LGCI
Lahlaf Geotechnical Consulting, Inc.

March 3, 2023

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Re: **Geotechnical Report**
Proposed Manufacturing Building
Cranston, Rhode Island
LGCI Project No. 2252-Rev. 1

Dear Mr. Giampietro:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed a geotechnical study for the proposed Manufacturing Building in Cranston, Rhode Island. We are submitting our geotechnical report electronically.

The soil and rock samples from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil and rock samples after three (3) months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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GEOTECHNICAL REPORT
PROPOSED MANUFACTURING BUILDING
CRANSTON, RHODE ISLAND

LGCI Project No. 2252-Rev. 1
March 3, 2023

Prepared for:

Taco Comfort Solutions
1160 Cranston Street
Cranston, RI 02920
Phone: (401) 942-8000

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1160 Cranston Street
Cranston, RI 02920
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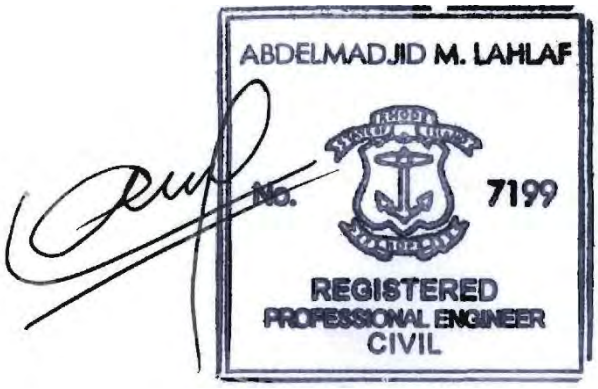

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

This geotechnical report presents the results of the subsurface explorations and a geotechnical evaluation performed by Lahlaf Geotechnical Consulting, Inc. (LGCI) for the proposed Manufacturing Building in Cranston, Rhode Island. To date, we have performed our services in two phases as follows.

We performed our original services in general accordance with our proposal No. 22037-Rev. 1 dated September 7, 2022, revised on September 19, 2022. Mr. Jon Giampietro of Taco Comfort Solutions (TCS) authorized our original services by signing our proposal on October 9, 2022.

We performed additional services in general accordance with our proposed No. 23012 dated February 9, 2023. Mr. Jon Giampietro of TCS authorized our additional services by signing our proposal on February 13, 2023.

1.2 Purpose and Scope of Services

The purpose of our geotechnical services was to perform subsurface explorations at the site for the proposed manufacturing building, and to provide foundation design and construction recommendations. LGCI performed the following services:

- Coordinated our exploration locations with TCS and with Mr. Robert Kelliher of Thermo-Mechanical Systems Corporation (TMSC), the project manager.

- Marked the exploration locations at the site and notified Dig Safe Systems Inc. (Dig Safe) and the City of Cranston for utility clearance.

- Engaged a drilling subcontractor for a total of six (6) days to advance nineteen (19) soil borings at the site, including four (4) days to advance seventeen (17) soil borings as part of our original services and two (2) days to advance an additional two (2) soil borings as part of our additional services.

- Observed fifteen (15) test pits performed at the site by an excavator subcontractor hired by TMSC.

- Provided an LGCI geotechnical engineer at the site to coordinate and observe the test pits and borings, describe the soil samples, and prepare field logs.

- Submitted fourteen (14) soil samples from the test pits for laboratory testing, including four (4) samples included in our scope, six (6) additional samples approved by the owner as part of our original services, and four (4) samples as part of our additional services. The laboratory tests included eight (8) grain size analyses, two (2) organic content tests on fill from

explorations performed as part of our original services, and four (4) organic content tests on buried organic soil from our additional service explorations.

- Prepared this geotechnical report containing the results of our subsurface explorations and our recommendations for foundation design and construction.

Upon the completion of our original services, LGCI submitted a geotechnical report dated January 16, 2023. This geotechnical report includes the results of our original services and supersedes the aforementioned report.

Our scope does not include preparing specifications, reviewing contract documents, attending meetings, or providing construction services. LGCI would be pleased to perform these services when needed. Recommendations for unsupported slopes, stormwater management, erosion control, pavement design, slope stability analyses, liquefaction and/or site-specific seismic analysis, pile analysis and design, and cost or quantity estimates are not included in our scope of work.

LGCI's scope of services does not include an environmental assessment for the presence or absence of wetlands or analytical testing for hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site, or mold in the soil or in any structure at the site. Any statements regarding odors, colors, or unusual or suspicious items or conditions are strictly for the information of the client.

1.3 Site Description

Our understanding of the site is based on our field observations, our discussions with TMSC, and on the following documents:

- Document titled: "Environmental Land Usage Restriction," (ELUR Document) dated January 19, 2015, and provided to LGCI by TMSC via e-mail on March 21, 2022.

- Drawing C-200 titled: "Civil Proposed Site Plan, Taco, Inc., 1160 Cranston Street, Cranston, RI 02920, 35 Carlsbad Building," (Site Plan) prepared by Woodard & Curran, dated August 2022, and provided to LGCI by TMSC via email on August 23, 2022.

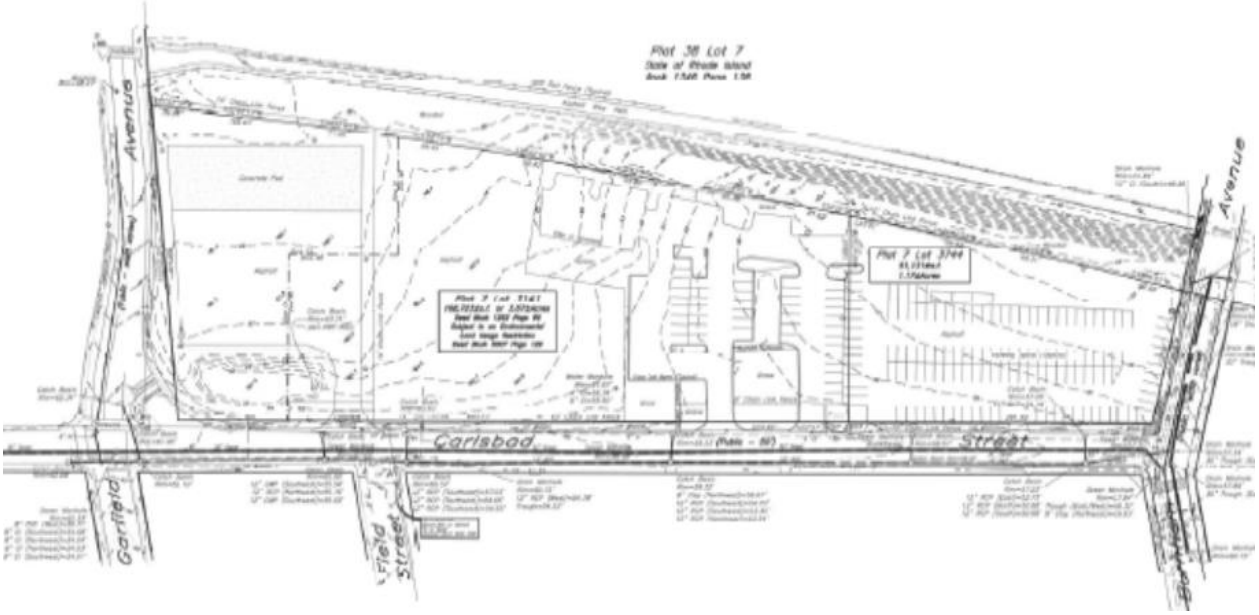
- Drawing titled: "Exiting Conditions, Assessors Plat 7-3, Lots 3141 & 3744, 35 Carlsbad Street, Cranston, RI 02920," (Existing Conditions Plan), prepared by Crossman Engineering, dated April 5, 2022, and provided to LGCI by TMSC on August 23, 2022.

The site is located east of the existing TCS building located at 1160 Cranston Street in Cranston, Rhode Island as shown in Figure 1. The site is bordered by Carlsbad Street on the western side, by Burnham Street on the southern side, by Carolina Street on the northern side, and by Washington Secondary Trail on the eastern side. The site is currently used as a parking lot and tractor trailer storage yard. The site consists of asphalt and concrete parking areas and grass

landscape features. A portion of the site is capped with crushed stone and geotextile fabric due to an Environmental Land Usage Restriction (EULR) described below.

Based on the Site Plan, the grades at the site generally range from El. 52 feet near Burnham Street near the southeastern corner of the site and El. 70 feet near Carolina Street near the northeastern corner of the site. The existing grades within the general area of the proposed building (described in Section 1.4) range between El. 57 feet near the southern side of the proposed building and El. 68 feet near the northern side of the proposed building. The existing grades within the general area of the proposed northern parking lot range between El. 62 feet and El. 69 feet. The existing grades within the general area of the proposed southern parking lot range between El. 54 feet and El. 59 feet.

Based on the Existing Conditions Plan, the site is divided into two (2) lots as shown in the plan below: a northern Lot 3141 zoned C-4 on the northern side and M-2 on the southern side, and a southern Lot 3744 zoned M-2. Lot 3141 comprises most of the site and has an area of about 3.87 acres. Lot 3744 has an area of about 1.17 acres.



Excerpt from Existing Conditions Plan

We understand that the northern portion of the site, i.e., Lot 3141, has an EULR. Based on the ELUR Document, we understand that the site is capped and that the top several feet of soil consist of contaminated soil. We understand that as a result of the ELUR on Lot 3141, materials excavated from the northern portion of the site, i.e., Lot 3141, cannot be transferred or reused on the southern side in Lot 3744.

1.4 Project Description

Our understanding of the proposed construction is based on our discussions with TMSC and the documents listed in Section 1.3.

We understand that TCS is planning to develop the site into a new manufacturing building. We understand that the proposed construction will consist of a one-story manufacturing building located on the northern side of the site that will have a footprint of about 85,500 square feet. The proposed building will be located entirely in Lot 3141. We understand that the proposed building will not have a basement.

We understand that the proposed grading, including the finished floor elevation of the proposed building, is a work in progress and will be finalized based on the results of this report and on the environmental constraints from the ELUR. The grading information described herein is preliminary and is based on the drawings listed in Section 1.3.

Based on the Site Plan, the proposed building will have a first finished floor elevation (FFE) of El. 64 feet; thus, requiring cuts of up to 4 feet on the northern side and fills of up to 7 feet on the southern side to achieve the proposed grade of the building.

We understand that the proposed construction will also consist of paved parking lots located to the north and south of the proposed building. The proposed grades within the proposed northern parking lot will range between El. 62 feet and El. 68 feet, requiring cuts of about 2 feet and fills of about 2.5 feet to achieve the proposed grades. The proposed grades within the proposed southern parking lot will range between El. 56 feet and El. 62 feet, requiring fills ranging between 2 and 6 feet to achieve the proposed grades. The northern parking lot will be accessible from Carolina Street via an access road. The southern parking lot will be accessible from Burnham Street via an access road.

We understand that after the proposed grades are finalized, the magnitude of the cuts and fill described above may change slightly. However, the general pattern of the earthwork operation will still remain as consisting of slights cuts on the northern side and fill on the southern side of the site.

1.5 Elevation Datum

We understand that the elevations provided in the Site Plan and Existing Conditions Plan are referenced with respect to the North American Vertical Datum of 1988 (NAVD88). Elevations are in feet.

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

LGCI reviewed a surficial geologic map titled: "Geologic Map of Providence Quadrangle, Rhode Island, Surficial Geology," prepared by J. Hiram Smith in 1956, Geological Survey, Map GQ-84.

The surficial geologic map of the site indicates that the natural soils in the general vicinity of the site consist of outwash plains.

The outwash plains consist of sorted sand and local deposits of coarse gravel.

The Surficial Geologic Map is shown in Figure 2.

2.2 LGCI's Explorations

2.2.1 General

LGCI coordinated our exploration locations with TMSC and marked the exploration locations in the field. LGCI notified Dig Safe and the City of Cranston for utility clearance prior to starting our explorations at the site.

Unless notified otherwise, we will dispose of the soil and rock samples obtained during our explorations after three (3) months.

2.2.2 LGCI's Test Pits

LGCI observed fifteen (15) test pits (TP-1 to TP-15) excavated at the site by JRD, Inc. of Assonet, Massachusetts on November 14 and 15, 2022. The test pits were excavated using a Deere 710G backhoe. The test pits extended to depths ranging between 9 feet and 12 feet beneath the ground surface. Upon completion, the test pits were backfilled with the excavated material in 12-inch to 18-inch lifts and tamped with the excavator bucket.

An LGCI geotechnical engineer observed and logged the test pits in the field.

2.2.3 LGCI's Soil Borings

As part of our original services, LGCI engaged Northern Drilling Services, Inc. (NDS) of Northborough, Massachusetts to advance seventeen (17) soil borings (B-1 to B-17) at the site between December 19 and 22, 2022. The borings were advanced with a Mobile B-53 ATV Drill Rig using 3 ¼" inner diameter hollow stem augers. The borings extended to depths ranging between 12 and 22 feet beneath the ground surface. Upon completion, the boreholes were backfilled with the soil cuttings and sand. The ground surface was restored with asphalt cold patch in paved areas.

During our additional services, LGCI engaged NDS to advance an additional two (2) soil borings (B-101 & B-102) at the site on February 17 and 20, 2023. The borings were advanced with a Mobile B-48 ATV Drill Rig using drive and wash boring techniques with 4-inch casings. Borings B-101 and B-102 extended to depths ranging between 49 and 53.5 feet beneath the ground surface, respectively. Upon completion, the boreholes were backfilled with the soil cuttings and gravel. The ground surface was restored with asphalt cold patch.

NDS performed Standard Penetration Tests (SPT) and obtained split spoon samples with an automatic hammer at typical depth intervals of 2 feet or 5 feet as noted on the boring logs in general accordance with ASTM D-1586.

An LGCI geotechnical engineer observed and logged the borings in the field.

2.2.4 Exploration Logs and Locations

The boring and test pit locations are shown in Figure 3. Appendix A contains LGCI's test pit logs. Appendix B contains LGCI's boring logs. Tables 1 and 2 include summaries of LGCI's test pits and borings, respectively.

2.3 Subsurface Conditions

The subsurface description in this report is based on a limited number of explorations and is intended to highlight the major soil strata encountered during our explorations. The subsurface conditions are known only at the actual exploration locations. Variations may occur and should be expected between exploration locations. The boring and test pit logs represent conditions that we observed at the time of our explorations and were edited, as appropriate, based on the results of the laboratory test data and inspection of the soil samples in the laboratory. The strata boundaries shown in our boring and test pit logs are based on our interpretations and the actual transitions may be gradual. Graphic soil symbols are for illustration only.

The soil strata encountered in LGCI's test pits and borings were as follows, starting at the ground surface.

Asphalt – Asphalt was encountered at the ground surface in test pits TP-1 to TP-4, TP-11, and TP-13 and in borings B-1 to B-6, B-12, B-14 to B-16, B-101, and B-102. The thickness of the asphalt ranged between 0.2 feet and 0.4 feet.

Topsoil – A layer of surficial organic topsoil was encountered at the ground surface in test pits TP-5 to TP-7, TP-10, and TP-12, and in borings B-7 and B-13. The thickness of the topsoil ranged between 0.2 feet and 2 feet beneath the ground surface.

Crushed Stone – A layer of crushed stone was encountered at the ground surface in test pits TP-8 to TP-9, and TP-14 to TP-15, and in borings B-8 to B-11, and B-17. The thickness of the crushed stone ranged between 0.3 feet and 0.5 feet.

Fill – A layer of fill was encountered beneath the asphalt, topsoil, or crushed stone in all test pits and borings, except in test pit TP-7. The fill extended to depths ranging between 1 foot and 12 feet beneath the ground surface. The samples in this layer were mostly described as silty sand, well graded sand, or poorly graded sand. Two (2) samples were described as well graded gravel. The fines content in the fill ranged between 0 and 30 percent, but was in most samples less than 20 percent. The gravel content in the fill ranged between 0 and 30 percent. When described as gravel, the sand content in the fill ranged between 15 and 30 percent. The fill contained traces of organic soil, brick, roots, concrete, asphalt, wood, plastic, glass, clay pipe, and construction debris.

The SPT N-values in this layer ranged between 3 blows per foot (bpf) and 54 bpf, with most values ranging below 15 bpf, indicating very loose to medium dense material. Please note that the high SPT N-values recorded in the fill may be due to obstructions such as cobbles and boulders present in the fill and may not represent the true density of the fill. Also, the deeper fill was generally looser than the shallow fill. The excavation effort in the fill layer was described as easy to moderate.

Buried Organic Soil – A layer of buried organic soil was encountered beneath the fill in test pits TP-4 and TP-6, and in borings B-2, B-4, and B-102 performed within or near the southern side of the proposed building. The buried organic soil extended to depths ranging between 8 feet and 11 feet beneath the ground surface. The samples in this layer were described as silty sand. The fines content in the buried organic soil ranged between 20 and 35 percent and the gravel content ranged between 5 and 10 percent. The buried organic soil contained traces of organic soil and roots.

The SPT N-values in this layer ranged between 2 and 10 bpf, indicating very loose to loose material. The excavation effort within this layer was described as easy.

Buried Subsoil – A layer of buried subsoil was encountered beneath the fill in test pits TP-1, TP-3, and TP-5. The buried subsoil extended to depths ranging between 5 feet and 7.7 feet beneath the ground surface. The samples in this layer were described as silty sand and well graded sand. The fines content in the buried subsoil ranged between 10 and 20 percent and the gravel content ranged between 15 and 20 percent. The buried subsoil contained traces of organic soil and roots.

The excavation effort within this layer was described as easy, indicating loose material.

Sand and Gravel – A layer of sand and gravel was encountered beneath the topsoil, fill, buried organic soil, or buried subsoil in all test pits and borings. The sand and gravel extended to the termination depths of the test pits and borings, except in borings B-101 and B-102 where the sand and gravel extended to depths of 33 feet and 44 feet beneath the ground surface, respectively. The samples in this layer were mostly described as poorly graded sand and well graded sand. Five (5) samples were described as silt, three (3) samples were described as silty sand, and two (2) samples were described as well graded gravel. The fines content in this layer ranged between 0 and 40 percent, with most samples containing less than 25 percent fines. The gravel content ranged between 0 and 35 percent. When described as gravel or silt, the sand

content in this layer ranged between 20 and 45 percent. The silt was described as non-plastic. One (1) sample within this layer contained traces of weathered rock.

