same extent and under the same terms and conditions as Licensee is required to release, defend and indemnify Licensor herein.

15.6.10 Failure to provide evidence as required by this **Section 15** shall entitle, but not require, Licensor to terminate this License immediately. Acceptance of a certificate that does not comply with this Section shall not operate as a waiver of Licensee's obligations hereunder.

15.6.11 The fact that insurance (including, without limitation, self-insurance) is obtained by Licensee shall not be deemed to release or diminish the liability of Licensee, including, without limitation, liability under the indemnity provisions of this License. Damages recoverable by Licensor shall not be limited by the amount of the required insurance coverage.

15.6.12 These insurance provisions are intended to be a separate and distinct obligation on the part of the Licensee. Therefore, these provisions shall be enforceable and Licensee shall be bound thereby regardless of whether or not indemnity provisions are determined to be enforceable.

15.6.13 For purposes of this **Section 15**, Licensor shall mean "Burlington Northern Santa Fe, LLC", "BNSF Railway Company" and the subsidiaries, successors, assigns and affiliates of each.

## COMPLIANCE WITH LAWS, REGULATIONS, AND ENVIRONMENTAL MATTERS

16. Compliance with Laws, Rules, and Regulations.

16.1 Licensee shall observe and comply with any and all laws, statutes, regulations, ordinances, orders, covenants, restrictions, or decisions of any court of competent jurisdiction ("**Legal Requirements**") relating to the construction, maintenance, and use of the Pipeline and the use of the Premises.

16.2 Prior to entering the Premises, Licensee shall and shall cause its contractor(s) to comply with all of Licensor's applicable safety rules and regulations. Licensee must ensure that each of its employees, contractors, agents or invitees entering upon the Premises completes the safety orientation program at the Website "www.BNSFcontractor.com" (the "**Safety Orientation**") within one year prior to entering upon the Premises. Additionally, Licensee must ensure that each and every employee of Licensee, its contractors, agents and invitees possess a card certifying completion of the Safety Orientation prior to entering upon the Premises. Licensee must renew the Safety Orientation annually.

16.3 Licensee shall obtain on or before the date it or its contractor enters the Premises, any and all additional rights-of way, easements, licenses and other agreements relating to the grant of rights and interests in and/or access to the Premises (collectively, the "**Rights**") and such other rights, licenses, permits, authorizations, and approvals (including without limitation, any necessary local, state, federal or tribal authorizations and environmental permits) that are necessary in order to permit Licensee to construct, maintain, own and operate the Pipeline and otherwise to perform its obligations hereunder in accordance with the terms and conditions hereof.

16.4 Licensee shall either require that the initial stated term of each such Rights be for a period that does not expire, in accordance with its ordinary terms, prior to the last day of the term of this License or, if the initial stated term of any such Right expires in accordance with its ordinary terms on a date earlier than the last day of the term of this License, Licensee shall, at its cost, exercise any renewal rights thereunder, or otherwise acquire such extensions, additions and/or replacements as may be necessary, in order to cause the stated term thereof to be continued until a date that is not earlier than the last day of the term of this License.

16.5 Upon the expiration or termination of any Right that is necessary in order for Licensee to own, operate or use the Pipeline in accordance with the terms and conditions of this License, this License thereby shall automatically expire upon such expiration or termination of the Right.

17. Environmental.

17.1 Licensee shall strictly comply with all federal, state and local environmental Legal Requirements and regulations in its use of the Premises, including, but not limited to, the Resource Conservation and Recovery Act, as amended (RCRA), the Clean Water Act, the

Oil Pollution Act, the Hazardous Materials Transportation Act, and CERCLA (collectively referred to as the "**Environmental Laws**"). Licensee shall not maintain a treatment, storage, transfer or disposal facility, or underground storage tank, as defined by Environmental Laws on the Premises. Licensee shall not release or suffer the release of oil or hazardous substances, as defined by Environmental Laws on or about the Premises.

17.2 Licensee covenants that it will not handle or transport "hazardous waste" or "hazardous substances", as "hazardous waste" and "hazardous substances" may now or in the future be defined by any federal, state, or local governmental agency or body through the Pipeline on Licensor's property. Licensee agrees periodically to furnish Licensor with proof, satisfactory to Licensor that Licensee is in compliance with the provisions of this **Section 17.2**.

