

DOCUMENT 00901
ADDENDUM NO 1

DATE: January 29, 2026

PROJECT NAME: River Bend Transit Facility Addition

This addendum forms a part of the bidding and contract documents. This Addendum supersedes and supplements all portions of the original bidding and contract documents dated Jan 20, 2026 with which it conflicts.

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED ON THE BID FORM.
FAILURE TO DO SO MAY SUBJECT THE BIDDER TO DISQUALIFICATION.

GENERAL ITEMS – ARCHITECTURAL

1. **Bid date has been changed to Thursday Feb 26th @ 2:00pm @ the same location**
2. A mandatory pre-bid meeting was held on Jan 27, 2026, at 10:00 AM in the Conference Room of River Bend Transit. A list of attendees is attached.
3. Unless confirmed in writing by Addendum no changes are binding, and no interpretations or clarifications are reliable.
4. Requests for interpretations or clarifications must be in writing to pnewman@willetthofmann.com by **Feb 20th, 2026**.
5. Final addendum will include the most current wage determination from SAM.GOV. Bidders are responsible for making sure they are using the most current wage determination for their bids.
6. BABAA clarification
 - a. USDOT does have a [de minimis and small grants waiver](#) that applies to FTA grants that were obligated after August 16, 2023:
 - i. Under the waiver, BABA's construction materials requirements and FTA's manufactured product and iron and steel standards are waived for -
 - a. The total value of the non-compliant products is no more than the lesser of \$1,000,000 or 5% of total applicable costs for the project.
 - b. "Total applicable project costs" are defined as the cost of materials (including the cost of any manufactured products) used in the project that are subject to a domestic preference requirement, including materials that are within the scope of an existing waiver
7. General Contractor will be responsible for purchasing the Builders risk insurance.
8. Testing and inspection services
 - a. General Contractor will be responsible for
 - i. Concrete compressive testing
 - ii. Soil bearing capacity, moisture content, and density testing
 - iii. Soil compaction testing
 - iv. Backfill material testing
9. See attached updated form 00420 Schedule of Bid Prices.
10. Soil borings were performed in fall of 2025 – The Geotechnical report is attached.

SPECIFICATIONS – ARCHITECTURAL

1. Division 00
 - a. Section 00 80 00 – Supplementary Conditions
 - i. 9.11.1 – Liquidated Damages – **REVISE** paragraph to read “The Contractor and the Contractor's surety, if any, shall be liable for and shall pay the Owner for any extra cost for engineering or architectural services and construction services and related expenses necessitated by the delayed prosecution of the Work by the Contractor beyond the date of **FINAL** Completion as required by the Agreement. Such costs are in no way a penalty but represent additional expenses to the Owner caused by the Contractor's delay. **FINAL Completion is listed as December 31, 2026**. This date assumes on-site work can commence by the end of March or early April.

2. Division 01
 - a. **ADD** Section 01250 – Substitution Requirements

SPECIFICATIONS – MECHANICAL

1. See attached

DRAWINGS – ARCHITECTURAL

1. Sheet A2.1 – Exterior Elevations
 - a. **REVISE** high side eave height to be +29'-6" Above existing concrete slab. This change is for all exterior elevations.
2. Sheet A2.2 – Exterior Elevations
 - a. **REVISE** high side eave height to be +29'-6" Above existing concrete slab. This change is for all exterior elevations.
3. Sheet A3.1 – Building Sections
 - a. **REVISE** high side eave height to be +29'-6" Above existing concrete slab. This change is for all building sections.
4. Sheet A3.2 – Wall Sections, Details
 - a. Detail 1 – Wall Section
 - i. **REVISE** high side eave height to be +29'-6" Above existing concrete slab.
 - ii. **CLARIFICATION** – The +12'-0" elevation is indicating that sidewall building columns are to be straight to +12'-0", then taper after that.
 - iii. **CLARIFICATION** – The top of structural fiberglass panels varies, but will not be above the straight portion of the perimeter building columns. The structural fiberglass panels will be on all exterior walls with the top of panels stepping with the slope of the slab. The top of the panels will generally be around +8'-0" AFF.

DRAWINGS – MECHANICAL

1. See attached

DRAWINGS – ELECTRICAL

1. See attached

Prepared By: **Willett Hofmann & Associates**



Paul E. Newman, AIA

Iowa License No. 05739

Registration Renewal Date: June 30, 2027

Date: January 29, 2026

Project: River Bend Transit – Bus Storage Facility

To: Paul Newman
Willett Hofmann, Inc.

Project #: BI21072

From: Michael Hessman
Bill Bruns

Project Location: Davenport, IA

Addendum Number: 1

To: All prime contract bidders and all others to whom Drawings and Specifications have been issued by the Engineer. Acknowledge receipt of the Addendum by inserting its number and date on the Bid Form. Failure to do so may subject bidder to disqualification. This Addendum forms a part of the Contract Documents. It modifies them as follows:

Specifications

Mechanical

1. 23 5533 Fuel-Fired Unit Heaters

Under paragraph I. Operating Controls,;

CHANGE paragraph to read “1. Thermostat – provide manufacturer’s remote-mounted thermostat with switching sub-base.”

Drawings

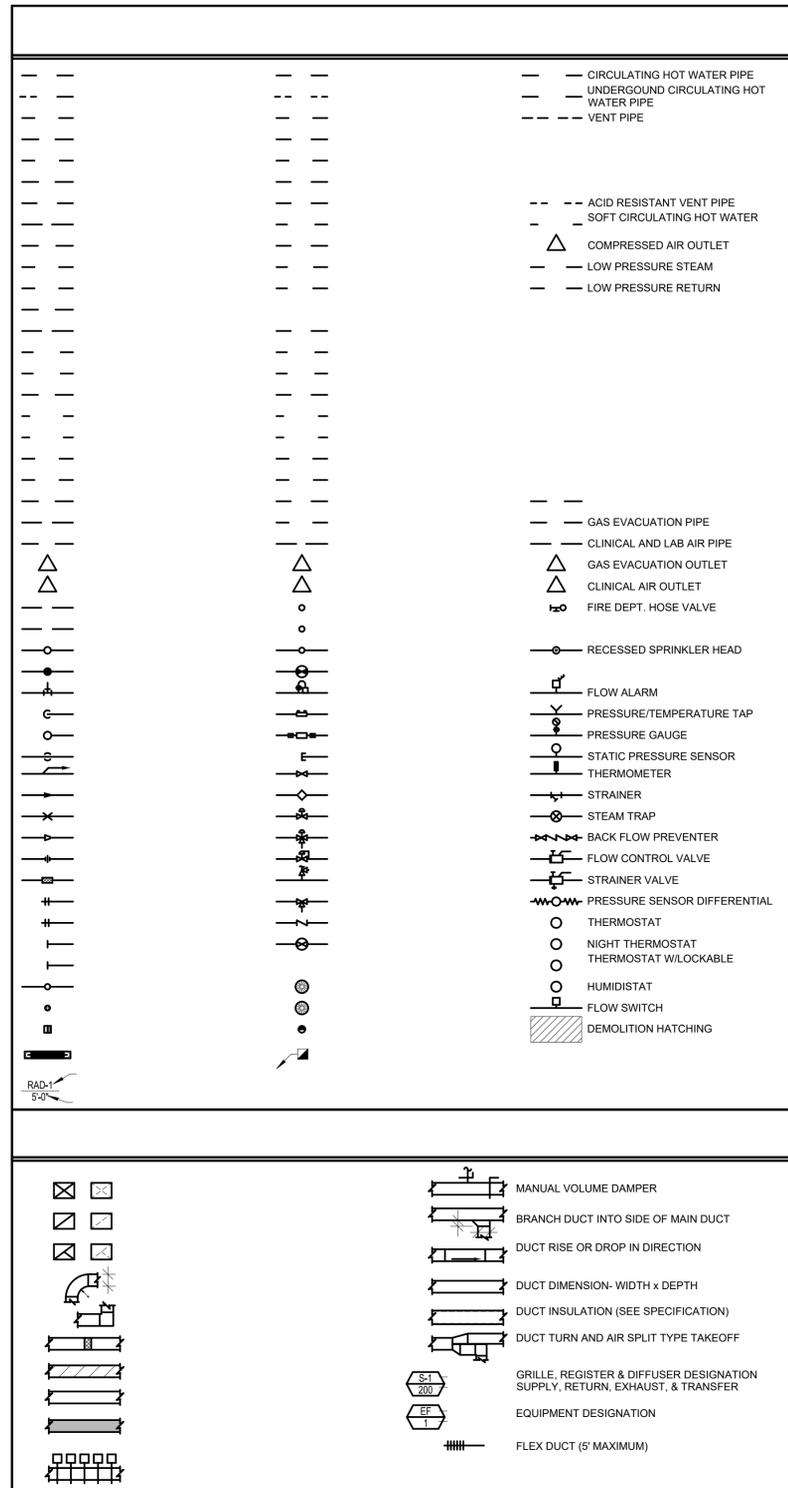
Electrical

1. Sheet E2: Electrical Schedules.
 - a. **ADD** note for Panel PV Schedule.

Mechanical

1. Sheet M3: Replace sheet in its entirety with revised sheet. Provide remote-mounted thermostat for each unit heater. Provide combination CO/NO2 sensors in lieu of separate CO and NO2 sensors.
2. Sheet M4: Replace sheet in its entirety with revised sheet. Replace Gas-Fired Unit Heater Schedule and CO and NO2 Monitoring Equipment Schedule. The CO and NO2 Monitoring Equipment manufacturer was changed to Marcurco and combination sensors.

END OF DOCUMENT – MHH, BB



PLUMBING FIXTURE SCHEDULE

FIXTURE NO	MANUFACTURER'S DESIGNATION	FIXTURE TYPE	MATERIAL	WASTE	VENT	FAUCET MFGR MODEL	MISC.	SUPPLY		NOTES
								CW	HW	
HB-1	WOODFORD 17	HOSE BIBB - 3/4" MALE HOSE THREAD NOZZLE	BRASS	-	-	-	VACUUM BREAKER	3/4"	-	1
1. PROVIDE BABAA-COMPLIANT FIXTURE WITH BABAA DOCUMENTATION.										