The SPT N-values in this layer ranged between 3 bpf and 66 bpf, with most values ranging between 10 bpf and 31 bpf, indicating mostly medium dense material. Please note that the high SPT N-values recorded in the sand and gravel may be due to obstructions such as cobbles and boulders present in the sand and gravel and may not represent the true density of the sand and gravel.

Silt – A layer of silt was encountered beneath the sand and gravel in boring B-101 and within the sand and gravel layer in boring B-102. The silt extended to depths of 45 feet and 39 feet beneath the ground surface in borings B-101 and B-102, respectively. The samples within this layer were described as silt with sand. The sand content within this layer ranged between 10 and 20 percent. The silt was described as non-plastic to moderately plastic. A few samples within this layer contained traces of weathered rock.

The SPT N-values in this layer ranged between 3 bpf and 12 bpf, indicating soft to medium stiff silt. Split spoon refusal was encountered on apparent rock within this layer in boring B-101 at a depth of 45 feet beneath the ground surface.

Weathered Rock – A layer of weathered rock was encountered beneath the sand and gravel in boring B-102 at a depth of 44 feet beneath the ground surface. The weathered rock extended to a depth of 46 feet beneath the ground surface. The sample within this layer was described as silty sand. The fines content within this layer ranged between 20 and 25 percent and the gravel content ranged between 20 and 25 percent.

Split spoon refusal was encountered on rock within this layer at a depth of 46 feet beneath the ground surface.

Rock – Split spoon refusals were encountered in borings B-101 and B-102 at depths of 45 feet and 46 feet beneath the ground surface, respectively.

To confirm and characterize the rock, rock was cored in boring B-101. The rock consisted of a very soft to soft, fresh, moderately fractured to sound, black, fine-grained, Shale. The rock core recovery was 100 percent, and the Rock Quality Designation (RQD) was 56.7 percent. The coring rate ranged between 2.0 and 4.0 minutes per foot (min./ft.).

2.4 Groundwater

Groundwater was encountered in test pits TP-1 to TP-5, and in all borings except in borings B-1 and B-11 at depths ranging between 6.0 and 22.0 feet beneath the ground surface, as shown in Tables 1 and 2 and in the boring and test pit logs.

The groundwater information reported herein is based on observations made during or shortly after the completion of drilling or excavation. In addition, water was introduced into borings B-

101 and B-102 during drilling. Therefore, the reported groundwater levels may not represent the actual groundwater conditions, as additional time may be required for the groundwater levels to stabilize. The groundwater information presented in this report only represents the conditions encountered at the time and location of the explorations. Seasonal fluctuation should be anticipated.

2.5 Laboratory Test Data

LGCI submitted eight (8) soil samples collected from the test pits for grain-size analysis. The results of the grain-size analyses are provided in the test data sheets included in Appendix C and are summarized in the table below.

Grain-Size Analysis Test Results

Test Pit No.	Sample No.	Stratum	Sample Depth (ft.)	Percent Gravel	Percent Sand	Percent Fines
TP-4	Grab	Fill	0.3 – 3.0	31.6	56.8	11.6
TP-5	Grab	Silt	7.7 – 12.0	0.1	40.1	59.8
TP-6	Grab	Fill	1.5 – 8.5	32.6	55.5	11.9
TP-7	Grab	Sand and Gravel	2.0 – 5.0	25.5	72.7	1.8
TP-8	Grab	Fill	0.3 – 5.5	29.4	56.4	14.2
TP-9	Grab	Fill	0.3 – 5.0	49.4	42.1	8.5
TP-10	Grab	Fill	0.8 – 6.5	17.3	76.6	6.1
TP-15	Grab	Fill	0.3 – 4.0	46.4	49.2	4.4

LGCI also submitted two (2) soil samples from the fill strata in test pits TP-3 (from 0.5 feet to 4 feet) and TP-13 (from 0.5 feet to 5 feet) to a laboratory for organic content tests, and the tests indicated organic contents (by weight) of 2.6 and 2.2 percent, respectively. LGCI also submitted four (4) soil samples from the buried organic soil stratum in the borings B-2 (from 8 feet to 10 feet), B-4 (from 6 feet to 8 feet), and B-102 (from 8 feet to 10 feet), and from test pit TP-4 (from 6.5 to 9.0 feet). The results from these tests will be provided separately.

3. EVALUATION AND RECOMMENDATIONS

3.1 General

Based on our understanding of the proposed construction, our observation of our borings, and the results of our laboratory testing, there are a few issues that we would like to highlight for consideration and discussion.

3.1.1 Asphalt, Surficial Topsoil, Existing Fill, Buried Topsoil, and Buried Subsoil

- Asphalt, topsoil, existing fill, crushed stone cap, buried topsoil, and buried subsoil were encountered in the borings. These materials are not suitable to support foundations.

- The asphalt and the surficial topsoil should be removed from within the entire construction area, including the proposed building footprint and the proposed driveways and parking lots.

- The existing fill was observed to be variable in composition and was generally very loose to medium dense. In addition, variable amounts of organic matter were noted in several of the fill samples. Existing fill that was not placed with strict moisture, density, and gradation control presents risk of unpredictable settlement that may result in poor performance of floor slabs and foundations. Due to these risks, the existing fill as well as the buried topsoil and buried subsoil should be entirely removed from within the proposed building footprint. We anticipate that the removal will extend up to depths of about 12 feet. The removal may extend to greater depths at locations not explored by LGCI. Laterally, the removal should extend beyond the proposed building footprint a distance equal to the distance between the bottom of the proposed footings and the top of the natural sand and gravel, or 5 feet, whichever is greater.

- We recommend segregating the buried organic topsoil and buried subsoil from the existing fill. After the excavation of the existing fill and the buried organic topsoil and buried subsoil is completed, the existing fill may be placed back in 9-inch loose lifts and compacted to 95 percent relative compaction. Whereas the existing fill generally contained a fines content higher than 10 percent, we recommend improving the existing fill to meet the gradation of Structural Fill by blending it with crushed stone and use the blend under footings and within 3 feet from the bottom of the proposed slab. We estimate that a blending ratio of about 2 parts crushed stone to 5 parts existing fill would produce a blend that meets the gradation requirements for Structural Fill. The blending ratios may be revised during construction based on grain-size analyses on bulk samples. The Structural Fill should extend to within the zone of influence of footings, i.e., within a zone defined by a line inclined at 45 degrees and extending from the outside edge of the proposed footing downward and outward.

- The blending of the existing fill with crushed stone will generate surplus material, mainly of existing fill. The surplus material could be reused to raise the grades at the site including in the southern lot (Lot 3744). This would require combining the two lots and applying, if possible, the ELUR on the combined lot. If this is not possible, a cost benefit analysis should be performed to compare the cost of the excavation, blending, replacement, and disposal of the surplus material to another option such as ground improvements by means of aggregate piers as described later in this report.

- The subgrade of footings should be prepared in accordance with the recommendations in Section 4.1.

- Within paved areas, the existing fill, should be removed to the top of the natural sand and gravel or to a depth of 18 inches beneath the bottom of the proposed pavement. Where organic soil is exposed, the organic soil should be removed. Where existing fill or buried subsoil are exposed, the existing fill deeper than 18 inches beneath the bottom of the proposed pavement can remain in place provided that it is firm and unyielding following proofrolling and compaction as described in Section 4.1.

3.1.2 Aggregate Piers

Aggregate piers (APs) are typically relatively short, stiff elements of compacted aggregate which improve the existing fill. These elements are typically installed by augering holes ranging from 20 inches to 36 inches in diameter. Aggregate (new crushed stone, recycled concrete, or other granular material) is then introduced into the hole and is generally compacted in one-foot lifts by repeated penetrations with the vibrator, which can be mounted to a crane or tracked carrier. The vibratory or ramming energy densifies the aggregate in the element; thus, producing high modulus aggregate piers. The installation of APs also densifies the surrounding soil depending on the type of soil. These high modulus elements reinforce the treatment zone and increase the composite friction angle and stiffness of the reinforced soil mass. The design of APs is typically verified with a modulus load test.

Where the subsurface conditions include a layer of organic soil and/or peat, the aggregate piers should be grouted in order to reduce the potential for bulging of the AP elements in the soft organic material or peat.

The work of the specialty contractor installing the APs should be coordinated with that of the site contractor who should perform pre-trenching for possible boulders, abandoned foundations, metal pipes, or other obstructions before the installation of the APs.

While the AP installation generates little spoils. Where it is not desired to generate spoils during the improvement process, vertical displacement APs could be used. These are installed by driving a mandrel and hammer to the design depth, feeding the backfill material through the hollow mandrel, and compacting the backfill in one-foot lifts using the hammer; thus, generating no spoils. Vertical displacement APs are typically installed with diameters

ranging between 12 and 16 inches to typical depths ranging between 15 and 35 feet, and to depths of up to 60 feet where needed.

The length of the APs should be based on improvements that reduce the total and differential settlement to within the thresholds established for the project for both static and earthquake loads.

To reduce the length of the APs, we believe that the APs should be installed from the current grade, before placing the Structural Fill required to raise the grades. This option will result in shorter APs under the proposed slab. However, this option will likely require more AP elements under the proposed slab.

The ground improvement technologies are patented, and the design is performed by the specialty contractors. We recommend that if the ground improvement option is selected, the project plans and specifications for ground improvement be performance-based, allowing a variety of ground improvement contractors the opportunity to bid the work. Specifications should indicate the required allowable bearing pressure for footings and slabs, and the allowable total and differential settlements for the structure, including static and earthquake induced settlement. In addition, we recommend that the specifications require that the supporting design calculations be available for review by the design team. Ground improvement contractors should also be provided with grading plans and subsurface information associated with the proposed structure for use in preparing their bids.

3.1.3 Shallow Foundations

Based on the results of the borings, the subsurface conditions are suitable to support shallow spread and continuous footings bearing on Structural Fill placed directly on top of the sand and gravel layer after entirely removing the asphalt, the existing fill, the buried topsoil, and the buried subsoil, or on ground improved with aggregate piers. Our recommendation for net allowable bearing capacity in the sand and gravel is presented in Section 3.2.1.

3.2 Foundation Recommendations

3.2.1 Footing Design

- We recommend entirely removing the surficial topsoil, buried organic soil, buried subsoil, and the existing fill from within the proposed building footprint or improving the site with APs as described in Section 3.1.

- We recommend supporting the proposed building on spread footings bearing on Structural Fill placed directly on the natural sand and gravel or on ground improved with APs.

- We recommend designing the proposed footings using a net allowable bearing pressure of 4 kips per square foot (ksf). We recommend that the footings bear on a minimum of 12 inches of Structural Fill placed directly on top of the natural sand or on ground improved

with APs. The Structural Fill should extend at least on foot laterally beyond the limits of the footings.

- Footing subgrades should be prepared in accordance with the recommendations in Section 4.1.

- All foundations should be designed in accordance with *The Rhode Island State Building Code* (RISBC).

- Exterior footings and footings in unheated areas should be placed at a minimum depth of 4.5 feet below the final exterior grade to provide adequate frost protection. Interior footings in heated areas may be designed and constructed at a minimum depth of 2 feet below finished floor grades.

- Wall footings should be designed and constructed with continuous, longitudinal steel reinforcement for greater bending strength to span across small areas of loose or soft soils that may go undetected during construction.

- A representative of LGCI should be engaged to observe that the subgrade has been prepared in accordance with our recommendations.

3.2.2 Settlement Estimates

Based on our experience with similar soils and designs using a net allowable bearing pressure of 4 ksf, we anticipate that the total settlement will be approximately 1 inch, and that the differential settlement of the footings will be 3/4 inch or less over a distance of 25 feet. We believe that total and differential settlements of this magnitude are tolerable for a similar structure. However, the tolerance of the proposed structure to the predicted total and differential settlements should be assessed by the structural engineer.

If the site is improved using APs, the specialty contractor should design the APs to limit the settlement within the limits listed above.

3.3 Concrete Slab Considerations

3.3.1 Slabs-on-Grade

- Floor slabs should be constructed as a slabs-on-grade bearing on a minimum of 12 inches of Structural Fill placed directly on top of the natural sand and gravel or on top of ground improved with APs. The subgrade of the slabs should be prepared as described in Section 4.1.

- To reduce the potential for dampness in the proposed floor slab, the project architect may consider placing a vapor barrier beneath the floor slab. The vapor barrier should be protected from puncture during the placement of the proposed slab reinforcement.

- For the design of the floor slab bearing on the materials described above, we recommend using a modulus of subgrade reaction, k_{s1}, of 80 tons per cubic foot (tcf). Please note that the values of k_{s1} are for a 1 x 1 square foot area. These values should be adjusted for larger areas using the following expression:

$$Modulus\ of\ Subgrade\ \mathrm{Re}action\ (k_s) = k_{s1} * \left(\frac{B+1}{2B}\right)^2$$

where:

k_s = Coefficient of vertical subgrade reaction for loaded area;
k_{s1} = Coefficient of vertical subgrade reaction for a 1 x 1 square foot area; and
B = Width of area loaded, in feet.

Please note that cracking of slabs-on-grade can occur as a result of heaving or compression of the underlying soil, but also as a result of concrete curing stresses. To reduce the potential for cracking, the precautions listed below should be closely followed during the construction of all slabs-on-grade:

- Construction joints should be provided between the floor slab and the walls and columns in accordance with the American Concrete Institute (ACI) requirements, or other applicable code.

- The backfill in interior utility trenches should be properly compacted.

- In order for the movement of exterior slabs not to be transmitted to foundations or superstructures, exterior slabs, such as approach slabs and sidewalks, should be isolated from the superstructure.

3.3.2 Under-slab Drains and Waterproofing

Based on the groundwater level observed in the borings, we believe that an under-slab drainage system is not required.

If the proposed building includes an elevator pit or other structure that extends beneath the FFE, such elevator pit or other structure should be designed to be waterproof.

3.4 Seismic Design

Based on the SPT N-values from the borings, we estimate that the seismic criteria for the site are as follows:

- Site Class: D
- Spectral Response Acceleration at short period (Ss): 0.178g
- Spectral Response Acceleration at 1 sec. (S_1): 0.063g
- Site Coefficient Fa (Table 1613.5.3(1)): 1.6
- Site Coefficient Fv (Table 1613.5.3(2): 2.4
- Adjusted spectral response S_{MS}: 0.285g
- Adjusted spectral response S_{M1}: 0.151g

A few low SPT N-values were recorded in borings B-4, B-5, and B-6 advanced on the southern side of the proposed building as part of our explorations performed as part of our original services. To explore whether low SPTs are present deeper than the bottom of the explorations performed as part of our original services, additional borings B-101 and B-102 were advanced to the top of rock. Borings B-101 and B-102 indicated that the low SPT N-values recorded in borings B-4, B-5, and B-6 were isolated, i.e., they were not indicative of a distinct, loose sublayer within the sand and gravel layer. Accordingly, and based on the SPT N-value data from the borings, the site soils are not susceptible to liquefaction.

3.5 Lateral Pressures for Wall Design

3.5.1 Lateral Earth Pressures

Lateral earth pressures for the design of below-grade walls, if any, and site retaining walls are provided below.

Coefficient of Active Earth Pressure, K_A:	0.31
Coefficient of At-Rest Earth Pressure, K_o:	0.47
Coefficient of Passive Earth Pressure, K_p:	3.3
Total Unit Weight γ:	125 pcf

Note: The values in the table are based on a friction angle for the backfill of 32 degrees and neglecting friction between the backfill and the wall. The design active and passive coefficients are based on horizontal surfaces (non-sloping backfill) on both the active and passive sides, and on a vertical wall face.

- Exterior walls of below-ground spaces and other retaining walls braced at the top to restrain movement/rotation, should be designed using the "at-rest" pressure coefficient.

- We recommend placing free-draining material within the 3 feet immediately behind retaining walls.

- We recommend providing weep holes at the bottom of site retaining walls, including temporary SOE systems, to promote drainage where possible. Alternatively, a pipe should

be placed at the base of the wall to collect the water. Groundwater collected by the wall drains should be discharged into a lower area if gravity flow is possible.

- Passive earth pressures should only be used at the toe of the wall where special measures or provisions are taken to prevent the disturbance or future removal of the soil on the passive side of the wall, or in areas where the wall design includes a key. In any case, the passive pressures should be neglected in the top 4 feet.

- Where a permanent vertical uniform load will be applied to the active side immediately adjacent to the wall, a horizontal surcharge load equal to half of the uniform vertical load should be applied over the height of the wall. At a minimum, a temporary lateral construction surcharge load of 100 pounds per square foot (psf) should be applied uniformly over the height of the wall.

- We recommend using an ultimate friction factor of 0.5 between the natural sand and gravel or Structural Fill and the bottom of the wall. Below-grade walls should be designed for minimum factors of safety of 1.5 for sliding and 2.0 for overturning.

- The design of retaining walls should include the seismic increment to the lateral earth pressures.

3.5.2 Perimeter Drains

- We recommend that free-draining material be placed within 3 feet of the exterior of walls of below-ground spaces, if any. To reduce the potential for dampness in below-ground spaces, proposed below-ground walls should be damp-proofed.

- We recommend that drains be provided behind the exterior of walls of below-ground spaces. The drains should consist of 4-inch perforated PVC pipes installed with the slots facing down. Perimeter drains should be installed at the bottom of the wall in 18 inches of crushed stone wrapped in a geotextile for separation and filtration.

To the extent possible, groundwater collected by the wall drains should be discharged in a lower area if gravity flow is possible. In any case, the groundwater collected by the wall drains should be discharged in accordance with municipal, state, and other applicable standards.

3.6 Parking Lots, Driveways, and Sidewalks

3.6.1 General

The subsurface conditions encountered at the site are generally suitable to support the proposed driveways, parking lots, and sidewalks after preparation of the subgrade as described in Section 4.1.

- We recommend entirely removing the existing asphalt and the surficial topsoil from within the footprint of the proposed driveways and parking lots.

- The existing fill should be improved in accordance with the recommendations in Section 4.1.

- Cobbles and boulders should be removed to at least 18 inches below the bottom of the pavement.

3.6.2 Sidewalks

- Sidewalks should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

- To reduce the potential for heave caused by surface water penetrating under the sidewalk, the joints between sidewalk concrete sections should be sealed with a waterproof compound. The sidewalks should be sloped away from the building or other vertical surfaces to promote flow of water. To the extent possible, roof leaders should not discharge onto sidewalk surfaces.