17.3 Licensee shall give Licensor immediate notice to Licensor's Resource Operations Center at (800) 832-5452 of any known (i) release of hazardous substances on, from, or affecting the Premises, (ii) violation of Environmental Laws, or (iii) inspection or inquiry by governmental authorities charged with enforcing Environmental Laws with respect to Licensee's use of the Premises. Licensee shall use the best efforts to promptly respond to any release on, from, or affecting the Premises. Licensee also shall give Licensor immediate notice of all measures undertaken on behalf of Licensee to investigate, remediate, respond to or otherwise cure such release or violation.

17.4 If Licensor has notice from Licensee or otherwise of a release or violation of Environmental Laws arising in any way with respect to the Pipeline which occurred or may occur during the term of this License, Licensor may require Licensee, at Licensee's sole risk and expense, to take timely measures to investigate, remediate, respond to or otherwise cure such release or violation affecting the Premises or Licensor's right-of-way.

17.5 Licensee shall promptly report to Licensor in writing any conditions or activities upon the Premises known to Licensee which create a risk of harm to persons, property or the environment and shall take whatever action is necessary to prevent injury to persons, property, or the environment arising out of such conditions or activities; provided, however, that Licensee's reporting to Licensor shall not relieve Licensee of any obligation whatsoever imposed on it by this License. Licensee shall promptly respond to Licensor's request for information regarding said conditions or activities.

## DISCLAIMER OF WARRANTIES

18. No Warranties.

18.1 **LICENSOR'S DUTIES AND WARRANTIES ARE LIMITED TO THOSE EXPRESSLY STATED IN THIS LICENSE AND SHALL NOT INCLUDE ANY IMPLIED DUTIES OR IMPLIED WARRANTIES, NOW OR IN THE FUTURE. NO REPRESENTATIONS OR WARRANTIES HAVE BEEN MADE BY LICENSOR OTHER THAN THOSE CONTAINED IN THIS LICENSE. LICENSEE HEREBY WAIVES ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE PREMISES OR WHICH MAY EXIST BY OPERATION OF LAW OR IN EQUITY, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, HABITABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

18.2 **LICENSOR MAKES NO WARRANTY, REPRESENTATION OR CONDITION OF ANY KIND, EXPRESS OR IMPLIED, CONCERNING (A) THE SCOPE OF THE LICENSE OR OTHER RIGHTS GRANTED HEREUNDER TO LICENSEE OR (B) WHETHER OR NOT LICENSEE'S CONSTRUCTION, MAINTENANCE, OWNERSHIP, USE OR OPERATION OF THE PIPELINE WILL VIOLATE OR INFRINGE UPON THE RIGHTS, INTERESTS AND ESTATES OF THIRD PARTIES, INCLUDING, WITHOUT LIMITATION, ANY LEASES, USE RIGHTS, EASEMENTS AND LIENS OF ANY THIRD PARTY.**

19. Disclaimer of Warranty for Quiet Enjoyment. **LICENSOR DOES NOT WARRANT ITS TITLE TO THE PREMISES NOR UNDERTAKE TO DEFEND LICENSEE IN THE PEACEABLE POSSESSION OR USE THEREOF. NO COVENANT OF QUIET ENJOYMENT IS MADE.**

20. Eviction at Risk of Licensee. In case of the eviction of Licensee by anyone owning, claiming title to, or claiming any interest in the Premises, or by the abandonment by Licensor of the affected rail corridor, Licensor shall not be liable (i) to refund Licensee any compensation paid hereunder, except for the pro-rata part of any recurring charge paid in advance, or (ii) for any damage Licensee sustains in connection with the eviction.

## LIENS AND TAXES

21. Liens and Charges. Licensee shall promptly pay and discharge any and all liens arising out of any construction, alterations or repairs done, suffered or permitted to be done by Licensee on Premises. Licensor is hereby authorized to post any notices or take any other action upon or with respect to Premises that is or may be permitted by law to prevent the attachment of any such liens to Premises; provided, however, that failure of Licensor to take any such action shall not relieve Licensee of any obligation or liability under this **Section 21** or any other Section of this License.

22. Taxes. Licensee shall pay when due any taxes, assessments or other charges (collectively, "**Taxes**") levied or assessed by any governmental or quasi-governmental body upon the Pipeline or any other improvements constructed or installed on the Premises by or for Licensee (collectively, the "**Improvements**") or any Taxes levied or assessed against Licensor or the Premises that are attributable to the Improvements.

