SPECIAL MEETING
AGENDA
CITY OF CREVE COEUR
CITY COUNCIL
300 NORTH NEW BALLAS RD
OCTOBER 6, 2025
4:30 PM

ZOOM MEETING INFORMATION

Members of the public may access live audio and/or video by accessing the following:

https://us02web.zoom.us/j/87278716607?pwd=InaLWqrdzJvhm98x1x1Doag4kHhbDq.1
Meeting ID: 872 7871 6607
Passcode: 351947

CALL TO ORDER

ROLL CALL

NEW BUSINESS

1. **Resolution No. 1834 — A Resolution of the City Council of the City of Creve Coeur, Missouri, authorizing the execution of a change order with Ideal Landscape Construction, Inc. for the Venable Park Improvement Project for a lump sum contract sum of $222,222.00.**
   Summary: Staff recommends approval of Change Order #4 for the Venable Park project in the amount of $222,222. The change order addresses unstable soil conditions in the parking lot that must be removed for construction to continue safely and adjusts retaining wall block quantities to reflect the actual square footage installed.

ADJOURNMENT

Pursuant to Section 610.022 RSMo., the City Council could, at any time during the meeting, vote to close the public meeting and move to closed session to discuss matters relating to litigation, legal actions and/or communications from the City Attorney as provided under Section 610.021(1) RSMo. and/or personnel matters under Section 610.021(13) RSMo. And/or employee matters under Section 610.021(3) RSMo. and/or real estate matters under Section 610.021(2) or other matters as permitted by Chapter 610.

Posted by: _____

Date/Time posted: _____

SPECIAL MEETING
AGENDA
CITY OF CREVE COEUR
CITY COUNCIL
300 NORTH NEW BALLAS RD
OCTOBER 6, 2025
4:30 PM

If you need special accommodations to attend a meeting, services may be arranged by contacting the Office of the City Administrator in advance.

MEMORANDUM

DATE: September 30, 2025

TO: Sharon Stott, Interim City Administrator

FROM: Tom Delia, Project Manager Engineer

CC: Dione Garson, Interim Assistant Director of Public Works

SUBJECT: Recommendation for Change Order #4 for Venable Park Renovation.

RECOMMENDATION:

Public Works staff recommends approval of change order #4 in the amount of $222,222 for the Venable Park project. This change order addresses a critical issue with unstable parking lot soil that must be removed before construction can safely proceed, and it also ensures the retaining wall blocks are accurately reflected for the actual square footage installed.

PROJECT FUNDING:

The original bid was approved by City Council in Resolution #1792 for $2,315,736. To date, three (3) change orders have been approved by the City Administrator, adding $59,713.00 to the project. This brings the total authorized project amount to date, prior to the requested Change Order #4, to $2,375,449.

Change Order #4 Request Summary:	
Retaining Wall Actual Square Footage Increase	$ 30,168.00
Haul Off for Excess Materials	$ 67,500.00
Type 5 Aggregate Base	$ 127,254.00
Truck Call Off Fee to Pause Removal	$ 3,300.00
Picnic Tables Credit	($ 6,000.00)
Total Change Order Requested	**$ 222,222.00**

This request will bring the total of change orders (#1 through #4) to $281,935, which is approximately a 12.2% increase over the awarded construction contract.

BACKGROUND INFORMATION:

Public Works staff is currently working on a construction project with Ideal Landscape Construction at Venable Park which includes the demolition and rebuilding of the existing pavilion and walking paths, along with a new small child playground and memorial to Dr. Venable. Further work is being done to install new storm and bioretention areas. In the process of this construction work several items are

apparent that need to be added to the project that were not part of the original bid approved by City Council. The change orders approved to date are:

- Change Order #1: Changing the high-density polyethylene (HDPE) pipe in the stormwater plan to Sanitite dual wall pipe, changing three (3) flared end sections from metal to concrete, and changing two (2) nyloplast structures to precast concrete structure. All due in part to MSD review and comment. Total cost of $14,910.

- Change Order #2: Design changes for replacement of existing 12" metal pipe and cracked manhole structure that did not pass MSD field inspection and were beyond economical repair. Total cost of $25,243.

- Change Order #3: Increase in the electrical allowance for memorial and pavilion, a change to a storm water structure to accommodate an existing piping, ramp handrail accommodations for ADA compliance, and MSD bio basin modifications per MSD. Total cost $19,560.

Following are requested items for Change Order #4:

- Retaining Wall - This bid item is measured and paid for based on square footage. The contracted quantity for the wall was estimated to be 1,965 square feet; actual square footage was measured to be 2,225.25 square feet. The increase in additional square footage was due to an extra row that was added to provide more stabilization of the base due to poor soils. A difference of 419 square feet. Total cost for the additional square feet is $30,168.

- Haul Off Excess Materials (Plastic Soils) – A parking lot bore sample was taken in December 2023, which indicated the following make up of 4" asphalt, followed by 8" crushed rock, followed by 48" of medium stiff to stiff, brown & gray lean clay (see Exhibit A). Upon removal of the asphalt parking lot, unstable soils were found. On September 16, the contractor, SCI Field Manager, and Tom Delia met on site to sample the soil under the parking lot. Inorganic plastic soil was found to a depth of 3 feet and ground water collected at the bottom of the excavation. On September 19, Ideal Landscape crew conducted a proof roll across the parking lot with a fully loaded rock dump truck. Rutting across the graveled area was observed by Delia over a wide stretch of the parking lot from top to bottom. It was decided to excavate and remove soils to determine the full extent of the situation. On the third day it was determined that the extent was large and the task was halted. Prior to the halt, a total of 720 cubic yards of plastic soil was removed, with an estimated 180 cubic yards to yet be removed. Total Cost: $67,500.

- Type 5 aggregate rock base - The removal of the previously mentioned poor soils will require replacement to stabilize the base to prepare for the application of an asphalt parking lot. TWM was consulted on the situation and showed video of the site conditions, they agreed with the recommendation to remove the plastic soils and the application of shot rock to bridge the deeper sections of plastic soils, followed by the application of compacted type 5 aggregate base rock. Total Cost: $127,254.

- Truck Fee – On the morning of the fourth day of soil removal, the contractor was notified to halt the removal of the plastic soils till approval was granted by the City Council. The contractor had already hired three (3) dump trucks and absorbed a cancellation fee. Total Cost: $3,300.

- Picnic Table Credit – Ideal Landscape ordered the wrong type of picnic tables for the park, as requested in an addendum submitted during the bid process. They have offered a refund to receive the tables as is which represents a 40% discount. The City has agreed to receive the tables. Total refund: $6,000.

PROJECT SCHEDULE:

The original schedule had October 15, 2025, as the completion date for this project. Due to MSD delays, this project did not start on time and in the first change order Ideal Landscape Construction requested and was granted a three (3) week time extension. Additionally, with change order #3, Ideal Landscape Construction received a five (5) day time extension. Ideal Landscape Construction is requesting an additional ten (10) day time extension due to this unforeseen delay. The revised completion date for this project is November 26, 2025.

ATTACHMENTS:

Exhibit A: Ideal Landscaping – change order #4, UES geotechnical report, and SCI site visit report

Exhibit A

October 2, 2025

City of Creve Coeur
300 N. New Ballas Rd
St. Louis, MO 63129

Project: Venable Park Improvements
RE: Handrail Change

Change Order Request

Revisions to the Contract for Venable Park Improvements between Ideal Landscape Construction, Inc. and the City of Creve Coeur are requested as follows.