3.6.3 Pavement Sections

A typical, minimum, standard-duty pavement section that could be used for parking areas is as follows:

1.5"	Asphalt "Top Course"
2.0"	Asphalt "Base Course"
8"	Aggregate Base (Gravel Borrow, RIDOT M.01.09; Table 1, Column 1)

A typical, minimum, heavy-duty pavement section that could be used in access roads and for areas of heavy traffic is as follows:

2.0"	Asphalt "Top Course"
2.5"	Asphalt "Base Course"
12"	Aggregate Base (Gravel Borrow, RIDOT M.01.09; Table 1, Column 1)

The pavement sections shown above represent minimum thicknesses representative of typical local construction practices for similar use. Periodic maintenance should be anticipated.

Pavement material types and construction procedures should conform to specifications of the Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, 2004 Edition with the latest amendment.

Areas to receive relatively highly concentrated, sustained loads such as dumpsters, loading areas, and storage bins are typically installed over a rigid pavement section to distribute concentrated loads and reduce the possibility of high stress concentrations on the subgrade. Typical rigid pavement sections consist of 6 inches of concrete placed over a minimum of 12 inches of subbase material.

3.7 Underground Utilities

Boulders at the bottom of utility trenches should be removed to at least 12 inches below the pipe invert and the resulting excavation should be backfilled with suitable backfill. Utilities should be placed on suitable bedding material in accordance with the manufacturer's recommendations. "Cushion" material should be placed, by hand, above the utility pipe in maximum 6-inch lifts. The lift should be compacted by hand to avoid damage to the utility. Where the bedding/cushion material consists of crushed stone, it should be wrapped in a geotextile fabric.

Compaction of fill in utility trenches should be in accordance with our recommendations in Section 4.3. To reduce the potential for damage to utilities, placement and compaction of fill immediately above the utilities should be performed in accordance with the manufacturer's recommendations.

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- Organic materials, existing fill, buried organic soil, buried subsoil, abandoned utilities, buried foundations, and other below-ground structures should be entirely removed from within the footprint of the proposed building and site structures, including site retaining walls, and exterior stairs, if any, before the start of foundation work. The excavation should be restored with Structural Fill. Alternatively, the ground should be improved with APs.

- Tree stumps, root balls, and roots larger than ½ inch in diameter should be removed and the cavities filled with suitable material and compacted per Section 4.3 of this report.

- Cobbles and boulders should be removed at least 6 inches from beneath footings and 18 inches beneath the bottom of slabs and paved areas. The resulting excavations should be backfilled with compacted Structural Fill under the building and with Ordinary Fill under the subbase of paved areas.

- The bottom of the excavation resulting from the removal of the existing fill or natural soil should be compacted with a dynamic vibratory compactor imparting a minimum of 40 kips of force to the subgrade.

- The base of the footing excavations in granular soil should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade.

- After the surficial materials are removed to a depth of 18 inches within the proposed paved areas in accordance with the recommendations in Section 3.1, the exposed existing fill and buried subsoil deeper than 18 inches beneath the bottom of the proposed pavement should be improved by compacting the exposed surface with at least six (6) passes of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft zones of soil are observed, the soft soil should be removed, and the grade should be restored using Ordinary Fill to the bottom of the proposed subbase layer. If pumping of the existing fill or buried subsoil deeper than 18 inches beneath the bottom of the proposed pavement is observed, the soft and/or pumping material should be removed and replaced.

- Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill, shown in Section 4.3.1.

- Fill placed under the subbase of paved areas should meet the gradation and compaction requirements of Ordinary Fill, shown in Section 4.3.2.

- Fill placed in the top 12 inches beneath sidewalks should consist of Structural Fill with less than 5 percent fines.

- Loose or soft soils identified during the compaction of the footing or floor slab subgrades should be excavated to a suitable bearing stratum, as determined by the representative of LGCI. Grades should be restored by backfilling with Structural Fill or crushed stone.

- When crushed stone is required in the drawings or is used for the convenience of the contractor, it should be wrapped in a geotextile fabric for separation except where introduction of the geotextile fabric promotes sliding. A geotextile fabric should not be placed between the bottoms of the footings and the crushed stone.

- An LGCI representative should observe the exposed subgrades prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure. If soft or loose pockets are encountered in the footing excavations, the soft or loose materials should be removed and the bottom of the footing should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Structural Fill, or crushed stone wrapped in a filter fabric.

- APs that are damaged as a result of excavation for footings should be repaired in accordance with the requirements of the specialty contractor installing the APs.

- Before fill is placed under footings or to raise the grades, the aggregate piers should be exposed, and the subgrade should be compacted to a firm and unyielding conditions.

- An LGCI geotechnical representative should observe the installation of the aggregate piers and the modulus test. An LGCI geotechnical representative should also observe the exposed subgrades prior to fill and concrete placement to verify that the exposed the aggregate piers are properly exposed.

4.2 Subgrade Protection

The onsite fill and natural soils are frost susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final six inches of soil just before pouring the concrete. Footings should be backfilled as soon as possible after footing construction. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Filling operations should be halted during freezing weather.

Materials with high fines contents are typically difficult to handle when wet, as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel free from organic matter, clay, surface coatings, and deleterious materials, and should conform to the gradation requirements shown below.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of the optimum moisture content.

Sieve Size Percent	Passing by Weight
3 inches	100
1 ½ inch	80-100
½ inch	50-100
No. 4	30-85
No. 20	15-60
No. 60	5-35
No. 200*	0-10

* 0 – 5 for the top 12 inches under sidewalks, exterior slabs, pads, and walkways

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of the optimum moisture content.

Sieve Size Percent	Passing by Weight
6 inches	100
1 inch	50-100
No. 4	20-100
No. 20	10-70
No. 60	5-45
No. 200	0-20

4.4 Reuse of Onsite Materials

The reuse of the existing fill and excavated natural sand and gravel, if applicable, should be in accordance with the recommendations in Section 3.1.1. The buried topsoil and buried subsoil should be segregated from the existing fill before reusing and/or improving the existing fill.

The contractor should avoid mixing the reusable soils with fine-grained and/or organic soils. The soils to be reused should be excavated and stockpiled separately for compliance testing. Soils with 20 percent or greater fines contents are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during the compaction of onsite soils with fines contents of 20 percent or greater. The contractor should be prepared to remove and replace such soils if pumping occurs.

To improve the existing fill, the existing fill should be blended with ¾-inch or 1 ½-inch crushed stone at the ratio listed in Section 3.1.1. Grain-size analyses should be performed on the blended material and the blending ratio should be adjusted as needed based on the results of the grainsize analyses.

Due to the large scale of earth moving operations, we recommend that excavated materials slated for reuse be protected from wetness, including by means of tarps.

Materials to be used as fill should first be tested for compliance with the applicable gradation specifications.

4.5 Groundwater Control Procedures

Based on the groundwater levels measured in our borings, we do not anticipate that major groundwater control procedures will be needed during construction. We anticipate that filtered sump pumps installed in a series of sump pump pits located at least three feet below the bottom of planned excavations may be sufficient to handle groundwater and surface runoff that may enter the excavation during wet weather. The contractor should be prepared to use multiple sump pumps to maintain a dry excavation during the removal of the existing fill.

The contractor should be permitted to employ whatever commonly accepted means and practices are necessary to maintain the groundwater level below the bottom of the excavation and to maintain a dry excavation during wet weather. Groundwater levels should be maintained at a minimum of 1 foot below the bottom of the excavations during construction. The placement of reinforcing steel or concrete in standing water should not be permitted.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile fabric. Alternatively, the crushed stone should be entirely removed after the sump pump is no longer in use, and the sump pump pit should be restored with suitable backfill.

4.6 Temporary Excavations

All excavations to receive human traffic should be constructed in accordance with OSHA guidelines.

The site soils should generally be considered Type "C" and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain the stability of the excavation sides and bottom.

5. RECOMMENDATIONS FOR FUTURE WORK

We recommend engaging LGCI to perform the following services:

- Prepare Earth Moving Specifications and APs, if needed, and review the geotechnical aspect of contract drawings.

- Review contractor submittals and Request for Information (RFIs);

- Provide a field engineer during construction to observe the removal of the unsuitable soil, the improvement of the existing fill, to observe the subgrade of footings and slabs, and to observe the installation of ground improvement as well as the modulus test, if the ground improvement option is selected.

6. REPORT LIMITATIONS

Our analyses and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations, and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Taco Comfort Solutions for the Proposed Manufacturing Building in Cranston, Rhode Island as conceived at this time.

7. REFERENCES

In addition to the references included in the text of the report, we used the following references:

Rhode Island State Building Code (Feb. 2022), comprised of the International Building Code of 2018 (IBC-2018) and RI amendments.

The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

USGS Cranston, RI topographic map from http://mapserver.mytopo.com.

Table 1 - Summary of LGCI's Test Pits
Proposed Manufacturing Building
Cranston, RI
LGCI Project No. 2252

Test Pit No.	Ground Surface Elevation (ft.)[1]	Groundwater[2] Depth / El. (ft.)	Bottom of Asphalt / **Topsoil** Depth / El. (ft.)	Bottom of Crushed Stone Depth / El. (ft.)	Bottom of Fill Depth / El. (ft.)	Bottom of Buried Organic Soil / **Buried Subsoil** Depth / El. (ft.)	Bottom of Sand and Gravel Depth / El. (ft.)	Bottom of Test Pit Depth / El. (ft.)
TP-1	56.0	10.0 / **46.0**	0.3 / **55.7**	- / -	4.0 / **52.0**	**5.0** / **51.0**	10.0 [3]/ **46.0**	10.0 / **46.0**
TP-2	55.0	9.5 / **45.5**	0.3 / **54.7**	- / -	5.5 / **49.5**	- / -	10.0 [3]/ **45.0**	10.0 / **45.0**
TP-3	57.0	10.0 / **47.0**	0.3 / **56.7**	- / -	4.0 / **53.0**	**5.0** / **52.0**	10.3 [3]/ **46.7**	10.3 / **46.7**
TP-4	56.0	10.5 / **45.5**	0.3 / **55.7**	- / -	6.5 / **49.5**	9.0 / **47.0**	11.0 [3]/ **45.0**	11.0 / **45.0**
TP-5	56.0	12.0 / **44.0**	**2.0** / **54.0**	- / -	6.7 / **49.3**	**7.7** / **48.3**	12.0 [3]/ **44.0**	12.0 / **44.0**
TP-6	59.0	- / -	**1.5** / **57.5**	- / -	8.5 / **50.5**	11.0 / **48.0**	12.0 [3]/ **47.0**	12.0 / **47.0**
TP-7	62.0	- / -	**2.0** / **60.0**	- / -	- / -	- / -	10.0 [3]/ **52.0**	10.0 / **52.0**
TP-8	64.0	- / -	- / -	0.3 / **63.7**	5.5 / **58.5**	- / -	9.0 [3]/ **55.0**	9.0 / **55.0**
TP-9	67.0	- / -	- / -	0.3 / **66.7**	5.0 / **62.0**	- / -	10.0 [3]/ **57.0**	10.0 / **57.0**
TP-10	62.0	- / -	**0.8** / **61.2**	- / -	6.5 / **55.5**	- / -	10.0 [3]/ **52.0**	10.0 / **52.0**
TP-11	68.0	- / -	0.3 / **67.7**	- / -	1.5 / **66.5**	- / -	9.0 [3]/ **59.0**	9.0 / **59.0**
TP-12	69.0	- / -	**0.5** / **68.5**	- / -	1.0 / **68.0**	- / -	10.0 [3]/ **59.0**	10.0 / **59.0**
TP-13	68.0	- / -	0.3 / **67.7**	- / -	5.0 / **63.0**	- / -	10.0 [3]/ **58.0**	10.0 / **58.0**
TP-14	65.0	- / -	- / -	0.3 / **64.7**	6.0 / **59.0**	- / -	9.0 [3]/ **56.0**	9.0 / **56.0**
TP-15	63.0	- / -	- / -	0.3 / **62.7**	4.0 / **59.0**	- / -	9.0 [3]/ **54.0**	9.0 / **54.0**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.
2. Groundwater was measured during excavation, at the end of excavation, after excavation, or based on sample moisture whichever is shallower.
3. Test pit terminated in the sand and gravel layer.
4. "-" means groundwater or layer was not encountered.

Table 2 - Summary of LGCI's Borings
Proposed Manufacturing Building
Cranston, RI
LGCI Project No. 2252

Boring No.	Ground Surface Elevation (ft.)[1]	Groundwater[2] Depth / El. (ft.)	Bottom of Asphalt / **Topsoil** / *Crushed Stone* Depth / El. (ft.)	Bottom of Fill Depth / El. (ft.)	Bottom of Buried Organic Soil Depth / El. (ft.)	Bottom of Sand and Gravel Depth / El. (ft.)	Bottom of Silt Depth / El. (ft.)	Top of Rock / Weathered Rock Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
2022 Borings									
B-1	58.0	- / **-**	0.3 / **57.7**	8.0 / **50.0**	- / **-**	12.0 [3]/ **46.0**	- / **-**	- / **-**	12.0 / **46.0**
B-2	57.0	8.0 / **49.0**	0.3 / **56.7**	8.0 / **49.0**	10.0 / **47.0**	12.0 [3]/ **45.0**	- / **-**	- / **-**	12.0 / **45.0**
B-3	58.0	12.0 / **46.0**	0.3 / **57.7**	6.0 / **52.0**	- / **-**	22.0 [3]/ **36.0**	- / **-**	- / **-**	22.0 / **36.0**
B-4	58.0	10.0 / **48.0**	0.3 / **57.7**	6.0 / **52.0**	8.0 / **50.0**	22.0 [3]/ **36.0**	- / **-**	- / **-**	22.0 / **36.0**
B-5	60.0	14.0 / **46.0**	0.2 / **59.8**	8.0 / **52.0**	- / **-**	22.0 [3]/ **38.0**	- / **-**	- / **-**	22.0 / **38.0**
B-6	60.0	10.0 / **50.0**	0.3 / **59.7**	8.0 / **52.0**	- / **-**	22.0 [3]/ **38.0**	- / **-**	- / **-**	22.0 / **38.0**
B-7	61.0	14.0 / **47.0**	**0.7** / **60.3**	10.0 / **51.0**	- / **-**	22.0 [3]/ **39.0**	- / **-**	- / **-**	22.0 / **39.0**
B-8	63.0	19.0 / **44.0**	*0.3* / **62.7**	8.0 / **55.0**	- / **-**	22.0 [3]/ **41.0**	- / **-**	- / **-**	22.0 / **41.0**
B-9	65.0	19.0 / **46.0**	*0.3* / **64.7**	6.0 / **59.0**	- / **-**	22.0 [3]/ **43.0**	- / **-**	- / **-**	22.0 / **43.0**
B-10	66.0	19.0 / **47.0**	*0.3* / **65.7**	6.0 / **60.0**	- / **-**	21.0 [3]/ **45.0**	- / **-**	- / **-**	21.0 / **45.0**
B-11	68.0	- / **-**	*0.5* / **67.5**	6.5 / **61.5**	- / **-**	22.0 [3]/ **46.0**	- / **-**	- / **-**	22.0 / **46.0**
B-12	66.0	20.0 / **46.0**	0.3 / **65.7**	2.0 / **64.0**	- / **-**	22.0 [3]/ **44.0**	- / **-**	- / **-**	22.0 / **44.0**
B-13	67.0	20.0 / **47.0**	**0.2** / **66.8**	4.0 / **63.0**	- / **-**	22.0 [3]/ **45.0**	- / **-**	- / **-**	22.0 / **45.0**
B-14	68.0	22.0 / **46.0**	0.3 / **67.7**	4.0 / **64.0**	- / **-**	22.0 [3]/ **46.0**	- / **-**	- / **-**	22.0 / **46.0**
B-15	59.0	13.0 / **46.0**	0.3 / **58.7**	10.4 / **48.6**	- / **-**	22.0 [3]/ **37.0**	- / **-**	- / **-**	22.0 / **37.0**
B-16	56.0	10.0 / **46.0**	0.4 / **55.6**	6.8 / **49.2**	- / **-**	12.0 [3]/ **44.0**	12.0 [3]/ **44.0**	- / **-**	12.0 / **44.0**
B-17	61.0	20.0 / **41.0**	*0.3* / **60.7**	4.0 / **57.0**	- / **-**	22.0 [3]/ **39.0**	- / **-**	- / **-**	22.0 / **39.0**
2023 Borings									
B-101	58.0	8.0 / **50.0**	0.3 / **57.7**	10.5 / **47.5**	- / **-**	33.0 / **25.0**	45.0 / **13.0**	45.0 [4]/ **13.0**	53.5 / **4.5**
B-102	57.0	6.0 / **51.0**	0.3 / **56.7**	12.0 / **45.0**	10.0 / **47.0**	44.0 / **13.0**	39.0 / **18.0**	44.0 [4]/ **13.0**	49.0 / **8.0**

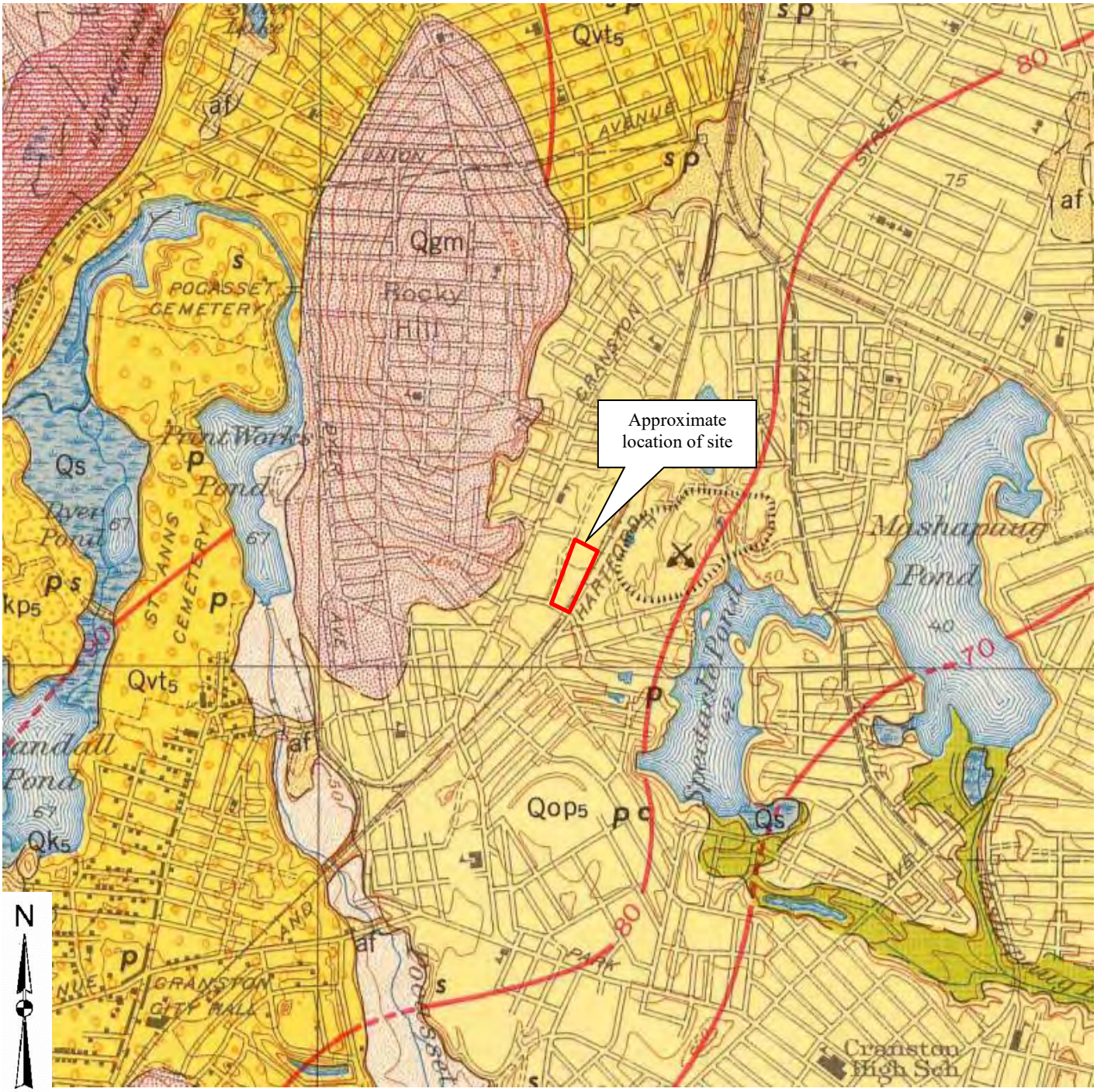
1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.
2. Groundwater was measured during drilling, at the end of drilling, after drilling, or based on sample moisture whichever is shallower.
3. Boring terminated in the sand and gravel layer.
4. Boring terminated in rock.
5. "-" means groundwater or layer was not encountered.