FAN SCHEDULE

UNIT NO	MANUFACTURER'S DESIGNATION	SERVES	LOCATION	FAN TYPE	CFM	S.P.D. (IN)	RPM	DRIVE	BHP	HP (watts)	ELEC. RPM	SONES (dBA)	NOTES	
														CO
EF-1	JENCO FAN SQB 42	CO NO2 EXHAUST	PARKING GARAGE	CENTRIF SQUARE INLINE	15,680	0.50	453	BELT	3.82	5	208/3	1750	17	1.2,3
EF-2	JENCO FAN SQB 42	CO NO2 EXHAUST	PARKING GARAGE	CENTRIF SQUARE INLINE	15,680	0.50	453	BELT	3.82	5	208/3	1750	17	1.2,3
EF-3	JENCO FAN SQB 12	EXHAUST	PARKING GARAGE	CENTRIF SQUARE INLINE	2240	0.50	1617	BELT	0.69	3/4	208/1	1750	17	1.2,3

NOTES:

- PROVIDE NON-FUSED DISCONNECT SWITCH, ENCLOSED FAN STARTER, OVERLOAD PROTECTION & PILOT LIGHT, NEMA 4 START/STOP SWITCHES, MOTORIZED DAMPERS WITH 115V LINE VOLTAGE ACTUATORS, RIS VIBRATION ISOLATORS, WALL BRACKETS FOR SIDE WALL MOUNTING.
- PROVIDE EXHAUST FANS WITH EXPOSED INLETS WITH WIRE SCREENS. PROVIDE BELT AND MOTOR SHAFT COVERS FOR EXPOSED FANS DRIVES.
- PROVIDE DUCT ACCESS DOORS, 120V MOTORIZED DAMPERS, DUCT DRAIN PORTS FOR DUCTS AT WALL LOUVERS.
- PROVIDE BABAA-COMPLIANT EQUIPMENT WITH BABAA DOCUMENTATION.

CO AND NO2 MONITORING EQUIPMENT SCHEDULE

UNIT NO	DETECTOR TYPE	DETECTION RANGE		ACCURACY		ELECTRICAL DATA		DESIGN BASIS	NOTES
		CO	NO2	CO	NO2	V/A	VOLTS PHASE		
COC-1	CONTROLLER					41	24	MARCURCO DVP-120M	1, 2, 3, 4, 5
CO / NO2-1	ELECTRO-CHEMICAL FOR CO NO2	0-200 PPM	0-20 PPM	+/- 3%	+/- 3%		24	MARCURCO CX-6-CO & NO2 COMBINATION SENSOR	1, 2, 3, 4, 5

NOTES:

- PROVIDE WITH LOW VOLTAGE TRANSFORMER, RELAYS, 24V TWISTED PAIR, REFER TO MANUFACTURER'S WIRING DIAGRAMS & SCHEMATICS FOR A COMPLETE OPERATING SYSTEM.
- DETECTOR IS POWERED BY THE CONTROLLER.
- PROVIDE ALL SENSORS AS SHOWN ON PLANS.
- PROVIDE FACTORY CERTIFIED PROGRAMMING, TEST & VERIFICATION AND CERTIFICATION. PROVIDE WRITTEN TESTING & CERTIFICATION REPORT TO AHJ.
- PROVIDE BABAA-COMPLIANT EQUIPMENT WITH BABAA DOCUMENTATION.

GAS FIRED UNIT HEATER SCHEDULE

UNIT NO	MANUFACTURER'S DESIGNATION	LOCATION	MBH		CFM	THROW	MOTOR			REMARKS	
			INPUT	OUTPUT			RPM	HP	VOLTAGE		
UH-1	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	
UH-2	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	
UH-3	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	
UH-4	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	
UH-5	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	
UH-6	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	
UH-7	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	
UH-8	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	
UH-9	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	
UH-10	MODINE PDP 200	GARAGE	200	160	2870	51	1750	1/6	5.5	115/1	

NOTES:

- PROVIDE REMOTE-MOUNTED HEATING THERMOSTAT WITH SWITCHING SUB-BASE, POWER VENTING WITH CLASS B VENTING
- PROVIDE BABAA-COMPLIANT EQUIPMENT WITH BABAA DOCUMENTATION.

SUMP PUMP SCHEDULE

UNIT NO	MANUFACTURER'S DESIGNATION	GPM	HEAD (FT) H2O	ELECTRICAL			REMARKS
				HP	VOLTAGE	PH	
P-1	LIBERTY PUMPS EPS122847 DUPLEX PUMP SYSTEM W/ MODEL LE7M2-2 2" DISCHARGE PUMPS	20	26	3/4	115	1	1.2,3,4

NOTES:

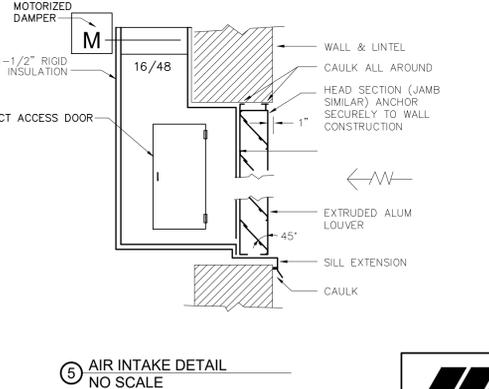
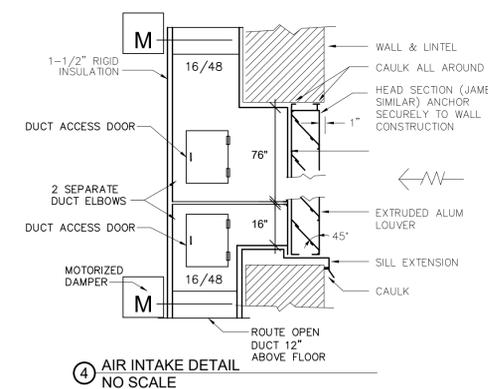
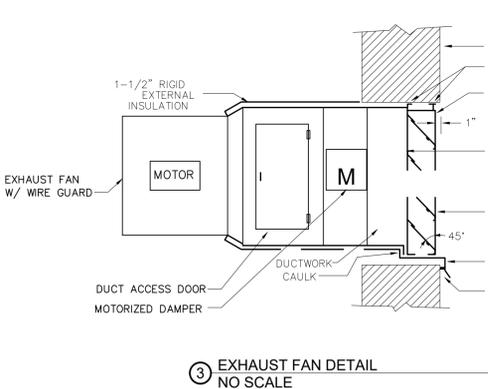
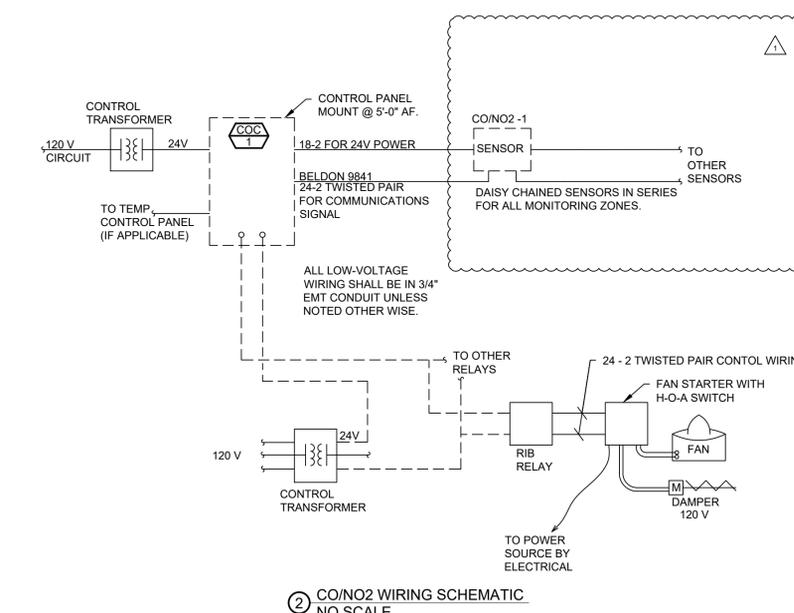
- PROVIDE PRE-PACKAGED DUPLEX SYSTEM WITH A/E24L-3 NEMA 4X DUPLEX ALTERNATING CONTROL PANEL, INCLUDE 3 FLOATS, AUX CONTACTS, INTEGRAL AUDIOVISUAL ALARM
- PROVIDE CHECK VALVES, ISOLATION VALVES, 2" DISCHARGE, 2" VENT, POWER CORD FROM PUMPS TO PANEL.
- INSTALL IN SEALED FIBERGLASS 30" DIA x 36" DEEP BASIN WITH PUMP STEEL, ACCESS COVER, HUB KIT, GUIDE RAILS, LIFTING CHAIN, ETC.
- PROVIDE BABAA-COMPLIANT EQUIPMENT WITH BABAA DOCUMENTATION.

LOUVER SCHEDULE

UNIT NO	MANUFACTURER'S DESIGNATION	FUNCTION	SERVES	SIZE W" X H"	CFM	S.P. (IN. W.G)	FREE AREA VELOCITY (FPM)	REMARKS
L-1	UNITED ENTERTECH FL-D4	OUTSIDE MAKE-UP AIR	EF-1	48 X 96	8247	0.10	730	1-4,5
L-2	UNITED ENTERTECH FL-D4	OUTSIDE MAKE-UP AIR	EF-3	48 X 96	8552	0.10	780	1-4,5
L-3	UNITED ENTERTECH FL-D4	OUTSIDE MAKE-UP AIR	EF-3	48 X 96	8552	0.10	780	1-4,5
L-4	UNITED ENTERTECH FL-D4	OUTSIDE MAKE-UP AIR	EF-2	48 X 96	8247	0.10	730	1-4,5
L-5	UNITED ENTERTECH FL-D4	EXHAUST AIR	EF-1	48 X 48	15680	0.10	1250	1-4,5
L-6	UNITED ENTERTECH FL-D4	EXHAUST AIR	EF-2	48 X 48	2240	0.10	600	1-4,5
L-7	UNITED ENTERTECH FL-D4	EXHAUST AIR	EF-3	48 X 48	15680	0.10	1250	1-4,5

NOTES:

- PROVIDE LOUVERS WITH BIRD SCREENS AND MOTORIZED DAMPERS WITH 115V ACTUATORS
- COORDINATE FRAME TYPE WITH ARCHITECTURE DETAILS AND METAL WALLS.
- ARCHITECT TO SELECT COLOR
- PROVIDE 4" DEEP ALUMINUM FIXED, DRAINABLE LOUVER WITH KYNAR FINISH
- PROVIDE DUCT ACCESS DOORS, 120V MOTORIZED DAMPERS, DUCT DRAIN PORTS FOR DUCTS AT WALL LOUVERS. SEE DETAILS.
- PROVIDE BABAA-COMPLIANT EQUIPMENT WITH BABAA DOCUMENTATION.