Change Order Items Include:

- Retaining Wall Increase at Parking Lot and Tennis Courts
  - 419 sf @ $72.00/sf……$30,168.00
- Haul Off Excess Material
  - 900 cy @ $75.00/cy……..$67,500.00
- Type 5 Aggregate Increase
  - 1,696.73 cy @ $75.00/cy……..$127,254.00
- Fee to Cancel Trucks (Day 4)
  - Truck Cancellation Fee……$3,300.00
- Refund Picnic Tables
  - Discount/Deduct……-$6,000.00

** 10 Day Time Extension for Increases Above

Total Change Order Cost: $222,222.00

Sincerely,

Dave Buckel
President
Ideal Landscape Construction, Inc.
6252 Olsen Rd, St. Louis, MO 63129

DFR

Report #: 0001-000001

St. Charles
130 Point West Boulevard
St. Charles, MO 63301
Phone: 636-949-8200
Fax: 636-949-8269

Client:

Ideal Landscape Group
6252 Olsen Road
St. Louis, MO 63129

Project:

20251319.00
Venable Memorial Park Site Design Improvements
10630 Country View Drive
Creve Coeur, MO 63141

SERVICE & TESTING SUMMARY

Report Date: 09/16/2025

SCI Inspector: Christopher Minks

Services: Subgrade

COMPACTION TEST SUMMARY

Location(s) Tested:

Material:

Required Footing Bearing Capacity (PSF):

CONCRETE TEST SUMMARY

Location(s) Tested:

Number of Sets:

Cylinders Per Set:

Cylinder Storage Location:

SUMMARY OF ACTIVITIES

Arrival:	11:10	**Departure:**	12:40	**Temperature:**	90	**Weather:**	

Comments:

SCI was on site to observe the soft soils encountered beneath the removed asphalt. Section observed was in the future parking lot area behind wall 1a between stations 0+10-0+80. Soft organic soils underlain by firm natural lean clay was observed. Water was observed were the organic soil met the lean clay soil which seemed to be trapped water causing the pumping soil, not groundwater. We recommend the soft organic soil be removed to the firm natural lean clay. The overexcavation will be roughly 3 feet. The overexcavation will be backfilled with 1 inch minus rock placed in lifts and tested for compaction by SCI.

Follow-Up Required:

DFR

Report #: 0001-000001

St. Charles
130 Point West Boulevard
St. Charles, MO 63301
Phone: 636-949-8200
Fax: 636-949-8269

Client:

Ideal Landscape Group
6252 Olsen Road
St. Louis, MO 63129

Project:

20251319.00
Venable Memorial Park Site Design Improvements
10630 Country View Drive
Creve Coeur, MO 63141

IMAGES/ATTACHMENTS:

This Report has been reviewed and approved by:

Christopher Minks

Field Manager

GEOTECHNICAL EXPLORATION
VENABLE MEMORIAL PARK
CREVE COEUR, MISSOURI

Prepared for:

THOUVENOT, WADE & MOERCHEN, INC.
ST. LOUIS, MISSOURI

Prepared by:

GEOTECHNOLOGY, LLC, DBA UES.
ST. LOUIS, MISSOURI

Date:

FEBRUARY 20, 2024

Project No.:

J044966.01

SAFETY
TEAMWORK
RESPONSIVENESS
INTEGRITY
VALUE
EXCELLENCE

February 20, 2024

Mr. Ryan Cerniglia, P.E.
Thouvenot, Wade & Moerchen, Inc.
3701 S. Lindbergh, Suite 100
St. Louis, Missouri 63127

Re: Geotechnical Exploration
Venable Memorial Park
Creve Coeur, Missouri
UES Project No. J044966.01

Dear Mr. Cerniglia:

Presented in this report are the results of our geotechnical exploration completed for the Venable Memorial Park project in Creve Coeur, Missouri. Our services were performed in general accordance with our authorized agreement dated December 5, 2023.

We appreciate the opportunity to provide geotechnical services for this project. If you have any questions regarding this report, or if we can be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,
UES

Adam C. Emerick
Project Manager

Joel A. Weinhold, P.E.
Area Manager

ACE/JAW:ace/jlf

Copies submitted: (1) pdf

TABLE OF CONTENTS

LIST OF TABLES

GEOTECHNICAL EXPLORATION
VENABLE MEMORIAL PARK
CREVE COEUR, MISSOURI
February 20, 2024 | UES Project No. J044966.01

1.0 INTRODUCTION

Geotechnology, LLC, dba UES, prepared this geotechnical exploration report for Thouvenot, Wade & Moerchen, Inc (TWM) for the Venable Memorial Park project located in Creve Coeur, Missouri. Our services documented in this report were provided in general accordance with the terms and scope of services described in our authorized agreement dated December 5, 2023.

The purposes of the geotechnical exploration were to develop a general subsurface profile at the site and prepare recommendations for the geotechnical aspects of the design and construction of the project as defined in our proposal. Our scope of services included site reconnaissance, geotechnical borings, laboratory testing, engineering analyses, and preparation of this report.

A copy of "Important Information about This Geotechnical-Engineering Report," published by the Geotechnical Business Council (GBC) of the Geoprofessional Business Association (GBA), is included in Appendix A for your review. The publication discusses report limitations and ways to manage risk associated with subsurface conditions.

2.0 PROJECT INFORMATION

The project involves design and construction of renovations to the existing Venable Memorial Park. The renovations include removal and replacement of parking lot pavement with anticipated 3.5 foot retaining wall on the east side, new walkways throughout, bioretention basins, tennis court improvements, new splash pad and playground, new pavilion structure, new artistic monument, and pedestrian bridge. Structural loads for the pedestrian bridge are not known at the time of this report but are anticipated to be up to 75 kips.

The site is located between Lindbergh Boulevard and Spoede Road at the address of 10630 Country View Drive in Creve Coeur, Missouri. The park is approximately seven and a half acres and will require rough grading in order to construct the proposed improvements. UES understands that general cuts and fills will be less than 3 feet. The site location and regional topography of the area are shown on Figure 1 - Site Location and Topography in Appendix B.

3.0 GEOTECHNICAL EXPLORATION

The geotechnical exploration consisted of six borings (numbered B-1 through B-6). The borings and were located in the field by UES using GPS equipment and coordinates provided by TWM. The elevations at the boring locations, as shown on the boring logs, were estimated, and provided by the client. The locations of the borings are shown on Figure 2 – Aerial Photograph of Site and Boring Locations in Appendix B.

The borings were drilled on December 20 and 21, 2023 with a CME 55LC track-mounted drill rig advancing hollow-stem augers, as indicated on the boring logs presented in Appendix C. Sampling of the overburden soils and bedrock was accomplished ahead of the augers at the depths indicated on the boring logs, with 2-inch-outside-diameter (O.D.) split-spoons, thin-walled Shelby tube samplers in general accordance with the procedures outlined by ASTM D1586 and ASTM D1587, respectively. Standard Penetration Tests (SPTs) were performed on the split-spoon samples using an automatic hammer to obtain the standard penetration resistance or N-value[1] of the sampled material. Borings B-1 and B-2 were cored through the existing pavement section using a thin-walled pavement core barrel. Photographs of the recovered pavement core samples are included in Appendix D. Observations for groundwater were made in the borings during drilling, and before backfilling the boring holes.

A geologist from UES provided direction during field exploration, observed drilling and sampling, assisted in obtaining samples, and prepared field logs of the material encountered.

Representative portions of the split-spoon samples were placed in glass jars to preserve sample moisture. The Shelby tubes were capped and taped at their ends to preserve sample moisture and unit weight, and the tubes were transported and stored in an upright position. The glass jars, and Shelby tubes were marked and labeled in the field for identification when returned to our laboratory.

4.0 LABORATORY REVIEW AND TESTING

Laboratory testing was performed on soil samples to assess engineering and index properties. Laboratory testing of selected soil samples included the following: moisture content, Atterberg limits, and unconsolidated undrained triaxial compression (UU). The results of these tests are presented on the boring logs.

