ADDENDUM NO. 1

January 31, 2025

TRI-COUNTY SCHOOL CORPORATION – JR-SR HIGH SCHOOL ADDITION AND RENOVATIONS

Wolcott, IN 47995

TO: ALL BIDDERS OF RECORD

This Addendum forms a part of and modifies the Bidding Requirements, Contract Forms, Contract Conditions, the Specifications, and the Drawings dated December 20, 2024, by Gibraltar Design. Acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of Pages ADD 1-1 through ADD 1-2, GEO Tech Report, and attached Addendum No. 1 from Gibraltar Design dated January 30, 2025, consisting of 3 pages and 8 drawings.

A. SPECIFICATION SECTION 00 00 20 - TABLE OF CONTENTS

1. **Add:**

   Specification Section 00 20 00 - Information Available to Bidders.

B. <u>SPECIFICATION SECTION 01 12 00 - MULTIPLE CONTRACT SUMMARY</u>

Under 3.03 Bid Categories

C. BID CATEGORY NO. 03 - METAL STUD/DRYWALL/CEILINGS

1. **Delete:**

   Specification Section 09 72 16 - Fabric Wall Covering

D. BID CATEGORY NO. 04 - PAINTING

1. **Add:**

   Specification Section 09 72 16 - Fabric Wall Covering

SECTION 00 20 00 - INFORMATION AVAILABLE TO BIDDERS

A. Subsurface Investigation Information: The Soils Exploration Report and Soil Boring Logs were prepared for the Owner by **Alt & Witzig Engineering, Inc., 4105 West 99th Street, Carmel, IN 46032, (317) 875-7000,** for use in design. The following Subsurface Investigation Report is not a part of the construction Contract Documents and is enclosed within this document for informational use only. The Architect/Engineer and Construction Manager do not accept responsibility for the information contained in the report.

1. The enclosed report and Log of Borings, and any interpolations of conditions between test borings is not a warrant or guarantee by the Owner or Architect/Engineer of subsurface conditions.
2. The Contractor should visit the site and acquaint himself with all existing conditions. Prior to bidding, bidders may make their own subsurface investigations to satisfy themselves as to the site and subsurface conditions, but such subsurface investigations shall be performed only under the time schedules and arrangements approved in advance by the Owner. Any additional information, needed by the Contractor, shall be obtained by the Contractor at no cost to the Owner.
3. Structural design has been based on the report and assumes that existing soils are clean and can be compacted and will achieve the densities specified in the earthwork section. It shall be the Contractor's responsibility to determine for himself existing Site and or soil conditions.

B. Existing Site Survey Information: A Site survey can be found within the construction drawings. It is not however, part of the Construction Contract Documents and is for informational use only. Information found is not a warrant or guarantee by the Owner or Project Consultant. The Contractor should visit the site and acquaint himself with all existing conditions. Any additional information, needed by the Contractor, shall be obtained by the Contractor at no cost to the Owner.

C. Asbestos Report: The Asbestos Report (if applicable), prepared for the Owner, is not part of the Construction Documents, and is on file at the Owner’s Office and is available for review upon written request. The Architect and Construction Manager do not accept responsibility for the information contained in the report.

D. Lead Based Paint: Lead Based Paint Report (if applicable), prepared for the Owner, is not part of the Construction Documents, and is on file at the Owner’s Office and is available for review upon written request. The Architect and Construction Manager do not accept responsibility for the information contained in the report.

END OF SECTION 00 20 00

SUBSURFACE INVESTIGATION & GEOTECHNICAL RECOMMENDATIONS

TRI-COUNTY SCHOOL IMPROVEMENTS
WOLCOTT AND REMINGTON, INDIANA
A&W PROJECT NO.: 24IN0392

PREPARED FOR:
TRI-COUNTY SCHOOL CORPORATION
WOLCOTT, INDIANA

PREPARED BY:
ALT & WITZIG ENGINEERING, INC.
GEOTECHNICAL DIVISION

AUGUST 16, 2024

Alt & Witzig Engineering, Inc.
4105 West 99th Street • Carmel, Indiana • 46032
Ph (317) 875-7000 • Fax (800) 875-6028

August 16, 2024

Tri-County School Corporation
105 North 2nd Street
Wolcott, Indiana 47995
Attn: Mr. Patrick Culp, Superintendent

Report of Subsurface Investigation and Geotechnical Recommendations

RE: Tri-County School Improvements
200 West North Street, 11298 West 100 South, and 300 East Michigan Street
Wolcott and Remington, Indiana
Alt & Witzig File: 24IN0392

Dear Mr. Culp:

In compliance with your request, we have conducted a subsurface investigation and geotechnical evaluation for the above referenced projects. It is our pleasure to transmit an electronic copy of the report.

The purpose of this subsurface investigation was to determine the various soil profile components, the engineering characteristics of the subsurface materials, and to provide criteria for use by the design engineers in assessing the sites for construction, preparation of site grading plans, and determination of appropriate foundation types. A detailed discussion of our subsurface investigation results and recommendations are presented herein.

We appreciated the opportunity to work with you on these projects. Often, because of design and construction details that occur on a project, questions arise concerning the soil conditions. If we can give further service in these matters, please contact us at your convenience.

JACOB L. RANKIN
REGISTERED
No. PE11900847
STATE OF
INDIANA
PROFESSIONAL ENGINEER

Sincerely,
Alt & Witzig Engineering, Inc.

Nicholas K. Hayes, E.I.

Jacob L. Rankin, M. Eng., P.E.

TABLE OF CONTENTS

INTRODUCTION

This report presents the results of a subsurface investigation performed for the proposed improvements to three (3) separate Tri-County Schools in Wolcott and Remington, Indiana. Our investigation was conducted for Tri-County School Corporation of Wolcott, Indiana. Authorization to perform this investigation was in the form of a proposal prepared by Alt & Witzig Engineering, Inc. (Alt & Witzig Proposal: *2406G011)* that was accepted by Joseph P. Briggs of Gibraltar Design.

The scope of this investigation included a review of geological maps of the areas and a review of geologic and related literature, a reconnaissance of the immediate sites, a subsurface exploration at each site, field and laboratory testing, and an engineering analysis and evaluation of the materials.

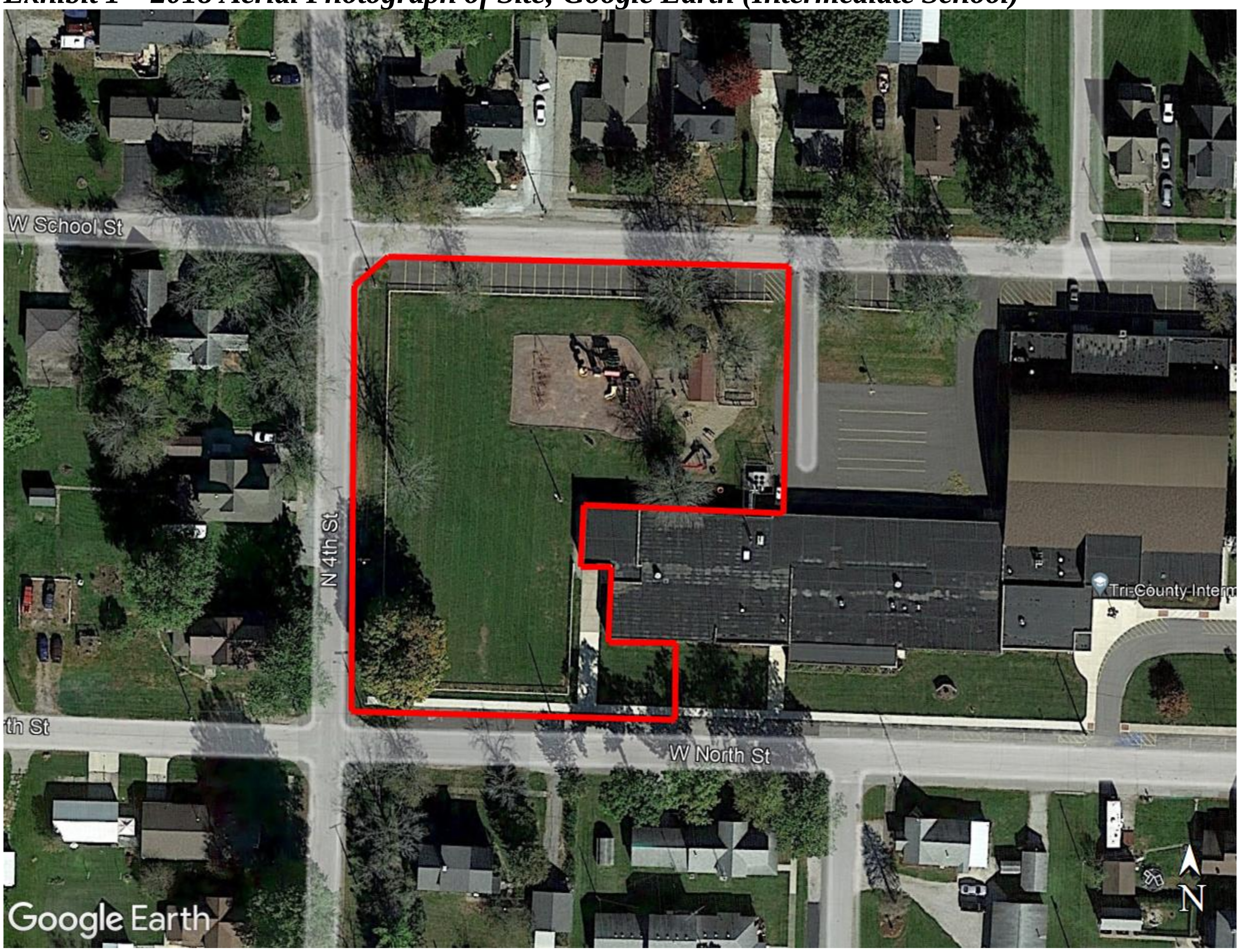
The purpose of this subsurface investigation was to determine the various soils profile components, the engineering characteristics of the subsurface materials, and to provide criteria for use in assessing the sites for construction and evaluating subsurface conditions.

The scope or purpose of this investigation did not either specifically or by implication provide an environmental assessment of the sites.

DESCRIPTION OF SITES

The first site is located at Tri-County Intermediate School, at the street address of 200 West North Street in Wolcott, Indiana. An aerial photograph of the site taken in 2018 is provided in *Exhibit 1* below.

Exhibit 1 – 2018 Aerial Photograph of Site; Google Earth (Intermediate School)



The site is relatively flat, with an estimated elevation difference of approximately one (1) foot across the area, with elevations ranging between 718 feet to 719 feet per Google Earth. Ground cover across the site during drilling operations consisted of grass. The immediate surrounding areas are developed with Tri-County Intermediate School, along with associated infrastructure and playgrounds. The surrounding areas are developed with both residential and commercial structures, paved roadways, and underground/overhead utilities.

