

ECS Southwest, LLP

Geotechnical Engineering Report

Stone Road Improvements

WA Allen Boulevard to Bennett Road Wylie, Texas

ECS Project Number 19:8613

March 16, 2022





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TX Registered Engineering Firm F-8461

March 16, 2022

Mr. Tim Porter, P.E., CFM **Director of Public Works** City of Wylie 949 Hensley Lane, Suite 300 Wylie, Texas 75098

ECS Project No. 19:8613

Reference: Geotechnical Engineering Report **Stone Road Improvements** From WA Allen Boulevard to Bennett Road Wylie, Texas

Dear Mr. Porter:

ECS Southwest, LLP (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering analyses for the above-referenced project. Our services were performed in general accordance with our agreed to scope of work. This report presents our understanding of the geotechnical aspects of the project along with the results of the field exploration and laboratory testing conducted, and our recommendations.

It has been our pleasure to be of service to you for the project. We would appreciate the opportunity to remain involved during the continuation of the design phase, and we would like to provide our services during construction phase operations as well to verify subsurface conditions assumed for this report. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

ECS Southwest, LLP

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The electronic seal on this document was authorized by Michael P. Batuna No. 92147, on March 16, 2022

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EXECUTIVE SUMMARY

The following summarizes the main findings of the exploration, particularly those that may have a cost impact on the planned roadway improvements. Further, our pavement and subgrade improvement recommendations are summarized. Information gleaned from the executive summary should not be utilized in lieu of reading the entire geotechnical report.

- Based on our interpretation of the borings drilled for this study, the existing pavements generally consist of 2 to 4 inches of asphalt concrete (AC). Sand and gravel fill (3 to 10 inches) was encountered below the asphalt concrete in all the borings. Below the pavement and gravel fill, soil fill, lean clay and fat clay were encountered in the borings.
- Groundwater seepage was not observed in borings during drilling and at the completion of drilling operations.
- Design values for the proposed pavement, subgrade preparation and stabilization, as well as materials specifications are provided in the report. Based on the anticipated traffic, the pavement section for the planned reconstruction may consist of 9 inches of Asphalt Concrete (AC) pavement and 8 inches of Portland Cement Concrete (PCC) for a 25-year design life. For a 40 year design life, the proposed pavement may consist of 9 inches of Portland Cement Concrete (PCC). The AC and PCC pavements can be supported on lime stabilized subgrade, flexible base with geogrid, or cement treated Reclaimed Asphalt Pavement (RAP) base.
- The potential vertical movement (PVM) of the site is estimated to be about 3 to 5 inches under a dry soil condition. These potential movements reflect moisture changes in the soil that can occur over the life of the structure and after construction is complete.
- It is recommended that ECS conduct a geotechnical review of the project plans (prior to issuance for construction) to check to see that ECS' geotechnical recommendations have been properly interpreted and implemented.
- To prevent misinterpretation of ECS recommendations, ECS should be retained to perform quality control testing and documentation during construction of the earthwork and foundations for the project.

1.0 INTRODUCTION

The purpose of this study was to provide geotechnical information for the design and reconstruction of the street pavements in Wylie, Texas. The recommendations developed for this report are based on project information provided by the client. This report contains the results of our subsurface explorations and geotechnical laboratory testing programs, site characterization, engineering analyses, and recommendations for the design and construction of the planned pavement improvements.

Our services were performed in general accordance with ECS Proposal No. 19:11708-GP, dated November 22, 2021. The project was authorized by client on January 3, 2022. The terms of this agreement will be according to the Contract for Professional Engineering Services between the City of Wylie and ECS Southwest, LLP.

This report contains the procedures and results of our subsurface exploration with soil borings and laboratory testing programs, review of existing site conditions, engineering analyses, and recommendations for the design and construction of the project.

The report includes the following items.

- A brief review and description of our field and laboratory test procedures and the results of testing conducted.
- A review of site conditions.
- A review of area and site geologic conditions.
- A review of subsurface soil stratigraphy with pertinent available physical properties.
- A final copy of our soil test borings.
- Recommendations for pavement design.
- Recommendations for site preparation and construction of compacted fills, including an evaluation of on-site soils for use as compacted fills.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION/CURRENT SITE USE

The proposed project consists of the pavement improvements of the Stone Road which include a 2-lane undivided roadway from WA Allen Boulevard to Bennett Road in Wylie, Texas. The project location is depicted in the attached Site Location Diagram in Appendix A and below.

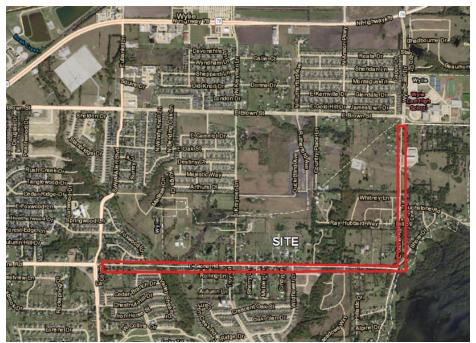


Figure 2.1.1 Site Location Diagram

2.2 PROPOSED CONSTRUCTION

The following information was provided by the City of Wylie and explains our understanding of the planned development of the street section.

| Table 2.2.1 A Summary of Design mormation | | | |
|---|--|--|--|
| SUBJECT | DESIGN INFORMATION / ASSUMPTIONS | | |
| Street Classification | A local residential street and will be upgraded to future roadway as a Secondary Thoroughfare with 4-lane divided concrete with 100-feet right-of-way. | | |
| Existing Street Pavement | 21 feet wide Asphalt Concrete (AC) pavement with drainage ditches. | | |
| Type of the Proposed Streets | Asphalt Concrete (AC) or Portland Cement Concrete (PCC) pavement. | | |
| Design Life | 25 years (AC and PCC) and 40 years (PCC) | | |
| Growth Factor | 1.5 % | | |
| Total Linear Foot | About 11,500 feet. | | |

If ECS' understanding of the project is not correct, please contact ECS so that we may review these changes and revise our recommendations, as appropriate.

3.0 FIELD EXPLORATION

Our scope of work included drilling a total of 23 soil borings to a depth of 10 feet below the existing grades. These borings were located with a handheld GPS unit and their approximate locations are shown on the Boring Location Diagram in Appendix A.

3.1 SUBSURFACE CHARACTERIZATION

The subsurface conditions encountered were generally consistent with published geological mapping. The following sections provide generalized characterizations of the soil and rock strata. Please refer to the boring logs in Appendix B. Based on a review of available published geological maps, the project area is located within the Ozan formation (Ko). The location of the site on the geologic map are depicted in the attached Regional Geology in Appendix A.

<u>Ozan formation (Ko)</u>: The Ozan formation typically consists of relatively uniform, massive, calcareous shale (commonly referred to as marl). Because marl weathers easily, this rock typically cannot be seen in creek beds or outcrops, and soil is found instead. Upper portions of the "limy" shale can weather into softer, clayey shale.

Through chemical and mechanical weathering, this formation produces highly plastic clay soils. Soil above the marl is typically tan and gray, having a blocky structure. Shallower soils typically have a dark brown to black appearance. These clays can be calcareous with silt and sand content increasing incrementally toward the surface. Glauconitic, phosphate pellets, and hematite and pyrite nodules may appear within the soil matrix.

Based on the soil boings, the existing pavements generally consist of 2 to 4 inches of asphalt concrete (AC) underlain by the sand and gravel fill. A summary of the thickness of the existing pavement section with gravel and sand fill encountered in the borings is shown in the following table.

| Boring Location | Asphalt Concrete (in.) | Sand and Gravel Fill (in.) |
|-----------------|------------------------|----------------------------|
| B-01 | 3 | 7 |
| B-02 | 3 | 5 |
| B-03 | 3 | 5 |
| B-04 | 2 | 6 |
| B-05 | 3 | 6 |
| B-06 | 2 | 5 |
| B-07 | 3 | 7 |
| B-08 | 2 | 5 |
| B-09 | 4 | 5 |
| B-10 | 3 | 6 |
| B-11 | 4 | 4 |
| B-12 | 3 | 7 |
| B-13 | 3 | 8 |
| B-14 | 4 | 6 |

 Table 3.1.1 Existing Pavement Section at Boring locations

| B-15 | 3 | 8 |
|------|---|----|
| B-16 | 4 | 8 |
| B-17 | 4 | 7 |
| B-18 | 4 | 6 |
| B-19 | 4 | 4 |
| B-20 | 2 | 10 |
| B-21 | 2 | 8 |
| B-22 | 3 | 4 |
| B-23 | 3 | 3 |
| | | |

A summary of subsurface stratigraphy encountered in the borings is shown in Table 3.1.2 below.

| Approximate Depth to Bottom of Strata (feet) | Stratat | Stratum No. Material Description | | Consistency |
|---|------------------------------------|----------------------------------|--|-----------------------|
| 2 to 8 | 464 to 510 | I | FILL, LEAN and FAT CLAYS, brown, light brown, dark brown | Firm to Hard |
| 6 to 10 ² | 456 to 509 | II | FAT CLAY (CH), dark brown, brown, light brown | Stiff to Hard |
| 10 ² | 476 to 496 III brown, light browni | | LEAN CLAY (CL), light brown, brown, light brownish yellow, brownish yellow | Very Stiff to Hard |

 Table 3.1.2 Subsurface Stratigraphy

Note:

¹Please note that the ground surface elevations were not surveyed by a licensed surveyor; these elevations are approximate based on dfwmaps.com. Elevation ranges are approximate +/- several feet.

²Boring termination depths

Please refer to the attached boring logs and laboratory data summary for a more detailed description of the subsurface conditions encountered as the stratification descriptions above are generalized for presentation purposes. A graphical presentation of the subsurface conditions is shown on the Generalized Subsurface Soil Profile included in Appendix A.

3.3 GROUNDWATER OBSERVATIONS

Groundwater level observations were made in the borings during drilling operations. In auger drilling operations, water is not introduced into the borehole and the groundwater level can often be determined by observing water flowing into the excavation. Furthermore, visual observation of soil samples retrieved can often be used in evaluating the groundwater conditions.

Groundwater seepage was not observed in borings during drilling and at the completion of drilling operations.

The highest groundwater observations are normally encountered in the late winter and early spring. Fluctuation in the location of the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff and other factors not immediately apparent at the

time of this investigation. The groundwater conditions at this site are expected to be significantly influenced by surface water runoff and rainfall.

3.4 LABORATORY TESTING

The laboratory testing consisted of selected tests performed on samples obtained during our field exploration operations. Classification and index property tests were performed on representative soil samples. The soil samples were tested for moisture content, Atterberg limits, soluble sulfate, lime/pH series, and percent passing No. 200 sieve.

Each sample was visually classified on the basis of texture and plasticity in accordance with ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedures) and including USCS classification symbols. After classification, the samples were grouped in the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses along with the soil descriptions. The stratification lines between strata on the logs are approximate; in situ, the transitions may be gradual.

The soil samples will be retained in our laboratory for a period of 60 days, after which, they will be discarded unless other instructions are received as to their disposition.

4.0 DESIGN RECOMMENDATIONS

The following recommendations have been developed on the basis of the previously described project characteristics and subsurface conditions. If there are any changes to the project characteristics or if different subsurface conditions are encountered during construction, ECS should be consulted so that the recommendations of this report can be reviewed.

4.1 POTENTIAL VERTICAL MOVEMENTS

The soils encountered at this site are moderate to highly expansive. These soils are susceptible to shrink swell tendencies, occurring seasonally, throughout the life of the pavement with the changes in moisture content. Based on test method TEX-124-E in the Texas Department of Transportation (TxDOT) Manual of Testing Procedures, and our experience with similar soils, we estimate potential vertical soil movements (PVM) under a dry soil moisture condition will be about 3 to 5 inches. The actual movements could be greater if poor drainage, ponded water, and/or other unusual sources of moisture are allowed to saturate the soils beneath the pavement after construction.

In order to minimize the impact of moisture changes within the subgrade soils and reduce potential for movements, the exposed subgrade during construction should be kept moist by adding moisture and covering the subgrade. Positive drainage should be conducted during all phases of construction. Regular pavement maintenance should be performed by routinely sealing all cracks and joints in the pavement. Subgrade treatment should be considered to reduce future movement potential. In addition, root barriers to about 5 feet below the existing grade along the edge of the pavement may be considered to reduce root penetration below the pavement that may affect long term pavement performance.

4.2 SOLUBLE SULFATE

Soluble sulfate tests were performed on selected samples to evaluate the potential for sulfate induced heave. The laboratory test results indicated that soluble sulfate concentrations were generally less than 3,000 ppm in the subgrade soils except for one sample with 3,066 ppm from Boring B-23. This sulfate level is considered to have a moderate to high risk for sulfate induced heave upon lime stabilization.

In general, soil with soluble sulfate concentrations of 3,000 ppm or less, are not considered to require special treatment considerations when lime stabilized in accordance with TxDOT "Guidelines for Modification and Stabilization of Soils and Base for Use in Pavement Structures" (2005). We recommend that sulfate contents be confirmed by additional laboratory tests during the construction phase after final grading.

Double lime stabilization should be used on the subgrade with high sulfate contents (3,000 to 8,000 ppm). As an alternative, flexible base material may be used in lieu of lime stabilized subgrade.

4.3 PAVEMENT SECTION

The proposed street section is classified as a local residential street and will be upgraded to future roadway as a Secondary Thoroughfare with 4-lane divided concrete with 100-feet right-of-way, according to the Thoroughfare Plan by the City of Wylie, dated December 2018.

A Preliminary Engineering Report, prepared by Brinkley & Barfield Consulting Engineer for Collin County, "E. Stone Road Improvements Study" – From W.A. Allen Boulevard to Bennett Road, dated November 2021, was provided by the City of Wylie for the use of this geotechnical study. The proposed road will have a long-term growth factor of 1.5 percent. Traffic volumes were observed at four locations for 48 hours along the corridor on August 24 to 26, 2021. Combined two-way traffic on the east-west segment between WA Allen Boulevard and Beaver Creek Road, average daily traffic ranged from 2,127 to 5,167 vpd. Combined two-way traffic on the north-south segment between Bennet Road and Shore Drive, average daily traffic ranged from 2,172 to 2,791 vpd. The highest average daily traffic (ADT) of 5,167 vpd was used in the traffic study.

Based on the information obtain from the preliminary engineering report for the Stone Road Improvements provided by the City of Wylie and our past experience, we use the design parameters summarized on the following Table 4.3.1 for the pavement design analysis with 25-year design life (AC/PCC pavements) and 40-year design life (PCC pavement).

| Design Parameters | Design Values | | |
|---|---------------|-------------|--|
| Pavement Type | Flexible (AC) | Rigid (PCC) | |
| Average Daily Traffic (ADT) | 5,1 | .67 | |
| Growth Factor (%) | 1. | .5 | |
| Percent Heavy Trucks (%) (assumed) | 5. | .0 | |
| ESAL Truck Factor (assumed) | 1. | 7 | |
| Total ESALs (25-Year Design Life) - AC/PCC | 2,411 | 1,300 | |
| Total ESALs (40-Year Design Life) - PCC | 4,352 | 2,720 | |
| Subgrade Soil Type | Clay Soils | | |
| Unified Soil Classification System (USCS) | CH or CL | | |
| Reliability (percentage) | 90 | | |
| Overall Standard Deviation | 0.45 0.39 | | |
| Initial Pavement Serviceability | 4.2 4.5 | | |
| Terminal Pavement Serviceability | 2.5 | | |
| Concrete Modulus of Rupture (psi) -28 Days | 620 | | |
| Concrete Modulus of Elasticity (psi) -28 days | 4,000,000 | | |
| Drainage Coefficient | 1.0 | | |
| Load Transfer Coefficient – Rigid | 3.0 | | |
| Layer Coefficient of Asphalt Surface Course | 0.44 | | |
| Layer Coefficient of Asphalt Base Course | 0.4 | 41 | |

Table 4.3.1: Design Parameters for Stone Road Improvements

| Layer Coefficient (Asphalt Pavement) | 0.12 (Lime Stabilized Subgrade) 0.14 (Flexible Base with Geogrid) |
|---|--|
| | 0.15 (Cement Treated RAP) |
| Modulus of Subgrade Reaction (psi/in) – k (PCC Pavement) | 200 (Lime Stabilized Subgrade) 240 (Flexible Base with Geogrid) |
| | 240 (Cement Treated Base/RAP) |

Pavement sections provided in this report were designed in general accordance with the AASHTO Guide for Design of Pavement Structures (1993). Based on our analysis and the calculations with the design parameters on the Table 4.3.2, the pavement reconstruction may be designed as asphalt concrete pavement section supported on either lime stabilized subgrade, flexible base with geogrid (Tensar BX1100 or similar), or cement treated Reclaimed Asphalt Pavement (RAP) subgrade. The proposed asphalt concrete pavement sections are summarized in the following table.

| Design Life (year) | Asphalt Surface Course (inches) | Asphalt Base Course (inches) | Cement Treated RAP (inches) | Flexible Base with Geogrid (inches) | Lime Stabilized Subgrade (inches) |
|-----------------------|--|------------------------------------|-----------------------------------|--|--|
| 25 | 2 | 7 | N/A | N/A | 8 |
| 25 | 2 | 7 | N/A | 8 | N/A |
| 25 | 2 | 7 | 8 | N/A | N/A |

| Table 4.3.2: Asphalt Concrete (AC) Pavement Section |
|---|
|---|

| Table 4.3.3: Portland Cement Concrete (PCC) Pavement Section |
|--|
|--|

| Design Life (year) | Concrete Pavement Thickness (inches) | Cement Treated RAP (inches) | Flexible Base with Geogrid (inches) | Lime Stabilized Subgrade (inches) |
|-----------------------|---|-----------------------------------|---|---|
| 25 | 8 | N/A | N/A | 8 |
| 25 | 8 | N/A | 8 | N/A |
| 25 | 8 | 8 | N/A | N/A |
| 40 | 9 | N/A | N/A | 8 |
| 40 | 9 | N/A | 8 | N/A |
| 40 | 9 | 8 | N/A | N/A |

We recommend the existing HMAC and fill material (consisted of sand and gravel) be removed from below the footprint of the proposed new pavement area before using lime to stabilize the clay fill and native soil if lime stabilized subgrade will be used for the project.

For the design and construction of pavement, the subgrade should be prepared in accordance with the recommendations in the "Earthwork Operations" section of this report. An important consideration with the design and construction of pavements is surface and subsurface drainage. Where standing water develops, either on the pavement surface or within the base course layer, softening of the subgrade and other problems related to the deterioration of the pavement can be expected. Furthermore, good drainage should reduce the possibility of the subgrade materials becoming saturated during the normal service period of the pavement.

Please note, the recommended pavement sections provided above are considered the minimum necessary to provide satisfactory performance based on the provided traffic loading. In some cases, jurisdictional minimum standards for pavement section construction may exceed those provided above.