The boring logs were prepared by the project geotechnical engineer from the field logs, visual classification of the soil samples in the laboratory, and laboratory test results. Terms and symbols used on the boring logs are presented on the Boring Log: Terms and Symbols Sheets in Appendix C. Stratification lines on the boring logs indicate approximate changes in strata. The transition between strata could be abrupt or gradual.

[1] The standard penetration resistance, or N-value, is defined as the number of blows required to drive the split-spoon sampler 12 inches with a 140-pound hammer falling 30 inches. Since the split spoon sampler is driven 18 inches or until refusal, the blows for the first 6 inches are for seating the sampler, and the number of blows for the final 12 inches is the N-value. Additionally, “refusal” of the split-spoon sampler occurs when the sampler is driven less than 6 inches with 50 blows of the hammer.

5.0 SUBSURFACE CONDITIONS

5.1 Stratigraphy

An existing pavement section was drilled through in Borings B-1 and B-2 consisting of approximately 4 to 4.75 inches of asphaltic concrete above 8 inches of crushed rock.

The soil stratigraphy consists generally of natural lean clays and silty clay to the termination depths of 5 to 10 feet in Borings B-1 through B-4. The lean clay is underlain by shaley fat clay and weathered limestone in Borings B-5 and B-6. The lean clay soils are typically medium stiff to stiff in consistency based on SPT N-values ranging from 7 to 15 blows per foot (bpf) and moisture content values ranging from 10 to 27 percent.

Shaley fat clay soil occurs at approximate depths of 12 to 15 feet in Boring B-6. The fat clay is stiff in consistency, based on SPT N-value of 12. The moisture content in the fat clay is 26 percent.

Auger refusal occurred in Borings B-5 and B-6 on apparent limestone at an approximate depth of 16 feet. Boring augers can often penetrate several feet of highly weathered rock without encountering refusal. Auger refusal could represent boulders, rock remnants (rock layers within the soil), or generally competent bedrock. Since rock coring was not performed, the character of the refusal materials was not established.

5.2 Groundwater

Groundwater was not observed in the borings during the geotechnical exploration program. Groundwater levels might not have stabilized before backfilling, which is typical in low permeability, cohesive soils. Consequently, the lack of observed groundwater levels might not represent present or future levels. Groundwater levels could vary over time due to the effects of seasonal variation in precipitation, recharge, or other factors not evident at the time of exploration.

6.0 CONCLUSIONS AND RECOMMENDATIONS

UES has prepared the following conclusions and recommendations based on understanding of the proposed project, the field and laboratory data presented in this report, engineering analyses, and our experience and judgement. Given the proposed wall height and configuration, it is UES's opinion that a global stability analysis is not necessary for wall design. If the wall height increases or a load becomes present behind the wall, UES should be contracted as a global stability analysis could be required.

6.1 Site Preparation and Earthwork

Earthwork for the project involves cuts and fills up to 3 feet. Initial preparation of the site for grading should include the removal of vegetation, heavy root systems, and topsoil from planned cut, fill, pavement, and structure areas. Topsoil can be stockpiled for future use on completed cut and fill slopes or in landscaped areas, whereas vegetation, root wads, and other organics should be disposed offsite.

Existing structures and pavements within the grading and proposed structure limits should be demolished and the foundations removed, along with below-grade utilities (if present) and associated backfill. The parking lot pavement base course can be re-used as fill. The parking lot base course could be re-used as base course underneath planned new pavements provided the rock is free of soil contamination. We recommend a discussion with the grading contractor to determine the feasibility of this. UES should be retained to review these provisions to evaluate their impact on the recommendations in this report. Pavements outside of the footprints of the proposed structures can be temporarily left in place to support construction equipment and then later removed.

Proofroll. After performing site preparation and excavations in cut areas, the exposed subgrade should be proofrolled using a heavily loaded truck (18,000 pounds per axle) under the review of the project geotechnical engineer or a representative thereof. Soft or yielding soils should be undercut to stiff cohesive soils or medium dense cohesionless soils. The undercut should be backfilled with new compacted fill satisfying the material and compaction requirements presented in this section. The undercut soils can be reused provided that they conform to the recommendations contained in this report regarding acceptable fill materials. Proofrolling can be waived if the project geotechnical engineer judges that it would disturb an otherwise acceptable subgrade.

If soft or yielding soils extend to a significant depth, the subgrade can be stabilized using a biaxial or triaxial geogrid (e.g., Tensar BX-1100 or TriAx TX140) and an 8- to 12-inch lift of compacted well-graded crushed rock. The remainder of the undercut should be backfilled with well-graded crushed rock or clayey soils satisfying the material and compaction requirements presented in this section. If clayey soils are used, a separation geotextile fabric such as Mirafi 500X should be placed between the crushed rock and the clayey soils.

Fill Materials, Placement, and Compaction. Fill materials should consist of on-site, inorganic, clayey soil (liquid limit less than 45 percent) or borrow material that are relatively free of topsoil, vegetation, trash, construction or demolition debris, frozen materials, particles over 4 inches in maximum dimension, or other deleterious materials.

Fill or backfill should be placed in maximum 8-inch-thick loose lifts and compacted to the levels given in Table 1, Compaction Summary. The soil should be placed at a moisture content compatible with the required unit weight. Depending on the soil moisture at the time of construction, drying or wetting might be required to achieve compaction. Deleterious material should not be included in fill, and the fill should not be placed on soft materials or frozen ground.

Table 1. Compaction Summary

Category	Minimum Compaction[a]
General soil fill	90%
Crushed rock backfill	95%
Floor slab subgrade	90%[b]

[a] Measured as a percent of the maximum dry unit weight as determined by the modified Proctor test in a laboratory (ASTM D 1557)
[b] Moisture content within 3% of optimum moisture content

Settlement of trench backfill can result in unsightly depressions and localized pavement failures. The magnitude of settlement can be reduced by mechanically compacting the trench backfill. Select granular backfill can be used for pipe bedding and minimum cover for utilities. The remainder of the utility trenches should be backfilled with flowable fill or compacted clayey soils up to design subgrade elevation to reduce the potential for water collecting in these trenches and being absorbed by the surrounding clays, causing heave of foundations, slabs, pavement, etc.

We recommend that permanent cut and fill slopes for this project be designed not steeper than 1V:3H. Gentler slopes should be used whenever possible for ease of maintenance. Additionally, we recommend that the fill slopes be slightly overbuilt and then trimmed back to the design slope to achieve a well-compacted surface. Silt and/or sand soils should also be excluded from the surficial 5 feet of the fill slopes, as these materials are more susceptible to erosion.

Maintaining the moisture content of bearing and subgrade soils within the acceptable range provided in Table 1 is important during and after construction for the proposed structures. The clayey bearing and subgrade soils should not be allowed to become wet or dry during or after construction, and measures should be taken to hinder water from ponding on these soils and to reduce drying of these soils during droughts. Groundwater is not expected to have an adverse effect on the proposed earthwork construction; however, the contractor should be prepared to remove seepage that accumulates on fill surfaces or at subgrade levels.

Managing site water is important in successful performance of the pavement and foundation systems. Water from surface runoff, downspouts, and subsurface drains should be collected and discharged through a storm water collection system. Positive drainage should be established around the proposed structures to promote drainage of surface water away from the structures and reduce ponding of water adjacent to these structures.

6.2 Shallow Foundations

Bearing Capacity. The proposed structures, including the site retaining wall may be supported by strip and spread footings proportioned for a net allowable bearing pressure of 2,000 pounds per square foot (psf), provided they bear on medium stiff to stiff native lean clay soils. The minimum lateral dimensions for spread footings should be 24 inches. Exterior footings and footings in unheated interior areas should be embedded 30 inches below the lowest adjacent exterior grade to provide protection from seasonal moisture variations and frost penetration.