## DEFAULT, TERMINATION, AND SURRENDER

23. Default and Termination. In addition to and not in limitation of Licensor's right to terminate for failure to provide evidence of insurance as required pursuant to the terms of **Section 15**, the following events are also deemed to be events of default pursuant to which Licensor has the right to terminate as set forth below:

    23.1 If default shall be made in any of Licensee's covenants, agreements, or obligations contained in this License and Licensee fails to cure said default within thirty (30) days after written notice is provided to Licensee by Licensor, or in case of any assignment or transfer of this License in violation of **Section 26** below, Licensor may, at its option, terminate this License by serving five (5) days' notice in writing upon Licensee. Notwithstanding the foregoing, Licensor shall have the right to terminate this License immediately if Licensee fails to provide evidence of insurance as required in **Section 15**.

    23.2 Should Licensee not comply fully with the obligations of **Section 17** regarding the handling or transporting of hazardous waste or hazardous material, notwithstanding anything contained in any other provision of this License, Licensor may, at its option, terminate this License by serving five (5) days' notice of termination upon Licensee.

    23.3 Any waiver by Licensor of any default or defaults shall not constitute a waiver of the right to terminate this License for any subsequent default or defaults, nor shall any such waiver in any way affect Licensor's ability to enforce any Section of this License. The remedy set forth in this **Section 23** shall be in addition to, and not in limitation of, any other remedies that Licensor may have at law or in equity.

    23.4 In addition to and not in limitation of Licensor's rights to terminate this License for failure to provide evidence of insurance or occurrence of defaults as described above, this License may be terminated by either party, at any time, by serving thirty (30) days' written notice of termination upon the other party. Such termination shall not release either party hereto from

any liability or obligation under the License, whether of indemnity or otherwise, resulting from any acts, omissions or events happening prior to the date of termination or thereafter in case by the terms of the License it is provided that anything shall or may be done after termination hereof.

24. Surrender of the Premises.

24.1 On or before expiration or termination of this License for any reason, Licensee shall, at its sole cost and expense:

24.1.1 if so directed by Licensor in writing, remove the Improvements, the Pipeline and all appurtenances thereto, or, at the sole discretion of Licensor, fill and cap or otherwise appropriately decommission the Pipeline with a method satisfactory to Licensor;

24.1.2 report and restore any damage to the Premises or Licensor's other property arising from, growing out of, or connected with Licensee's use of the Premises;

24.1.3 remedy any unsafe conditions on the Premises created or aggravated by Licensee; and

24.1.4 leave the Premises in substantially the condition which existed as of the Effective Date.

24.2 Upon any expiration or termination of this License, if Licensee fails to surrender the Premises to Licensor or if Licensee fails to complete its obligations under **Section 24.1** above (the "**Restoration Obligations**"), Licensee shall have a limited license to enter upon the Premises solely to the extent necessary for Licensee to complete the Restoration Obligations, and all liabilities and obligations of Licensee hereunder shall continue in effect until the Premises are surrendered and the Restoration Obligations are completed. Neither termination nor expiration shall release Licensee from any liability or obligation under this License, whether of indemnity or otherwise, resulting from any acts, omissions or events happening prior to the date of termination, or, if later, the date when Licensee surrenders the Premises and all of the Restoration Obligations are completed.

24.3 If Licensee fails to complete the Restoration Obligations within thirty (30) days after the date of such termination of its tenancy, then Licensor may, at its election, either: (i) remove the Pipeline and the other Improvements or otherwise restore the Premises, and in such event Licensee shall, within thirty (30) days after receipt of bill therefor, reimburse Licensor for cost incurred, (ii) upon written notice to Licensee, take and hold the Pipeline and the other Improvements and personal property as its sole property, without payment or obligation to Licensee therefor, or (iii) specifically enforce Licensee's obligation to restore and/or pursue any remedy at law or in equity against Licensee for failure to so restore. Further, if Licensor has consented to the Pipeline and the other Improvements remaining on the Premises following termination, Licensee shall, upon request by Licensor, provide a bill of sale in a form acceptable to Licensor conveying the Pipeline and the other Improvements to Licensor.

## MISCELLANEOUS

25. Successors and Assigns. All provisions contained in this License shall be binding upon, inure to the benefit of, and be enforceable by the respective successors and assigns of Licensor and Licensee to the same extent as if each such successor and assign was named a party to this License.