4.3.1 Pavement Materials

We recommend that pavement be specified, constructed and tested to meet the following *requirements*:

- 1. Hot Mix Asphaltic Concrete: Item 340 of the TxDOT Standard Specifications, Type B Base Course (binder), Type D Surface Course.
- 2. Portland Cement Concrete: A minimum compressive strength of 4,000 psi at 28 days.
- 3. Reinforcing Steel: #4 bars at 18" centers both ways.
- 4. Concrete Pavement Joints:
 - a. Transverse Joints shall be sawed on 15' centers. Use 18" #8 or #10 dowels (smooth bars) at 12" spacing per TxDOT concrete Pavement Details Contraction Design (CPCD-14)
 - b. Longitudinal Joints shall be sawed based on the following:
 25' Width Saw Joint 3" from the center; 27' & 31' Width Saw Joint along the center
 - c. Expansion Joints to be constructed a maximum of 500' to 700' apart on straight paving, and on all radii, PC, PT and CR or otherwise specified. Use at least 18" (#10) dowels for paving 8" thick or greater.
- 5. Lime Stabilized Subgrade: 8% Lime by dry weight of soil (about 48 lbs/sy for 8 inches)
- 6. Flexible Base Subgrade (TxDOT Item 247)
- 7. Cement Treated Subgrade (Public Works Construction Standards, NCTCOG, 4th Edition, Item 301.1 and 301.3) or TxDOT Item 275 (Cement Treatment Road Mixed)

4.3.2 Pavement Maintenance

Routine maintenance, such as sealing and repair of cracks, is necessary to achieve the long-term life of a pavement system. We recommend a preventive maintenance program be developed and followed for all pavement systems so the design life can be realized. Choosing to defer maintenance usually results in accelerated deterioration leading to higher future maintenance costs, and/or repair.

The life and serviceability of the pavement system is dependent upon a well-planned pavement maintenance program. Pavement maintenance guidelines are provided in the following tables. We also recommend a Pavement Information Management System to be instituted and a strict maintenance schedule to be implemented.

| Year | Program | | | | |
|------|--|--|--|--|--|
| 7 | Joint Seal and Crack Seal | | | | |
| 14 | Joint Seal and Crack Seal Patch and Slab Replacement | | | | |
| 20 | Diamond Grind ½ inch and Reseal Joints or Cracks | | | | |
| 27 | Joint Seal and Crack Seal | | | | |
| 35 | Joint Seal and Crack Seal Patch and Slab Replacement | | | | |
| 40 | Overlay with 3-inch AC Pavement Maintenance to Follow AC Pavement Recommendations in Table 4.3.2.2 | | | | |

Table 4.3.2.1: General Rigid (PCC) Pavement Maintenance Program

Table 4.3.2.2: Flexible (AC) Pavement Maintenance Program

| Year | Program |
|------|--|
| 7 | Crack Seal and 2-inch Stone Matrix Asphalt (SMA) Overlay |
| 10 | Crack Seal |
| 15 | 2 inches Mill and 2-inch SMA Inlay |
| 18 | Crack Seal |
| 22 | Crack Seal and 2-inch SMA Inlay |
| 25 | Crack Seal or Reconstruct the Asphalt section Layer |

5.0 SITE CONSTRUCTION RECOMMENDATIONS

5.1 SUBGRADE PREPARATION

In a dry and undisturbed state, the upper 1-foot of the majority of the soil at the site will provide good subgrade support for fill placement and construction operations. However, these soils contain fines which are considered moderately erodible and are moisture and disturbance sensitive. Therefore, good site drainage should be maintained during earthwork operations, which would help maintain the integrity of the soil.

We recommend that an attempt be made to enhance the natural drainage without interrupting its pattern. All erosion and sedimentation should be controlled in accordance with sound engineering practice and current jurisdictional requirements.

The site should be stripped. After stripping, cutting to the proposed grade, and prior to the placement of any structural fill, the exposed subgrade should be examined by the Geotechnical Engineer or authorized representative. The exposed subgrade should be thoroughly proofrolled with previously approved construction equipment having a minimum axle load of 20 tons (e.g. fully loaded tandem-axle dump truck). The areas subject to proofrolling should be traversed by the equipment in two perpendicular (orthogonal) directions with overlapping passes of the vehicle under the observation of the Geotechnical Engineer or authorized representative. This procedure is intended to assist in identifying any localized yielding materials.

In the event that unstable or "pumping" subgrade is identified by the proofrolling, those areas should be marked for repair prior to the placement of any subsequent structural fill or other construction materials. Methods of repair of unstable subgrade, such as undercutting or moisture conditioning or chemical stabilization, should be discussed with the Geotechnical Engineer to determine the appropriate procedure with regard to the existing conditions causing the instability.

5.1.1 Proofrolling

Prior to fill placement or other construction on subgrades, the subgrades should be evaluated by an ECS field technician. The exposed subgrade outside moisture conditioned soil zone should be thoroughly proofrolled with construction equipment having a minimum axle load of 10 tons [e.g. fully loaded tandem-axle dump truck]. Proofrolling should be traversed in two perpendicular directions with overlapping passes of the vehicle under the observation of an ECS technician. This procedure is intended to assist in identifying any localized yielding materials.

Where proofrolling identifies areas that are unstable or "pumping" subgrade those areas should be repaired prior to the placement of any subsequent Structural Fill or other construction materials. Methods of stabilization include undercutting, moisture conditioning, or chemical stabilization. The situation should be discussed with ECS to determine the appropriate procedure. Test pits may be excavated to explore the shallow subsurface materials to help in determining the cause of the observed unstable materials, and to assist in the evaluation of appropriate remedial actions to stabilize the subgrade.

5.2 EARTHWORK OPERATIONS

Prior to placement of any new fill, all subgrades should be scarified to a minimum depth of 6 inches, compacted to at least 95% of Maximum Dry Density as obtained by the Standard Proctor Method (ASTM D-698) and moisture conditioned at +3% or above the optimum value. All fills should be benched into the existing soils.

Soil moisture levels should be preserved (by various methods that can include covering with plastic, watering, etc.) until new fill, or pavements are placed. All fill soils should be placed in 8 inch loose lifts for mass grading operations and 4 inches for trench type excavations where walk behind or "jumping jack" compaction equipment is used.

Upon completion of the filling operations, care should be taken to maintain the soil moisture content prior to construction of floor slabs and pavements. Soil moisture levels can be preserved by various methods that can include covering with plastic, watering, etc. If the soil becomes desiccated, the affected material should be removed and replaced, or these materials should be scarified, moisture conditioned and recompacted.

Utility cuts should not be left open for extended periods of time and should be properly backfilled. Backfilling should be accomplished with properly compacted on-site soils, rather than granular materials. A utility trench cut-off is recommended to help prevent water from migrating through the utility trench backfill to beneath the proposed structure.

Field density and moisture tests should be performed on each lift as necessary to verify that adequate compaction is achieved. As a guide, one test per 2,500 square feet per lift is recommended in the paving areas (two tests minimum per lift). Utility trench backfill should be tested at a rate of one test per lift per each 150 linear feet of trench (two tests minimum per lift). Certain jurisdictional requirements may require testing in addition to that noted previously. Therefore, these specifications should be reviewed and the more stringent specifications should be followed.

5.3 MATERIAL SPECIFICATIONS

This section is intended to outline the material requirements of those recommendations.

Lime stabilized subgrade: Lime stabilized on site clay should be used below the pavement. Lime application rate of 8% hydrated lime (about 48 lbs/sy for 8 inches) by dry weight of clay (TxDOT Item 260) can be used for budgeting purposes. The actual amount of lime required should be confirmed by additional laboratory tests (lime series) during the construction phase.

The lime stabilized clay should be thoroughly mixed and appropriately mellowed for at least 48 hours (TxDOT Item 260) and tested for gradation and lime solubility (pH) prior to final placement and compaction. Once appropriately mixed and mellowed, this material may then be placed and compacted at workable moisture contents within of at least +3 percent of optimum moisture content and compacted to at least 95% of the Maximum Dry Density as obtain using the Standard Proctor Method (ASTM D-698).

Please refer to the "General Recommendations for Quality Assurance (QA) Testing" table provided in the Appendix A of this report for specific requirements.

<u>Flexible base material:</u> The material may be used beneath pavements. Flexible base should meet the requirements of TxDOT Item 247, Type D, Grade 1-2, or NCTCOG Item 301.5. Recycled concrete meeting the gradation requirements of flexible base is also acceptable for use. The flexible base and recycled concrete should be compacted to at least 95% of maximum dry density at or above the optimum moisture content as obtained using the Standard Proctor Method (ASTM D-698).

Please refer to the "General Recommendations for Quality Assurance (QA) Testing" table provided in the Appendix A of this report for specific requirements.

<u>Cement Treated Reclaimed Asphalt Pavement (RAP)</u>: The existing asphalt pavement sections may be considered for the project. The existing pavement sections should be milled/crushed down or pulverized to fragments by using a pulverizing/mixing rototiller or similar equipment. Asphalt concrete, gravelly fill materials, and subgrade soils should be mixed together. The particle size distribution of the pulverized material should be such that 100 percent passing the 1-3/4-in. sieve, 85 percent passing the 3/4-in. sieve, and at least 60 percent passing the No. 4 sieve.

The resulting mix should be cement stabilized (TxDOT Item 275) to the minimum depth of 8 inches and compacted to at least 95 percent of its maximum standard Proctor dry density (ASTM D 698) at a moisture content above the optimum moisture. We recommend 3 to 5 percent cement (TxDOT Item 275), by dry weight, for the treatment. The cement should be thoroughly mixed and blended with the pulverized mixture. The resulting mix should have a minimum unconfined compressive strength of 240 psi, as determined by TxDOT method Tex-120-E.

6.0 CLOSING

ECS has prepared this report to guide the geotechnical-related design and construction aspects of the project. We performed these services in accordance with the standard of care expected of professionals in the industry performing similar services on projects of like size and complexity at this time in the region. No other representation, expressed or implied, and no warranty or guarantee is included or intended in this report.

The description of the proposed project is based on information provided to ECS by Client. If any of this information is inaccurate or changes, either because of our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted so we can review our recommendations and provide additional or alternate recommendations that reflect the proposed construction.

All construction activities should be conducted in accordance with the most recent City's Design Standards, as well as the latest edition of North Central Texas Council of Governments (NCTCOG) Standard Specifications for Public Works Construction and TxDOT specifications.

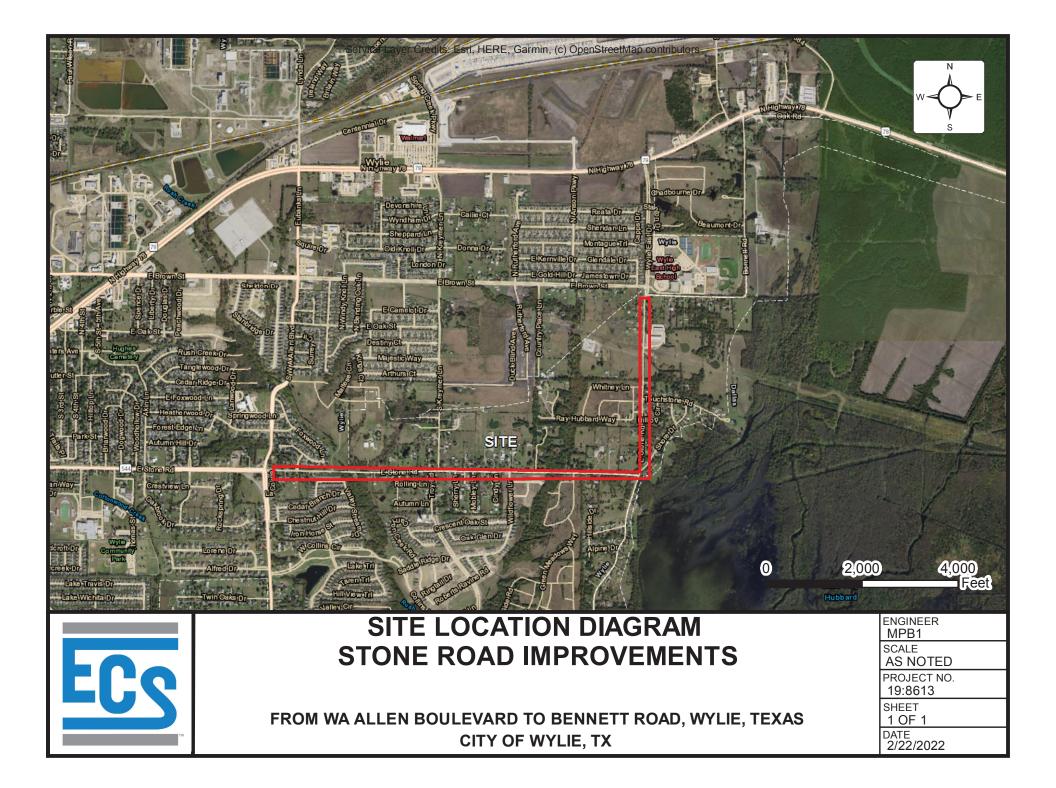
We recommend that ECS review the project plans and specifications so we can confirm that those plans/specifications are in accordance with the recommendations of this geotechnical report.

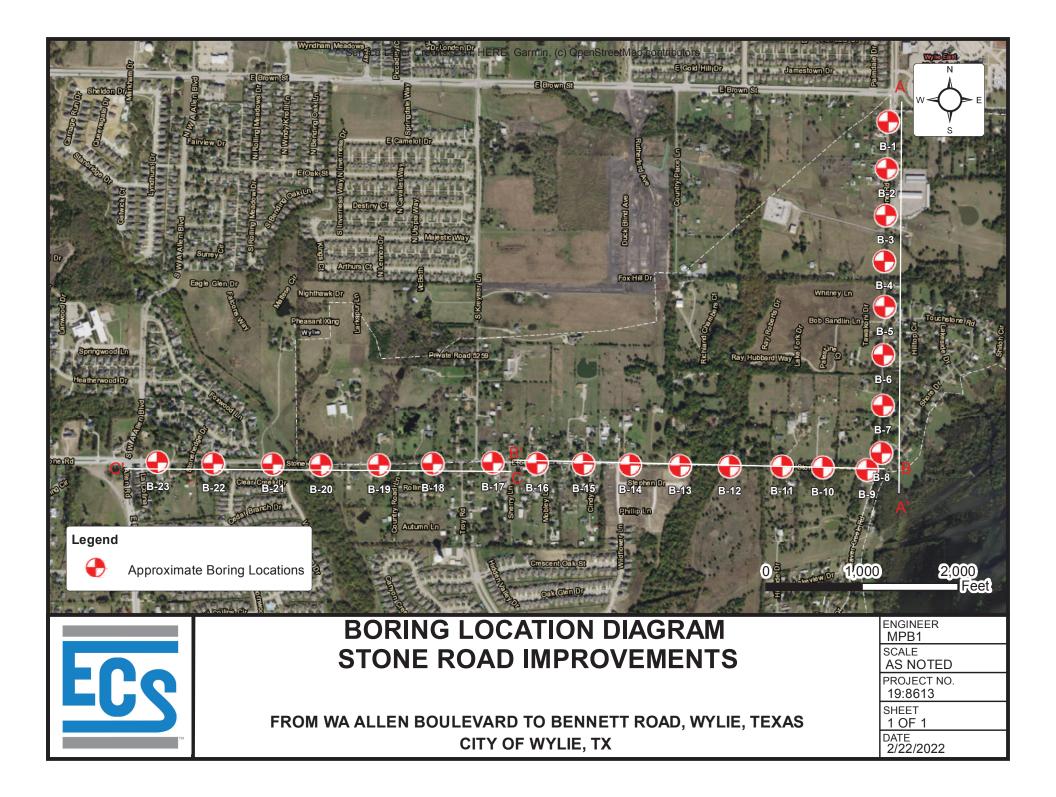
Field observations, and quality assurance testing during earthwork and foundation installation are an extension of, and integral to, the geotechnical design. We recommend that ECS be retained to apply our expertise throughout the geotechnical phases of construction, and to provide consultation and recommendation should issues arise.

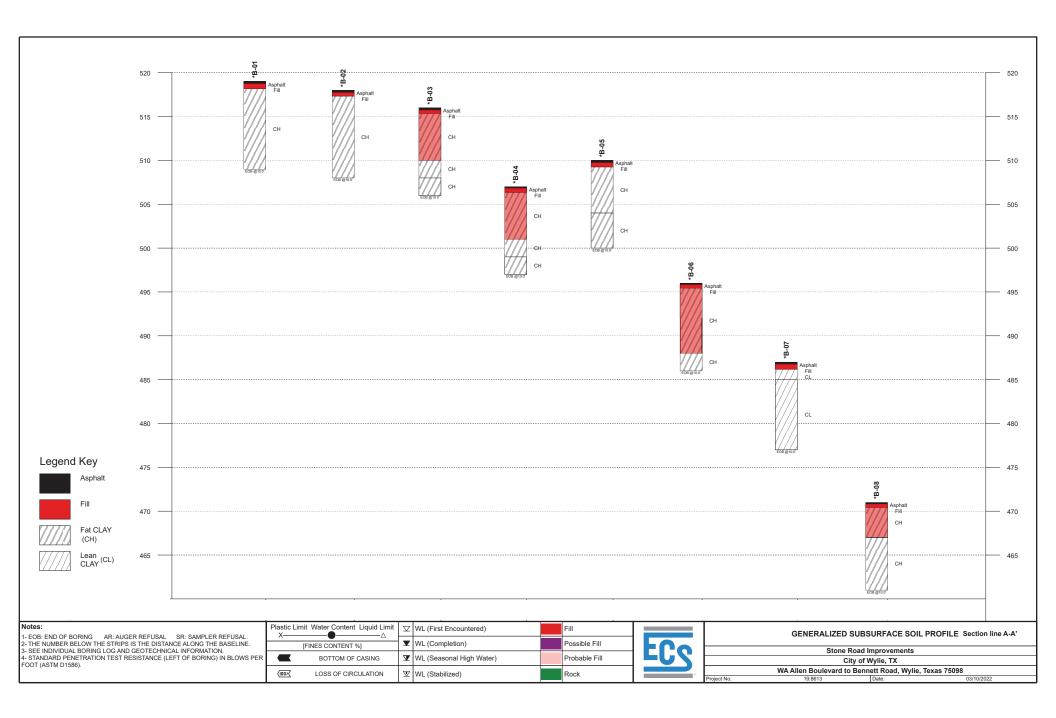
ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