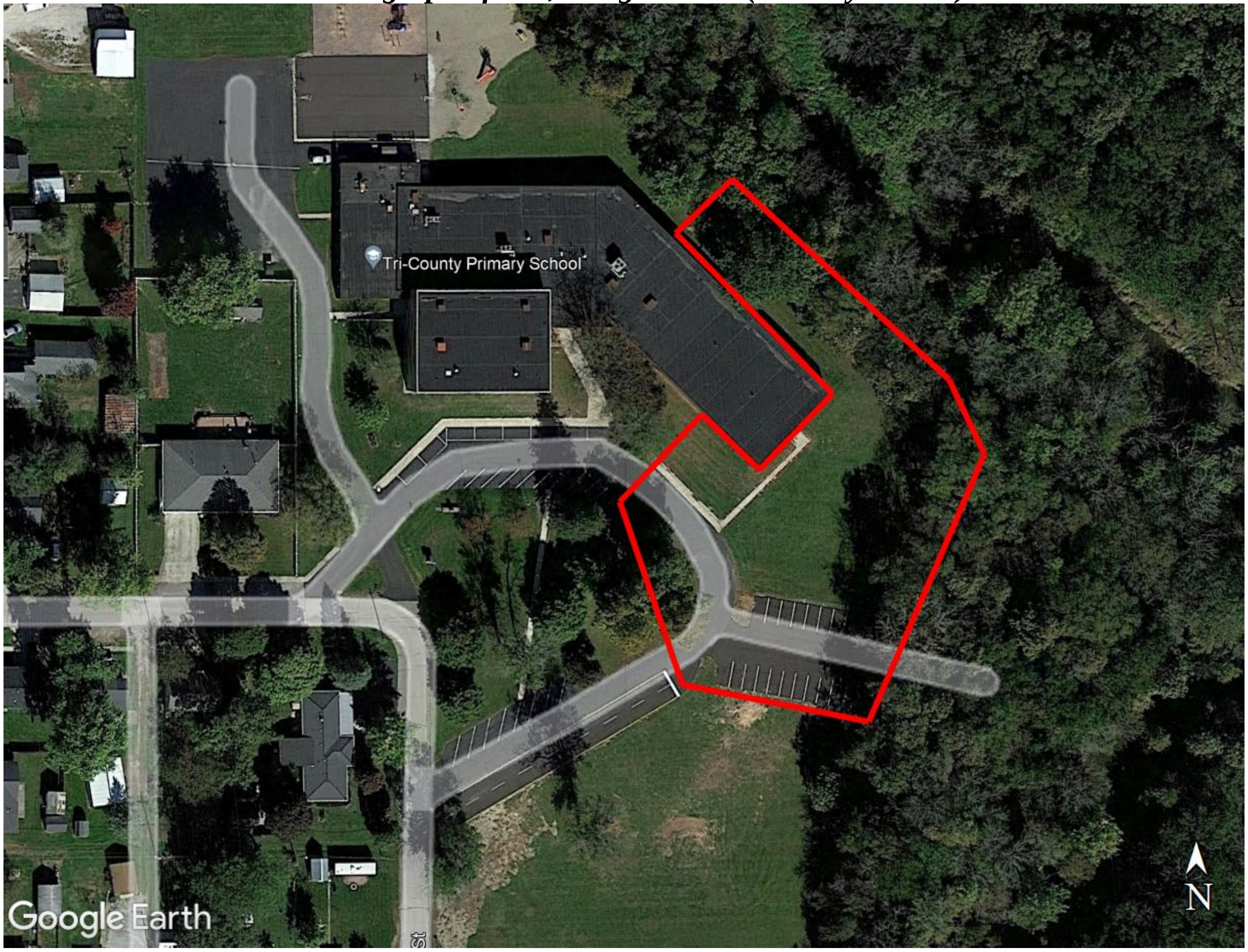
The second site is located at Tri-County Junior-Senior High School, at the street address of 11298 West 100 South in Wolcott, Indiana. An aerial photograph of the site taken in 2018 is provided in *Exhibit 2* below.

Exhibit 2 – 2018 Aerial Photograph of Site; Google Earth (JR/SR High School)

The proposed area is relatively flat, with an estimated elevation difference of approximately one (1) foot, with elevations ranging between 729 feet to 730 feet per Google Earth. Ground cover across the site during drilling operations consisted of grass. The immediate surrounding areas are developed with Tri-County Junior-Senior High School, along with associated infrastructure and sporting fields. The surrounding areas are developed with residential structures, paved roadways, underground/overhead utilities, and agricultural fields. Also, Mason Eastburn Ditch is located approximately 700 feet south of the site.

The third site is located at Tri-County Primary School, at the street address of 300 East Michigan Street in Remington, Indiana. An aerial photograph of the site taken in 2018 is provided in *Exhibit 3* below.

Exhibit 3 – 2018 Aerial Photograph of Site; Google Earth (Primary School)



The proposed site is sloping down from west to east, with an estimated elevation difference of five (5) feet, with elevations ranging between 725 feet to 730 feet per Google Earth. Ground cover across the site during drilling operations consisted of grass, concrete sidewalk, and asphalt pavement. The immediate surrounding areas are developed with Tri-County Primary School, along with associated infrastructure. The surrounding areas are developed with residential structures, paved roadways, and underground/overhead utilities. Also, a wooded area is present directly to the east, along with Carpenter Creek approximately 200 feet east.

FIELD INVESTIGATION

Boring Locations

Field investigations to determine the engineering characteristics of the subsurface materials included a reconnaissance of the project sites and performing five (5) soil borings at the Intermediate School, three (3) soil borings at the JR/SR High School, and four (4) borings at the Primary School. The boring locations can be located approximately as shown on the *Boring Location Plan*, performing standard penetration tests, and obtaining soil samples retained in the standard spilt-spoon sampler for further laboratory testing. The apparent groundwater level at each boring location was also determined.

Drilling and Sampling Procedures

The soil borings were drilled using a track-mounted drilling rig equipped with a rotary head. Hollow-stem augers were used to advance the holes. The advancement of the borings was temporarily stopped at regular intervals in order to perform standard penetration tests in accordance with ASTM Procedure D-1586 to obtain the standard penetration value of the soil.

The standard penetration test involves driving a split spoon soil sampler into the ground by dropping a 140-pound hammer, thirty (30) inches. The number of hammer drops required to advance the split-spoon sampler one (1) foot into the soil is defined as the standard penetration value. The soil samples retained in the split-spoon sampling device as a result of the penetration tests were obtained, classified, and labeled for further laboratory investigation.

Water Level Measurements

The apparent groundwater level at each boring location was measured during and upon completion of the drilling operations, as well as at delayed time intervals.

These water level measurements consisted of observing the depth at which water was encountered on the drilling rods during the soil sampling procedure and measuring the depth to the top of any water following removal of the hollow stem augers. It should be noted that the groundwater level measurements recorded on the individual *Boring Logs* in Appendix A of this report are accurate only for the specific dates on which the measurements were performed. It must be understood that the groundwater levels will fluctuate throughout the year and the *Boring Logs* do not indicate these fluctuations.

LABORATORY INVESTIGATION

In addition to field investigations, a supplemental laboratory investigation was conducted to ascertain additional pertinent engineering characteristics of the subsurface materials. The laboratory-testing program included:

- Classification of soils in general accordance with ASTM D-2488
- Moisture content tests in general accordance with ASTM D-2216
- Samples of the cohesive soil were frequently tested in unconfined compression by use of a calibrated spring testing machine.
- A soil Penetrometer was used as an aid in determining the strength of the soil.

The values of the unconfined compressive strength as determined on soil samples from the split-spoon sampling must be considered, recognizing the manner in which they were obtained since the split-spoon sampling techniques provide a representative but somewhat disturbed soil sample.

SUBSURFACE CONDITIONS

General

The types of foundation materials encountered have been visually classified and are described in detail on the *Boring Logs*. The results of the field penetration tests, strength tests, water level observations and laboratory water contents are presented on the *Boring Logs* in numerical form. Representative samples of the soils encountered in the field were placed in sample jars and are now stored in our laboratory for further analysis if desired. Unless notified to the contrary, all samples will be disposed of after two (2) months.

Soil Conditions

Borings B-01 to B-05 (Intermediate School)

The borings encountered approximately three (3) to four (4) inches of topsoil at the ground surface. Beneath the surface materials, the borings generally encountered medium stiff cohesive soils within the upper four (4) to seven (7) feet. These shallow soils generally exhibited moisture contents between twelve (12) and twenty-two (22) percent. The soils then transitioned to stiff to very stiff cohesive soils to depths ranging between fifteen (15) and nineteen (19) feet. Weathered shale bedrock was encountered at these depths and extended to the termination depths of the borings.

According to the *Soil Survey of White County, Indiana* published by the United States Department of Agriculture Soil Conservation Service, the majority of the natural shallow soil covering this site is classified as Conover loam (CnA).

Borings B-101 to B-103 (JR/SR High School)

The borings encountered approximately two (2) to four (4) inches of topsoil at the ground surface. Beneath the surface materials, the borings generally encountered soft to medium stiff cohesive soils within the upper four (4) to seven (7) feet of the borings. These shallow soils generally exhibited moisture contents between fourteen (14) and twenty-four (24) percent. The soils then transitioned to stiff to very stiff cohesive soils to depths ranging between ten (10) and twenty-four (24) feet. Weathered shale bedrock was then encountered to the termination depths of the borings. It should be noted that boring B-102 encountered a layer of dense granular soil at depths of nineteen (19) to twenty-two (22) feet.

According to the *Soil Survey of White County, Indiana* published by the United States Department of Agriculture Soil Conservation Service, the majority of the natural shallow soil covering this site is classified as Conover loam (CnA) and Wolcott clay loam (Wo).

Borings B-201 to B-204 (Primary School)

The borings encountered approximately three (3) to five (5) inches of topsoil at the ground surface. Beneath the surface materials, the borings generally encountered possible fill and fill materials, consisting of cohesive soils, within the upper four (4) to six (6) feet. It should noted that boring B-204 encountered brick debris within the fill materials. Beneath this layer, the borings generally encountered medium stiff to very stiff cohesive soils to the termination depths of the borings. Borings B-201, B-202, and B-203 encountered layers of silt soils at depths of nineteen (19) to thirty-one (31) feet.

According to the *Soil Survey of Jasper County, Indiana* published by the United States Department of Agriculture Soil Conservation Service, the majority of the natural shallow soil covering this site is classified as Corwin loam (CoB) and Sloan silt loam (So).

Detailed soil descriptions at each boring location have been included on the *Boring Logs* in Appendix A of this report. The Custom Soil Resource Reports for Johnson County and Jasper County, Indiana has been included in Appendix B.

Bedrock Geology

Borings B-01 to B-05 (Intermediate School)

Geologic maps published by the Indiana Geological Survey indicate the bedrock at this site consists of the New Albany Group, which is characterized by shale, dolomite, and sandstone of the Devonian/Mississippian age. The approximate elevation of this bedrock is 700 feet. As mentioned, bedrock was encountered as shallow as fifteen (15) feet.

Borings B-101 to B-103 (JR/SR High School)

Geologic maps published by the Indiana Geological Survey indicate the bedrock at this site consists of the New Albany Group, which is characterized by shale, dolomite, and sandstone of the Devonian/Mississippian age. The approximate elevation of this bedrock is between 700 and 750 feet. As mentioned, bedrock was encountered as shallow as ten (10) feet.

Borings B-201 to B-204 (Primary School)

Geologic maps published by the Indiana Geological Survey indicate the bedrock at this site consists of the New Albany Group, which is characterized by shale, dolomite, and sandstone of the Devonian/Mississippian age. The approximate elevation of this bedrock is 700 feet. It should be noted that bedrock was not encountered in the borings for the Primary School.

Seismic Design Considerations

Borings B-01 to B-05 (Intermediate School)

Based on the field and laboratory tests performed on the subsurface materials and the encountered bedrock within fifteen (15) to twenty (20) feet of the existing ground surface, this site should be considered a Site Class C in accordance with the current Indiana Building Code.

The location of the site was entered into the website www.seismicmaps.org to determine seismic parameters. Maximum spectral response acceleration values of Ss=0.128 and S_1=0.073 g were generated by the program.

Borings B-101 to B-103 (JR/SR High School)

Based on the field and laboratory tests performed on the subsurface materials and the encountered bedrock within ten (10) to twenty-four (24) feet below the existing ground surface, this site should be considered a Site Class C in accordance with the current Indiana Building Code.

The location of the site was entered into the website www.seismicmaps.org to determine seismic parameters. Maximum spectral response acceleration values of Ss=0.167 and S_1=0.089 g were generated by the program.

Borings B-201 to B-204 (Primary School)

Based on the field and laboratory tests performed on the subsurface materials and an assumption that the bedrock surface is greater than thirty (30) feet below the existing ground surface, this site should be considered a Site Class C in accordance with the current Indiana Building Code.

The location of the site was entered into the website www.seismicmaps.org to determine seismic parameters. Maximum spectral response acceleration values of Ss=0.130 and S_1=0.074 g were generated by the program.

Additional parameters are included in the printout in Appendix B for each school.

Groundwater

Tables 1, 2 and 3 below indicate the groundwater depths as encountered during and upon completion of the boring operations. The exact location of the water table may fluctuate somewhat depending upon normal seasonal variations in precipitation and surface runoff.

Table 1– Groundwater Depths (Intermediate School)

Boring ID	*During Drilling*	*Upon Completion*
B-01	*20.0 ft.*	*15.0 ft.*
B-02	*21.0 ft.*	*--*
B-03	*Dry*	*Dry*
B-04	*27.0 ft.*	*10.0 ft.*
B-05	*Dry*	*Dry*

Table 2– Groundwater Depths (JR/SR High School)

Boring ID	*During Drilling*	*Upon Completion*
B-101	*Dry*	*Dry*
B-102	*7.5 ft.*	*7.0 ft.*
B-103	*9.0 ft.*	*--*

Table 3– Groundwater Depths (Primary School)

Boring ID	*During Drilling*	*Upon Completion*
B-201	*19.0 ft.*	*12.5 ft.*
B-202	*Dry*	*Dry*
B-203	*14.0 ft.*	*12.0 ft.*
B-204	*Dry*	*Dry*

The *Soil Survey of White County and Jasper County, Indiana* indicates a seasonal high groundwater table as shallow as the natural ground surface. Again, it should be noted that the groundwater level measurements recorded on the individual *Boring Logs* included in Appendix B of this report, are accurate **only** for the dates on which the measurements were performed.