Contour Intervals: 10 feet

0.4 mi

Note: Figure based on USA Topo Maps of Cranston, RI obtained from https://viewer.nationalmap.gov/

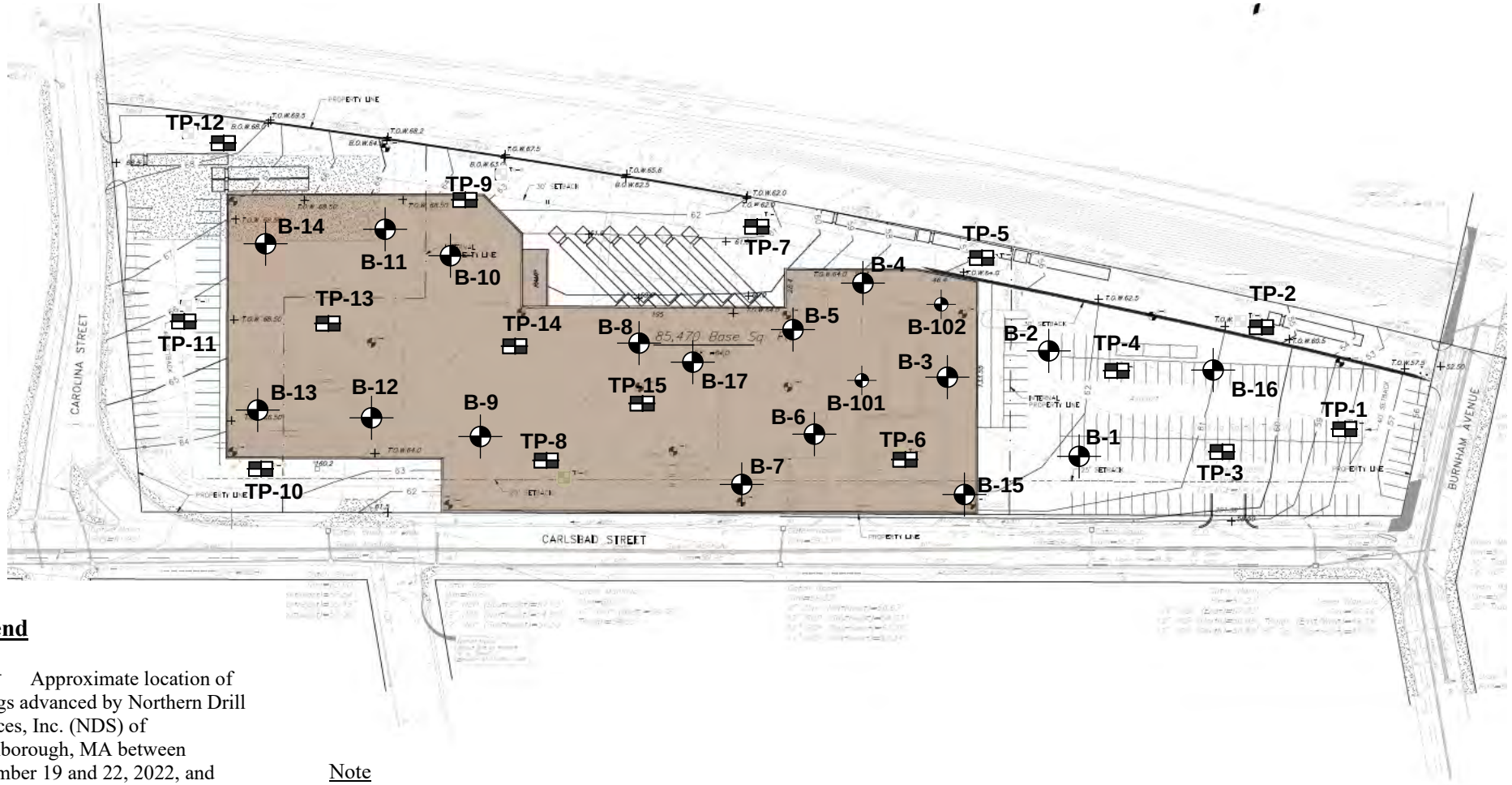
Client:	Project:	Figure 1 – Site Location Map	
Taco Comfort Solutions	Proposed Manufacturing Building		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Cranston, RI	LGCI Project No.: 2252	Date: Mar. 2023



Qop5 — Outwash plains
Sorted sand and local deposits of coarse gravel.

Figure based on map titled: "Geologic Map of the Providence Quadrangle, Rhode Island, Surficial Geology," prepared by J. Hiram Smith in 1956, Geological Survey, Map GQ-84.

Client:	Project:	Figure 2 – Surficial Geologic Map	
Taco Comfort Solutions	Proposed Manufacturing Building		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Cranston, RI	LGCI Project No.: 2252	Date: Mar. 2023



Legend

Approximate location of borings advanced by Northern Drill Services, Inc. (NDS) of Northborough, MA between December 19 and 22, 2022, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI).

Approximate location of borings advanced by NDS on February 17 and 20, 2023, and observed by LGCI.

Approximate location of test pit advanced by JRD, Inc. of Assonet, MA on November 14 and 15, 2022, and observed by Inc. LGCI.

Note

Figure based on drawing C-200 titled: "Civil Proposed Site Plan," prepared by Wood & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical via e-mail on August 23, 2022.

0 40 80 120

Approximate Scale (ft.)

Client:	Project:	Figure 3 – Exploration Location Plan	
Taco Comfort Solutions	Proposed Manufacturing Building		
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Cranston, RI	LGCI Project No.: 2252	Date: Mar. 2023

Appendix A – LGCI's Test Pit Logs

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Road, Suite 2
Billerica, MA 01862
Telephone: (978) 330-5912
Fax: (978) 330-5056

TEST PIT LOG

TP-1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/14/22 **DATE COMPLETED:** 11/14/22
TEST PIT LOCATION: Near southern side of prop. parking lot
COORDINATES: NA
SURFACE EL.: 56 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** 10.0 ft. / El. 46.0 ft.

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 12.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Asphalt	0.3 / 55.7	0 ft. - 0.3 ft.: Asphalt
	55.0	E		Fill		0.3 ft. - 4 ft.: Silty SAND (SM), fine to coarse, 20-25% fines, 10-15% fine to coarse subrounded gravel, trace of organic soil, trace of asphalt, trace of brick, brown, moist
2.5	52.5				4.0 / 52.0	
5.0		E		Buried Subsoil	5.0 / 51.0	4 ft. - 5 ft.: Silty SAND with Gravel (SM), fine to coarse, ~20% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, orange-brown, moist
	50.0	E		Sand and Gravel		5 ft. - 10 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 25-30% fine to coarse subrounded gravel, light brown, moist to wet
7.5	47.5					
10.0					10.0 / 46.0 ▼	Bottom of test pit at 10.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-2

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/14/22 **DATE COMPLETED:** 11/14/22
TEST PIT LOCATION: Near SE portion of prop. parking lot
COORDINATES: NA
SURFACE EL.: 55 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** 9.5 ft. / El. 45.5 ft. Seeping in side of excavation

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 11.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E	1	Asphalt	0.3 / 54.7	0 ft. - 0.3 ft.: Asphalt REMARK 1: Asphalt cut using pneumatic jackhammer.
2.5	52.5	E		Fill		0.3 ft. - 4 ft.: Silty SAND (SM), fine to coarse, 15-20% fines, 10-15% fine to coarse subrounded gravel, trace of organic soil, trace of asphalt, trace of roots, brown, moist
5.0	50.0	E				4 ft. - 5.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 20-25% fine to coarse subrounded gravel, trace of roots, orange-brown, moist
7.5	47.5	E		Sand and Gravel	5.5 / 49.5	5.5 ft. - 10 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, ~25% fine to coarse subrounded gravel, light brown, moist to wet
10.0	45.0				10.0 / 45.0	Bottom of test pit at 10.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-3

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/14/22 **DATE COMPLETED:** 11/14/22
TEST PIT LOCATION: Near western side of prop. parking lot
COORDINATES: NA
SURFACE EL.: 57 ft. (see note 1) **TOTAL DEPTH:** 10.3 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: 10.0 ft. / El. 47.0 ft.

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 12.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Asphalt	0.3 / 56.7	0 ft. - 0.3 ft.: Asphalt
	55.0	E		Fill	4.0 / 53.0	0.3 ft. - 4 ft.: Silty SAND (SM), fine to coarse, 25-30% fines, ~10% fine to coarse subrounded gravel, trace of organic soil, trace of asphalt, trace of brick, brown, moist
2.5						
	52.5	E		Buried Subsoil	5.0 / 52.0	4 ft. - 5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, trace of roots, orange-brown, moist
5.0						
	50.0	E	1	Sand and Gravel	10.3 / 46.7	5 ft. - 10.3 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 25-30% fine to coarse subrounded gravel, light brown, moist to wet REMARK 1: Groundwater seeping in sides of excavation at depth of 10 feet. Bottom of test pit at 10.3 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.
7.5						
	47.5					
10.0						

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-4

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/14/22 **DATE COMPLETED:** 11/14/22
TEST PIT LOCATION: Near northern side of prop. parking lot
COORDINATES: NA
SURFACE EL.: 56 ft. (see note 1) **TOTAL DEPTH:** 11 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** 10.5 ft. / El. 45.5 ft.

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 9.0' x 4.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Asphalt	0.3 / 55.7	0 ft. - 0.3 ft.: Asphalt
	55.0	E		Fill		0.3 ft. - 3 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse subangular gravel, trace of asphalt, dark brown, moist
2.5						
	52.5	E				3 ft. - 4.5 ft.: Silty SAND (SM), fine to medium, ~15% fines, 10-15% fine to coarse subrounded gravel, trace of organic soil, trace of roots, light brown, moist
5.0		E				4.5 ft. - 6.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subrounded gravel, brown, moist
	50.0				6.5 / 49.5	
7.5		E		Buried Organic Soil		6.5 ft. - 9 ft.: Silty SAND (SM), fine to medium, 30-35% fines, trace of organic soil, trace of roots, black, moist
	47.5				9.0 / 47.0	
10.0		E		Sand and Gravel		9 ft. - 11 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded gravel, light brown, moist to wet
	45.0				11.0 / 45.0	Bottom of test pit at 11.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-5

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/15/22 **DATE COMPLETED:** 11/15/22
TEST PIT LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE EL.: 56 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** 12.0 ft. / El. 44.0 ft.

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 10.0' x 4.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	55.0	E		Topsoil	2.0	0 ft. - 2 ft.: Topsoil
2.5	52.5	E	1	Fill	54.0 6.7	2 ft. - 6.7 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, 5-10% fine to coarse subrounded gravel, trace of organic soil, brown, moist REMARK 1: Layer of buried organic soil encountered on southern side of test pit between depths of 5.3 feet and 6.7 feet.
5.0	50.0					
7.5		E		Buried Subsoil	49.3 7.7	6.7 ft. - 7.7 ft.: Silty SAND (SM), fine to coarse, 15-20% fines, trace of roots, orange-brown, moist
	47.5	E		Sand and Gravel	48.3	7.7 ft. - 12 ft.: Sandy SILT (ML), slightly plastic, 40-45% mostly fine sand, gray to orange, moist to wet
10.0	45.0				12.0 ▼	
						Bottom of test pit at 12.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-6

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/15/22 **DATE COMPLETED:** 11/15/22
TEST PIT LOCATION: Near SW corner of prop. building
COORDINATES: NA
SURFACE EL.: 59 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 10.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth / El. (ft.)	Material Description
	57.5	E		Topsoil	1.5 / 57.5	0 ft. - 1.5 ft.: Topsoil
2.5		E		Fill		1.5 ft. - 8.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse subrounded gravel, trace of wood, brown, moist
	55.0	M	1			REMARK 1: Abandoned concrete foundation encountered at depth of 4 feet.
5.0						
	52.5					
7.5		E			8.5 / 50.5	
	50.0	E		Buried Organic Soil	11.0 / 48.0	8.5 ft. - 11 ft.: Silty SAND (SM), fine to coarse, 25-30% fines, trace of organic soil, black, moist
10.0						
	47.5	E		Sand and Gravel	12.0 / 47.0	11 ft. - 12 ft.: Silty SAND (SM), fine to medium, ~15% fines, orange to gray, moist
						Bottom of test pit at 12.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-7

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/15/22 **DATE COMPLETED:** 11/15/22
TEST PIT LOCATION: Near prop. trailer parking and loading dock
COORDINATES: NA
SURFACE EL.: 62 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 8.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	2.0 / 60.0	0 ft. - 2 ft.: Topsoil
2.5	60.0 / 57.5	M		Sand and Gravel	5.0 / 55.0	2 ft. - 5 ft.: Poorly Graded SAND with Gravel (SP), mostly medium, 0-5% fines, 25-30% fine to coarse angular gravel, brown, moist
5.0						5 ft. - 10 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist
7.5	55.0	E				
10.0	52.5				10.0 / 52.0	Bottom of test pit at 10.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-8

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/14/22 **DATE COMPLETED:** 11/14/22
TEST PIT LOCATION: Near western side of prop. building
COORDINATES: NA
SURFACE EL.: 64 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 9.0' x 5.5'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E	1	Crushed Stone	0.3 / 63.7	0 ft. - 0.3 ft.: Crushed stone REMARK 1: Geotextile fabric encountered under crushed stone layer.
	62.5					0.3 ft. - 5.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% mostly fine subrounded gravel, trace of organic soil, trace of brick, trace of asphalt, brown, moist
2.5		E		Fill		
	60.0					
5.0			2		5.5 / 58.5	REMARK 2: Piece of concrete encountered at depth of 5.5 feet. Possible foundation on utility duct. 5.5 ft. - 9 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
	57.5					
7.5		E		Sand and Gravel		
	55.0		3		9.0 / 55.0	REMARK 3: Test pit terminated due to sidewall collapse at depth of 9 feet. Bottom of test pit at 9.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-9

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/14/22 **DATE COMPLETED:** 11/14/22
TEST PIT LOCATION: Near eastern side of prop. building
COORDINATES: NA
SURFACE EL.: 67 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 10.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E	1	Crushed Stone	0.3 / 66.7	0 ft. - 0.3 ft.: Crushed stone REMARK 1: Geotextile fabric encountered under crushed stone layer.
	65.0					0.3 ft. - 5 ft.: Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, 5-10% fines, 40-45% fine to coarse sand, trace of asphalt, brown, moist
2.5		E		Fill		
	62.5					
5.0					5.0 / 62.0	5 ft. - 10 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, ~5% fines, light brown, moist
	60.0					
7.5		E		Sand and Gravel		
	57.5					
10.0					10.0 / 57.0	Bottom of test pit at 10.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-10

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/14/22 **DATE COMPLETED:** 11/14/22
TEST PIT LOCATION: Near western side of prop. parking lot
COORDINATES: NA
SURFACE EL.: 62 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 9.0' x 4.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E	1	Topsoil	0.8 / 61.2	0 ft. - 0.8 ft.: Topsoil REMARK 1: Geotextile fabric encountered under topsoil layer.
2.5	60.0	E	2	Fill	6.5 / 55.5	0.8 ft. - 6.5 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), mostly medium, 5-10% fines, 15-20% fine to coarse subangular gravel, brown, moist REMARK 2: Fill extended to a depth of 5.0 feet on the western side of the test pit and 6.5 feet on the eastern side.
5.0	57.5					
7.5	55.0	E		Sand and Gravel	10.0 / 52.0	6.5 ft. - 10 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
10.0	52.5					Bottom of test pit at 10.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

LGCI
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Fax: (978) 330-5056

TEST PIT LOG

TP-11

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/14/22 **DATE COMPLETED:** 11/14/22
TEST PIT LOCATION: Near northern side of prop. parking lot
COORDINATES: NA
SURFACE EL.: 68 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 8.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	67.5	E		Asphalt	0.3 / 67.7	0 ft. - 0.3 ft.: Asphalt
		E		Fill	1.5 / 66.5	0.3 ft. - 1.5 ft.: Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, trace of asphalt, brown, moist
2.5	65.0					
5.0	62.5	E		Sand and Gravel		1.5 ft. - 9 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, ~20% fine to coarse subrounded gravel, light brown, moist
7.5	60.0					
			1		9.0 / 59.0	REMARK 1: Test pit terminated at depth of 9 feet due to sides of excavation collapsing.
						Bottom of test pit at 9.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-12