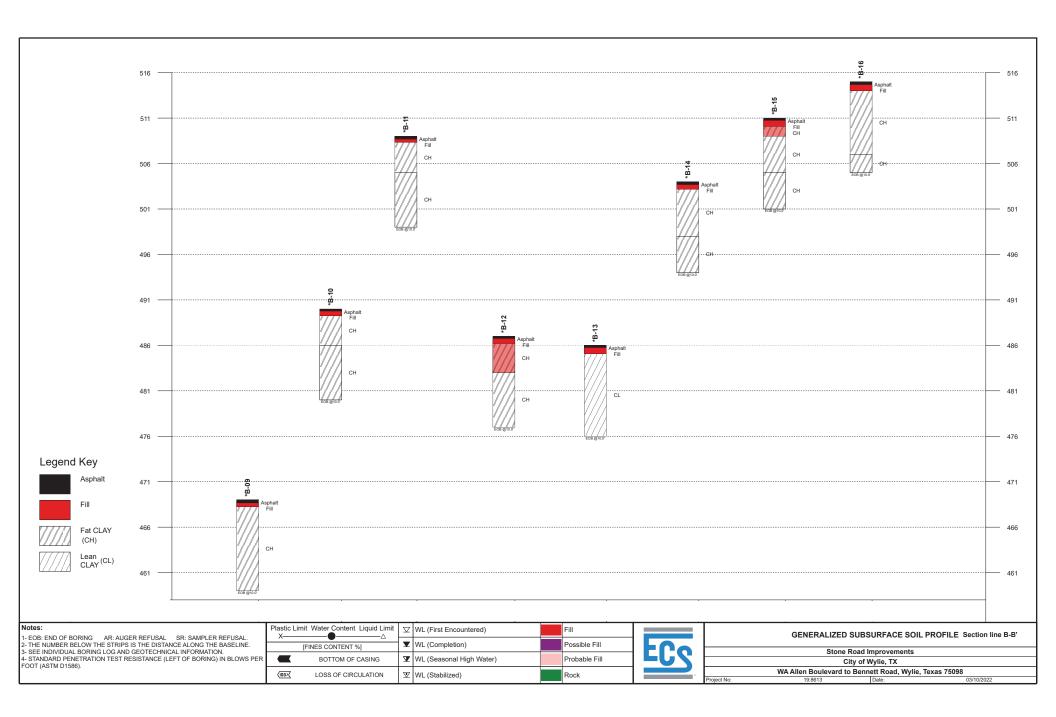
APPENDIX A – Figures

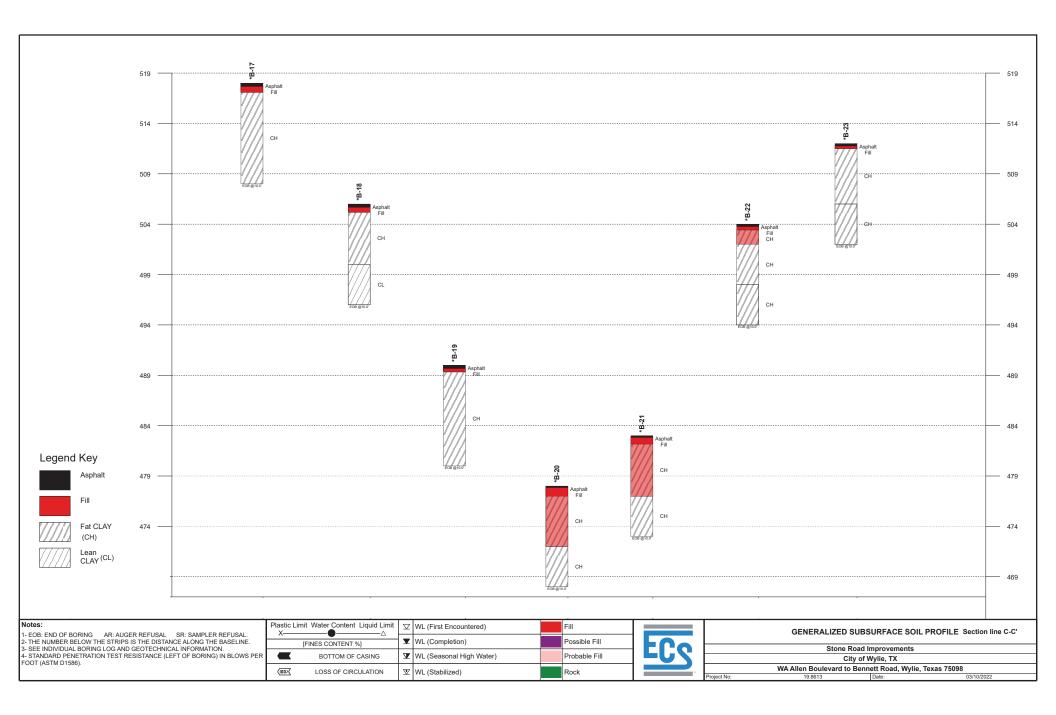
Site Location Diagram Boring Location Diagram Generalized Subsurface Soil Profile (From West to East) Regional Geology General Recommendations for Quality Assurance (QA) Testing

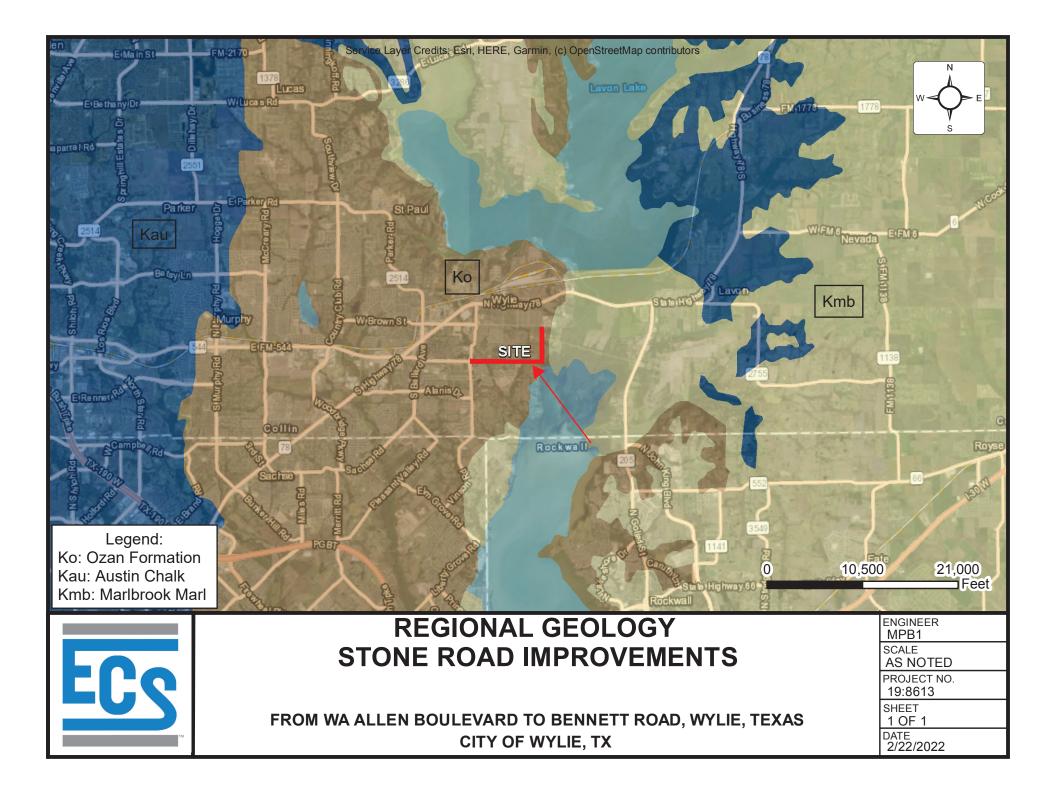












| Item | Parameter | Test Method ASTM unless noted otherwise | Test Frequency or Observations | Requirements |
|---------------------|--|--|---|--|
| | Standard Proctor Curve | D698 | 1 per soil type | |
| General Earth Fill | Atterberg Limits | D4318 | 1 per soil type | |
| Below Paving & | -200 Mesh Sieve | D1140 | 1 per soil type | |
| Structures | In Situ Density/Moisture Nuclear Gauge | D2922 D3017 | 1 per each 200 ft. of lane direction per 6 inch lift (2 tests minimum per lift per section) | Density <u>></u> 95% Moisture: Pl < 20 (-2 to +5) Pl > 20 (0 to +5) |
| | Standard Proctor Curve | D698 | 1 per soil type | Lean Sandy Clay (CL) or Clayey Sand (SC) |
| | Atterberg Limits | D4318 | 1 per soil type | LL ≤ 35 6 ≤ PI ≤ 15 |
| Select Fill | -200 Mesh Sieve (P 200) | D1140 | 1 per soil type | P200 <u><</u> 50 |
| | In Situ Density/Moisture Nuclear Gauge | D2922 D3017 | 1 per each 200 ft. of lane direction per 6 inch lift (2 tests minimum per lift per section) | Density <u>></u> 95% Moisture: (-2 to +5) |
| | Standard Proctor Curve | D698 | 1 per soil type | |
| | Atterberg Limits | D4318 | 1 per soil type | PI <u><</u> 15 |
| Stabilized Subgrade | In Situ D2922 Density/Moisture D3017 | | 1 per each 200 ft. of lane direction (2 tests minimum) | Density <u>></u> 95% Moisture: +3% |
| | Gradation | D422 | 1 per 2 Density/Moisture tests | 100% Passing 1-3/4" Sieve 60 % passing #4 Sieve |
| | Depth Check | Survey, drive probe or hand auger | 1 per 2 Density/Moisture tests | Min. Specified |

*Performed by the Construction Materials Engineering and Testing Company hired by owner.

| Item | Parameter | Test Method ASTM unless noted otherwise | Test Frequency or Observations | Requirements |
|--|--|--|--|--|
| | Standard Proctor Curve | D698 | 1 per soil type | |
| Trench Backfill | Atterberg Limits | D4318 | 1 per soil type | |
| Below Streets & | -200 Mesh Sieve | D1140 | 1 per soil type | |
| Structures | Density/Moisture D2922 | | 1 per each 250 ft. of lane direction per 12 inch lift (2 tests minimum per lift per section) | Density <u>></u> 95% Moisture: -1 to +4 |
| | Standard Proctor Curve | D698 | 1 per soil type | |
| | Atterberg Limits | D4318 | 1 per soil type | LL <u><</u> 35 6 <u><</u> PI <u><</u> 15 |
| | -200 Mesh Sieve (P 200) | D1140 | 1 per soil type | P200 <u><</u> 50 |
| Wall Backfill | In Situ Density/Moisture Nuclear Gauge | D2922 D3017 | 1 per each 200 ft. of lane direction per 8 inch lift 6 inch lifts if hand-operated tampers are used (2 tests minimum per lift per section) | Density <u>></u> 95% Moisture: (-1 to +4) |
| | Modified Proctor Curve | D1557 | 1 per material type | Type A, Grade 1 or better |
| | Atterberg Limits | D4318 | 1 per material type | LL <u><</u> 40 PI <u><</u> 12 |
| Crushed Limestone Flexible Base (TxDOT Item 247) | Sieve Analysis | D422 | 1 per material type | 0-10 % Passing 1-3/4 inch 45-75 % Passing No. 4 60-85 % Passing No. 40 |
| | Wet Ball Mill | TxDOT | 1 per material type | Max. 45 |
| | In Situ Density/Moisture Nuclear Gauge | D2922 D3017 | 1 per each 200 ft. of lane direction (Streets/Roads) | Density <u>></u> 95% (Modified) Moisture: -2 to +4% |

Notes: 1. Table 1 is a guide for sampling and testing. Each of these items may not apply to the specified project.

2. Material changes, suspect areas, or other field conditions may require the engineer to increase testing and sampling frequencies.

3. Minimum of two tests per lift.

4. The moisture content ranges specified are to be considered as maximum allowable ranges. The contractor may have to maintain a more narrow range (within the maximum allowable) in order to consistently achieve the specified density for some soils or under some conditions.

APPENDIX B – Field Operations

Reference Notes for Boring Logs Subsurface Exploration Procedure Boring Logs



REFERENCE NOTES FOR BORING LOGS

| | | | | | | | | | - |
|--------------------------|-----------------------|---|-----------------------------------|-----------------------|----------------|------------------|-----------------------------|--|----|
| MATERIAL ¹ | ,2 | | DRILLING SAMPLING SYMBOLS & ABBRE | | | | | | Т |
| | ASPI | Т | SS | Split Spoor | n Sampler | | PM | Pressuremeter | ٢e |
| | | | ST | Shelby Tub | • | r | RD RC | Rock Bit Drilling | |
| | CON | CRETE | WS | · · | | | | Rock Core, NX, | |
| | | | BS | Bulk Samp | | 0 | REC | Rock Sample R | |
| | GRA | VEL | PA | Power Aug | RQD | Rock Quality De | s | | |
| | | | HSA Hollow Stem Auger | | | | | | |
| | TOPS | SOIL | | | F | PARTICLE S | IZE IDE | NTIFICATION | |
| | VOID | | DESIGNA | TION | PARTIC | CLE SIZES | | | |
| | | | Boulder | | 12 i | nches (300 n |) mm) or larger | | |
| | BRIC | к | Cobbles | | | | ` | 5 mm to 300 mm) | |
| | | | Gravel: | Coarse | | | ` | m to 75 mm) | |
| O | AGGREGATE BASE COURSE | | Condi | Fine | | |) mm (No. 4 sieve to ¾ inch | | |
| 2.7.4 | GW | WELL-GRADED GRAVEL | Sand: | Coarse | | | ` | b. 10 to No. 4 siev | |
| • .• | | gravel-sand mixtures, little or no fines | | Medium Fine | | | `` | lo. 40 to No. 10 si No. 200 to No. 40 | |
| \$°.0 | GP | POORLY-GRADED GRAVEL | Silt & Cl | ay ("Fines") | | | | No. 200 to No. 40 a No. 200 sieve) | |
| <u>ে ০ ন</u> চার্গস্ম | | gravel-sand mixtures, little or no fines | | | -0.0 | | | 1 4 1 10. 200 SIEVE | |
| SP.D | GM | SILTY GRAVEL gravel-sand-silt mixtures | | COHESIVE | E SILTS & | CLAYS | | | |
| A B | GC | CLAYEY GRAVEL | UNCO | NFINED | | | | RELATIVE AMOUNT ⁷ | |
| 6794 | | gravel-sand-clay mixtures | COMP | RESSIVE | SPT⁵ | CONSISTEN | CY ⁷ | AMOUNT | L |
| | SW | WELL-GRADED SAND | | GTH, QP⁴ | (BPF) | (COHESIV | | Trace | |
| | 0.0 | gravelly sand, little or no fines | | 0.25 | <2 2 - 4 | Very Sof Soft | t | With | |
| | SP | POORLY-GRADED SAND gravelly sand, little or no fines | | - <0.50 - <1.00 | 2 - 4 5 - 8 | Firm | | Adjective | |
| | SM | SILTY SAND | | · <2.00 | 9 - 15 | Stiff | | (ex: "Silty") | |
| | | sand-silt mixtures | | - <4.00 | 16 - 30 | Very Stif | f | | |
| / / / | SC | CLAYEY SAND | | - 8.00 | 31 - 50 | Hard | | | - |
| <u>/:////</u> | | sand-clay mixtures | >8 | 8.00 | >50 | Very Har | d | WA | т |
| | ML | SILT | | | | | | | 1 |
| | | non-plastic to medium plasticity | GRAVE | LS, SANDS | & NON-C | OHESIVE SI | LTS | ₩ WL (Firs | t |
| | МН | ELASTIC SILT high plasticity | | SPT⁵ | | DENSITY | | WL (Cor | n |
| $\overline{111}$ | CL | LEAN CLAY | | <5 | , | Very Loose | | | 11 |
| | | low to medium plasticity | 5 | 5 - 10 | | Loose | | WL (Sea | s |
| | СН | FAT CLAY | 1 | 1 - 30 | M | edium Dense | | | |
| | _ | high plasticity | 3 | 1 - 50 | | Dense | | WL (Stal | JÍ |
| 222 | OL | ORGANIC SILT or CLAY non-plastic to low plasticity | | >50 | | Very Dense | | | |
| | ОН | ORGANIC SILT or CLAY | | | | | | | |
| 222 | 011 | high plasticity | | | | FILL | AND R | оск | |
| 36 56 | РТ | PEAT | | | 1 | | | | |
| 2 36 3 | | highly organic soils | | and the second second | | | | | |

ABBREVIATIONS

| | PM | Pressuremeter Test | | | | | | | |
|----------------------------|-----|----------------------------|--|--|--|--|--|--|--|
| | RD | Rock Bit Drilling | | | | | | | |
| | RC | Rock Core, NX, BX, AX | | | | | | | |
| 3 | REC | Rock Sample Recovery % | | | | | | | |
| e) | RQD | Rock Quality Designation % | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| RTICLE SIZE IDENTIFICATION | | | | | | | | | |

| | (PDE) | | | | | | | | |
|---|--------|--------------------------|--------------------|---------------------------------|-----------------------------|-----------------------------|--|--|--|
| NFINED | SPT⁵ | CONSISTENCY ⁷ | | RELATIVE AMOUNT ⁷ | GRAINED (%) ⁸ | GRAINED (%) ⁸ | | | |
| COHESIVE SILTS & CLAYS | | | | | COARSE | FINE | | | |
| | | | | | | | | | |
| lay ("Fines") <0.074 mm (smaller th | | | | an a No. 200 sieve) | | | | | |
| Fine | 0.07 | 74 mm to 0.425 mm | ı (İ | No. 200 to No. 40 |) sieve) | | | | |
| Medium 0.425 mm to 2.00 mm (No. 40 to No. 10 sieve) | | | | | | | | | |
| Coarse 2.00 mm to 4.75 mm (No. 10 to No. 4 sieve) | | | | | | | | | |
| Fine | 4.75 | 5 mm to 19 mm (No | a sieve to ¾ inch) | sieve to ¾ inch) | | | | | |
| Coarse | ³⁄₄ ir | nch to 3 inches (19 | mr | m to 75 mm) | | | | | |

| COARSE GRAINED (%) ⁸ | FINE GRAINED (%) ⁸ |
|---------------------------------------|---|
| <u><</u> 5 | <u><</u> 5 |
| 10 - 20 | 10 - 25 |
| 25 - 45 | 30 - 45 |
| | GRAINED (%) ⁸ ≤5 10 - 20 |

| WATER LEVEL | S6 |
|-------------|----|
|-------------|----|

| 7 | WL (First Encountered) |
|---|------------------------|
| | WL (Completion) |

- WL (Seasonal High Water)
- WL (Stabilized)

| FILL AND ROCK | | | | | | | | | |
|---------------|---------------|---------------|------|--|--|--|--|--|--|
| FILL | POSSIBLE FILL | PROBABLE FILL | ROCK | | | | | | |
| | | | Rook | | | | | | |

¹Classifications and symbols per ASTM D 2488-17 (Visual-Manual Procedure) unless noted otherwise.

²To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

³Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-FILL)].

⁴Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

⁵Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler

required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf). SPT correlations per 7.4.2 Method B and need to be corrected if using an auto hammer.

⁶The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

⁷Minor deviation from ASTM D 2488-17 Note 14.

⁸Percentages are estimated to the nearest 5% per ASTM D 2488-17.

SUBSURFACE EXPLORATION PROCEDURES

The field exploration was planned with the objective of characterizing the project site in general geotechnical and geological terms and to evaluate subsequent field and laboratory data to assist in the determination of geotechnical recommendations.

The subsurface conditions were explored by drilling and sampling 23 borings to a depth of approximately 10 feet below the existing site grades. A truck-mounted drill rig with continuous flight augers was utilized to drill the borings. The boring locations were determined by and identified in the field by ECS personnel using the supplied diagram. The approximate as-drilled boring locations are shown on the Boring Location Diagram in Appendix A. The ground surface elevations noted on the boring logs were obtained from NCTCOG (www.dfwmaps.com), which provided elevation contours in 2-foot intervals.

Representative soil samples were obtained by means of Shelby tube sampling procedures in accordance with ASTM Specification D-1587. In the Shelby tube sampling procedure, a thin walled, steel, seamless tube with sharp cutting edges is pushed hydraulically into the soil, and a relatively undisturbed sample is obtained.