WPE # B21072

WPE

West Plains Engineering

215 2ND AVENUE SE, SUITE 200 • CEDAR RAPIDS, IA 52401
PHONE: (319) 365-0030 • FAX: (319) 365-4122
WWW.WESTPLAINSENGINEERING.COM
RAPID CITY, SD • SIOUX FALLS, SD • CASPER, WY • CEDAR RAPIDS, IA

RBT
River Bend Transit

Architect:

WILLET HOFMANN & ASSOCIATES INC.
ENGINEERING ARCHITECTURE LAND SURVEYING

Project:

RIVER BEND TRANSIT SERVICES
7440 VINE ST CT, DAVENPORT, IA 52806
PH: (563) 386-1350
JOB NO. 1427C21

Issue & Revision Dates	Description	Date	No.
ISSUED FOR BID		1/20/2026	1
ADDENDUM #1		1/29/2026	

Sheet Name:

MECHANICAL SCHEDULES

RIVER BEND TRANSIT

Sheet Number:

M4



Architect:



Project: RIVER BEND TRANSIT SERVICES 7440 VINE ST. CT. DAVENPORT, IA 52806 PH: (563) 386-1350 JOB NO. 1427C21

Table with 3 columns: Issue & Revision Dates, Description, Date, No. Includes rows for ISSUED FOR BID, ADDENDUM #1, and blank rows.

Table with 3 columns: Description, Date, No. Includes rows for ISSUED FOR BID, ADDENDUM #1, and blank rows.

Sheet Name: ELECTRICAL SCHEDULES RIVER BEND TRANSIT Sheet Number: E2

EQUIPMENT CONNECTION SCHEDULE table with columns: EQUIP NO., EQUIPMENT DESCRIPTION, VOLTS, PHASE, HP OR WATTS, FLA, MCA, OCPD SIZE, EQUIPMENT FEEDER, DISCONNECT AT EQUIP., NOTES. Includes rows for EXHAUST FAN, L# UNIT HEATER, and OVRD.

MOTOR STARTER SCHEDULE table with columns: UNIT NO., MOTOR HP, VOLT PHASE, STARTER TYPE, NEMA SIZE, ENCLOSURE TYPE, KEY FEATURES, DISCONNECT SIZE, NOTES. Includes rows for EF-1, EF-2, EF-3.

LIGHTING CONTROL PANEL SCHEDULE 'LCP-1' table with columns: SWITCHING SCHEME, RELAY NUMBER, CONTROL, LOAD DESCRIPTION, TOTAL WATTS, COMMENTS. Includes rows a through o.

LIGHTING CONTROL SCHEDULE table with columns: MARK, DESCRIPTION, MANUFACTURER, SIZE, NOTES. Includes rows B1, OS1, PC1.

PANEL E table with columns: CIRC NO., ITEM FED, WATTS, WIRE SIZE, CIRCUIT BREAKER, NEUTRAL, CIRCUIT BREAKER, WIRE SIZE, LOAD WATTS, ITEM FED, CIRC NO. Includes rows 1 through 53.

PANEL PV table with columns: CIRC NO., ITEM FED, WATTS, WIRE SIZE, CIRCUIT BREAKER, NEUTRAL, CIRCUIT BREAKER, WIRE SIZE, LOAD WATTS, ITEM FED, CIRC NO. Includes rows 1 through 30.

LIGHTING FIXTURE SCHEDULE table with columns: MARK, DESCRIPTION, MANUFACTURER AND SERIES, LAMPING TYPE, MOUNTING, VOLT, WATT, NOTES. Includes rows E1, EX1, H1, H1E, EW1, EW2, EW4.

DOOR ACCESS SCHEDULE table with columns: MARK, DESCRIPTION, OPERATION, NOTES. Includes rows RFD, MOT, LTS.

ALL MATERIAL SHALL MEET THE REQUIREMENTS OF THE BUILD AMERICA, BUY AMERICA ACT.

ELECTRICAL SYMBOLS section containing various symbols for LIGHTING, POWER, FIRE ALARM, TELECOM, and SECURITY AND DOOR/GATE ACCESS.

Plot Date: January 27, 2:55pm File: P:\2021\1012\1072 - E2 - ELECTRICAL SCHEDULES & DETAILS.dwg



215 2ND AVENUE SE, SUITE 200 • CEDAR RAPIDS, IA 52401 PHONE: (319) 365-0030 • FAX: (319) 365-4122 WWW.WESTPLAINSENGINEERING.COM RAPID CITY, SD • SIOUX FALLS, SD • CASPER, WY • CEDAR RAPIDS, IA

PROJECT: RIVER BEND TRANSIT FACILITY ADDITION

BIDDER: _____

The bid price on this form must be stated in words and numerals. In case of discrepancy, words will take precedence. Submit prices for all items below:

BASE BID

Furnish and install all necessary construction work in accordance with the contract documents required for the River Bend Transit Facility Addition. The work will be performed for the lump sum of:

_____ Dollars

(\$ _____)

UNIT PRICES

Furnish and install all necessary construction work in accordance with the recommendations listed in the soils report as it pertains to the removal and stabilization of the soils under the footings. Pricing to be in Cubic Yards (CY's).

_____ Dollars

(\$ _____)

SECTION 01250
SUBSTITUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance.
- B. Product options.
- C. Product substitution procedures.

1.2 QUALITY ASSURANCE

- A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.
- B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.
- C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless substitution has been accepted and approved in writing by Owner.

1.3 PRODUCT OPTIONS

- A. See Section 01 60 00 - Product Requirements.

1.4 PRODUCT SUBSTITUTION PROCEDURES

- A. Architect/Engineer will consider requests for substitutions only within 15 days after date of Owner-Contractor Agreement.
- B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.
- C. Document each request with complete data, substantiating compliance of proposed substitution with Contract Documents, including:
 - 1. Manufacturer's name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
 - 2. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
 - 3. Reference to Article and Paragraph numbers in Specification Section.
 - 4. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
 - 5. Changes required in other Work.

SECTION 01 25 00
SUBSTITUTION REQUIREMENTS

6. Availability of maintenance service and source of replacement parts as applicable.
7. Certified test data to show compliance with performance characteristics specified.
8. Samples when applicable or requested.
9. Other information as necessary to assist Architect/Engineer's evaluation.

D. A request constitutes a representation that Bidder or Contractor:

1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
2. Will provide same warranty for substitution as for specified product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Will coordinate installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
6. Will reimburse Owner and Architect/Engineer for review or redesign services associated with reapproval by authorities having jurisdiction.

E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request or when acceptance will require revision to Contract Documents.

F. Substitution Submittal Procedure:

1. Submit requests for substitutions on form attached to end of this Section.
2. Submit three copies of Request for Substitution for consideration. Limit each request to one proposed substitution.
3. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
4. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

1.5 INSTALLER SUBSTITUTION PROCEDURES

A. Architect/Engineer will consider requests for substitutions only within 15 days after date of Owner-Contractor Agreement.

B. Document each request with:

1. Installer's qualifications.
2. Installer's experience in work similar to that specified.
3. Other information as necessary to assist Architect/Engineer's evaluation.

C. Substitution Submittal Procedure:

1. Submit three copies of Request for Substitution for consideration. Limit each request to one proposed substitution.
2. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

SECTION 01 25 00
SUBSTITUTION REQUIREMENTS



**SUBSTITUTION
REQUEST**
(After the Bidding/Negotiating Phase)

Project: _____ Substitution Request Number: _____

From: _____
To: _____ Date: _____

A/E Project Number: _____
Re: _____ Contract For: _____

Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: _____ Address: _____ Phone: _____

History: New product 1-4 years old 5-10 years old More than 10 years old

Differences between proposed substitution and specified product: _____

Point-by-point comparative data attached — REQUIRED BY A/E

Reason for not providing specified item: _____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: No Yes; explain _____

Savings to Owner for accepting substitution: _____ (\$ _____).

Proposed substitution changes Contract Time: No Yes [Add] [Deduct] _____ days.

Supporting Data Attached: Drawings Product Data Samples Tests Reports _____

SECTION 01 25 00
SUBSTITUTION REQUIREMENTS

**SUBSTITUTION
REQUEST**

(After the Bidding/Negotiating Phase — Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

Attachments:

A/E's REVIEW AND RECOMMENDATION

- Approve Substitution - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures.
- Approve Substitution as noted - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures.
- Reject Substitution - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

OWNER'S REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures. Prepare Change Order.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01 33 00 Submittal Procedures. Prepare Change Order.
- Substitution rejected - Use specified materials.

Signed by: _____ Date: _____

Additional Comments: Contractor Subcontractor Supplier Manufacturer A/E

SECTION 01 25 00
SUBSTITUTION REQUIREMENTS

PART 3 - EXECUTION - Not Used

END OF SECTION 01 25 00

012500-5

Geotechnical Engineering Report

November 4, 2025

RBT Bus Storage Facility

Davenport, Iowa

TEAM Project No. 1-5764

Prepared for:

River Bend Transit

7440 Vince Street Ct

Davenport, IA 52806

Prepared by:

TEAM Services, Inc.

260-C 33rd Avenue SW

Cedar Rapids, Iowa





November 4, 2025

River Bend Transit
7440 Vince Street Ct
Davenport, IA 52806

Attn: Sherli Childers

Re: Geotechnical Exploration
RBT Bus Storage Facility
Davenport, Iowa
TEAM Project No. 1-5764

Dear Ms. Childers:

We have completed the subsurface exploration for the proposed addition to the River Bend Transit facility in Davenport, Iowa. The accompanying geotechnical report presents the findings of the subsurface exploration and recommendations concerning the geotechnical aspects of design and construction for the proposed structure.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service to you in any way, please do not hesitate to contact us.

Sincerely yours,
TEAM Services

Nicholas Gilles, P.E.
Sr. Project Engineer

	<p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p><i>Nicholas Gilles</i> 11-4-2025</p>
	<p>Nicholas M. Gilles, P.E. License Number 21385 Date: 11/4/2025 My license renewal date is December 31, 2025. Pages covered by this seal: <u> All Pages </u>.</p>

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BORING PLAN
LOG OF BORINGS 1 to 9
UNIFIED SOIL CLASSIFICATION SYSTEM
GENERAL NOTES

PROJECT INFORMATION

Project information has been provided by Ms. Sherli Childers of River Bend Transit in an email to our Mr. Chad Hale. A floor plan with proposed boring locations was also provided. The project will consist of construction of a new bus storage addition to the existing RBT facility in Davenport, Iowa. The building will be about 240 feet by 204 feet in size. We have assumed that the building will be slab-on-grade and one story. Structural loads had not been provided at the time of this report. For the purposes of our analysis, we have assumed that maximum column and wall loads will be 125 kips and 8 klf, respectively. We expect that several feet of cut and fill may be required across the site to achieve the desired final grades.

SITE CONDITIONS

The site is located at the existing RBT facility at 7440 Vine Street Court in Davenport, Iowa. Borings were performed in and around the existing parking lot on the west side of the property. The site is gently sloping downhill to the west with an overall relief of about 5 feet across our borings.