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/14/22 **DATE COMPLETED:** 11/14/22
TEST PIT LOCATION: Near NE corner of prop. parking lot
COORDINATES: NA
SURFACE EL.: 69 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 8.0' x 5.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E	1	Topsoil	0.5 / 68.5	0 ft. - 0.5 ft.: Topsoil REMARK 1: Geotextile fabric encountered under topsoil layer.
		E		Fill	1.0 / 68.0	0.5 ft. - 1 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 25-30% fine to coarse subrounded gravel, trace of organic soil, light brown, moist
	67.5					1 ft. - 10 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 25-30% fine to coarse subrounded gravel, 5-10% cobbles up to about 6 inches in diameter, light brown, moist
2.5						
	65.0					
5.0		E		Sand and Gravel		
	62.5					
7.5						
	60.0					
10.0					10.0 / 59.0	Bottom of test pit at 10.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-13

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/15/22 **DATE COMPLETED:** 11/15/22
TEST PIT LOCATION: Near northern side of prop. building
COORDINATES: NA
SURFACE EL.: 68 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 10.0' x 3.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	67.5	E		Asphalt	0.3 / 67.7	0 ft. - 0.3 ft.: Asphalt
						0.3 ft. - 5 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 25-30% fine to coarse subrounded gravel, trace of organic soil, trace of brick, trace of concrete, trace of asphalt, brown, moist
2.5	65.0	E		Fill		
5.0					5.0 / 63.0	
	62.5	E		Sand and Gravel		5 ft. - 10 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 15-20% fine to coarse subrounded gravel, 0-5% cobbles up to about 8" in diameter, light brown, moist
7.5	60.0					
10.0					10.0 / 58.0	Bottom of test pit at 10.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-14

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/15/22 **DATE COMPLETED:** 11/15/22
TEST PIT LOCATION: Near eastern side of prop. building
COORDINATES: NA
SURFACE EL.: 65 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 8.0' x 5.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E	1	Crushed Stone	0.3 / 64.7	0 ft. - 0.3 ft.: Crushed stone
		E				0.3 ft. - 3 ft.: Silty SAND (SM), fine to medium, 20-25% fines, 10-15% fine to coarse subrounded gravel, trace of organic soil, trace of concrete, trace of brick, trace of roots, trace of clay pipe, buried building foundation, brown, moist
		M				REMARK 1: Pieces of abandoned concrete foundation encountered between depths of 0.3 feet and 3 feet.
2.5	62.5					
		M		Fill		3 ft. - 6 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist (appears reworked)
		E				
5.0	60.0		2		6.0 / 59.0	REMARK 2: Clay pipe encountered at depth of 6 feet.
		E		Sand and Gravel		6 ft. - 9 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
7.5	57.5		3		9.0 / 56.0	REMARK 3: Test pit terminated at depth of 9 feet due to sides of excavation collapsing.
						Bottom of test pit at 9.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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TEST PIT LOG

TP-15

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 11/15/22 **DATE COMPLETED:** 11/15/22
TEST PIT LOCATION: Near western side of prop. building
COORDINATES: NA
SURFACE EL.: 63 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
DURING EXCAVATION: -
AT END OF EXCAVATION: Not encountered

EXCAVATION SUBCONTRACTOR: JRD Inc.
EXCAVATION FOREMAN: Mike Devmorvill
EXCAVATOR TYPE/MODEL: Deere 710G
WEATHER: 40's / Sunny
TEST PIT DIMENSIONS: 10.0' x 6.0'
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	62.5	E		Crushed Stone	0.3 / 62.7	0 ft. - 0.3 ft.: Crushed stone
2.5	60.0	E	1	Fill	4.0 / 59.0	0.3 ft. - 4 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 45-50% fine to coarse angular gravel, brown, moist REMARK 1: Piece of possible abandoned building foundation encountered at depth of 2 feet.
5.0 7.5	57.5 55.0	E		Sand and Gravel	9.0 / 54.0	4 ft. - 9 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist Bottom of test pit at 9.0 feet. Test pit backfilled with excavated materials in 12-inch to 18-inch lifts and tamped with the excavator bucket.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

Appendix B – LGCI's Boring Logs

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BORING LOG

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/22/22 **DATE COMPLETED:** 12/22/22
BORING LOCATION: Near NW corner of prop. parking lot
COORDINATES: NA
SURFACE El.: 58 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: Not encountered
AT END OF DRILLING: Dry at the end of drilling
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.5	S1	2-3-6 (9)	18/12		Asphalt	0.3 / 57.7	Top 4": Asphalt S1 - Silty SAND (SM), fine to coarse, 20-25% fines, 5-10% fine subrounded gravel, trace of organic soil, trace of asphalt, brown, moist
	55.0	2	S2	6-7-3-2 (10)	24/13				S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subrounded gravel, brown, moist
5		4	S3	4-5-2-2 (7)	24/9		Fill		S3 - Top 3": Silty SAND (SM), fine to medium, 20-25% fines, trace of organic soil, trace of asphalt, brown, moist Bot. 6": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown, moist
		6	S4	3-3-2-2 (5)	24/15				S4 - Silty SAND (SM), fine to medium, 20-25% fines, trace of organic soil, dark brown, moist
	50.0	8	S5	2-2-6-9 (8)	24/19			8.0 / 50.0	S5 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, light brown, moist
10		10	S6	16-29-24-25 (53)	24/15		Sand and Gravel		S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 30-35% fine to coarse angular gravel, light brown, moist
		12						12.0	Bottom of borehole at 12.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.
	45.0								
15									
	40.0								
20									
	35.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-2
PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/22/22 **DATE COMPLETED:** 12/22/22
BORING LOCATION: Near NE corner of prop. parking lot
COORDINATES: NA
SURFACE El.: 57 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 8.0 ft. / El. 49.0 ft. Based on sample moisture
AT END OF DRILLING: 9.0 ft. / El. 48.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.5	S1	11-10-5 (15)	18/14		Asphalt	0.3 / 56.7	Top 3": Asphalt
	55.0	2	S2	6-4-5-6 (9)	24/5		Fill		S1 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, brown, moist
		4	S3	6-4-2-2 (6)	24/7				S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 5-10% fines, 25-30% coarse angular gravel, trace of concrete, light brown, moist
5		6	S4	4-4-3-2 (7)	24/11				S3 - Similar to S2, trace of organic soil
	50.0	8	S5	0-2-7-4 (9)	24/10		Buried Organic Soil	8.0 / 49.0	S4 - Similar to S2, trace of organic soil
10		10	S6	6-6-4-4 (10)	24/16		Sand and Gravel	10.0 / 47.0	S5 - Silty SAND (SM), fine to medium, 25-30% fines, 5-10% fine to coarse angular gravel, trace of organic soil, black, wet
	45.0	12						12.0	S6 - Silty SAND (SM), fine, 20-25% fines, gray, wet
									Bottom of borehole at 12.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.
15									
	40.0								
20									
	35.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-3
PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/21/22 **DATE COMPLETED:** 12/21/22
BORING LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE El.: 58 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 15.0 ft. / El. 43.0 ft. Based on sample moisture
AT END OF DRILLING: 12.0 ft. / El. 46.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
							Asphalt	0.3 / 57.7	Top 4": Asphalt
		0.5	S1	22-10-8 (18)	18/17				S1 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 0-5% fine subrounded gravel, light brown, moist
		2	S2	6-6-5-6 (11)	24/15		Fill		S2 - Similar to S1, 10-15% fine to coarse subangular gravel, trace of organic soil
	55.0	4	S3	2-5-5-3 (10)	24/15				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, ~15% fine to coarse subrounded gravel, trace of organic soil, brown, moist
5		6	S4	5-6-5-4 (11)	24/14			6.0 / 52.0	S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, ~15% fine to coarse subrounded gravel, brown, moist
	50.0	8							
10		10	S5	7-18-14-12 (32)	24/22				S5 - Similar to S4
		12					Sand and Gravel		
	45.0								
15		15	S6	5-4-9-19 (13)	24/22				S6 - Well Graded SAND (SW), fine to coarse, 0-5% fines, light brown, wet
		17							
	40.0								
20		20	S7	3-16-44-51 (60)	24/24				S7 - Similar to S6
		22						22.0	
	35.0								Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/21/22 **DATE COMPLETED:** 12/21/22
BORING LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE El.: 58 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 48.0 ft. Based on sample moisture
AT END OF DRILLING: 13.0 ft. / El. 45.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
							Asphalt	0.3 / 57.7	Top 3": Asphalt
		0.5	S1	14-12-8 (20)	18/14				S1 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace of organic soil, brown, moist
	55.0	2	S2	9-10-6-4 (16)	24/15		Fill		S2 - Similar to S1
5		4	S3	4-3-2-2 (5)	24/11				S3 - Similar to S1
		6	S4	2-1-1-2 (2)	24/17			6.0 / 52.0	S4 - Silty SAND (SM), fine to medium, 20-25% fines, trace of organic soil, brown, moist
	50.0	8	S5	4-4-4-13 (8)	24/8		Buried Organic Soil	8.0 / 50.0	S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, light brown, moist
10		10	S6	13-12-10-9 (22)	24/16				S6 - Similar to S5, wet
	45.0	12							
15		15	S7	1-1-4-4 (5)	24/21		Sand and Gravel		S7 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, gray, wet
	40.0	17							
20		20	S8	1-4-4-6 (8)	24/17				S8 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 10-15% fine to coarse subangular gravel, light brown, wet
	35.0	22						22.0	Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-5

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/20/22 **DATE COMPLETED:** 12/20/22
BORING LOCATION: Near eastern side of prop. building
COORDINATES: NA
SURFACE El.: 60 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 15.0 ft. / El. 45.0 ft. Based on sample moisture
AT END OF DRILLING: 14.0 ft. / El. 46.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
							Asphalt	0.2 / 59.8	Top 2": Asphalt
		0.5	S1	15-7-7 (14)	18/13				S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subangular gravel, trace of organic soil, trace of brick, brown, moist
		2	S2	5-4-6-5 (10)	24/1				S2 - Piece of brick
		4					Fill		
5	55.0		S3	6-3-3-4 (6)	24/11				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, light brown, moist
		6	S4	2-3-2-2 (5)	24/17				S4 - Silty SAND (SM), fine to coarse, ~20% fines, 5-10% fine to coarse subangular gravel, trace of organic soil, brown, moist
		8						8.0 / 52.0	
			S5	2-2-2-3 (4)	24/20				S5 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, trace of fine gravel, light brown, moist
10	50.0	10	S6	3-4-4-6 (8)	24/18				S6 - Similar to S5
		12							
15	45.0						Sand and Gravel		
		15	S7	1-2-2-4 (4)	24/19				S7 - Sandy SILT (ML), non-plastic, 30-35% fine to medium sand, gray, wet
		17							
20	40.0								
		20	S8	14-12-10-8 (22)	24/21				S8 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subrounded gravel, brown, wet
		22						22.0	
25	35.0								Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/20/22 **DATE COMPLETED:** 12/20/22
BORING LOCATION: Near center of prop. building
COORDINATES: NA
SURFACE El.: 60 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 50.0 ft. Based on sample moisture
AT END OF DRILLING: 13.5 ft. / El. 46.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.5	S1	5-8-6 (14)	18/18		Asphalt	0.3 59.7	Top 4": Asphalt S1 - Silty SAND (SM), fine to medium, 20-25% fines, 5-10% fine subrounded gravel, trace of organic soil, trace of asphalt, brown, moist
		2	S2	5-14-13-9 (27)	24/9				S2 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 10-15% fine to coarse subrounded gravel, brown, moist
		4	S3	4-4-6-4 (10)	24/16		Fill		S3 - Similar to S2
5	55.0	6	S4	2-3-5-6 (8)	24/10				S4 - Silty SAND (SM), fine to medium, 15-20% fines, trace of organic soil, brown, moist
		8	S5	2-4-4-4 (8)	24/16			8.0 52.0	S5 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
10	50.0	10	S6	4-5-5-6 (10)	24/17				S6 - Similar to S5, wet
		12							
15	45.0	15	S7	3-2-1-2 (3)	24/20		Sand and Gravel		S7 - Top 10": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, brown, wet Bot. 10": Sandy SILT (ML), non-plastic, 30-35% fine sand, gray, wet
		17							
20	40.0	20	S8	9-12-13-14 (25)	24/19				S8 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine subrounded gravel, brown, wet
		22						22.0	Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.
25	35.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/21/22 **DATE COMPLETED:** 12/21/22
BORING LOCATION: Near western side of prop. building
COORDINATES: NA
SURFACE El.: 61 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 14.0 ft. / El. 47.0 ft. Based on sample moisture
AT END OF DRILLING: 15.5 ft. / El. 45.5 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	60.0	0	S1	2-6-8-6 (14)	24/8		Topsoil	0.7 60.3	S1 - Silty SAND (SM), fine to medium, 15-20% fines, trace of organic soil, trace of asphalt, brown, moist
		2	S2	2-4-2-3 (6)	24/3		Fill		S2 - Silty SAND (SM), fine to coarse, ~20% fines, 5-10% fine to coarse subrounded gravel, trace of organic soil, trace of asphalt, black, moist
5		4	S3	5-6-3-5 (9)	24/6				S3 - Similar to S2
	55.0	6	S4	6-4-4-6 (8)	24/10				S4 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, angular, 10-15% fines, 25-30% fine to coarse sand, trace of organic soil, dark brown, moist
		8	S5	5-4-2-5 (6)	24/9				S5 - Silty SAND (SM), fine to medium, 20-25% fines, 0-5% fine angular gravel, gray, moist (appears reworked)
10		10	S6	7-3-3-5 (6)	24/14			10.0 51.0	S6 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, brown, moist
	50.0	12	S7	4-8-8-15 (16)	24/8				S7 - Similar to S6
		14	S8	9-9-8-41 (17)	24/19				S8 - Similar to S6, wet
15									
	45.0	16					Sand and Gravel		
20		20	S9	9-10-10-12 (20)	24/8				S9 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, angular, 5-10% fines, 20-25% fine to coarse sand, brown, wet
	40.0	22						22.0	Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings and four bags of sand.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/19/22 **DATE COMPLETED:** 12/19/22
BORING LOCATION: Near eastern side of prop. building
COORDINATES: NA
SURFACE El.: 63 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 20.0 ft. / El. 43.0 ft. Based on sample moisture
AT END OF DRILLING: 19.0 ft. / El. 44.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-3-5-10 (8)	24/11		Crushed Stone	0.3 / 62.7	S1 - Top 3": Crushed stone Bot. 8": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 15-20% fine to coarse subangular gravel, trace of organic soil, trace of brick, brown, moist
	60.0	2	S2	7-8-7-5 (15)	24/14				S2 - Poorly Graded SAND with Gravel (SP), fine to medium, 0-5% fines, 15-20% fine to coarse subangular gravel, brown, moist
5		4	S3	6-7-6-7 (13)	24/19		Fill		S3 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, trace of organic soil, trace of brick, light brown, most
		6	S4	5-5-5-8 (10)	24/18				S4 - Similar to S3
	55.0	8	S5	4-5-5-5 (10)	24/19			8.0 / 55.0	S5 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
10		10	S6	3-5-6-6 (11)	24/18				S6 - Similar to S5
	50.0	12							
15		15	S7	3-6-9-4 (15)	24/17		Sand and Gravel		S7 - Similar to S5
	45.0	17							
20		20	S8	2-6-5-15 (11)	24/18				S8 - Similar to S5, wet
	40.0	22						22.0	Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/19/22 **DATE COMPLETED:** 12/19/22
BORING LOCATION: Near western side of prop. building
COORDINATES: NA
SURFACE El.: 65 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 20.0 ft. / El. 45.0 ft. Based on sample moisture
AT END OF DRILLING: 19.0 ft. / El. 46.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	5-6-12-11 (18)	24/15		Crushed Stone	0.3 64.7	S1 - Top 3": Crushed stone Bot. 12": Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, trace of organic soil, trace of brick, black, moist
		2	S2	6-3-4-2 (7)	24/16		Fill		S2 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace of organic soil, brown, moist
		4	S3	2-3-5-6 (8)	24/14				S3 - Silty SAND (SM), fine to medium, 20-25% fines, 5-10% fine to coarse subrounded gravel, trace of organic soil, black, moist
5	60.0	6	S4	4-3-5-5 (8)	24/6			6.0 59.0	S4 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
		8							
10	55.0	10	S5	3-5-6-7 (11)	24/17				S5 - Similar to S4
		12					Sand and Gravel		
15	50.0	15	S6	7-10-10-10 (20)	24/18				S6 - Similar to S4
		17							
20	45.0	20	S7	6-10-15-17 (25)	24/24				S7 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, wet
		22						22.0	Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings.
25	40.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-10
PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/19/22 **DATE COMPLETED:** 12/19/22
BORING LOCATION: Near eastern side of prop. building
COORDINATES: NA
SURFACE El.: 66 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 19.0 ft. / El. 47.0 ft. Based on sample moisture
AT END OF DRILLING: Dry at the end of drilling
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	65.0	0	S1	6-7-6-5 (13)	24/15		Crushed Stone	0.3 65.7	S1 - Top 3": Crushed stone Bot. 12": Silty SAND (SM), fine to medium, ~20% fines, 5-10% fine subangular gravel, trace of asphalt, trace of brick, trace of organic soil, brown, moist
		2	S2	6-5-3-2 (8)	24/14		Fill		S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, trace of organic soil, light brown, moist
5		4	S3	12-25-17-15 (42)	24/7				S3 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 5-10% fines, 25-30% fine to coarse angular gravel, trace of organic soil, light brown, moist
	60.0	6	S4	37-36-30-23 (66)	24/16			6.0 60.0	S4 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 25-30% fine to coarse angular gravel, light brown, moist
		8							
		9	S5	14-22-18-23 (40)	24/16				S5 - Similar to S4
10									
	55.0	11							
							Sand and Gravel		
		14	S6	8-7-3-3 (10)	24/14				S6 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, 5-10% fine to coarse subangular gravel, light brown, moist
15									
	50.0	16							
		19	S7	5-9-9-10 (18)	24/16				S7 - Similar to S6, wet
20									
	45.0	21						21.0	Bottom of borehole at 21.0 feet. Borehole backfilled with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-11