26. Assignment.

26.1 Licensee may not sell, assign, transfer, or hypothecate this License or any right, obligation, or interest herein (either voluntarily or by operation of law, merger, or otherwise) without the

prior written consent of Licensor, which consent may not be unreasonably withheld or delayed by Licensor. Any attempted assignment by Licensee in violation of this **Section 26** shall be a breach of this License and, in addition, shall be voidable by Licensor in its sole and absolute discretion.

26.2 For purposes of this **Section 26**, the word "assign" shall include without limitation (a) any sale of the equity interests of Licensee following which the equity interest holders of Licensee immediately prior to such sale own, directly or indirectly, less than 50% of the combined voting power of the outstanding voting equity interests of Licensee, (b) any sale of all or substantially all of the assets of (i) Licensee and (ii) to the extent such entities exist, Licensee's parent and subsidiaries, taken as a whole, or (c) any reorganization, recapitalization, merger or consolidation involving Licensee. Notwithstanding the foregoing, any reorganization, recapitalization, merger or consolidation following which the equity interest holders of Licensee immediately prior to such reorganization, recapitalization, merger or consolidation own, directly or indirectly, at least 50% of the combined voting power of the outstanding voting equity interests of Licensee or any successor thereto or the entity resulting from such reorganization, recapitalization, merger or consolidation shall not be deemed an assignment. THIS LICENSE SHALL NOT RUN WITH THE LAND WITHOUT THE EXPRESS WRITTEN CONSENT OF LICENSOR, SUCH CONSENT TO BE IN LICENSOR'S SOLE DISCRETION.

26.3 Notwithstanding the provisions of **Section 26.1** above or anything contained in this License to the contrary, if Licensee sells, assigns, transfers, or hypothecates this License or any interest herein in contravention of the provisions of this License (a "**Purported Assignment**") to another party (a "**Purported Transferee**"), the Purported Transferee's enjoyment of the rights and privileges granted under this License shall be deemed to be the Purported Transferee's agreement to be bound by all of the terms and provisions of this License, including but not limited to the obligation to comply with the provisions of **Section 15** above concerning insurance requirements. In addition to and not in limitation of the foregoing, Licensee, for itself, its successors and assigns, shall indemnify, defend and hold harmless Licensor for all Liabilities of any nature, kind or description of any person or entity directly or indirectly arising out of, resulting from or related to (in whole or in part) a Purported Assignment.

26.4 The provisions of this **Section 26** shall survive the expiration or earlier termination of this License.

27. Notices. Any notice, invoice, or other writing required or permitted to be given hereunder by one party to the other shall be in writing and the same shall be given and shall be deemed to have been served and given if (i) placed in the United States mail, certified, return receipt requested, or (ii) deposited into the custody of a nationally recognized overnight delivery service, addressed to the party to be notified at the address for such party specified below, or to such other address as the party to be notified may designate by giving the other party no less than thirty (30) days' advance written notice of such change in address.

If to Licensor: Jones Lang LaSalle Brokerage, Inc.
4300 Amon Carter Blvd., Suite 100
Fort Worth, TX 76155
Attn: Permits/Licenses

with a copy to: BNSF Railway Company
2301 Lou Menk Drive GOB-3W
Fort Worth, TX 76131
Attn: Senior Manager Real Estate

If to Licensee: City of Frisco
6101 Frisco Square Blvd.
Frisco, Texas 75034

28. Survival. Neither termination nor expiration will release either party from any liability or obligation under this License, whether of indemnity or otherwise, resulting from any acts, omissions or events happening prior to the date of termination or expiration, or, if later, the date when the Pipeline and the other Improvements are removed and the Premises are restored to its condition as of the Effective Date.

29. Recordation. It is understood and agreed that this License shall not be placed or allowed to be placed on public record.

30. Applicable Law. All questions concerning the interpretation or application of provisions of this License shall be decided according to the substantive laws of the State of Texas without regard to conflicts of law provisions.

31. Severability. To the maximum extent possible, each provision of this License shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this License shall be prohibited by, or held to be invalid under, applicable law, such provision shall be ineffective solely to the extent of such prohibition or invalidity, and this shall not invalidate the remainder of such provision or any other provision of this License.