Shallow foundations, proportioned and constructed as recommended above, are expected to settle approximately 1 inch. Differential settlement between any two adjacent footings could be approximately 3/4-inch. The estimated values of settlement contained in this report are based on our experience. Consolidation tests and corresponding settlement calculations have not been made.

Each footing subgrade should be observed by a representative of UES to verify that the exposed material is consistent with that described in the subsurface exploration. Modifications to the remediation plan could be required based on observed conditions.

Uplift Capacity. Uplift loads can be resisted with the dead weight of the footing, and the weight of soil above the footing. A unit weight of 120 pounds per cubic foot (pcf) can be used for determining the soil weight above the footing, and the volume of soil acting on the footing can include a wedge of material within a line that extends from the top of footing and away from the footing edge to the ground surface at an angle of 30 degrees from the vertical.

Lateral Capacity. Lateral loads can be resisted by available frictional resistance between the base of the footing and the underlying soil. Resistance to sliding for foundations bearing on natural soil or compacted fill can be computed assuming an ultimate coefficient of friction of 0.35. The ultimate resistance, however, should be limited to 500 psf. If a higher sliding resistance value is required, excavation of footing bearing material and backfilling with minus-graded crushed rock may be performed, and a sliding ultimate coefficient of friction of 0.5 may be used. A maximum sliding resistance value would not apply with the crushed rock backfill approach. Ultimate passive resistance, if required, can be computed by assuming an equivalent fluid pressure of 225 pcf for soil. Passive resistance in the top 30 inches of material should be neglected due to seasonal variations in moisture and frost penetration. Safety factors of 2 and 3 should be applied to determine the allowable sliding and passive resistance, respectively.

Pedestrian Bridge. New shallow foundations for the pedestrian bridge should be constructed far enough away from the creek channel or deep enough that the zone of influence does not intersect with the stream channel embankments. The zone of influence can be assumed as a 1:1 slope leading over from the bottom edge of the footing.

6.3 Seismic Site Classification and Seismic Design Parameters

Site Class. The site soil is defined as Class C, Very Dense Soil. The site class designation is based on the results of the borings and our local knowledge of the geologic conditions in the area. The assessment of the soil and/or rock properties below the boring termination depths is based on our professional opinion in accordance with the International Building Code (IBC).

Spectral Acceleration Values. The site is under the jurisdiction of St. Louis County Building Code which has adopted the use of IBC 2015. According to USGS seismic design maps, a Spectral response acceleration at short period (S_S), and at 1 second period (S_1) of 0.403 g and 0.151 g, respectively, should be used. Design values of S_{DS} and S_{D1} of 0.349 g and 0.151 g should be used for Site Class C.

6.4 Floor Slab

Slabs-on-grade should be underlain by 4- to 6-inch layer of crushed rock placed atop properly prepared subgrades and compacted as indicated in Table 1 Compaction Summary. A 15-mil or thicker plastic sheet should be placed below habitable areas of the floor to reduce the potential for moisture to permeate the slab and reduce the potential for mold growth in the building. Notwithstanding other structural considerations, the slab-on-grade floor should be designed to allow for differential movements that normally occur between the floor slab, columns, and foundation walls. Constructed as such, the concrete floor slab thicknesses can be designed using a modulus of subgrade reaction (k) of 100 to 125 pounds per cubic inch (pci).

Care should be taken during slab-on-grade construction to not allow the subgrade to become desiccated or saturated. Additionally, consideration should be given to the timing of construction relative to the time of year and weather. If slab construction is performed during relatively cold and wet weather, lime- or cement-treatment of the subgrade could be beneficial to maintain progress during construction. Otherwise, the subgrade could be weakened by softening from saturation by rain and/or snow, leading to delays in reworking the subgrade to prepare it back to its pre-softened condition.

It is recommended that control joints be provided within the concrete slab-on-grade floors. These joints should be sealed to mitigate surface water infiltration until the building is enclosed. We recommend that the floor slab be structurally separated from walls, columns, footings, and penetrations to allow independent movement of the floor.

6.5 Pavement Design and Construction

A pavement design and analysis were beyond the scope of our services. Standard asphaltic concrete pavement design for a given service life requires evaluation of the soil by California Bearing Ratio (CBR) tests or other methods, estimates of daily traffic volumes and axle weights, drainage requirements, and the desired level of maintenance.

Asphaltic pavement sections are frequently used in the St. Louis region that are thinner than would typically result from a pavement design. These reduced thickness sections often perform adequately; however, maintenance or an overlay is generally required sooner than would be required for a thicker, designed section. Based on our experience with projects of similar nature, pavement sections consisting of 3 inches of asphalt over 6 inches of well-graded crushed rock and 4 inches of asphalt over 8 inches of well-graded, crushed rock are often used in parking areas and main drive lanes, respectively, subjected to automobile traffic only. However, the existing pavement section was 4 inches of asphaltic concrete over 8 inches of base course. It may be advisable to utilize the same pavement section if partial replacement of the parking lot is planned.

Regardless of which pavement sections are selected, the soil subgrade should be stable and the top 12 inches compacted to the levels provided in Table 1, Compaction Summary. Pavement service life can decrease substantially if the pavement is constructed on a poor subgrade, if it has

poor surface or subsurface drainage, and/or if the pavement is not maintained. Periodic maintenance, such as filling cracks and sealing, is required for any pavement section.

If pavements are not constructed immediately after grading, the subgrade should be shaped to prevent ponding. Minor ponding, of even short duration, can cause softening of a soil subgrade. If there is a lapse of time between grading and paving, or if the subgrade is disturbed by construction activities, the subgrade should be proof-rolled with a loaded, tandem-wheeled dump truck. Soft spots observed during initial construction or proof-rolling should be removed and replaced with compacted soil or crushed rock, possibly combined with a geotextile or geogrid. The crushed rock base course and soil subgrade should be compacted to the levels provided in Table 1, Compaction Summary.

Depending on when the pavement is constructed, the subgrade might not support construction equipment such as rock trucks or asphalt trucks which have heavier axle loads than those vehicles which the pavement section is expected to support. Such conditions will be more apparent during wetter periods of the year. Overexcavation of soft subgrade and placement of additional base course and/or geogrid could be required to construct the pavement during these periods.

6.6 Lateral Earth Pressures

Retaining walls shall be designed to resist lateral soil loads. Design lateral pressures from surcharge loads shall be added to the lateral earth pressure load. Lateral earth pressures can vary with wall restraint conditions, type of backfill, slope of ground surface behind the wall, and method of backfill compaction.

Design values are given herein for soil lateral loads on walls with horizontal backfill, subject to active and at-rest conditions. Conventional concrete walls may be designed for active earth pressures if the top is permitted to tilt (after construction) approximately 0.5 percent of its height. Walls with fixed-heads or rigid walls should be designed for at-rest earth pressures.

Table 2. Lateral Earth Pressures for Level (Horizontal) Ground Surface

Area	Design soil lateral load (psf per foot of depth)	
	At-Rest	Active
Inorganic clays of low to medium plasticity (CL)	69h + 0.58q	49h + 0.41q
Well graded gravel-sand mix (GW/SW) (e.g., 1-inch minus, but not screenings)	57h + 0.44q	36h + 0.28q

Where:

h = depth below adjacent grade, feet
q = surcharge load, psf

In giving these values, it is assumed that hydrostatic pressures will not develop behind walls and that the wall backfill will be compacted as recommended in Table 1. Therefore, the walls should be provided with a drain system or properly designed weep holes to allow for dissipation of water. Undrained walls may be subjected to additional pressures from groundwater, perched water, pipe leakages or surface water infiltration.

For the above equations to be valid for sand or gravel backfill, the backfill should be placed in a wedge extending upward and away from the edge of the wall footing at a 45-degree angle or flatter. If sand and gravel are to be placed within a steeper wedge, the values for low plasticity soil given above should be used. Further, soft uncompacted soil on the excavation slope should be removed prior to placement of backfill. Design drawings should reflect this requirement.