Field logs of the soils encountered in the borings were maintained by the drilling crew. After recovery, each sample was removed from the sampler and visually classified. Representative portions of each soil sample were then wrapped in plastic and transported to our laboratory for further visual examination and laboratory testing. After completion of the drilling operations, the boreholes were backfilled with auger cuttings and patched on the surface.

| CLIENT | | | | | | | PROJECT NC |).: | | BORING I | NO.: | SHEET: | | |
|---------------------|---------------|-------------|-------------------|---------------|----------------------------|------------|-----------------------|------|--------------|----------------|----------------|------------------|----------------------|-------------------|
| City of N PROJEC | | | | | | | 19:8613 DRILLER/CO | | | 5- 01 | | 1 of 1 | | ECO |
| Stone R | | | nents | | | | StrataBore, L | | | n. | | | | |
| SITE LO | | | | | | | | | | | | 1.000 | | Ving |
| WA Alle | n Boul | evard t | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | | LOSS | OF CIRCULATION | <u>)1007</u> |
| NORTH | | | | | ASTING: | STATION: | | | | | LEVATION: | BOT | TOM OF CASING | |
| 705809 | 5.9 | | | 25 | 82679.1 | | | | 519 | 9.00 | | | | |
| | ER | | Î | <u> </u> | | | | | S | Ê | | Plastic Lin X | nit Water Content Li | quid Limit —∧ |
| (FT) | UME | SAMPLE TYPE | ST. (| JI) X | | | | | EVEL | N (F | .9/9 | STAI | NDARD PENETRATION B | LOWS/FT |
| DЕРТН (FT) | E N | IPLE | E DI | VER | DESCRIPTION O | F MATERIAL | | | ERLI | ATIO | BLOWS/6" | | UALITY DESIGNATION & | RECOVERY |
| DE | SAMPLE NUMBER | SAN | SAMPLE DIST. (IN) | RECOVERY (IN) | | | | | WATER LEVELS | ELEVATION (FT) | BL | RC | | |
| | S/ | | /S | | | | | | | | | | IBRATED PENETROMETE | R TON/SF |
| _ | | | | | Asphalt [3"] | | | | _ | - | | [FINES C | ONTENT] % | |
| | S-1 | ST | 14 | 14 | FILL, sand and gravel, | brown [7' | "] | | | - | | | ○ _{2.25} | |
| - | | 51 | 14 | 14 | (CH) FAT CLAY, brown a | and dark l | brown, | | | - | | | ○ _{2.75} | |
| _ | S-2 | ST | 24 | 24 | moist, very stiff to har | d | | | | - | | | | |
| | | | | | | | | | | - | | | ⊖ _{3.5} | 0 |
| 5- | S-3 | ST | 24 | 24 | | | | | | 514 | | | 0.0 | 0 |
| - | 00 | 51 | 27 | 27 | | | | | | | | | \circ | |
| - | ~ ^ | CT | 24 | 24 | | | | | | - | | | ⊖ _{3.5} | 0 |
| - | S-4 | ST | 24 | 24 | | | | | | - | | | | |
| | | | | | | | | | | - | | | | ⊖ _{4.25} |
| | S-5 | ST | 24 | 24 | | | | | | - | | | | |
| 10- | | | | | END OF BORIN | IG AT 10.0 | FT | | | 509- | | | | |
| - | | | | | | | | | | - | | | | |
| | | | | | | | | | | _ | | | | |
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| - | | | | | | | | | | - | | | | |
| 15- | | | | | | | | | | 504 - | | | | |
| | | | | | | | | | | 504 | | | | |
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| | | | | | | | | | | - | | | | |
| 20- | | | | | | | | | | 499 - | | | | |
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| - | | | | | | | | | | - | | | | |
| - | | | | | | | | | | - | | | | |
| | | | | | | | | | | 40.4 | | | | |
| 25- | | | | | | | | | | 494 – | | | | |
| - | | | | | | | | | | - | | | | |
| | | | | | | | | | | - | | | | |
| _ | | | | | | | | | | - | | | | |
| | | | | | | | | | | - | | | | |
| 30- | | | | | | | | | | 489- | | | | |
| | | | | | | | | | | - | | | | |
| | т. | HE STR | | | NES REPRESENT THE APPROXII | MATE BOUN | | WEEN | SOII | TYPES IN | I-SITLI THE TR | | | |
| | VL (Firs | | | | Dry | | | | | | | | DE GIADUAL | |
| | | | | -~/ | | | RING STARTED: | Fe | 010 | 2022 | CAVE IN | UEPIH: | | |
| | VL (Cor | - | - | | Dry | | RING MPLETED: | Fe | b 10 | 2022 | HAMME | R TYPE: | Auto | |
| | VL (Sea | | | Vater) | N/A | | JIPMENT: | LC |)GGF | ED BY: | | | | |
| V 🗵 | VL (Sta | bilized |) | | N/A | Truc | k | Sti | rataE | Bore | | METHOD: (| CFA | |
| | | | | | GEC | DTECHNI | ICAL BOREI | HOLE | ELC |)G | | | | |

| CLIENT | | | | | | | BORING | NO.: | | | | | |
|-------------------|---|-------------|-------------------|---------------|---------------------------|------------|-------------------------------|---------------|----------------|------------|--|--|--|
| | | | | | | | 19:8613 | TDACT | B-02 | | | | |
| PROJEC Stone R | | | nonte | | | | DRILLER/CON StrataBore, LL | | OR: | | | | |
| SITE LO | | | ients | | | | Stratabore, EL | C | | | | | |
| | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | LOSS OF CI | RCULATION SIDE | |
| NORTH | | | | | ASTING: | STATION: | SURFACE ELEVATION: | | | ELEVATION: | BOTTOM OF CASING | | |
| 705760 | 5.1 | | | 25 | 82663.0 | | | ! | 518.00 | | <u> </u> | | |
| (F- | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | (NI) | | | | MATER LEVIELS | ELEVATION (FT) | -9 | Plastic Limit Water Content Liquid Limit X∆ | | |
| DЕРТН (FT) | NU | LE T | DIS | RECOVERY (IN) | DESCRIPTION C | F MATERIAL | | - H | | BLOWS/6" | - | PENETRATION BLOWS/FT DESIGNATION & RECOVERY | |
| DEP | MPLI | AMF | MPLI | ECO | | | | /ATF | EVA | BLC | RQD | | |
| | SAI | 0) | SAI | ~ | | | | > | · | | | D PENETROMETER TON/SF | |
| | | | | | Asphalt [3"] | | | | _ | | [FINES CONTEN | T] % | |
| _ | S-1 | ST | 16 | 16 | FILL, sand and gravel, | brown [5' | 'I // // | | - | - | | ⊖ _{3.50} | |
| - | 51 | 51 | 10 | 10 | (CH) FAT CLAY, brown | | | | - | - | | ⊖ _{3.50} | |
| | S-2 | ST | 24 | 24 | moist, very stiff to har | | | | - | - | | 0.00 | |
| _ | | - | | | | | | | - | - | | 0 _{3.75} | |
| 5- | 6.2 | ст | 24 | 24 | | | | | 513- | - | | 3.75 | |
| -c | S-3 | ST | 24 | 24 | | | | | 513- | - | | | |
| - | | | | | | | | | - | - | | O _{4.00} | |
| | S-4 | ST | 24 | 24 | | | | | - | - | | | |
| | | | | | | | | | - | - | | ⊖ _{4.25} | |
| | S-5 | ST | 24 | 24 | | | | A | - | - | | | |
| 10- | | | | | END OF BORIN | IG AT 10.0 | FT | | 508- | _ | | | |
| _ | | | | | | | | | - | - | | | |
| _ | | | | | | | | | - | - | | | |
| | | | | | | | | | - | - | | | |
| - | | | | | | | | | _ | - | | | |
| 45 | | | | | | | | | 502 | _ | | | |
| 15- | | | | | | | | | 503- | - | | | |
| - | | | | | | | | | - | - | | | |
| - | | | | | | | | | - | - | | | |
| - | | | | | | | | | - | - | | | |
| | | | | | | | | | - | - | | | |
| 20- | | | | | | | | | 498- | - | | | |
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| - | | | | | | | | | 100 | - | | | |
| 25- | | | | | | | | | 493- | - | | | |
| | | | | | | | | | - | - | | | |
| | | | | | | | | | - | - | | | |
| _ | | | | | | | | | - | - | | | |
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| 30- | | | | | | | | | 488- | - | | | |
| | | | | | | | | | _ | - | | | |
| | т. | IE CTD | | | NES REPRESENT THE APPROXI | | | | | | | GRADUAL | |
| | VL (Firs | | | | Dry | | | | | | | | |
| | | | | cuj | | | RING STARTED: | Feb | 10 2022 | CAVE IN | DEPTH: | | |
| | vL (Cor | - | - | | Dry | BOR | | Feb | 10 2022 | HAMME | R TYPE: Auto | | |
| V V | VL (Sea | sonal | High V | Vater) | N/A | | /IPLETED: JIPMENT: | | GED BY: | | | | |
| V 🗹 | VL (Sta | bilized |) | | N/A | | | | | DRILLING | 6 METHOD: CFA | | |
| | WL (Stabilized) N/A Truck StrataBore DRILLING METHOD: CFA GEOTECHNICAL BOREHOLE LOG | | | | | | | | | | | | |

| CLIENT City of \ | | × | | | | | PROJECT 19:8613 | NO.: | BORING NO.: B-03 | | | SHEET: 1 of 1 | | |
|---------------------|---------------------|-------------|-------------------|---------------|--|-------------------------|-----------------------|------------------------------|----------------------------|-----------------------|-----------|--|--------------------|----------------------|
| PROJEC | | | | | | | DRILLER/ | CONTRA | | | | | | EUQ |
| Stone R | oad Im | proven | nents | | | | StrataBo | re, LLC | | | | _ | | |
| SITE LO WA Alle | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | | LOS | S OF CIRCULATION | <u>>100</u> % |
| NORTH 705712 | | | | | ASTING: 82653.8 | STATION: | | SURFACE ELEVATION: 516.00 | | | LEVATION: | BO | TTOM OF CASING | |
| | BER | ш | (IN) | 7 | | | | | WATER LEVELS | ELEVATION (FT) | | Plastic Li X— | imit Water Content | Liquid Limit ───△ |
| DEPTH (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION C | DESCRIPTION OF MATERIAL | | | | | BLOWS/6" | STANDARD PENETRATION BLOWS/FT ROCK QUALITY DESIGNATION & RECOVERY RQD REC CALIBRATED PENETROMETER TON/SF [FINES CONTENT] % | | & RECOVERY |
| - | 6.4 | CT | 10 | 10 | Asphalt [3"] FILL, sand and gravel, | brown [5 | יין | | | - | | | 0 _{2.75} | |
| | S-1 | ST | 16 | 16 | FILL, LEAN/FAT CLAYS, | brown ar | | | | | | | 0 _{2.75} | |
| | S-2 | ST | 24 | 24 | brown, moist, very sti | Π | | | | | | O _{3.25} | | 5 |
| 5 | S-3 | ST | 24 | 24 | (CH) FAT CLAY, brown | and dark | brown, | | | 511 | | | O _{3.00} | |
| | S-4 | ST | 24 | 24 | moist, very stiff | | | | | | | | | O _{4.25} |
| 10- | S-5 | ST | 24 | 24 | moist, hard | | | | | 506 — | | | | |
| - | | | | | | | | | | - | | | | |
| - | | | | | | | | | | - | | | | |
| 15- | | | | | | | | | | 501- | | | | |
| - | | | | | | | | | | - | | | | |
| 20- | | | | | | | | | | 496 - | | | | |
| | | | | | | | | | | - | | | | |
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| 25- | | | | | | | | | | 491 - | | | | |
| | | | | | | | | | | - | | | | |
| 30- | | | | | | | | | | 486- | | | | |
| | | | | | | | | | | | | | | : |
| | | | | | | | | | I SOIL | TYPES. IN | | | AY BE GRADUA | L |
| | VL (Firs VL (Coi | | | ea) | Dry | | | ED: F | eb 10 | 2022 | CAVE IN | DEPTH: | | |
| | VL (Sea | _ | - | Vater) | N/A | COI | RING MPLETED: | | | 2022 | HAMME | R TYPE: | Auto | |
| | VL (Sta | | | | N/A | EQU Truc | JIPMENT: :k | | OGG tratal | ED BY: Bore | DRILLING | 6 METHOD: | CFA | |
| | | | | | GEC | DTECHN | ICAL BOF | | | | | | | |

| CLIENT | | | | | | | PROJECT NC | .: | BORING NO .: | | NO.: | SHEET: | |
|-------------------|---|-------------|-------------------|---------------|--|--|--------------------------------|------|--------------|----------------|------------------|--|-------------------|
| | | | | | | | 19:8613B-04DRILLER/CONTRACTOR: | | | 1 of 1 | -ECc | | |
| PROJEC Stone R | | | nonte | | | | StrataBore, L | | | К: | | | |
| SITE LO | | - | ients | | | | Stratabore, L | | | | | | |
| | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | | LOSS OF CIRCULATION | v XIOO X |
| NORTH | ING: | | | EA | STING: | STATION: | SURFACE ELEVATION: | | | LEVATION: | BOTTOM OF CASING | | |
| 705664 | 7.6 | | | 25 | 82638.7 | | | | 507 | 7.00 | | | |
| DЕРТН (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION OF MATERIAL | | | | | ELEVATION (FT) | BLOW5/6" | Plastic Limit Water Conte X STANDARD PENETRATI ROCK QUALITY DESIGNATIC RQD RQD CALIBRATED PENETROI [FINES CONTENT] % | ON BLOWS/FT |
| - | | | | Asphalt [2"] | | | | | - | | | | |
| | S-1 | ST | 16 | 16 | FILL, sand and gravel, I | brown and | I | | | - | | O _{2.75} | |
| - | S-2 | ST | 24 | 24 | vellowish brown [6"] FILL, FAT/LEAN CLAYS, brown, moist, very stif | | | | | | | O _{3.25} | |
| 5- | S-3 | ST | 24 | 24 | brown, moist, very sti | 1 | | | | 502- | | O ₃ | .25 |
| - | S-4 | ST | 24 | 24 | (CH) FAT CLAY, dark bro | (CH) FAT CLAY, dark brown, moist, hard | | | | | | | 0 _{4.25} |
| - | S-5 | ST | 24 | 24 | (CH) FAT CLAY, light bro | own, mois | t, very | | | | | | ○ _{3.75} |
| 10- | | | | | END OF BORIN | O AT 40 0 | | | | 497 - | | | |
| - | | | | | END OF BORIN | G AT 10.01 | | | | - | | | |
| - | | | | | | | | | | - | | | |
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| 15- | | | | | | | | | | 492 - | | | |
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| 20- | | | | | | | | | | 487 - | | | |
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| 25- | | | | | | | | | | 482 | | | |
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| - | | | | | | | | | | - | | | |
| 30- | | | | | | | | | | 477 - | | | |
| | | | | | | | | | | +// - | | | |
| | | | | | | | | | | | | | |
| | | | | | NES REPRESENT THE APPROXIN | MATE BOUND | ARY LINES BET | NEEN | SOIL | TYPES. IN | I-SITU THE TR | ANSITION MAY BE GRADU | JAL |
| | VL (Firs | | | ed) | Dry | BORI | NG STARTED: | Fe | b 10 | 2022 | CAVE IN | DEPTH: | |
| V | VL (Cor | npleti | on) | | Dry | BORI | | Fe | b 10 | 2022 | HAMMEI | R TYPE: Auto | |
| V V | VL (Sea | sonal | High V | Vater) | N/A | | PLETED: | | | | | | |
| V V | VL (Sta | bilized |) | | N/A | | PMENT: | | | ED BY: Bore | DRILLING | 6 METHOD: CFA | |
| | Image: WL (Stabilized) N/A Truck StrataBore GEOTECHNICAL BOREHOLE LOG | | | | | | | | | | | | |

| CLIENT | | | | | | | BORING NO.: SHEET: | | | | | |
|------------|----------------|-------------|-------------------|---------------|----------------------------|--------------|---------------------|--------------|----------------|-----------|--------------------------|---------------------------------|
| City of \ | | | | | | | 19:8613 | | B-05 | | 1 of 1 | ECo |
| PROJEC | | | | | | | DRILLER/CONT | | OR: | | | |
| Stone R | | - | nents | | | | StrataBore, LLC | | | | | |
| 1 | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | LOSS OF CIRCULATION | |
| NORTH | | | | | | STATION: | SURFACE ELEVATION: | | | LEVATION: | | |
| 705616 | 8.1 | | | 25 | 82642.0 | | | | 10.00 | | BOTTOM OF CASING | |
| | SAMPLE NUMBER | д | (NI | Î | | | | | (L | | Plastic Limit V X | /ater Content Liquid Limit ∆ |
| DЕРТН (FT) | MUN | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | | | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | STANDAR | D PENETRATION BLOWS/FT |
| PTH | LE D | APLE | Е | DVE | DESCRIPTION O | = MATERIAL | | ER I | ATIC | NO | ROCK QUALIT | Y DESIGNATION & RECOVERY |
| DE | AMP | SAN | AMP | REO | | | | MAI | ELEV | BI | REC | |
| | Ś | | Ś | | | | | | | | CALIBRAT [FINES CONTE | ED PENETROMETER TON/SF |
| - | | | | | Asphalt [3"] | | | | | | | |
| _ | S-1 | ST | 15 | 15 | FILL, sand and gravel, o | ark brow | n [6"] | | | | | ⊖ _{3.50} |
| - | | 0. | 10 | | (CH) FAT CLAY, dark bro | | | | | | | ⊖ _{3.50} |
| | S-2 | ST | 24 | 24 | stiff | | | | | | | |
| | - | 0. | | | | | | | - | | | \sim |
| - | | | | | | | | | _ | | | ⊖ _{3.50} |
| 5- | S-3 | ST | 24 | 24 | | | | | 505 | | | |
| - | | | | | (CH) FAT CLAY, brown a | nd light h | | | - - | | | O _{4.50} |
| _ | S-4 | ST | 24 | 24 | moist, hard | inu iigint t | | | | | | |
| | | | | | | | | | | | | O _{4.50} |
| - | 6.5 | ст | 24 | 24 | | | | | - | | | ⁰ 4.50 |
| - | S-5 | ST | 24 | 24 | | | | | | | | |
| 10- | | | | | END OF BORIN | G AT 10.0 | FT | | 500 | | | |
| - | | | | | | | | | - | | | |
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| 15- | | | | | | | | | 495- | | | |
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| 20- | | | | | | | | | 490- | | | |
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| 25 – | | | | | | | | | 485- | | | |
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| 30- | | | | | | | | | 480- | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | TH VL (Firs | | | | NES REPRESENT THE APPROXIN | | | | | | | E GRADUAL |
| | | | | cuj | Dry | | ING STARTED: | Feb 1 | 0 2022 | CAVE IN | DEPTH: | |
| | VL (Cor | - | - | | Dry | BOR | | Feb 1 | 0 2022 | HAMME | R TYPE: Auto | D |
| V V | VL (Sea | sonal | High V | Vater) | N/A | | IPLETED: IPMENT: | 1060 | GED BY: | | | |
| V 🗵 | VL (Sta | bilized |) | | N/A | Truck | | Strata | | DRILLING | 6 METHOD: CFA | |
| | | | | | GEO | | CAL BOREH | | | | | |