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/19/22 **DATE COMPLETED:** 12/19/22
BORING LOCATION: Near NE corner of prop. building
COORDINATES: NA
SURFACE El.: 68 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: Not encountered
AT END OF DRILLING: Dry at the end of drilling
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	6-10-11-11 (21)	24/14		Crushed Stone	0.5	S1 - Top 6": Crushed stone
								67.5	Bot. 8": Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, trace of organic soil, trace of asphalt, brown, moist
	65.0	2	S2	14-14-15-12 (29)	24/8		Fill		S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse angular gravel, trace of organic soil, trace of asphalt, brown, moist
5		4	S3	15-19-19-18 (38)	24/15				S3 - Similar to S2, black
		6	S4	14-13-12-12 (25)	24/17			6.5	S4 - Top 6": Similar to S2, black
	60.0	8	S5	10-8-8-8 (16)	24/16			61.5	Bot. 11": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, ~15% fine to coarse subrounded gravel, light brown, moist
10		10	S6	9-12-10-13 (22)	24/17				S5 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist
		12							S6 - Similar to S5
	55.0						Sand and Gravel		
15		15	S7	4-6-6-7 (12)	24/16				S7 - Similar to S5
		17							
	50.0								
20		20	S8	11-10-8-8 (18)	24/19				S8 - Similar to S5
		22						22.0	
	45.0								Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/20/22 **DATE COMPLETED:** 12/20/22
BORING LOCATION: Near western side of prop. building
COORDINATES: NA
SURFACE El.: 66 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 20.0 ft. / El. 46.0 ft. Based on sample moisture
AT END OF DRILLING: Dry at the end of drilling
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
							Asphalt	0.3 / 65.7	Top 3": Asphalt
	65.0	0.5	S1	14-16-13 (29)	18/13		Fill		S1 - Silty SAND with Gravel (SM), fine to coarse, ~15% fines, 15-20% fine to coarse subangular gravel, trace of organic soil, trace of brick, light brown, moist
		2	S2	10-10-12-9 (22)	24/15			2.0 / 64.0	S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, light brown, moist
		4	S3	5-7-10-10 (17)	24/16				S3 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
5	60.0	6	S4	4-5-7-8 (12)	24/18				S4 - Similar to S3
		8							
10		10	S5	5-8-6-8 (14)	24/18		Sand and Gravel		S5 - Similar to S3, fine to medium, trace coarse
	55.0	12							
15		15	S6	5-11-6-8 (17)	24/16				S6 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist
	50.0	17							
20		20	S7	5-9-9-10 (18)	24/15				S7 - Similar to S6, wet
	45.0	22						22.0	Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/20/22 **DATE COMPLETED:** 12/20/22
BORING LOCATION: Near NW corner of prop. building
COORDINATES: NA
SURFACE El.: 67 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 20.0 ft. / El. 47.0 ft. Based on sample moisture
AT END OF DRILLING: Dry at the end of drilling
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.2 / 66.8	S1 - Topsoil
	65.0	2	S1	5-6-6-5 (12)	24/2		Fill		S2 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, angular, 5-10% fines, 15-20% fine to coarse sand, trace of organic soil, brown, moist
		4	S2	4-5-7-14 (12)	24/5			4.0 / 63.0	
5			S3	10-12-10-9 (22)	24/13				S3 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 10-15% fine to coarse subangular gravel, brown, moist
	60.0	6	S4	10-9-9-10 (18)	24/12				S4 - Similar to S3
		8							
10		10	S5	7-10-9-8 (19)	24/16				S5 - Similar to S3
	55.0	12					Sand and Gravel		
15		15	S6	11-10-8-12 (18)	24/17				S6 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist
	50.0	17							
20		20	S7	8-12-17-17 (29)	24/18				▽ S7 - Similar to S6, wet
	45.0	22						22.0	Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-14
PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/19/22 **DATE COMPLETED:** 12/19/22
BORING LOCATION: Near NE corner of prop. building
COORDINATES: NA
SURFACE El.: 68 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 22.0 ft. / El. 46.0 ft. Based on sample moisture
AT END OF DRILLING: Dry at the end of drilling
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
							Asphalt	0.3 / 67.7	Top 3": Asphalt
		0.5	S1	16-20-10 (30)	18/16		Fill		S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subangular gravel, trace of organic soil, trace of brick, trace of asphalt, brown, moist
		2	S2	20-16-18-13 (34)	24/12				S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subangular gravel, light brown, moist
	65.0							4.0 / 64.0	
		4	S3	7-15-16-20 (31)	24/13				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 25-30% fine to coarse angular gravel, light brown, moist
5		6	S4	18-17-16-14 (33)	24/15				S4 - Similar to S3
	60.0	8							
10		10	S5	11-14-15-13 (29)	24/21		Sand and Gravel		S5 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist
	55.0	12							
15		15	S6	12-14-11-9 (25)	24/18				S6 - Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 15-20% fine to coarse subrounded gravel, light brown, moist
	50.0	17							
20		20	S7	9-17-18-15 (35)	24/21				S7 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, 5-10% fine subrounded gravel, light brown, moist to wet
		22						22.0 ▽	
	45.0								Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-15
PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/21/22 **DATE COMPLETED:** 12/21/22
BORING LOCATION: Near SW corner of prop. building
COORDINATES: NA
SURFACE El.: 59 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 15.0 ft. / El. 44.0 ft. Based on sample moisture
AT END OF DRILLING: 13.0 ft. / El. 46.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.5	S1	18-13-5 (18)	18/14		Asphalt	0.3 / 58.7	Top 4": Asphalt S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subrounded gravel, light brown, moist
		2	S2	8-11-14-11 (25)	24/0				S2 - No recovery
	55.0	4	S3	5-5-4-5 (9)	24/17		Fill		S3 - Well Graded SAND (SW), fine to coarse, 0-5% fines, 5-10% fine subrounded gravel, light brown, moist
5		6	S4	6-8-7-4 (15)	24/17				S4 - Similar to S3
	50.0	8							
10		10	S5	1-1-13-17 (14)	24/21			10.4 / 48.6	S5 - Top 5": Silty SAND (SM), fine to medium, 25-30% fines, trace of organic soil, brown, moist Bot. 16": Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist
		12							
	45.0								
15		15	S6	10-10-11-30 (21)	24/8		Sand and Gravel		S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse angular gravel, brown, wet
		17							
	40.0								
20		20	S7	2-4-11-21 (15)	24/19				S7 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, 5-10% fine subrounded gravel, brown, wet
		22						22.0	Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.
	35.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-16

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/22/22 **DATE COMPLETED:** 12/22/22
BORING LOCATION: Near SE corner of prop. parking lot
COORDINATES: NA
SURFACE El.: 56 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 10.0 ft. / El. 46.0 ft. Based on sample moisture
AT END OF DRILLING: Dry at the end of drilling
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark
	55.0	0.5	S1	11-7-4 (11)	18/16	
		2	S2	2-2-3-5 (5)	24/15	
		4	S3	4-2-1-1 (3)	24/11	
5	50.0	6	S4	1-2-3-9 (5)	24/17	
		8	S5	17-16-19-22 (35)	24/16	
10	45.0	10	S6	31-23-20-18 (43)	24/12	
		12				
15	40.0					
20	35.0					
25						

Strata	Depth El.(ft.)	Material Description
Asphalt	0.4 / 55.6	Top 5": Asphalt
Fill		S1 - Silty SAND (SM), fine to coarse, 15-20% fines, 5-10% fine to coarse subangular gravel, trace of organic soil, trace of asphalt, brown, moist
		S2 - Silty SAND (SM), fine to medium, 15-20% fines, 0-5% fine subrounded gravel, trace of organic soil, brown, moist
		S3 - Similar to S2, trace of asphalt
		S4 - Top 9": Similar to S2, trace of asphalt
	6.8 / 49.2	
Sand and Gravel		Bot. 8": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subangular gravel, light brown, moist
		S5 - Similar to S4 Bot. 8"
		S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse angular gravel, gray, wet
	12.0	
		Bottom of borehole at 12.0 feet. Borehole backfilled with drill cuttings. Ground surface restored with asphalt cold patch.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-17
PAGE 1 OF 1

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 12/22/22 **DATE COMPLETED:** 12/22/22
BORING LOCATION: Near center of prop. building
COORDINATES: NA
SURFACE El.: 61 ft. (see note 1) **TOTAL DEPTH:** 22 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
DURING DRILLING: 20.0 ft. / El. 41.0 ft. Based on sample moisture
AT END OF DRILLING: Dry at the end of drilling
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Hollow Stem Auger (3-1/4" I.D.)
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	60.0	0	S1	11-34-20-12 (54)	24/10	1	Crushed Stone	0.3	S1 - Top 3": Crushed stone
								60.7	Bot. 7": Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 20-25% fine to coarse angular gravel, trace of organic soil, trace of roots, orange-brown, moist
		2	S2	5-11-19-12 (30)	24/16		Fill		REMARK 1: Encountered possible abandoned foundation between depths of 2 feet and 4 feet.
									S2 - Piece of concrete
		4						4.0	
5			S3	13-13-10-9 (23)	24/10			57.0	S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse angular gravel, light brown, moist
	55.0	6	S4	18-13-15-16 (28)	24/24				S4 - Poorly Graded SAND (SP), fine to medium, trace coarse, 0-5% fines, 10-15% fine to coarse subangular gravel, light brown, moist
		8							
10		10	S5	5-7-5-6 (12)	24/20				S5 - Poorly Graded SAND (SP), fine to medium, trace coarse, 0-5% fines, ~5% fine subrounded gravel, light brown, moist
	50.0	12					Sand and Gravel		
15		15	S6	10-6-5-5 (11)	24/16				S6 - Similar to S5
	45.0	17							
20		20	S7	3-4-5-7 (9)	24/24				S7 - Similar to S6
	40.0	22						22.0	
25									Bottom of borehole at 22.0 feet. Borehole backfilled with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-101

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 2/17/23 **DATE COMPLETED:** 2/17/23
BORING LOCATION: Near southern side of prop. building
COORDINATES: NA
SURFACE El.: 58 ft. (see note 1) **TOTAL DEPTH:** 53.5 ft.
WEATHER: 50's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 8.0 ft. / El. 50.0 ft. Based on sample moisture
AT END OF DRILLING: 13.0 ft. / El. 45.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-48 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NX
LOGGED BY: TG **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.5	S1	8-5-8 (13)	18/2		Asphalt	0.3 / 57.7	Top 3": Asphalt S1 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 5-10% fines, ~10% fine angular gravel, trace of asphalt, trace of brick, brown, moist
		2	S2	12-6-4-3 (10)	24/12	1			S2 - Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown, moist REMARK 1: Organic soil washing up in drill cuttings at depth of 3 feet.
	55.0	4	S3	6-6-7-6 (13)	24/10		Fill		S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 5-10% fines, 5-10% fine subrounded gravel, brown, moist (appears reworked)
5		6	S4	7-5-4-2 (9)	24/11				S4 - Similar to S3
	50.0	8	S5	2-1-2-2 (3)	24/6				S5 - Silty SAND (SM), fine to coarse, 20-25% fines, 0-5% fine subrounded gravel, trace of organic soil, brown, wet
10		10	S6	12-11-10-11 (21)	24/14			10.5 / 47.5	S6 - Top 6": Similar to S5, 15-20% fines Bot. 8": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, orange-brown, wet
	45.0	12	S7	8-7-9-12 (16)	24/13				S7 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, brown, wet
15		14	S8	17-25-17-12 (42)	24/7				S8 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 5-10% fines, 20-25% fine to coarse angular gravel, brown, wet
		16	S9	16-9-10-15 (19)	24/4				S9 - Similar to S8, ~15% fine to coarse angular gravel
	40.0	18					Sand and Gravel		
		19	S10	10-10-9-7 (19)	24/2				S10 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 5-10% fines, 10-15% fine to coarse subangular gravel, light brown, wet
20		21							
	35.0	24							S11 - Similar to S10, 0-5% fine subrounded gravel
25				8-7-8-6					

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

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BORING LOG

B-101

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		24	S11	(15)	24/8				
		26							
	30.0						Sand and Gravel		
		29							S12 - Well Graded GRAVEL with Sand (GW), fine to coarse, subrounded, 0-5% fines, 25-30% fine to coarse sand, brown, wet
30			S12	5-2-6-3 (8)	24/2				
		31							
	25.0					2		33.0	
								25.0	REMARK 2: Strata change assumed based on drilling effort and change in color of drill water.
		34							
			S13	8-4-4-10 (8)	24/9				S13 - SILT with Sand (ML), moderately plastic, ~20% fine to coarse sand, gray, wet
35		36							
	20.0								
		39					Silt		
			S14	4-5-7-7 (12)	24/14				S14 - Similar to S13
40		41							
	15.0								
		44							
			S15	57-53	12/10				S15 - SILT (ML), non-plastic, 10-15% fine sand, trace of weathered rock, gray, wet
45		45						45.0	
								13.0	
	10.0								
		48.5					Rock		C1 - Min./ft.: 4.0, 3.1, 2.5, 2.6, 2.0 REC. = 60"/60" = 100% RQD = 34"/60" = 56.67% Very soft to soft, fresh, moderately fractured to sound, fine-grained, black, SHALE
50			C1		60/60				
	5.0								
		53.5						53.5	
									Bottom of borehole at 53.5 feet. Borehole backfilled with drill cuttings and 0.5 bags of gravel. Ground surface restored with asphalt cold patch.
55									
	0.0								
60									

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BORING LOG

B-102

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

DATE STARTED: 2/20/23 **DATE COMPLETED:** 2/20/23
BORING LOCATION: Near SE corner of prop. building
COORDINATES: NA
SURFACE El.: 57 ft. (see note 1) **TOTAL DEPTH:** 49 ft.
WEATHER: 50's / Cloudy
GROUNDWATER LEVELS:
DURING DRILLING: 6.0 ft. / El. 51.0 ft. Based on sample moisture
AT END OF DRILLING: 8.0 ft. / El. 49.0 ft.
OTHER: -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Jon Beirholm
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-48 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: NP **CHECKED BY:** TG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.5	S1	14-10-12 (22)	18/13		Asphalt	0.3 / 56.7	Top 3": Asphalt S1 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, 0-5% fine subrounded gravel, trace of asphalt, brown, moist
	55.0	2	S2	10-10-8-6 (18)	24/16		Fill		S2 - Similar to S1, trace of organic soil, no asphalt
5		4	S3	8-7-10-8 (17)	24/0				S3 - No recovery
		6	S4	12-7-9-7 (16)	24/17				S4 - Poorly Graded SAND (SP), fine, 0-5% fines, light brown, wet
	50.0	8	S5	4-4-6-9 (10)	24/22		Buried Organic Soil	8.0 / 49.0	S5 - Silty SAND (SM), fine to medium, 25-30% fines, trace of organic soil, trace of roots, black, wet
10		10	S6	6-6-7-7 (13)	24/12		Fill	10.0 / 47.0	S6 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace of organic soil, trace of roots, brown, wet
	45.0	12	S7	1-2-1-1 (3)	24/13		Silt	12.0 / 45.0	S7 - Sandy SILT (ML), non-plastic, 40-45% fine sand, light brown, wet
		14	S8	1-2-2-2 (4)	24/7				S8 - Similar to S7
15		16							
	40.0					1		17.5 / 39.5	REMARK 1: Strata change assumed.
		19	S9	10-9-11-8 (20)	24/11		Sand and Gravel		S9 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 10-15% fines, 20-25% fine to coarse subangular gravel, light brown, wet
20		21							
	35.0								
		24							S10 - Similar to S9, 5-10% fines
25				16-9-10-10					

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from drawing C-200 titled: "Civil Proposed Site Plan," prepared by Woodard & Curran, dated August 2022, and provided to LGCI by Thermo-Mechanical Systems Corporation via e-mail on August 23, 2022.