7.0 RECOMMENDED ADDITIONAL SERVICES

The conclusions and recommendations given in this report are based on: UES's understanding of the proposed design and construction, as outlined in this report; site observations; interpretation of the exploration data; and our experience. Since the intent of the design recommendations is best understood by UES, we recommend that UES be included in the final design and construction process, and be retained to review the project plans and specifications to confirm that the recommendations given in this report have been correctly implemented. We recommend that UES be retained to participate in prebid and preconstruction conferences to reduce the risk of misinterpretation of the conclusions and recommendations in this report relative to the proposed construction of the subject project.

Since actual subsurface conditions between boring locations could vary from those encountered in the borings, our design recommendations are subject to adjustment in the field based on the subsurface conditions encountered during construction. Therefore, we recommend that UES be retained to provide construction observation services as a continuation of the design process to confirm the recommendations in this report and to revise them accordingly to accommodate differing subsurface conditions. Construction observation is intended to enhance compliance with project plans and specifications. It is not insurance, nor does it constitute a warranty or guarantee of any type. Regardless of construction observation, contractors, suppliers, and others are solely responsible for the quality of their work and for adhering to plans and specifications.

8.0 LIMITATIONS

This report has been prepared on behalf of, and for the exclusive use of, the client for specific application to the named project as described herein. If this report is provided to other parties, it should be provided in its entirety with all supplementary information. In addition, the client should make it clear that the information is provided for factual data only, and not as a warranty of subsurface conditions presented in this report.

UES has attempted to conduct the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same

locality and under similar conditions. The recommendations and conclusions contained in this report are professional opinions. The report is not a bidding document and should not be used for that purpose.

Our scope for this phase of the project did not include any environmental assessment or investigation for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors noted or unusual or suspicious items or conditions observed are strictly for the information of our client. Our scope did not include an assessment of the effects of flooding and erosion of creeks or rivers adjacent to or on the project site.

Our scope did not include: any services to investigate or detect the presence of mold or any other biological contaminants (such as spores, fungus, bacteria, viruses, and the by-products of such organisms) on and around the site; or any services, designed or intended, to prevent or lower the risk of the occurrence of an infestation of mold or other biological contaminants.

The analyses, conclusions, and recommendations contained in this report are based on the data obtained from the geotechnical exploration. The field exploration methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Consequently, subsurface conditions could vary gradually, abruptly, and/or nonlinearly between sample locations and/or intervals.

The conclusions or recommendations presented in this report should not be used without UES's review and assessment if the nature, design, or location of the facilities is changed, if there is a lapse in time between the submittal of this report and the start of work at the site, or if there is a substantial interruption or delay during work at the site. If changes are contemplated or delays occur, UES must be allowed to review them to assess their impact on the findings, conclusions, and/or design recommendations given in this report. UES will not be responsible for any claims, damages, or liability associated with any other party's interpretations of the subsurface data or with reuse of the subsurface data or engineering analyses in this report.

The recommendations included in this report have been based in part on assumptions about variations in site stratigraphy that can be evaluated further during earthwork and foundation construction. UES should be retained to perform construction observation and continue its geotechnical engineering service using observational methods. UES cannot assume liability for the adequacy of its recommendations when they are used in the field without UES being retained to observe construction.

APPENDIX A – IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

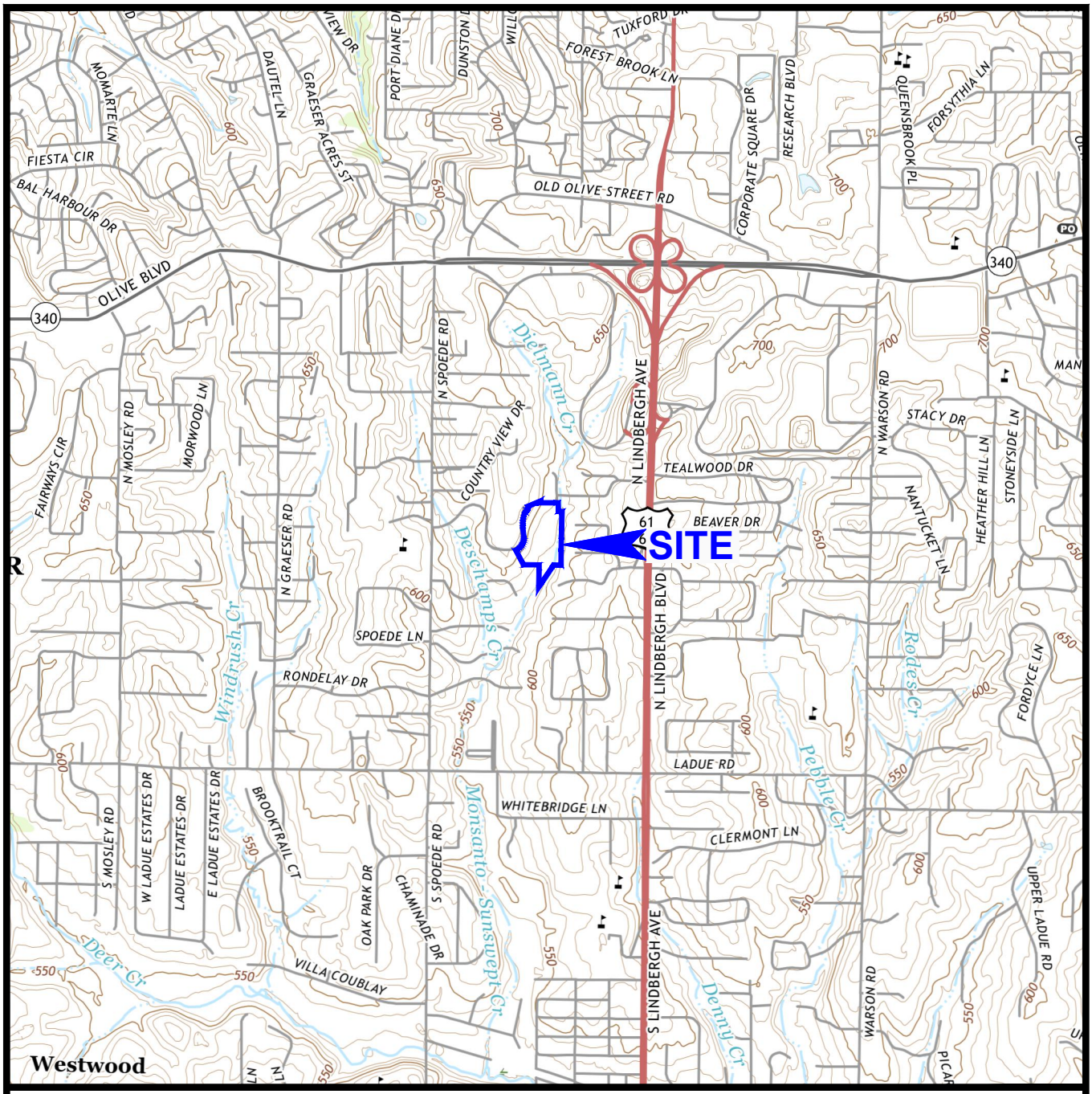
Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX B – FIGURES