| CLIENT | | ~ | | | | | PROJECT 19:8613 | NO.: | | BORING I B-06 | NO.: | SHEET: 1 of 1 | | |
|-----------------|----------------|-------------|-------------------|---------------|---|-------------|----------------------|--------|--------------|-------------------------|-----------|------------------|---|-------------------------|
| City of N | | | | | | | DRILLER/ | CONTRA | | | | 1 01 1 | | ECQ |
| Stone R | | | nents | | | | StrataBo | | | | | | | |
| SITE LO | | | | | | | | -, - | | | | | | |
| | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | | LOS | S OF CIRCULATION | <u>>100/</u> > |
| NORTH 705567 | | | | | ASTING: 82631.5 | STATION: | | | | IRFACE E 6.00 | LEVATION: | BO | TTOM OF CASING | |
| | BER | ш | (ZI) | Î | | | | | S | (L | | Plastic Li X— | mit Water Conten | t Liquid Limit ────△ |
| DEPTH (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION O | PF MATERIA | L | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | ROCK (| ANDARD PENETRATIC QUALITY DESIGNATION QD EC LIBRATED PENETROM CONTENT] % | I & RECOVERY |
| - | 6.4 | | 47 | 47 | Asphalt [2"] FILL, sand and gravel, | brown [E | ייו | | | | | [11165 | | ⊖ _{4.50} |
| | S-1 | ST | 17 | 17 | FILL, LEAN/FAT CLAYS, | light bro | wn and | | | - | | | O _{3.00} | |
| | S-2 | ST | 24 | 24 | dark brown, moist, ve | ry stiff to | hard | | | - | | | O _{3.00} | |
| 5- | S-3 | ST | 24 | 24 | | | | | | 491- | | | |) _{3.75} |
| | S-4 | ST | 24 | 24 | | | | | | | | | 0 _{2.75} | |
| - - 10- | S-5 | ST | 24 | 24 | (CH) FAT CLAY, light bro moist, very stiff | | | | | 486- | | | 2.70 | |
| - | | | | | END OF BORIN | IG AT 10.0 |) FT | | | - | | | | |
| | | | | | | | | | | | | | | |
| 15- | | | | | | | | | | 481 – - - | | | | |
| - | | | | | | | | | | - | | | | |
| 20- | | | | | | | | | | 476 - - | | | | |
| | | | | | | | | | | - | | | | |
| | | | | | | | | | | | | | | |
| 25- | | | | | | | | | | 471 – - - - | | | | |
| - | | | | | | | | | | - | | | | |
| 30- | | | | | | | | | | 466 | | | | |
| | | | | | | | | | | | | | | |
| v | TI VL (Firs | | | | NES REPRESENT THE APPROXII Dry | | | | | | | | AY BE GRADU | AL |
| | VL (Coi | | | , | Dry | | RING START | | | 2022 | CAVE IN | | | |
| V V | VL (Sea | asonal | High V | Vater) | N/A | со | MPLETED: JIPMENT: | | | 2022 ED BY: | HAMME | K TYPE: | Auto | |
| ⊻ v | VL (Sta | bilized |) | | N/A | True | | St | rata | Bore | DRILLING | 6 METHOD: | CFA | |

| CLIENT City of V | | × | | | | PROJECT NO.: 19:8613 | | BORING I B-07 | NO.: | SHEET: 1 of 1 |
|---------------------|----------------|-------------|-------------------|---------------|---|-------------------------|--------------|-------------------------|-----------|---|
| PROJEC | | | | | | DRILLER/CONTR | | | | EUS |
| Stone R | | - | nents | | | StrataBore, LLC | | | | |
| SITE LO | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | LOSS OF CIRCULATION |
| NORTH 705514 | | | | | ASTING: STATION: 82613.0 | | | URFACE E 87.00 | LEVATION: | BOTTOM OF CASING |
| DEPTH (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION OF MATERIAL | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | Plastic Limit Water Content Liquid Limit X |
| | S₽ | | SP | | | | | | | CALIBRATED PENETROMETER TON/SF [FINES CONTENT] % |
| - | S-1 | ST | 14 | 14 | Asphalt [3"] FILL, sand and gravel, brown, br yellow [7"] | ownish | | | | ○ _{3.00} ○ _{3.00} |
| - | S-2 | ST | 24 | 24 | (CL) LEAN CLAY, light brownish y moist, very stiff | rellow, | | - | | |
| 5- | S-3 | ST | 24 | 24 | (CL) LEAN CLAY, brown and light moist, very stiff to hard | brown, | | 482 | | O _{3.50} |
| - | S-4 | ST | 24 | 24 | | | | | | O _{4.25} |
| | S-5 | ST | 24 | 24 | | | | | | O _{4.50} |
| 10- | | | | | END OF BORING AT 10.0 | FT | 4 | 477 - | | |
| - | | | | | | | | | | |
| | | | | | | | | 472 | | |
| - | | | | | | | | - | | |
| - | | | | | | | | - | | |
| 20- | | | | | | | | 467 - | | |
| - | | | | | | | | - | | |
| 25- | | | | | | | | 462- | | |
| | | | | | | | | - | | |
| | | | | | | | | | | |
| 30- | | | | | | | | 457 - | | |
| | | | | | | | | | | |
| | Tł VL (Firs | | | | NES REPRESENT THE APPROXIMATE BOUN | | | | | |
| | VL (Cor | | | ~~/ | Dry BOR | ING | | 0 2022 | CAVE IN | |
| | VL (Sea | _ | - | Vater) | N/A CON | IPLETED: | | 0 2022 | HAMME | R TYPE: Auto |
| V V | VL (Sta | bilized |) | | N/A Truck | | Strata | | DRILLING | 6 METHOD: CFA |
| | | | | | GEOTECHNI | CAL BOREHO | LEL | .OG | | |

| CLIENT City of \ | | x | | | | | PROJEC 19:861 | CT NO.: 3 | | BORING I B-08 | NO.: | SHEET: 1 of 1 | | |
|---------------------|----------------|-------------|-------------------|---------------|---|---------------|------------------|--------------|--------------|-------------------------|-----------|----------------------|--|-------------------|
| PROJEC | | | | | | | | R/CONTRA | | | | 1011 | | EUQ |
| Stone R | | - | nents | | | | Strata | ore, LLC | | | | 1 | | ~ |
| SITE LO WA Alle | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | | LOSS OF | CIRCULATION |)IOD |
| NORTH 705464 | | | | | STING: 82601.5 | STATION: | | | | JRFACE E 1.00 | LEVATION: | BOTTON | 1 OF CASING | |
| _ | BER | ЭE | (IN) | ź | | | | | ILS | (L1 | | Plastic Limit V X | Water Content | Liquid Limit ∆ |
| DЕРТН (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION C | IF MATERIAL | | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | ROCK QUALI | RD PENETRATION TY DESIGNATION (TED PENETROMET ENT] % | & RECOVERY |
| - | S-1 | ST | 17 | 17 | Asphalt [2"] FILL, sand and gravel, | brown [5' | '] | | | | | |) 2.25 | |
| | S-2 | ST | 24 | 24 | FILL, FAT/LEAN CLAYS, light brown, moist, ve | | vn and | | | - | | | ⊖ _{3.00} | |
| | <u> </u> | | 24 | 24 | (CH) FAT CLAY, brown | and light I | prown, | | | 466 | | | ⊖ _{3.00} | |
| 5- | S-3 | ST | 24 | 24 | moist, very stiff | | | | | 400 - | | | ⊖ _{3.00} | |
| | S-4 | ST | 24 | 24 | | | | | | - | | | O _{3.00} | |
| - - 10- | S-5 | ST | 24 | 24 | | | | | | 461 | | | 0.00 | |
| - 10 | | | | | END OF BORIN | IG AT 10.0 | FT | | | 401 | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 15- | | | | | | | | | | 456 | | | | |
| | | | | | | | | | | - | | | | |
| | | | | | | | | | | - | | | | |
| 20- | | | | | | | | | | 451- | | | | |
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| 25- | | | | | | | | | | 446 | | | | |
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| - | | | | | | | | | | | | | | |
| 30- | | | | | | | | | | 441- | | | | |
| | | | | | | | | | | | | | | : |
| | Tł VL (Firs | | | | NES REPRESENT THE APPROXI | | | | | | | | BE GRADUAI | |
| | VL (Coi | | | -~/ | Dry | BOF | ING STAR | | |) 2022 | CAVE IN | | | |
| | VL (Sea | | - | Vater) | N/A | CON | /PLETED: | | |) 2022 | HAMME | R TYPE: Aut | :0 | |
| V 🗹 | VL (Sta | bilized |) | | N/A | Truc | | s | trata | | DRILLING | G METHOD: CFA | 1 | |
| | | | | | GEO | TECHNI | CAL BC | DREHOL | .E L | OG | | | | |

| CLIENT | | | | | | | PROJECT NO.: | | BORING | NO.: | SHEET: | | |
|---------------------|---------------|-------------|-------------------|---------------|---------------------------------|-------------|--------------------------|--------------|----------------|---------------|------------------|---------------------------------------|-----------------|
| City of V PROJEC | | | | | | | 19:8613 DRILLER/CONTR | | B-09 | | 1 of 1 | Ľ | CQ |
| Stone R | | | nents | | | | StrataBore, LLC | ACTO | ν π . | | | | |
| SITE LO | | | | | | | 0 | | | | | | |
| WA Alle | n Boul | evard t | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | LOSS | OF CIRCULATION | <u>) 1007</u>) |
| NORTH | | | | | | STATION: | | | | LEVATION: | BOT | TOM OF CASING | |
| 7054468 | 8.9 | | | 25 | 82459.5 | | | 46 | 59.00 | | | | |
| | BER | ш | (Z | | | | | S | Ê | | Plastic Li X— | mit Water Content Liquic | l Limit |
| (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | | | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | STA | NDARD PENETRATION BLOW | S/FT |
| DЕРТН (FT) | LE N | 1PLE | LE D | DVEF | DESCRIPTION OF | MATERIAL | | ERL | ATIO | MO | | UALITY DESIGNATION & RECO | VERY |
| DE | AMP | SAN | AMP | RECO | | | | WAT | ELEV | BL | R R | | |
| | S/ | | S/ | | | | | | | | | IBRATED PENETROMETER TO CONTENT] % | N/SF |
| | | | | | Asphalt [4"] | | | | | | [FINES | | |
| - | S-1 | ST | 15 | 15 | FILL, sand and gravel, b | rown [5"] | | | | | | ⊖ _{3.50} | |
| _ | | | | | (CH) FAT CLAY, dark bro | | ght 🛛 | 4 | - | | | ⊖ _{3.50} | |
| _ | S-2 | ST | 24 | 24 | brown, moist, very stiff | 2 | | 4 | - | | | | |
| _ | | | | | | | | 4 | - | | | O _{3.25} | |
| 5- | S-3 | ST | 24 | 24 | | | | 4 | 464 - | | | 0.20 | |
| - | | | | | | | | 4 | - | | | ⊖ _{3.50} | |
| - | S-4 | ST | 24 | 24 | | | | 1 | - | | | ○ 3.50 | |
| - | 5-4 | 31 | 24 | 24 | | | | 1 | - | | | 0 | |
| - | | _ | | | | | | 1 | - | | | ⊖ _{3.50} | |
| - | S-5 | ST | 24 | 24 | | | | | | | | | |
| 10- | | | | | END OF BORING | G AT 10.0 F | =T | | 459- | | | | |
| - | | | | | | | | | - | | | | |
| - | | | | | | | | | - | | | | |
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| - | | | | | | | | | | | | | |
| 15- | | | | | | | | | 454 - | | | | |
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| 20- | | | | | | | | | 449 | | | | |
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| 25- | | | | | | | | | 444 - | | | | |
| - 20 | | | | | | | | | | | | | |
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| 30- | | | | | | | | | 439- | | | | |
| | | | | | | | | | | | | | |
| | LLLL TH | HE STRA | l Atifica | i Tion Li | L NES REPRESENT THE APPROXIM | 1ATE BOUND | ARY LINES BETWEE | N SOIL | L TYPES. IN | I-SITU THE TR | i Ansition M | AY BE GRADUAL | |
| V V | VL (Firs | | | | Dry | | | | 0 2022 | CAVE IN | | | |
| | VL (Cor | | | | Dry | | | | | | //// | | |
| | VL (Sea | - | - | N/ator) | | BORI COM | NG PLETED: | Feb 10 | 0 2022 | HAMME | R TYPE: | Auto | |
| | | | | valei) | | | | LOGG | ED BY: | | METHOD: | CEA | |
| <u>×</u> v | VL (Sta | bilized |) | | N/A | Truck | | Strata | | | | UN | |
| | | | | | GEO | TECHNIC | CAL BOREHO | LE L | ÜĞ | | | | |

| CLIENT | | | | | | | PROJECT NO. | : | | NG NO.: | SHEET: | |
|-------------------|---------------|-------------|-------------------|---------------|--|--------------|-------------------------------|---------|----------------------------------|---------------|--------------------------------|-------------------|
| | | | | | | | 19:8613 | | B-10 | | 1 of 1 | -ECe |
| PROJEC Stone R | | | nents | | | | DRILLER/CON StrataBore, LL | | IOR: | | | |
| SITE LO | CATIO | ٧: | | | | | Stratabore, EE | | | | LOSS OF CIRCULATIO | N XIDD |
| | | evard t | o Benn | | ad, Wylie, Texas 75098 | CTATION | | | | | | |
| NORTH 705449 | | | | | ASTING: 81997.8 | STATION: | | | 490.00 | CE ELEVATION: | BOTTOM OF CASING | s 🗾 |
| DЕРТН (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION C | DF MATERIAL | | | VVAIEK LEVELS EI FVATION (FT) | BLOWS/6" | Plastic Limit Water Conto X | |
| DE | SAMP | SAN | SAMP | RECO | | | | | FI FV | BL | REC | |
| | 0, | | 0, | | | | | | _ | | CALIBRATED PENETRO | METER TON/SF |
| | | | | | Asphalt [3"] FILL, sand and gravel, | brown [6" | ·····/// | | | _ | | O _{4.50} |
| | S-1 | ST | 15 | 15 | (CH) FAT CLAY, dark br | | | | | - | | 0 _{4.50} |
| | S-2 | ST | 24 | 24 | | | | | | - | | |
| | S-3 | ST | 24 | 24 | (CH) FAT CLAY, light br | own and b | rown, | | 48 | 5_ | | ⊖ _{4.50} |
| - | 3-3 | 31 | 24 | 24 | moist, hard | | | | 40 | - | | ⊖ _{4.50} |
| | S-4 | ST | 24 | 24 | | | | | | - | | |
| | 6.5 | CT | 24 | 24 | | | | | | - | | ⊖ _{4.50} |
| 10- | S-5 | ST | 24 | 24 | | IC AT 40.0 | | | 48 | 0- | | |
| - | | | | | END OF BORIN | NG AT 10.0 | | | | - | | |
| | | | | | | | | | | - | | |
| | | | | | | | | | | _ | | |
| | | | | | | | | | 47 | | | |
| 15- | | | | | | | | | 47 | 5- | | |
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| 20- | | | | | | | | | 47 | | | |
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| 25- | | | | | | | | | 46 | 5_ | | |
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| | | | | | | | | | | - | | |
| | | | | | | | | | | | | |
| 30- | | | | | | | | | 46 | U | | |
| | тı | ЧЕ СТР | | | | | ARV LINES DET | /EENI C | | | | |
| ∠ v | VL (Firs | | | | NES REPRESENT THE APPROXI Dry | | ING STARTED: | | 10 2022 | | | JAL |
| | VL (Coi | | | | Dry | BOR | | | | | | |
| V V | VL (Sea | isonal | High V | Water) | N/A | CON | IPLETED: | | | | R TYPE: Auto | |
| V 🗹 | VL (Sta | bilized |) | | N/A | EQU Truck | IPMENT: | | GGED B taBore | | g method: CFA | |
| | | | | | GEC | DTECHNI | CAL BOREH | | | | | |

| CLIENT | | | | | | | PROJECT NO.: | | BORING I | NO.: | SHEET: | | |
|---------------------|----------------|-------------|-------------------|---------------|--|-------------|--------------------------|--------------|-----------------------|-----------|----------------------|---|------------------------|
| City of V PROJEC | | | | | | | 19:8613 DRILLER/CONTE | | B-11 | | 1 of 1 | | ECQ |
| Stone R | | | aanta | | | | StrataBore, LLC | ACTO | JK: | | | | |
| SITE LO | | - | ients | | | | Stratabore, LLC | | | | | | ~ |
| WA Alle | n Boul | | o Benn | | ad, Wylie, Texas 75098 | | | | | | LOSS OF CI | RCULATION | <u>>100</u> 2 |
| NORTH 705450 | | | | | ASTING: 81576.3 | STATION: | | | URFACE E 09.00 | LEVATION: | BOTTOM | DF CASING | |
| DEPTH (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION C | DF MATERIAL | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | ROCK QUALITY | PENETRATION DESIGNATION 8 DESIGNATION 8 | BLOWS/FT & RECOVERY |
| | S-1 | ST | 16 | 16 | Asphalt [4"] FILL, sand and gravel, | brown [4" | 'I | | | | | | O _{4.50} |
| - | S-2 | ST | 24 | 24 | (CH) FAT CLAY, dark br | | | | | | | | ⊖ _{4.50} |
| - | | | | | (CH) FAT CLAY, light br | own, mois | st, hard | 4 | 504 - | | | | O _{4.50} |
| 5- | S-3 | ST | 24 | 24 | | | | | 504 - | | | | ⊖ _{4.50} |
| | S-4 | ST | 24 | 24 | | | | | | | | | O _{4.50} |
| 10- | S-5 | ST | 24 | 24 | END OF BORIN | NG AT 10.0 | FT | 4 | - 499- | | | | |
| - | | | | | | 10 AT 10.0 | F1 | | | | | | |
| - | | | | | | | | | - | | | | |
| 15- | | | | | | | | | 494 - | | | | |
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| 20- | | | | | | | | | 489 | | | | |
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| 25- | | | | | | | | | 484 – | | | | |
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| 30- | | | | | | | | | 479- | | | | |
| | | | | | | | | | | | | | |
| | TH VL (Firs | | | | NES REPRESENT THE APPROXI Dry | | DARY LINES BETWEE | | L TYPES. IN 0 2022 | CAVE IN | | GRADUAI | <u></u> |
| | VL (Cor | | | , | Dry | BOR | | | | _ | | | |
| V V | VL (Sea | isonal | High V | Vater) | N/A | CON | IPMENT: | | 0 2022 GED BY: | HAMME | |) | |
| V V | VL (Sta | bilized |) | | N/A | Truc | k | Strata | Bore | DRILLING | G METHOD: CFA | | |
| | | | | | GEC | JIECHINI | CAL BOREHO | LE L | UG | | | | |

| CLIENT | | | | | | | PROJECT NO | .: | | ORING | NO.: | SHEET: | |
|---------------------|---------------|-------------|-------------------|---------------|---------------------------|------------|------------------------|-------------|--------------|----------------|--------------|---------------------------------------|---------------------|
| City of N PROJEC | | | | | | | 19:8613 DRILLER/COI | | | -12 | | 1 of 1 | -ECe |
| Stone R | | | nents | | | | StrataBore, L | | .106 | | | | |
| SITE LO | CATIO | N: | | | | | Stratabore, E | | | | | LOSS OF CIRCULA | |
| | | evard t | o Benn | | ad, Wylie, Texas 75098 | CTATION | | | CLU | | | | |
| NORTH 705450 | | | | | ASTING: 81026.9 | STATION: | | | 501 487 | | LEVATION: | BOTTOM OF CAS | ing |
| | | | _ | | | 1 | | | | | | Plastic Limit Water Co | ontent Liquid Limit |
| F | MBEI | γPE | I. (IN | (IN) | | | | | ELS | (FT) | - | X• | Δ |
| DЕРТН (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION C | F MATERIAL | | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | STANDARD PENET ROCK QUALITY DESIGN | |
| DEPT | 4PLE | AMP | APLE | COV | | | | | ATEF | EVAT | BLO | RQD | |
| | SAN | Ś | SAN | RE | | | | | 3 | | | CALIBRATED PENE | TROMETER TON/SF |
| | | | | | Asphalt [3"] | | | | | | | [FINES CONTENT] % | |
| | C 1 | ст | 1.1 | 14 | FILL, sand and gravel, | brown [7" | 1 | | _ | _ | | | O _{4.50} |
| | S-1 | ST | 14 | 14 | FILL, FAT/LEAN CLAYS, | | | | | - | | | O _{4.50} |
| | S-2 | ST | 24 | 24 | | | | | | - | | | |
| | | | | | | | | | | - | | | O _{4.50} |
| 5- | S-3 | ST | 24 | 24 | (CH) FAT CLAY, light br | own and b | rown, | | | 482- | | | - 4.50 |
| - | 55 | 51 | 24 | 24 | moist, hard | | | | | -102 | | | 0 |
| - | 6.4 | CT. | 24 | 24 | | | | | | - | | | ⊖ _{4.50} |
| - | S-4 | ST | 24 | 24 | | | | | | - | | | 0 |
| - | | | | | | | Ĩ | | | - | | | O _{4.50} |
| | S-5 | ST | 24 | 24 | | | | $ \rangle$ | | | | | |
| 10- | | | | | END OF BORIN | NG AT 10.0 | FT | | | 477 - | | | |
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| 15- | | | | | | | | | | 472 - | | | |
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| 20- | | | | | | | | | | 467 - | | | |
| - 20 | | | | | | | | | | - 104 | | | |
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| 25- | | | | | | | | | | 462 - | | | |
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| 30- | | | | | | | | | | 457 - | | | |
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| | TI | HE STR4 | L Atifica | I TION I I | NES REPRESENT THE APPROXI | MATE BOUNF | DARY LINES BFT | VEENIS | 011 - | TYPES. IN | -SITU THF TR | L ANSITION MAY BF GRA | DUAL |
| ∠ v | VL (Firs | | | | Dry | | NG STARTED: | | | 2022 | CAVE IN | | |
| | VL (Coi | | | , | , Dry | | | reb | , | 2022 | | | |
| | | | | | | BOR | NG IPLETED: | Feb | 09 | 2022 | HAMME | R TYPE: Auto | |
| | | | | Water) | | | IPMENT: | LO | GGE | D BY: | | | |
| ⊻ V | VL (Sta | bilized |) | | N/A | Truck | I. | Stra | ataB | ore | DRILLING | 6 METHOD: CFA | |
| | | | | | GEO | DTECHNI | CAL BOREH | IOLE | LC |)G | | | |