GEOTECHNICAL ANALYSIS & RECOMMENDATIONS

Project Description

It is anticipated that the proposed additions and improvements to the three (3) schools will be one to two-story, slab-on-grade additions. Also, it is understood that new pavements will be constructed. The location of the soil borings in relation to the layout of the sites are shown on the enclosed *Boring Location Plans*.

Grading plans were not available at the time of this report. It is assumed that finished grade will match the existing structures.

Approximate structural loads were not available at the time of this report. It is assumed that structural loads for the building will be transferred to the soils by spread footings and continuous wall footings founded at a shallow depth, if possible. It is assumed that the additions will experience maximum column loads in the range of 100-150 kips and wall loads of 2-4 klf. Once final design loads and grading plans are available, they should be submitted to Alt & Witzig Engineering, Inc. for review. After a review of this information, it will be determined if changes to these recommendations are warranted.

Existing Structure/Utility Concerns

As previously mentioned, the existing school buildings and associated infrastructure currently occupy each of the sites. Shallow, uncontrolled fills may be evident from activities associated with past construction. Care should be taken to properly abandon any existing utilities located in the area of the additions. At no time should new foundations be placed on or above abandoned utilities. Some loose fill materials should be anticipated in areas of the utilities. It is further recommended that if backfilling is required, a representative of Alt & Witzig Engineering, Inc. be present to assure that proper compaction is achieved.

Adjacent Foundations

New foundations to be placed near or adjacent to existing foundations should be constructed such that undermining of adjacent footings and lateral loading of footings located at a different elevation is avoided. If it is necessary to construct the new foundations within the "influence area" of the existing structures, shoring or underpinning of the existing structures will be necessary to allow for construction. The lateral loads applied by the existing footing should be considered in design of the proposed foundation. This investigation did not include the evaluation of the existing structures or foundation systems. Caution must be exercised during construction to not undermine existing foundations or jeopardize the integrity of the existing structures.

Foundation Recommendations

Considering the encountered soil conditions at the boring locations, the estimated loads of the structure, and the relative economics of the available foundation types, conventional spread and continuous wall footings founded at a shallow depth appear to represent a feasible foundation solution for this project.

Intermediate School

The borings encountered medium stiff cohesive soils near the anticipated footing depth. Therefore, net allowable bearing pressures of **2,000** and **1,600 psf** are recommended for dimensioning spread footings and continuous wall footings, respectively, provided they are founded on firm natural soil or properly compacted structural fill. Isolated undercuts may be necessary if unsuitable soils are encountered during the foundation excavations.

JR/SR High School

The borings encountered soft to medium stiff cohesive soils near the anticipated footing depth. Therefore, net allowable bearing pressures of **2,000** and **1,600 psf** are recommended for dimensioning spread footings and continuous wall footings, respectively, provided they are founded on firm natural soil or properly compacted structural fill. Isolated undercuts may be necessary where soft or unsuitable soils are encountered near the proposed foundation depth.

Primary School

As mentioned, the borings encountered fill and possible fill materials at the anticipated footing depths. Net allowable bearing pressures of **2,000** and **1,600 psf** are recommended for dimensioning spread footings and continuous wall footings, respectively, provided they are founded on the medium stiff soils or properly compacted structural fill. Isolated undercuts may be necessary where soft soils are encountered at or near the proposed foundation depth, such as in borings B-201 and B-203.

As mentioned, the Primary School site slopes down from west to east. It will be important to consider the slope of the hill when adding fill materials to establish the final grade. Benching of fill materials is outlined later in this report.

General

It is recommended that a representative of Alt & Witzig Engineering, Inc. inspect all foundation excavations prior to the placement of concrete. At the time of this inspection, Housel penetrometer or other approved tests may be performed in order to confirm that suitable materials are present.

The above recommended bearing pressures will help reduce differential settlements associated with footings founded on soil with varying stiffness across the building pad. Using the above-mentioned bearing pressure and recommendations for limiting settlements, total settlements of less than one (1) inch and differential settlements of one half (½) inch or less can be anticipated. In utilizing the above-mentioned net allowable pressures for dimensioning footings, it is necessary to consider only those loads applied above the finished floor elevation.

In order 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 three (3) feet below the final grade.

Some modifications to the recommendations provided in this report may be necessary based on potential complications or modifications to the design plan. The modifications may influence the overall cost of the project and construction sequence. If complications become apparent to the design team or owner, this information should be provided to Alt & Witzig Engineering, Inc. at the earliest possible date.

Floor Slab Recommendations

It is typically desirable to place the floor slab as a slab-on-grade supported by the soil. In the areas where the existing grade is above the final floor elevation, the building area should be undercut and a well-draining granular material placed beneath the slab. In those areas where the existing grade is below the final floor elevation, a well-compacted structural fill will be necessary to raise the site to the desired grade. All fill materials may consist of approved materials if proper moisture content and compaction procedures are maintained.

Prior to elevating the sites, all surface materials should be stripped from the site. The subgrade soils must then be proofrolled with approved equipment. It is recommended that a representative of Alt & Witzig Engineering, Inc. be present to determine the exact depth of undercutting and to monitor backfilling operations if necessary. Areas of shallow unstable materials should be anticipated in most areas due to elevated moisture contents and encountered fill materials. The exact remediation method used will be dependent upon the size of the area and the types of materials encountered, as well as the project schedule. If weather conditions are favorable, the soils may be aerated, dried, and recompacted or undercut and replaced. However, if weather conditions or construction schedule dictate immediate improvement then undercutting and replacement or chemical modification may be necessary. Remediation will be dictated by the field conditions upon construction.

After the building area has been raised to the proper elevation, a layer of well-draining granular material should be placed immediately beneath all floor slabs. It is recommended that the materials within the subgrade area, above footing elevation, be compacted to a minimum density of 93 percent of maximum density in accordance with ASTM D-1557.

Pavement Subgrade Preparations

The strength of the subgrade soils at this site depends upon several variables including compaction and drainage. It is, therefore, extremely important that all paved areas be designed to prevent water from collecting or ponding immediately beneath the pavement. This can be accomplished by sheet draining the parking area and sloping the subgrade soils and outletting them to a drain or a ditch to allow for subgrade drainage, or by the installation of a subsurface drainage system. It is recommended that underdrains be installed at the transitions from concrete to asphalt as well.

For these soils to provide adequate support for pavement, it will also be necessary that the earthmoving contractor follow proper site work techniques. The exposed subgrade should be proof-rolled with equipment approved by a representative of Alt & Witzig Engineering, Inc. This proof-rolling will assist in identifying pockets of soft unstable materials beneath exposed subgrades. As mentioned before, areas of shallow unstable materials should be anticipated due to elevated moisture contents and the encountered fill materials. The exact remediation method used will be dependent upon the size of the area and the types of materials encountered, as well as the project schedule. If weather conditions are favorable, the soils may be aerated, dried, and recompacted or undercut and replaced. However, if weather conditions or construction schedule dictate immediate improvement then undercutting and replacement or chemical modification may be necessary. Remediation will be dictated by the field conditions upon construction.

In areas where fill will be required to raise the site to proposed grade, the performance of the pavements will be greatly affected by the quality of compaction achieved in the subgrade soils. Thus, it is recommended that all pavement areas be compacted to 93 percent of the material's maximum dry density as determined by ASTM D-1557.

CONSTRUCTION CONSIDERATIONS

Site Preparation

Excessively organic topsoil and loose dumped fill materials will generally undergo high volume changes that are detrimental to the behavior of floor slabs, structural fills, and foundations placed upon them. It is recommended that all topsoil and/or loose materials be stripped from the construction areas and wasted or stockpiled for later use.

The depth and consistency of these materials will vary across the site. It should be noted that the soil borings only indicate the apparent topsoil, asphalt, concrete, and stone thickness at their specific locations. Borings do not indicate variations in the thickness of these layers between selected locations. Thus, borings only provide a general indication of the amount of stripping.

The condition of the subgrade at the time of earthmoving operations and the methods used by the contractor will influence the depth of stripping. A representative of Alt & Witzig Engineering, Inc. in the field should determine the exact depth of stripping and undercutting at the time of stripping operations.

It is recommended that after the above-mentioned stripping procedures have been performed, the exposed subgrade should be proofrolled with approved equipment. This proofrolling will determine where areas of soft unsuitable materials are encountered. Due to the elevated moisture contents encountered in natural cohesive soils and the encountered fill materials, it is anticipated that some subgrade soils will not favorably pass a proofroll inspection. It is recommended that a representative of Alt & Witzig Engineering, Inc. be present for this phase of this project.

After the existing subgrade soils are excavated to design grade, proper control of subgrade compaction and fill, and structural fill replacement should be maintained in accordance with the *Recommended Specifications for Compacted Fills and Backfills*, presented in Appendix A of this report; thus minimizing volume changes and differential settlements which are detrimental to behavior of shallow foundations, floor slabs, and pavements.

Benched Fills (Primary School)

Given the existing relief, it may be necessary to properly integrate these fills with the natural topography to avoid the creation of a slip surface leading to potential slope instability by benching the fills into the natural hillside. Benches should be of sufficient width to accommodate the required compaction equipment (minimum 10 feet). Benching of natural slopes and existing embankments slopes steeper than 4H:1V should be performed in accordance with Section 203.21 of the INDOT Standard Specifications and the *Benching Diagram* in Appendix A. Finished earth slopes shall not exceed 3H:1V if the slope will be finished with grass that is to be mowed. Slopes steeper than 3:1 may be possible with special consideration to erosion control and slope stability.

Rock Excavations

The soil borings indicate the presence of weathered shale bedrock. During drilling, slow penetration rates were achieved within the weathered rock and hard residual soils. It is anticipated that large excavators with rippers will be necessary to provide initial loosening of the bedrock. Deeper excavation into the bedrock should be anticipated to require jackhammering or blasting.

Groundwater

Depending upon the time of the year and the weather conditions when the excavations are made, seepage from surface runoff may occur into shallow excavations or soften the subgrade soils. Since these foundation materials tend to loosen when exposed to free water, every effort should be made to keep the excavations dry should water be encountered. Sump pumps or other conventional dewatering procedures should be sufficient for this purpose within the cohesive soils. Significant dewatering should be expected if excavations penetrate groundwater within a wet sand layer.

It is also recommended that all concrete for footings be poured the same day as the excavation is made.

STATEMENT OF LIMITATIONS

This report is solely for the use of Tri-County School Corporation and any reliance of this report by third parties shall be at such party's sole risk and may not contain sufficient information for purposes of other parties for other uses. This report shall only be presented in full and may not be used to support any other objectives than those set out in the scope of work, except where written approval and consent are provided by Tri-County School Corporation and Alt & Witzig Engineering, Inc.

An inherent limitation of any geotechnical engineering study is that conclusions must be drawn based on data collected at a limited number of discrete locations. The geotechnical parameters provided in this report were developed from the information obtained from the test borings that depict subsurface conditions only at these specific locations and on the date indicated on the boring logs. Soil conditions at other locations may differ from conditions encountered at these boring locations and groundwater levels shall be expected to vary with time. The nature and extent of variations between the borings may not become evident until the course of construction.

The exploration and analysis reported herein is considered in sufficient detail and scope to form a reasonable basis for initial design. The recommendations submitted are based on the available soil information and assumed design details enumerated in this report. If actual design details differ from those specified in this report, this information should be brought to the attention of Alt & Witzig Engineering, Inc. so that it may be determined if changes in the foundation recommendations are required.