Figure 1 - Site Location and Topography

Figure 2 – Aerial Photograph of Site and Boring Locations



NOTES

1. Plan adapted from a 7.5 minute U.S.G.S. map for Creve Coeur, Missouri quadrangle, last revised in 2021.

0 2,000 4,000

SCALE IN FEET

N

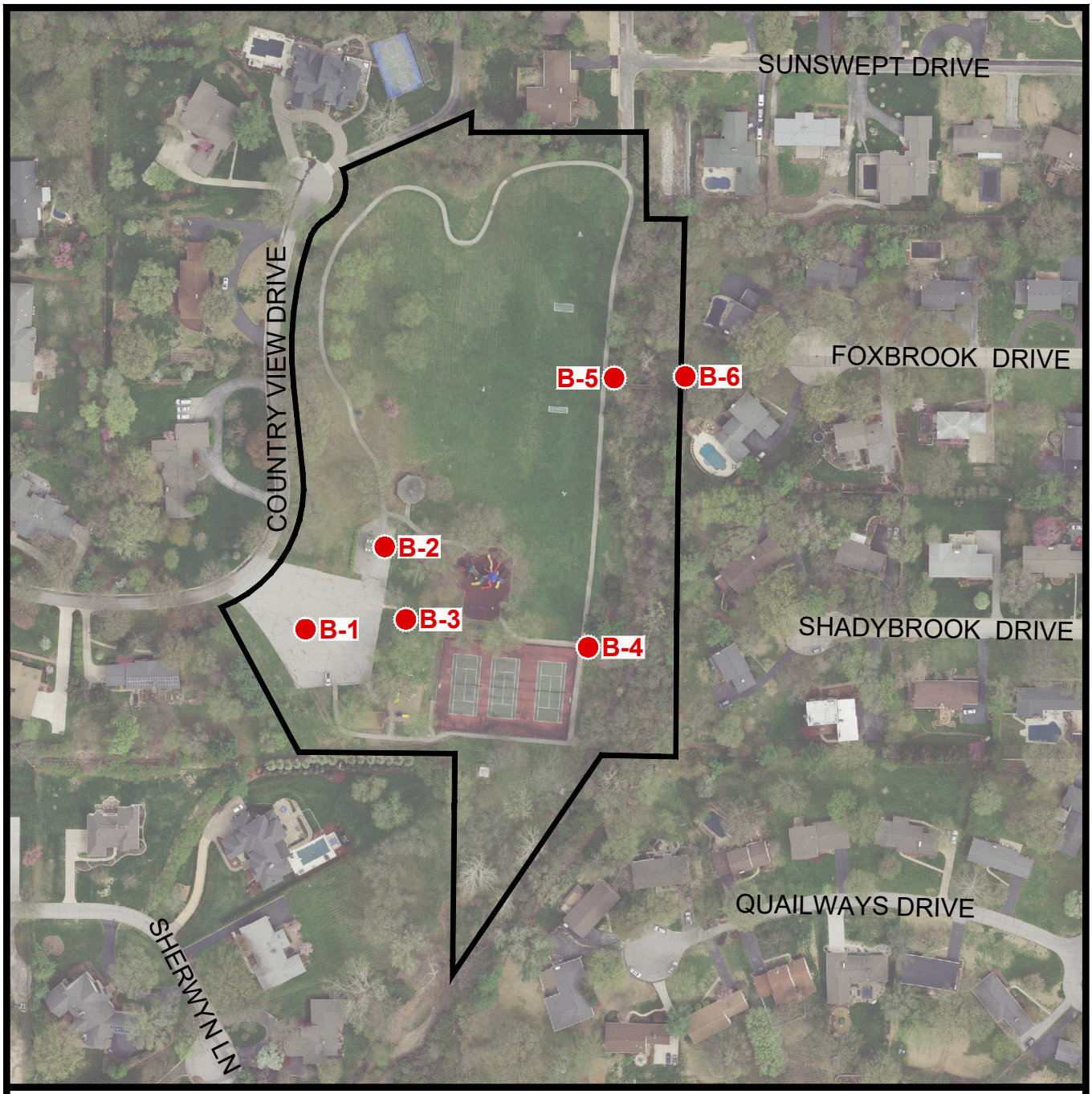
Drawn By: WAH	Ck'd By: ACE	App'vd By: JAW
Date: 12-27-23	Date: 1-17-24	Date: 1-24-24

UES

Venable Memorial Park
Creve Coeur, Missouri

SITE LOCATION AND TOPOGRAPHY

Project Number J044966.01	FIGURE 1



NOTES

1. Plan adapted from "2015 Aerial Imagery for the St. Louis Region" supplied by East-West Gateway Council of Governments.

2. Borings were located in the field with reference to site features and are shown approximate only.

LEGEND

● Boring Location

0 200 400

SCALE IN FEET

N

Drawn By: WAH	Ck'd By:ACE	App'vd By: JAW
Date: 12-27-23	Date: 1-17-24	Date: 1-24-24

UES

Venable Memorial Park
Creve Coeur, Missouri

AERIAL PHOTOGRAPH OF SITE AND BORING LOCATIONS

Project Number J044966.01	FIGURE 2

APPENDIX C – BORING INFORMATION

Boring Logs

Boring Log Terms and Symbols

Surface Elevation: 595 Datum: NAVD88

Completion Date: 12/21/23

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
	Asphalt - 4.0 inches			
	Crushed rock - 8.0 inches			
	Medium stiff to stiff, brown and gray, LEAN CLAY, silty, trace sand - CL		2-3-4	SS1
			2-5-5	SS2
5	Boring terminated at 5.0 feet			
10				
15				

SHEAR STRENGTH, tsf

△ - UU/2 ○ - QU/2 □ - SV

0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE

▲ N-VALUE (BLOWS PER FOOT)

(ASTM D 1586)

WATER CONTENT, %

PL 10 20 30 40 50 LL

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

KA DRILLER SAG LOGGER

CME 55LC DRILL RIG

HAMMER TYPE Auto

HAMMER EFFICIENCY 79 %

REMARKS:

N: 1030229.76

E: 845672.31

Drawn by: WAH	Checked by: ACE	App'vd. by: JAW
Date: 12/27/23	Date: 1/11/24	Date: 1/24/24

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Venable Memorial Park
Creve Coeur, Missouri

LOG OF BORING: B-1

Project No. J044966.01

LOG OF BORING 2002 N/E J044966.01 BORING LOGS.GPJ 00 CLONE ME.GPJ 1/29/24

Surface Elevation: 590 Datum: NAVD88

Completion Date: 12/21/23

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
	Asphalt - 4.75 inches			
	Crushed rock - 8.0 inches			
	Medium stiff to stiff, brown and gray, LEAN CLAY, trace sand - (CL)		98	ST1
			3-4-6	SS2
5				
			2-3-4	SS3
			2-3-6	SS4
10	Boring terminated at 10.0 feet			
15				

SHEAR STRENGTH, tsf

△ - UU/2 ○ - QU/2 □ - SV

0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE

▲ N-VALUE (BLOWS PER FOOT)

(ASTM D 1586)

WATER CONTENT, %

PL 10 20 30 40 50 LL

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

KA DRILLER SAG LOGGER

CME 55LC DRILL RIG

HAMMER TYPE Auto

HAMMER EFFICIENCY 79 %

REMARKS:

N: 1030332.34

E: 845773.33

Drawn by: WAH	Checked by: ACE	App'vd. by: JAW
Date: 12/27/23	Date: 1/11/24	Date: 1/24/24

UES™

Venable Memorial Park
Creve Coeur, Missouri

LOG OF BORING: B-2

Project No. J044966.01

LOG OF BORING 2002 N/E J044966.01 BORING LOGS.GPJ 00 CLONE ME.GPJ 1/29/24

Surface Elevation: 584 Datum: NAVD88

Completion Date: 12/20/23

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
	Stiff to medium stiff, brown and gray, LEAN CLAY, trace sand - CL			
			5-8-7	SS1
			4-7-7	SS2
5				
			3-3-5	SS3
			3-4-5	SS4
10	Boring terminated at 10.0 feet			
15				

SHEAR STRENGTH, tsf

Δ - UU/2 ○ - QU/2 □ - SV

0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE

▲ N-VALUE (BLOWS PER FOOT)