| CLIENT | | | | | | | PROJECT NO.: | | BORING | NO.: | SHEET: | |
|-------------------|---------------|-------------|-------------------|---------------|---------------------------|-------------|---------------------------------|--------------|--|---------------|------------------------|-------------------------|
| | | | | | | | 19:8613 | DACT | B-13 | | 1 of 1 | ECe |
| PROJEC Stone R | | | nonte | | | | DRILLER/CONT StrataBore, LLC | | UR: | | | |
| SITE LO | | | ients | | | | Stratabore, LLC | | | | | |
| | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | LOSS OF CIRC | |
| NORTH | | | | | ASTING: | STATION: | | | | ELEVATION: | BOTTOM OF | |
| 7054510 | 0.2 | | | 25 | 80515.1 | | | 4 | 86.00 | | | |
| | ER | | 2 | = | | | | S | Ē | | Plastic Limit Wat | er Content Liquid Limit |
| (FT) | JMB | SAMPLE TYPE | ST. (| X (IV | | | | NEL | N (F | /9" | STANDARD F | PENETRATION BLOWS/FT |
| DЕРТН (FT) | E NI | PLE | E DI | VER | DESCRIPTION C | OF MATERIAL | | LE | ATIO | BLOWS/6" | | ESIGNATION & RECOVERY |
| DEI | SAMPLE NUMBER | SAM | SAMPLE DIST. (IN) | RECOVERY (IN) | | | | WATER LEVELS | ELEVATION (FT) | BL(| RQD REC | |
| | SA | | SA | | | | | | | | | PENETROMETER TON/SF |
| | | | | | Asphalt [3"] | | | | | | [FINES CONTENT] | % |
| | S-1 | ST | 13 | 13 | FILL, sand and gravel, | brown [8" | 1 /77 | 7 | | | | ⊖ _{4.25} |
| - | | 51 | 15 | 10 | (CL) LEAN CLAY, light b | | brown, | Ά | - | | | O _{3.75} |
| | S-2 | ST | 24 | 24 | moist, very stiff to har | ď | | Ά | | | | |
| - | | | | | - | | | Ά | - | | | O _{3.75} |
| 5- | S-3 | ST | 24 | 24 | | | | Ά | 481- | | | 5.75 |
| | | 51 | 27 | 24 | | | | Ά | | | | \bigcirc |
| - | C A | ст | 24 | 24 | | | | Ά | - | | | O _{4.00} |
| | S-4 | ST | 24 | 24 | | | | Ά | - | | | |
| | | | | | | | | Ά | - | | | ⊖ _{4.25} |
| | S-5 | ST | 24 | 24 | | | | Ά | - | | | |
| 10- | | | | | END OF BORIN | NG AT 10.0 | FT | 4 | 476 | | | |
| - | | | | | | | | | - | | | |
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| 15- | | | | | | | | | 471- | | | |
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| 20- | | | | | | | | | 466 - | | | |
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| 25- | | | | | | | | | 461- | | | |
| - 20 | | | | | | | | | - | | | |
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| 30- | | | | | | | | | 456 | | | |
| \mid | | | | | | | | - | | | | |
| | LLLL Tł | HE STRA | l Atifica | i Tion Li | NES REPRESENT THE APPROXI | MATE BOUN | DARY LINES BETWE | EN SO | IL TYPES. IN | N-SITU THE TR | I ANSITION MAY BE (| GRADUAL |
| V W | VL (Firs | | | | Dry | | ING STARTED: | | 9 2022 | CAVE IN | | |
| | VL (Cor | | | | Dry | | | | ,, | | | |
| | | _ | - | | | BOR | ING 1PLETED: | Feb 0 | 9 2022 | HAMME | R TYPE: Auto | |
| | VL (Sea | | | vater) | | | IPMENT: | LOG | GED BY: | | | |
| V 12 | VL (Sta | bilized |) | | N/A | Truc | k | Strat | aBore | | 6 METHOD: CFA | |
| | | | | | GEO | DTECHNI | CAL BOREHO | DLE I | LOG | | | |

| CLIENT | | | | | | | PROJECT NO.: | | BORING I | NO.: | SHEET: | |
|-------------------|---------------|-------------|-------------------|---------------|--|-----------------|-----------------------------------|--------------|----------------|----------------|---------------|-----------------------------|
| | | | | | | | 19:8613 | | 3-14 | | 1 of 1 | -tCe |
| PROJEC Stone R | | | nonte | | | | DRILLER/CONTR. StrataBore, LLC | ACIO | K: | | | |
| SITE LO | | - | ients | | | | | | | | | |
| | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | LOSS OF CIRC | |
| NORTH | IING: | | | EA | ASTING: STA | ATION: | | SL | JRFACE E | LEVATION: | BOTTOM OF | |
| 705451 | 9.9 | | r | 25 | 79996.2 | | | 50 | 4.00 | | borrowror | |
| DЕРТН (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION OF M | IATERIAL | | WATER LEVELS | ELEVATION (FT) | BLOW5/6" | X | r Content Liquid Limit ● |
| - | | | | | Asphalt [4"] | | | | - | | | |
| - | S-1 | ST | 14 | 14 | FILL, sand and gravel, bro | | | | | | | O _{3.00} |
| | | | | | (CH) FAT CLAY, dark brown moist, very stiff | n and bro | wn, | | | | | ⊖ _{3.50} |
| - | S-2 | ST | 24 | 24 | | | | | | | | |
| | | 6T | 24 | 24 | | | | | | | | ⊖ _{3.75} |
| 5- | S-3 | ST | 24 | 24 | | | | | 499- | | | |
| - | | | | | (CH) FAT CLAY, light brown | n and bro | wn, | | | | | 2.75 |
| - | S-4 | ST | 24 | 24 | moist, very stiff | | | 1 | | | | |
| | | _ | | | | | | | - | | | O _{3.00} |
| | S-5 | ST | 24 | 24 | | | | | | | | |
| 10- | | | | | END OF BORING A | AT 10.0 FT | | | 494 – | | | |
| - | | | | | | | | | | | | |
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| 15- | | | | | | | | | 489- | | | |
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| 20- | | | | | | | | | 484 - | | | |
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| 25- | | | | | | | | | 479- | | | |
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| 30 - | | | | | | | | | 474 | | | |
| | | | | | | | | - | | | | |
| | т. | IE CTD | | | NES REPRESENT THE APPROXIMAT | | AV LINES RETINE | | TYPES IN | _SITI I THE 78 | | |
| ∠ v | VL (Firs | | | | Dry | | | | | | | |
| | VL (Cor | | | -~/ | | | | -eo 09 | 2022 | CAVE IN | UEPIH: | |
| | | - | - | | Dry | BORING COMPL | | eb 09 | 2022 | HAMMEI | R TYPE: Auto | |
| | VL (Sea | | | vater) | | | | OGG | ED BY: | | | |
| ⊻ V | VL (Sta | bilized |) | | N/A | Truck | 9 | Strata | Bore | DRILLING | 6 METHOD: CFA | |
| | | | | | GEOTE | CHNICA | AL BOREHO | LEL | OG | | | |

| CLIENT City of V | | x | | | | PROJECT N 19:8613 | 0.: | | BORING I 3-15 | NO.: | SHEET: 1 of 1 |
|---------------------|---------------|-------------|-------------------|---------------|---|----------------------|-------|--------------|-------------------------|---------------|---|
| PROJEC | | | | | | DRILLER/CO | ONTRA | | | | |
| Stone R | | - | nents | | | StrataBore, | LLC | | | | |
| SITE LO | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | LOSS OF CIRCULATION |
| NORTH 705453 | | | | | ASTING: STATION: 79510.3 | | | | JRFACE E 1.00 | LEVATION: | BOTTOM OF CASING |
| DEPTH (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION OF MATERIAL | | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | Plastic Limit Water Content Liquid Limit X |
| - | | | 10 | 10 | Asphalt [3"] FILL, sand and gravel, brown [8"] | / | | | | | ⊖ _{3.50} |
| - | S-1 | ST | 13 | 13 | FILL, LEAN/FAT CLAYS, brown, mo | | | | | | 0 _{2.75} |
| | S-2 | ST | 24 | 24 | \ <u>stiff</u> (CH) FAT CLAY, dark brown, moist stiff | , very | | | | | ⊖ _{2.50} |
| 5 | S-3 | ST | 24 | 24 | (CH) FAT CLAY, light brown and d | ark | | | 506 - | | O _{3.75} |
| - | S-4 S-5 | ST | 24 | 24 | brown, moist, very stiff to hard | | | | - | | O _{4.50} |
| 10- | 5-5 | ST | 24 | 24 | END OF BORING AT 10.0 F | T | | | 501- | | |
| | | | | | | | | | | | |
| 15 | | | | | | | | | 496 | | |
| 20- | | | | | | | | | 491 | | |
| 25 | | | | | | | | | 486 - | | |
| | | | | | | | | | 481- | | |
| | | | | | | | | | - | | |
| | Tł | HE STRA | L ATIFICA | I TION LI | NES REPRESENT THE APPROXIMATE BOUND | ARY LINES BE | TWEEN | L I SOIL | TYPES. IN | I-SITU THE TR | ANSITION MAY BE GRADUAL |
| V V | VL (Firs | | | | Davi | NG STARTED | | | 2022 | CAVE IN | |
| • • | VL (Cor | npleti | on) | | Dry BORI | | F | eb 09 | 2022 | HAMMEI | R TYPE: Auto |
| | VL (Sea | | | Vater) | N/A | PLETED: PMENT: | | | ED BY: | | |
| <u>▼</u> ∨ | VL (Sta | bilized |) | | N/A Truck GEOTECHNIC | | S | tratal | Bore | DRILLING | 6 METHOD: CFA |

| CLIENT City of V | | × | | | | PROJECT NO.: 19:8613 | | BORING I B-16 | NO.: | SHEET: 1 of 1 |
|---------------------|---------------|-------------|-------------------|---------------|---|-------------------------|--------------|-------------------------|-----------|--|
| PROJEC | | | | | | DRILLER/CONTRA | | | | |
| Stone R | oad Im | proven | nents | | | StrataBore, LLC | | | | |
| SITE LO | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | LOSS OF CIRCULATION |
| NORTH 7054534 | ING: | | | EA | ASTING: STATION: 79024.9 | | | JRFACE E 15.00 | LEVATION: | BOTTOM OF CASING |
| | 3ER | ш | (N | , | | | S | F | | Plastic Limit Water Content Liquid Limit X∆ |
| DЕРТН (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION OF MATERIAL | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | STANDARD PENETRATION BLOWS/FT ROCK QUALITY DESIGNATION & RECOVERY RQD REC CALIBRATED PENETROMETER TON/SF [FINES CONTENT] % |
| - | | | | | Asphalt [4"] | | | - | | O _{2.25} |
| - | S-1 | ST | 12 | 12 | FILL, sand and gravel, brown [8" (CH) FAT CLAY, dark brown, mois | | | - | | ○2.25 ○ _{3.50} |
| - | S-2 | ST | 24 | 24 | stiff | | | | | |
| 5- | S-3 | ST | 24 | 24 | | | | 510- | | O _{2.75} |
| | | | | | | | | - | | O _{3.25} |
| - | S-4 | ST | 24 | 24 | | | | | | O _{4.25} |
| | S-5 | ST | 24 | 24 | (CH) FAT CLAY, brown, moist, har | a | | | | |
| 10- | | | | | END OF BORING AT 10.0 | FT | | - 505 - | | |
| - | | | | | | | | - | | |
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| 15- | | | | | | | | 500 | | |
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| 20- | | | | | | | | 495- | | |
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| 25- | | | | | | | | 490- | | |
| 20- | | | | | | | | 490 | | |
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| - | | | | | | | | | | |
| | | | | | | | | - | | |
| 30- | | | | | | | | 485- | | |
| | т | HE STR | | | NES REPRESENT THE APPROXIMATE BOUND | ARY LINES RETWIEEN | | TYPES IN | | |
| V V | VL (Firs | | | | Data | | | 9 2022 | CAVE IN | |
| | VL (Cor | | | | Dry BORI | NG | | | | |
| V V | VL (Sea | isonal | High V | Vater) | N/A COM | IPLETED: | | 9 2022 | HAMME | R TYPE: Auto |
| V V | VL (Sta | bilized |) | | N/A EQU | | | ED BY: Bore | DRILLING | g method: CFA |
| | | | | | | CAL BOREHOL | | | | |

| CLIENT | | | | | | | PROJECT NO.: | | BORING I | NO.: | SHEET: | |
|-----------------|----------------|-------------|-------------------|---------------|---|-------------|---------------------------|--------------|-------------------------|-----------|---|-------------------|
| City of PROJEC | | | | | | | 19:8613 DRILLER/CONTRA | | 3-17 | | 1 of 1 | - ECe |
| Stone R | | | nents | | | | StrataBore, LLC | 4010 | η. | | | |
| SITE LO | | | | | | | | | | | | |
| WA Alle | en Boul | evard t | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | LOSS OF CIRCULATIO | |
| NORTH 705454 | | | | | ASTING: S 78566.0 | STATION: | | | JRFACE E 8.00 | LEVATION: | BOTTOM OF CASIN | G D |
| | ER | | (N) | - | | | | S | í. | | Plastic Limit Water Con | tent Liquid Limit |
| DEPTH (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION OF | MATERIAL | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | STANDARD PENETRA ROCK QUALITY DESIGNA' RQD RQD REC CALIBRATED PENETR | FION & RECOVERY |
| | - | | | | Asphalt [4"] | | | | - | | [FINES CONTENT] % | |
| - | S-1 | ST | 13 | 13 | FILL, sand and gravel, bi (CH) FAT CLAY, dark brow | | | | - | | 02.75 | ⊖ _{4.25} |
| - | S-2 | ST | 24 | 24 | moist, very stiff to hard | | | | - | | 2.75 | |
| 5- | S-3 | ST | 24 | 24 | | | | | 513 | | O _{2.75} | 5 |
| - | 3-5 | 31 | 24 | 24 | - | | | | - | | O _{2.50} | |
| - | S-4 | ST | 24 | 24 | | | | | - | | | |
| - | S-5 | ST | 24 | 24 | - | | | | - | | O _{2.50} | |
| 10- | - | | | | END OF BORING | G AT 10.0 F | т | | 508- | | | |
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| - | - | | | | | | | | - | | | |
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| 15- | - | | | | | | | | 503- | | | |
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| 20- | - | | | | | | | | 498- | | | |
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| 25- | - | | | | | | | | 493 - | | | |
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| 30- | | | | | | | | | 488- | | | |
| | | | | | | | | | | | | : : |
| \ \\ | TH VL (Firs | | | | NES REPRESENT THE APPROXIM | | | | TYPES. IN | CAVE IN | | UAL |
| | vL (Cor | | | | Dry | BORIN | IG | | | | | |
| | VL (Sea | | | Water) | N/A | | PLETED: | | ED BY: | HAMME | | |
| 1 🖭 V | | | | | N/A | 1-201 | | | | | 5 METHOD: CFA | |

| CLIENT | | | | | | | PROJECT | NO.: | | BORING | NO.: | SHEET: | |
|--|---------------|-------------|-------------------|---------------|---------------------------|--------------|----------------------|---------|--------------|----------------|---------------|----------------------|------------------------|
| | | | | | | | 19:8613 | | | 3-18 | | 1 of 1 | -ECc |
| PROJEC Stone R | | | nonte | | | | DRILLER/ StrataBo | | 4010 | K: | | | |
| SITE LO | | - | ients | | | | Stratabo | e, LLC | | | | | |
| | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | | LOSS OF CIRC | |
| NORTH | IING: | | | EA | ASTING: | STATION: | | | SL | JRFACE E | LEVATION: | BOTTOM OF | |
| 7054534 | 4.4 | | | 25 | 77937.4 | | | | 50 | 6.00 | | | |
| | R | | î | | | | | | | _ | | Plastic Limit Wate | r Content Liquid Limit |
| ET) | MBI | -YPE | 5T. (I | U. | | | | | VELS | l (FT | 9, | | ENETRATION BLOWS/FT |
| DЕРТН (FT) | E NU | LE 1 | E DIS | VERY | DESCRIPTION C | F MATERIAL | | | R LE | 10 I | BLOWS/6" | | SIGNATION & RECOVERY |
| DEP | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | | | | | WATER LEVELS | ELEVATION (FT) | BLC | RQD | |
| | SAI | 0) | SAI | ~ | | | | | > | | | CALIBRATED P | ENETROMETER TON/SF |
| | | | | | Asphalt [4"] | | | | | - | | [FINES CONTENT] | <u>6</u> : : : |
| _ | 6.4 | ст | | 1.4 | FILL, sand and gravel, | dark brow | /n [6"] | | | - | | | ⊖ _{3.50} |
| | S-1 | ST | 14 | 14 | (CH) FAT CLAY, brown | | | -{/// | | - | | | O _{4.00} |
| - | S-2 | ST | 24 | 24 | moist, very stiff to har | • | , | | | - | | | 4.00 |
| - | | | | | | | | | | - | | | O _{3.50} |
| 5- | 6.2 | ст | 24 | 24 | | | | | | 501- | | | 3.50 |
| 5- | S-3 | ST | 24 | 24 | | | | | | 501- | | | ~ |
| - | | | | | (CL) LEAN CLAY, light b | rown and | | | | - | | | O _{4.25} |
| - | S-4 | ST | 24 | 24 | brownish yellow, mois | st, very sti | ff to hard | | 1 | | | | |
| | | | | | | | | | 1 | - | | | ⊖ _{3.75} |
| _ | S-5 | ST | 24 | 24 | | | | | 1 | - | | | |
| 10- | | | | | END OF BORIN | IG AT 10 0 | FT | | | 496- | | | |
| - | | | | | | 10 AT 10.0 | F I | | | | | | |
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| 15- | | | | | | | | | | 491- | | | |
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| 20- | | | | | | | | | | 486 - | | | |
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| 25- | | | | | | | | | | 481 - | | | |
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| 20 | | | | | | | | | | 470 | | | |
| 30- | | | | | | | | | | 476- | | | |
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| | Tł | HE STRA | ATIFICA | TION LI | NES REPRESENT THE APPROXI | MATE BOUN | DARY LINES | BETWEEN | I SOIL | TYPES. IN | I-SITU THE TR | RANSITION MAY BE G | RADUAL |
| V V | VL (Firs | st Enco | ounter | ed) | Dry | BOF | ING START | ED: F | eb 09 | 2022 | CAVE IN | DEPTH: | |
| V V | VL (Cor | npleti | on) | | Dry | BOF | ING | | | | | | |
| Image: Complete the second sec | | | | | | F | eb 09 | 2022 | HAMME | R TYPE: Auto | | | |
| | | | | valet) | | | JIPMENT: | | | ED BY: | | 6 METHOD: CFA | |
| <u>×</u> | VL (Sta | pilized |) | | N/A | Truc | | | tratal | | | S WETHOD. CFA | |
| 1 | | | | | GEC | JIECHN | CAL BOI | ĸĿHOl | .E L(| UG | | | |