FIELD EXPLORATION

A total of 9 borings were drilled at the site to a depth of approximately 20 feet below existing grades on October 14, 2023. The boring locations were determined in the field by referencing the provided site plan and measuring from existing site features. Due to access issues, several borings were moved to the pavement from their proposed locations outside of the fenced areas. The approximate boring locations are indicated on the attached Boring Plan. The ground surface elevations at the boring locations were estimated using LiDAR elevation maps. The approximate ground surface elevations are noted on the Boring Logs. The locations and elevations of the borings should be considered accurate only to the degree implied by the means and methods used to define them.

Our drilling equipment consisted of an ATV-mounted auger drill rig. The borings were made by twisting a continuous flight hollow stem steel auger into the soil. At assigned intervals, the center bit of the auger was removed and soil samples were obtained.

Representative samples were obtained using thin-walled tube and split-barrel sampling procedures in general accordance with ASTM Specifications D 1587 and D 1586, respectively. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge is pushed hydraulically into the ground to obtain relatively undisturbed samples of cohesive or moderately cohesive soils. In the split-barrel sampling procedure, a standard 2-inch O.D. split-barrel sampling spoon is driven into the ground with a 140-pound hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the standard penetration resistance value. These values are indicated on the Boring Logs at the depths of occurrence. The samples were tagged for identification, sealed and returned to the laboratory for testing and classification.

An automatic hammer was used to perform the Standard Penetration Tests in the borings. In the automatic hammer system, the cathead and rope used traditionally in the manual test procedure is replaced with an automatic lifting mechanism for the 140-pound driving weight. The reduction in system friction with the automatic hammer system results in a significant increase in the driving energies. This results in significantly greater driving efficiencies and a corresponding decrease in the number of blows in the Standard Penetration Test results. We have taken the driving efficiency of the automatic hammer system into account when analyzing this data.

Field logs of each boring were prepared by the drill crew. These logs included visual classifications of the materials encountered during drilling, as well as the driller's interpretation of the subsurface conditions between samples. Final Boring Logs included with this report represent an interpretation of the field logs and include modifications based on laboratory observation and tests of the samples.

LABORATORY TESTING

Based on the driller's field records and examination of the samples in the laboratory, a soil testing program was developed to collect more information about the soil conditions at the site. The following is a brief description of the specific tests completed for this project.

Natural Moisture Content -- The natural moisture content of selected samples was determined in accordance with ASTM D 2216. The moisture content of the soil is the ratio, expressed as a percentage, of the weight of water in a given mass of soil to the weight of the soil particles. The results are presented on the Boring Log at the depths from which the samples were obtained.

Unit Weight -- In the laboratory, selected undisturbed samples of the site soils were measured and weighed to determine gross weight and volume of the samples. Where possible, the samples are placed in a template and trimmed at each end to fit the template. The moisture content of each specimen was then determined, and the dry unit weight was calculated. The results of these tests are also presented on the Boring Log at the appropriate sample depths.

Unconfined Compressive Strength -- A calibrated hand penetrometer was used to estimate the approximate unconfined compressive strength of selected cohesive soil samples. The calibrated hand penetrometer has been correlated with unconfined compression tests and provides a better estimate of soil consistency than visual examination alone.

As part of the testing program, the samples were classified in the laboratory based on visual observation, texture and plasticity. The descriptions of the soils indicated on the Boring Log are in accordance with the enclosed *General Notes* and the *Unified Soil Classification System*. Estimated group symbols according to the *Unified Soil Classification System* are given on the Boring Log. A brief description of this classification system is attached to this report.

SUBSURFACE CONDITIONS

Subsurface conditions encountered during this exploration are indicated on the individual Boring Logs. Based on the results of the borings, subsurface conditions on the project site can be generalized as follows.

Borings 1, 4, 5, 6, and 9 were drilled in areas of existing pavement. The pavement consisted of concrete and asphalt with thicknesses ranging from about 3 to 6 inches.

Existing fill and possible fill were encountered below the pavement in Borings 1, 4, 5, 6, and 9 and at the ground surface of the remaining borings. The fill and possible fill consisted of gravel and lean clay. The fill and possible fill extended to depths of about 3 to 12 feet below existing grades.

Buried topsoil was encountered below the fill in Borings 1 and 3. The buried topsoil consisted of lean clay and fat clay with trace amounts of organic matter. The topsoil extended to a depth of about 11 feet below existing grades in these borings.

Alluvial (water-deposited) soils were encountered below the fill and topsoil in Borings 1 through 5. The alluvium consisted of soft to stiff lean clay, lean to fat clay, fat clay, silty clay, and silt. The alluvium extended to a depth of about 17 feet below existing grade in Boring 4. Borings 1, 2, 3, and 5 were terminated in the alluvium at depths of 20 feet below existing grades.

Loess (wind-blown) deposits were encountered below the existing fill in Borings 6, 7, and 9. Loess soils have typically not experienced significant overburden pressures beyond the weight of the soil above them, below the zone of soil affected by seasonal wet/dry cycles (where some preconsolidation by desiccation has occurred). The loess is often near-normally consolidated. Loess soils more than a few feet deep often have moisture contents approaching saturation levels and are highly susceptible to disturbance. The loess soils at the site generally consisted of medium stiff to stiff lean clay. Where encountered, the loess extended to depths of about 6 to 8½ feet below existing grades.

Glacially derived soils were encountered below the loess in Borings 6, 7, and 9 and below the possible fill in Boring 8. These materials were deposited during the advance or retreat of continental glacial ice sheets which previously covered this area. The typical deposits, referred to as glacial till, consist of unsorted soil deposits with a mixture of sand, silt, and clay, with the engineering properties of the soil often being controlled by the clay fraction. The glacial till soils consisted of medium stiff to stiff sandy lean clay. Where deposits were sorted by glacial meltwater streams, they are referred to as outwash. The glacial outwash at this site consisted of medium dense sand. Borings 6 through 9 were terminated in the glacial soils at depths of 20 feet below existing grades.

Cobbles and boulders were not noted in our borings; however, it is common to encounter these materials within glacial deposits as well as seams or layers of sand. The possibility of their presence should be considered if excavations or grading operations at this site advance into the glacial soils.

The above descriptions provide a general summary of the subsurface conditions encountered. The attached Boring Logs contain detailed information recorded at the boring locations. The Boring Logs represent our interpretation of the field logs based on engineering examination of the field samples. The lines designating the interfaces between various strata represent approximate boundaries and the transition between strata may be gradual. Where strata changes occur between sample depths, the strata change elevation is typically estimated based on interpolation and is approximate.

GROUNDWATER CONDITIONS

The borings were monitored while drilling and shortly after the completion of drilling operations for the presence and level of groundwater accumulation. Groundwater levels if observed in the borings are noted on the Boring Logs.

During and shortly following drilling operations, groundwater seepage was observed at depths of about 5 to 19½ feet below existing grades. These groundwater level observations provide an

approximate indication of the groundwater conditions existing on this site at the time of drilling operations. Longer-term observations may be necessary for a groundwater level to develop and stabilize in the borehole. Monitoring in cased holes or piezometers would be required for a more accurate evaluation of the groundwater conditions at this site.

Fluctuation of groundwater levels can occur due to seasonal variations in the amount of rainfall, runoff, surface drainage, subsurface drainage, site topography, irrigation practices, ground cover (pavement or vegetation), and other factors not evident at the time the borings were conducted. Generally, the highest groundwater levels occur in the late winter and spring time while the lowest groundwater levels occur in the late summer and fall time. The fluctuation of the groundwater levels should be considered when developing the design and construction plans for this project.

CONCLUSIONS AND RECOMMENDATIONS

Existing Fill and Topsoil Considerations

Existing fill and possible fill were encountered below the pavement in Borings 1, 4, 5, 6, and 9 and at the ground surface of the remaining borings. The fill and possible fill consisted of gravel and lean clay. The fill and possible fill extended to depths of about 3 to 12 feet below existing grades. Based on visual examination of the samples and penetration test results in the borings, it appears that the fill is moderately to well-compacted at our boring locations and generally suitable to support the proposed structure.

It should be noted that man-made fills have an inherently high risk of variability and careful construction inspection will be necessary to assure adequate support performance. In areas where fill is encountered, we recommend that additional testing be conducted at the time of construction to further explore the suitability of the existing fill when more of these materials are exposed in excavations. Foundations, floor slabs, and pavements may be placed on existing fill where testing confirms suitability. If unsuitable soils are encountered, these soils should be removed and replaced with engineered compacted and tested fill. It should be noted that the most conservative

approach in dealing with unknowns within the existing fill would be to completely remove the fill and replace it with engineered compacted and tested fill.

Buried topsoil was encountered below the fill in Borings 1 and 3. The buried topsoil consisted of lean clay and fat clay with trace amounts of organic matter. The topsoil extended to a depth of about 11 feet below existing grades in these borings. Depending on the organic content and density, topsoil may not be suitable for direct support of structures. Based on the samples obtained from our borings, the topsoil appears to be suitable to remain in place below the structures but careful inspection during construction will be required to identify any unsuitable materials present directly below the foundations.

Contract allowances should be made for some remedial work at the site related to subgrade preparation and foundation construction. This may include overexcavation and backfilling of unsuitable soils encountered at subgrade elevation or in the foundation excavations in accordance with the recommendations of this report or lowering of the foundations to suitable bearing materials. The amount of such work cannot be defined at this time; therefore, the owner should be informed of these cost variables.

Site Preparation

Site preparation should begin with removal of any pavement, structures, or utilities that will not remain in service. Site preparation should continue with the removal of any organic-laden soils, vegetation and any loose, soft or otherwise unsuitable materials. Unsuitable existing fill should be removed at this time, if encountered.

After striping and removal, the exposed grade in both cut and fill areas should be proofrolled and inspected by TEAM Services personnel. Proofrolling should be performed at the lowest cut grade, prior to any fill placement. Proofrolling should be conducted with a fully loaded tandem axle dump truck having a minimum gross weight of 25 tons. Where proofrolling is not possible due to poor access or excessive disturbance to existing soils, these soils should be probed and visually inspected by TEAM Services to determine the suitability of the subgrade. Any unsuitable soils identified during this process should be removed and replaced with suitable engineered compacted

and tested fill which meets Class 1 Construction Application requirement in Table A in the following **Fill Placement** report section.

It should be noted that initial subgrade preparation for the cohesive soils at this site may not be suitable under repeated heavy construction vehicle loads and may require stabilization to greater depths or stabilization with fly ash, cement or lime. The use of crushed rock with or without geogrid could also be considered in-lieu of the additional stabilization methods. Contract allowances should be made for some remedial work at the site related to subgrade preparation. The amount of such work cannot be defined at this time; therefore, the owner should be informed of these cost variables.