32. Integration. This License is the full and complete agreement between Licensor and Licensee with respect to all matters relating to Licensee's use of the Premises, and supersedes any and all other agreements between the parties hereto relating to Licensee's use of the Premises as described herein. However, nothing herein is intended to terminate any surviving obligation of Licensee or Licensee's obligation to defend and hold Licensor harmless in any prior written agreement between the parties.

33. Joint and Several Liability. If Licensee consists of two or more parties, all the covenants and agreements of Licensee herein contained shall be the joint and several covenants and agreements of such parties.

34. Waiver. The waiver by Licensor of the breach of any provision herein by Licensee shall in no way impair the right of Licensor to enforce that provision for any subsequent breach thereof.

35. Interpretation.

35.1 This License shall be interpreted in a neutral manner, and not more strongly for or against any party based upon the source of the draftsmanship; both parties hereby agree that this License shall not be subject to the principle that a contract would be construed against the party which drafted the same. Article titles, headings to sections and paragraphs and the table of contents (if any) are inserted for convenience of reference only and are not intended to be a part or to affect the meaning or interpretation hereof. The exhibit or exhibits referred to herein shall be construed with and as an integral part of this License to the same extent as if they were set forth verbatim herein.

35.2 As used herein, "include", "includes" and "including" are deemed to be followed by "without limitation" whether or not they are in fact followed by such words or words of like import; "writing", "written" and comparable terms refer to printing, typing, lithography and other means of reproducing words in a visible form; references to any person are also to that person's successors and permitted assigns; "hereof", "herein", "hereunder" and comparable terms refer to the entirety hereof and not to any particular article, section, or other subdivision hereof or attachment hereto; references to any gender include references to the

masculine or feminine as the context requires; references to the plural include the singular and vice versa; and references to this License or other documents are as amended, modified or supplemented from time to time.

36. Counterparts. This License may be executed in multiple counterparts, each of which shall, for all purposes, be deemed an original but which together shall constitute one and the same instrument, and the signature pages from any counterpart may be appended to any other counterpart to assemble fully executed documents, and counterparts of this License may also be exchanged via email or electronic facsimile machines and any email or electronic facsimile of any party's signature shall be deemed to be an original signature for all purposes.

37. Licensor's Representative. Jones Lang LaSalle Brokerage, Inc. is acting as representative for BNSF Railway Company.

This License has been duly executed by the parties hereto as of the date below each party's signature; to be effective, however, as of the Effective Date.

**LICENSOR:**

**BNSF RAILWAY COMPANY** a Delaware corporation

**By:** Jones Lang LaSalle Brokerage, Inc.,
4300 Amon Carter Blvd, Suite 100
Fort Worth, TX 76155

By: _____
Ed Darter
Title: Sr. Vice President - National Accounts

Date: _____

**LICENSEE:**

**CITY OF FRISCO** a Texas corporation

6101 Frisco Square Blvd.
Frisco, Texas 75034

By: _____

Title: _____

Date: _____

COORDINATE SYSTEM: TX_NC

TRACKING NO. 15-53017

MAP REF. r67358

# EXHIBIT "A"

ATTACHED TO CONTRACT BETWEEN

**BNSF RAILWAY COMPANY**

AND

## CITY OF FRISCO

N

SCALE: 1 IN.= 100 FT.