| CLIENT | | | | | | | PROJECT NO | D.: | | BORING I | NO.: | SHEET: | |
|------------|---------------|-------------|-------------------|---------------|---------------------------|---------------|---|------|--------------|----------------|---------------|------------------------------------|-----------------------------|
| | | | | | | | 19:8613 | | | 8-19 | | 1 of 1 | -tCe |
| PROJEC | | | | | | | DRILLER/CC | | CIO | K: | | | |
| Stone R | | | nents | | | | StrataBore, | | | | | | ····· |
| | | | o Benn | nett Roa | ad, Wylie, Texas 75098 | | | | | | | LOSS OF CIRCU | |
| NORTH | | | | | ASTING: | STATION: | | | SU | IRFACE E | LEVATION: | | |
| 705452 | 2.3 | | | 25 | 77377.1 | | | | 49 | 0.00 | | BOTTOM OF (| |
| DEPTH (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | | | | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | X | r Content Liquid Limit ● |
| EPTH | LE N | MPLE | LE C | OVE | DESCRIPTION C | F MATERIAL | | | LER | /ATI0 | POW | ROCK QUALITY DES | SIGNATION & RECOVERY |
| ā | AMF | SAN | AMF | REC | | | | | WA | ELEV | B | REC | |
| | S | | S | | | | | | | | | CALIBRATED PI [FINES CONTENT] 9 | ENETROMETER TON/SF |
| - | | | | | Asphalt [4"] | | | | | - | | | |
| - | S-1 | ST | 16 | 16 | FILL, sand and gravel, | | | | | - | | | O _{4.50} |
| | | | | | (CH) FAT CLAY, brown | and light l | prown, | | | - | | | O _{4.50} |
| _ | S-2 | ST | 24 | 24 | moist, hard | | | | | _ | | | |
| _ | | | | | | | | | | - | | | O _{4.50} |
| 5- | S-3 | ST | 24 | 24 | | | | [[]] | | 485- | | | |
| - | | _ | | | | | | | | - | | | O _{4.50} |
| - | сл | ст | 24 | 24 | | | | | | - | | | ^{4.50} |
| - | S-4 | ST | 24 | 24 | | | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | [[]] | | - | | | |
| - | | | | | | | , , | [[]] | | - | | | O _{4.50} |
| | S-5 | ST | 24 | 24 | | | , , | [[]] | | - | | | |
| 10- | | | | | END OF BORIN | IG AT 10.0 | FT | | | 480 – | | | |
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| 20- | | | | | | | | | | 470- | | | |
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| 25- | | | | | | | | | | 465 - | | | |
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| 30- | | | | | | | | | | 460- | | | |
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| | Tł | HE STRA | ATIFICA | TION LI | NES REPRESENT THE APPROXI | MATE BOUN | DARY LINES BET | WEEN | SOIL | TYPES. IN | I-SITU THE TR | RANSITION MAY BE G | RADUAL |
| | VL (Firs | st Enco | ounter | ed) | Dry | BOF | ING STARTED | Fe | eb 09 | 2022 | CAVE IN | DEPTH: | |
| V V | | npleti | on) | | Dry | | | | | | | | |
| | | | | | | Fe | eb 09 | 2022 | HAMME | R TYPE: Auto | | | |
| | | | | water) | | | IPMENT: | L | DGGI | ED BY: | | | |
| V 🗹 | VL (Sta | bilized |) | | N/A | Truc | k | St | rataE | Bore | | 6 METHOD: CFA | |
| | | | | | GEO | TECHNI | CAL BORE | HOL | E LC | DG | | | |

| CLIENT | | | | | | | PROJECT NO |).: | | BORING I | NO.: | SHEET: | |
|------------|---------------|-------------|-------------------|---------------|---|------------|-----------------|------|--------------|----------------|---------------|-----------------------|---------------------|
| City of V | | | | | | | 19:8613 | | | 3-20 | | 1 of 1 | -ECc |
| PROJEC | | | | | | | DRILLER/CO | | | K: | | | |
| Stone R | | | nents | | | | StrataBore, I | | | | | | ~ |
| | | | o Benn | ett Roa | ad, Wylie, Texas 75098 | | | | | | | LOSS OF CIRCULA | |
| NORTH | | | | | ASTING: | STATION: | | | SU | IRFACE E | LEVATION: | | |
| 7054522 | 2.6 | | | 25 | 76774.3 | | | | 478 | 8.00 | | BOTTOM OF CA | |
| | R | | î | | | | | | | _ | | Plastic Limit Water C | ontent Liquid Limit |
| (LI | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | | | | | WATER LEVELS | ELEVATION (FT) | | STANDARD PENE | |
| I) HI | NN | LE T | DIS | /ERY | DESCRIPTION C | F MATERIAL | | | LE 2 | VOL | BLOWS/6" | ROCK QUALITY DESIG | |
| DЕРТН (FT) | APLE | AMF | APLE | l Ó | | | | | ATE | EVA. | BLO | RQD | |
| | SAN | Ś | SAN | RE | | | | | 3 | | | CALIBRATED PENE | TROMETER TON/SE |
| | | | | | | | | | | | | [FINES CONTENT] % | |
| | | | | | Asphalt [2"] | L | / | | | _ | | | O _{4.50} |
| - | S-1 | ST | 12 | 12 | FILL, sand and gravel, | | // | | | - | | | 0 _{4.50} |
| - | | | | | FILL, LEAN/FAT CLAYS, brown, moist, hard | light brow | vn anu | | | - | | | 4.50 |
| | S-2 | ST | 24 | 24 | brown, moist, naru | | 1 | | | - | | | |
| - | | | | | - | | / | | | - | | | O _{4.50} |
| 5- | S-3 | ST | 24 | 24 | | | / | | | 473- | | | |
| | | | | | | | | | | - | | O _{2.00} | |
| - | S-4 | ST | 24 | 24 | (CH) FAT CLAY, dark br | own, mois | st, stiff | | | - | | 2.00 | |
| | 54 | 51 | 27 | 27 | | | | | | - | | | |
| - | | | | | | | | | | | | O _{1.50} | |
| | S-5 | ST | 24 | 24 | | | | | | | | | |
| 10- | | | | | END OF BORIN | IG AT 10.0 | FT | | | 468 – | | | |
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| 15- | | | | | | | | | | 463 - | | | |
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| 25- | | | | | | | | | | 453 | | | |
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| 30- | | | | | | | | | | 448- | | | |
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| | Tł | HE STRA | ATIFICA | TION LI | NES REPRESENT THE APPROXI | MATE BOUNI | DARY LINES BET | WEEN | SOIL | TYPES. IN | I-SITU THE TR | ANSITION MAY BE GRA | ADUAL |
| V V | VL (Firs | st Encc | ounter | ed) | Dry | BOR | ING STARTED: | Fe | b 09 | 2022 | CAVE IN | DEPTH: | |
| V V | VL (Cor | npleti | on) | | Dry | BOR | | | | | | | |
| | VL (Sea | - | - | Vater) | | | ING IPLETED: | Fe | b 09 | 2022 | HAMME | R TYPE: Auto | |
| | VL (Sta | | | | N/A | | IPMENT: | | | ED BY: | DRILLING | 6 METHOD: CFA | |
| | v L (Std | JIIIZEU | 1 | | | | | | rataB | | | | |
| 1 | | | | | GEC | JI ECHINI | LAL BUKE | TUL | = L(| טע | | | |

| CLIENT | | | | | | | PROJECT N | 10.: | | BORING I | NO.: | SHEET: | |
|---|---------------|-------------|-------------------|---------------|---|--------------|-----------------------------|---------------|--------------|----------------|---------------|------------------------------|-------------------|
| City of N PROJEC | | | | | | | 19:8613 DRILLER/C | | | 8-21 | | 1 of 1 | - ECe |
| Stone R | | | nents | | | | StrataBore | | | N. | | | |
| SITE LO | CATION | N: | | | | | | , | | | | LOSS OF CIRCULATION | DN XIO |
| NORTH | | evard t | o Benn | | ad, Wylie, Texas 75098 ASTING: | STATION: | | | SU | IRFACE E | LEVATION: | | |
| 705452 | | | | | 76274.8 | | | | | 3.00 | | BOTTOM OF CASIN | IG |
| DЕРТН (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION C | F MATERIAL | | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | Plastic Limit Water Con X | |
| - | | | | | Asphalt [2"] | | / | | | - | | | 0 |
| - | S-1 | ST | 14 | 14 | FILL, sand and gravel, | | | | | | | | ⊖ _{4.50} |
| - | S-2 | ST | 24 | 24 | FILL, LEAN/FAT CLAYS, brown, moist, hard | light brow | n and | | | | | | O _{4.50} |
| | S-3 | ST | 24 | 24 | | | | | | 478- | | | ⊖ _{4.50} |
| | | | | | (CH) FAT CLAY, dark br | own, moist | :, hard | | | - | | | O _{4.50} |
| - | S-4 | ST | 24 | 24 | | | | | | - | | | O _{4.50} |
| 10- | S-5 | ST | 24 | 24 | | | | | | 473- | | | |
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| 15- | | | | | | | | | | 468- | | | |
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| 30- | | | | | | | | | | 453- | | | |
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| | | | | | NES REPRESENT THE APPROXI | | | | | | | | UAL |
| | VL (Firs | | | ea) | Dry | | NG STARTED |): F o | eb 09 | 2022 | CAVE IN | DEPTH: | |
| ▼ WL (Completion) Dry BORING | | | | | | | F | eb 09 | 2022 | HAMME | R TYPE: Auto | | |
| Y WL (Seasonal High Water) N/A COMPLETED: EQUIPMENT: EQUIPMENT: | | | | | | | L | OGG | ED BY: | | 6 METHOD: CFA | | |
| | VL (Sta | bilized |) | | N/A GEO | Truck | | | trataE | | | SMETHOD. GA | |

| CLIENT City of V | | v | | | | | PROJECT NC 19:8613 | D.: | | ORING N - 22 | 10.: | SHEET: 1 of 1 | | |
|---------------------|---|-------------|-------------------|---------------|--|------------|-----------------------|-------|---------------------------------------|------------------------|--------------|------------------|--|----------------------|
| PROJEC | - | | | | | | DRILLER/CO | NTRAG | | | | 1011 | | EUQ |
| Stone R | | | nents | | | | StrataBore, I | | | | | | | |
| SITE LO WA Alle | | | o Benn | ett Roa | ıd, Wylie, Texas 75098 | | | | | | | LC | DSS OF CIRCULATION | <u>>100%</u> |
| NORTH 705453 | | | | | STING: 75652.5 | STATION: | | | 1 | RFACE E 1.00 | LEVATION: | E | BOTTOM OF CASING | |
| | BER | ЪЕ | (IN) | î | | | | | ILS | (L1 | | | Limit Water Content | Liquid Limit ───△ |
| DЕРТН (FT) | SAMPLE NUMBER | SAMPLE TYPE | SAMPLE DIST. (IN) | RECOVERY (IN) | DESCRIPTION O | F MATERIAL | | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | | STANDARD PENETRATION K QUALITY DESIGNATION RQD REC CALIBRATED PENETROME ES CONTENT] % | & RECOVERY |
| - | S-1 | ST | 19 | 19 | Asphalt [3"] FILL, sand and gravel, b | | / | | | - | | | ⊖ _{2.50} | |
| | S-2 | ST | 24 | 24 | FILL, LEAN/FAT CLAYS, brown, moist, very stif | f | | | | - | | | O _{3.00} | |
| | S-3 | ST | 24 | 24 | (CH) FAT CLAY, dark bro stiff | own, moi | st, very | | | 499- | | | ○ _{2.50} | |
| | | | | | (CH) FAT CLAY, light bro | own and l | brown, | | | - | | | ⊖ _{2.25} | |
| | S-4 | ST | 24 | 24 | moist, very stiff | | 1 | | | - | | | 0 _{2.25} | |
| 10- | S-5 | ST | 24 | 24 | END OF BORIN | G AT 10 0 | FT | | | 494 – | | | | |
| | | | | | | | | | | - | | | | |
| - | | | | | | | | | | - | | | | |
| 15- | | | | | | | | | | 489 | | | | |
| - | | | | | | | | | | - | | | | |
| | | | | | | | | | | | | | | |
| 20- | | | | | | | | | | 484 | | | | |
| | | | | | | | | | | - | | | | |
| 25 | | | | | | | | | | 479- | | | | |
| | | | | | | | | | | - | | | | |
| | | | | | | | | | | - | | | | |
| 30- | | | | | | | | | | 474 | | | | |
| | | | | | | | | | | | | | | |
| | TI VL (Firs | | | | NES REPRESENT THE APPROXIN | | IDARY LINES BET | | | TYPES. IN | -SITU THE TR | | MAY BE GRADUA | L |
| | VL (Coi | | | , | Dry | | | rei | 0.02 | 2022 | | | | |
| | VL (Sea | | | Vater) | N/A | | RING MPLETED: | Fel | b 09 | 2022 | HAMME | R TYPE: | Auto | |
| | - | | - | | | | JIPMENT: | | | | DRILLING | 6 METHOD |): CFA | |
| | WL (Stabilized) N/A Truck GEOTECHNICAL BORE | | | | | | | | Truck StrataBore DRILLING METHOD: CFA | | | | | |

| CLIENT | | | | | | | PROJECT N | 10.: | | BORING | NO.: | SHEET: | |
|---|---------------|-------------|-------------------|---------------|--|-------------|-----------------------------|--------|--------------|----------------|-----------|--|--------------------------|
| City of N PROJEC | | | | | | | 19:8613 DRILLER/C | | | 3-23 | | 1 of 1 | ECe |
| Stone R | | | nents | | | | StrataBore | | ACTO | η. | | | |
| SITE LO | | | | | | | 0110102010 | , | | | | | |
| | | evard t | o Benn | | ad, Wylie, Texas 75098 | | | | | | | LOSS OF CIRCULATION | |
| NORTH | | | | | ASTING: | STATION: | | | | | LEVATION: | BOTTOM OF CASING | |
| 705454 | 9.5 | | | 25 | 75075.3 | | | | 51 | 2.00 | | | |
| | BER | ш | Ê | Î | | | | | S | F | | Plastic Limit Water Conte X | nt Liquid Limit ────△ |
| (FT) | UME | ТҮР | IST. (| ر (II | | | | | evei | L) N | \$/6" | STANDARD PENETRAT | ON BLOWS/FT |
| DЕРТН (FT) | LE N | SAMPLE TYPE | LED | RECOVERY (IN) | DESCRIPTION C | OF MATERIAL | | | WATER LEVELS | ELEVATION (FT) | BLOWS/6" | ROCK QUALITY DESIGNATIO | ON & RECOVERY |
| B | SAMPLE NUMBER | SAN | SAMPLE DIST. (IN) | REC | | | | | IAW | ELEV | BI | | |
| | S | | S | | | | | | | | | CALIBRATED PENETRON [FINES CONTENT] % | METER TON/SF |
| - | | | | | Asphalt [3"] | | / | | | _ | | | |
| - | S-1 | ST | 18 | 18 | FILL, sand and gravel, | | | | | - | | 0 _{0.75} | |
| - | | | | | FILL, LEAN/FAT CLAYS, brown, moist, firm to | | d light | | | - | | 0 _{1.25} | |
| - | S-2 | ST | 24 | 24 | | SUII | | | | | | | |
| | | | | | | | | | | - | | 0 _{1.25} | |
| 5- | S-3 | ST | 24 | 24 | | | | | | 507 - | | | |
| | | | | | (CH) FAT CLAY, dark br | own. mois | t. stiff | | | - | | O _{2.00} | |
| - | S-4 | ST | 24 | 24 | | - , | -, | | | _ | | | |
| - | | | | | | | | | | - | | O _{1.75} | |
| | S-5 | ST | 24 | 24 | | | | | | _ | | | |
| 10- | | | | | END OF BORIN | IG AT 10.0 | FT | | | 502- | | | |
| _ | | | | | | | •• | | | _ | | | |
| | | | | | | | | | | - | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | - | | | |
| 15- | | | | | | | | | | 497 - | | | |
| - | | | | | | | | | | - | | | |
| - | | | | | | | | | | - | | | |
| - | | | | | | | | | | - | | | |
| - | | | | | | | | | | - | | | |
| - | | | | | | | | | | - | | | |
| 20- | | | | | | | | | | 492- | | | |
| - | | | | | | | | | | - | | | |
| - | | | | | | | | | | | | | |
| - | | | | | | | | | | - | | | |
| - | | | | | | | | | | _ | | | |
| 25 - | | | | | | | | | | 487 – | | | |
| _ | | | | | | | | | | | | | |
| | | | | | | | | | | _ | | | |
| | | | | | | | | | | - | | | |
| | | | | | | | | | | _ | | | |
| 30- | | | | | | | | | | 482- | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | VL (Firs | | | | NES REPRESENT THE APPROXI | | | | | | | | JAL |
| | | | | euj | Dry | BOR | ING STARTEI |): F | eb 09 | 2022 | CAVE IN | DEPTH: | |
| | VL (Cor | - | - | | Dry | BOR | | F | eb 09 | 2022 | HAMMEI | R TYPE: Auto | |
| ▼ WL (Seasonal High Water) N/A COMPLETE | | | | | IPLETED: IPMENT: | | | ED BY: | | | | | |
| ⊻ v | VL (Sta | bilized |) | | N/A | Truc | | | tratal | | DRILLING | METHOD: CFA | |
| | | | | | GEO | | CAL BOR | | | | | | |

APPENDIX C – Laboratory Testing

Laboratory Testing Summary Lime/pH Series Results



ECS Southwest, LLP Carrollton, Texas Laboratory Testing Summary

Project Name: Stone Road Improvements (Wylie, TX)