Fill Placement

Fill and backfill placed for support of the proposed structure should consist of approved materials which are free of organic matter and debris. Brick, concrete, rocks or other solid pieces with a maximum dimension of 3 inches or larger should not be placed in the newly placed fill sections. We recommend that low-plasticity cohesive soil or granular soil be used for general fill placement. By our definition, low-plasticity cohesive soil would have a liquid limit of 45 or less and a plasticity index of 25 or less. In our opinion, most of the surface soils at this site appear to meet these criteria and can be reused as newly placed engineered compacted and tested fill. Any off site potential borrow materials should be evaluated by TEAM Services prior to their use as engineered compacted fill.

The following Table A lists recommended minimum compaction requirements for cohesive and cohesionless fill materials for specific applications. For low-plasticity (CL and ML) cohesive soils, moisture contents within a range of -2 to +3 percent of the material's optimum moisture content (as determined by Standard Proctor ASTM D 698) are necessary to achieve the desired fill qualities for general grading and utility backfill. Granular materials should be placed within 3 percent of the material's optimum moisture content if the material contains enough fines content that suitable compaction is sensitive to moisture content. Clean granular materials are not moisture sensitive.

TABLE A
RECOMMENDED DEGREE OF COMPACTION GUIDELINES

Construction Application		Standard Proctor (ASTM D698) Cohesive Soil	Standard Proctor (ASTM D698) Cohesionless Soil ²	Relative Density (ASTM D4253 & D4254) Cohesionless Soil ^{1,2}
Class 1	Subgrade preparation for structures, pavements and other critical backfill areas	95%	98%	75%
Class 2	Backfill adjacent to structures not supporting other structures or pavements. Minor subsidence possible.	90%	93%	45%
Class 3	Backfill in non-critical areas. Moderate subsidence possible.	85%	88%	20%

1. Use Relative Density technique (ASTM D4253 & D4254) where Standard Proctor technique (ASTM D698) does not result in a definable maximum dry density and optimum moisture content.
2. Clean gravel should be inspected visually during compaction by a qualified engineering technician to confirm adequate compactive effort and appropriate lift thicknesses in lieu of density testing.

The on-site soils can be excavated utilizing conventional excavation equipment. Granular soils can generally be suitably compacted with vibratory compaction equipment. Proper compaction of cohesive soils can be achieved with sheepsfoot or pneumatic type compactors within the above moisture content ranges. The soils should be placed in a maximum loose thickness of 12 inches and at a thickness compatible with the equipment being utilized. Sufficient density tests should be performed on each lift of engineered compacted fill placed to verify that adequate compaction is achieved.

Care should be taken to prevent unnecessary disturbance of subgrade soils. The cohesive soils at this site are susceptible to disturbance when moist. Disturbed areas should be removed and replaced with engineered fill placed and compacted in accordance with the recommendations of this report. In order to minimize disturbance of these soils, measures should be taken to control groundwater infiltration in accordance with the **Construction Dewatering** section of this report. A layer of crushed rock may be placed to provide a working surface where excavations extend into soils that are susceptible to disturbance.

Upon completion of the filling operation, care should be taken to maintain the subgrade moisture content prior to construction of foundations or slabs if these elements are to be placed on or near cohesive soils. If the subgrade should become desiccated, frozen or otherwise disturbed, the affected material should be removed or these materials should be scarified, moistened, recompacted and retested prior to concrete or asphalt placement. As a general guideline, cohesive fills which dry to a moisture content less than 2/3 of their optimum moisture content as determined by the Standard Proctor Test (ASTM D 698) in their upper 2 inches are candidates for reconditioning as described above.

Shallow Foundation Design

It appears that foundations for the proposed building will bear on the existing fill, natural soils, or on newly placed engineered fill required to replace unsuitable soils or to achieve the desired final grades. In our opinion, foundations bearing on existing fill and topsoil that is verified as suitable in the field, medium stiff to stiff natural soils, and newly placed engineered compacted and tested fill extending to suitable soils may be designed for a maximum net allowable bearing pressure of 1,500 pounds per square foot.

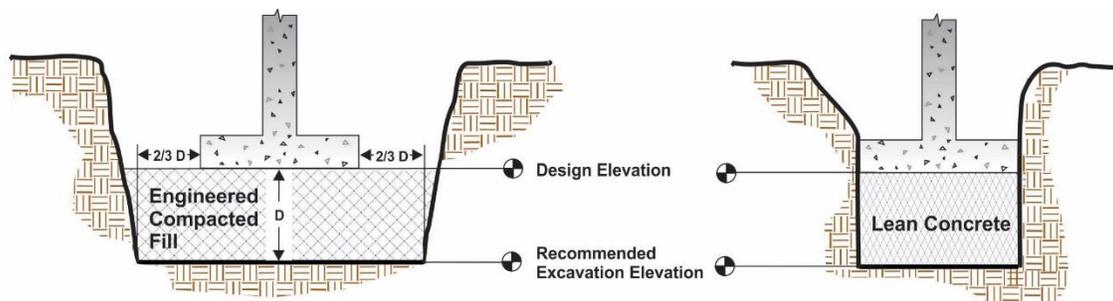
The net bearing pressure is the pressure in excess of the minimum adjacent overburden pressure at the foundation level. The bearing capacities discussed in the previous sections may be increased by 33% when considering transient forces such as wind. We estimate maximum settlements, due to the assumed structural loads, will be less than 1 inch and differential settlement may be on the order of 2/3 of the total settlement.

Continuous foundations should be adequately reinforced to limit deflections caused by non-uniform soil support characteristics. All perimeter foundations and foundations in unheated areas should extend at least 42 inches below the lowest adjacent finished grade for frost protection and reduce movements associated with changes in soil moisture content. Interior footings located in permanently frost-free environments should have at least 18 inches of protective embedment below lowest adjacent finished grade. We recommend that isolated spread footings should have a minimum width of 24 inches, continuous formed footings a minimum width of 16 inches and trench footings a minimum width of 12 inches.

Shallow Foundation Construction

We recommend that the base of all foundations and excavations beneath structural areas be observed and tested by the geotechnical engineer prior to fill placement and/or placement of concrete. Where loose, soft, organic, or otherwise unsuitable materials are encountered, these unsuitable materials should be removed and replaced with suitable engineered compacted fill soils prepared in accordance with the recommendations in Table A in the **Fill Placement** section of this report. The following Figure 1 shows a typical cross sectional view of this over-excavation and backfill procedure.

In general, the over-excavation is widened $\frac{2}{3}$ of a foot laterally on each side of the foundation per each foot of excavation that is below the foundation bearing elevation. The depth of over-excavation (shown as “D” in Figure 1) should be determined in consultation with the geotechnical engineer. Backfill materials should be suitable cohesive or granular soil, prepared and compacted in accordance with the recommendations in Table A in the **Fill Placement** section of this report. Another option would be to remove the unsuitable soils down to suitable soils and replace the excavated area with lean concrete (minimum 50 psi compressive strength), in which case widening of the excavation would not be required.



Overexcavation / Backfill

NOTE: Excavations should be sloped as necessary for safety.

Figure 1.

Footing excavations should be kept free of water accumulation to prevent softening of subgrade materials and conducted in a manner which avoids disturbance of soils beneath existing foundations. The cohesive soils at this site are susceptible to disturbance when wet. Any disturbed soils may require additional removal or compaction prior to concrete or backfill placement.

Concrete should be placed as soon as possible after providing an approved bearing grade to minimize bearing soil disturbance. Should the soils at bearing level become excessively dry, saturated, or otherwise disturbed, the affected soil should be removed prior to placing concrete.

Floor Slabs

Interior floor slabs can be adequately supported on a subgrade prepared in accordance with the **Existing Fill Considerations, Site Preparation, and Fill Placement** sections of this report.

During building construction, the surface of the completed building pad may have been disturbed by construction equipment. Therefore, it is recommended that the building areas be proofrolled or probed and tested where proofrolling cannot be conducted to delineate zones of soft soils present near the surface which may require additional removal or compaction prior to construction of the floor slab. If the exposed subgrade has been disturbed since the original subgrade preparation, the subgrade should be scarified to a minimum depth of 9 inches, moisture conditioned (if needed), and recompacted to meet or exceed the Class 1 Construction Application requirement given in Table A in the **Fill Placement** section. It should be noted that initial subgrade preparation for some soil types may not be suitable under repeated heavy construction vehicle loads and may require stabilization to greater depths or stabilization with fly ash, cement or lime. The use of crushed rock with or without geogrid could also be considered in-lieu of the additional stabilization methods.

To avoid localized slab failures, it is important that interior backfill around foundations and in plumbing trenches be properly compacted. Therefore, all fill materials placed beneath the proposed floor slab are to meet or exceed the Class 1 Construction Application requirement given in Table A.

A continuous wire mesh reinforcement or a regular rebar schedule may be considered for the floor slab. Crack control joints should be sawn with a regular spacing not greater than about 10 to 12 feet depending on the thickness of the slab. Isolation joints should be considered between the floor slabs and perimeter or interior foundations so that they can move independently without damage. These measures are taken with the intent of allowing the floor slab to deflect somewhat without

experiencing large differential movements across slab joints and to channel the cracking of the floor slabs to the crack control joints so that they are not perceived as structure distress.

In order to allow successful use of a variety of floor systems, measures to control vapor transmission through the floor slab are recommended where moisture sensitive floor coverings are a possibility. This would include use of a vapor barrier/retarder with a minimum thickness of 10 mils placed between the slab and an underlying capillary break material. The vapor barrier/retarder should be strong enough to resist puncturing by the capillary break materials.

We recommend that the capillary break consist of clean manufactured sand or crushed limestone (drainable material). The capillary break should be at least 4 inches thick and contain less than 6 percent material finer than the U.S. No. 200 sieve. Floor slabs which are protection from frost action may be designed with a modulus of subgrade reaction of 150 pci when subgrade soils, subbase, and capillary breaks are constructed in accordance with the recommendations of this report.

Lateral Earth Pressures

Any below-grade walls or retaining walls must be capable of resisting the lateral earth pressures due to the unbalanced soil heights. Therefore, the walls should be designed to accommodate these unbalanced lateral soil pressures. The following Table B lists the estimated lateral earth pressures for cohesive and cohesionless (granular) backfill.

Cohesionless (granular) backfill lateral earth pressure parameters may be used where granular backfill is installed behind the subsurface wall in accordance with Figure No. 2 enclosed in the Appendix. The granular backfill should have a minimum width of 2 feet and be wide enough to accommodate the back slope limit line of 1:2 (horizontal to vertical) or flatter. The area between the required minimum zone of granular material and the actual limits of excavation may be backfilled with either cohesive or granular soils. The granular material should be a free draining material (less than 3 percent passing the No. 200 sieve) and hydraulically connected to a suitable drainage system. An acceptable drainage system may be constructed using perforated rigid pipe encased in coarse clean granular material graded such to prevent the intrusion of fines or an

alternative free draining granular material encapsulated with a suitable filter fabric. The drain lines should be sloped to provide positive gravity drainage to a suitable outlet such as a sump pump, a storm drain, or frost-free outfall if sufficient topographic relief is available at the site. If wall drains are not provided, then the design groundwater elevation should be considered equal to the ground surface.