(ASTM D 1586)

WATER CONTENT, %

PL 10 20 30 40 50 LL

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

KA DRILLER SAG LOGGER

CME 55LC DRILL RIG

HAMMER TYPE Auto

HAMMER EFFICIENCY 79 %

REMARKS:

N: 1030223.93

E: 845803.52

Drawn by: WAH	Checked by: ACE	App'vd. by: JAW
Date: 12/27/23	Date: 1/11/24	Date: 1/24/24

UES™

Venable Memorial Park
Creve Coeur, Missouri

LOG OF BORING: B-3

Project No. J044966.01

LOG OF BORING 2002 N/E J044966.01 BORING LOGS.GPJ 00 CLONE ME.GPJ 1/29/24

Surface Elevation: 578 Datum: NAVD88

Completion Date: 12/20/23

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
	Stiff, brown, SILTY CLAY - (CL-ML)			
			4-5-5	SS1
	Stiff, brown, LEAN CLAY, little sand - CL			
5			3-4-5	SS2
	Boring terminated at 5.0 feet			
10				
15				

SHEAR STRENGTH, tsf

△ - UU/2 ○ - QU/2 □ - SV

0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE

▲ N-VALUE (BLOWS PER FOOT)

(ASTM D 1586)

WATER CONTENT, %

PL 10 20 30 40 50 LL

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

KA DRILLER SAG LOGGER

CME 55LC DRILL RIG

HAMMER TYPE Auto

HAMMER EFFICIENCY 79 %

REMARKS:

N: 1030200.88

E: 846034.82

Drawn by: WAH	Checked by: ACE	App'vd. by: JAW
Date: 12/27/23	Date: 1/11/24	Date: 1/24/24

UES™

Venable Memorial Park
Creve Coeur, Missouri

LOG OF BORING: B-4

Project No. J044966.01

LOG OF BORING 2002 N/E J044966.01 BORING LOGS.GPJ 00 CLONE ME.GPJ 1/29/24

Surface Elevation: 585 Datum: NAVD88

Completion Date: 12/20/23

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
	Stiff to medium stiff, brown, LEAN CLAY - (CL)			
			8-7-5	SS1
			3-4-4	SS2
5	little sand, trace roots			
			5-5-5	SS3
			104	ST4
10				
	Brown, FAT CLAY and weathered LIMESTONE		50/1"	SS5
15	Gray, weathered LIMESTONE			
			50/4"	SS6
	Auger refusal at 15.8 feet			

SHEAR STRENGTH, tsf

△ - UU/2 ○ - QU/2 □ - SV

0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE

▲ N-VALUE (BLOWS PER FOOT)

(ASTM D 1586)

WATER CONTENT, %

PL 10 20 30 40 50 LL

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

KA DRILLER SAG LOGGER

CME 55LC DRILL RIG

HAMMER TYPE Auto

HAMMER EFFICIENCY 79 %

REMARKS:

N: 1030547.80

E: 846071.24

Drawn by: WAH	Checked by: ACE	App'vd. by: JAW
Date: 12/27/23	Date: 1/11/24	Date: 1/24/24

UES™

Venable Memorial Park
Creve Coeur, Missouri

LOG OF BORING: B-5

Project No. J044966.01

LOG OF BORING 2002 N/E J044966.01 BORING LOGS.GPJ 00 CLONE ME.GPJ 1/29/24

Surface Elevation: 584 Datum: NAVD88

Completion Date: 12/20/23

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
	Stiff, brown, LEAN CLAY, trace roots - CL			
			3-5-7	SS1
	Stiff, brown, SILTY CLAY - (CL-ML)			
			97	ST2
5				
			3-4-3	SS3
	Stiff, brown and gray, LEAN CLAY, little sand and gravel - CL			
			3-6-7	SS4
10				
	Stiff, gray, Shaley CLAY			
			3-5-7	SS5
15				
	Gray, weathered LIMESTONE			
	Auger refusal at 16.1 feet		50/1"	SS6

SHEAR STRENGTH, tsf
Δ - UU/2 ○ - QU/2 □ - SV
0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE
▲ N-VALUE (BLOWS PER FOOT)
(ASTM D 1586)

WATER CONTENT, %
PL 10 20 30 40 50 LL

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM ___ FEET
KA DRILLER SAG LOGGER
CME 55LC DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 79 %

REMARKS:
N: 1030545.17
E: 846144.86

Drawn by: WAH	Checked by: ACE	App'vd. by: JAW
Date: 12/27/23	Date: 1/11/24	Date: 1/24/24

UES™

Venable Memorial Park
Creve Coeur, Missouri

LOG OF BORING: B-6

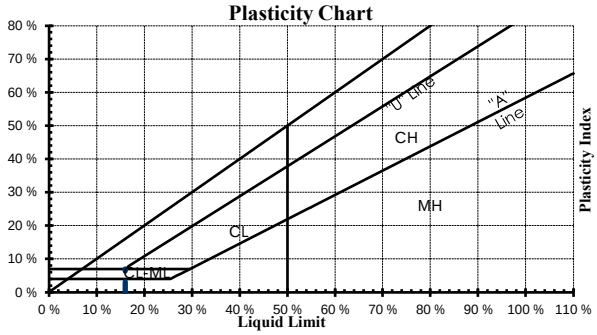
Project No. J044966.01

LOG OF BORING 2002 N/E J044966.01 BORING LOGS.GPJ 00 CLONE ME.GPJ 1/29/24

BORING LOG: TERMS AND SYMBOLS

LEGEND

CS	Continuous Sampler
GB	Grab Sample
NQ	NQ Rock Core
PST	Three-Inch Diameter Piston Tube Sample
SS	Split-Spoon Sample (Standard Penetration Test)
ST	Three-Inch Diameter Shelby Tube Sample
*	Sample Not Recovered
PL	Plastic Limit (ASTM D4318)
LL	Liquid Limit (ASTM D4318)
SV	Shear Strength from Field Vane (ASTM D2573)
UU	Shear Strength from Unconsolidated-Undrained Triaxial Compression Test (ASTM D2850)
QU	Shear Strength from Unconfined Compression Test (ASTM D2166)



SOIL GRAIN SIZE

US STANDARD SIEVE

12"	3"	3/4"	4	10	40	200

BOULDERS	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

300	76.2	19.1	4.76	2.00	0.42	0.074	0.005

SOIL GRAIN SIZE IN MILLIMETERS

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions			Symbol	Description
Coarse-Grained Soils (More than 50% Larger than No. 200 Sieve Size)	Gravel and Gravelly Soil	Clean Gravels Little or no Fines	GW	Well-Graded Gravel, Gravel- Sand Mixture
			GP	Poorly-Graded Gravel, Gravel-Sand Mixture
		Gravels with Appreciable Fines	GM	Silty Gravel, Gravel-Sand-Silt Mixture
			GC	Clayey-Gravel, Gravel-Sand-Clay Mixture
	Sand and Sandy Soils	Clean Sands Little or no Fines	SW	Well-Graded Sand, Gravelly Sand
			SP	Poorly-Graded Sand, Gravelly Sand
		Sands with Appreciable Fines	SM	Silty Sand, Sand-Silt Mixture
			SC	Clayey-Sand, Sand-Clay Mixture
Fine-Grained Soils (More than 50% Smaller than No. 200 Sieve Size)	Silts and Clays	Liquid Limit Less Than 50	ML	Silt, Sandy Silt, Clayey Silt, Slight Plasticity
			CL	Lean Clay, Sandy Clay, Silty Clay, Low to Medium Plasticity
			OL	Organic Silts or Lean Clays, Low Plasticity
	Silts and Clays	Liquid Limit Greater Than 50	MH	Silt, High Plasticity
			CH	Fat Clay, High Plasticity
			OH	Organic Clay, Medium to High Plasticity
	Highly Organic Soils		PT	Peat, Humus, Swamp Soil

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength (tsf)	Unconfined Comp. Strength (tsf)
Very Soft	less than 0.125	less then 0.25
Soft	0.125 to 0.25	0.25 to 0.5
Medium Stiff	0.25 to 0.5	0.5 to 1.0
Stiff	0.5 to 1.0	1.0 to 2.0
Very Stiff	1.0 to 2.0	2.0 to 3.0
Hard	greater than 2.0	greater than 4.0

DENSITY OF GRANULAR SOILS

Descriptive Term	Approximate N_{60}-Value Range
Very Loose	0 to 4
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	>50

N-Value (Blow Count) is the last two, 6-inch drive increments (i.e. 4/7/9, N = 7 + 9 = 16). Values are shown as a summation on the grid plot and shown in the Unit Dry Weight/SPT column.