Project Engineer: CT

Project Number: 19:8613

Principal Engineer: MPB

Summary By: CT

Date: 3/2/2022

| | | | | Soil | Atte | rberg Limi | ts ³ | Percent | Dry Unit | | One-E | Dimensional | Swell ⁶ | Soluble |
|----------------------|----------|-----------------|------------------------|-------------------|----------|------------|-----------------|---------------------------------------|------------------------------|----------------------------------|--------------------------|--------------------|--------------------|--|
| mber Sample Numbe | | Depth (feet) | MC ¹ (%) | Type ² | LL | PL | PI | Passing No. 200 Sieve ⁴ | Weight ⁵ (pcf) | Compressive Strength (tsf) | Final Moisture (%) | Surcharge (psf) | Swell (%) | Soluble Sulfate ⁷ (ppm) |
| | <u>^</u> | 0.4 | 00.0 | 011 | 70 | 05 | 45 | 00.0 | | | | | | . 0. 000 |
| S-2 S-4 | | 2-4 6-8 | 29.8 26.9 | СН | 70 | 25 | 45 | 98.3 | | | | | | < 3,000 |
| | | | | | | | | | | | | | | |
| S-1 | | 1-2 | 10.1 | | | | | | | | | | | < 3,000 |
| S-3 | -3 | 4-6 | 25.7 | CH | 74 | 25 | 49 | | | | | | | |
| S-1 | .1 | 1-2 | 10.0 | | | | | | | | | | | < 3,000 |
| S-3 | -3 | 4-6 | 23.4 | CH | 42 | 18 | 24 | 89.5 | | | | | | . 0,000 |
| S-1 | 1 | 1-2 | 20.4 | | | | | | | | | | | < 3,000 |
| S-3 | | 4-6 | 13.7 | СН | 54 | 21 | 33 | | | | | | | < 3,000 |
| | Ŭ | + 0 | 10.1 | 011 | 04 | | 00 | | | | | | | |
| S-1 | | 1-2 | 15.2 | | | | | | | | | | | < 3,000 |
| S-4 | -4 | 6-8 | 22.5 | CH | 66 | 24 | 42 | | | | | | | |
| S-1 | .1 | 1-2 | 7.9 | | | | | | | | | | | < 3,000 |
| S-4 | | 6-8 | 5.4 | FILL | 31 | 16 | 15 | | | | | | | - 0,000 |
| | | | | | | | | | | | | | | |
| S-1 S-4 | | 1-2 6-8 | 17.7 17.9 | CL CL | 45 49 | 19 20 | 26 29 | | | | | | | < 3,000 |
| 5-4 | -4 | 6-8 | 17.9 | UL | 49 | 20 | 29 | | | | | | | |
| S-1 | -1 | 1-2 | 11.7 | | - | | | | | | - | | | < 3,000 |
| S-3 | | 4-6 | 30.2 | CH | 73 | 25 | 48 | | | | | | | - |
| | | 1.0 | | | | | | | | | | | | |
| S-1 S-3 | | 1-2 4-6 | 17.4 29.1 | СН | 69 | 24 | 45 | 95.0 | | | | | | < 3,000 |
| 5-3 | -3 | 4-0 | 29.1 | СП | 09 | 24 | 40 | 90.0 | | | | | | |
| S-1 | | 1-2 | 17.6 | | | | | | | | | | | < 3,000 |
| S-3 | -3 | 4-6 | 16.3 | CH | 54 | 21 | 33 | | | | - | | | - |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 5-3 | -0 | 4-0 | 10.3 | СП | 54 | | 33 | | | | | | | |

Notes:

1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 422, 5. ASTM D 2937, 6. ASTM D4546, 7 TEX 145E, 8 ASTM D 2166

Definitions:

MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, NP: Non Plastic



Carrollton, Texas Laboratory Testing Summary

Project Name: Stone Road Improvements (Wylie, TX)

•

Date: 3/2/2022

Project Number: 19:8613

Project Engineer: CT

Principal Engineer: MPB

Summary By: CT

| | | | 4 | | Atte | erberg Limi | ts ³ | Percent | Dry Unit | _ | One-[| Dimensional | Swell ⁶ | |
|---------------|------------------|-----------------|------------------------|---------------------------|------|-------------|-----------------|---------------------------------------|------------------------------|----------------------------------|--------------------------|--------------------|--------------------|--|
| Boring Number | Sample Number | Depth (feet) | MC ¹ (%) | Soil Type ² | LL | PL | PI | Passing No. 200 Sieve ⁴ | Weight ⁵ (pcf) | Compressive Strength (tsf) | Final Moisture (%) | Surcharge (psf) | Swell (%) | Soluble Sulfate ⁷ (ppm) |
| | 0.4 | 4.0 | 40.5 | | | | | | | | | | | . 0.000 |
| B-11 | S-1 S-4 | 1-2 6-8 | 19.5 16.6 | СН | 58 | 22 | 36 | | | | | | | < 3,000 |
| | 0-4 | 0-0 | 10.0 | 011 | 50 | 22 | | | | | | | | |
| B-12 | S-1 | 1-2 | 22.3 | | | | | | | | | | | < 3,000 |
| | S-4 | 6-8 | 20.0 | CH | 58 | 22 | 36 | | | | | | | |
| | | | | | | | | | | | | | | |
| B-13 | S-1 S-4 | 1-2 6-8 | 17.1 18.1 | CL | 41 | 18 | 23 | 98.7 | | | | | | < 3,000 |
| | 5-4 | 0-0 | 10.1 | UL | 41 | 10 | 23 | 90.7 | | | | | | |
| B-14 | S-1 | 1-2 | 40.6 | | | | | | | | | | | < 3,000 |
| | S-3 | 4-6 | 24.8 | СН | 64 | 23 | 41 | 96.2 | | | | | | |
| | | | | | | | | | | | | | | |
| B-15 | S-2 | 2-4 | 26.5 | | | | | | | | | | | < 3,000 |
| | S-4 | 6-8 | 23.1 | CH | 59 | 22 | 37 | | | | | | | |
| B-16 | S-1 | 1-2 | 26.1 | | | | | | | | | | | < 3,000 |
| D 10 | S-3 | 4-6 | 25.6 | СН | 67 | 24 | 43 | 98.7 | | | | | | 10,000 |
| | | | | - | - | | | | | | | | | |
| B-17 | S-1 | 1-2 | 18.6 | | | | | | | | | | | < 3,000 |
| | S-4 | 6-8 | 18.2 | CH | 68 | 24 | 44 | 85.7 | | | | | | |
| B-18 | S-1 | 1-2 | 19.1 | | | | | | | | | | | < 3,000 |
| D-10 | S-3 | 4-6 | 20.7 | | | | | | | | | | | < 3,000 |
| | S-5 | 8-10 | 22.1 | CL | 47 | 19 | 28 | | | | | | | |
| | | | | - | | | | | | | | | | |
| B-19 | S-1 | 1-2 | 15.0 | | | | | | - | | | | | < 3,000 |
| | S-4 | 6-8 | 19.5 | CH | 52 | 21 | 31 | | | | | | | |
| B-20 | S-1 | 1-2 | 18.9 | | | | | | | | | | | < 3,000 |
| D-20 | S-3 | 4-6 | 8.6 | FILL | 27 | 14 | 13 | 42.6 | | | | | | < 3,000 |
| | 0.0 | - 0 | 0.0 | | | | 10 | 72.0 | | | | | | |
| | | | | | | | | | | | | | | |

Notes:

1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 422, 5. ASTM D 2937, 6. ASTM D4546, 7 TEX 145E

Definitions:

MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, NP: Non Plastic



Carrollton, Texas Laboratory Testing Summary

Date: 3/2/2022

Project Number: 19:8613

Project Name: Stone Road Improvements (Wylie, TX)

| Project Engine | er: CT | | | | Principa | | | 3 | | | | | ary By: CT |
|----------------|------------------|-----------------|------------------------|---------------------------|----------|----|----|--|--|----------------------------------|-----------------------------------|-----------------------------------|--|
| Boring Number | Sample Number | Depth (feet) | MC ¹ (%) | Soil Type ² | Atte | PL | PI | Percent Passing No. 200 Sieve ⁴ | Dry Unit Weight ⁵ (pcf) | Compressive Strength (tsf) | One-E Final Moisture (%) | Dimensional Surcharge (psf) | Soluble Sulfate ⁷ (ppm) |
| B-21 | S-1 S-3 | 1-2 4-6 | 14.0 11.6 | FILL | 54 | 21 | 33 | 79.9 | | | | | < 3,000 |
| B-22 | S-1 S-3 | 1-2 4-6 | 19.9 23.2 | СН | 62 | 23 | 39 | | | | | | < 3,000 |
| B-23 | S-1 S-3 | 1-2 4-6 | 19.7 28.6 | FILL | 58 | 22 | 36 | 55.1 | | | | | 3066 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | |

Notes:

1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 422, 5. ASTM D 2937, 6. ASTM D4546, 7 TEX 145E MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, NP: Non Plastic Definitions:

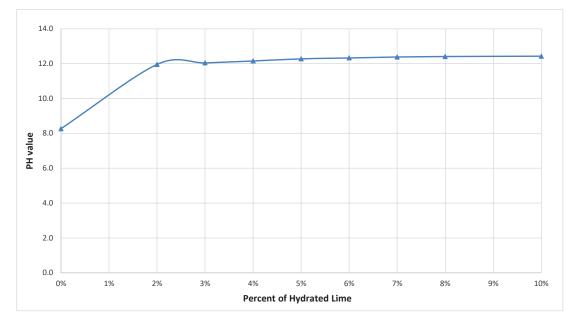


ECS Southwest, LLP Dallas, TX

Project No: 19:8613 Project : Stone Road Improvements (Wylie, TX) Source : B - 1 at 1' - 2' Sample Information: Fat Clay, dark brown (CH) Date : 02/17/22 Tested By : KM

Lime pH Series Test

| % of Hydrated Lime | Corrected pH | Remarks |
|--------------------|--------------|---------|
| 0% | 8.3 | |
| 2% | 12.0 | |
| 3% | 12.0 | |
| 4% | 12.2 | |
| 5% | 12.3 | |
| 6% | 12.3 | |
| 7% | 12.4 | |
| 8% | 12.4 | |
| 10% | 12.4 | |



APPENDIX D – Winpas Pavement Design Outputs

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Rigid Design Inputs

E

Agency: City of Wylie Company: ECS Contractor: Project Description: Stone Road Improvements Location: From WA Allen Blvd. to Bennett Road

Rigid Pavement Design/Evaluation

| PCC Thickness | 7.89 | inches | Load Transfer, J | 3.00 |
|-----------------------|-----------|---------|---------------------------|-------------------|
| Design ESALs | 2,411,295 | | Mod. Subgrade Reaction, k | 200 psi/in |
| Reliability | 90.00 | percent | Drainage Coefficient, Cd | 1.00 |
| Overall Deviation | 0.39 | | Initial Serviceability | 4.50 |
| Modulus of Rupture | 620 | psi | Terminal Serviceability | 2.50 |
| Modulus of Elasticity | 4,000,000 | psi | - | |

| Resilient Modulus of the Subgrade | 0.0 psi |
|-----------------------------------|----------------------|
| Resilient Modulus of the Subbase | 0.0 psi |
| Subbase Thickness | 0.00 inches |
| Depth to Rigid Foundation | 0.00 feet |
| Loss of Support Value (0,1,2,3) | 0.0 |
| Modulus of Subgrade Reaction | 200.00 psi/in |

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Rigid Design Inputs

E

Agency: City of Wylie Company: ECS Contractor: Project Description: Stone Road Improvements Location: From WA Allen Blvd. to Bennett Road

Rigid Pavement Design/Evaluation

| PCC Thickness | 7.78 | inches | Load Transfer, J | 3.00 |
|-----------------------|-----------|---------|---------------------------|-------------------|
| Design ESALs | 2,411,295 | | Mod. Subgrade Reaction, k | 240 psi/in |
| Reliability | 90.00 | percent | Drainage Coefficient, Cd | 1.00 |
| Overall Deviation | 0.39 | | Initial Serviceability | 4.50 |
| Modulus of Rupture | 620 | psi | Terminal Serviceability | 2.50 |
| Modulus of Elasticity | 4,000,000 | psi | - | |

| Resilient Modulus of the Subgrade Resilient Modulus of the Subbase Subbase Thickness Depth to Rigid Foundation Loss of Support Value (0,1,2,3) | 0.0 0.00 | psi psi inches feet | |
|--|-------------|------------------------------|--|
| Modulus of Subgrade Reaction | 240.00 | psi/in | |

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Flexible Design Inputs

Agency: City of Wylie Company: ECS Contractor: roject Description: Stone Road Improvements Location: From WA Allen to Bennett Road

Flexible Pavement Design/Evaluation

| | 4.62 1,295 90.00 percent 0.45 | Soil Resilient Modulus Initial Serviceability Terminal Serviceability | 5,000.00 psi 4.20 2.50 |
|--|---|---|-------------------------------------|
|--|---|---|-------------------------------------|

| Layer Material | Layer Coefficient | Drainage Coefficient | Layer Thickness | Layer SN |
|---------------------------|----------------------|-------------------------|--------------------|-------------|
| Asphalt Cement Concrete | 0.44 | 1.00 | 2.00 | 0.88 |
| Asphalt Treated Agg. Base | 0.41 | 1.00 | 7.00 | 2.87 |
| Bitum. Treated Agg. Base | 0.12 | 1.00 | 8.00 | 0.96 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | | • | ΣSN | 4.71 |

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Flexible Design Inputs

Agency: City of Wylie Company: ECS Contractor: roject Description: Stone Road Improvements Location: From WA Allen to Bennett Road

Flexible Pavement Design/Evaluation

| | 4.62 1,295 90.00 percent 0.45 | Soil Resilient Modulus Initial Serviceability Terminal Serviceability | 5,000.00 psi 4.20 2.50 |
|--|---|---|-------------------------------------|
|--|---|---|-------------------------------------|

| Layer Material | Layer Coefficient | Drainage Coefficient | Layer Thickness | Layer SN |
|---------------------------|----------------------|-------------------------|--------------------|-------------|
| Asphalt Cement Concrete | 0.44 | 1.00 | 2.00 | 0.88 |
| Asphalt Treated Agg. Base | 0.41 | 1.00 | 7.00 | 2.87 |
| Bitum. Treated Agg. Base | 0.14 | 1.00 | 8.00 | 1.12 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | | • | ΣSN | 4.87 |

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Flexible Design Inputs

Agency: City of Wylie Company: ECS Contractor: roject Description: Stone Road Improvements Location: From WA Allen to Bennett Road

Flexible Pavement Design/Evaluation

| | 4.62 1,295 90.00 percent 0.45 | Soil Resilient Modulus Initial Serviceability Terminal Serviceability | 5,000.00 psi 4.20 2.50 |
|--|---|---|-------------------------------------|
|--|---|---|-------------------------------------|

| Layer Material | Layer Coefficient | Drainage Coefficient | Layer Thickness | Layer SN |
|---------------------------|----------------------|-------------------------|--------------------|-------------|
| Asphalt Cement Concrete | 0.44 | 1.00 | 2.00 | 0.88 |
| Asphalt Treated Agg. Base | 0.41 | 1.00 | 7.00 | 2.87 |
| Bitum. Treated Agg. Base | 0.15 | 1.00 | 8.00 | 1.20 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | • | • | ΣSN | 4.95 |

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Rigid Design Inputs

Г

Agency: City of Wylie Company: ECS Contractor: Project Description: Stone Road Improvements Location: From WA Allen Blvd. to Bennett Road

Rigid Pavement Design/Evaluation

| PCC Thickness | 8.72 i | inches | Load Transfer, J | 3.00 |
|-----------------------|-----------|---------|---------------------------|-------------------|
| Design ESALs | 4,352,719 | | Mod. Subgrade Reaction, k | 200 psi/in |
| Reliability | 90.00 | percent | Drainage Coefficient, Cd | 1.00 |
| Overall Deviation | 0.39 | | Initial Serviceability | 4.50 |
| Modulus of Rupture | 620 | psi | Terminal Serviceability | 2.50 |
| Modulus of Elasticity | 4,000,000 | psi | - | |

| Resilient Modulus of the Subgrade | 0.0 psi |
|-----------------------------------|----------------------|
| Resilient Modulus of the Subbase | 0.0 psi |
| Subbase Thickness | 0.00 inches |
| Depth to Rigid Foundation | 0.00 feet |
| Loss of Support Value (0,1,2,3) | 0.0 |
| Modulus of Subgrade Reaction | 200.00 psi/in |

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Rigid Design Inputs

Agency: City of Wylie Company: ECS Contractor: Project Description: Stone Road Improvements Location: From WA Allen Blvd. to Bennett Road

Rigid Pavement Design/Evaluation

| PCC Thickness | 8.62 | inches | Load Transfer, J | 3.00 |
|-----------------------|-----------|---------|---------------------------|------------|
| Design ESALs | 4,352,719 | | Mod. Subgrade Reaction, k | 240 psi/in |
| Reliability | 90.00 | percent | Drainage Coefficient, Cd | 1.00 |
| Overall Deviation | 0.39 | | Initial Serviceability | 4.50 |
| Modulus of Rupture | 620 | psi | Terminal Serviceability | 2.50 |
| Modulus of Elasticity | 4,000,000 | psi | - | |

| Resilient Modulus of the Subgrade | 0.0 psi |
|-----------------------------------|----------------------|
| Resilient Modulus of the Subbase | 0.0 psi |
| Subbase Thickness | 0.00 inches |
| Depth to Rigid Foundation | 0.00 feet |
| Loss of Support Value (0,1,2,3) | 0.0 |
| Modulus of Subgrade Reaction | 240.00 psi/in |

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Flexible Design Inputs

Agency: City of Wylie Company: ECS Contractor: roject Description: Stone Road Improvements Location: From WA Allen to Bennett Road

Flexible Pavement Design/Evaluation

| Structural Number5.0Design ESALs4,352,71Reliability90.0Overall Deviation0.4 | 9 0 percent | Soil Resilient Modulus Initial Serviceability Terminal Serviceability | 5,000.00 psi 4.20 2.50 |
|---|----------------|---|-------------------------------------|
|---|----------------|---|-------------------------------------|

| Layer Material | Layer Coefficient | Drainage Coefficient | Layer Thickness | Layer SN |
|---------------------------|----------------------|-------------------------|--------------------|-------------|
| Asphalt Cement Concrete | 0.44 | 1.00 | 2.00 | 0.88 |
| Asphalt Treated Agg. Base | 0.41 | 1.00 | 8.00 | 3.28 |
| Bitum. Treated Agg. Base | 0.12 | 1.00 | 8.00 | 0.96 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | | • | ΣSN | 5.12 |

Pavement Thickness Design According to

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Flexible Design Inputs

Agency: City of Wylie Company: ECS Contractor: roject Description: Stone Road Improvements Location: From WA Allen to Bennett Road

Flexible Pavement Design/Evaluation

| Structural Number5.0Design ESALs4,352,77Reliability90.0Overall Deviation0.4 | 9 0 percent | Soil Resilient Modulus Initial Serviceability Terminal Serviceability | 5,000.00 psi 4.20 2.50 |
|---|-----------------------|---|-------------------------------------|
|---|-----------------------|---|-------------------------------------|

| Layer Material | Layer Coefficient | Drainage Coefficient | Layer Thickness | Layer SN |
|---------------------------|----------------------|-------------------------|--------------------|-------------|
| Asphalt Cement Concrete | 0.44 | 1.00 | 2.00 | 0.88 |
| Asphalt Treated Agg. Base | 0.41 | 1.00 | 8.00 | 3.28 |
| Bitum. Treated Agg. Base | 0.14 | 1.00 | 8.00 | 1.12 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | • | • | ΣSN | 5.28 |

Pavement Thickness Design According to

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American Concrete Pavement Association

Flexible Design Inputs

Agency: City of Wylie Company: ECS Contractor: roject Description: Stone Road Improvements Location: From WA Allen to Bennett Road

Flexible Pavement Design/Evaluation

| Structural Number5.0Design ESALs4,352,71Reliability90.0Overall Deviation0.4 | 9 0 percent | Soil Resilient Modulus Initial Serviceability Terminal Serviceability | 5,000.00 psi 4.20 2.50 |
|---|----------------|---|-------------------------------------|
|---|----------------|---|-------------------------------------|

| Layer Material | Layer Coefficient | Drainage Coefficient | Layer Thickness | Layer SN |
|---------------------------|----------------------|-------------------------|--------------------|-------------|
| Asphalt Cement Concrete | 0.44 | 1.00 | 2.00 | 0.88 |
| Asphalt Treated Agg. Base | 0.41 | 1.00 | 8.00 | 3.28 |
| Bitum. Treated Agg. Base | 0.15 | 1.00 | 8.00 | 1.20 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | ΣSN | 5.36 |