LGCI
Lahlaf Geotechnical Consulting, Inc.
100 Chelmsford Rd Suite 2
Billerica, MA 01862
Telephone: 9783305912
Fax: 9783305056

BORING LOG

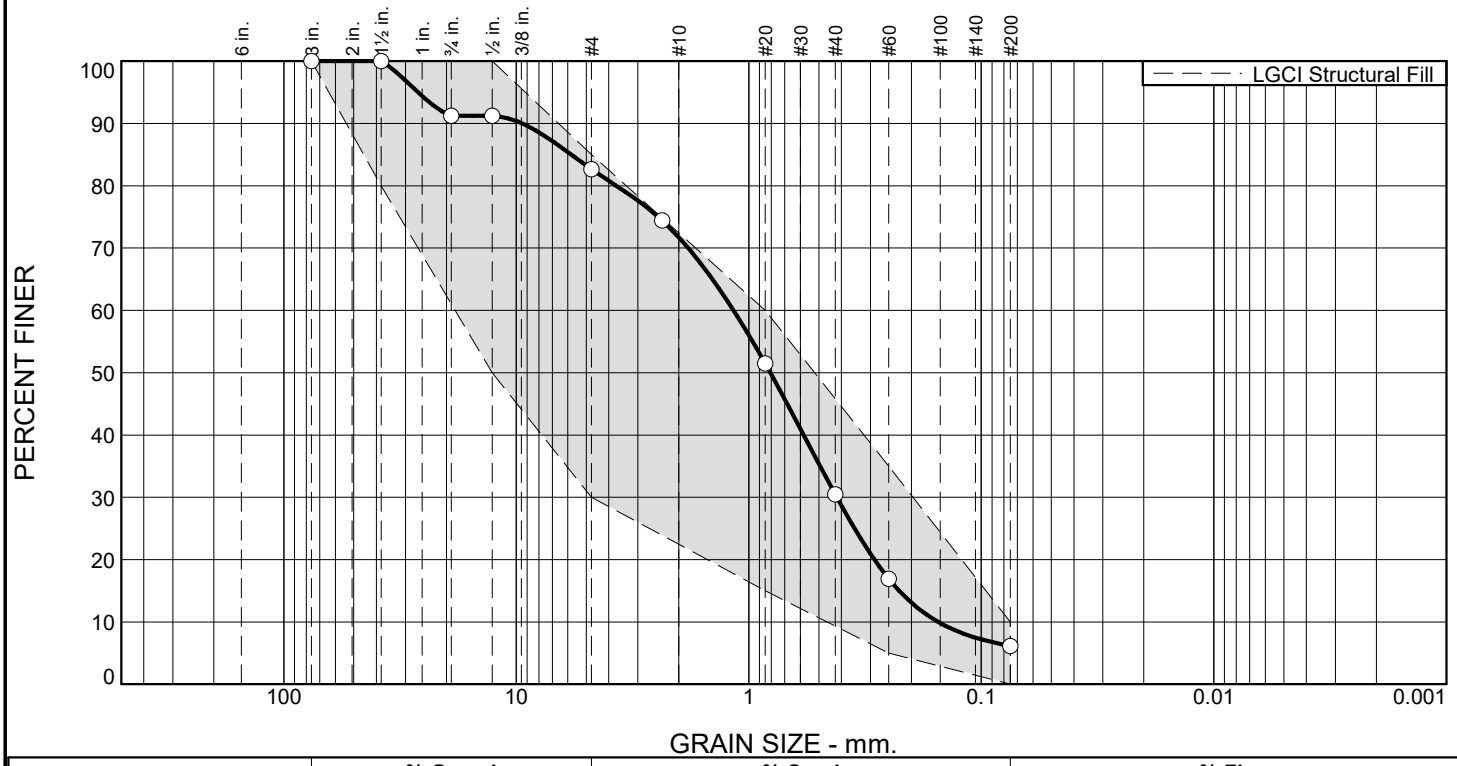
B-102

CLIENT: Taco Comfort Solutions
PROJECT NAME: Prop. Manufacturing Building
LGCI PROJECT NUMBER: 2252
PROJECT LOCATION: Cranston, RI

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		24	S10	(19)	24/18				
		26							
	30.0								
		29					Sand and Gravel		S11 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 5-10% fines, ~20% fine to coarse subrounded gravel, light brown, wet
30			S11	6-7-8-7 (15)	24/15				
		31							
	25.0								
		34						34.0	
			S12	3-4-3-4 (7)	24/22		Silt	23.0	S12 - SILT with Sand (ML), slightly plastic, ~20% fine sand, gray, wet
35		36							
	20.0							39.0	
		39						18.0	S13 - Silty SAND with Gravel (SM), fine to coarse, 35-40% fines, 25-30% fine to coarse angular gravel, trace of weathered rock, gray, wet
40			S13	6-5-13-11 (18)	24/20		Sand and Gravel		
		41							
	15.0							44.0	
		44						13.0	
45			S14	61-36-64/4" (100/10")	16/12		Weathered Rock		S14 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 20-25% fine subrounded gravel, gray, wet (weathered rock)
		45.3						46.0	
						2		11.0	REMARK 2: Drill bit refusal encountered at depth of 46 feet on rock. Drilled to depth of 49 feet o confirm presence of rock.
	10.0						Rock		
								49.0	
50									Bottom of borehole at 49.0 feet. Borehole backfilled with drill cuttings and 3.5 bags of gravel. Ground surface restored with asphalt cold patch.
	5.0								
55									
	0.0								
60									

Appendix C – Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.7	8.6	11.0	41.2	24.4	6.1	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	91.3		
0.5"	91.2	50.0 - 100.0	
#4	82.7	30.0 - 85.0	
#8	74.4		
#20	51.5	15.0 - 60.0	
#40	30.5		
#60	16.9	5.0 - 35.0	
#200	6.1	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt and Gravel (SP-SM), mostly medium, 5-10% fines, 15 20% fine to coarse subangular gravel, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 9.4240 D_{85}= 5.7993 D_{60}= 1.1630
D_{50}= 0.8078 D_{30}= 0.4179 D_{15}= 0.2253
D_{10}= 0.1534 C_u= 7.58 C_c= 0.98

Remarks

Fill sample.

Date Received: 11/14/2022 **Date Tested:** 12/7/2022

Tested By: MBH

Checked By: JPE

Location: Test Pit TP-10
Sample Number: Grab **Depth:** 0.8'-6.5'

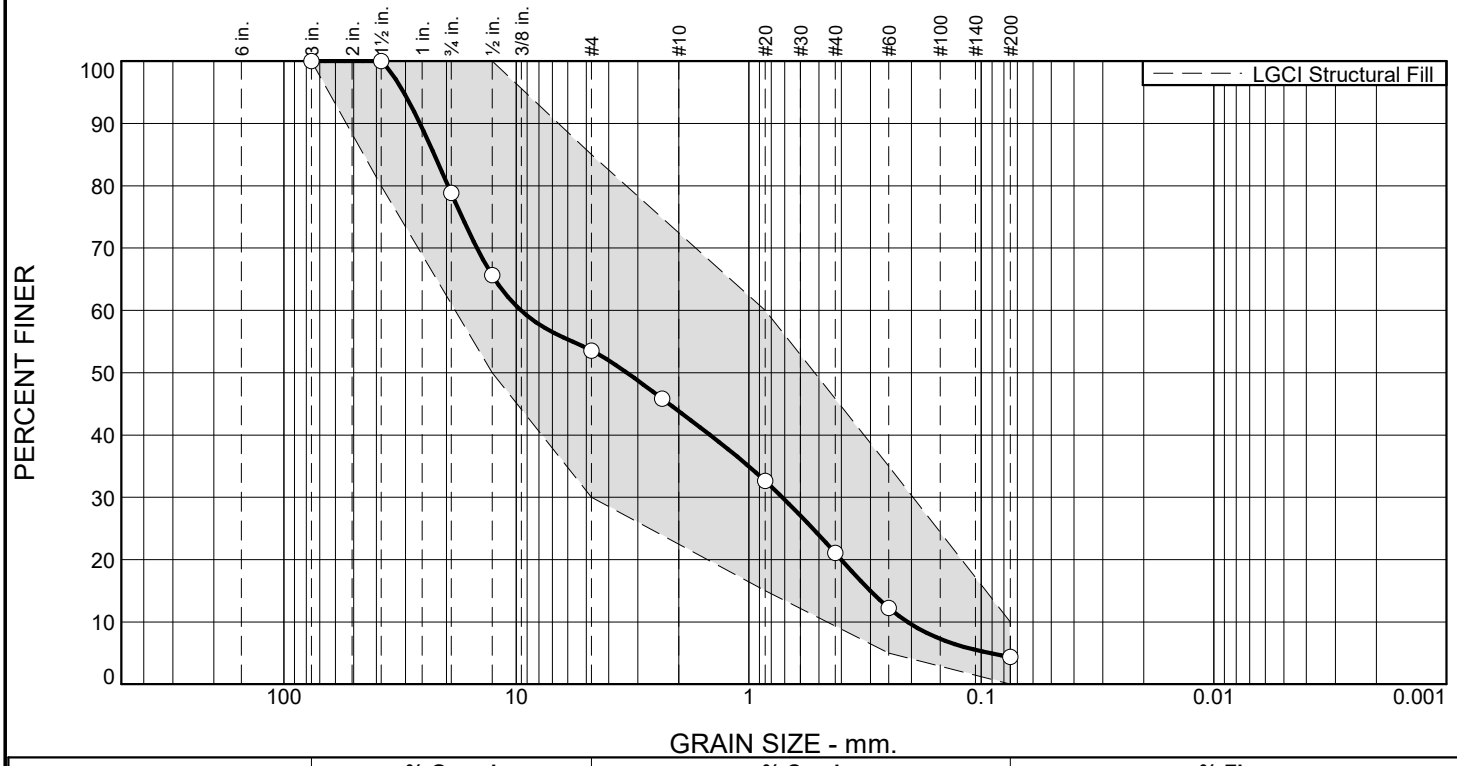
Date Sampled: 11/14/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Taco Comfort Solutions
Project: Proposed Manufacturing Building, Cranston, RI

Project No: 2252 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	21.2	25.2	9.8	22.7	16.7	4.4	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	78.8		
0.5"	65.7	50.0 - 100.0	
#4	53.6	30.0 - 85.0	
#8	45.8		
#20	32.6	15.0 - 60.0	
#40	21.1		
#60	12.3	5.0 - 35.0	
#200	4.4	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 45-50% fine to coarse angular gravel, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SP **AASHTO (M 145)=**

Coefficients

D_{90}= 25.9597 D_{85}= 22.5272 D_{60}= 9.5529
D_{50}= 3.3428 D_{30}= 0.7180 D_{15}= 0.2999
D_{10}= 0.2075 C_u= 46.04 C_c= 0.26

Remarks

Fill sample.

Date Received: 11/15/2022 **Date Tested:** 12/7/2022

Tested By: JPE

Checked By: MBH

Location: Test Pit TP-15
Sample Number: Grab **Depth:** 0.3'-4.0'

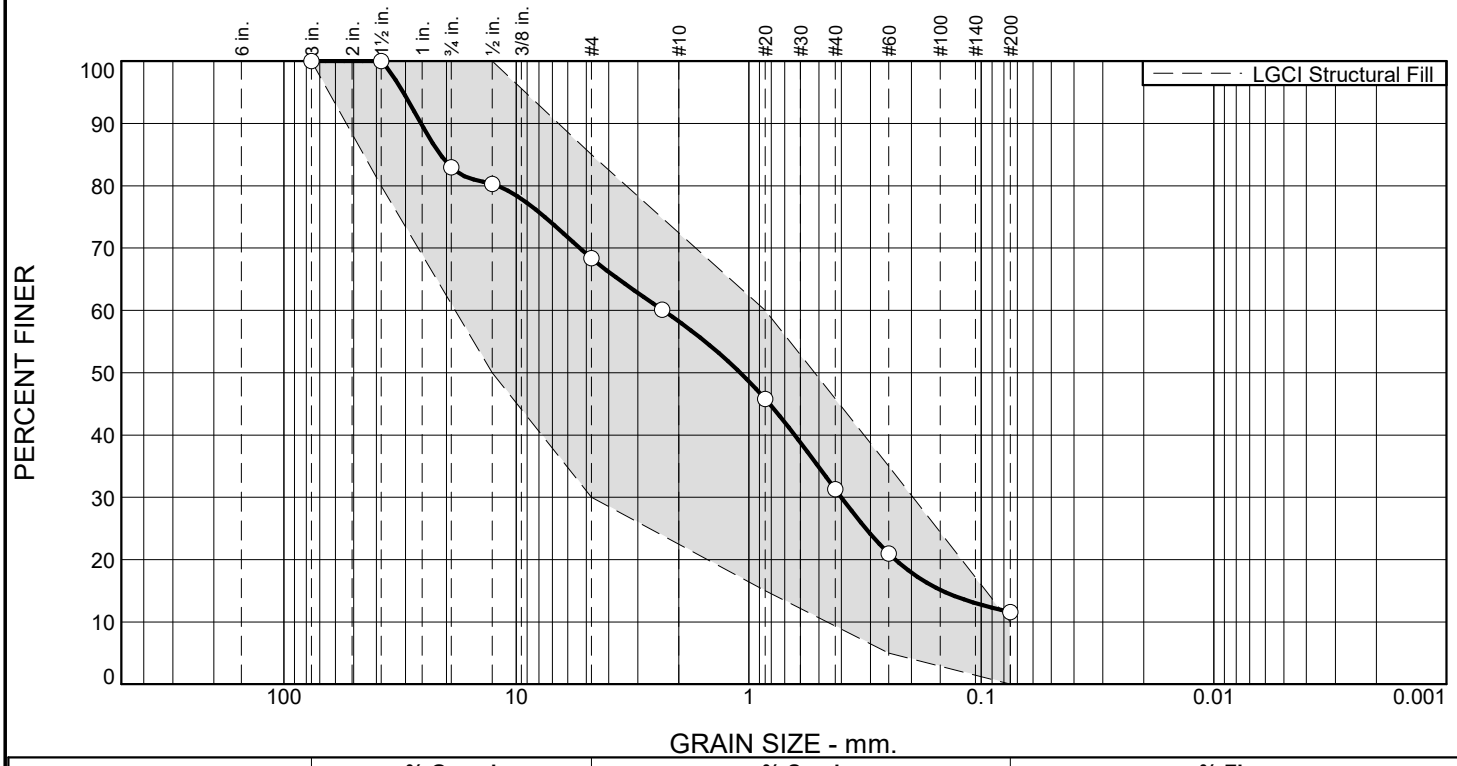
Date Sampled: 11/15/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Taco Comfort Solutions
Project: Proposed Manufacturing Building, Cranston, RI

Project No: 2252 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.0	14.6	10.2	26.9	19.7	11.6	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	83.0		
0.5"	80.3	50.0 - 100.0	
#4	68.4	30.0 - 85.0	
#8	60.1		
#20	45.8	15.0 - 60.0	
#40	31.3		
#60	21.0	5.0 - 35.0	
#200	11.6	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse subangular gravel, trace of asphalt, dark brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=**

Coefficients

D_{90}= 25.7072 D_{85}= 21.2158 D_{60}= 2.3324
D_{50}= 1.0880 D_{30}= 0.3999 D_{15}= 0.1472
D_{10}= C_u= C_c=

Remarks

Fill sample.

Date Received: 11/14/2022 **Date Tested:** 12/7/2022

Tested By: MBH

Checked By: JPE

Location: Test Pit TP-4
Sample Number: Grab **Depth:** 0.3'-3.0'

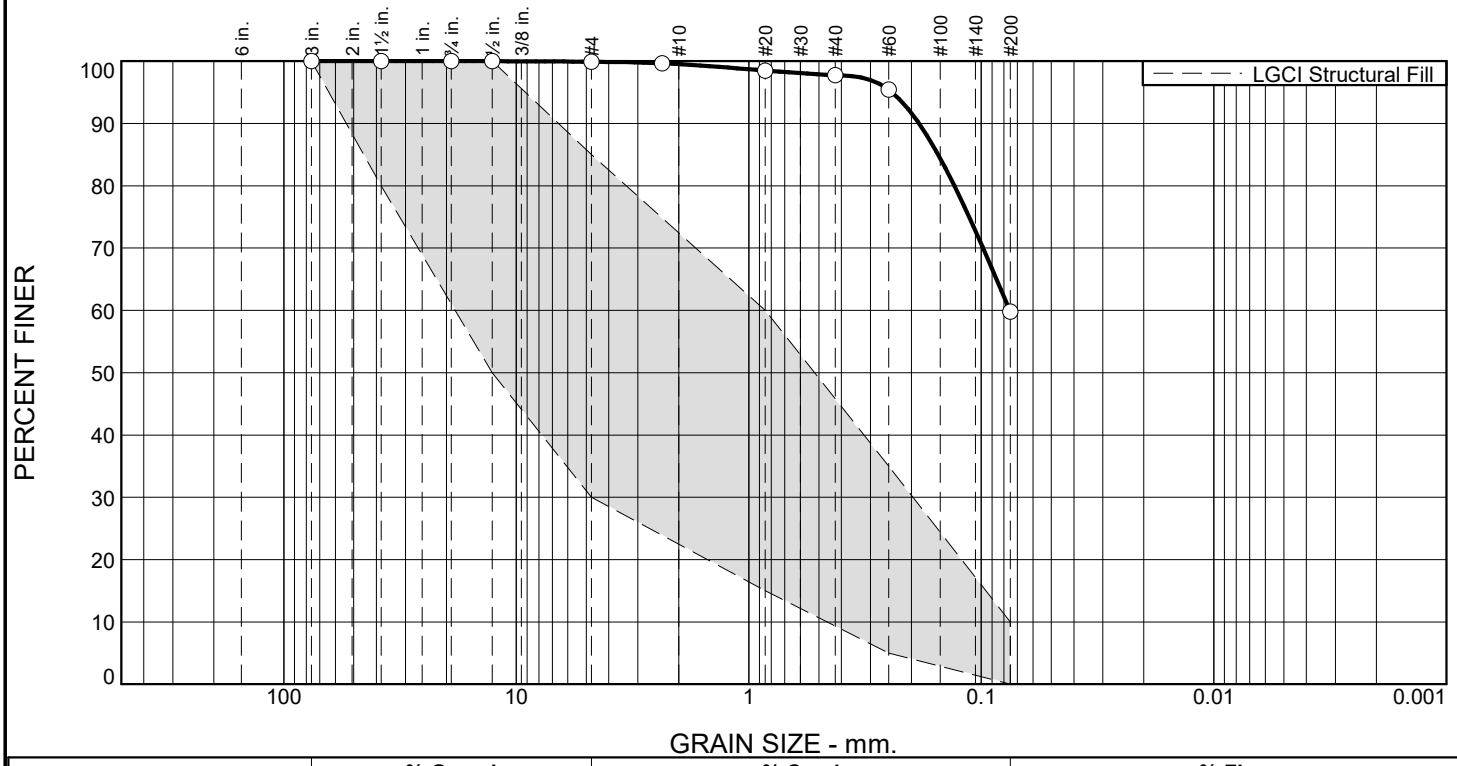
Date Sampled: 11/14/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Taco Comfort Solutions
Project: Proposed Manufacturing Building, Cranston, RI

Project No: 2252 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.4	1.7	38.0	59.8	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	99.9	30.0 - 85.0	X
#8	99.7		
#20	98.5	15.0 - 60.0	X
#40	97.8		
#60	95.4	5.0 - 35.0	X
#200	59.8	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Sandy SILT (ML), slightly plastic, 40-45% mostly fine sand, gray to orange

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 0.1851 D_{85}= 0.1532 D_{60}= 0.0754
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural silt sample.