RELATIVE COMPOSITION

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35 to 50%

OTHER TERMS

Layer - Inclusion greater than 3 inches thick.

Seam - Inclusion 1/8-inch to 3 inches thick

Parting - Inclusion less than 1/8-inch thick

Pocket - Inclusion of material that is smaller than sample diameter

UES

Relative composition and Unified Soil Classification System (USCS) designations are based on visual descriptions and are approximate only. If laboratory tests were performed to classify the soil, the USCS designation is shown in parenthesis.

APPENDIX D – PAVEMENT CORE PHOTOGRAPHS

J044966.01 **Venable Memorial Park**
Creve Coeur, Missouri
B-1 and B-2

Photo 1 of 1

Boring	Pavement Type	Thickness (inch)	Crushed Rock Thickness (inch)
B-1	Asphaltic Concrete	4.0	8.0
B-2	Asphaltic Concrete	4.75	8.0

RESOLUTION NO. 1834

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CREVE COEUR, MISSOURI, AUTHORIZING THE EXECUTION OF A CHANGE ORDER WITH IDEAL LANDSCAPE CONSTRUCTION, INC. FOR THE VENABLE PARK IMPROVEMENT PROJECT FOR A LUMP SUM CONTRACT SUM OF $222,222.00.

WHEREAS, the City strives to maintain quality of life amenities that make Creve Coeur a desirable destination for new residents and businesses;

WHEREAS, Venable Park has important City assets that help make Creve Coeur an exceptional place to live and work;

WHEREAS, it is necessary to address subsurface issue for the parking lot by removing unsuitable soil and replacing with compacted rock, placing additional retaining wall block to place below unsuitable soil, cover fee cost for truck cancelation, and to provide credit to the City for the wrong type of park furniture;

WHEREAS, this project for park improvements has been competitively bid per the requirements outlined in the City of Creve Coeur Code of Ordinances; and

WHEREAS, Ideal Landscape Construction, Inc. has provided a fair and reasonable bid for material and labor costs related to all the items included in the change order.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CREVE COEUR, AS FOLLOWS:

Section 1. A Change Order between **Ideal Landscape Construction, Inc.** and the City, attached hereto as "Exhibit A," with a **lump sum contract amount of $ 222,222,00**, is hereby approved and the City Administrator is hereby authorized and directed to enter into and execute that Change Order. The Change Order as executed shall be substantially in the form of "Exhibit A," with such changes therein as shall be approved by the officers of the City executing same, consistent with the provisions and intent of this Resolution. The City Administrator and his designated representatives are hereby authorized and directed to take any and all actions necessary, desirable, convenient, or proper in order to carry out the intent of this Resolution, the matters herein authorized, and the rights and duties of the City under the Contract.

ADOPTED THIS 6TH DAY OF OCTOBER, 2025.

_____
ROBERT HOFFMAN
MAYOR

ATTEST:

_____
KELLIE HENKE, MRCC
CITY CLERK

City of Creve Coeur
Change Order Details
2025 Venable Park Renovation Project

Description	Renovation of park to include memorial, new pavilion, playground, walking trail improvements and improvements to parking lot.
Prime Contractor	Ideal Landscaping Construction Inc
Change Order	4
Status	Pending
Date Created	10/01/2025
Type	Differing Field Conditions
Summary	Change Order #4 - Differing feild conditions related to unstable soil type under the asphalt parking lot at Venable Park, resulted in removal of poor soil, increase quantities for rock base and additional retaining wall blocks.
Change Order Description	Ideal Landscape Construction provided cost for several items as a result of differing field conditions at Venable Park. During the retaining wall excavation and removal of the asphalt parking lot, unstable inorganic soil was found. Due to this unstable soil, additional excavation and poor soil removal was required to build the retaining wall and parking lot on a firm base. In the case of the retaining wall an extra row of blocks was added to the depth, resulting in an additional 419 square feet of block wall. For the parking lot, poor soil varying in depth from one (1) to three (3) feet will need to be removed and replaced with type 5 aggregate rock to stabilize the substructure and make it stable for asphalt surface application. In the process of the exploration of the subsurface the task was stopped on the fourth day, which resulted in a truck cancelation fee for three dump trucks for a half day of work. Finally, the change order does show a credit to the City for acceptance of the wrong type of picnic tables which were ordered by the contractor, but still met the City's standards. Ideal Landscape Construction is requesting a ten (10) day time extension to the contract due to unforeseen underground soil conditions which required over digging and additional time to place and compact rock to stabilize the subbase of the parking lot. .Additions

- Retaining Wall Increase $ 30,168.00
- Haul Off Excess Materials $ 67,500.00
- Type 5 Aggregate Increase $127,254.00

- Truck Cancellation Fee $ 3,300.00
- Picnic Table Credit ($ 6,000.00)

Total Change Order Amount: $222,222.00

Awarded Project Amount	$2,315,736.00
Authorized Project Amount	$2,375,449.00
Change Order Amount	$222,222.00
Revised Project Amount	$2,597,671.00

Increases/Decreases

Line Number	Item ID	Unit	Unit Price	Current		Change		Revised	
				Quantity	Amount	Quantity	Amount	Quantity	Amount
Section: 2 - Description									
0070	7	CY	$75.000	0.000	$0.00	900.000	$67,500.00	900.000	$67,500.00
HAUL OFF FOR EXCESS MATERIAL **Reason:** Poor soil under parking lot - removal of excess materials									
0220	22	CY	$75.000	625.000	$46,875.00	1,696.720	$127,254.00	2,321.720	$174,129.00
TYPE 5 AGGREGATE BASE - VARIOUS DEPTH (PARKING LOT) **Reason:** Additional rock base under the parking lot to replace poor soils									
0290	29	SF	$72.000	1,965.000	$141,480.00	419.000	$30,168.00	2,384.000	$171,648.00
SMALL BLOCK RETAINING WALL									

Line Number	Item ID	Unit	Unit Price	Current		Change		Revised	
				Quantity	Amount	Quantity	Amount	Quantity	Amount
Reason: Additional block row deeper due to poor soils									
3 items			Totals		$188,355.00		$224,922.00		$413,277.00

New Items

Line Number	Item ID	Unit	Quantity	Unit Price	Extension
Section: 2 - Description					
1070	999-06.00	LS	1.000	-$6,000.000	-$6,000.00
Outdoor Furniture					
Reason: Credit for wrong type of picnic table					
1080	109-99.01	LS	1.000	$3,300.000	$3,300.00
MISC.					
Reason: Truck Cancellation Fee for 1/2 day (3 trucks)					
2 items					Total: -$2,700.00

THE TERMS OF SETTLEMENT OUTLINED ABOVE ARE HEREBY AGREED TO.

_____

Contractor Date

_____

Project Manager- City of Creve Coeur Date

_____

Interim Asst. Director of Public Works – City of Creve Coeur Date

_____

Interim City Administrator – City of Creve Coeur Date