RDA GROUP ARCHITECTS
7945 Washington Woods Drive
Dayton, Ohio 45459
937.610.3440

Addendum #2

Bus Maintenance Facility
Twin Valley Community Local School District

March 9, 2023

This Addendum modifies and shall become a part of the original Contract Documents and is hereby made part of the Bidding Documents for the referenced project.

All bidders shall indicate in their bid/proposal that this Addendum has been received and considered in their bid proposal.

The Addendum items are intended to supplement, clarify or correct parts of the bid proposal package. Items in the addendum shall take precedence over items corrected and shall be of equal value with items supplemented or clarified. Any questions in reference to this addendum must be directed, in writing, to:

Jonathan Schaaf
RDA Group Architects
7945 Washington Woods Drive
Dayton, Ohio 45459
937.610.3440
jrs@rda-group.com

Addendum Items:

1. Pre-Bid Meeting: Pre-Bid Meeting Minutes and sign-in sheet have been attached to this addendum.
2. Aid to Construction Allowance: intended for reimbursement of DIRECT costs only, no OH/P, markup shall be permitted for this allowance.
3. Permits:
    - 3.1. Zoning Permit has been applied for at West Alexandria.
    - 3.2. Building permit will be applied for at Preble County by RDA once zoning permit is approved.
        - 3.2.1. All trade permits shall be applied and paid for by the trade contractor within their bid amount.
4. Special Inspections / Testing: By Owner.
5. Funding: This project is locally funded, there is no OFCC involvement.
6. Scope definition: The project is being awarded to [1] general contractor who will include all aspects of the scope of the project. The delineation of scope between site, mechanical, electrical contractors, etc. and the general contractor is up to the respective bidder and their sub-contractors.
7. Additional site inspections can be accomplished upon request by contacting Jeff Tully at Twin Valley Community Local Schools.
8. Geo-Technical Report: Alt & Witzig Engineering accomplished soils borings and prepared a Geo-Technical Report for the project site. The report is attached to this addendum.
9. Specification Section 08 36 13: 2.1, B, 10, b: ADD the following: Each overhead door shall have [2] remote control operators. This is in addition to the push button controls within the building.
10. Specification Section 13 34 18: 2,1, A:

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10.1. Other building manufacturers are acceptable providing that the manufacturer meets the performance criteria outlined in the specification as a minimum.

10.2. Metal siding, roof, and liner panels may be of a manufacturer acceptable to the building manufacturer, providing that they meet the minimum specifications outlined. The Contractor shall coordinate any such requirements if the panels are not directly supplied by the building manufacturer.

11. Drawing C-4.0 / C-4.1: Utility Plan: CLARIFICATION of design intent:

11.1. Gas Service: Centerpoint will install gas service to the meter as indicated on the drawings. Tap and connection Fees shall be direct reimbursable from Aid to Construction Allowance.

11.2. Sanitary Sewer Service: new sanitary service to extend +/- 1,000 LF to the sanitary lift station; then extend +/- 1,100 LF to a new manhole at SR 503 / North Main Street. Scope to include all work to install sanitary service / force main complete, including all connections. Tap and Connection Fees shall be direct reimbursable from the Aid to Construction Allowance.

11.3. Sanitary Lift Station: Cut sheet for the lift station is attached to this addendum for reference.

11.4. Water Service: new water service extends to the existing 10" water main at the west side of the existing school. Scope to include all work to install water service complete, including all connections. Tap and connection Fees shall be direct reimbursable from Aid to Construction Allowance.

11.5. Electric Service [Bus Maintenance Facility]: AES has not finalized the location of the pad mounted transformer. The transformer is intended to be located to the north of the fuel tank pad as indicated on Drawing E2.3. AES will provide power to the transformer. Contractor to provide service line to the building from the transformer pad, +/- 150' from the NE corner of the building. Tap and connection Fees shall be direct reimbursable from Aid to Construction Allowance.

11.6. Electric Service [Lift Station / Future Concession / Ballfield power]: This transformer is not indicated on Civil sheet C-4.1. AES has not finalized the location of the pad mounted transformer. The transformer is intended to be located approximately 100' to the east of the proposed sanitary lift station near the location of the of the fuel tank pad as indicated on Drawing E2.3. AES will provide power to the transformer. Contractor to provide service per E4.1, including all connections to the lift station. Tap and connection Fees shall be direct reimbursable from Aid to Construction Allowance.

12. Drawing C-5.0: Concrete Pavement Detail; Gravel Drive Section: REVISE details as per the attached sketch from Burkhardt Engineering.

13. Drawing A1.5, Mezzanine Framing Plan / Joist Spacing Plan: Contractor Option: Contractor may provide 16" deep TJI floor joists in lieu of [2] 14" deep TJI joists provided that the 16" deep TJI joists meet the 125 PSF live load requirement for the mezzanine. The joist spacing shall remain as outlined to provide pathways for ductwork as diagramed. If this option is selected by the Contractor, the stair framing shall be altered for the new floor to floor height. Maximum riser height is 7".

14. Drawing E3.2: CLARIFICATION of Intent:

14.1. There are [2] services planned as part of this project, [1] for the building, [1] for the Lift Station. Coordinate with the clarifications on C-4.0 / C-4.1 in this addendum .

14.2. Key Note 14: This note refers to the service for the Bus Maintenance Facility.

14.3. Key Note 15: This note refers to the service for the Lift Station / Future Concession / Ball Field]

15. Drawing E4.1: Lift Station Single Line: REPLACE single line with the version attached to this addendum.

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End.

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March 2, 2023

Pre-Bid Meeting Minutes

Bus Maintenance Facility
Twin Valley Community Local School District

1. Sign-in & Introductions
- 1.1. *Sign in sheet attached.*

2. Project Discussion
- 2.1. Review of Project Scope
  - 2.1.1. Building
    - 2.1.1.1. *General description reviewed. Wood frame building, full foundation, metal liner panels, gyp. board.*
  - 2.1.2. Site Development
    - 2.1.2.1. *General description reviewed. Driveway, car and bus parking, fuel filling station, limited concrete, mostly gravel.*
  - 2.1.3. Utilities
    - 2.1.3.1. *General description reviewed. Most come from Route 503 adjacent to Education Drive. Water can tie into loop. Installing lift station for Sanitary – expect to remove some existing vegetation as a result. Storm drainage modifications/improvements. New lighting.*
- 2.2. Project Schedule
  - 2.2.1. *Anticipate May 1 start, 200 days proposed construction schedule*
- 2.3. *Soils report will be provided in an addendum.*
- 2.4. *3rd party testing will be by owner*
- 2.5. *RDA applying for zoning and building permits*

3. Review of Bidding Requirements
- 3.1. Bid Form
  - 3.1.1. Project Allowances
    - 3.1.1.1. *See bid documents for contingency, aid to construction and permit allowances*
  - 3.1.2. Alternates
    - 3.1.2.1. *Add Alternate #1: Slab insulation*
- 3.2. Bid Submission – March 20, 2023 at 12 noon
  - 3.2.1. *We will be in the same room as the Pre-Bid meeting. Sign in at High School Office.*
- 3.3. Post Bid Review Process
- 3.4. Prevailing Wages [not required]
- 3.5. Bonds
- 3.6. Addenda
- 3.7. Substitution Requests
  - 3.7.1. *Must be submitted by 3/13/23*
- 3.8. *Goal is to make decision for Board Approval at March 27th meeting.*
- 3.9. *Front End documents vary slightly from RDA typical. Please review.*

4. Review of Owner Requirements
- 4.1. Owner point of contact
  - 4.1.1. *Jeff Tully (937)839-4688 Ext. 405, Scott Cottingim, (937) 839-4688 Ext. 400*
- 4.2. Hours of Work
  - 4.2.1. *No limit – Coord. with TVS if during school hours to avoid congestion during dismissal times.*
- 4.3. Owner Concerns

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5. Job Site Conditions

5.1. Utilities
5.1.1. *Bring temp as required by work.*
5.2. Project staging area.
5.2.1. *At project site*
5.3. Parking.
5.4. Access.
5.4.1. *Minimize impact to existing drive / lot*

6. Site Visit

End.

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March 2, 2023

Pre-Bid Meeting Sign in Sheet

Bus Maintenance Facility
Twin Valley Community Local School District

Name	Company	Phone	Email
JEFF KASH	FENDER CONST.	937-258-9604	JKASH@RLFENDER.COM
Jamie Hileman	Brumbaugh Const.	937-564-3431	Jamie@brumbaughconstruction.com
Justin Petry	DeBra-Kuempel	937-677-2301	JPETRY@DKEMCOR.COM
Tyler Ponchot	K&T Construction	937 790 1020	Tyler@ktconstructioninc.com
Marcus Horner	Arcon Builders	937-692-6330	marcushorner@arconbuilders.com
Jeff York	C+N	937-322-7341	jyork@CN-CONTRACTORS.com
Scott Stayton	Miami Valley Site Work	513-479-6721	miamivalleysitework@yahoo.com

SUBSURFACE INVESTIGATION AND GEOTECHNICAL RECOMMENDATIONS

TWIN VALLEY BUS GARAGE AND PARKING LOT
WEST ALEXANDRIA, OHIO

Prepared for:

RDA GROUP ARCHITECTS
DAYTON, OHIO

Prepared by:

ALT & WITZIG ENGINEERING, INC.
WEST CHESTER, OHIO

MARCH 6, 2023 **PROJECT NO.: 23CN0041**

Alt & Witzig Engineering, Inc.
6205 Schumacher Park Drive • West Chester, Ohio 45069
Phone: (513) 777-9890 • www.altwitzig.com

March 6, 2023

RDA Group Architects
7945 Washington Wood Drive
Dayton, Ohio 45459
Attn: Mr. Greg Snyder

RE: Subsurface Investigation &
Geotechnical Recommendations
Twin Valley Bus Garage and Parking Lot
100 Education Drive
West Alexandria, Ohio
Alt & Witzig File #: 23CN0041

Dear Mr. Snyder:

This report presents the results of a subsurface investigation and provides geotechnical recommendations for construction of the garage to the northwest of the school located at 100 Education Drive. The investigation was conducted for RDA Group Architects. The purpose of this subsurface investigation was to determine the various soils profile components, the engineering characteristics of the subsurface materials and to provide criteria for use by the design engineers and architects in preparing the foundation design for the proposed building and associated parking lot.

Field Investigations

The field investigation to determine the engineering characteristics of the subsurface materials included a reconnaissance of the project site and drilling 4 borings. Borings are located as shown on Figure 1 and on the *boring location plan* found in the appendix of this report. The soil borings were performed with a drilling rig equipped with a rotary head. Conventional hollow-stem augers were used to advance the holes. Representative samples were obtained employing split-spoon sampling procedures in accordance with ASTM Procedure D1586.

During the sampling procedure, standard penetration tests were performed at regular intervals to obtain the standard penetration value of the soil. The standard penetration value is defined as the number of blows a 140-pound hammer, falling 30-inches, is required to advance the split-spoon sampler 1 foot into the soil. The results of the standard penetration tests indicate the relative density and comparative consistency of the soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

The exact location of the water table should be anticipated to fluctuate somewhat depending upon normal seasonal variations in precipitation and surface runoff. In addition, it generally requires several months of observation to estimate groundwater levels and the levels given on the enclosed boring logs are from the short observations made during our on-site observations.

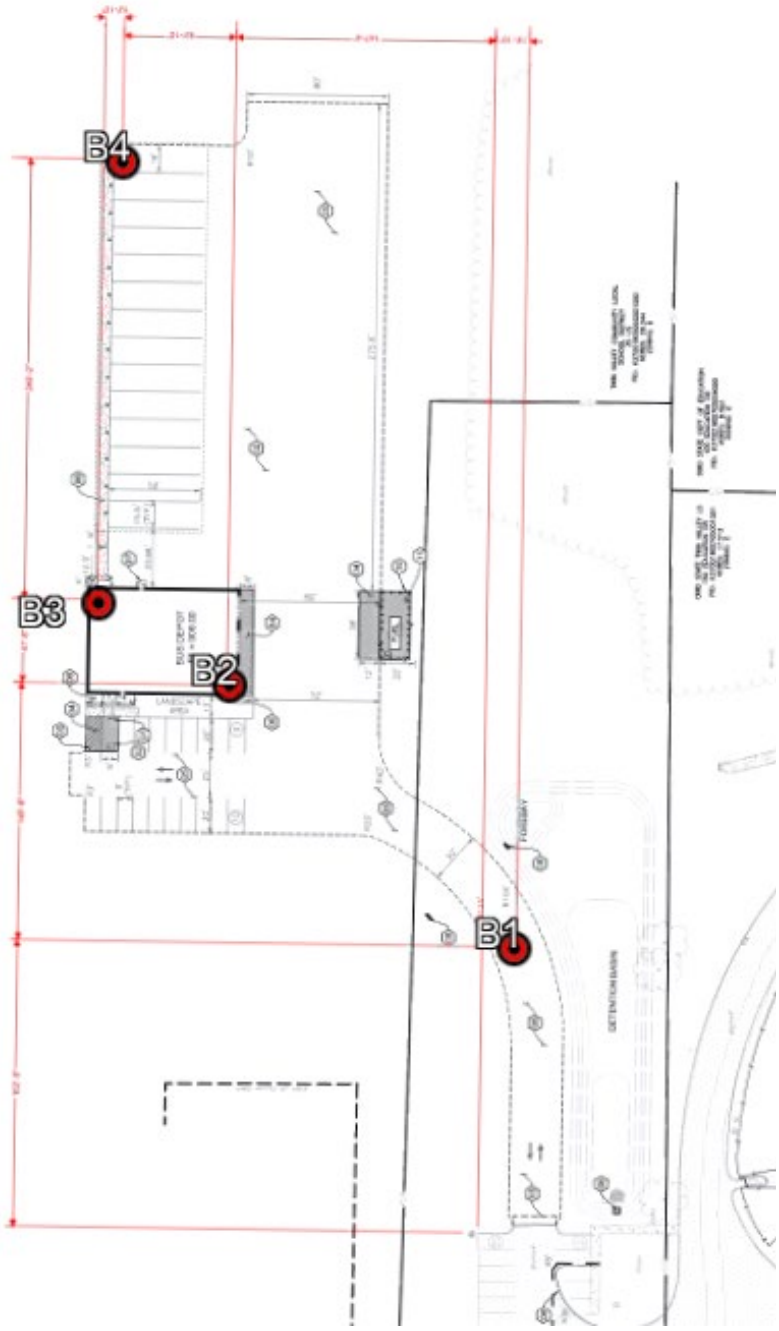


Figure 1: Borings Locations for the Proposed Development

Laboratory Investigations

In addition to the field investigation, a supplemental laboratory investigation was conducted to ascertain additional pertinent engineering characteristics of the subsurface materials necessary in analyzing the behavior of the proposed improvements.

All phases of the laboratory investigation were conducted in general accordance with applicable ASTM Specifications. The laboratory testing program included supplementary visual classification of all samples and water content tests on all cohesive samples.

Description of Site/Project Description

It is assumed the new garage and building will be constructed near current site grades. The area is currently occupied by agricultural fields and maintained greenspace. The approximate location of the site is shown on the enclosed *Site Location Map* presented in the Appendix of this report. It is anticipated the building to be constructed will be steel framed building with masonry exterior and a slab on grade near current site grades.

Subsurface Conditions

A total of 4 borings were performed to obtain the subsurface conditions of the proposed building and parking lot. Relatively similar conditions were encountered across the site. At the immediate surface, borings encountered approximately 5-inches of topsoil. Below the topsoil, borings encountered 2 to 3-feet of brown, soft to medium stiff clay, with some trace organic matter. Below the shallow clay, brown, medium stiff to very stiff, sandy clay/ silty sandy clay with gravel and wet sand seams was encountered to boring termination at 16-feet below the surface. Generally, the medium stiff soils were restricted to 4 to 7-feet and are very stiff below 7-feet. Silt seams and sand seams were encountered throughout the sandy clay strata. Generally, the silt and sand seams were wet in consistency.

Seismic Site Class

An evaluation of the seismic site class has been performed for this site. The Ohio Building Code indicates that the seismic site class is determined by averaging soil conditions within the top 100-feet with respect to the shear wave velocity. This evaluation is based on data obtained on soil to termination of the borings and our knowledge of soils in the area. Based on the field and laboratory tests performed on the encountered subsurface materials to boring termination, this site should be considered a Site Class D in accordance with the current Ohio Building Code.

Site Preparation

Prior to cut/fill operations, the topsoil at the immediate surface should be removed. The topsoil should be stockpiled for later use or be exported from the site. After removal of the topsoil, the exposed subgrade should be proofroll inspected with approved equipment. Where soft or yielding soils are observed, stabilization of the subgrade will be required. Corrective measures, such as undercut and replacement of soft soils with crushed stone, stone/geogrid, or suitable onsite soils could be considered. Factors including weather, schedule, material availability, and costs with determine the most desired method. In addition, modifications to the remediation measures are anticipated based the utility easements crossing the site.

All of the soils, with the exception to topsoil, encountered during boring operations were suitable for reuse as structural fill. However, portions of the shallow soils were found to be too wet and will need to be dried prior to their reuse as structural fill. Most of the shallow native clay/sandy clays have moisture contents between 10% and 22%. The shallow soils were anticipated to have optimum moisture contents between 12% and 18%.

It is important that proper moisture content be maintained for these soils to be used as structural fill. Based on the moisture contents taken during boring operations and anticipated optimum moisture content, some soils will have to be dried before using as structural fill. This can be performed by spreading the soils in a thin (12 inches or so) loose lift in favorable weather conditions and continuously disking the soils until a suitable moisture content is reached. If construction occurs during the wetter portion of the year (November to April), chemical drying could be a more economical drying method. Chemical drying can be performed by mixing the shallow soils with approximately 3% LKD by soil weight with wet soils. A representative of Alt & Witzig should be present to ensure proper placement in regard to density and moisture content of any earthwork that is performed.

Foundation Discussion and Recommendations

Based on the findings and understanding of the proposed construction, the building can be supported on conventional foundations with undercutting of soft soils when encountered. A maximum net allowable soil bearing pressure of 2,500-psf is recommended to design conventional spread footings and continuous wall footings. The above-recommended bearing pressure assumes the footings will be founded on the undisturbed clay/sandy clay soils.

If the above suggested bearing pressure is used in the design of the footings, then all interior footings can be founded at nominal depths below the finished floor slab provided suitable strengths of the foundation soils exist at the shallower depths below grade. To alleviate the effects of seasonal variation in moisture content on the behavior of the footings and eliminate the effects of frost action, all exterior foundations should be founded a minimum of 30-inches below the final grade.

Floor Slab Recommendations

The ground floor for the proposed additions can be constructed as a slab-on-grade supported by the existing soils and/or newly compacted fills provided the existing subgrade can pass a proofroll inspection. Once the immediate subgrade is stripped of topsoil, the now exposed subgrade should be proofroll inspected. Any yielding areas should be corrected by removal and replacement as determined at the time construction occurs before proceeding with any new fill or concrete placement. The actual method of remediation should be determined at the time of construction; however, it is anticipated that the most economical method for the building footprint size is undercut and replacement with suitable soils/subbase stone, and/or geogrid.

After the building area has been prepared to the proper elevation, a 4 to 6-inch compacted granular fill should be placed immediately beneath the floor slab. This compacted granular fill

will provide a uniform surface for construction of the slab and minimize capillary rise of groundwater from the subgrade into the slab. In addition, a vapor barrier should be placed in any area that will be covered in tile, carpet, or other surface coverings. A modulus of subgrade reaction of 100-pci can be utilized to dimension the floor slab over a properly prepared subgrade.

Parking Lot Recommendations

It is understood that the parking lot will be gravel. The number of buses expected to enter/exit the gravel lot was not provided. Based on the amount of bus parking available, it is estimated that up to 12 buses will enter and leave the facility daily. Based on the obtained field data and estimation of the proposal traffic loads, a minimum of 12-inches of subbase stone should be placed in the gravel lot. A separator fabric should be placed immediately below the subbase stone to minimize movement of fines into the stone. The section would support the estimated traffic loads with a service life of 3 to 5 years. For more long-term solutions, an asphalt/concrete section is recommended.

The buses often impart large torque loads to the immediate surface of the subbase during turns. Tight turning on gravel subbase often results in rutting of the stone. It is anticipated that subbase will require regular maintenance in the form of regrading and compaction of the rutted areas.

It is recommended that the apron in front of the service bays be constructed with a concrete pad. These concrete aprons will support the heavy twisting loads often imparted to the pavement section service and loading/unloading procedures. It is suggested that 6-inches of compacted #304 crushed limestone and 7-inches of unreinforced concrete be used to construct these aprons. Maximum joint spacing within the concrete pavement on the order of 12-feet is recommended. Control joints must be sawed a minimum of one-fourth of the thickness of the slab and must be cut at such a time that random cracking does not occur.

Also, enhancing drainage with a socked 4-inch perforated drain tile through the lot and/or along the perimeter is suggested. The underdrain should gravity outlet to a swale or catch basin that directs water to the detention area. The specific location of the drain(s) should be determined by the Civil designer based on grades and utility design.

Utility Excavations

With construction of the new building, placement of numerous underground utility/structures will be required, including underground detention on the north side of the proposed building. The onsite soils classify as Type B soils in accordance with OSHA Construction Standards for Excavations. Therefore, it will be necessary to maintain all construction slopes at 1:1 (H:V). If it is not possible to maintain this slope, flattening of the slopes or shoring will be required. Where isolated sand/silt seams are encountered, the excavation should be flattened to 1.5:1 (H:V) or flatter. All shoring should be in accordance with applicable OSHA standards. It should be noted that the shallow soils are susceptible to erosion and the amount of time excavations are left open and unprotected should be very limited.

At the time of this report, a grading plan had not yet been generated. Once a grading plan is generated, it be provided to Alt & Witzig for evaluation in determining if additional recommendations are warranted. If we can give further service in these matters, please contact us at your convenience.

Respectfully Submitted,
ALT & WITZIG ENGINEERING, INC.

Dustin Horn, P.E.
Project Engineer

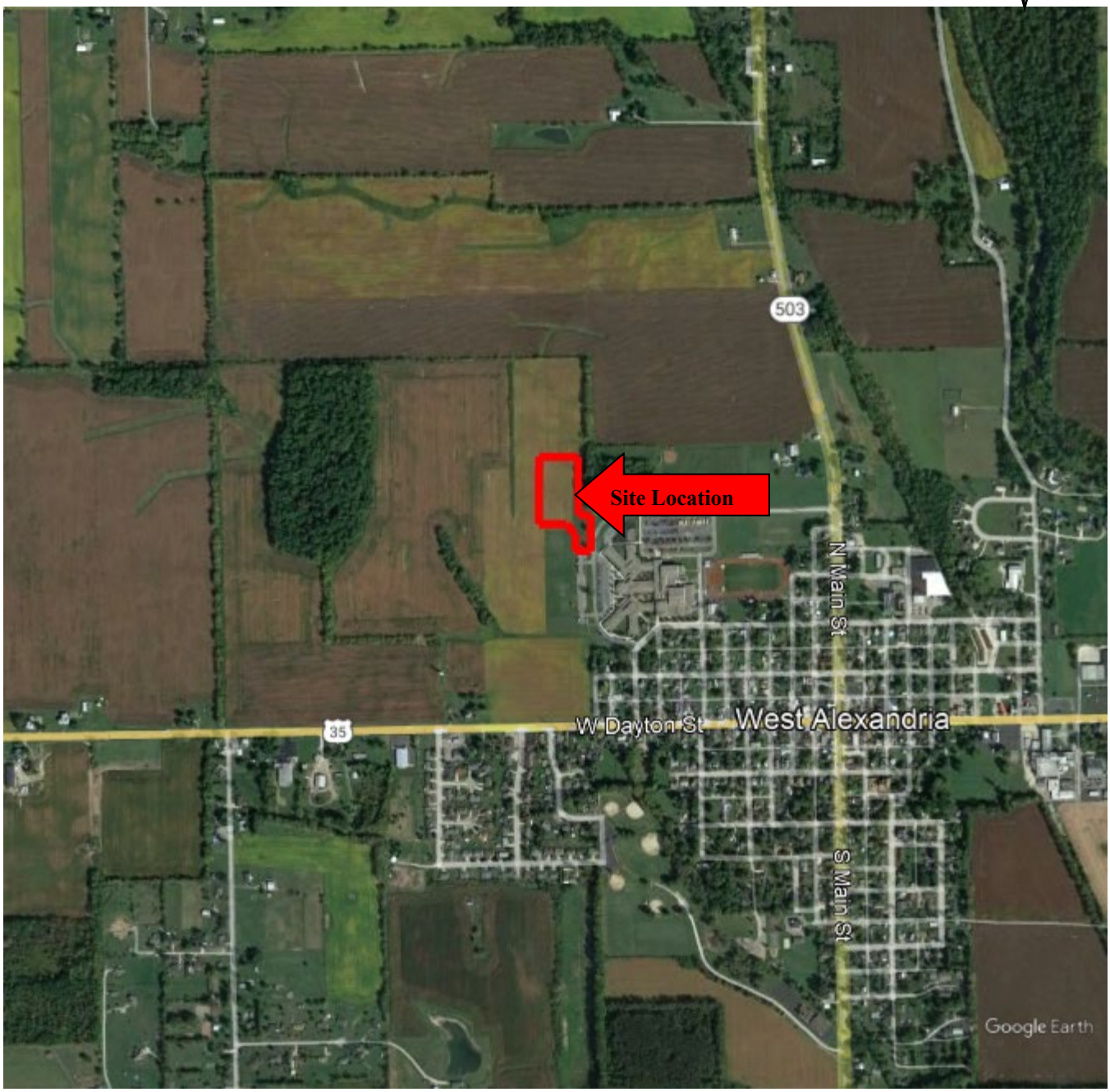
Patrick A. Knoll, P.E.
Principal Engineer

APPENDIX

RECOMMENDED SPECIFICATIONS FOR COMPACTED FILLS AND BACKFILLS

All fill shall be formed from material free of vegetable matter, rubbish, large rock, and other deleterious material. Prior to placement of fill, a sample of the proposed fill material should be submitted to the soil engineer for his approval. The fill material should be placed in layers not to exceed eight (8) inches in loose thickness and should be sprinkled with water as required to secure specified compactions. Each layer should be uniformly compacted by means of suitable equipment of the type required by the materials composing the fill. Under no circumstances should a bulldozer or similar tracked vehicles be used as compacting equipment. Material containing an excess of water so the specified compaction limits cannot be attained should be spread and dried to a moisture content that will permit proper compaction. All structural fill should be compacted to 98% of the maximum density obtained in accordance with ASTM density Test D-698. Should the results of the in-place density tests indicate that the specified compaction limits are not obtained, the areas represented by such tests should be reworked and retested as required until the specified limits are reached.

SITE LOCATION MAP

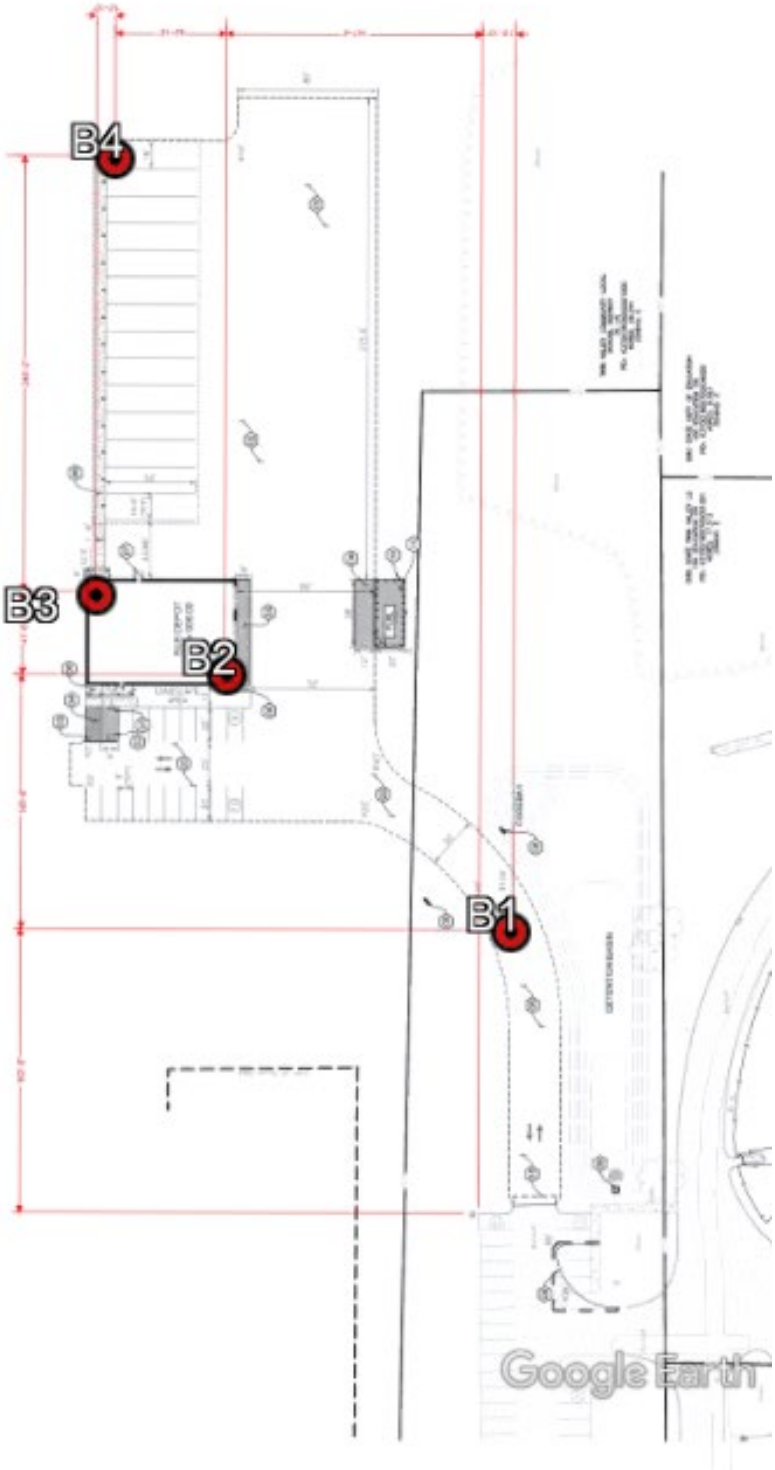


PROJECT: Twin Valley Bus Garage and Parking Lot
LOCATION: West Alexandria, Ohio
CLIENT: RDA Group Architects
ALT & WITZIG ENGINEERING FILE NO.: 23CN0041

Alt & Witzig Engineering, Inc.
6205 Schumacher Park Drive
Cincinnati, OH 45069
TEL (513)777-9890 · FAX (513) 777-9070
www.altwitzig.com

BORING LOCATION PLAN

N



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www.altwitzig.com

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **RDA Group Architects**

PROJECT NAME **Twin Valley Bus Garage and Lot**

PROJECT LOCATION **West Alexandria, Ohio**

BORING # **B01**

ALT & WITZIG FILE # **23CN0041**

DRILLING and SAMPLING INFORMATION

Date Started **3/2/23**

Date Completed **3/2/23**

Boring Method **HSA**

Driller **J. Roark**

Hammer Wt. **140** lbs.

Hammer Drop **30** in.

Spoon Sampler OD **2** in.

Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL 5"	0.4										
	Brown CLAY with Trace Organics	2.5		1	SS			7		0.8	19.9	
	Brown/ Gray Sandy CLAY	5.5	5	2	SS			8		0.8	27.2	
	Brown, Wet Sandy SILT	7.0		3	SS		○ ▽	8		0.3	12.9	
	Brown Sandy CLAY with Trace Gravel and Wet Sand Seams	11.0	10	4	SS			14		4.0	11.4	
	End of Boring at 11 feet											

Sample Type

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater

○ During Drilling *7 ft.*
▽ At Completion *9 ft.*

Boring Method

HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **RDA Group Architects** BORING # **B02**

PROJECT NAME **Twin Valley Bus Garage and Lot** ALT & WITZIG FILE # **23CN0041**

PROJECT LOCATION **West Alexandria, Ohio**

DRILLING and SAMPLING INFORMATION

Date Started **3/2/23** Hammer Wt. **140** lbs.

Date Completed **3/2/23** Hammer Drop **30** in.

Boring Method **HSA** Spoon Sampler OD **2** in.

Driller **J. Roark** Rig Type **D-50 Track ATV**

STRATA ELEV. / SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
TOPSOIL 5"	0.4										
Brown CLAY with Sand	3.5		1	SS			10		1.8	16.8	
Brown, Stiff CLAY with Gravel	7.0	5	2	SS			12		2.5	12.3	
			3	SS			47		4.5	9.5	
Brown Silty Sandy CLAY with Trace Gravel and Wet Sand Seams		10	4	SS		○ ▽	50			9.6	Auger Sample
	15.0	15	5	SS			42				Drove on Rock
End of Boring at 16 feet											

Sample Type

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater

○ During Drilling *10.5 ft.*
▽ At Completion *13 ft.*

Boring Method

HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **RDA Group Architects**
PROJECT NAME **Twin Valley Bus Garage and Lot**
PROJECT LOCATION **West Alexandria, Ohio**

BORING # **B03**
ALT & WITZIG FILE # **23CN0041**

DRILLING and SAMPLING INFORMATION

Date Started **3/2/23**
Date Completed **3/2/23**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

TEST DATA

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL 5"	0.3										
	Brown CLAY with Trace Organics	1.0										
	Brown Sandy CLAY with Gravel	2.0		1	SS			8		1.0	10.3	
			5	2	SS			3		0.3	22.8	
				3	SS			17		4.5	9.5	
	Brown Sandy CLAY with Trace Gravel and Wet Sand Seams *(Till)*		10	4	SS			28			15.6	Auger Sample
			15	5	SS		▽	27		4.5	7.9	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *Dry ft.*
▽ At Completion *14 ft.*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **RDA Group Architects**

PROJECT NAME **Twin Valley Bus Garage and Lot**

PROJECT LOCATION **West Alexandria, Ohio**

BORING # **B04**

ALT & WITZIG FILE # **23CN0041**

DRILLING and SAMPLING INFORMATION

Date Started **3/2/23**

Date Completed **3/2/23**

Boring Method **HSA**

Driller **J. Roark**

Hammer Wt. **140** lbs.

Hammer Drop **30** in.

Spoon Sampler OD **2** in.

Rig Type **D-50 Track ATV**

TEST DATA

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics Recovery Graphics	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL 5"	0.4										
	Brown CLAY with Trace Organics	2.0		1	SS			8			20.9	Auger Sample
	Brown CLAY with Trace Sand	5.0	5	2	SS			8		1.3	12.6	
				3	SS			9		1.5	12.5	
	Brown Sandy CLAY with Trace Gravel and Wet Sand Seams		10	4	SS			20				
		11.0										
	End of Boring at 11 feet											

Sample Type

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater

○ During Drilling *Dry ft.*
▽ At Completion *Dry ft.*

Boring Method

HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N:	Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch O.D. split-spoon.
Qu:	Unconfined compressive strength, TSF
Qp:	Penetrometer value, unconfined compressive strength, TSF
Mc:	Water content, %
LL:	Liquid limit, %
PL:	Plastic limit, %
Dd:	Natural dry density, PCF
▼ :	Apparent groundwater level at time noted after completion

DRILLING AND SAMPLING SYMBOLS

SS:	Split-spoon - 1 3/8" I.D., 2" O.D., except where noted
ST:	Shelby tube - 3" O.D., except where noted
AU:	Auger sample
DB:	Diamond bit
CB:	Carbide bit
WS:	Washed sample

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

TERM (NON-COHESIVE SOILS)	BLOWS PER FOOT
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	Over 50

TERM (COHESIVE SOILS)	Qu (TSF)
Very soft	0 - 0.25
Soft	0.25 - 0.50
Medium	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

PARTICLE SIZE

Boulders	8 in.(+)	Coarse Sand	5 mm-0.6 mm	Silt	0.075 mm - 0.005 mm
Cobbles	8 in. - 3 in.	Medium Sand	0.6mm-0.2 mm	Clay	0.005mm(-)
Gravel	3 in. - 5 mm	Fine Sand	0.2mm-0.075 mm		

Alt & Witzig Engineering, Inc.
6205 Schumacher Park Drive • West Chester, Ohio 45069
Phone: (513) 777-9890 • www.altwitzig.com

March 10, 2023

RDA Group Architects
7945 Washington Wood Drive
Dayton, Ohio 45459
Attn: Mr. Greg Snyder

RE: Pavement Addendum
Twin Valley Bus Garage and Parking Lot
100 Education Drive
West Alexandria, Ohio
Alt & Witzig File #: 23CN0041 addendum 1

Dear Mr. Snyder:

In compliance with your request, Alt & Witzig has evaluated the proposed bus garage traffic for future pavement. Although no specific traffic information was provided, it is anticipated that light-duty pavements (parking stalls) will be primarily subjected to light vehicular traffic. It is anticipated that the heavy-duty pavements will be primarily subjected to 12 buses per day. The following pavement sections were determined based on these assumed traffic conditions, utilizing a 15-year design life and a CBR value of 3.0 and the American Association of State Highway Officials (AASHTO) design method. It must be noted that the design conditions have been estimated. If actual traffic conditions differ greatly than mentioned above, Alt & Witzig Engineering should be contacted so that appropriate changes in the design can be made.

Asphalt Pavement Section			
Traffic Type	**Surface Course**	**Binder Course**	**ODOT #304**
Light Duty Pavement (Car Parking Stalls)	1.5”	2.0”	6.0”
Heavy Duty Pavement (Drive Lanes and Bus Court and Stalls)	1.5”	3.0”	8.0”

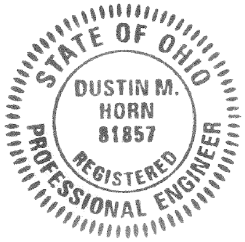
Concrete Pavement Section		
Traffic Type	**Concrete Course**	**ODOT #304**
Light Duty Pavement (Parking Stalls)	5”	4.0”
Heavy Duty Pavement (Drive Lanes and Bus Court)	6”	4.0”

If we can be of further assistance, please let us know.

Respectfully Submitted,
ALT & WITZIG ENGINEERING, INC.

Dustin Horn

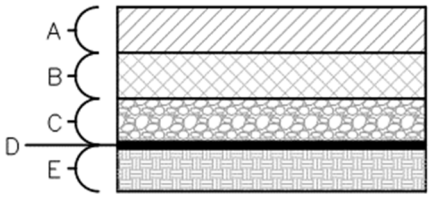
Dustin Horn, P.E.



BURKHARDT
ENGINEERS ▾ SURVEYORS
A 28 North Cherry Street
Germantown, OH 45327
P 937-388-0060
E info@burkhardtinc.com
BURKHARDTINC.COM

Twin Valley School Bus Barn
Addendum #2 – March 9th, 2023

KEY
FUTURE ITEM A – 1.5" ASPHALT CONCRETE
SURFACE COURSE, ODOT ITEM 448
FUTURE ITEM B – 3" ASPHALT CONCRETE
INTERMEDIATE COURSE, ODOT ITEM 448
C – 12" CRUSHED AGGREGATE BASE
ODOT ITEM 304
D – FILTER FABRIC BARRIER
ODOT TYPE D GEOTEXTILE
E – ODOT ITEM 204 SUBGRADE COMPACTION AS PER
GEOTECH SPECIFICATIONS

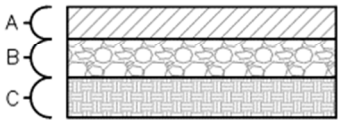


FUTURE ITEMS A AND B WILL NOT BE INSTALLED WITH THIS PROJECT. SEE NOTE ON GRADING PLAN REGARDING AREAS WHERE ADDITIONAL GRAVEL WILL BE NECESSARY TO TRANSITION GRADES.

NOTES:
1. CONTRACTOR SHALL VERIFY WITH GEOTECHNICAL ENGINEER AND OWNER THAT SECTION IS SUITABLE.

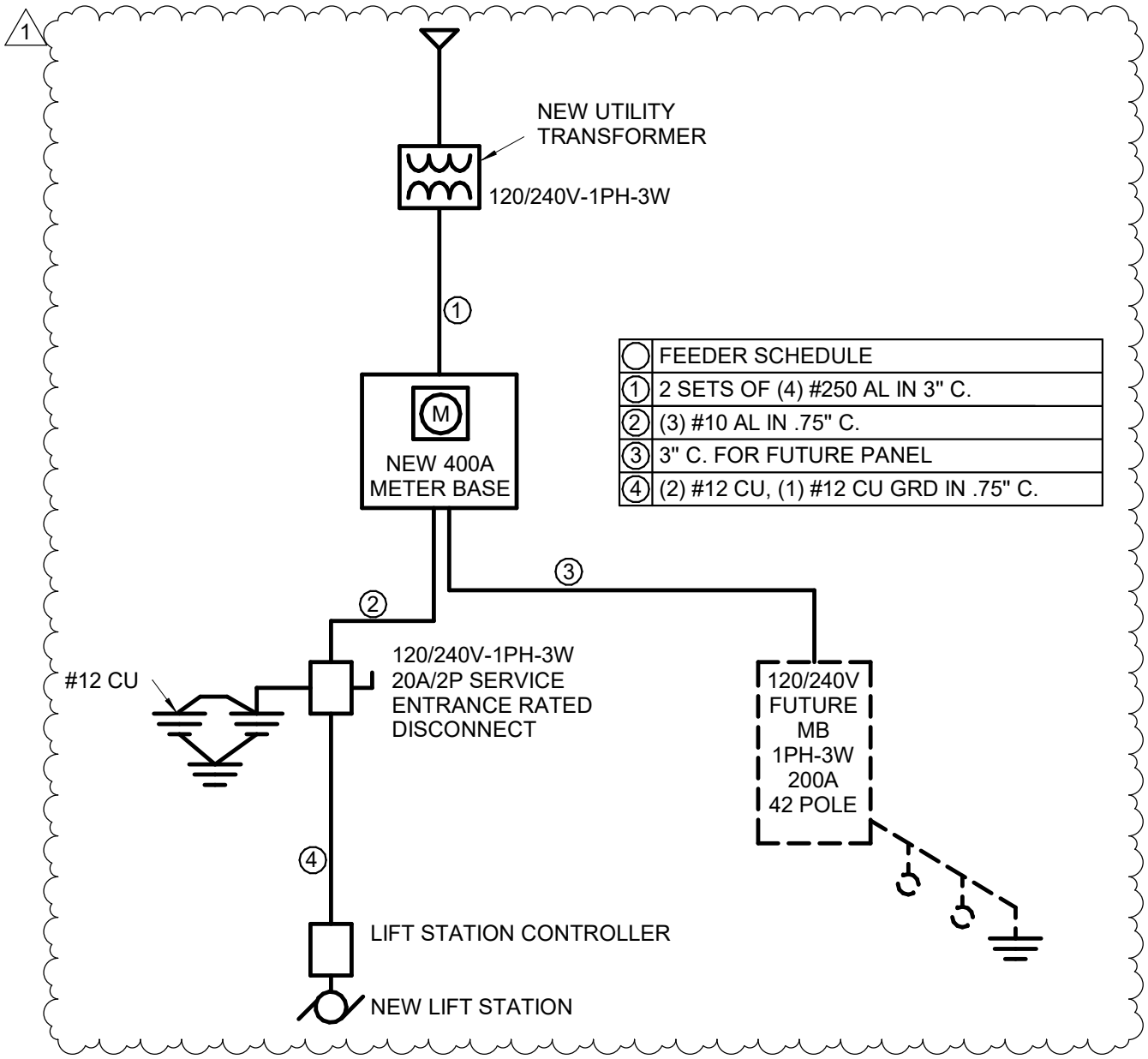
GRAVEL DRIVE / PARKING SECTION
NOT TO SCALE

KEY
A – 7" PORTLAND CEMENT CONCRETE (3500 PSI)
B – 6" CRUSHED AGGREGATE BASE
ODOT ITEM 304
C – ODOT ITEM 204 SUBGRADE COMPACTION AS PER
GEOTECH SPECIFICATIONS



NOTES:
1. CONTRACTOR SHALL VERIFY WITH GEOTECHNICAL ENGINEER AND OWNER THAT SECTION IS SUITABLE.

CONCRETE PAVEMENT
NOT TO SCALE



1 LIFT STATION SINGLELINE

NTS

ENGINEERING

PROJECT TITLE

Twin Valley Community School District

SHEET NAME

LIFT STATION SINGLELINE

DRAWING NO.

SKE1.0