Date Received: 11/16/22 **Date Tested:** 11/16/22

Tested By: TG

Checked By: NP

Location: Test Pit TP-5
Sample Number: Grab **Depth:** 7.7'-12.0'

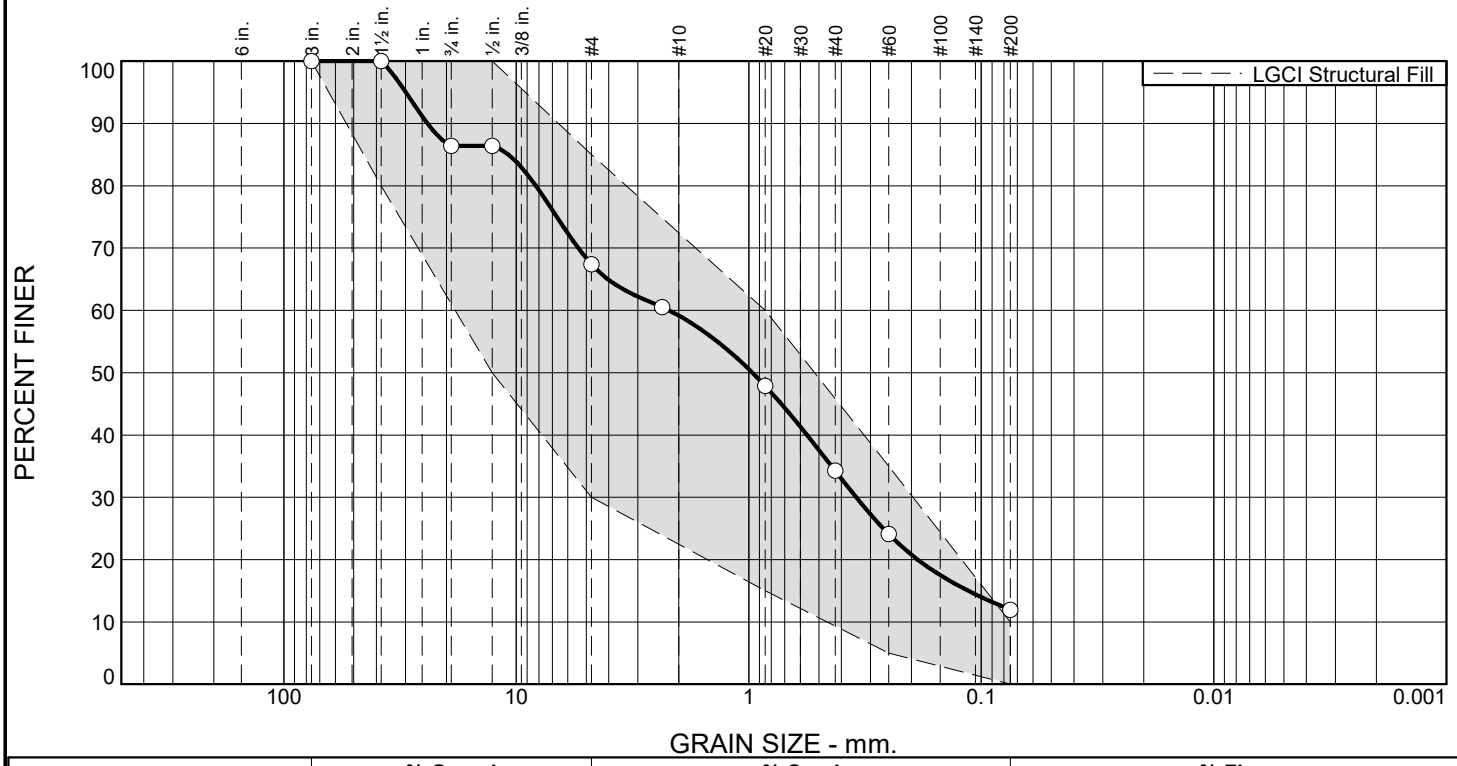
Date Sampled: 11/16/22

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Taco Comfort Solutions
Project: Proposed Manufacturing Building, Cranston, RI

Project No: 2252 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.6	19.0	8.2	25.0	22.3	11.9	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	86.4		
0.5"	86.4	50.0 - 100.0	
#4	67.4	30.0 - 85.0	
#8	60.5		
#20	47.9	15.0 - 60.0	
#40	34.2		
#60	24.1	5.0 - 35.0	
#200	11.9	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse subrounded gravel, trace of wood, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 24.1357 D_{85}= 10.7801 D_{60}= 2.2016
D_{50}= 0.9652 D_{30}= 0.3449 D_{15}= 0.1138
D_{10}= C_u= C_c=

Remarks

Fill sample.

Date Received: 11/15/2022 **Date Tested:** 12/7/2022

Tested By: JPE

Checked By: MBH

Location: Test Pit TP-6
Sample Number: Grab **Depth:** 1.5'-8.5'

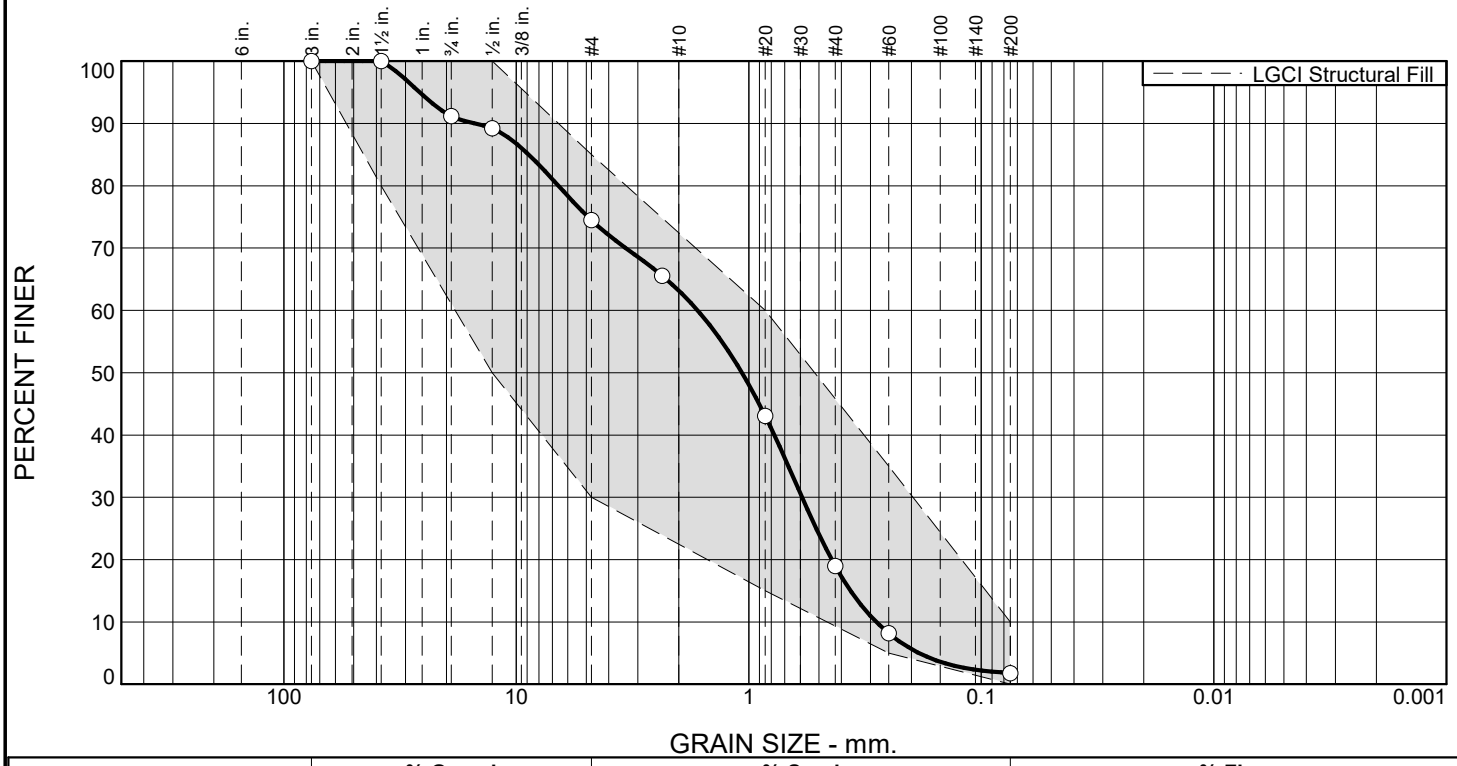
Date Sampled: 11/15/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Taco Comfort Solutions
Project: Proposed Manufacturing Building, Cranston, RI

Project No: 2252 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.8	16.7	11.3	44.2	17.2	1.8	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	91.2		
0.5"	89.2	50.0 - 100.0	
#4	74.5	30.0 - 85.0	
#8	65.6		
#20	43.1	15.0 - 60.0	
#40	19.0		
#60	8.2	5.0 - 35.0	
#200	1.8	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Gravel (SP), mostly medium, 0-5% fines, 25-30% fine to coarse angular gravel, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SP **AASHTO (M 145)=**

Coefficients

D_{90}= 14.9807 D_{85}= 8.8286 D_{60}= 1.6609
D_{50}= 1.0692 D_{30}= 0.5902 D_{15}= 0.3651
D_{10}= 0.2829 C_u= 5.87 C_c= 0.74

Remarks

Natural sand and gravel sample.

Date Received: 11/15/2022 **Date Tested:** 12/7/2022

Tested By: JPE

Checked By: MBH

Location: Test Pit TP-7
Sample Number: Grab **Depth:** 2.0'-5.0'

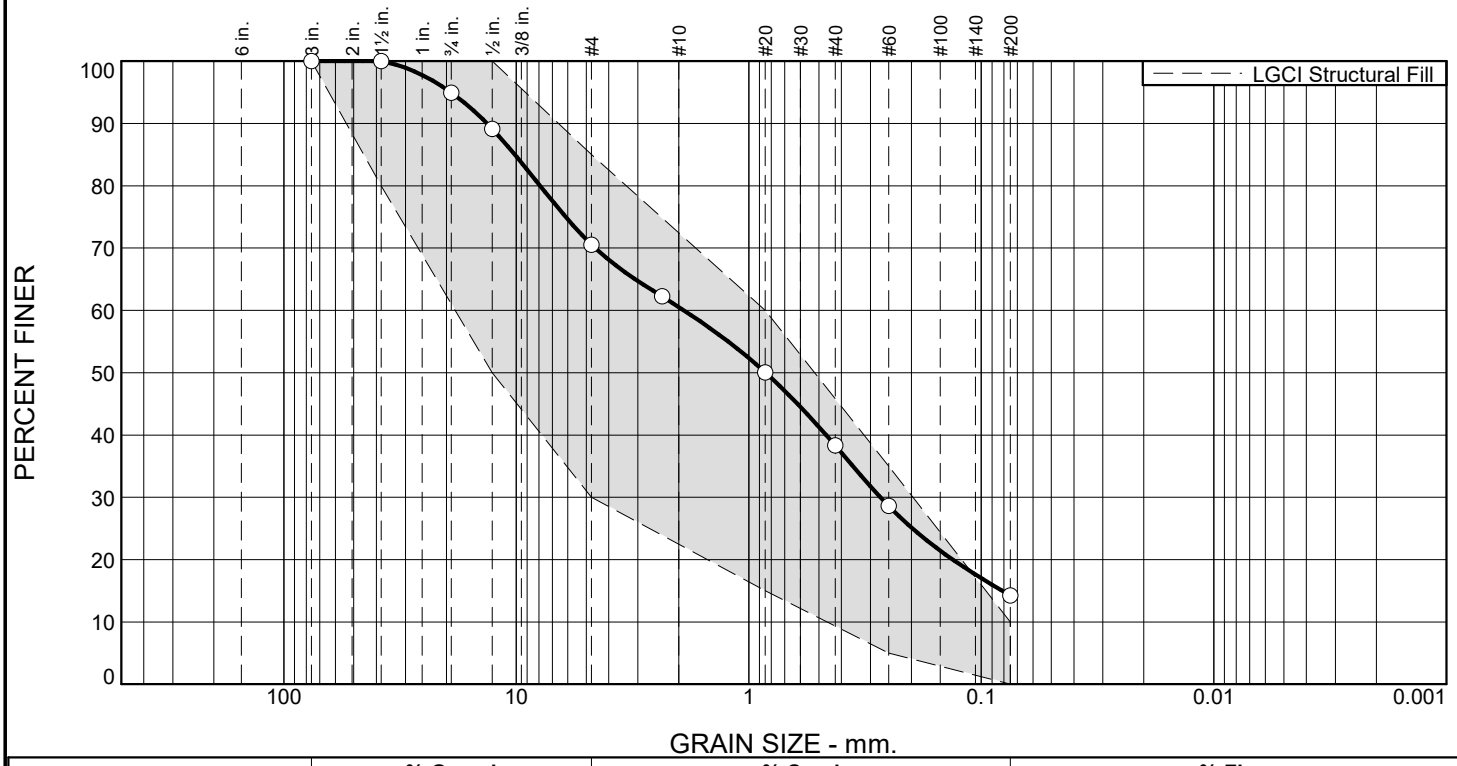
Date Sampled: 11/15/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Taco Comfort Solutions
Project: Proposed Manufacturing Building, Cranston, RI

Project No: 2252 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.0	24.4	10.1	22.2	24.1	14.2	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	95.0		
0.5"	89.2	50.0 - 100.0	
#4	70.6	30.0 - 85.0	
#8	62.3		
#20	50.1	15.0 - 60.0	
#40	38.3		
#60	28.6	5.0 - 35.0	
#200	14.2	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% mostly fine subrounded gravel, trace of organic soil, brick, asphalt, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 13.3623 D_{85}= 10.1329 D_{60}= 1.8998
D_{50}= 0.8470 D_{30}= 0.2713 D_{15}= 0.0813
D_{10}= C_u= C_c=

Remarks

Fill sample.

Date Received: 11/14/22 **Date Tested:** 11/14/22

Tested By: NP

Checked By: JPE

Location: Test Pit TP-8
Sample Number: Grab **Depth:** 0.3'-5.5'

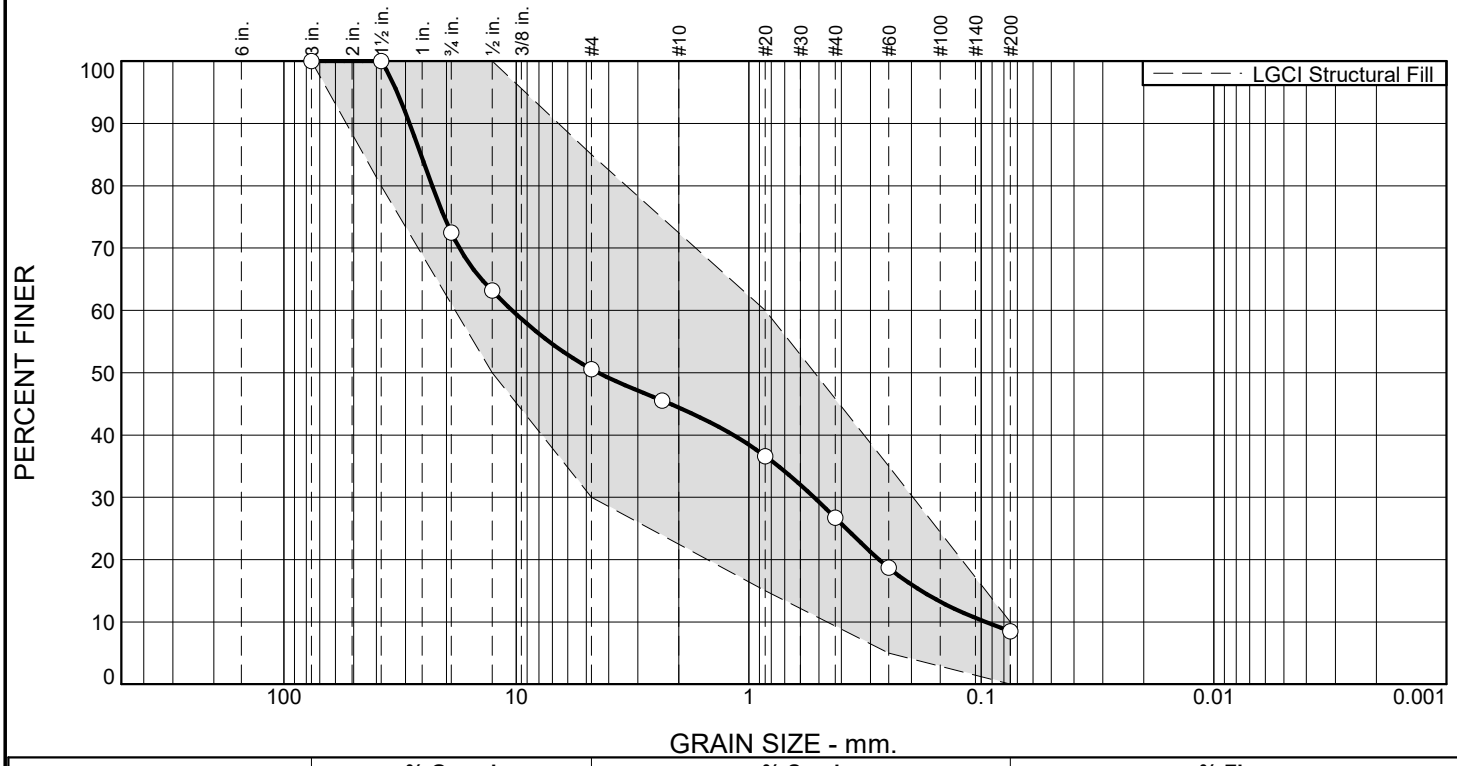
Date Sampled: 11/14/22

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Taco Comfort Solutions
Project: Proposed Manufacturing Building, Cranston, RI

Project No: 2252 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	27.5	21.9	6.2	17.7	18.2	8.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	72.5		
0.5"	63.2	50.0 - 100.0	
#4	50.6	30.0 - 85.0	
#8	45.5		
#20	36.6	15.0 - 60.0	
#40	26.7		
#60	18.7	5.0 - 35.0	
#200	8.5	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, 5-10% fines, 40-45% fine to coarse sand, trace of asphalt, brown

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= GP-GM **AASHTO (M 145)=**

Coefficients

D_{90}= 28.7736 D_{85}= 25.7266 D_{60}= 10.4090
D_{50}= 4.4422 D_{30}= 0.5247 D_{15}= 0.1815
D_{10}= 0.0960 C_u= 108.47 C_c= 0.28

Remarks

Fill sample.

Date Received: 11/14/2022 **Date Tested:** 12/7/2022

Tested By: MBH

Checked By: JPE

Location: Test Pit TP-9
Sample Number: Grab **Depth:** 0.3'-5.0'

Date Sampled: 11/14/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Taco Comfort Solutions
Project: Proposed Manufacturing Building, Cranston, RI

Project No: 2252 **Figure**

GeoTesting EXPRESS

Client:	Lahlaf Geotechnical Consulting				
Project:	Prop. Manufacturing Bldg				
Location:	Cranston, RI			Project No:	GTX-316439
Boring ID:	---	Sample Type:	---	Tested By:	ckg
Sample ID:	---	Test Date:	12/05/22	Checked By:	ank
Depth :	---	Test Id:	696832		

Moisture, Ash, and Organic Matter - ASTM D2974

Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
TP-13	Fill	0.3-5	Moist, dark brown sand with gravel	11	97.8	2.2
TP-3	Fill	0.3-4	Moist, dark brown sand with gravel	6	97.4	2.6

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 105º C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440º C