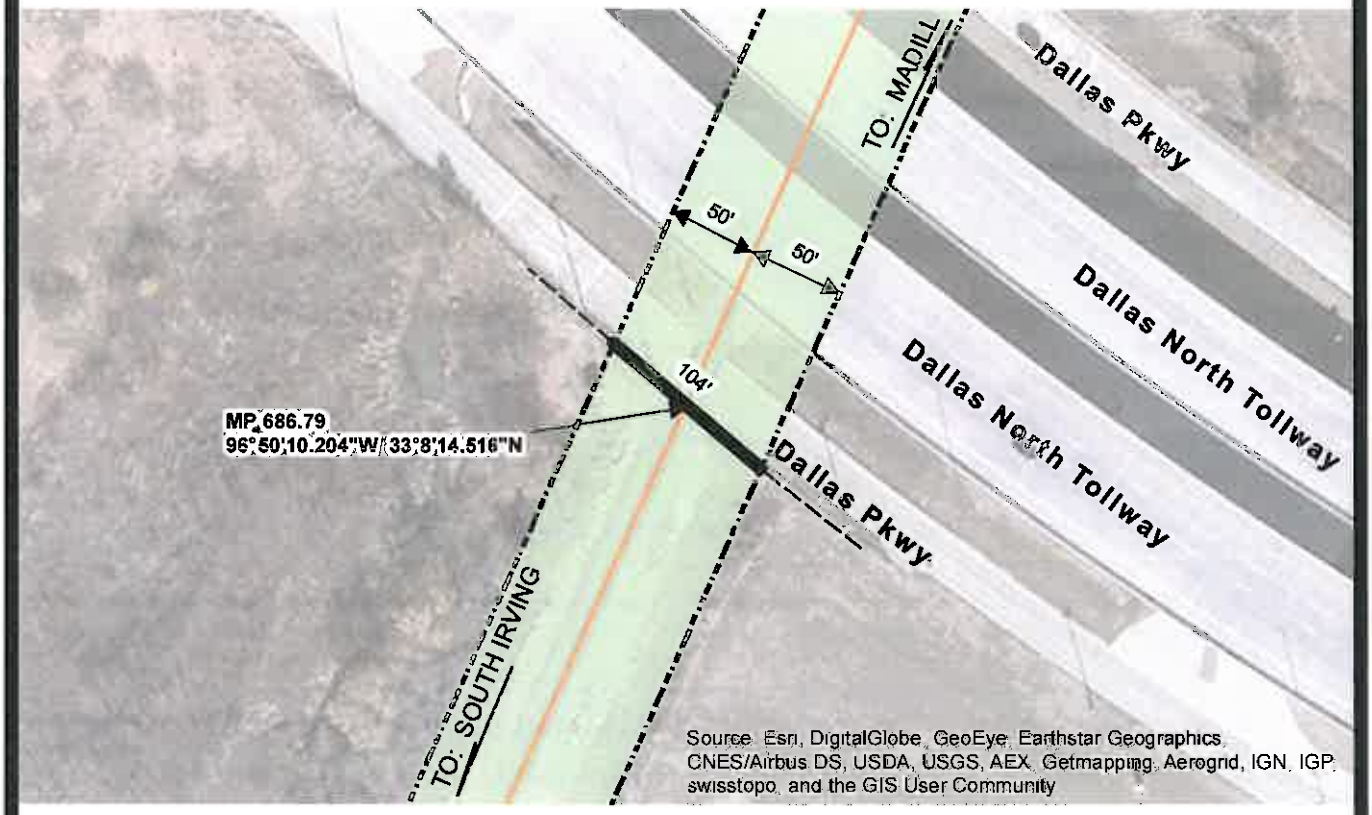
TEXAS DIV.

MADILL SUBDIV.

L.S. 1046 MP 686.79

DATE 06/24/2015

SURVEY: BOLIN, J




DESCRIPTION OF PIPELINE
PIPELINE SHOWN BOLD

| | CARRIER PIPE | CASING PIPE | | CARRIER PIPE | CASING PIPE |
|---|---|---|---|---|---|
| SIZE: | 11.734" | 17.5" | LENGTH ON R/W: | 104' | 104' |
| CONTENTS: | POTABLE WATER | | WORKING PRESSURE: | - | |
| PIPE MATERIAL: | PVC | STEEL | BURY: BASE/RAIL TO TOP OF CASING | | 7.85' |
| SPECIFICATIONS / GRADE: | CLASS 150 | 36 KIP | BURY: NATURAL GROUND | | 5.75' |
| WALL THICKNESS: | 0.733" | 0.25" | BURY: ROADWAY DITCHES | | 5.75' |
| COATING: | - | COAL-TAR EPOXY | CATHODIC PROTECTION | | N/A |

VENTS: NUMBER - SIZE - HEIGHT OF VENT ABOVE GROUND -

NOTE: CASING TO BE JACKED OR DRY BORED ONLY

AT FRISCO

COUNTY OF COLLIN

STATE OF TX

JNC

DRAWING NO. 64290

ENGINEERING SERVICES
DEPARTMENT

CITY OF FRISCO

GEORGE A. PUREFOY MUNICIPAL CENT
6101 FRISCO SQUARE BLVD · 3RD FLO
FRISCO, TEXAS 75034
TEL 972.292.5400 · FAX 972.292.5016
WWW.FRISCOTEXAS.GOV