TABLE B
ESTIMATED LATERAL EARTH PRESSURE PARAMETERS ¹

	Cohesive Soil (non-expansive)	Cohesionless Soil (granular or sand)
Approximate Total Density	130 pcf	120 pcf
Approximate Friction Angle	15° - 20°	30° - 35°
Active Pressure Coefficient, K_a	0.5	0.3
At-Rest Pressure Coefficient, K_o	0.7	0.5
Passive Pressure Coefficient, K_p	2	3.3
Coefficient of Friction for Sliding at base of Concrete Footing	0.3	0.6
Active Earth Pressures – Design Equivalent Fluid Pressures – No Factor of Safety		
Drained	65 pcf	35 pcf
Undrained ²	95 pcf	80 pcf
At-Rest Earth Pressures – Design Equivalent Fluid Pressures – No Factor of Safety		
Drained	90 pcf	60 pcf
Undrained ²	110 pcf	90 pcf
Passive Earth Pressures ⁴ – Design Equivalent Fluid Pressures		
Drained	130 pcf	200 pcf
Undrained ³	70 pcf	100 pcf

1. Assumes negligible wall friction, a vertical wall, level backfill, and zero surcharge loads. Excludes cohesion shear strength and sliding friction effects.
2. Combined factored buoyant backfill unit weight and hydrostatic water head (62.4 pcf).
3. Excludes hydrostatic loading (62.4 pcf).
4. Passive pressure to be ignored in the upper 2 feet of finished grades due to frost and desiccation effects. Factor of safety 2.0 has been applied to limit the amount of lateral deformation required to mobilize the passive resistance.

If the top of the wall is able to deflect approximately 0.2% to 0.4% of the wall height, then active earth pressures can develop with granular backfill. However, if the wall is rigidly fixed or otherwise restricted from deflecting, then at-rest pressure parameters should be used for design.

Lateral pressure arising from surcharge loads, sloped backfill loads and earthquake loads should be added to the above values to determine the total lateral earth pressures. In addition, transient loads imposed on the walls by construction equipment during backfilling should be taken into consideration during design and construction. Excessively heavy grading equipment (that could impose temporary excessive pressures or long-term excessive residual pressures against the constructed walls) should not be allowed within about 5 feet horizontally of the walls. Increased earth pressures can also develop from restricted soil drainage and compaction of the adjacent backfill.

Temporary Excavation Support

All excavations should also comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P, "Excavations and Trenches" and other applicable codes. This document states that excavation safety is the responsibility of the contractor. Reference to this OSHA requirement should be included in the job specifications.

Construction Groundwater Control

During construction activities, care should be taken to maintain positive drainage at the site to ensure that drainage is directed away from excavations. Based on the boring information, it appears possible that groundwater seepage may be encountered in deeper excavations at this site. When construction is performed during wet weather periods or where groundwater is anticipated to be high during construction, we recommend that construction groundwater control be established prior to excavating the final 2 feet of soil above the final desired final elevation. Groundwater seepage in granular soils may be controlled with a system of well points. Groundwater seepage in cohesive soils can be controlled by permitting it to drain into temporary construction sumps and be pumped outside the perimeter of the excavations.

The cohesive soils at this site can be susceptible to disturbance, especially when moist. During times of wet weather or groundwater seepage, the contractor may consider placing a lift of at least 6 inches of clean, crushed concrete or limestone gravel in excavations to provide a firm working surface for constructing foundations and floor slabs. The clean gravel can be well compacted in the

presence of water, will drive through and reinforce any surface materials which have become disturbed by water exposure, and can accumulate water seepage to flow to a peripheral sump pit to be pumped out of the excavation area.

If groundwater control is lost during construction, disturbance of the upper few inches to few feet below grade is possible in the soils at the site. In these circumstances, it will be necessary to reestablish groundwater control and remove the disturbed soils. TEAM Services should be consulted regarding the extent of remedial action which is necessary.

Site Drainage

Positive site drainage should be maintained along the perimeter of the structure. Final grades should be established to direct runoff away from structure foundations. Down spouts, gutters, and roof drains should discharge away from structure perimeters. Site grading should direct surface water away from excavations or completed foundations during construction and after site development is completed.

QUALIFICATION OF REPORT

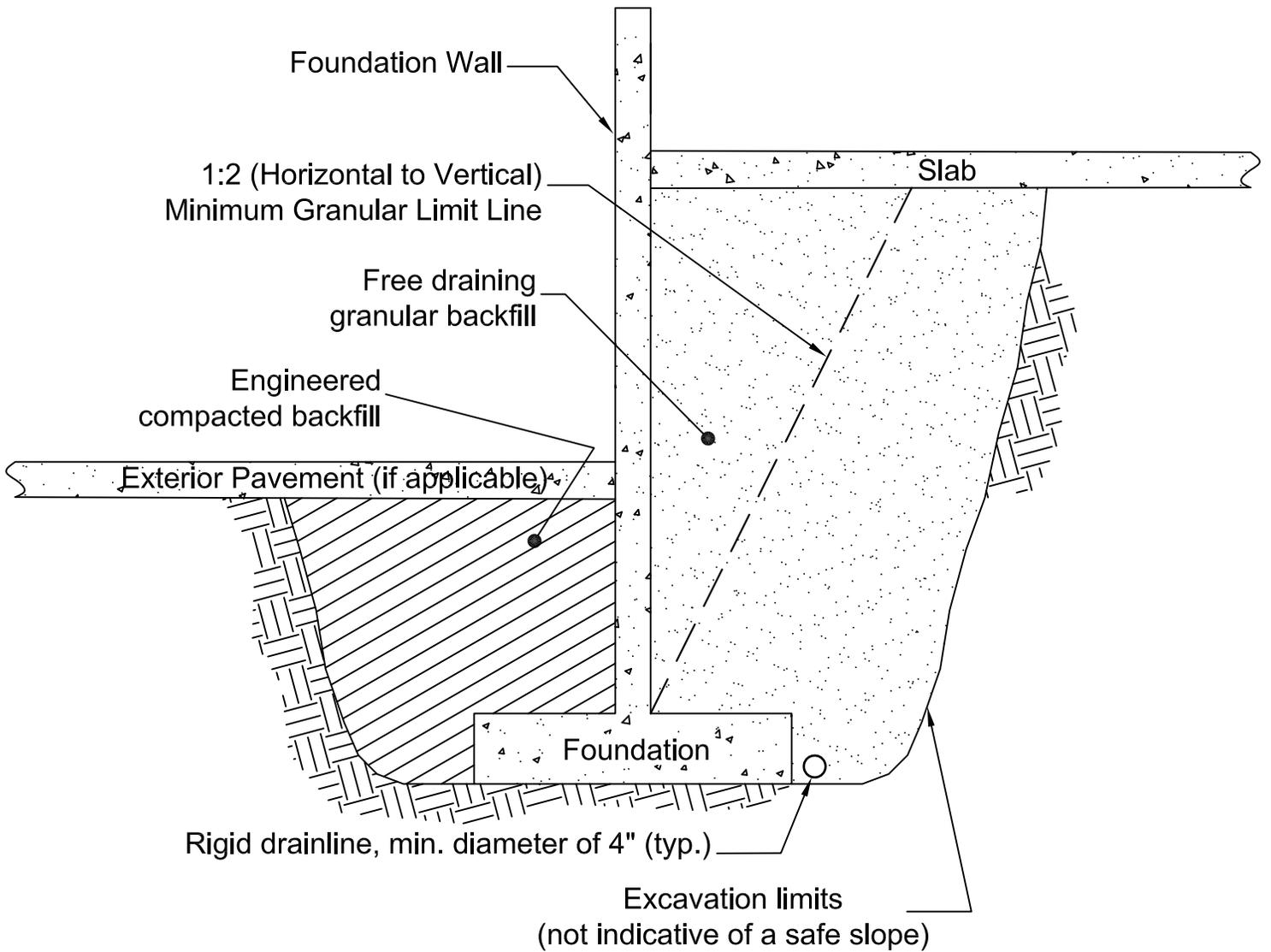
Our evaluation of foundation support conditions has been based on our understanding of the site and project information and the data obtained in our exploration. The general subsurface conditions utilized in our foundation evaluation have been based on interpolation of subsurface data between the borings. In evaluating the boring data, we have examined previous correlations between soil properties and foundation bearing pressures observed in soil conditions similar to those at your site. The discovery of any site or subsurface conditions during construction which deviate from the data outlined in this exploration should be reported to us for our evaluation. The assessment of slope stability, site environmental conditions, or the presence of pollutants in the soil, rock, and groundwater of the site was beyond the scope of this exploration.

Support of structures on existing fill is discussed in this report. Existing fills are potentially much more inconsistent than natural soil deposits. Support of structures upon existing fills carries with

it a degree of risk that unsuitable materials may be buried within the fill and not be detected in the inspection and testing program recommended herein. Unsuitable materials in the fill may experience settlement and cause distress to structures supported on the fill. Elimination of this risk requires removal of the fill or supporting structures on suitable foundations such that the fill would not adversely affect the structures.

It is recommended that the geotechnical engineer be retained to review the plans and specifications so that comments can be provided regarding the interpretation and implementation of the geotechnical recommendations in the design and specifications. It is further recommended that the geotechnical engineer be retained for testing and observation during the foundation construction phase to help determine that the design requirements are fulfilled.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranty is provided. In the event that any changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing by the geotechnical engineer.