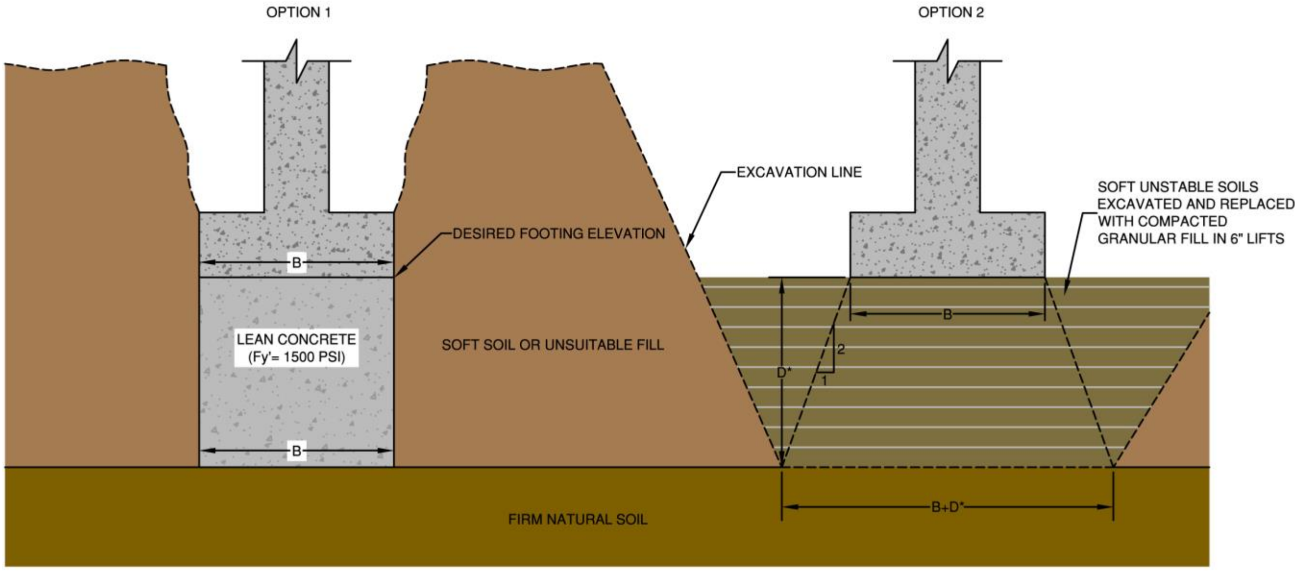
APPENDIX A

Recommended Specifications for Compacted Fills and Backfills
Undercut Detail for Footing Excavation in Unstable Materials
Benching Diagram
Boring Location Plan
Boring Logs
General Notes

RECOMMENDED SPECIFICATIONS FOR COMPACTED FILLS AND BACKFILLS

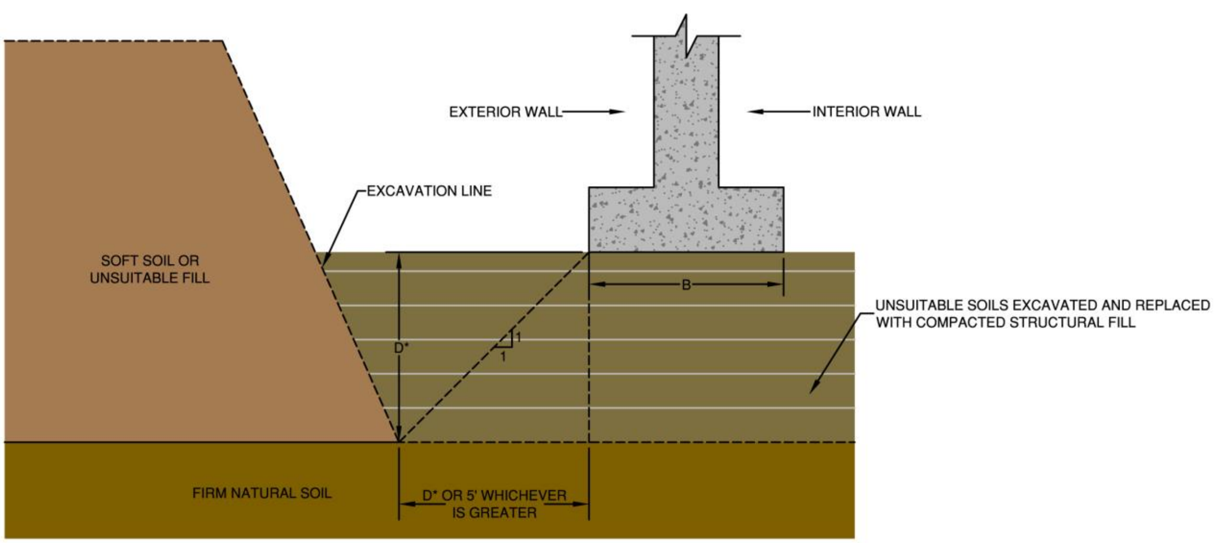
All fill shall be formed from material free of vegetable matter, rubbish, large rock, and other deleterious material. Prior to placement of fill, a sample of the proposed fill material should be submitted to Alt & Witzig Engineering, Inc. for approval. The surface of each layer will be approximately horizontal but will be provided with sufficient longitudinal and transverse slope to provide for runoff of surface water from every point. The fill material should be placed in layers not to exceed eight (8) inches in loose thickness. 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. The addition of water may be required if the fill is below moisture content that will permit compaction. All fill should be compacted to the specified percent of the maximum density obtained in accordance with ASTM density Test D-1557 (95 percent of maximum dry density below the base of footing elevation, 93 percent of maximum dry density beneath floor slabs and pavements). 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.

UNDERCUT EXCAVATION FOR ISOLATED FOOTINGS IN UNSTABLE MATERIALS



D* IS DEPTH FOR SUITABLE SOILS

MASS EXCAVATION FOR FOOTINGS IN UNSTABLE MATERIALS

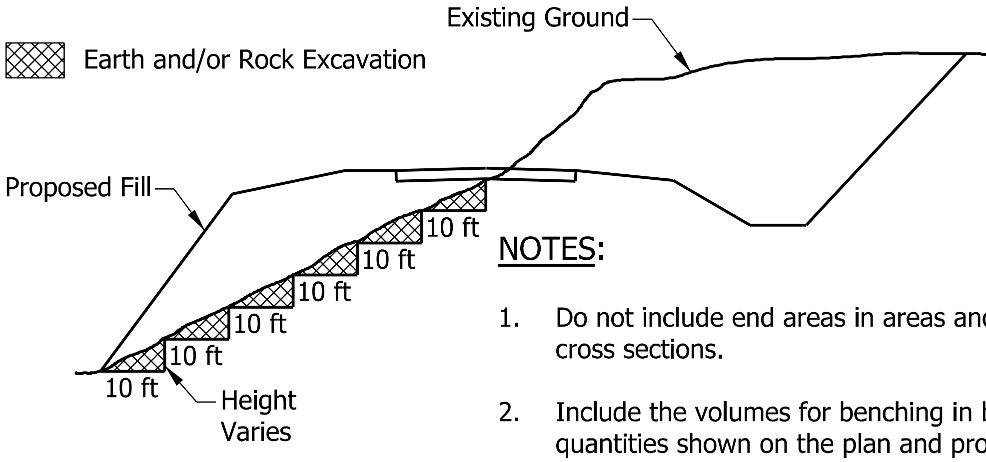


D* IS DEPTH FOR SUITABLE SOILS

Undercut Detail for Footing Excavation in Unstable Material

PROJECT: **Tri-County School Improvements**
LOCATION: **Wolcott & Remington, IN**
CLIENT: **Tri-County School Corporation**
A&W File No.: 24IN0392

Alt & Witzig Engineering Inc.
4105 W. 99th Street ·Carmel, IN 46032
TEL (317)875-7000 · FAX (317) 876-3705
www.altwitzig.com

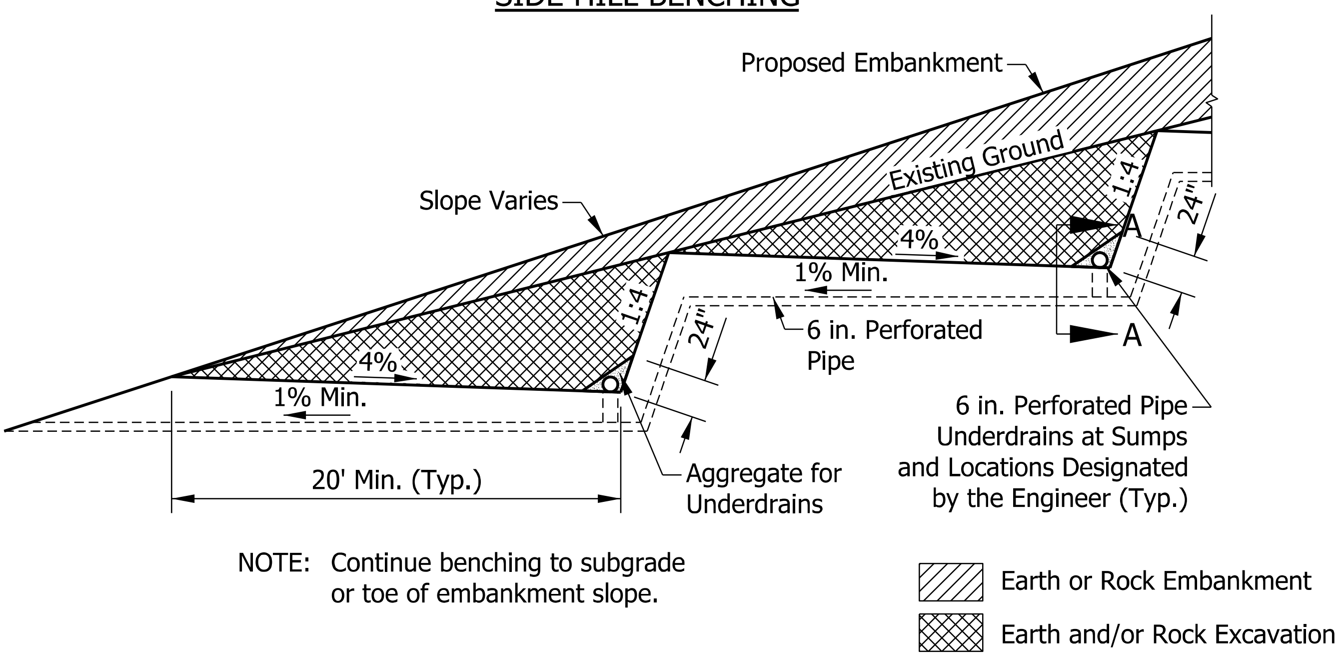


NOTES:

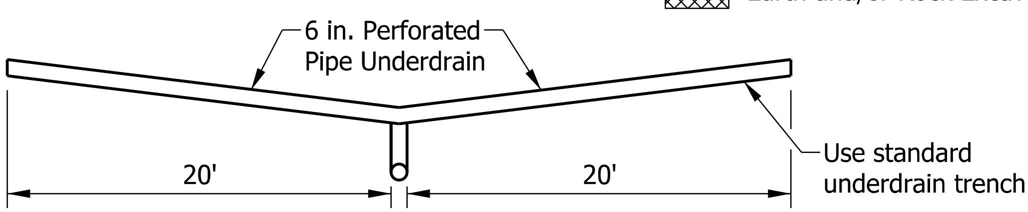
1. Do not include end areas in areas and volumes shown on cross sections.

2. Include the volumes for benching in both the cut and fill quantities shown on the plan and profile sheet for the balance or balances in which the quantities occur. Add the following note:
"The above quantities include ____ ft³ of cut and ____ ft³ of fill for benching from Sta. ____ to Sta. ____."

SIDE HILL BENCHING



NOTE: Continue benching to subgrade or toe of embankment slope.