# PRE-BID AGENDA
# DALLAS NORTH TOLLWAY 24-INCH AND 12-INCH WATERLINE BETWEEN MAIN STREET AND STALLION LANE

**TO: PROSPECT CONTRACTORS**

**CC:** FILE

**FROM:** ENGINEERING SERVICES

**DATE:** AUGUST 25, 2015

**SUBJECT:** PROJECT PRE-BID MEETING CIP 06-0020 BID NO. 1505-071

---

1. WELCOME AND INTRODUCTIONS
    a. Sign-In-Sheet
    b. Design Consultant – CDM Smith, Project Manager - Erik Cotter, PE (817-332-8727)
    c. City of Frisco Engineering Services Project Manager - David L. Chacon, PE (972-292-5437)

2. BIDDING REQUIREMENTS
    a. The Qualifications of Bidders may be required. Reference section in Instruction to Bidders. If required the information will be similar to AGC 220 or AGC 221.

3. SCOPE OF PROJECT
    a. Water
        i. Install
            1. 36” PVC approx. 61 LF
            2. 24” PVC approx. 2,529 LF (approx. 143 LF in 36” steel casing)
            3. 12” PVC approx. 2,861 LF
        ii. Install 12” HDPE approx. 870 LF by Horizontal Directional Drilling
        iii. Install 12” PVC under box culverts and Burlington Northern ROW approx. 153 LF (in 18” steel casing)
        iv. Cut and plug
            1. Existing 12” water mains
        v. Remove Existing Pressure Reducing Valve
        vi. Remove 2 valve boxes and fill with concrete

vii. Cap and plug four (4) 8-inch pipes
viii. Install
1. One (1) 12" cut-in valve with restrained joints
2. Five (5) Hydrant Assemblies
3. Five (5) 6" gate valves and valve boxes
4. Five (5) 6" PVC pipe
5. Seven (7) 12" Gate Valves
6. One (1) 30" butterfly valve
7. Three (3) 24" butterfly valves
8. Six (6) 2" Air Release and Vacuum Valves/Vault Type 2
9. One (1) Type 1 Gate

b. Install 27 Concrete Thrust Blocks in addition to required mechanical restraints
i. To be placed in accordance with construction drawings
c. Grading and Storm Sewer
d. Furnish, program, and place RFID Markers (as listed in construction drawings in addition to others as determined by contractor)
e. General Site Preparation
i. Mobilization
ii. Trench Safety
iii. Project Signs
iv. Gravel construction entrance
f. Erosion and Sediment Control and SWPPP
i. Hydromulch approx. 21,259 SY
g. Traffic Control
h. Pavement Replacement
i. Concrete Sidewalk (ramp at Cotton Gin Road and Main Street pavement impacted by construction)

4. CONSTRUCTION SEQUENCING
a. Install construction fencing and SWPPP pre-construction BMP's
b. Remainder of project constructed at Contractor's discretion
c. Construction schedule will be required

5. SWPPP
a. Submit prior to the pre-construction meeting
b. Separate quantities provided for silt fence, stabilized construction entrance, rock check dam, inlet protection, and hydro-mulch
c. Hydro-mulch placed in both permanent and temporary easements

6. Construction Access
a. Dallas North Tollway not to be used for access to project area
b. Allowable access from Main St, Cotton Gin Rd, and Stallion Ln
c. Construction schedule will be required

7. Trenchless Installation
a. Road Crossings and BNSF Railroad
b. Horizontal Directional Drilling

8. Design modification for northern sections of waterline

9. SPECIFICATIONS
    a. City of Frisco specifications (June 2012), project specific specs
    b. Excess soil is waste for the contractor to remove and is solely the responsibility of the contractor.
    c. Topsoil to be salvaged and reused. No separate pay item, subsidiary.

10. PROJECT SCHEDULE
    a. 180 Calendar Days (Final Completion)
    b. Bid opening September 1, 2015
    c. Award by Council meeting September 15, 2015
    d. NTP approx. September 29, 2015
    e. Liquidated damages set at $500.00 per calendar day

11. SPECIAL CONSTRUCTION REQUIREMENTS (NOT ALREADY ADDRESSED ABOVE)
    a. Work in Voluntary Clean-up Area of Park Property
    b. Pre- and Post-Construction Condition Assessment
    c. Horizontal Direction Drilling Qualifications

12. ADDENDUM ITEMS AND SCHEDULE
    a. Addendum 1 – to be posted August 28th
        i. Geotechnical report added to Project Manual (already available in planrooms)
        ii. RFID Markers
        iii. 20' stub
    b. Deadline for questions is August 28th at 2:00 PM
    c. Last Addendum will be issued by COB August 28th