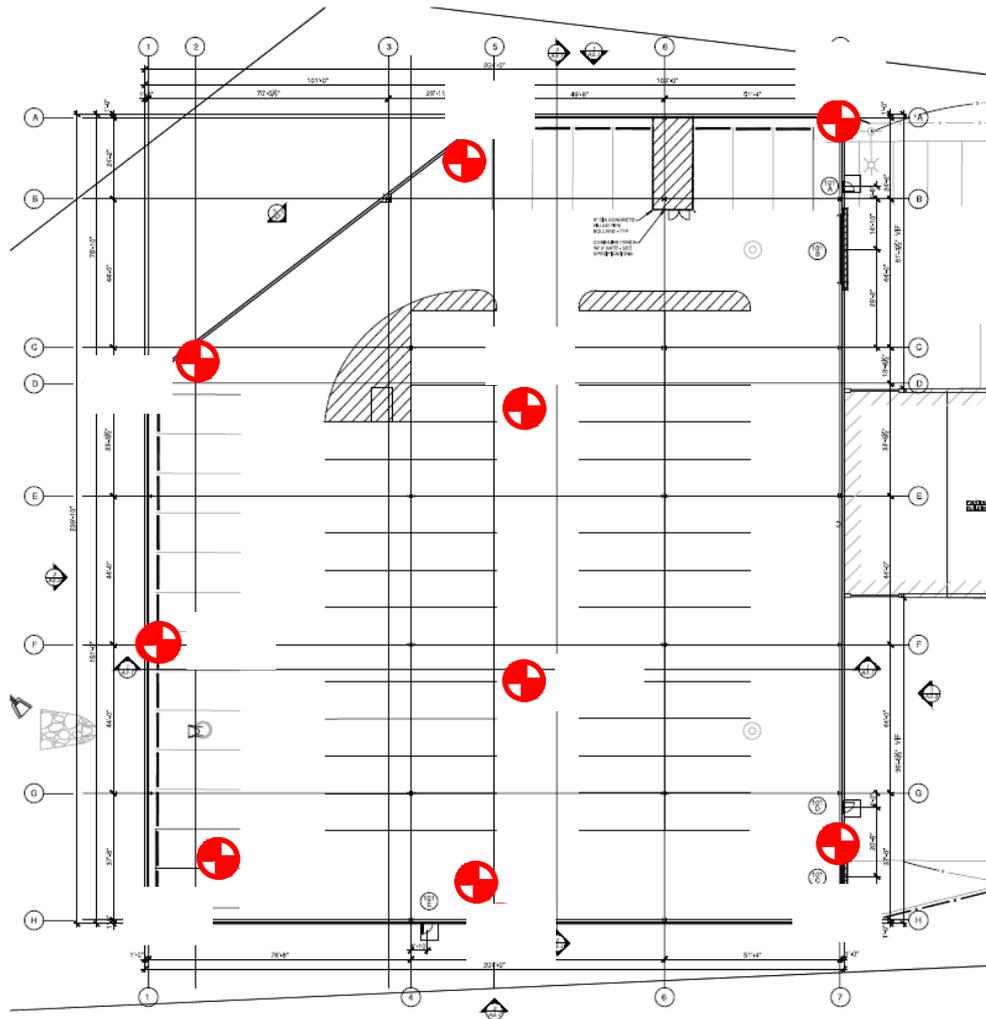


Grade Separation Wall Section

TEAM Services
 717 SE 6th Street
 Des Moines, IA 50309

**Shallow Foundation
 Stem Wall**

Figure No. 2



Not To Scale

Approximate boring location

N

TEAM Services, Inc.

717 SE 6th Street
Des Moines, IA 50309

RBT Bus Storage Facility

Davenport, IA

Boring Plan

Project No. 1-5764

November 4, 2025

BORING LOG No. 1

PROJECT RBT Bus Storage Facility	SITE Davenport, IA
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GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	DEPTH (ft.)	SAMPLES				TESTS			
				NUMBER	TYPE	RECOVERY	SPT - N (BLOWS / FT.)	MOISTURE, %	DRY DENSITY (PCF)	UNCONFINED STRENGTH (PSF)	OTHER
	0.5 Pavement -- Asphalt 6"		0								
	Fill -- Lean CLAY, dark olive gray and dark brown	CL		1	SS	18	7	21.3			
			4	2	SS	16	7	19.4			
	- With sand and color changes to dark grayish brown at about 6'										
	8.0 Buried topsoil -- Lean CLAY, trace organic matter, very dark gray, medium stiff	CL	8	3	SS	18	8	18.2			
				4	SS	18	5	33.3			
	11.0 Alluvium -- Lean to fat CLAY, dark gray, medium stiff	CL-CH	12								
				5	SS	18	3	29.9			
	17.0 Alluvium -- Silty CLAY, gray, medium stiff	CL-ML	16								
				6	SS	18	4	26			
	20.0 Bottom of boring		20								

Notes: * Calibrated hand penetrometer
Hammer Type: Manual

Water Level: None Ft. While Drilling 14' Ft. After Drilling Ft.	 Geotechnical and Construction Material Consultants	Boring Started: 10-14-2025 Boring Completed: 10-14-2025 Rig: TRK Foreman: JH Approved: NG Job #: 1-5764
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1-5764.gco TSBORER16.tbl 4/25/2017

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

BORING LOG No. 2

PROJECT RBT Bus Storage Facility	SITE Davenport, IA
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GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	DEPTH (ft.)	SAMPLES				TESTS			
				NUMBER	TYPE	RECOVERY	SPT - N (BLOWS / FT.)	MOISTURE, %	DRY DENSITY (PCF)	UNCONFINED STRENGTH (PSF)	OTHER
0.5	Fill -- GRAVEL	GP	0								
	Fill -- Lean CLAY, trace sand, very dark brown and dark grayish brown - Color changes to grayish brown at about 6' - Trace gravel at about 8'	CL		1	SS	18	6	18.5			
				2	SS	18	6	22.1			
				3	SS	18	10	14.9			
				4	SS	18	3	15.1			
	12.0	Alluvium -- Lean CLAY, trace organic matter, very dark gray, soft to medium stiff	CL	12							
17.0	Alluvium -- SILT, gray, medium stiff	ML		5	SS	5	2	37.7			
				6	SS	17	6	21.4			
20.0	Bottom of boring		20								

Notes: * Calibrated hand penetrometer
Hammer Type: Manual

Water Level: None Ft. While Drilling 16' Ft. After Drilling Ft.	 <small>Geotechnical and Construction Material Consultants</small>	Boring Started: 10-14-2025 Boring Completed: 10-14-2025 Rig: TRK Foreman: JH Approved: NG Job #: 1-5764
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1-5764.gco TSBORER16.tbl 4/25/2017

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

BORING LOG No. 3

PROJECT RBT Bus Storage Facility	SITE Davenport, IA
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GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	DEPTH (ft.)	SAMPLES				TESTS		
				NUMBER	TYPE	RECOVERY	SPT - N (BLOWS / FT.)	MOISTURE, %	DRY DENSITY (PCF)	UNCONFINED STRENGTH (PSF)
1.0	Fill -- GRAVEL 707.5	GP	0							
8.0	Fill -- Lean CLAY, trace sand and gravel, very dark brown and dark grayish brown 700.5	CL	4	1	SS	5	4	20.3		
8.0	Buried topsoil -- Fat CLAY, trace organic matter, very dark brown, medium stiff 700.5	CH	8	2	SS	18	6	20		
11.0	Alluvium -- Fat CLAY, gray, medium stiff 697.5	CH	12	3	SS	18	5	31.3		
17.0	Alluvium -- Fat CLAY, gray, medium stiff 691.5	CH	16	4	SS	18	3	33		
20.0	Alluvium -- SILT, dark gray, medium stiff 688.5	ML	20	5	SS	18	6	24.5		
	Bottom of boring 688.5		20							

Notes: * Calibrated hand penetrometer
Hammer Type: Manual

Water Level:		
▽	18'	Ft. While Drilling
▽	15'	Ft. After Drilling
▽	12'	Ft. 1 HR



Boring Started: 10-14-2025	
Boring Completed: 10-14-2025	
Rig: TRK	Foreman: JH
Approved: NG	Job #: 1-5764

1-5764.gco TSBORER16.tbl 4/25/2017

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

BORING LOG No. 4

PROJECT RBT Bus Storage Facility	SITE Davenport, IA
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GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	DEPTH (ft.)	SAMPLES				TESTS		
				NUMBER	TYPE	RECOVERY	SPT - N (BLOWS / FT.)	MOISTURE, %	DRY DENSITY (PCF)	UNCONFINED STRENGTH (PSF)
0.5	Pavement -- Concrete 6"	709.5	0							
0.8	Fill -- GRAVEL	709.3								
	Fill -- Lean CLAY, very dark brown and dark grayish brown	CL								
			1	SS	15	8	21.1			
			4							
			2	SS	16	10	21.8			
6.0	Alluvium -- Lean to fat CLAY, very dark grayish brown, medium stiff	704.0								
	- Color changes to grayish brown at about 8.5'									
			3	SS	12	4	35.9			
			8							
			4	SS	16	5	25.8			
12.0	Alluvium -- Sandy SILT, grayish brown, medium stiff	698.0	12							
			5	SS	18	4	22			
17.0	Glacial till -- Sandy lean CLAY, trace gravel, grayish brown, stiff	693.0								
			6	SS	18	9	12.7			
20.0	Bottom of boring	690.0	20							

Notes: * Calibrated hand penetrometer
Hammer Type: Manual

Water Level: None Ft. While Drilling 12' Ft. After Drilling Ft.	 Geotechnical and Construction Material Consultants	Boring Started: 10-14-2025 Boring Completed: 10-14-2025 Rig: TRK Foreman: JH Approved: NG Job #: 1-5764
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1-5764.gco TSBORE16.tbl 4/25/2017

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

BORING LOG No. 5

PROJECT RBT Bus Storage Facility	SITE Davenport, IA
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GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	DEPTH (ft.)	SAMPLES				TESTS		
				NUMBER	TYPE	RECOVERY	SPT - N (BLOWS / FT.)	MOISTURE, %	DRY DENSITY (PCF)	UNCONFINED STRENGTH (PSF)
	0.5 Pavement -- Concrete 6"	708.5	0							
	Fill -- Lean CLAY with gravel, dark grayish brown	CL		1	SS	9	7	18.9		
	3.5 Fill -- Lean CLAY, gray and pale gray	705.5	4	2	SS	16	7	22.7		
	5.5 Alluvium -- Lean CLAY, gray and yellowish brown, stiff	703.5	8	3	ST	11		27.2	94	2,000*
				4	SS	16	3	21.9		
	12.0 Alluvium -- Sandy lean CLAY, trace gravel, grayish brown, medium stiff to stiff	697.0	12	5	SS	18	5	12.3		
				6	SS	18	8	17.9		
	20.0 Bottom of boring	689.0	20							

Notes: * Calibrated hand penetrometer
Hammer Type: Manual

Water Level:		
▽	19.5'	Ft. While Drilling
▽	18'	Ft. After Drilling
▽	Ft.	



Boring Started: 10-14-2025	
Boring Completed: 10-14-2025	
Rig: TRK	Foreman: JH
Approved: NG	Job #: 1-5764

1-5764.gco TSBORER16.tbl 4/25/2017

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

BORING LOG No. 6

PROJECT RBT Bus Storage Facility	SITE Davenport, IA
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GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	DEPTH (ft.)	SAMPLES				TESTS			
				NUMBER	TYPE	RECOVERY	SPT - N (BLOWS / FT.)	MOISTURE, %	DRY DENSITY (PCF)	UNCONFINED STRENGTH (PSF)	OTHER
	0.5 Pavement -- Concrete 6"		0								
	Fill -- Lean CLAY, very dark gray and dark grayish brown	CL		1	SS	15	8	23			
	3.5 Loess -- Lean CLAY, grayish brown, medium stiff	CL	4	2	SS	13	5	26.1			
				3	SS	18	5	21.4			
	8.5 Glacial till -- Sandy lean CLAY, trace gravel, yellowish brown, medium stiff	CL	8	4	SS	18	5	15.3			
	- Color changes to gray and brown at about 12'		12	5	SS	18	5	12.7			
	- Becomes stiff at about 17'		16								
	20.0 Bottom of boring		20	6	SS	18	13	12.5			

Notes: * Calibrated hand penetrometer
Hammer Type: Manual

Water Level:		
▽	19'	Ft. While Drilling
▽	13'	Ft. After Drilling
▽	Ft.	



Boring Started: 10-14-2025	
Boring Completed: 10-14-2025	
Rig: TRK	Foreman: JH
Approved: NG	Job #: 1-5764

1-5764.gco TSBORER16.tbl 4/25/2017

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

BORING LOG No. 7

PROJECT RBT Bus Storage Facility	SITE Davenport, IA
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GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	DEPTH (ft.)	SAMPLES				TESTS			OTHER
				NUMBER	TYPE	RECOVERY	SPT - N (BLOWS / FT.)	MOISTURE, %	DRY DENSITY (PCF)	UNCONFINED STRENGTH (PSF)	
	Fill -- Crushed ROCK with clayey sand, very dark brown 3.0 706.0	SC/GC	0	1	AS			4.1			
	Loess -- Lean CLAY, gray, medium stiff 6.0 703.0	CL	4	2	SS	0	5				
	Glacial till -- Sandy lean CLAY, trace gravel, grayish brown, medium stiff - Color changes to gray at about 12' - Becomes stiff at about 17' 20.0 689.0	CL	8	3	ST	17		20.3	104	1,000*	
			12	4	SS	18	5	21.4			
			16	5	ST	15.5		14.4	109	2,000*	
			20	6	SS	18	5	9.3			
			20	7	SS	18	9	17.1			
	Bottom of boring										

Notes: * Calibrated hand penetrometer
Hammer Type: Manual

Water Level: None Ft. While Drilling None Ft. After Drilling Ft.	<p style="font-size: small;">Geotechnical and Construction Material Consultants</p>	Boring Started: 10-14-2025 Boring Completed: 10-14-2025 Rig: TRK Foreman: JH Approved: NG Job #: 1-5764
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1-5764.gco TSBORER16.tbl 4/25/2017

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

BORING LOG No. 8

PROJECT RBT Bus Storage Facility	SITE Davenport, IA
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GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	DEPTH (ft.)	SAMPLES				TESTS			
				NUMBER	TYPE	RECOVERY	SPT - N (BLOWS / FT.)	MOISTURE, %	DRY DENSITY (PCF)	UNCONFINED STRENGTH (PSF)	OTHER
1.0	Fill -- GRAVEL, gray 710.0	GP	0	1	AS			4.2			
	Possible fill -- Lean CLAY, gray and yellowish brown	CL		2	SS	16	9	20.6			
	- Trace gravel at about 3.5'		4	3	SS	14	7	14.4			
6.0	Glacial till -- Sandy lean CLAY, trace gravel, brown, medium stiff 705.0	CL		4	SS	17	5	20.5			
	- Color changes to gray at about 12'		12	5	SS	18	3	29.6			
17.0	Glacial outwash -- Fine to medium SAND, gray, medium dense 694.0	SM		7	SS	15	13	23			
20.0	Bottom of boring 691.0		20								

Notes: * Calibrated hand penetrometer
Hammer Type: Manual

Water Level:	
19'	Ft. While Drilling
12'	Ft. After Drilling
5'	Ft. 1.5 HRS



Boring Started: 10-14-2025	
Boring Completed: 10-14-2025	
Rig: TRK	Foreman: JH
Approved: NG	Job #: 1-5764

1-5764.gco TSBORER16.tbl 4/25/2017

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

BORING LOG No. 9

PROJECT RBT Bus Storage Facility	SITE Davenport, IA
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GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	DEPTH (ft.)	SAMPLES				TESTS			
				NUMBER	TYPE	RECOVERY	SPT - N (BLOWS / FT.)	MOISTURE, %	DRY DENSITY (PCF)	UNCONFINED STRENGTH (PSF)	OTHER
	0.3 Pavement -- Asphalt 3" Fill -- GRAVEL, trace sand, dark gray	713.3	0	1	AS			2.9			
	2.0 Possible fill -- Lean CLAY with sand, yellowish brown, medium stiff	711.5	2	SS	7	5	20				
	3.0 Loess -- Lean CLAY, dark grayish brown, stiff	710.5	4	ST	10		23	96	5,000*		
	6.0 Glacial till -- Sandy lean CLAY, trace gravel, yellowish brown, medium stiff	707.5	8	4	SS	16	6	24.6			
			12	5	SS	18	4	18.7			
			16	6	SS	18	4	12.3			
			20	7	SS	18	10	13.6			
Bottom of boring			20								

Notes: * Calibrated hand penetrometer
Hammer Type: Manual

Water Level:	
None	Ft. While Drilling
18'	Ft. After Drilling
10'	Ft. 1HR



Boring Started: 10-14-2025	
Boring Completed: 10-14-2025	
Rig: TRK	Foreman: JH
Approved: NG	Job #: 1-5764

1-5764.gco TSBORE16.tbl 4/25/2017

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

UNIFIED SOIL CLASSIFICATION SYSTEM

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

^A Based on the material passing the 3-in. (75-mm) sieve.

^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^C Gravels with 5 to 12% fines require dual symbols:
 GW-GM well-graded gravel with silt
 GW-GC well-graded gravel with clay
 GP-GM poorly graded gravel with silt
 GP-GC poorly graded gravel with clay

^D Sands with 5 to 12% fines require dual symbols:

SW-SM well-graded sand with silt
 SW-SC well-graded sand with clay
 SP-SM poorly graded sand with silt
 SP-SC poorly graded sand with clay

^E
 $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add "with organic fines" to group name.

^I If soil contains $> 15\%$ gravel, add "with gravel" to group name.

^J If Atterberg limits plots in shaded area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.

^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.

^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

^N $PI \geq 4$ and plots on or above "A" line.

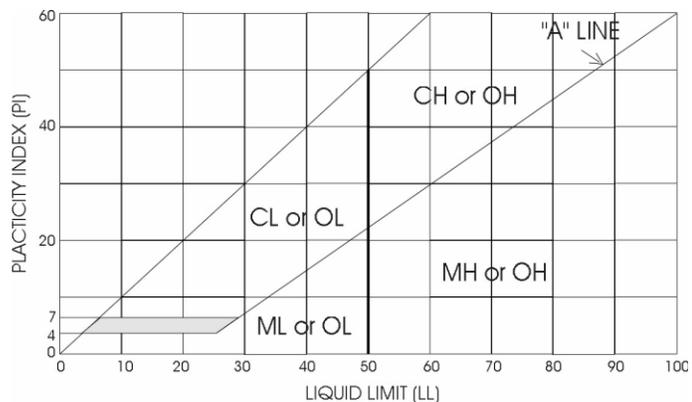
^O $PI < 4$ or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.

For classification of fine-grained soils and fine grained fraction of coarse-grained soils.

Equation of "A" Line:
 Horizontal at $PI = 4$ to $LL + 25.5$.
 then $PI = 0.73 (LL - 20)$



GENERAL NOTES

SOIL and ROCK TYPES			DRILLING & SAMPLING SYMBOLS	
	SAND		FAT CLAY	SS Split Spoon - 1 1/2" I.D., 2" O.D., unless otherwise noted
	SILT		FILL	ST Thin-Walled Tube - 3" O.D., unless otherwise noted
	LEAN CLAY		TOPSOIL	PA Power Auger
			GRAVEL	HA Hand Auger
			LIMESTONE	DB Diamond Bit - 4", N, B
			SHALE	AS Auger Sample
				HS Hollow Stem Auger
				WS Wash Sample
				RB Rock Bit
				BS Bulk Sample
				DC Dutch Cone
				WB Wash Bore
				AR Air Rotary

STRENGTH TERMS				
CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing No. 200 sieve)			RELATIVE DENSITY OF COARSE-GRAINED SOILS (50% or more retained No. 200 sieve)	
Consistency	Unconfined Compressive Strength, Qu, psf	N-Blows/ft* (Approx. Correlation)	Relative Density	N-Blows/ft. *
Very Soft	< 500	0 - 2	Very Loose	0 - 4
Soft	500 - 1,000	3 - 4	Loose	5 - 10
Medium	1,001 - 2,000	5 - 8	Medium Dense	10 - 29
Stiff	2,001 - 4,000	9 - 15	Dense	30 - 49
Very Stiff	4,001 - 8,000	16 - 30	Very Dense	50 - 80
Hard	8,001 - 16,000	31 - 50	Extremely Dense	80 +
Very Hard	> -16,000	50 +		

* Standard "N" Penetration Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch OD split spoon, except where noted.

RELATIVE PROPORTIONS OF SAND AND GRAVEL		RELATIVE PROPORTIONS OF FINES		GRAIN SIZE TERMINOLOGY	
Descriptive Term(s) (of components also present in sample)	Percent of Dry Weight	Descriptive Term(s) (of components also present in sample)	Percent of Dry Weight	Major Component of Sample	Size Range
Trace	< 15	Trace	< 5	Boulders	Over 12 in. (300 mm)
With Modifier	15 - 29	With Modifier	5 - 12	Cobbles	12 in. to 3 in. (300 mm to 4.75 mm)
	> 30		> 12	Gravel	3 in. to #4 sieve (75 mm to 4.75 mm)
				Sand	#4 to #200 sieve (4.75 mm to 0.075 mm)
				Silt or Clay	Passing #200 sieve (0.075 mm)
WATER LEVELS: WD = While Drilling AD = After Drilling					
	Depth groundwater first encountered during drilling				
	Groundwater level after 24 hours (unless otherwise noted, i.e. "AD" -- after drilling)				

TERMS DESCRIBING SOIL STRUCTURE			
Parting:	paper thin in size	Fissured:	containing shrinkage cracks, frequently filled with fine sand or silt, usually more or less vertical.
Seam:	1/8" to 3" in thickness	Interbedded:	composed of alternate layers of different soil types.
Layer:	greater than 3" in thickness	Laminated:	composed of thin layers of varying color and texture.
Ferrous:	containing appreciable quantities of iron	Slickensided:	having inclined planes of weakness that are slick and glossy in appearance.
Well-Graded:	having wide range in grain size and substantial amounts of all intermediate sizes.	NOTE:	Clays possessing slickensided or fissured structure may exhibit lower unconfined strength than indicated above. Consistency of such soil is interpreted using the unconfined strength along with pocket penetrometer results.
Poorly-Graded:	predominately one grain size or having a range of sizes with some intermediate sizes missing.		