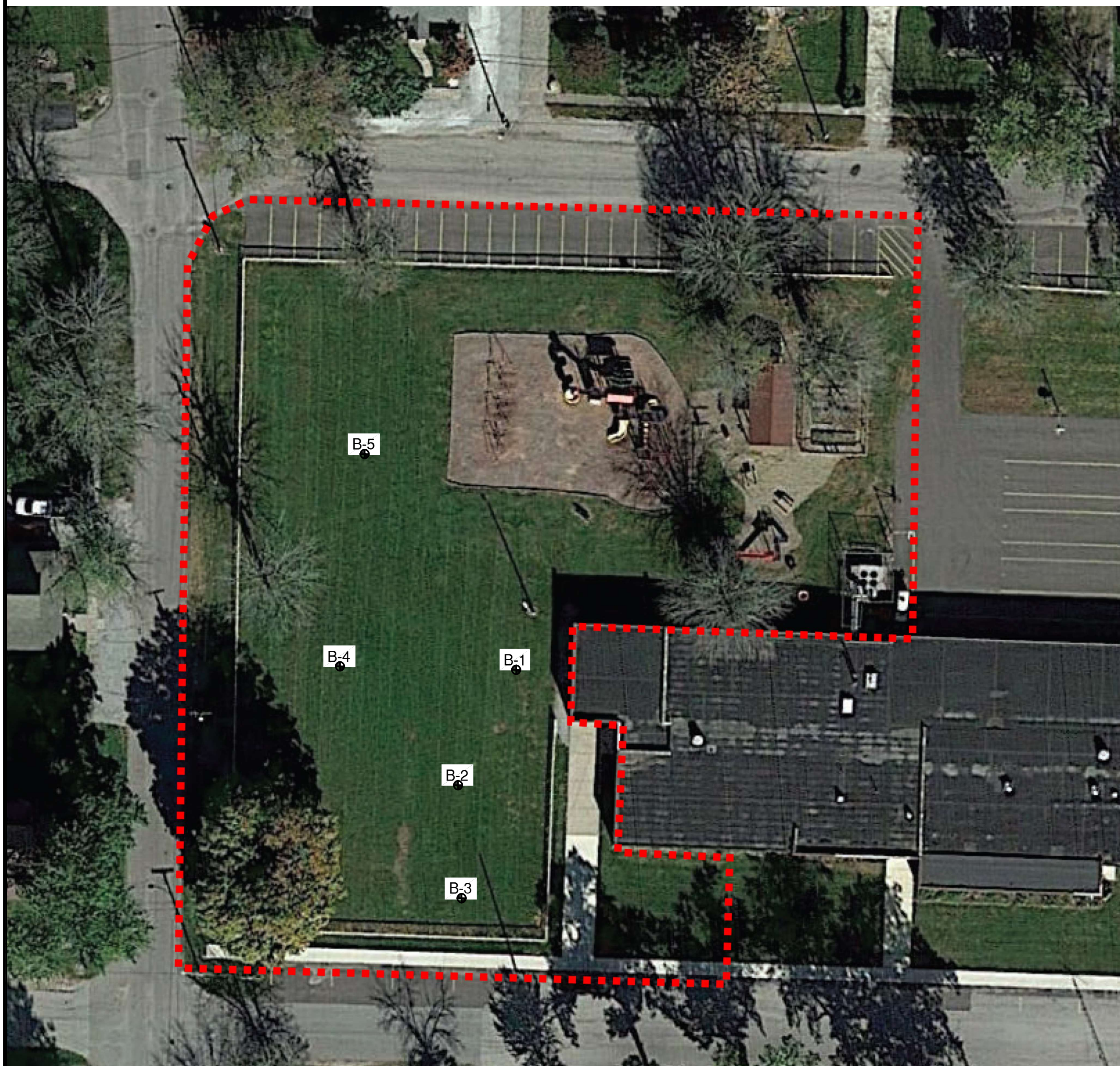


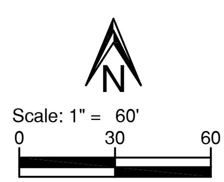
SECTION A-A
BENCHING WHEN WATER IS ENCOUNTERED

TYPICAL BENCHING METHODS

Figure 107-6B

Back



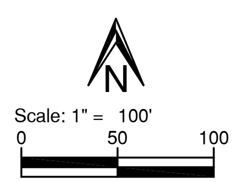


BORING LOCATION PLAN-1

PROJECT NAME: Tri-County School Improvements
LOCATION: 200 W. North St., Wolcott, IN
PREPARED FOR: Tri-County School Corporation
PROJECT NO: 24IN0392

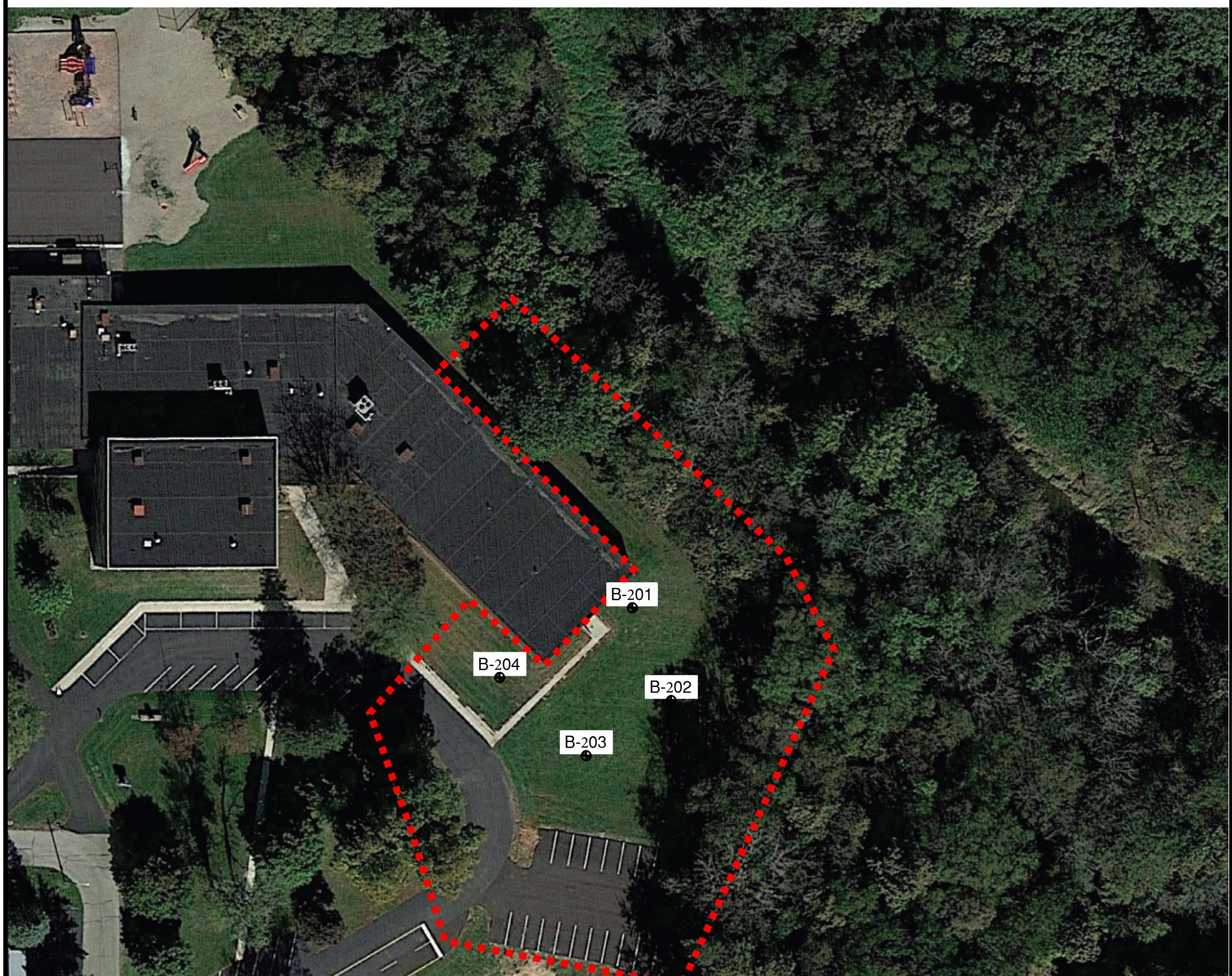
Project Manager:NH
Checked By:JR
Drawn By:JT
Date: 07/24

Alt & Witzig Engineering, Inc.
4105 West 99th Street • Carmel, IN 46032
Telephone: (317) 875-7000 • Fax (800) 875-6028



BORING LOCATION PLAN-2

PROJECT NAME: Tri-County School Improvements	Project Manager:NH	Alt & Witzig Engineering, Inc.
LOCATION: 11298 W. 100 S., Wolcott, IN	Checked By:JR	4105 West 99th Street • Carmel, IN 46032
PREPARED FOR: Tri-County School Corporation	Drawn By:JT	Telephone: (317) 875-7000 • Fax (800) 875-6028
PROJECT NO: 24IN0392	Date: 07/24	



N

Scale: 1" = 100'

0 50 100

BORING LOCATION PLAN-3

PROJECT NAME: Tri-County School Improvements LOCATION: 300 E. Michigan St., Remington, IN PREPARED FOR: Tri-County School Corporation PROJECT NO: 24IN0392	Project Manager:NH Checked By:JR Drawn By:JT Date: 07/24	A&W Alt & Witzig Engineering, Inc. 4105 West 99th Street • Carmel, IN 46032 Telephone: (317) 875-7000 • Fax (800) 875-6028

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT: **Tri-County School Corporation**
BORING #: **B-01**
PROJECT NAME: **Tri-County School Improvements**
ALT & WITZIG FILE #: **24IN0392**
PROJECT LOCATION: **Wolcott and Remington, IN**

DRILLING and SAMPLING INFORMATION

Date Started	**7/29/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/29/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 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	0.3										
	Dark Brown Silty CLAY *(Possible Fill)*	4.0		1	SS			8		2.0	22.4	
	Brown and Gray Silty CLAY	7.0	5	2	SS			5		0.5	17.0	
	Gray Silty CLAY	17.0		3	SS			16		4.5	12.5	
			10	4	SS			15		2.5	10.3	
			15	5	SS		▽	36		4.5	8.8	
	Gray Weathered Shale	31.0	20	6	SS		○	50/2"				
			25	7	SS			50/3"				
			30	8	SS			50/2"				
	End of Boring at 31 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 *20.0 ft.*
▽ At Completion *15.0 ft.*

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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation**
PROJECT NAME **Tri-County School Improvements**
PROJECT LOCATION **Wolcott and Remington, IN**

BORING # **B-02**
ALT & WITZIG FILE # **24IN0392**

DRILLING and SAMPLING INFORMATION

Date Started **7/29/24**
Date Completed **7/29/24**
Boring Method **HSA**
Driller **D. McWherter**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **CME 55 ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth
	TOPSOIL	0.3
	Dark Brown Silty CLAY	4.0
	Brown and Gray Silty CLAY	7.0
	Gray Silty CLAY with Gravel	19.0
	Gray Weathered Shale	31.0
	End of Boring at 31 feet	

TEST DATA

Depth Scale	Sample No.	Sample Type	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % *Dry Unit Weight (pcf)*	Remarks
	1	SS	5		2.0	21.9	
5	2	SS	8		2.0	17.2	
	3	SS	20		4.5	11.2	
10	4	SS	12		4.5	9.6	
15	5	SS	35				Driving on a Rock, No Recovery
20	6	SS	50/2"			8.8	
25	7	SS	50/2"				
30	8	SS	50/3"				

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 *21.0 ft.*
▽ At Completion *ft.*
▼ After *1.5* hours *16.0 ft.*

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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation**

PROJECT NAME **Tri-County School Improvements**

PROJECT LOCATION **Wolcott and Remington, IN**

BORING # **B-03**

ALT & WITZIG FILE # **24IN0392**

DRILLING and SAMPLING INFORMATION

Date Started	**7/29/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/29/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 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	0.3										
	Brown Clayey SILT	4.0		1	SS			7	0.5		16.2	
	Brown Silty CLAY with a Trace of Gravel	9.0	5	2	SS			15	1.5		14.3	
				3	SS			12	2.2		19.4	
	Gray Silty CLAY with Shale	11.0	10	4	SS			14		2.5	12.9	
	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.*
After *3.0* hours *Dry ft.*

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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation**

PROJECT NAME **Tri-County School Improvements**

PROJECT LOCATION **Wolcott and Remington, IN**

BORING # **B-04**

ALT & WITZIG FILE # **24IN0392**

DRILLING and SAMPLING INFORMATION

Date Started	**7/29/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/29/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 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	0.3										
	Brown Silty CLAY			1	SS			5		0.3	18.1	
			5	2	SS		▼	11		3.0	13.3	
		7.0										
	Gray Silty CLAY with Shale			3	SS			16	4.6	4.5	13.4	
			10	4	SS		∇	20	5.1	4.5	8.3	
		15.0										
	Gray Weathered Shale		15	5	SS			35				
			20	6	SS			82				
			25	7	SS		○	50/4"				
		31.0	30	8	SS			50/2"				
	End of Boring at 31 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 *27.0 ft.*
∇ At Completion *10.0 ft.*
▼ After *5.0* hours *6.0 ft.*

Boring Method

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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation**

PROJECT NAME **Tri-County School Improvements**

PROJECT LOCATION **Wolcott and Remington, IN**

BORING # **B-05**

ALT & WITZIG FILE # **24IN0392**

DRILLING and SAMPLING INFORMATION

Date Started	**7/29/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/29/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 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	0.3										
	Brown Sandy CLAY			1	SS			6		0.8	12.5	
		4.0										
	Brown Silty CLAY		5	2	SS			12		0.5	16.7	
		7.0					▼					
	Gray Silty CLAY with a Trace of Gravel			3	SS			9	2.6	1.5	16.7	
			10	4	SS			5	0.8		15.4	
		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.*
▼ After *7.0* hours *7.0 ft.*

Boring Method

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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation**
BORING # **B-101**
PROJECT NAME **Tri-County School Improvements**
ALT & WITZIG FILE # **24IN0392**
PROJECT LOCATION **Wolcott and Remington, IN**

DRILLING and SAMPLING INFORMATION

Date Started	**7/31/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/31/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 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	0.3										
	Brown Sandy Silty CLAY	4.0		1	SS			15	5.4	4.0	14.2	
	Brown Sandy CLAY	6.5	5	2	SS			9	2.1	2.3	16.3	
	Gray Silty CLAY	9.0		3	SS			13	3.3	4.5	11.6	
	Gray Silty CLAY with Weathered Shale	12.0	10	4	SS			9	5.4	4.5	11.3	
	Gray Weathered Shale		15	5	SS			50/3"				
			20	6	SS			50/4"				
			25	7	SS			50/4"				
		31.0	30	8	SS			50/3"				
	End of Boring at 31 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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation**
PROJECT NAME **Tri-County School Improvements**
PROJECT LOCATION **Wolcott and Remington, IN**

BORING # **B-102**
ALT & WITZIG FILE # **24IN0392**

DRILLING and SAMPLING INFORMATION

Date Started	**7/31/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/31/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 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	0.2										
	Brown and Gray Silty CLAY			1	SS			5	0.8		24.3	
		6.0	5	2	SS			4		3.0	17.8	
	Gray Silty CLAY with a Trace of Gravel			3	SS		▽ ○	9	1.6	1.0	13.9	
			10	4	SS			34		4.5	11.6	
			15	5	SS			40		4.5	11.0	
		19.0										
	Brown, Wet SAND		20	6	SS			35				
		22.0										
	Gray Sandy Silty CLAY	24.0										
	Gray Weathered Shale		25	7	SS			70				
		31.0	30	8	SS			50/4"				
	End of Boring at 31 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 *7.5 ft.*
▽ At Completion *7.0 ft.*

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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation**
PROJECT NAME **Tri-County School Improvements**
PROJECT LOCATION **Wolcott and Remington, IN**

BORING # **B-103**
ALT & WITZIG FILE # **24IN0392**

DRILLING and SAMPLING INFORMATION

Date Started **7/31/24**
Date Completed **7/31/24**
Boring Method **HSA**
Driller **D. McWherter**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **CME 55 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	0.3										
	Brown and Gray Silty CLAY			1	SS			9		3.0	15.0	
			5	2	SS			5	0.4	0.8	20.8	
		7.0										
	Gray Silty CLAY with a Trace of Gravel			3	SS			16	1.2	1.3	13.9	
							○					
		10.0	10	4	SS			50/2"				
	Gray Weathered Shale		15	5	SS			50/5"				
		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 *9.0 ft.*
∇ At Completion *ft.*

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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT: **Tri-County School Corporation**
PROJECT NAME: **Tri-County School Improvements**
PROJECT LOCATION: **Wolcott and Remington, IN**

BORING #: **B-201**
ALT & WITZIG FILE #: **24IN0392**

DRILLING and SAMPLING INFORMATION

Date Started	**7/30/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/30/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 ATV**

TEST DATA

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	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	0.4									
	Dark Brown Sandy Silty CLAY with Gravel *(FILL)*			1	SS		2				2 Attempts, No Recovery
		6.0	5	2	SS		10		2.5	25.2	
	Brown and Gray Sandy Silty CLAY			3	SS		13	3.3		13.8	
			10	4	SS		23		4.5	15.1	
		14.0				▽ (At Completion)					
	Gray Silty CLAY		15	5	SS		14		4.5	12.2	
		19.0				○ (During Drilling)					
	Gray SILT	24.0	20	6	SS		14		2.0	18.8	
	Gray Silty CLAY	26.0	25	7	SS		15	5.4	4.5	10.3	
	End of Boring at 26 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 *19.0 ft.*
▽ At Completion *12.5 ft.*

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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation**

BORING # **B-202**

PROJECT NAME **Tri-County School Improvements**

ALT & WITZIG FILE # **24IN0392**

PROJECT LOCATION **Wolcott and Remington, IN**

DRILLING and SAMPLING INFORMATION

Date Started	**7/30/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/30/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth
	TOPSOIL	0.4
	Brown Sandy CLAY *(Possible Fill)*	4.0
	Brown Clayey SAND	6.0
	Gray Silty CLAY	24.0
	Gray SILT	31.0
	End of Boring at 31 feet	

TEST DATA

Depth Scale	Sample No.	Sample Type	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % *Dry Unit Weight (pcf)*	Remarks
	1	SS		7	2.1	2.5	18.1	
5	2	SS		6				
	3	SS		8	3.3		14.8	
10	4	SS		8	3.1		15.2	
15	5	SS		17	4.7		16.0	
20	6	SS		17	5.4	4.5	10.9	
25	7	SS		8	3.3		23.5	
30	8	SS		11	2.3	2.5	18.9	

Sample Type	Groundwater	Boring Method
SS - Driven Split Spoon	○ During Drilling *Dry ft.*	HSA - Hollow Stem Augers
ST - Pressed Shelby Tube	∇ At Completion *Dry ft.*	CFA - Continuous Flight Augers
CA - Continuous Flight Auger		DC - Driving Casing
RC - Rock Core		MD - Mud Drilling
CU - Cuttings		
CT - Continuous Tube		

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation**

PROJECT NAME **Tri-County School Improvements**

PROJECT LOCATION **Wolcott and Remington, IN**

BORING # **B-203**

ALT & WITZIG FILE # **24IN0392**

DRILLING and SAMPLING INFORMATION

Date Started	**7/30/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/30/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 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	0.3										
	Dark Brown Sandy CLAY *(Possible Fill)*	4.0		1	SS			4	0.9		19.1	
	Brown Silty CLAY	7.0	5	2	SS			16		4.5	16.1	
	Gray Sandy Silty CLAY	19.0		3	SS			14	5.4	4.5	7.7	
			10	4	SS			13	5.0	4.5	12.9	
							▼ ∇ (11.5 ft / 12.0 ft)					
							○ (14.0 ft)					
			15	5	SS			9	3.3		10.4	
	Gray SILT	31.0	20	6	SS			14		2.3	20.4	
			25	7	SS			10			26.3	
			30	8	SS			8	3.5		24.5	
	End of Boring at 31 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 *14.0 ft.*
- ∇ At Completion *12.0 ft.*
- ▼ After *3.5* hours *11.5 ft.*

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

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Tri-County School Corporation** BORING # **B-204**

PROJECT NAME **Tri-County School Improvements** ALT & WITZIG FILE # **24IN0392**

PROJECT LOCATION **Wolcott and Remington, IN**

DRILLING and SAMPLING INFORMATION

Date Started	**7/31/24**	Hammer Wt.	**140** lbs.
Date Completed	**7/31/24**	Hammer Drop	**30** in.
Boring Method	**HSA**	Spoon Sampler OD	**2** in.
Driller	**D. McWherter**	Rig Type	**CME 55 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
	Brown Silty CLAY with Brick *(FILL)*	4.0		1	SS			4			16.4	
	Brown Sandy CLAY	7.0	5	2	SS			7	1.2	1.3	16.5	
	Brown and Gray Sandy Silty CLAY	11.0		3	SS			15		4.5	17.7	
			10	4	SS			19	5.4	4.5	13.9	
	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

MATERIAL GRAPHICS LEGEND

- CL-ML: USCS Low Plasticity Silty Clay
- CL: USCS Low Plasticity Sandy Clay
- FILL: Fill (made ground)
- ML: USCS Silt
- SC: USCS Clayey Sand
- SHALE: Shale
- SP: USCS Poorly-graded Sand
- TOPSOIL

SOIL PROPERTY SYMBOLS

N: *Standard "N" penetration value. Blows per foot of a 140-lb hammer falling 30" on a 2" O.D. split-spoon.*

Qu: *Unconfined Compressive Strength, tsf*

PP: *Pocket Penetrometer, tsf*

LL: *Liquid Limit, %*

PL: *Plastic Limit, %*

PI: *Plasticity Index, %*

DRILLING AND SAMPLING SYMBOLS

GROUNDWATER SYMBOLS

○ *Apparent water level noted while drilling.*

▽ *Apparent water level noted upon completion.*

▼ *Apparent water level noted upon delayed time.*

SAMPLER SYMBOLS

☒ SS: Split Spoon

RELATIVE DENSITY & CONSISTANCY CLASSIFICATION (NON-COHESIVE SOILS)

TERM	*BLOWS PER FOOT*
Very Loose	0 - 5
Loose	6 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	>51

RELATIVE DENSITY & CONSISTANCY CLASSIFICATION (COHESIVE SOILS)

TERM	*BLOWS PER FOOT*
Very Soft	0 - 3
Soft	4 - 5
Medium Stiff	6 - 10
Stiff	11 - 15
Very Stiff	16 - 30
Hard	>31

Alt & Witzig

Telephone:
Fax:

GENERAL NOTES

Project: Tri-County School Improvements

Location: Wolcott and Remington, IN

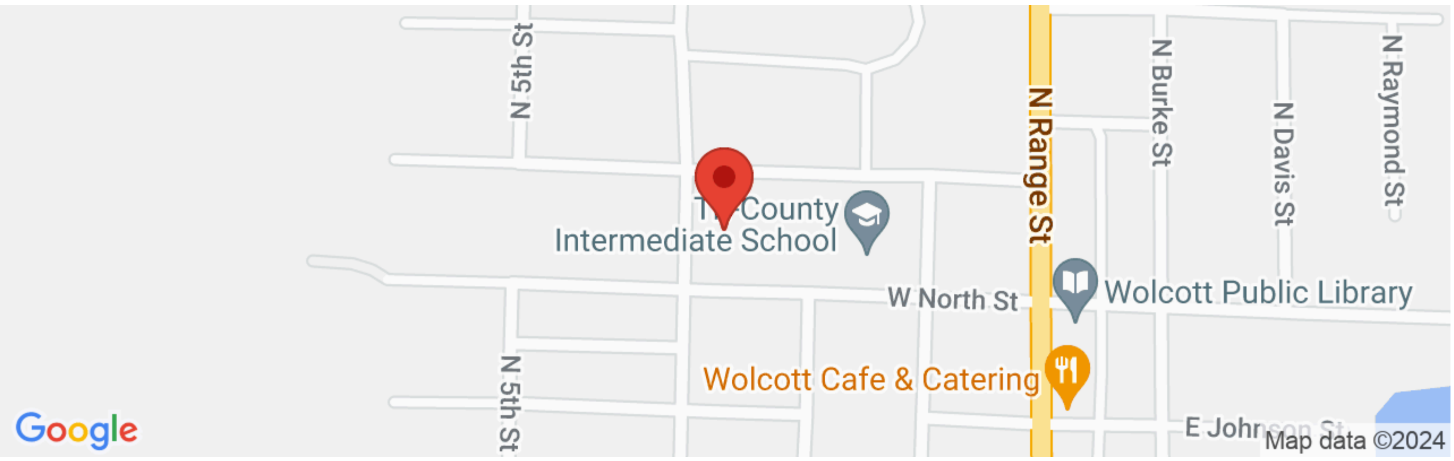
Number: 24IN0392

APPENDIX B

Seismic Design Parameters
Custom Soil Resource Reports for White County and Jasper County, Indiana

24IN0392 - Intermediate School

Latitude, Longitude: 40.760768, -87.044578



Date	8/5/2024, 2:06:18 PM
Design Code Reference Document	IBC-2015
Risk Category	III
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	0.128	MCE_R ground motion. (for 0.2 second period)
S_1	0.073	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.153	Site-modified spectral acceleration value
S_{M1}	0.124	Site-modified spectral acceleration value
S_{DS}	0.102	Numeric seismic design value at 0.2 second SA
S_{D1}	0.083	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	B	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.7	Site amplification factor at 1.0 second
PGA	0.058	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.07	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
SsRT	0.128	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.141	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.073	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.086	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.6	Factored deterministic acceleration value. (Peak Ground Acceleration)

Type	Value	Description
PGA_{UH}	0.058	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.905	Mapped value of the risk coefficient at short periods
C_{R1}	0.854	Mapped value of the risk coefficient at a period of 1 s
C_V		Vertical coefficient

DISCLAIMER

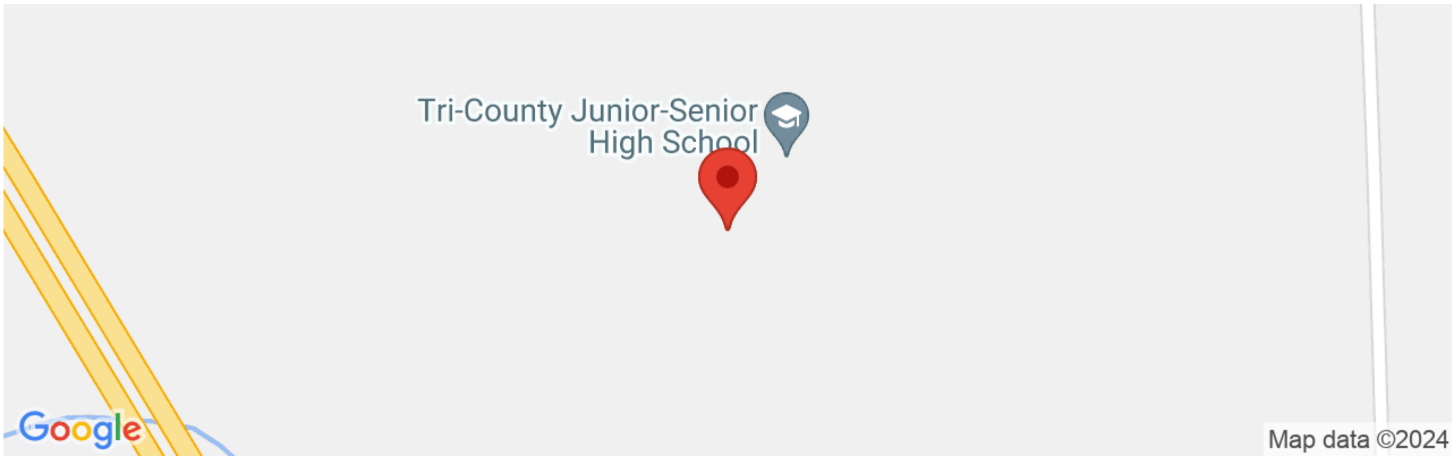
While the information presented on this website is believed to be correct, SEAOC /OSHPD and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in this web application should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. SEAOC / OSHPD do not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the seismic data provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the search results of this website.

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

OSHPD

24IN0392 - JR/SR High School

Latitude, Longitude: 40.734389, -87.085329



Date	8/5/2024, 2:08:02 PM
Design Code Reference Document	IBC-2015
Risk Category	III
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	0.13	MCE_R ground motion. (for 0.2 second period)
S_1	0.074	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.155	Site-modified spectral acceleration value
S_{M1}	0.126	Site-modified spectral acceleration value
S_{DS}	0.104	Numeric seismic design value at 0.2 second SA
S_{D1}	0.084	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	B	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.7	Site amplification factor at 1.0 second
PGA	0.059	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.071	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
SsRT	0.13	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.143	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.074	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.087	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.6	Factored deterministic acceleration value. (Peak Ground Acceleration)

Type	Value	Description
PGA_{UH}	0.059	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.905	Mapped value of the risk coefficient at short periods
C_{R1}	0.854	Mapped value of the risk coefficient at a period of 1 s
C_V		Vertical coefficient

DISCLAIMER

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

24IN0392 - Primary School

Latitude, Longitude: 40.762504, -87.145885

Date	8/16/2024, 11:10:21 AM
Design Code Reference Document	IBC-2015
Risk Category	III
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	0.13	MCE_R ground motion. (for 0.2 second period)
S_1	0.074	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.156	Site-modified spectral acceleration value
S_{M1}	0.125	Site-modified spectral acceleration value
S_{DS}	0.104	Numeric seismic design value at 0.2 second SA
S_{D1}	0.084	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	B	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.7	Site amplification factor at 1.0 second
PGA	0.06	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.071	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
SsRT	0.13	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.143	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.074	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.086	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.6	Factored deterministic acceleration value. (Peak Ground Acceleration)

Type	Value	Description
PGA_{UH}	0.06	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.905	Mapped value of the risk coefficient at short periods
C_{R1}	0.854	Mapped value of the risk coefficient at a period of 1 s
C_V		Vertical coefficient

DISCLAIMER

While the information presented on this website is believed to be correct, SEAOC /OSHPD and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in this web application should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. SEAOC / OSHPD do not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the seismic data provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the search results of this website.

United States Department of Agriculture

NRCS

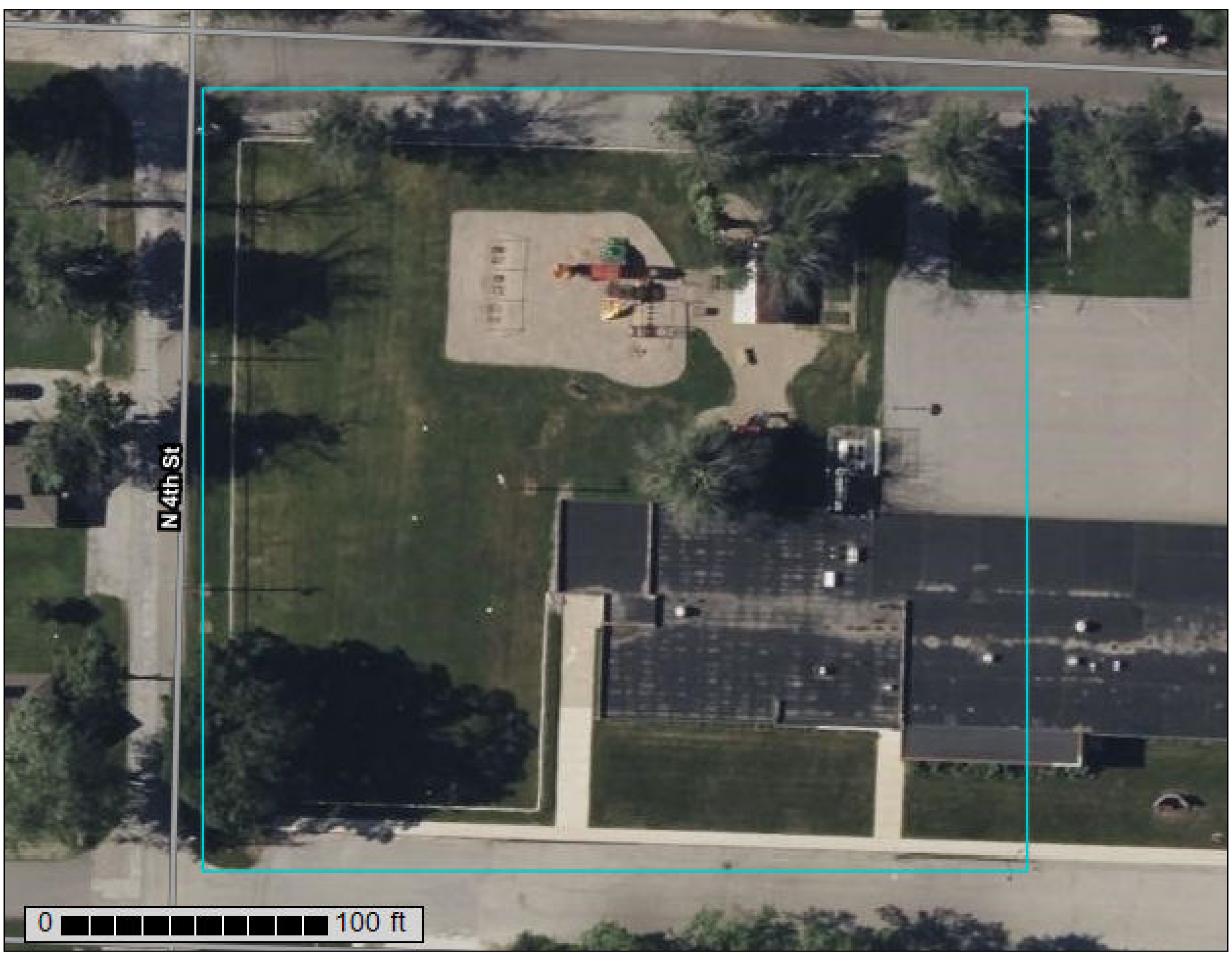
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

White County, Indiana

24IN0392 - Intermediate School



June 25, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:753 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 10, 20, 40, 60

Feet: 0, 35, 70, 140, 210

N

Map projection: Web Mercator   Corner coordinates: WGS84   Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
Area of Interest (AOI)

Soils
Soil Map Unit Polygons
Soil Map Unit Lines
Soil Map Unit Points

Special Point Features
Blowout
Borrow Pit
Clay Spot
Closed Depression
Gravel Pit
Gravelly Spot
Landfill
Lava Flow
Marsh or swamp
Mine or Quarry
Miscellaneous Water
Perennial Water
Rock Outcrop
Saline Spot
Sandy Spot
Severely Eroded Spot
Sinkhole
Slide or Slip
Sodic Spot
Spoil Area
Stony Spot
Very Stony Spot
Wet Spot
Other
Special Line Features

Water Features
Streams and Canals

Transportation
Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background
Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: White County, Indiana
Survey Area Data: Version 28, Sep 1, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 16, 2022—Jun 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CnA	Conover loam, 0 to 1 percent slopes	2.1	100.0%
Totals for Area of Interest		**2.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

White County, Indiana

CnA—Conover loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 5fds
Elevation: 580 to 1,540 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 47 to 51 degrees F
Frost-free period: 170 to 185 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Till plains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 11 inches: loam
Bt - 11 to 27 inches: clay loam
Cg - 27 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R111XC006IN - Flat Glacial Ridge
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 15 percent
Landform: Outwash plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Brookston

Percent of map unit: 10 percent
Landform: Depressions on outwash plains, depressions on till plains
Landform position (two-dimensional): Footslope, toeslope
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: Yes

Baugo

Percent of map unit: 5 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

White County, Indiana

24IN0392 - JR/SR High School

July 1, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

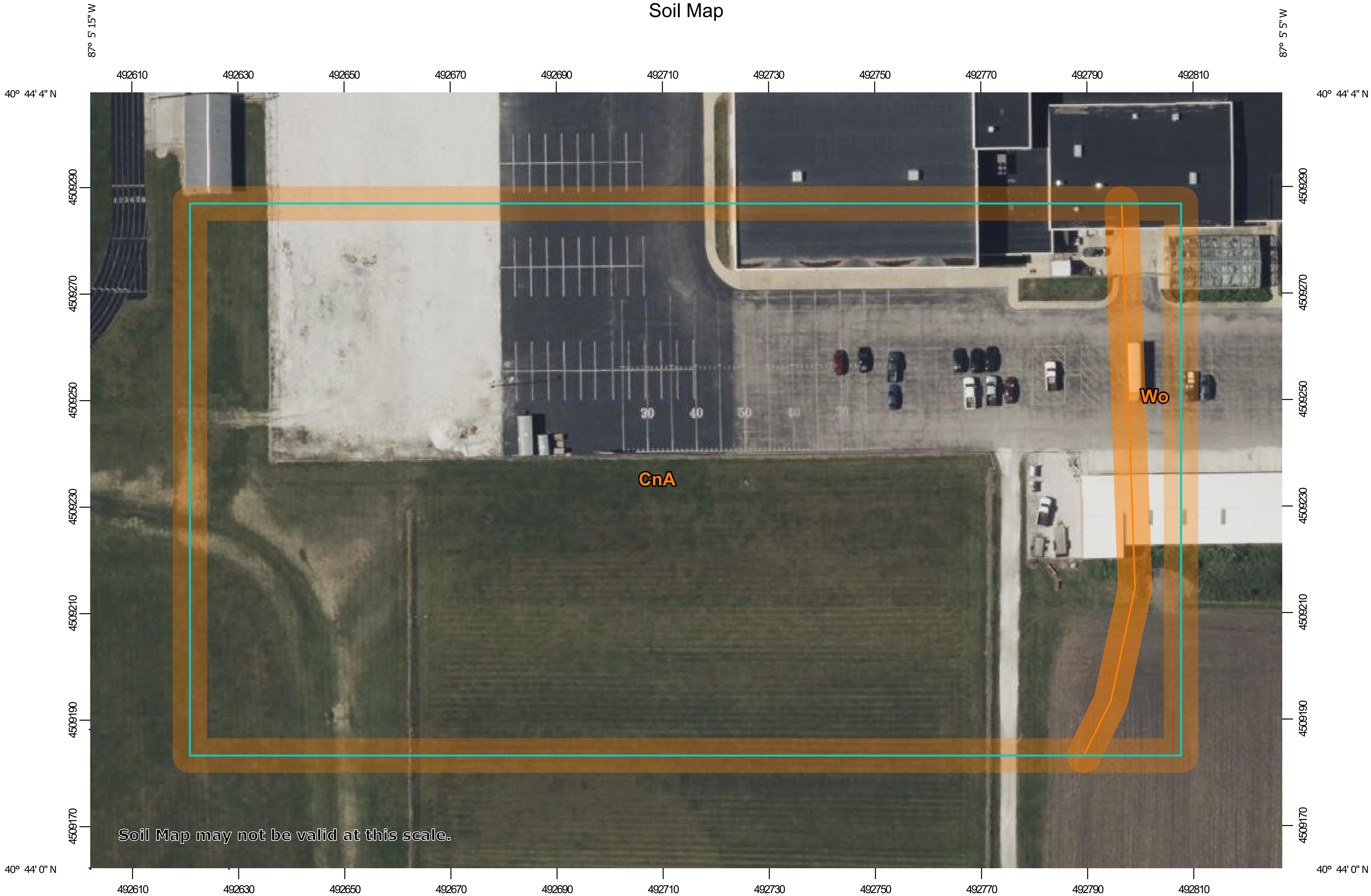
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,030 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 15, 30, 60, 90

Feet: 0, 50, 100, 200, 300

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: White County, Indiana
Survey Area Data: Version 28, Sep 1, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 16, 2022—Jun 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CnA	Conover loam, 0 to 1 percent slopes	4.5	94.3%
Wo	Wolcott clay loam	0.3	5.7%
Totals for Area of Interest		**4.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

White County, Indiana

CnA—Conover loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 5fds
Elevation: 580 to 1,540 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 47 to 51 degrees F
Frost-free period: 170 to 185 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Conover and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conover

Setting

Landform: Till plains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 11 inches: loam
Bt - 11 to 27 inches: clay loam
Cg - 27 to 60 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R111XC006IN - Flat Glacial Ridge
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: No

Minor Components

Crosier

Percent of map unit: 15 percent
Landform: Outwash plains, till plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Brookston

Percent of map unit: 10 percent
Landform: Depressions on outwash plains, depressions on till plains
Landform position (two-dimensional): Footslope, toeslope
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: Yes

Baugo

Percent of map unit: 5 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Wo—Wolcott clay loam

Map Unit Setting

National map unit symbol: 5ffy
Elevation: 520 to 770 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 47 to 51 degrees F
Frost-free period: 170 to 185 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Wolcott and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wolcott

Setting

Landform: Depressions on till plains
Landform position (two-dimensional): Footslope

Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 15 inches: clay loam
H2 - 15 to 47 inches: clay loam
H3 - 47 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 30 to 60 inches to densic material
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R111XC005IN - Glacial Depression
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

United States Department of Agriculture

NRCS

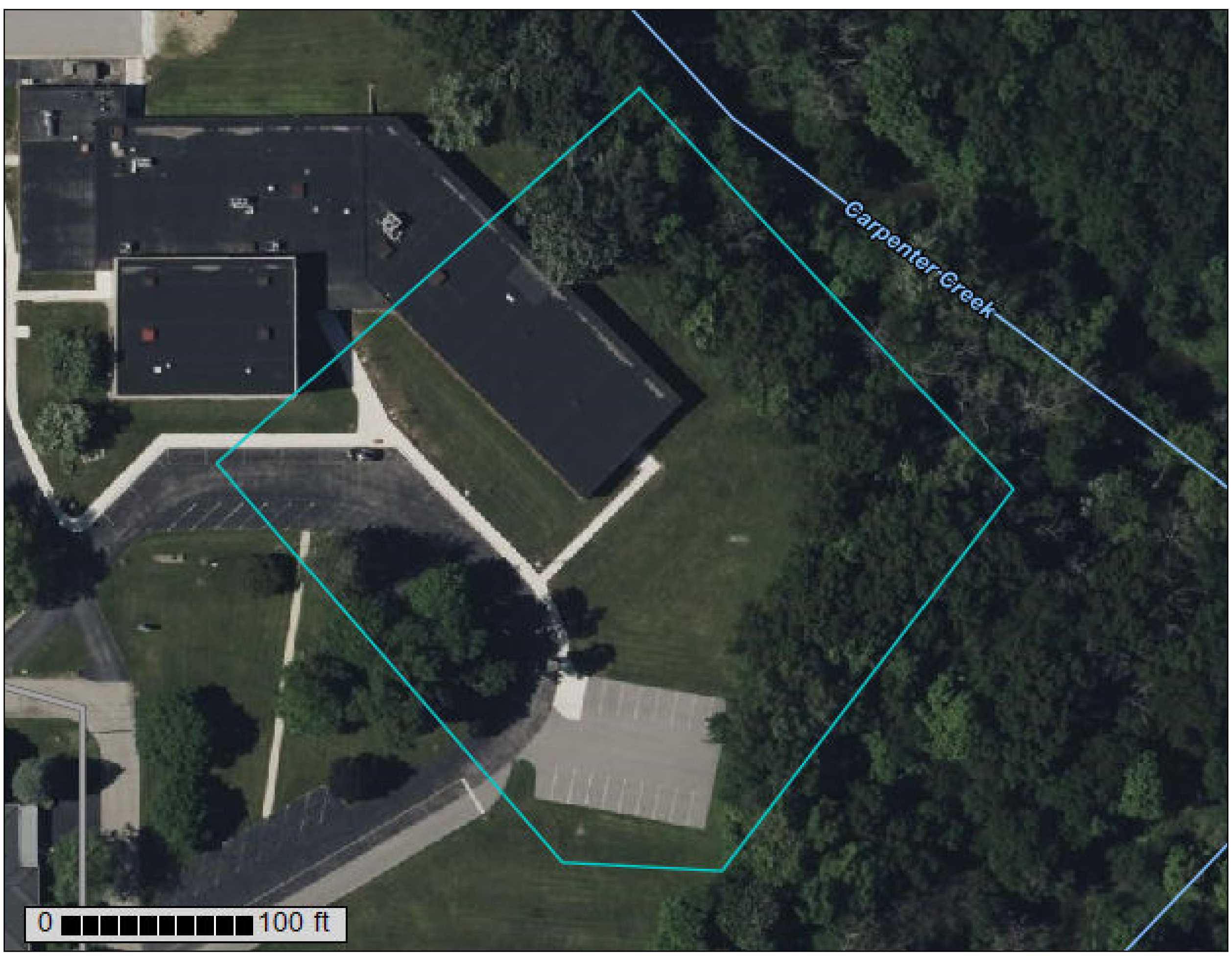
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Jasper County, Indiana

24IN0392 - Primary School



June 25, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:1,050 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jasper County, Indiana
Survey Area Data: Version 24, Sep 1, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 16, 2022—Jun 27, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CoB	Corwin loam, moderately permeable, 1 to 3 percent slopes	1.3	60.7%
So	Sloan silt loam, frequently flooded, undrained	0.8	39.3%
Totals for Area of Interest		**2.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Jasper County, Indiana

CoB—Corwin loam, moderately permeable, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 5dws
Elevation: 620 to 770 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 47 to 51 degrees F
Frost-free period: 170 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Corwin and similar soils: 90 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corwin

Setting

Landform: Recessionial moraines, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

H1 - 0 to 13 inches: loam
H2 - 13 to 35 inches: clay loam
H3 - 35 to 40 inches: loam
H4 - 40 to 60 inches: loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: 20 to 55 inches to densic material
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R111XC006IN - Flat Glacial Ridge
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: No

Minor Components

Reddick

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Wolcott

Percent of map unit: 3 percent
Landform: Depressions
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: Yes

So—Sloan silt loam, frequently flooded, undrained

Map Unit Setting

National map unit symbol: 5dy2
Elevation: 620 to 770 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 47 to 51 degrees F
Frost-free period: 170 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Sloan, undrained, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sloan, Undrained

Setting

Landform: Flood plains
Landform position (two-dimensional): Footslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 40 inches: clay loam
H3 - 40 to 60 inches: stratified fine sandy loam to silt loam to fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent

Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F111XC014IN - Wet Floodplain
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

ADDENDUM ONE

Addendum One (AD.01) to the drawings and specifications prepared by Gibraltar Design for **Tri-County Jr/Sr High School Additions and Renovations** for Tri-County School Corporation, Wolcott, Indiana.

All Contractors bidding on this project shall read all of the items covered below and shall comply with all of the requirements as set forth, including any necessary refinements or additions generated by this Addendum and required by the intent of the original contract documents. All Contractors shall acknowledge on their bid form that they have received this Addendum and include the appropriate content of same within their bid proposal.

SPECIFICATIONS

1. **Specification Section 22 40 00 Plumbing Fixtures**

   A. Revise Trench Drains to read:

   "A. (P-4) Trench Drain 6" wide, pre-sloped modular section trench system.

   1. Channel construction of high-density polyethylene structural composite drain channel.
   2. Bottom of channel shall have a constant slope and shall have a radius for smooth flow and ease of cleaning.
   3. The drain system shall be complete with heavy duty frame, rigid mechanical interlocking joints, anchor studs and combination anchor tabs/leveling devices.
   4. Grates shall be special duty, Class E rated, slotted ductile cast iron suitable for dynamic loads."

   B. Add Paragraph 2.3 O, 2.3 P., and 2.3 Q. to read:

   "O. TRENCH DRAINS

   1. Zurn
   2. Jay R. Smith

   P. EMERGENCY SHOWER AND EYE WASH STATION:

   1. Bradley
   2. Guardian
   3. Haws

   Q. WASH FOUNTAIN:

   1. Bradley
   2. Acorn
   3. Willoughby

2. **Specification Section 23 81 26 Split Air Conditioning Units**

   A. Paragraph 2.1 Manufacturers: Add "York" to list of acceptable manufacturers.

DRAWINGS

Refer to Revised Full-Size Drawings included in this Addendum for revisions (unless noted that no drawing is attached).

3. **Sheet G-101 (No Drawing Attached)**
   A. Add sheet A-404 Stair Plan, Sections, and Details to Sheet Index
4. **Sheet S-204 (No Drawing Attached)**
   A. Revise Keynote 3 to refer to detail 13/S-402 in lieu of 8/S-402.
   B. Revise location of new door and masonry lintel into Storage D-105 per architectural drawings in this addendum.
5. **Sheet S-402**
   A. Detail 13 added.
6. **Sheet AD103**
   A. Revise location of masonry wall to be removed for new door opening into Storage D-105.
7. **Sheet A-103**
   A. Revise location of new door into Storage D-105.
8. **Sheet A-404**
   A. New sheet issued for metal stair sections and details.
9. **Sheet A-820**
   A. Revise ACT 3.
10. **Sheet P-204**
    A. Revised plumbing to match furnace FURN-1 location.
    B. Revised natural gas piping to match furnace FURN-1 and UH-5 locations.
    C. Added floor drain for FURN-1 condensate disposal.
11. **Sheet M-104**
    A. Revised location of furnace FURN-1 to clear shelving units.
    B. Revised supply duct routing due to furnace relocation and addition of utility closet.
    C. Revised UH-5 location to improve access into backpack storage area.
12. **Sheet M-601**
    A. Added 35K short circuit rating requirement to Rooftop Air Handling Unit Schedule notes.
13. **Sheets A-703, A-803, A-903, M-103, P-103, E-103, E-203, and T-103 (No Drawings Attached)**
    A. Revise location of new door into Storage D-105 per Architectural drawings in this addendum.

Pages 1 through 3, inclusive, and eight (8) Full-Size Drawings, constitute the total makeup of **Addendum One**.

Y:\24-120 Tri-County SC - Jr-Sr High School Addition and Renovations\Specs\Addendum One\AD02 - 24-120.docx