13. QUESTIONS AND OPEN DISCUSSION

# MEETING MINUTES

## Pre-Bid Meeting

**Date:** August 25, 2015
**Time:** 2:00 p.m.
**Location:** City of Frisco Planning Department Conference Room
**Prepared by:** Emily Booth

**Project Name:** 24-Inch and 12-Inch Dallas North Tollway Waterline (Main Street to Stallion Lane)
**Project Number:** 1505-071

**Attendees:** See sign-in sheet attached

**Meeting Objective:** Pre-Bid Meeting

### Meeting Summary:

See attached agenda.

### Addendum Items Reviewed:

1. On C-13, the 12" pipe stub will be 20 feet long
2. RFID Markers will be required and a table with locations is on sheet C-20. A specification was also added as well as some bid items for furnishing and installing the markers.
3. The geotechnical report is included as an attachment to the Project Manual
4. Other Changes
    a. Ductile Iron pipe to be an alternative for 24" and 36" PVC piping C151, PC 150

### Questions from Potential Bidders:

1. Related to Agenda item 3.a.iii. in response to a comment about contractor completing orientation prior to starting work in ROW: Can we get the permit language for this work to know the requirements?
    a. Resolution: The BNSF work requirements will be provided in Addendum 1.
2. Agenda item 3.a.viii.6 question: For the 36"x30" MJxMJ tee to 30" MJxMJ BFV and 30" MJ cap called out (sheet C-6), there would need to be pipe between the tee and BFV and between the BFV and cap but there is no 30" pipe listed as a bid item.
    a. Resolution: Due to the location of this tee, valve, and cap near other utilities that restricts the length of pipe to less than 20 feet, "Piping, Joints, and other associated items" was added to bid item 31: Install 30" Butterfly Valve
3. Bid item question: 36" AWWA C905 DR 18 PVC pipe availability – was not able to find
    a. Resolution: this pipe, with pressure rating 235psi, is available from manufacturers such as Diamond Plastics Corporation (DPC) which is a major PVC producer in North America with facilities in Texas.
4. Agenda item 3.a.viii.8 question: Confirm/correct sizing of air release and vacuum valves/vault type 2 (bid item 33)
    a. Resolution: split bid item into three items, one each for sizes 2", 3", and 4"
5. Question: Is HDPE HDD pipe size in ductile iron size (DIPS) or iron pipe size (IPS)?

    a. Resolution: Refer to Specification 333300 High Density Polyethylene Pipe and Fittings (Pressure Pipe) 2.01 B. 1., which specifies IPS.
6. Question about order of HDPE to PVC couplings and bends at either end of HDD section – looked like coupling was between two sections of PVC rather than between PVC and HDPE.
    a. Resolution: there is a note by the label for the coupling type that shows a line defining the change from PVC to HDPE. The labels are placed as necessary on the sheet and the couplings and bends are in the correct order.
7. Work in Voluntary Clean-up Area of Park Property: There used to be old battery factory nearby and there could be contamination in the area of the HDD section. See also notes on sheet C-10 and Specification Special Condition 12.

# 24-Inch and 12-Inch Dallas North Tollway Waterline (Main Street to Stallion Lane)
## August 25, 2015 Pre-Bid Meeting Sign-In Sheet

| | Name | Company | Email | Phone |
|---|---|---|---|---|
| 1 | Adrian Smartt | Dowager Utility Construction | dowagerconstruction@hotmail.com | (9) 931-1263 |
| 2 | Raul Canales | Kodiak Trenching and Boring, LLC | raulc@kodiak-us.com | 817-690-8392 |
| 3 | DONAVAN ULLSTROM | JOHN BURNS CONSTRUCTION | DULLSTROM@JBCCO.com | 972.434.6789 |
| 4 | Eduardo M. Hernandez | Flow-Line Construction Inc. | eduardo.hernandez@flow-line construction.com | 773-369-5666 |
| 5 | David L. Chenon | COF | dchenon@friscotexas.gov | 972-292-5437 |
| 6 | CHRIS POTEET | FNI | chris.poteet@freese.com | 214 217 2210 |
| 7 | Emily Booth | CDM Smith | boothe@cdmsmith.com | 817-916-2932 |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |