Addendum 02

DOCUMENT 00 91 00

DATE: June 18, 2026

PROJECT: Lakota Local School Bus Building Addition
5186 County Road 13
Kansas, OH 44841

PROJECT #: 25108.00

OWNER: Lakota Local School District
Contact: Chad Coffman
5200 County Road 13
Kansas, OH 44841

ARCHITECT: Garmann Miller
38 South Lincoln Drive
P.O. Box 71
Minster, Ohio 45865

TO: Prospective Bidders

This addendum form is a part of the Contract Documents and modifies the Construction Documents dated May 27, 2026, with amendments and additions noted below.

Acknowledge receipt of this Addendum on the Bid Form. Failure to do so may disqualify the Bidder.

This addendum consists of 2 pages, 5 specification sections, and 7 re-issued drawing sheets.

FOR INFORMATION ONLY

1. Pre-bid meeting minutes and the pre-bid meeting sign-in sheet are attached.

2. Geotechnical Exploration Report, dated June 1, 2026.

CHANGES TO THE PROJECT MANUAL

1. 01 21 00 – Allowances
   a. Change item 1.05. A. Contingency Allowance from $100,000.00 to $50,000.00.

GARMANN MILLER

2. 07 42 13.13 – Formed Metal Wall Panels
   a. Added section in its entirety.

3. 07 61 00 – Sheet Metal Roofing
   a. Added section in its entirety.

4. 07 71 23 – Manufactured Gutters and Downspouts
   a. Added section in its entirety.

5. 13 34 18 – Post Frame Building System
   a. Replace section in its entirety.

6. 13 34 19 – Pre-Engineered Buildings
   a. Replace section in its entirety.

CHANGES TO THE DRAWINGS

1. A4.2 – Wall Section Details: Foundation Updates
   a. Reworked/Simplified Foundation Details.
   b. Reworked Slab Assembly.
   c. Corrected Keynotes.

2. A1.1, A2.1, A4.1, A4.2, A5.1, A5.2, A6.1 – Metal Panel/Roofing Keynote Updates
   a. Renumbered Metal Panel Keynotes.
   b. Renumbered Roof Keynotes.
   c. Renumbered Downspout Keynotes.
   d. Renumbered Gutter Keynotes.
   e. Renumbered Snow Guard Keynotes.
   f. Renumbered Ridge Cap Keynotes.
   g. Renumbered Fascia Keynotes.

ATTACHMENTS

The following attachments are included and are part of this addendum:

Pre-bid meeting minutes and the pre-bid meeting sign-in sheet.

Geotechnical Exploration Report

Specification Sections: 07 42 13.13, 07 61 00, 07 71 23, 13 34 18, 13 34 19

Drawing Sheets: A1.1, A2.1, A4.1, A4.2, A5.1, A5.2, A6.1

END OF ADDENDUM

GARMANN MILLER

GARMANN MILLER

Pre-Bid Meeting

Project Name	Lakota Local School – Bus Building Addition	GM Project No.	25108.00
Meeting Date	06/10/2026	Meeting Location	Lakota Local Schools District Office

Outline

1. Attendees: See attached sign in sheet

2. Introductions

3. Project overview
   a. Review of scope of work (this is not to be considered the full scope)
   b. General Construction: PEMB single bay addition to the existing bus building with a post framed bus storage building connected to the PEMB with a breezeway constructed of typical dimensional wood framing. Project also includes the relocation of an existing fuel pump and site paving.
   c. Plans have been submitted to the Sandusky County Building Department for plan approval.
      - Plans have been partially approved and will be released once the selected contractor's information is filed with the building department.
      - Full approval will be received once the PEMB and wood truss stamped shop drawings are submitted and approved.

4. Bidding
   a. Date: Wednesday, June 24, 2026 at 9:00 am
   b. Bids will be received at the school's district office until 9:00.00 am on June 24, 2026 at which time they will be opened and read aloud.
   c. Tax exempt project
   d. Builders risk is furnished by the owner

5. Addendums
   a. Addendum #1: Was issued on June 9, 2026

6. Bid Categories
   a. Contract A – General Construction

7. Contingency amounts to be included in bid:
   a. General Construction - $50,000

8. Unit Prices
   - Contaminated soils encountered during fuel island relocation.
   - Unsuitable soils encountered during building site excavation.

9. Contracts will be administered by Garmann Miller
   a. All questions and correspondence to go through the A-E office
   b. All RFIs through A-E office
   c. Pay applications to A-E office

10. Schedule.
    a. Tentative award date – Soon after bids are received
    b. Start of Construction – July 6, 2026
    c. Post Framed Building Completion Date – November 20, 2026
    d. Project Completion Date – April 30, 2027

11. General Conditions
    a. General Contractor:
        i. Responsible for construction schedule and general supervision
        ii. Submit preliminary schedule 10 days after notice to proceed, coordinate this closely with owner to allow for regularly scheduled events and services.
        iii. Responsible for administering job meetings.
        iv. Temporary utilities
        v. Temporary telecommunications services
        vi. Temporary sanitary facilities
        vii. Temporary controls: barriers, enclosures, and fencing
        viii. Waste removal
        ix. Job superintendent on site available via cell phone

12. Temporary Electricity
    a. Contractor may use electricity from the existing building. If more is needed than what the owner has available, then the contractor is responsible for providing that.

13. Temporary Water
    a. Contractor may use water from the existing building. If more is needed than what the owner has available, then the contractor is responsible for providing that.

14. Substitution requests are to be received 7 days prior to bid.

15. Correspondence
    a. Correspondence to run through the Architect's office
        i. Project Manager: Ryan Heitkamp rheitkamp@creategm.com
        ii. Construction Admin: Jason Fleming jfleming@creategm.com

16. Drawings available at DC Reprographics, 1254 Courtland Ave, Columbus, Ohio 43201; www.DCplanroom.com; Phone 614-297-1200. Each Bidder is responsible for shipping cost.

17. Contractor questions/comments
    - The two signs on either side of the drive connecting the bus parking lot to the parking lot to the west should be removed and turned over to the school.

18. Owner questions/comments
    - Uncontaminated soil spoils can be stockpiled onsite for the school's use.
    - Asphalt spoils are to be disposed of off site by contractor.

GARMANN MILLER

Sign-in Sheet

Project Name: Lakota Local Schools Bus Building Addition | GM Project No.: 25108.00
Meeting Location: Lakota Local Schools District Office | Meeting Date: 06/10/2026

Purpose: Pre-Bid Meeting

Attendees

Name	Chad Coffman	Phone	419-986-6650
Business/Title	Lakota Local Schools / Superintendent		
Email	ccoffman@lakotaschools.org		
Name	Joe Harvey	Phone	419-967-0373
Business/Title	Lakota Local Schools / Maintenance Supervisor		
Email	jharvey@lakotaschools.org		
Name	Greg King	Phone	419-722-3780
Business/Title	Clouse Construction		
Email	greg@clouseconstruction.com		
Name	Noah Adcock	Phone	567-712-9893
Business/Title	Touchstone CPM / Estimator		
Email	noaha@tuttleconstruction.com		
Name	Michael Blunk	Phone	419-722-5332
Business/Title	Helms Construction Inc		
Email			
Name	Ryan Heitkamp	Phone	419-628-4240
Business/Title	Garmann Miller / Project Manager		
Email	rheitkamp@creategm.com		
Name	Trey Graver	Phone	567-429-9291
Business/Title	Helms Construction Inc.		
Email	tgraver@helmsandsons.com		
Name	Chad Kirian	Phone	419-436-1538
Business/Title	Zender Electric, LLC		
Email	ckirian@zenderelectric.com		

Name	Norm Elchert	Phone	419-986-6650
Business/Title	Lakota Local Schools / Treasurer		
Email	nelchert@lakotaschools.org		
Name		Phone	
Business/Title			
Email			
Name		Phone	
Business/Title			
Email			
Name		Phone	
Business/Title			
Email			
Name		Phone	
Business/Title			
Email			
Name		Phone	
Business/Title			
Email			
Name		Phone	
Business/Title			
Email			
Name		Phone	
Business/Title			
Email			
Name		Phone	
Business/Title			
Email			
Name		Phone	
Business/Title			
Email			

Geotechnical Exploration Report

for

Proposed New Bus and Maintenance Buildings
5186 County Road 13
Kansas, Sandusky County, Ohio 44841

Prepared for

Lakota Local Schools
5200 County Road 13
Kansas, Ohio 44841

Prepared by

Intertek-PSI
2341 Spencerville Road
Lima, OH 45805

Report Date: June 1, 2026

PSI Project No. 01253794

Brandon France
Project Manager

Christopher L. Carson, P.E.

Principal Consultant

TABLE OF CONTENTS

LIST OF APPENDICES

1 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries, Inc. (PSI), an Intertek company, has completed the geotechnical exploration for the proposed new bus and maintenance buildings for Lakota Local Schools. The project is to be located at 5186 County Road 13 in Kansas, Sandusky County, Ohio. This geotechnical engineering study was authorized via signed PSI proposal number 0125-475978 dated April 15, 2026. The proposal was signed by Mr. Chad Coffman, Superintendent for Lakota Local Schools on April 16, 2026.

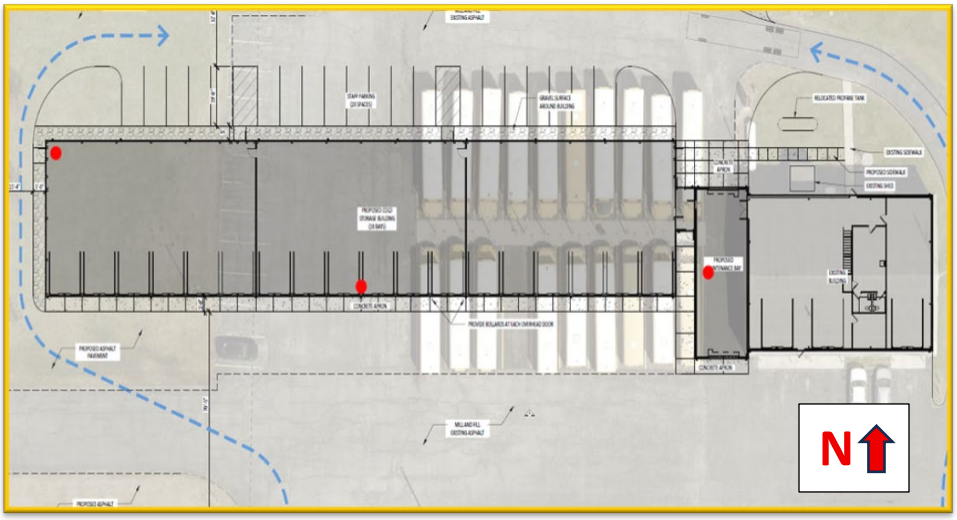
1.2 PROJECT DESCRIPTION

Based on the information provided, a summary of our understanding of the proposed project is provided below in the following project description table.

TABLE 1: PROJECT DESCRIPTION

Project Items (Provided/Proposal Basis)	**Bus/Cold Storage Building** - Single story pre-engineered structure measuring approximately 12,250 SF, with 18 bays. **Maintenance Building** – Single story pre-engineered structure with mezzanine over office for storage, measuring approximately 2,400 SF.
Building Construction Types	Pre-engineered metal buildings (Proposal Basis)
Existing Grade Change within Project Site	Relatively Flat, ± 1 Foot (707 to 708) Estimated, Sloping downward from East to West (Google Earth Pro)
Finished Floor Elevations	Not available at this time; PSI estimates within 2 feet ± of current grade
Requested or Anticipated Foundation Types	Shallow spread and continuous wall footings with grade supported slabs (no basement/below grade levels)
Maximum Design Column Loads	100 kips (estimated by PSI)
Maximum Design Wall Loads	3-6 kips per Lineal Foot (estimated by PSI)
Maximum Design Floor Loads	150 pounds per square foot (estimated by PSI)

The following image shows the existing and proposed building/pavement addition with requested boring locations provided by the client to PSI.



The geotechnical recommendations presented in this report are based on the available project information, the proposed location and orientation of the structure and pavement areas, and the subsurface materials described in this report. If any of the information we have is incorrect, please contact us so that we may amend the recommendations presented accordingly. PSI will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

1.3 SCOPE OF SERVICES

The purpose of this study was to explore the subsurface conditions at the site to prepare recommendations for foundation systems and other design parameters for the proposed development. PSI's contracted scope of services included drilling soil test borings, a select laboratory testing program, and preparation of this geotechnical report. This report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and presents recommendations regarding the following:

- General site development and subgrade preparation recommendations
- Estimated potential soil movements associated with collapsing, shrinking, and swelling soils and methods to reduce these movements to acceptable levels
- Recommendations for site excavation, fill compaction, and the use of on-site and imported fill material under pavements and the structures
- Recommendations for building pad preparation for ground supported slabs having a maximum movement potential, due to heave or settlement, of 1-inch
- Recommendations for the design of foundations for supporting the proposed structure
- Seismic design site classification per the 2021 International Building Code

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air on, below, or around this site. Any statements in this report or on the boring logs regarding odors, colors, and

unusual or suspicious items or conditions are strictly for informational purposes. Prior to further development of this site, an environmental assessment is advisable.

PSI's scope also did not provide any service to investigate or detect the presence of moisture, mold, or other biological contaminants in or around any structure, or any service that was designed or intended to prevent or lower the risk of the occurrence or the amplification of the same. The Client should be aware that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. The Client should also be aware that site conditions are outside of PSI's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence or reoccurrence of mold amplification.

2 SITE AND SUBSURFACE CONDITIONS

2.1 SITE LOCATION AND CONDITIONS

The proposed project site area is located within the existing Lakota School District property at 5186 County Road 13 in Kansas, Sandusky County, Ohio. PSI has provided additional site description information in the table below.

Table 2: Site Description

Site Location	Latitude: 41.2698°; Longitude: -83.3227°
Site History	Area has been used as bus storage/parking since at least May 1995. (Google Earth Pro)
Existing Site Ground Cover	Topsoil, Grass, Asphalt and Concrete Pavement
Existing Site Features	Building to the east and Northwest of proposed construction
Site Boundaries/Neighboring Development	Farmland and school buildings to the northwest

2.2 SITE GEOLOGY

Based on the on-line geologic map provided by the Ohio Geological Survey, the proposed site area is located in the Central Lowland Province, Huron-Erie Lake Plains Section, Woodville Lake-Plain Reefs Region. The section is characterized by wave-planed ground moraine and lake deposits topography supported by Silurian age bedrock as part of the Wisconsinan Glaciation Period.

The area's bedrock limestone formation was encountered during the investigation at depths of approximately 11.5 to 15 feet beneath the existing surface grades. The Quaternary Geology Map of Ohio provided ODNR web site, labels the area "L4", indicating an area of lake-planed moraine, very flat, planed by waves in glacial lakes; small patches of sand, silt, or clay on the surface in many areas.

Based on a review of the ODNR Karst Map program the project site area does not appear to be directly within known karst areas; however, suspected karst areas were identified southwest, southeast and northwest of the project location approximately 2 to 3.5 miles away. Additional karst information can be found on the ODNR Karst Map #1 through #4 in the appendix. Additional soil information can be found on the USDA Web Soil Survey Map in the appendix.

2.3 SUBSURFACE CONDITIONS

The scope of PSI's services included a subsurface exploration program consisting of drilling and Standard Penetration Testing (SPT) at three (3) locations to depths of 25 feet each. The general test boring locations were selected by the client and field located by Intertek-PSI. A boring layout can be found in the appendix of this report.

The borings were advanced utilizing 3¼-inch inside diameter, hollow-stem auger drilling methods. Soil samples were routinely obtained during the drilling process. Select soil samples were later tested in the laboratory to obtain soil material properties for the foundation, concrete slab-on-grade, and pavement recommendations. Drilling, sampling, and laboratory testing was accomplished in general accordance with ASTM procedures.

SURFICIAL MATERIALS: The surficial material at test boring location B-1 consisted of approximately 11 inches of topsoil material. The surficial materials at test boring locations B-2 and B-3 consisted of approximately 4 inches of asphalt underlain by approximately 6 to 10 inches of granular base material. It must be recognized that these thicknesses are approximate and should be expected to vary across the site areas.

COHESIVE SOILS: Underlying the surficial materials, natural cohesive soils consisting of **Lean Clay (CL), Silty Clay (CL-ML) and Fat Clay (CH)** with varying amounts of clay, sand, silt, and gravel were encountered. The Standard Penetration Test values ("N_{60}"-values) for the natural granular soils ranged from twelve (12) to seventy-two (72) blows per foot (bpf) indicating "stiff" to "very hard" consistencies, generally getting stiffer with depth. The moisture contents of the cohesive soil samples ranged from nine (9) to twenty-five (25) percent.

GRANULAR SOILS: No apparent NATURAL granular soils were noted during the field drilling operations. However, it must be recognized that sand and gravel seams and layers are common in this area and therefore may be encountered during the earthwork and foundation phase of the project.

BEDROCK/REFUSAL: The area's bedrock formation was encountered at each of the test boring locations at depths ranging from approximately 11.5 to 15 feet beneath the existing surface grades.

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in the Appendix should be reviewed for specific information at individual boring locations. These records include soil/rock descriptions, stratifications, penetration resistances, and locations of the samples and laboratory test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during the field operations is also shown on these boring logs. The samples that were not altered by laboratory testing will be retained for sixty (60) days from the date of this report and then will be discarded.

2.4 GROUNDWATER LEVEL MEASUREMENTS

Groundwater was encountered while drilling and at completion of drilling. The levels observed from ground surface and the boring locations are provided in the following table.

Table 3: Groundwater Levels

Boring Location	Ground Surface Elevation MSL (Per Google Earth Pro)	Water Level Encountered During Drilling (MSL)*	Water Level Upon Completion of Drilling (MSL)
B-1	707	696	698
B-2	708	696	703.5
B-3	708	696	702

*Encountered and completion water levels taken from Google Earth Pro ground surface elevation.

It must be recognized that free groundwater levels can significantly fluctuate (seasonally) and as a function of rainfall and may be present at other locations or at depths shallower than those encountered. During a time of year or weather different from the time of drilling, there may be a considerable change in the water table, or the occurrence of water where not previously encountered. Furthermore, the free groundwater levels in the boreholes often are not representative of the actual groundwater level, because the boreholes remain open for a relatively short time. To obtain longer-term measurements, it is necessary to install water level observation wells or piezometers. The water level measurements presented in this report are the levels that were measured at the time of PSI's field activities. Therefore, we recommend that the contractor determine the actual groundwater levels at the time of construction to evaluate groundwater impact on the construction procedures.

3 GEOTECHNICAL DISCUSSION

The project field exploration has revealed concerns at this site which may affect the overall performance of foundations, or slabs for the project. The following summarizes these concerns.

3.1 HIGH PLASTIC - FAT CLAY

High plasticity and "Fat" Clays (CH) were noted at soil test boring locations B-1 and B-2 to depths of approximately 6 below the existing surface grades. These higher plasticity and Fat Clays have a larger potential to expand and shrink thereby possibly impacting the proposed construction. Additionally, these higher plasticity "Fat" Clay soils may be present in other areas of the site and in greater quantities than that observed in the soil test borings. Additionally, these fat clays will most likely be present in the on-site borrow soils for the anticipated building fill material. Accordingly, careful selection of borrow soils should be undertaken prior to earthwork operations to verify that these fat clay soils are not being used. Moreover, where these soils exist within 2 feet of floor slabs and footings, or within 1 foot of pavements, removal and replacement is recommended to reduce the shrink/swell potential.

Although it is not possible to prevent soil moisture changes, a number of steps may be taken to aid in the reduction of subsoil moisture content variations. These steps are intended to help reduce the shrink/swell potential, not eliminate it. Some of these measures are:

1. During construction, a positive drainage scheme should be implemented and maintained to prevent ponding of water on subgrades.

2. The building subgrade should not be allowed to dry out; backfill should proceed as soon as possible to minimize changes in the natural moisture regime.

3. Permanent positive drainage should be maintained around the construction, thereby transmitting water away from the foundation perimeter. In addition, site grading should provide rapid drainage of surface water away from foundation areas.

4. Utility trenches should be backfilled with low plasticity clays to reduce the potential of the trenches to act as aqueducts transmitting water beneath the structures due to excess surface water infiltration.

5. Shrubbery, flower beds and sprinkler systems surrounding the structures should be eliminated or at least limited and should be designed so that the bedding soils drain away from the building areas. The planters should have impermeable bases with weep holes discharging into drainage pipes or onto paved surfaces.

6. Trees and/or large bushes should not be planted adjacent to the structures.

7. Since plumbing and other water leaks can cause excessive heaving of high plasticity soils, every effort should be made to maintain the plumbing in good working order and prevent or minimize water leaks and discharges. It is recommended that all water supply lines and wastewater lines be tested for leaks prior to backfilling the utility trenches.

Please refer to the "Site Preparation" section and "Engineering Fill" section of this report for further recommendations.

3.2 SHALLOW WATER LEVELS

Water levels were noted upon completion of drilling at depths as shallow as approximately 4.5 feet below the existing surface grades. Long term water level measurements as a function of installation and observation of piezometer type monitoring wells were beyond the scope of this study.

Based on the provided site plan and the anticipated foundation plan, the encountered shallow water levels observed will likely impact foundation design and excavations during construction. Please refer to the Foundation Recommendation Section (4.3), and the Drainage and Groundwater Considerations Section (5.2) of this report for additional information and recommendations relating to these conditions.

3.3 FOUNDATION DESIGN CONSIDERATIONS

The presence of fat clay and shallow ground water on the site poses a risk of excessive settlement of foundations and floor slabs placed on them. The thickness of the fat clay is as much as 6 feet. To mitigate the risk of excessive settlement the fat clay can be completely removed and be replaced with structural fill. When this is performed, the new structure can be supported on shallow spread footings bearing on the structural fill. The floor slab can be supported on grade.

The excavation and replacement of the existing fat clay will require the site ground water level be lowered to at least 2 feet below the deepest excavation level and maintained at that level until the site is filled to grade.

4 GEOTECHNICAL RECOMMENDATIONS

The following geotechnical related recommendations have been developed based upon the subsurface conditions encountered, our experience with similar soils and site conditions, and PSI's understanding of the proposed development. Should changes in the project criteria occur, a review must be made by PSI to determine if modifications to our recommendations will be required.

4.1 SITE PREPARATION

PSI recommends that topsoil, soft, organic, frozen, or otherwise objectionable soils in the construction areas be removed and either wasted or stockpiled for later use in non-structural areas. Additionally, PSI recommends that where encountered, high plasticity/fat clays be removed to a minimum depth/distance of 24 inches from footings, walls, and floor slabs and a minimum of 12 inches beneath pavement sections. Alternatively, the high plasticity/fat clays can be chemically stabilized using lime. A representative of the geotechnical engineer should determine and document the depth of removal at the time of construction.

In this region, these otherwise competent sands, silts and lean clays can undergo a significant loss of stability when construction activities are performed during wetter portions of the year. PSI anticipates that the soils in the project area can become easily disturbed if subjected to conventional rubber tire or narrow track-type equipment. Soils that become disturbed would need to be excavated and replaced; however, this remedial excavation may expose progressively wetter soils with depth, thus compounding the situation. Therefore, a normal approach to subgrade preparation may not be possible. Appropriate wide-track equipment selection should aid in minimizing potential disturbance.

After stripping to the proposed subgrade level and replacing objectionable soils with engineered fill, as required, the building and paving areas should be proof-rolled with a loaded tandem-axle dump truck or similar heavy rubber-tired vehicle (typically with a load greater than nine (9) tons per axle). Soils that are observed to rut or deflect excessively (typically greater than one (1) inch) under the moving load should be undercut and replaced with properly compacted low plasticity fill material. The proof-rolling and undercutting activities should be witnessed by a representative of the geotechnical engineer and should be performed during a period of dry weather. If the earthwork activities take place during wet seasons, lime stabilization of the subgrade could be required prior to engineered fill placement. Care should be taken during construction activities not to allow excessive drying or wetting of exposed soils. The subgrade soils should be scarified and compacted to at least 98% of the materials' standard Proctor maximum dry density, in general accordance with ASTM procedures, to a depth of at least twelve (12) inches below the surface. Additionally, new fill for building structures, asphalt, and concrete should not be placed on soft or frozen ground.

4.2 ENGINEERED FILL

After subgrade preparation and observation have been completed, fill placement required to establish grade may begin. Low plasticity structural fill materials should be free of organic or other deleterious materials and have a maximum particle size of less than three (3) inches. Low-plasticity soils are defined as having a liquid limit less than forty-five (45) and plasticity index between ten (10) and twenty (20). PSI understands that the team plans to use some of the materials excavated from the proposed pond areas as structural fill on site. Based on the laboratory testing of the materials that will be excavated from the ponds, the high plasticity soils, by themselves, are not suitable to be used as structural fill. However, the materials

may be suitable if mixed in with other site materials. Samples of proposed fill materials should be provided to PSI well in advance of their use to determine if the proposed fill material is suitable for use at the project. Additionally, a representative of PSI should be on-site to observe, test, and document placement of the fill. If the fill is too dry, water should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Close moisture content control will be required to achieve the recommended degree of compaction. If wet or cool season earthwork is necessary, PSI recommends the use of imported fill materials meeting the requirements of Ohio Department of Transportation (ODOT) No. 304 aggregate.

Fill should be placed in maximum loose lifts of eight (8) inches and compacted to at least 98% of the materials' standard Proctor maximum dry density, and within a range of the optimum moisture content as designated in the table below, as determined in general accordance with ASTM procedures. Each lift of compacted-engineered fill should be tested and documented by a representative of the geotechnical engineer prior to placement of subsequent lifts. The edges of compacted fill should extend a minimum of five (5) feet beyond the building footprint, or a distance equal to the depth of fill beneath the footings, whichever is greater. The measurement should be taken from the outside edge of the footing to the toe of the excavation prior to sloping.

In utility trenches, shallow foundation excavations, and other areas where large compaction equipment cannot be used, granular engineered fill should be placed as backfill. PSI recommends the use of material meeting Ohio Department of Transportation (ODOT) No. 304, for use as granular engineered fill. Engineered fill should be placed in accordance with the recommendations stated in this section of the report.

The fill placed should be tested and documented by a geotechnical technician and directed by a geotechnical engineer to evaluate the placement of fill material. It should be noted that the geotechnical engineer of record can only certify the testing that is performed, and the work observed by that engineer or staff in direct report to that engineer. The fill should be evaluated in accordance with the following table:

Table 4

MATERIAL TESTED	PROCTOR TYPE	MIN % DRY DENSITY	PLACEMENT MOISTURE CONTENT RANGE	FREQUENCY OF TESTING *1
Structural Lean Clay Fill (Cohesive)	Standard	98%	-2 to +2 %	1 per 5,000 ft^2 of fill placed / lift
Structural Fill (Granular)	Standard	98%	-2 to +2 %	1 per 5,000 ft^2 of fill placed / lift
Random Fill (non-load bearing)	Standard	90%	-3 to +3 %	1 per 10,000 ft^2 of fill placed / lift
Utility Trench Backfill	Standard	98%	-2 to +2 %	1 per 150 lineal foot / lift

*1 Minimum 2 per lift.

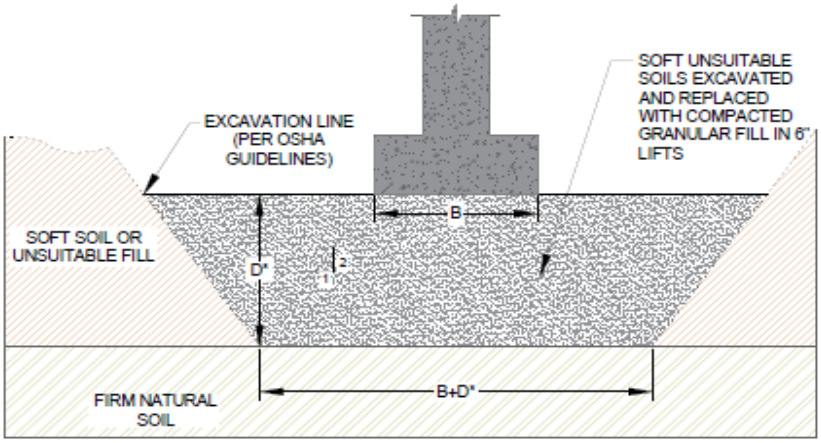
Tested fill materials that do not achieve either the required dry density or moisture content range shall be recorded, the location noted, and reported to the Contractor and Owner. A re-test of that area should be performed after the Contractor performs remedial measures and prior to the placement of additional fill material.

4.3 FOUNDATION RECOMMENDATIONS

PSI has based this report on maximum column and wall loads to be about 100 kips and 3 to 6 kips per lineal foot, respectively. Accordingly, the proposed structures can be supported on conventional spread-type footing foundations bearing on either competent naturally deposited soils or properly compacted, tested, and documented engineered fill. If it is desired for the planned foundations to bear on properly compacted and documented fill, the geotechnical engineer should be allowed to review the material to determine its consistency with the recommended bearing pressures. Spread footings for structure columns and continuous footings for bearing walls can be designed using a maximum allowable soil bearing pressure of **2,500 pounds per square foot (psf)**. This value contains a safety factor of 3 against ultimate soil failure. PSI recommends a minimum dimension of thirty (30) inches for square footings and eighteen (18) inches for continuous footings to minimize the possibility of a local bearing capacity failure.

Exterior footings and footings in unheated areas should be located at a depth of thirty-six (36) inches or deeper below the final exterior grade to provide adequate frost protection. If the building is to be constructed during the winter months or if footings will likely be subjected to freezing temperatures after foundation construction, then the footings should be protected from freezing. PSI recommends that interior footings be a minimum depth of eighteen (18) inches below the finished floor elevation.

The foundation excavations should be observed and documented by a representative of PSI prior to reinforcing steel or concrete placement to determine that the foundation materials are consistent with the materials discussed in this report, and therefore can support the design loads. Soft or loose soil zones encountered at the bottom of the footing excavations should be removed to the level of suitable natural soils and replaced with adequately compacted (granular) structural fill. Fill placed below the foundations where unsuitable materials are removed should extend one half (½) foot outside the foundation limits for every one (1) foot in thickness between the intended bearing surface and the underlying, suitable natural soils. Alternately, the foundations may be extended through unsuitable soils to bear on the underlying suitable material. Cavities formed because of excavation of soft or loose soil zones should be backfilled with lean concrete or dense graded compacted crushed stone.



D* IS DEPTH FOR SUITABLE SOILS

After opening, footing excavations should be observed, and concrete placed as quickly as possible to avoid exposure of the footing bottoms to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, the foundation concrete should be placed during the same day the excavation is made. If it is required that footing excavations be left open for more than one day, they should be protected to reduce evaporation or entry of moisture by placing a relatively thin seal slab of concrete.

Extreme care should be taken to prevent weakening of the foundation bearing materials because of prolonged atmospheric exposure, construction activity disturbance or an increase in moisture content. In the event that an overnight delay in concrete placement is anticipated, the foundation excavations should be cut approximately 6 inches and subsequently excavated to final grade immediately before placement of concrete.

In order to reduce the effects of differential movement that may occur due to variations in the character of the supporting soil and any variations in seasonal moisture contents, it is recommended that all continuous footings be reinforced, as per structural considerations.

PSI should be retained to provide observation and testing of construction activities involved in the foundation, earthwork, and related activities of this project. PSI cannot accept responsibility for conditions that deviate from those described in this report, nor for the performance and testing for this project.

4.4 EARTHQUAKE AND SEISMIC DESIGN CONSIDERATION

The 2021 International Building Code requires a site class for the calculation of earthquake design forces. This class is a function of soil type (i.e., depth of soil and strata types). Based on the depth to rock and the estimated shear strength of the soil at the test boring locations, Site Class "C" is recommended. The United States Geological Survey National Earthquake Hazard Reduction Program (USGS-NEHRP) probabilistic ground motion values "C" are as follows:

Table 5
For Latitude 41.2698°N / Longitude -83.3227°W

Period (seconds)	Site Coefficients	Max. Spectral Acceleration Parameters	Design Spectral Acceleration Parameters
0.137 (S_s)	F_a = 1.3	S_{ms} = 0.178	S_{Ds}= 0.119
0.055 (S_1)	F_v = 1.5	S_{m1} = 0.083	S_{D1}= 0.055

According to IBC 2021, the Site Coefficients, Fa and Fv were interpolated from ASCE7-16 as a function of the site classifications and the mapped spectral response acceleration at the short (Ss) and 1 second (S1) periods.

If a **Seismic Design Category A** is selected by the architect or structural engineer for this structure, Section 1802 of the Code does not require an assessment of slope stability, liquefaction potential, and surface rupture due to faulting or lateral spreading.

4.5 FLOOR SLAB RECOMMENDATIONS

The floor slab should be supported on properly placed, compacted, and tested fill or native low plasticity soil. Once the site area has been prepared in accordance with the "Site Preparation" section of this report, the floor slab can be grade supported on a minimum 2 feet non-expansive engineered fill. Proof-rolling, as discussed earlier in this report, should be accomplished to identify soft or unstable soils that should be removed from the floor slab area prior to fill placement and/or floor slab construction. These soils should be replaced with properly compacted structural fill as described earlier in this report.

PSI recommends that a minimum six (6) inch thick trimmable, compactable granular material be placed beneath the floor slab to enhance drainage. The soil surface shall be graded to drain away from the building without low spots that can trap water prior to placing the granular drainage layer. Polyethylene sheeting should be placed to act as a vapor retarder where the floor will be in contact with moisture sensitive equipment or products such as tile, wood, carpet, etc., as directed by the design engineer. The decision to locate the vapor retarder in direct contact with the slab or beneath the layer of granular fill should be made by the design engineer after considering the moisture sensitivity of subsequent floor finishes, anticipated project conditions, and the potential effects of slab curling and cracking. The floor slabs should have an adequate number of joints to reduce cracking resulting from differential movement and shrinkage.

For subgrade prepared as recommended and properly compacted fill, a modulus of subgrade reaction, *k* value, of **100 pounds per cubic inch (pci)** may be used in the grade slab design based on correlation to values typically resulting from a 1 ft. x 1 ft. plate load test. However, depending on how the slab load is applied, the value should be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesive and cohesionless soil:

$$\text{Modulus of Subgrade Reaction, } k_s = \left(\frac{k}{B}\right) \text{ for cohesive soil and}$$

$$k_s = k\left(\frac{B+1}{2B}\right)^2 \text{ for cohesionless soil}$$

where: k_s = coefficient of vertical subgrade reaction for loaded area,
k = coefficient of vertical subgrade reaction for 1 square foot area, and
B = effective width of area loaded, in feet

The precautions listed below should be followed for construction of slab-on-grade pads. These details will not reduce the amount of movement but are intended to reduce potential damage should some settlement of the supporting subgrade take place. Some increase in moisture content is inevitable because of development and associated landscaping. However, extreme moisture content increases can be largely controlled by proper and responsible site drainage, building maintenance and irrigation practices.

Cracking of slab-on-grade concrete is normal and should be expected. Cracking can occur not only because of heaving or compression of the supporting soil and/or bedrock material, but also because of concrete curing stresses. The occurrence of concrete shrinkage cracks, and problems associated with concrete curing may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement, finishing, and curing, and by the placement of crack control joints at frequent intervals, particularly where re-entrant slab corners occur. The American Concrete Institute (ACI) recommends a maximum panel size (in feet) equal to approximately three times the thickness of the slab (in inches) in both directions. For example, joints are recommended at a maximum spacing of twelve (12) feet based on having a four-inch slab. PSI also recommends that the slab be independent of the foundation walls. Using fiber reinforcement in the concrete can also control shrinkage cracking.

Areas supporting slabs should be properly moisture conditioned and compacted. Backfill in all interior and exterior water and sewer line trenches should be carefully compacted to reduce the shear stress in the concrete extending over these areas.

Exterior slabs should be isolated from the building. These slabs should be reinforced to function as independent units. Movement of these slabs should not be transmitted to the building foundation or superstructure.

4.6 UTILITIES TRENCHING

Excavation for utility trenches shall be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. It should be noted that utility trench excavations have the potential to degrade the properties of the adjacent fill materials. Utility trench walls that can move laterally can lead to reduced bearing capacity and increased settlement of adjacent structural elements and overlying slabs.

Backfill for utility trenches is as important as the original subgrade preparation or structural fill placed to support either a foundation or slab. Therefore, it is imperative that the backfill for utility trenches be placed to meet the project specifications for the structural fill of this project. PSI recommends that flowable fill or lean mix concrete be utilized for utility trench backfill. If on-site soils are placed as trench backfill, the backfill for the utility trenches should be placed in four (4) to six (6) inch loose lifts and compacted to a minimum of 98% of the maximum dry density achieved by the standard Proctor test. The backfill soil should be moisture conditioned to be within 2% of the optimum moisture content as determined by the standard Proctor test. Up to four (4) inches of bedding material placed directly under the pipes or conduits placed in the utility trench can be compacted to the 90% compaction criteria with respect to the standard Proctor. Compaction testing should be performed for every 200 cubic yards of backfill place or each lift within 150 linear feet of trench, whichever is less. Backfill of utility trenches should not be performed with water standing in the trench. If granular material is used for the backfill of the utility trench, the granular material should have a gradation that will filter protect the backfill material from the adjacent soils. If this gradation is not available, a geosynthetic non-woven filter fabric should be used to reduce the potential for the migration of fines into the backfill material. Granular backfill material shall be compacted to meet the above compaction criteria. The clean granular backfill material should be compacted to achieve a relative density greater than 75% or as specified by the geotechnical engineer for the specific material used.

4.7 SILTATION CONTROL

The Clean Water Act implemented in 1990 includes a federal permit program called the National Pollutant Discharge Elimination System (NPDES). This program requires that projects sites more than one (1) acre or are part of a development which exceeds one (1) acre be covered under a permit. This typically includes the development of a storm water pollution prevention plan (SWPPP) as well as period inspections (typically once a week plus after significant rainfall). PSI is available to assist with these services.

5 CONSTRUCTION CONSIDERATIONS

PSI should be retained to provide observation and testing of construction activities involved in the foundation, earthwork, and related activities of this project. PSI cannot accept responsibility for conditions that deviate from those described in this report, nor for the performance of the foundation system if not engaged to also provide construction observation and testing for this project.

5.1 MOISTURE SENSITIVE SOILS/WEATHER RELATED CONCERNS

The upper fine-grained soils encountered at this site will be sensitive to disturbances caused by construction traffic and to changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

5.2 DRAINAGE AND GROUNDWATER CONSIDERATIONS

Groundwater was encountered during drilling and upon completion of drilling at select test boring locations. Please refer to section *2.4 Groundwater Level Measurements* on Page 9 of this report for specific water level readings. PSI recommends that the Contractor determine the actual groundwater levels at the site at the time of the construction activities to assess the impact groundwater may have on construction. Water should not be allowed to collect in the foundation excavation, on floor slab areas, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of collected rainwater, groundwater, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slabs. The grades should be sloped away from the building and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the building. Overall site area drainage is to be arranged in a manner such that the possibility of water impounding below slab-on-grade areas and over the structural fill, is prevented at all times during and after construction.

5.3 EXCAVATONS

In Federal Register, Volume 54, Number 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better enhance the safety of workers entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavation or footing excavations, be constructed in accordance with the new OSHA guidelines. It is PSI's understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

Care must be taken to protect adjacent structure foundations and structures during the foundation excavation process, so no structure or foundation is undermined. All existing foundations must be protected during the installation process. In addition, care must be taken to maintain the groundwater level at least 2 feet below the deepest excavation at the site to reduce the potential for unstable soil conditions.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case, should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations. A trench safety plan was beyond the scope of our services for this project.

6 GEOTECHNICAL RISK

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding section constitutes PSI's professional estimate of those measures that are necessary for the proposed structure to perform per the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.

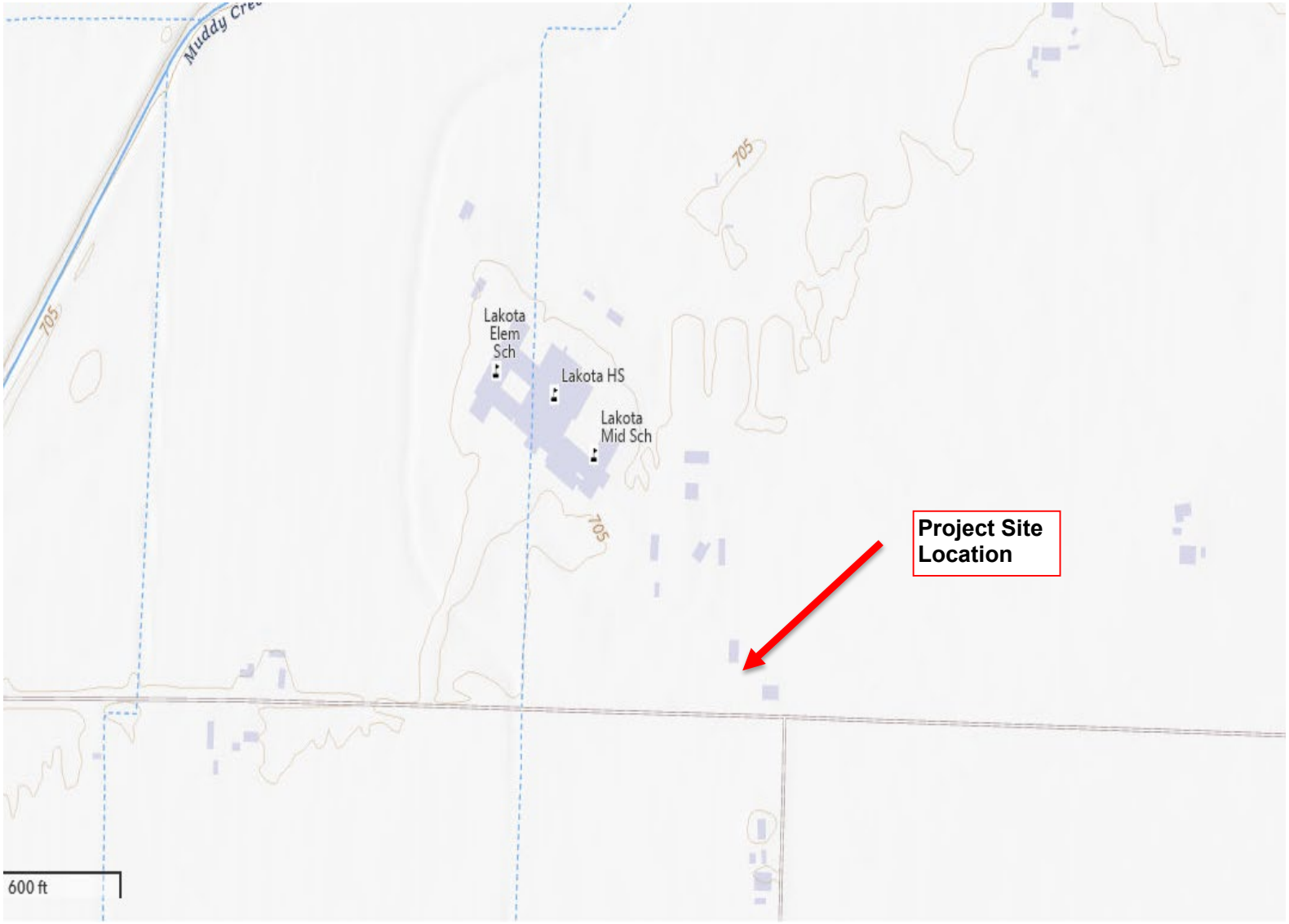
7 REPORT LIMITATIONS

The recommendations submitted in this report are based on the available subsurface information obtained by PSI and design details furnished by the client for the proposed warehouse structure. If there are any revisions to the plans for the proposed structure or pavement areas, or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be retained to determine if changes in the recommendations are required. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the geotechnical recommendations for the project.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein, have been presented after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

This report has been prepared for the exclusive use of Lakota Local Schools for the specific application to the proposed new bus and maintenance buildings for Lakota Local Schools. The project is to be located at 5186 County Road 13 in Kansas, Sandusky County, Ohio.

APPENDIX



intertek psi

Site Vicinity Map
New Bus/Maintenance Buildings
Latitude: 41.2698°; Longitude: -83.3227°
Kansas, Sandusky County, Ohio

Image Taken from USGS website

Project No. 01253794

BORING B-1

DATE STARTED:	5/19/26	**DRILL COMPANY:**	GME Testing
DATE COMPLETED:	5/19/26	**DRILLER:** RS	**LOGGED BY:**
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	TMG STR 138 Auto Hammer
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	N/A	**SAMPLING METHOD:**	2-in SSSplit Spoon
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	100%
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	BF/CC

Water

While Drilling	11 feet
Upon Completion	9.5 feet
Delay	N/A

BORING LOCATION:

REMARKS: N_{60} denotes the normalization to 60% efficiency as described in ASTM D4633.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					**11" TOPSOIL**	TOPSOIL				
				1	6	VERY STIFF, MOIST, DARK GRAY, **FAT CLAY** , MODERATE ORGANIC CONTENT IN SAMPLE #1		3-4-6 N_{60}=17	23		Organic Matter Content 7.6%
				2	6	STIFF, BROWN/GRAY 3.5'	CH	3-3-4 N_{60}=12	24		
	5			3	9	HARD, MOIST, BROWN, **LEAN CLAY WITH SAND**	CL	6-11-12 N_{60}=38	18		
				4	12	VERY HARD, MOIST, GRAY, **SANDY LEAN CLAY**	CL	14-14-19 N_{60}=55	9		Fines=51.5%
	10					**AUGER REFUSAL AND END OR BORING 11.5'**					
	15										

intertek psi

Professional Service Industries, Inc.
2341 Spencerville Road
Lima, OH 45805
Telephone: (419) 999-5660

PROJECT NO.: 01253794
PROJECT: Lakota Bus Garage
LOCATION: 5186 County Road 13
Kansas, Ohio

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-2

DATE STARTED:	5/19/26	**DRILL COMPANY:**	GME Testing
DATE COMPLETED:	5/19/26	**DRILLER:**	RS **LOGGED BY:**
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	TMG STR 138 Auto Hammer
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	N/A	**SAMPLING METHOD:**	2-in SSSplit Spoon
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	100%
STATION:	N/A **OFFSET:** N/A	**REVIEWED BY:**	BF/CC

Water

While Drilling	12 feet
Upon Completion	4.5 feet
Delay	N/A

BORING LOCATION:

REMARKS: N_{60} denotes the normalization to 60% efficiency as described in ASTM D4633.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0					**4" ASPHALT**	ASPHALT				
						6" GRAVEL BASE	GRAVEL BASE				
				1	9	STIFF, MOIST, BROWN/GRAY, **FAT CLAY**	CH	2-3-5 N_{60}=13	25		
				2	12			3-3-4 N_{60}=12	21		LL = 50 PL = 24
	5			3	12	HARD, MOIST, DARK BROWN, **LEAN CLAY**	CL	5-8-11 N_{60}=32	19		LL = 45 PL = 26 Fines=90.1%
				4	12	VERY HARD, MOIST, DARK BROWN, **LEAN CLAY WITH SAND**	CL	15-16-21 N_{60}=62	12		>>
	10			5	2	**LIMESTONE FRAGMENTS**		50/2"	22		>>
	15					**SPLIT SPOON REFUSAL 13.7'**					
						AUGER REFUSAL AND END OR BORING 14'					

intertek psi

Professional Service Industries, Inc.
2341 Spencerville Road
Lima, OH 45805
Telephone: (419) 999-5660

PROJECT NO.:	01253794
PROJECT:	Lakota Bus Garage
LOCATION:	5186 County Road 13
	Kansas, Ohio

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-3

DATE STARTED:	5/19/26	**DRILL COMPANY:**	GME Testing
DATE COMPLETED:	5/19/26	**DRILLER:**	RS **LOGGED BY:**
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	TMG STR 138 Auto Hammer
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	N/A	**SAMPLING METHOD:**	2-in SSSplit Spoon
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	100%
STATION:	N/A **OFFSET:** N/A	**REVIEWED BY:**	BF/CC

Water

While Drilling	12 feet
Upon Completion	6.5 feet
Delay	N/A

BORING LOCATION:

REMARKS: N_{60} denotes the normalization to 60% efficiency as described in ASTM D4633.

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎	Additional Remarks
	0					**4" ASPHALT**	ASPHALT				
						10" GRAVEL BASE	GRAVEL BASE				
						STIFF, MOIST, BROWN/GRAY, **LEAN CLAY**					
				1	6			3-3-4 N_{60}=12	20		
				2	12		CL	3-3-4 N_{60}=12	24		LL = 48 PL = 24
	5					HARD, BROWN 6'					
				3	12			5-12-15 N_{60}=45	16		
						VERY HARD, MOIST, DARK BROWN, **SANDY SILTY CLAY**					
				4	12			18-19-24 N_{60}=72	13	>>	LL = 27 PL = 20 Fines=59.8%
	10						CL				
				5	3	**WET, LIMESTONE FRAGMENTS**		50/3"	24	>>	Fines=23.5%
	15					**SPLIT SPOON REFUSAL 13.8'**					
						AUGER REFUSAL AND END OR BORING 15'					

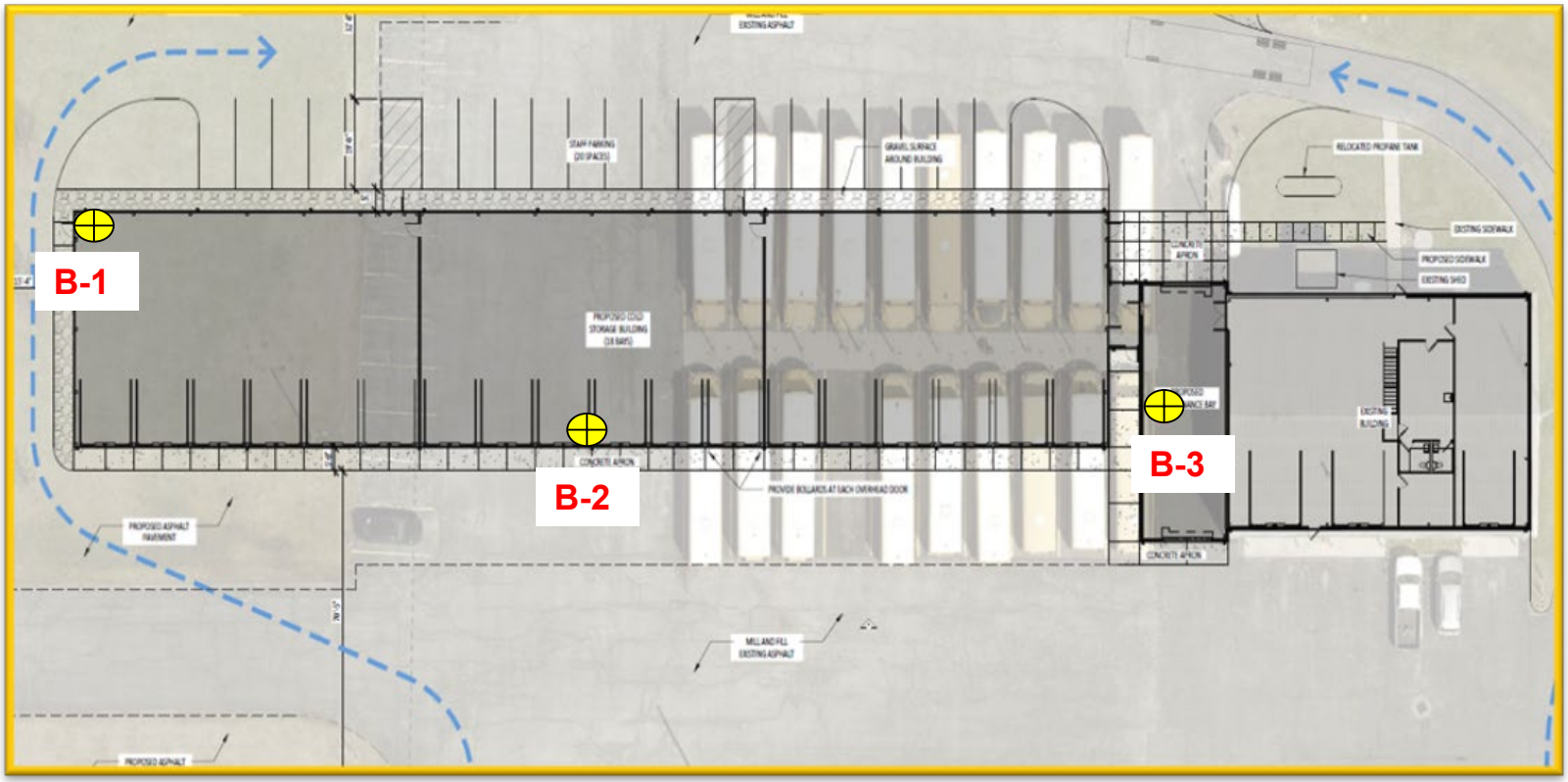
STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)

intertek psi

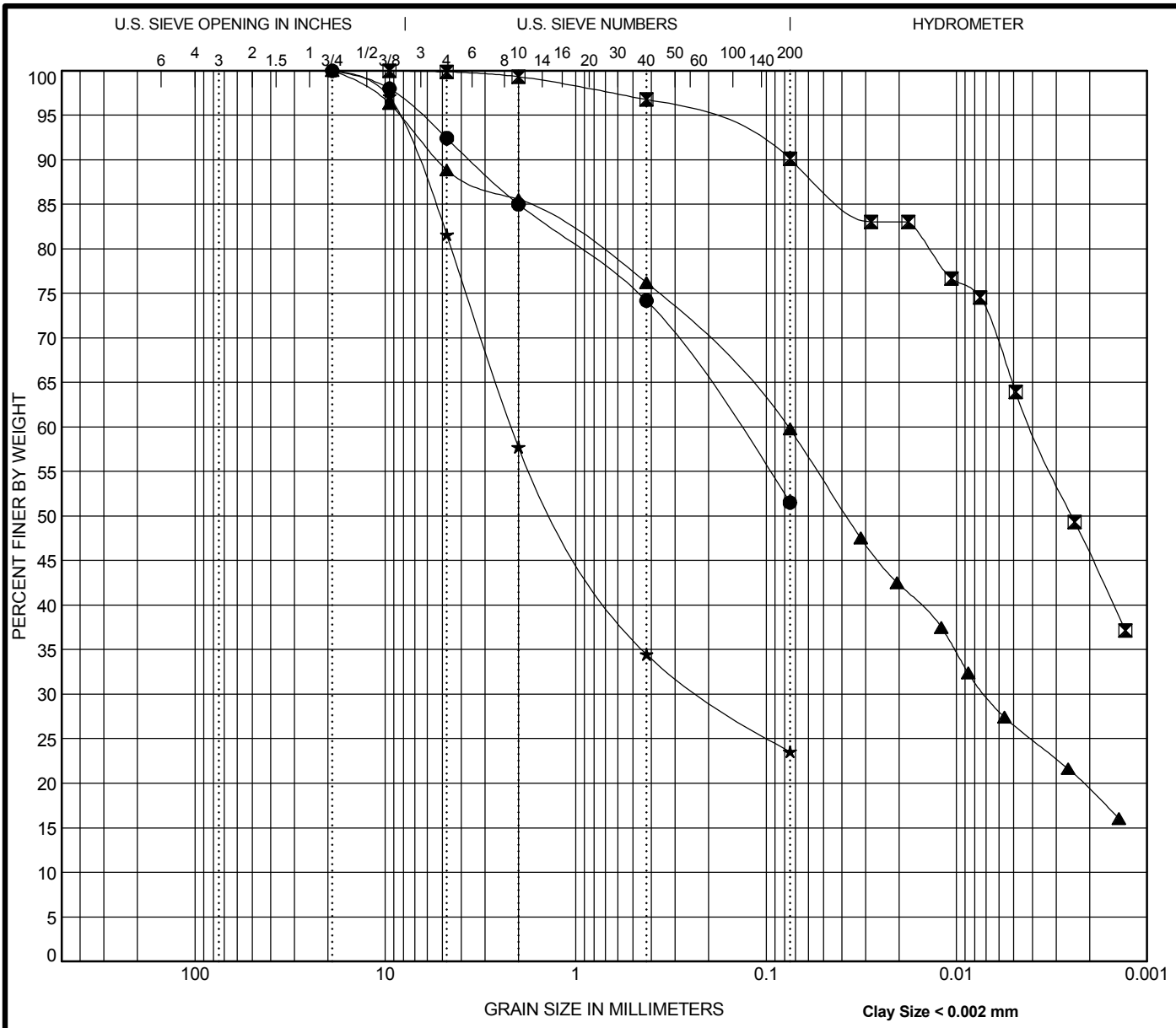
Professional Service Industries, Inc.
2341 Spencerville Road
Lima, OH 45805
Telephone: (419) 999-5660

PROJECT NO.: 01253794
PROJECT: Lakota Bus Garage
LOCATION: 5186 County Road 13
Kansas, Ohio

The stratification lines represent approximate boundaries. The transition may be gradual.



intertek psi	**Boring Location Plan** Kansas Site 5186 County Road 13 Kansas, Ohio	Drawing provided by Client 01253794



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

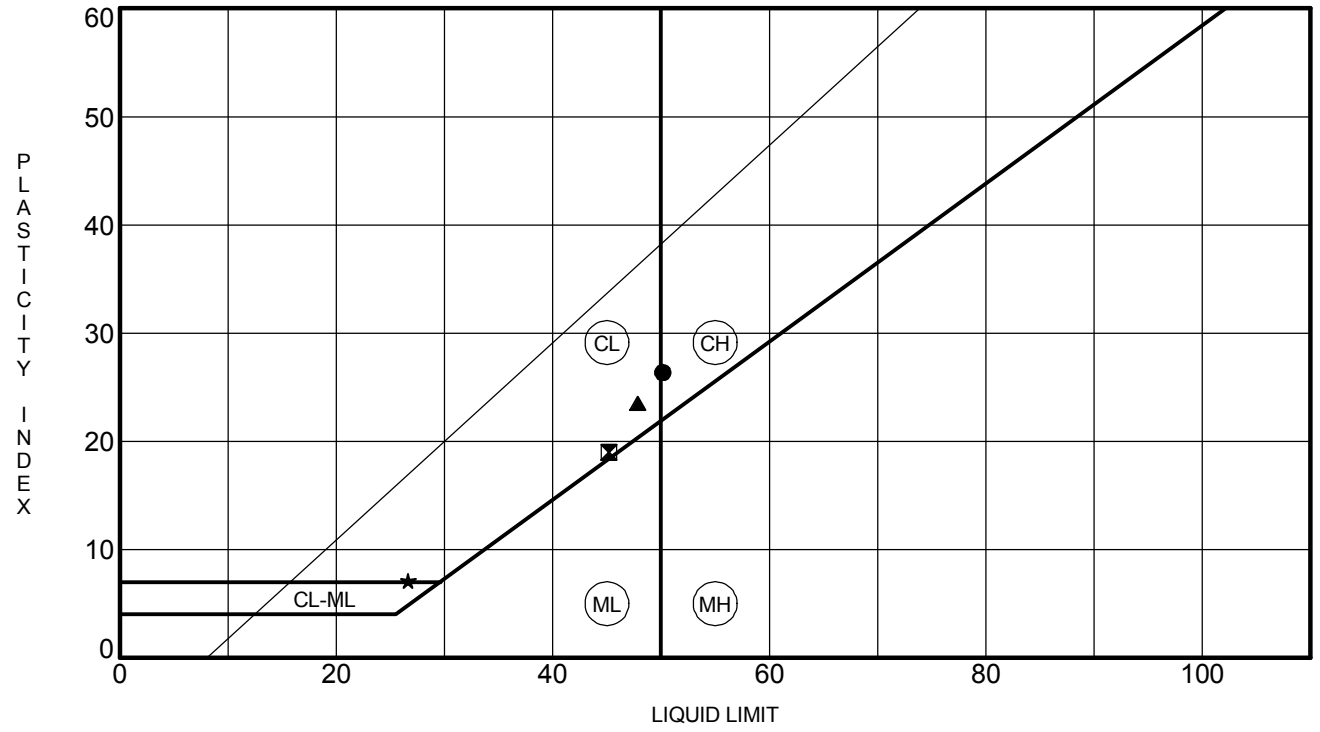
	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	B-1	9.3	SANDY LEAN CLAY (CL)					
⊠	B-2	6.8	LEAN CLAY (CL)	45	26	19		
▲	B-3	9.3	SANDY SILTY CLAY (CL-ML)	27	20	7		
★	B-3	14.3	CLAYEY SAND WITH GRAVEL (SC)					

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	9.3	19	0.143			7.6	40.9	51.5	
⊠	B-2	6.8	9.5	0.004			0.1	9.8	44.4	45.7
▲	B-3	9.3	19	0.077	0.007		11.2	29.0	40.5	19.3
★	B-3	14.3	19	2.17	0.209		18.4	58.1	23.5	

intertek psi
Professional Service Industries, Inc.
2341 Spencerville Road
Lima, OH 45805
Telephone: (419) 999-5660
Fax: (419) 999-6029

GRAIN SIZE DISTRIBUTION

Project: Lakota Bus Garage
PSI Job No.: 01253794
Location: 5186 County Road 13
Kansas, Ohio

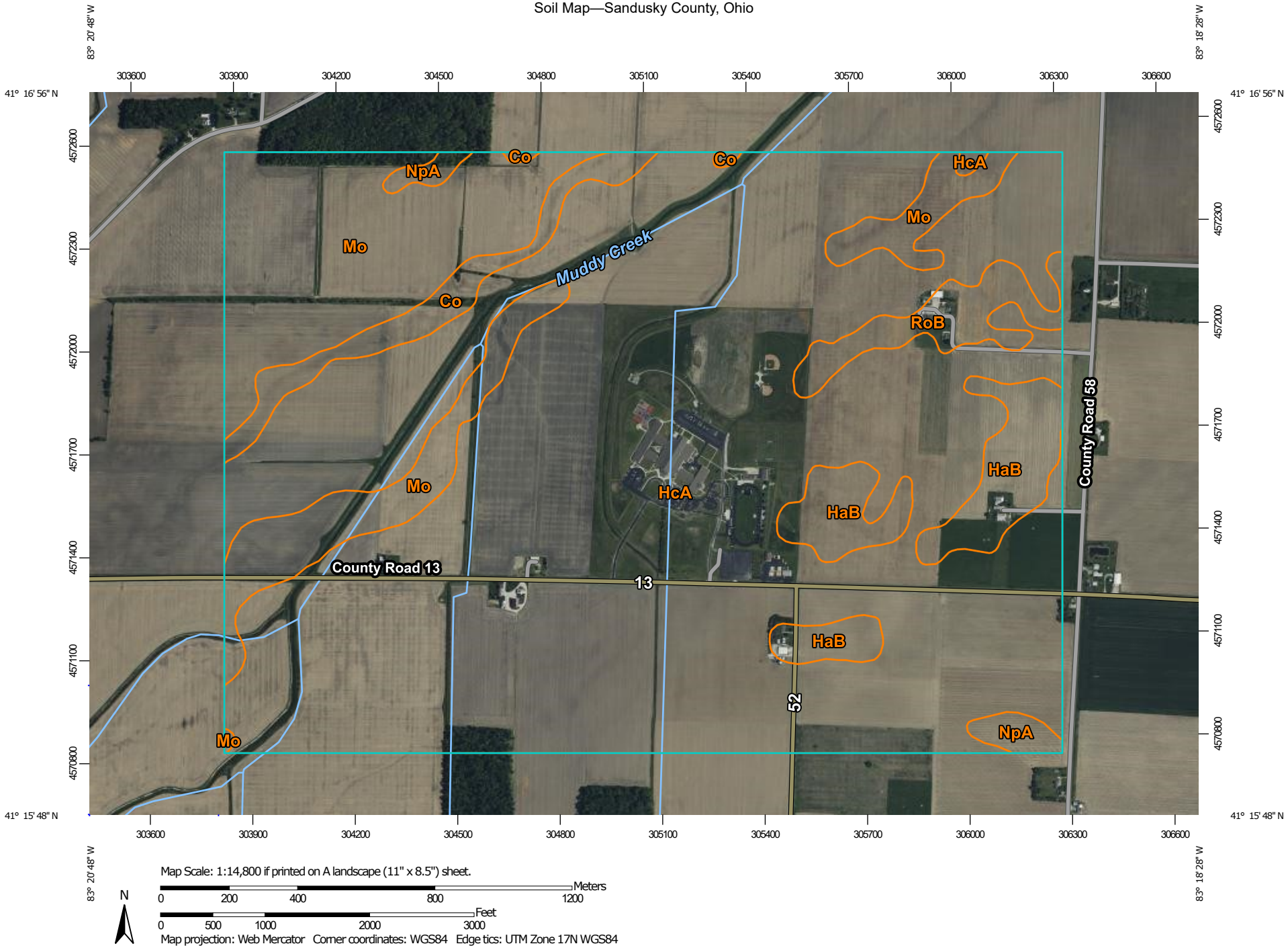


	Boring	Depth (ft)	LL	PL	PI	Fines	Classification (*Visual)
●	**B-2**	**4.3**	**50**	**24**	**26**		**FAT CLAY (CH)**
⊠	**B-2**	**6.8**	**45**	**26**	**19**	**90.1**	**LEAN CLAY (CL)**
▲	**B-3**	**4.3**	**48**	**24**	**24**		**LEAN CLAY (CL)**
★	**B-3**	**9.3**	**27**	**20**	**7**	**59.8**	**SANDY SILTY CLAY (CL-ML)**

intertek psi
Professional Service Industries, Inc.
2341 Spencerville Road
Lima, OH 45805
Telephone: (419) 999-5660
Fax: (419) 999-6029

ATTERBERG LIMIT RESULTS

PSI Job No.: 01253794
Project: Lakota Bus Garage
Location: 5186 County Road 13
Kansas, Ohio


83° 20' 48" W
83° 18' 28" W
41° 16' 56" N
41° 15' 48" N
303600
303900
304200
304500
304800
305100
305400
305700
306000
306300
306600
4572600
4572300
4572000
4571700
4571400
4571100
4570800
NpA
Co
Co
HcA
Mo
Mo
Muddy Creek
Co
RoB
County Road 58
HaB
Mo
HcA
HaB
County Road 13
13
HaB
52
Mo
NpA
Map Scale: 1:14,800 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
200
400
800
1200
Feet
0
500
1000
2000
3000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N 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.

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: Sandusky County, Ohio
Survey Area Data: Version 21, Sep 4, 2025

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

Date(s) aerial images were photographed: May 21, 2023—Jun 18, 2023

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
Co	Colwood fine sandy loam	27.2	2.6%
HaB	Haskins sandy loam, 1 to 4 percent slopes	53.6	5.0%
HcA	Hoytville silty clay loam, 0 to 1 percent slopes	781.7	73.3%
Mo	Mermill loam	169.4	15.9%
NpA	Nappanee silt loam, 0 to 3 percent slopes	9.4	0.9%
RoB	Rimer loamy fine sand, 1 to 4 percent slopes	24.8	2.3%
Totals for Area of Interest		**1,066.2**	**100.0%**

ArcGIS Web Map

5/28/2026, 4:47:00 PM

World_Boundaries_and_Places
Counties
Statewide Parcels

Structure Lines
Anticline, known
Anticline, approximate
Syncline, known
Syncline, approximate
Fault - certain
Fault - approximate

Bedrock Geology 24K
Qal - Alluvium
Qac - Lithified Stream Deposits (Peebles Quadrangle Only)
Qt2 - Second Terrace Deposits (Peebles Quadrangle Only)
Qt1 - First Terrace Deposits (Peebles Quadrangle Only)
Pd - Dunkard Group (Permian)
PIPd - Dunkard Group (Permian-Pennsylvanian)
IPm - Monongahela Group
IPc - Conemaugh Group
IPa - Allegheny Group
IPap - Allegheny And Pottsville Groups Undivided
IPb - Breathitt Group
Mu - Maxville Limestone, Logan Formation, And Cuyahoga Formations Undivided
Msbd - Sunbury And Bedford Formations Undivided
Mlc - Logan And Cuyahoga Formations Undivided
Mc - Cuyahoga Formation
Mc-d - Cuyahoga Formation, Sunbury Shale, Berea Sandstone, Bedford Shale Undivided (Serpent
Ms-d - Sunbury Shale, Berea Sandstone, And Bedford Shale Undivided (Michigan Basin Only)

1:18,090

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

KARST Map #1

5/27/2026, 10:48:29 AM

1:22,113

World_Boundaries_and_Places

Karst Points

- Karst - Field Verified
- Karst - Suspect - Field Visited
- Karst - Suspect - Not Visited
- Spring - Field Verified Carbonate

Spring Points

- Spring - Field Verified Carbonate
- Spring - Field Verified Non-Carbonate
- Spring - Suspect Carbonate
- Spring - Suspect Non-Carbonate
- Karst Detailed Mapping Completed Areas

- Current Township
- Counties
- Statewide Parcels
- World Imagery
- Low Resolution 15m Imagery

High Resolution 60cm Imagery

High Resolution 30cm Imagery

Citations

4.8m Resolution Metadata

0 0.2 0.4 0.8 mi

0 0.33 0.65 1.3 km

Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

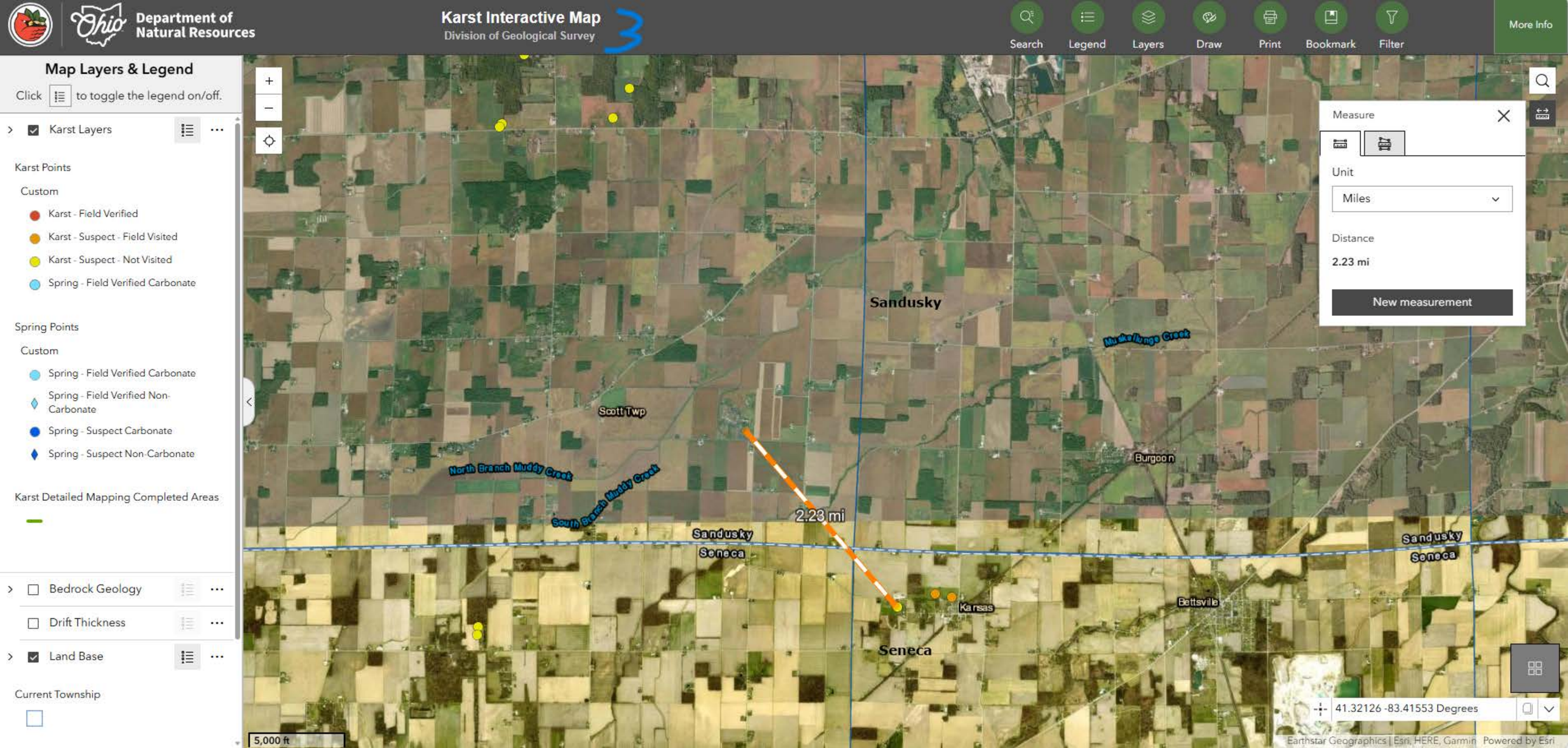
Map Layers & Legend

Click to toggle the legend on/off.

- Karst Layers
  - Karst Points
    - Custom
      - Karst - Field Verified
      - Karst - Suspect - Field Visited
      - Karst - Suspect - Not Visited
      - Spring - Field Verified Carbonate
  - Spring Points
    - Custom
      - Spring - Field Verified Carbonate
      - Spring - Field Verified Non-Carbonate
      - Spring - Suspect Carbonate
      - Spring - Suspect Non-Carbonate
  - Karst Detailed Mapping Completed Areas
- Bedrock Geology
- Drift Thickness
- Land Base
- Current Township

Measure
Unit: Miles
Distance: 3.19 mi
New measurement

Scott Twp
North Branch Muddy Creek
South Branch Muddy Creek
3.19 mi
Sandusky
Seneca
Muskellunge Creek
Burgoon
Kansas
Bettsville
41.31502 -83.40922 Degrees
5,000 ft

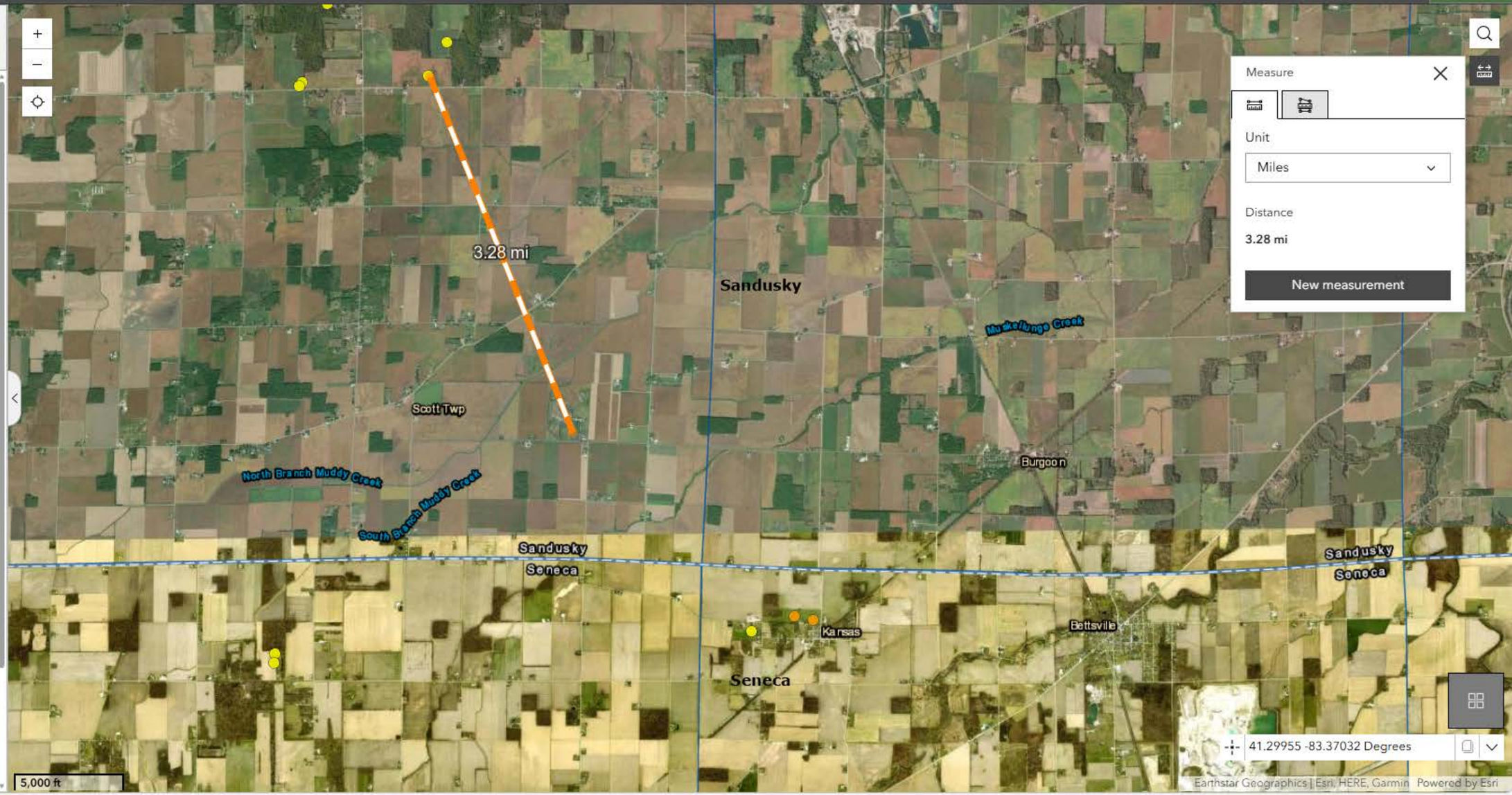

Department of Natural Resources
Karst Interactive Map
Division of Geological Survey
Search
Legend
Layers
Draw
Print
Bookmark
Filter
More Info
Map Layers & Legend
Click to toggle the legend on/off.
Karst Layers
Karst Points
Custom
Karst - Field Verified
Karst - Suspect - Field Visited
Karst - Suspect - Not Visited
Spring - Field Verified Carbonate
Spring Points
Custom
Spring - Field Verified Carbonate
Spring - Field Verified Non-Carbonate
Spring - Suspect Carbonate
Spring - Suspect Non-Carbonate
Karst Detailed Mapping Completed Areas
Bedrock Geology
Drift Thickness
Land Base
Current Township
Measure
Unit
Miles
Distance
2.23 mi
New measurement
Sandusky
Scott Twp
Muskellunge Creek
Burgoon
North Branch Muddy Creek
South Branch Muddy Creek
2.23 mi
Sandusky
Seneca
Kansas
Bettsville
Seneca
41.32126 -83.41553 Degrees
5,000 ft
Earthstar Geographics | Esri, HERE, Garmin Powered by Esri

Map Layers & Legend

Click to toggle the legend on/off.

- Karst Layers
  - Karst Points
    - Custom
      - Karst - Field Verified
      - Karst - Suspect - Field Visited
      - Karst - Suspect - Not Visited
      - Spring - Field Verified Carbonate
  - Spring Points
    - Custom
      - Spring - Field Verified Carbonate
      - Spring - Field Verified Non-Carbonate
      - Spring - Suspect Carbonate
      - Spring - Suspect Non-Carbonate
  - Karst Detailed Mapping Completed Areas
- Bedrock Geology
- Drift Thickness
- Land Base

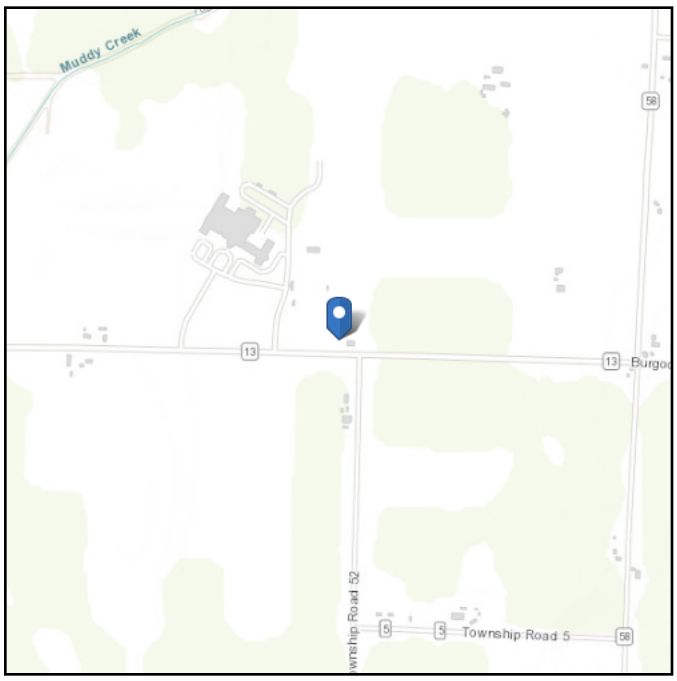
Current Township

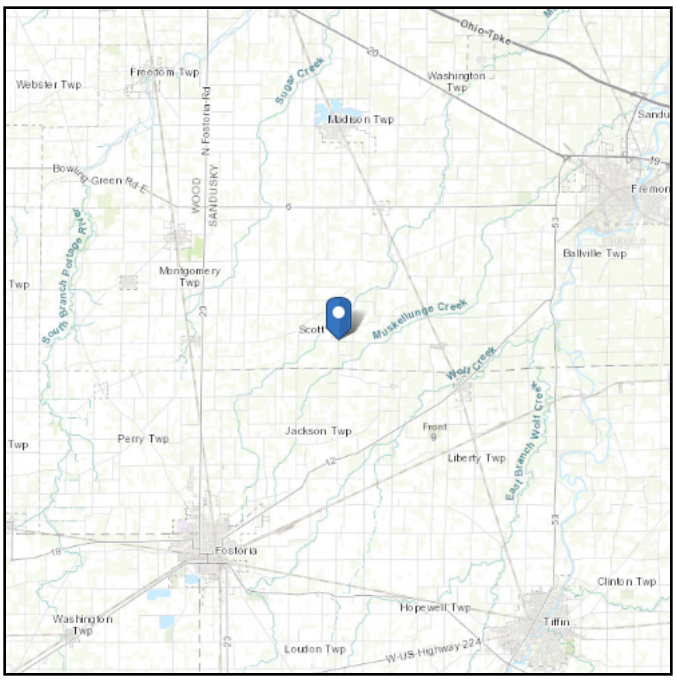


ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.2698
Risk Category:	II	**Longitude:**	-83.3227
Soil Class:	C - Very Dense Soil and Soft Rock	**Elevation:**	707.3712012087124 ft (NAVD 88)





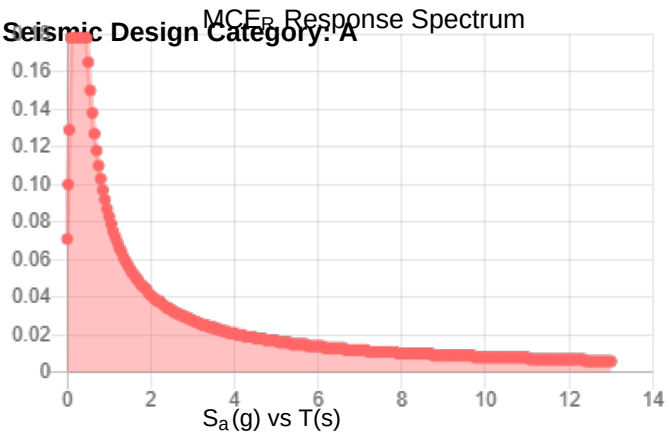
Seismic

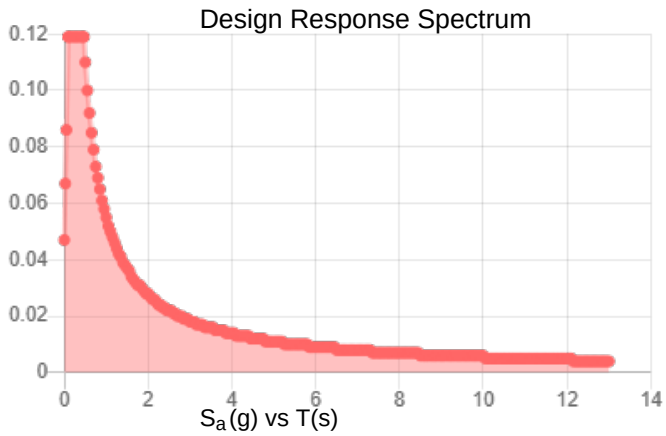
Site Soil Class: C - Very Dense Soil and Soft Rock

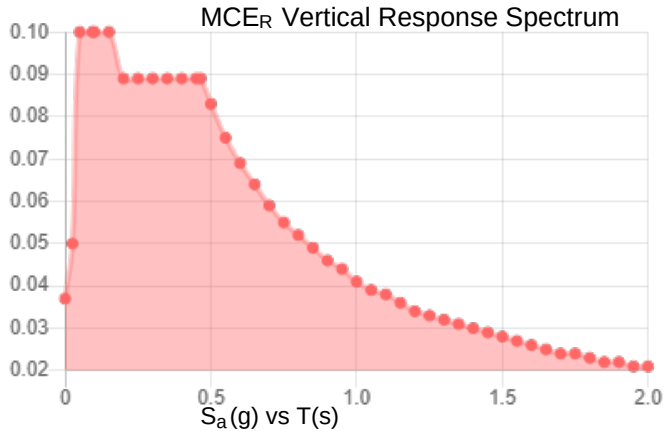
Results:

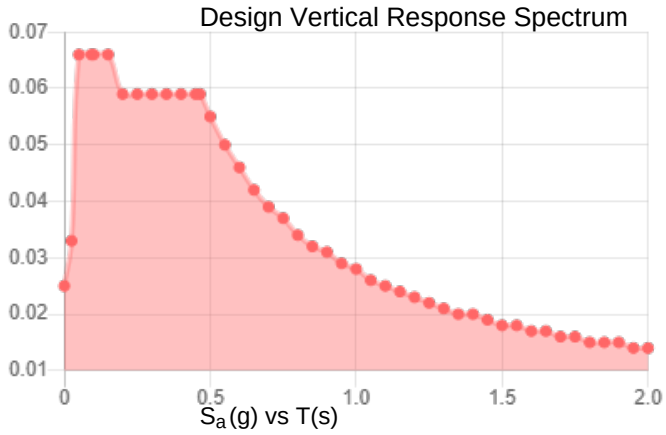
S_S :	0.137	S_{D1} :	0.055
S_1 :	0.055	T_L :	12
F_a :	1.3	PGA :	0.072
F_v :	1.5	PGA_M :	0.093
S_{MS} :	0.178	F_{PGA} :	1.3
S_{M1} :	0.083	I_e :	1
S_{DS} :	0.119	C_v :	0.7

Seismic Design Category: A









Data Accessed: **Mon Jun 01 2026**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE Hazard Tool.

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
RC: Rock Core
TC: Texas Cone
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,▼ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

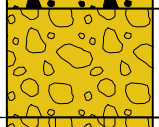
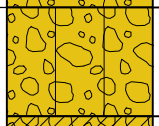
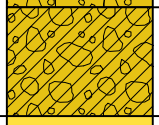
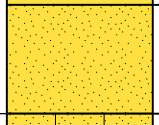
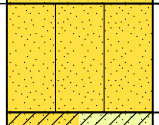
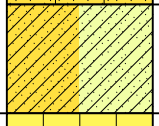
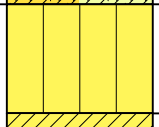
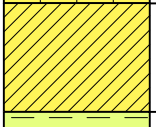
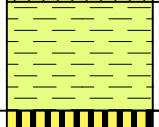
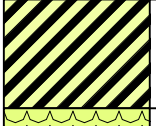
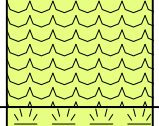
Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

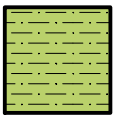
MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

intertek psi

Graphic Symbols for Materials and Rock Deposits

CONCRETE
Portland Cement Concrete

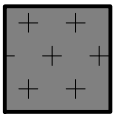
BITUMINOUS CONCRETE



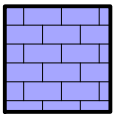
CLAYSTONE

COAL
Coal, Anthracite Coal

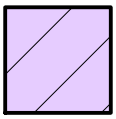
CONGLOMERATE/BRECCIA
Conglomerate, Breccia



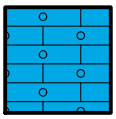
IGNEOUS ROCK
Anorthsite, Basalt, Metabasalt, Diabase (Gabbro), Gabbro, Granite/Granodionite, Homfels, Pegmatite, Rhyolite/Metarhyolite



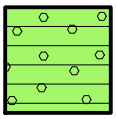
LIMESTONE
Limestone, Dolomite



METAMORPHIC ROCK
Amphibolite, Gneiss, Marble, Phyllite, Quartzite, Schist, Serpentinite, Slate

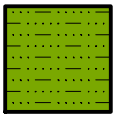


CHERT

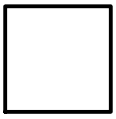


SANDSTONE
Sandstone, Orthoquarzite (Sandstone)

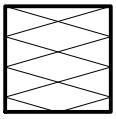
SHALE



SILTSTONE



NO RECOVERY



VOID

intertek
psi

SECTION 07 42 13.13
FORMED METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured metal panels for exterior wall panels and interior liner panels, with related flashings and accessory components.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements

B. Section 07 92 00 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

C. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate dimensions, layout, joints, construction details, and methods of anchorage.

C. Shop Drawing: Sub framing system: Indicate dimensions, layout, construction details, method of anchorage

D. Samples: Submit two samples of wall panel and soffit panel, 12 inch by 12 inch in size illustrating finish color, sheen, and texture.

1.05 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Wall system manufacturer has been engaged in the fabrication of metal wall systems for at least ten years.
   1. The Manufacturer shall be a member of the Metal Building Manufacturer's Association (MBNA).
   2. The American Institute of Steel Construction (AISC) currently certifies the Manufacturer for Category MB.
   3. The Manufacturer maintains a certified installer program for its products and maintains an up to date authorized roofing contractor list.
   4. The Manufacturer has a written warranty covering durability, color and weather tightness of its roof system.
   5. Manufacturer shall produce the metal panels on fixed equipment operated by the manufacturer.

B. Installer Qualifications: Company specializing in performing sheet metal installations with minimum 5 years of experience on projects of similar size and scope.
   1. Contractor shall follow the Manufacturer's installation details without exception unless written authorization from the manufacturer and architect are provided on an installation detail revision.

1.06 PRE-INSTALLATION MEETING

A. Convene two weeks before staring work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver system components to the project site in Manufacturer's unopened original containers.

B. Protect system components during shipment, storage, handling and erection from mechanical abuse, stains, discoloration and corrosion.

C. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

D. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.

E. Prevent contact with materials that may cause discoloration or staining of products.

F. Damaged materials will be rejected and removed from the site.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents

C. Standard Manufacturer Warranty: Provide a written warranty, with monetary limitation, signed by manufacturer agreeing to promptly repair leaks resulting from defects in materials or workmanship for the following warranty period:
   1. Warranty Period: 20 Years from the date of Substantial Completion

D. Finish Warranty: Furnish panel manufacturer's written warranty for twenty (20) years covering the finish of exposed coated metal surfaces against blistering, peeling, cracking, flaking, checking, chipping, rusting, and chalking and color change during the warranty period.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Wall Panels - Exposed Fasteners Basis of Design: DMI; R-Panel WPRP
   1. McElroy Metal: www.mcelroymetal.com/#sle.

B. Other Acceptable Manufacturers:
   1. Architectural Metal Systems, Alpharetta Ga
   2. Berridge Manufacturing, Houston Tx
   3. Centria.
   4. McElroy Metal, Inc. Bossier City La
   5. MBCI.
   6. Petersen, Pac-Clad

2.02 MANUFACTURED METAL PANELS

A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
   1. Provide exterior wall panels, interior liner panels, soffit panels, and subgirt framing assembly.
   2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
   3. Design Pressure: In accordance with applicable codes.
   4. Maximum Allowable Deflection of Panel: L/180 for length(L) of span.
   5. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.

6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
8. Corners: Factory-fabricated in one continuous piece with minimum 2 inch returns.

B. Interior Liner Panels:
1. Profile: Vertical; style as indicated.
2. Side Seams: Interlocking, sealed with continuous bead of sealant.
3. Material: Precoated steel sheet, 18 gage, 0.0478 inch minimum thickness.
4. Panel Width: 36 inch.
5. Color: As selected by Architect from manufacturer's standard line.

C. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.

D. Expansion Joints: Same material, thickness and finish as exterior sheets; manufacturer's standard brake formed type, of profile to suit system.

E. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

F. Anchors: Stainless steel.

2.03 MATERIALS

A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

B. Precoated Aluminum Sheet: ASTM B209 (ASTM B209M), 3105 alloy, O temper, smooth surface texture; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.04 ACCESSORIES

A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.

B. Sealants:
1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
2. Concealed Sealant: Non-curing butyl sealant or tape sealant.

C. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.
1. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws.

D. Field Touch-up Paint: As recommended by panel manufacturer.

2.05 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest practicable lengths.

C. Fabricate corners in one continuous piece with minimum 18 inch returns.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building framing members are ready to receive panels.

3.02 INSTALLATION

A. Install panels on walls in accordance with manufacturer's instructions.

B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.

C. Fasten panels to structural supports; aligned, level, and plumb.

D. Locate joints over supports.

E. Provide expansion and control joints where indicated by manufacturer.

F. Use concealed fasteners unless otherwise approved by Architect.

G. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.03 CLEANING

A. Remove site cuttings from finish surfaces.

B. Remove protective material from wall panel surfaces.

C. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

END OF SECTION

SECTION 07 61 00
SHEET METAL ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Complete preformed, roof system, including all materials, associated flashings, trim, closures, fasteners, framing, supports, sealants and underlayment required.

B. Roof curbs & jacks

C. Counterflashings.

D. Snow guards.

E. Vapor Retarder

F. Underlayment

G. Eave Protection

H. Integral fascias.

I. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

B. ASTM B32 - Standard Specification for Solder Metal; 2020.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

D. ASTM E 1646 - Standard Specification for Water Infiltration.

E. ASTM E 1680 - Standard Specification for Air Infiltration

F. AISC Catagory MB Certification

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene two weeks before starting work of this section.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Engineered Drawings: Manufacturer of the roofing system, shall provide engineer stamped drawings certifying that the roof system is designed specifically for this project and will meet all State of Ohio Building Codes. Engineer shall be certified in the State of Ohio.

C. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

G. Product Data: Provide data on metal types, finishes, characteristics .
   1. Flashing materials
   2. Insulation

3. Fasteners
4. Pre-manufactured pipe flashing
5. Accessories

H. Installation Samples: Submit two samples illustrating metal roofing mounted on plywood backing illustrating typical seam.

I. Submit three samples illustrating metal finish color.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise noted.

B. Manufacturer's Qualifications: Roof system manufacturer has been engaged in the fabrication of metal roof systems for at least ten years.
1. The Manufacturer shall be a member of the Metal Building Manufacturer's Association (MBNA).
2. The American Institute of Steel Construction (AISC) currently certifies the Manufacturer for Category MB.
3. The Manufacturer maintains a certified installer program for its products and maintains an up to date authorized roofing contractor list.
4. The Manufacturer has a written warranty covering durability, color and weather tightness of its roof system.
5. Manufacturer shall produce the metal roof panels on fixed equipment operated by the manufacturer. Portable roll forming shall not be permitted except for special applications and shall be licensed and operated by the Manufacturer in a permanent manufacturing facility.
6. Manufacturing facilities shall be currently under inspection by Underwriters Laboratory personal to verify compliance that the products fabricated are in accordance with the specifications of the products which were originally tested
7. Manufacturer's Field Services: Manufactures Technical Representative Inspection: Minimum of three visits to the jobsite to inspect and monitor the installation of the metal roof system. After each inspection provide the installer with a detailed written report communicating issues and progress of the roof inspection. All inspections must be performed by a technical field representative. A copy of the report shall be forwarded to the Architect for information purposes.
    a. Should the roofing system not be approved by the manufacturer’s technician, correcting the defective work shall be done by the contractor until the roofing system satisfactorily meets all the specifications and manufacturer’s requirements.

C. Installer Qualifications: Company specializing in performing sheet metal roof installations with minimum 10 years of experience on projects of similar size and scope.
1. Roofing Contractor shall be certified by the Manufacturer to install Manufacturer's roof system.
2. Roofing Contractor shall follow the Manufacturer's installation details without exception unless written authorization from the manufacturer and architect are provided on an installation detail revision.
3. Roofing Contractor shall have no viable claims pending regarding negligent acts or defective workmanship on previously performed or current projects.
4. Roofing Contractor shall have not filed for protection from creditors under any state or federal insolvency or debtor relief status or codes.
5. Roofing Contractor shall execute 100% of the roof system installation, utilizing full time employees of the Roofing Contractor. Second and third tier sub-contractors for the installation work in this section are not permitted.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver roof system components to the project site in Manufacturer's unopened original containers.

B. Protect roof system components during shipment, storage, handling and erection from mechanical abuse, stains, discoloration and corrosion.

C. Provide strippable plastic film on all painted surfaces between contact areas to prevent abrasion during shipping, storage, and handling.

D. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Store materials off the ground, under protective cover. Slope metal sheets to ensure drainage.

E. Prevent contact with materials that could cause discoloration or staining.

F. Damaged materials will be rejected and removed from the site.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents

C. Standard Manufacturer Roof Warranty: Provide a written warranty, with no monetary limitation, signed by roofing manufacturer agreeing to promptly repair leaks resulting from defects in materials or workmanship for the following warranty period:
   1. Warranty Period: 20 Years from the date of Substantial Completion

D. Weathertightness Warranty: Provide manufacturer's written weathertightness warranty for a minimum of 20 years against leaks in roof panel arising out of or caused by ordinary wear and tear under normal weather and atmospheric conditions. Warranty shall be signed by both the roofing system manufacturer and the roofing system contractor.

E. Finish Warranty: Furnish panel manufacturer's written warranty for twenty (20) years covering the finish of exposed coated metal surfaces including but not limited to roof panels, counterflashings, gutters, downspouts, fascias and trim flashings against blistering, peeling, cracking, flaking, checking, chipping, rusting, and chalking and color change during the warranty period.

F. Roofing Contractor Warranty: The roofing contractor will guarantee, from the date of Substantial Completion, at his cost and expense make or cause to make such repairs to the roof resulting from faults or defects in material or workmanship as necessary to maintain the roof in a watertight condition. Guarantee shall include, but is not limited, roof panels, flashing, roof insulation, fasteners, valleys, fascia, gutters, downspouts, trim flashings and roof joints. (Copy of the Warranty is included at the end of this Section.)
   1. Guarantee shall include, but is not limited, roof membrane, flashing, roof insulation, fasteners, walkways, and roof expansion joints.
   2. Warranty Period: 2 Years from the date of Substantial Completion
   3. Repairs required, either permanent or temporary, to the roofing or roof flashing under this guarantee shall be made within 3 days after notice of the need for repair. Should the contractor fail to make such repairs within the time period, the Owner may have the repairs made and the cost paid by the Contractor.
   4. Copy of the warranty is include at the end of this section.

PART 2 PRODUCTS

2.01 GENERAL

A. Product Source:

1. Single source responsibility for panel materials: Metal roof panels, wall panels, soffit panels and related metal components from a single manufacturer.

2.02 ROOF SYSTEM

A. Basis of Design:
   1. DMI; Span-Lock SL2016: www.dmimetals.com

B. Other Acceptable Manufacturers:
   1. AEP Span; Span-Lok hp: www.aepspan.com
   2. Berridge; Double-Lock Zee-Lock Panel: www.berridge.com
   3. Centria; SDP 200: www.centria.com
   4. Elevate; UNA-CLAD UC-6: www.holcimelevate.com
   5. Exceptional Metals; EM BattenLok HS: www.exceptionalmetals.com
   6. McElroy Metal; Maxima 2" Panel: www.mcelroymetal.com
   7. PAC-CLAD; Tite-Loc: www.pac-clad.com

C. Sheet Material: 22 gauge (.027"), 50 ksi steel sheet Galvalume Aluminum-Zinc Alloy Coated Steel meeting ASTM A792
   1. Prepainted by the coil coating process to comply with ASTM A755
   2. Panel continuous length without seam except where noted on the drawings.
   3. Finish: 2-coat fluoropolymer, 70 percent PDVF resin.
   4. Color: Selected from metal roof systems standard offering.

2.03 ACCESSORIES

A. General: Provide trim/flashing, fascias, ridge, valley, closures, gutters, gutter hangers and other related required items to provide a complete system

B. Clip: One piece floating clip with 3 1/2" x 6" x 18 ga. bearing plates screwed into deck at 36 inches on center of per roof manufacturer's requirements.

C. Fasteners:
   1. Use long life fasteners for all interior and exterior applications
   2. Provide fasteners with a factory applied coating in a color to match metal roof system.
   3. Provide neoprene washers under heads of exposed fasteners.

D. Fascia:
   1. Formed to size and configuration as indicated on drawings.
   2. Fascia shall be 20 gauge or heavier and same finish as roof panel.

E. Vapor Retarder:
   1. ASTM C 1136-06
   2. Maximum permeance rating of 0.13 perm.
   3. Manufacturers:
      a. Griffolyn Type-65; Reef Industries, Houston, Texas
      b. DURA-SKRIM 6WW; Raven Industries, Sioux Falls, South Dakota
      c. WMP-VR; Lamtec Corporation, Mount Bethel, Pennsylvania

F. Roof Jacks, Crickets and Flashings: Provide roof jacks, crickets and flashings for all roof penetrations.
   1. Curbs shall be constructed using minimum .080, 3003H14 aluminum, or heavier as required to support the load of the equipment, with fully mitered and heli-arc welded corners, integral base plates, with water diverter cricket.
   2. Minimum height of Curb shall be 12" above finished roof.
   3. Curbs shall be constructed to match slope of roof and provide a level top surface for mounting of equipment.

4. Curb flange shall be constructed to match configuration of roof panel. Side flange shall extend to the next natural seam in the roof panels and conform to seam configurations.
5. Color: Surfaces exposed to view are to match the color of the roof panels
6. Manufacturers:
    a. LM Curbs, Longview TX
    b. ThyBar, Addiston IL
    c. RPS Accessories, Bensenville Il.
    d. Substitutions: See Section 01 6000 - Products Requirements

G. Pipe flashing: Provide EPDM rubber flashings for vent penetrations.

H. Snow Guard
1. S-5! ColorGard Snow Guards by Metal Roof Innovations, Ltd. Colorado Spring, CO 80908 with SnoClip: www.s-5.com
2. Acceptable Manufacturers:
    a. Metal Roof Innovations, Ltd. Colorado Springs, CO
    b. Berger Building Products, Feasterville, Pennsylvania
    c. Colorbar; www.snobar.com
    d. Sno-Gem Inc
    e. Zaleski Snow Guards
    f. Substitutions: See Section 01 6000 - Products Requirements
3. Furnish and install where indicated on plans assembly for snow retention as follows: S-5! clamps are to be spaced at every panel seam. Clamps should be on or as near as possible to the hold down clip location without interfering with the ability of the roof to float. All clamps are to be installed true-to-line. Stainless steel fasteners are to be tightened using a tool with a rating of 115 inch-pounds. This tension shall be periodically verified during installation. In no event shall the clamp spacing exceed 24 inches.
4. The snow guard is to be furnished and installed on each S-5-U clamp with 3/8" x 3/4" st0ainless steel bolt and washer furnished by manufacturer. The snow guard shall be pre punched on 4" centers. Adjacent sections of snow guard are to be joined using a splice plate provided by manufacturer.
5. SnoClip: Aluminum component with integrated rubber foot to retard the migration of snow and ice beneath the cross member. Rubber foot to prevent abrasion to the roof panel finish.
6. The color strip, which is 2" wide x 8' long, that is inserted into the snow guard system shall be furnished with the system. Color shall match the roof panels.

I. Soffit Framing:
1. Framing System Components: Meeting requirements of ASTM C 645-08; C-channel, roll-formed from hot dipped galvanized steel; complying with ASTM A 1003 and ASTM A653 G40 or equivalent corrosion resistant coating.
    a. Studs: C shaped with flat or formed webs.
    b. Furring: Hat-shaped sections, minimum depth of 7/8 inch.

J. Fasteners: Galvanized steel, with soft neoprene washers.

K. Protective Backing Paint: Zinc molybdate alkyd.

L. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.

M. Sealant to be Exposed in Completed Work: {rs#1} elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.

N. Underlayment (Eave Protection Sheet): Rubberized asphalt bonded to sheet polyethylene, 40 mil total thickness minimum, with strippable treated release paper.
1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.

2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
3. Manufacturer:
    a. Certainteed; Grace Vycor Ice & Water Shield
    b. Dimensional Metal Inc; Dynaclad Ultra HT
    c. Protecto Wrap; Jiffyseal Ice & Water Guard HT
    d. Substitutions: See Section 01 6000 - Products Requirements

O. Solder: Sn50 (50/50) type.

P. Splash Blocks: Precast concrete type; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.
1. Size: 24 inches by 24 inches by 2 inches thick

2.04 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats of same material as sheet, thickness to be one gauge greater than roofing sheet, interlockable with sheet.

C. Fabricate starter strips, interlockable with sheet.

D. Form pieces in longest practical lengths.

E. Hem exposed edges on underside 1/2 inch; miter and seam corners.

F. Form material with standing seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

G. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS:

A. Install roofing and flashing in accordance with approved shop drawings and manufacturer's product data, within specified tolerances.

B. Isolate dissimilar metals, masonry and concrete from metal roof system with bituminous coating.

C. Anchorage shall allow for thermal expansion and contraction without stress or elongation of panels, clips or anchors.

D. Coordinate flashing and sheet metal work to provide watertight conditions at roof terminations. Fabricate and install in accordance with standards set forth in the SMACNA Manual using continuous cleats at all exposed edges.

3.02 EXAMINATION

A. Inspect roof deck to verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains.

B. Verify deck is dry and free of snow or ice.

C. Verify correct placement of wood nailers and insulation positioning between nailers.

D. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets are in place, and nailing strips located.

E. Verify roofing termination and base flashings are in place, sealed, and secure.

3.03 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels; seal top of reglets with sealant.

C. Back paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

D. Place eave edge and gable edge metal flashings tight with fascia boards. Weather lap joints 2 inches and seal with plastic cement. Secure flange with nails spaced 16 inches OC.

3.04 INSTALLATION - ROOFING

A. Install Vapor Retarder
   1. At acoustical metal deck, install acoustical insulation in roof deck flutes.
   2. Loosely lay vapor retarder over entire roof area extending to roof edges and to adjacent walls
   3. Side and end laps of each sheet a minimum of 6 inches
   4. Seal laps with continuous strip of tape recommended by the vapor retarder manufacturer.
   5. Seal at penetrations and at roof edges with manufacturer recommended butyl tape or sealant
   6. Vapor retarder shall be positively sealed at all edges, penetrations and wall utilizing manufacturers' vapor retarder accessories

B. Apply underlayment over entire roof area.
   1. Apply in single layer laid perpendicular to slope; weather lap edges 4 inches

C. Install metal roof system in accordance to manufacturer's instructions and shop drawings.
   1. Install metal roof system so that it is weather tight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.
   2. Provide concealed anchors at all panel attachment locations
   3. Install panels plumb, level and straight with seams and parallel, conforming to design indicated.

D. Flash around roof mounted equipment. This will become part of the roofing warranty

E. Install pipe flashing at all pipe penetrations.

F. Cleat and seam all joints.

G. Use plastic cement for joints between metal and bitumen and for joints between metal and felts.

H. Install snow guards:
   1. Furnish and stall where indicated on drawings for snow retention as follows: S-5-U clamps are to be spaced at every panel seam. Clamps should be on or as near as possible to the hold down clip location without interfering with the ability of the roof to float. All clamps are to be installed true-to-line. Stainless steel fasteners are to be tightened using a tool with a rating of 115 inch-pounds. This tension shall be periodically verified during installation. In no event shall the clamp spacing exceed 24 inches.

3.05 INSTALLATION - FLASHINGS

A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by roof panel manufacturer's recommendations and details.

B. Comply with SMACNA (ASMM) details.

C. Insert flashings into reglets to form tight fit.
   1. Seal flashings into reglets with sealant.

D. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

E. Cleat and seam all joints.

F. Apply plastic cement compound between metal flashings and felt flashings.

G. Fit flashings tight in place, and make corners square, surfaces true and straight in planes, and lines accurate to profiles.

H. Seal metal joints watertight.

3.06 FIELD QUALITY CONTROL

A. See Section 01 43 00 - Quality Assurance, for general requirements for field quality control and inspection.

B. Inspection: Roofing manufacturer's technical representative and roofing contractor shall conduct all required inspections. Submit all required drawings, details, and completed questionnaires to the roofing manufacturer before obtaining the specified warranty. After an authorized Technical Representative has inspected the roof for determining acceptability for warranty issuance, any deficiencies on the final inspection report shall be corrected by the contractor/applicator and made ready for reinspection within five (5) working days.

C. Warranty: Upon receipt of required materials, certifying inspection, and acceptance of the roofing system by the roofing manufacturer, the warranty shall be duly executed and issued to the Owner. Date of Warranty will be the date of Substantial Completion.

3.07 PROTECTION

A. Do not permit traffic over unprotected roof surface.

END OF SECTION

SECTION 07 71 23
MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pre-finished galvanized steel and Pre-finished aluminum gutters and downspouts.

B. Splash guards.

1.02 RELATED REQUIREMENTS

A. Section 07 54 19 - PVC Thermoplastic Roofing

B. Section 07 62 00 - Sheet Metal Flashing and Trim.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

D. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on prefabricated components.

C. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.

1.05 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Stack material to prevent twisting, bending, or abrasion and to provide ventilation. Slope to drain.

C. Prevent contact with materials that cause discoloration, staining, or damage.

1.06 PROJECT CONDITIONS

A. Coordinate the work with downspout discharge pipe inlet.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gutters and Downspouts:
   1. Metal Era
   2. Dimensional Metal Inc, 58 Kelma Drive, Reynoldsburg, Ohio 43068
   3. Exceptional Metals
   4. ATAS International, Inc
   5. MM Systems Company, Tucker, Georgia
   6. W.P. Hickman, Asheville, North Carolina
   7. Architectural Products Co
   8. Cheney Flashing Company: www.cheneyflashing.com

9. SAF Perimeter Systems, a division of Southern Aluminum Finishing Company, Inc: www.saf.com/persys
10. W.P. Hickman Company; Wind Resistant Gutter: www.wph.com.
11. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 GUTTERS AND DOWNSPOUTS

A. Gutters: SMACNA (ASMM) rectangular profile.
   1. Seal-Tite Industrial Gutter:
      a. Shape: As shown on the drawings.
      b. Heavy gauge gutter straps securely support gutter, water, snow, and ice.
   2. Gauge: 22 gauge steel
   3. Gutter length: Standard length: minimum of 12 feet
   4. Gutter size: 6" or as noted on the drawings.
   5. Finishes: Kynar 500 from manufacturer's standard colors.

B. Downspouts: SMACNA Rectangular profile. Locations as indicated on the drawings.
   1. Box Standard downspouts:
      a. Size: 6 x 4 inch or as shown on the drawings.
      b. Gauge: 22 gauge steel
      c. Length: As long as possible with one sheet.
      d. Location: Typical everywhere unless otherwise noted as Structural.
   2. Box Structural Steel downspouts shall be 6 " x 4" x 3/16" thick with finish matching roof panel.
      a. Downspout supports: Bracket, 1/8 inch thick, U shaped with flanges.

C. Anchors and Supports: Profiled to suit gutters and downspouts.
   1. Anchoring Devices: In accordance with SMACNA requirements.
   2. Gutter Supports: Brackets.
   3. Downspout Supports: Brackets.

D. Fasteners: Galvanized steel, with soft neoprene washers.

2.03 SPLASH GUARDS

A. Splash Pads: Precast concrete type, profiles sizes as indicated on drawings; minimum 3,000 psi compressive strength at 28 days, with minimum 5 percent air entrainment.

2.04 FINISHES

A. Prefinished Aluminum Sheets: Factory-applied topcoat systems applied to aluminum flat sheet substrates prior to fabrication by coil coating; topcoat systems consist of primers and organic topcoats on exposed side and backing coats on unexposed side.
   1. Aluminum Sheet Substrates: ASTM B209/B209M, alloy and temper as recommended by manufacturer for application.
   2. Superior Performance Organic Coating System: Comply with AAMA 2605 for aluminum preparation, pretreatment, primer, and finish coat system; provide thermally cured 70-percent PVDF fluoropolymer systems.
   3. Application: Gutters and downspouts.
      a. Coating System: High-performance organic coating system.
      b. Color: As selected by Architect from manufacturer's standard colors.

2.05 MATERIALS

A. Prefinished Galvanized Steel Sheet: ASTM A653/A653M, with G90 zinc coating; minimum 0.02-inch thick base metal.
   1. Finish: Shop precoated with PVDF (polyvinylidene fluoride) coating.
   2. Color: As indicated on drawings.

B. Prefinished Aluminum Sheet: ASTM B209/B209M; 0.032 inch thick.
   1. Finish: Plain, shop precoated with polyvinylidene fluoride (PVDF) coating.
   2. Color: As indicated on drawings.

2.06 ACCESSORIES

A. Corners, end caps, expansion joints shall be fabricated by manufacturer. Factory fabricated, mitered corners shall have 17 1/2 inch nominal leg lengths.

B. Provide matching ledge caps, downspouts, etc.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify surfaces are acceptable for product installation in accordance with manufacturer's written instructions.

3.02 PREPARATION

A. Paint concealed sheet metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to minimum dry film thickness of 15 mils, 0.015 inch.

3.03 INSTALLATION

A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.

B. Slope gutters 1/8 inch per foot or as required for project.

C. Provide elbows in the downspout to ensure that the offset to building veneer is no greater than 3 inches on average. Review lengths and elbows with Architect prior to installation.

END OF SECTION

This page intentionally left blank

SECTION 13 34 18
POST FRAME BUILDING SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pre-Engineered Timber Column Structure

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications.

B. Section 07 90 05 - Joint Sealers.

C. Section 08 11 13 - Hollow Metal Doors and Frames.

D. Section 08 36 13 - Sectional Doors.

1.03 REFERENCE STANDARDS

A. Preservative Treated Lumber
   1. American Wood Protection Association (AWPA)
      a. Commodity Specification C2 (2001), Preservative Treatment By Pressure Processes
      b. Use Category System U1, User Specification for Treated Wood
      c. UC4A (Important Structural - Ground Contact)
      d. UC4B (Structural Support - Ground Contact)
      e. Items treated under AWPA standards shall bear the quality mark of an independent testing agency or service
   2. International Code Council Evaluation Service (ICC-ES)
      a. Items treated under ICC-ES reports shall meet or exceed the applicable standard and shall bear the quality mark of an independent testing agency or service
   3. Federal Specification TT-W-571-J.

B. Framing Lumber shall be in accordance with the 2012 edition of the National Design Specification for Wood Construction
   1. Lumber Grading Rules and Wood Species
      a. National Design Specification for Wood Construction, current edition
      b. Northeastern Lumber Manufacturer's Association, Inc. (NELMA)
      c. Southern Pine Inspection Bureau (SPIB)
      d. West Coast Lumber Inspection Bureau (WCLIB)
      e. Western Wood Products Association (WWPA)

C. Wood Trusses
   1. All lumber used in the design of wood trusses shall be kiln dried to maximum 19% moisture content and graded in accordance with the current grading rules. Design stresses allowed are those listed in the current editions of the respective Lumber Association's grading rules.
   2. The design of wood members shall be in accordance with the formulas published in the 2012 edition of the National Design Specification for Wood Construction.
   3. Light metal toothed connector plates and joint design shall conform to specifications as set forth in the 2007 edition of Truss Plate Institute's Design Specification for Metal Plate Connected Wood Trusses (TPI-2007).
      a. Connector plates shall be fabricated in accordance with applicable ICC-ES standards.
   4. Truss members and joints shall be designed in accordance with TPI-2002. All truss designs shall be accompanied by complete and accurate shop drawings and contain the following information:
      a. Slope or depth, span and spacing of the truss

b. Heel bearing height
c. Design loading to include:
    1) Top chord live load
    2) Top chord dead load
    3) Bottom chord dead load
    4) Concentrated loads and their points
    5) Adjustments to lumber and plate design values for conditions of use
    6) Plate type, thickness of gauge and size
    7) Lumber size, species and grade for each member

1.04 DESIGN REQUIREMENTS

A. Design members to withstand dead load, applicable snow load, and design loads due to pressure and suction of wind calculated in accordance with applicable code.

1.05 DESIGN REQUIREMENTS

A. Roof Design Loads
    1. Design in accordance to the OBBC and Ohio Revised Code with minimum of:
        a. Snow Load 20 PSF
        b. Roof Dead Load 15 PSF
        c. Top Chord Live Load: 25 PSF
        d. Top Chord Dead Load: 6 psf
        e. Bottom Chord Dead Load: 5 psf
        f. Bottom Chord Point Loads: 250 pounds

B. Wind Speed
    1. Design in accordance to the OBBC and Ohio Revised Code with minimum of:
        a. 90 MPH (V3s). Exposure C

C. Roof and wall system shall be able to withstand the imposed loads with maximum allowable deflection of L/180.

D. Assembly shall permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

E. Size and fabrication of wall and roof systems to be free of distortion or defects that would be detrimental to appearance or performance.

1.06 SUBMITTALS

A. Design Data: Provide detailed design criteria and calculations for submission to the State of Ohio, Department of Commerce for approval. Provide seven (7) complete sets of drawings sealed and sighed by a structural engineer registered in the state of Ohio.

B. Certification: Manufacturer certification that the building conforms to the contract documents and manufacturer's standard design procedures.

C. Shop Drawings: Show building layout, primary and secondary framing member sizes and locations, cross-sections, and product and connection details for submission to the State of Ohio, Department of Commerce for approval.

D. Color Charts: For selection of colors.

1.07 QUALITY ASSURANCE

A. Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this Work.
    1. Design Engineer Qualifications: Licensed in Ohio.
    2. Conform to applicable code for submission of design calculations as required for acquiring permits.

3. Cooperate with regulatory agency or authority and provide data as requested.

1.08 QUALIFICATIONS

A. Design structural components under direct supervision of a Professional Engineer experienced in design of this work and licensed in the State of Ohio.

1.09 PRE-CONSTRUCTION MEETING

A. The meeting will convene no later than one week prior to commencing work.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver and store prefabricated components (trusses, columns, steel panels and other items) so that they will not be damaged or deformed.

B. Stack materials on platforms, pallets or other structures covered with tarpaulins or other suitable weather-tight ventilated covering. Handle and store structural parts in a manner that will avoid deforming members or subjecting parts to excessive stresses.

C. Store roofing and siding panels to allow water to drain freely.

D. Panels shall not be stored in contact with other materials that may cause staining or discoloration.

1.11 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Weathertightness Warranty: Provide manufacturer's written weathertightness warranty for a minimum of 20 years against leaks in roof panel arising out of or caused by ordinary wear and tear under normal weather and atmospheric conditions. Warranty shall be signed by both the roofing system manufacturer and the roofing system contractor.

D. Finish Warranty: Furnish panel (roof and wall) manufacturer's written warranty for twenty (20) years covering the finish of exposed coated metal surfaces including but not limited to roof panels, counterflashings, gutters, downspouts, fascias and trim flashings against blistering, peeling, cracking, flaking, checking, chipping, rusting, and chalking and color change during the warranty period.

PART 2PRODUCTS

2.01 MANUFACTURERS - BUILDING SYSTEM

A. Morton Buildings, Morton, Illinois

B. Lester Building Systems, Lester Prairie, MN; www.lesterbuildings.com

C. Stillwater Metal LLC

D. Walters Buildings Inc., Allenton, WI; www.waltersbuildings.com

E. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS - FRAMING

A. Columns:
   1. Factory fabricated from minimum 3-ply No. 1 SYP
   2. Provide factory or field installed blocking on outside face of column between nailers.

B. Wood Trusses
   1. Lumber
      a. Top Chord: Southern Yellow Pine of size and grade to meet design requirements
      b. Bottom Chord: Southern Yellow Pine of size and grade to meet design requirements
      c. Webs: Southern Yellow Pine of size and grade to meet design requirements

2. Trusses shall be constructed of surfaced lumber (S4S) and compliant with SPIB visual and structural grade requirements
3. Plates: Connector plates shall meet design requirements and shall be compliant with applicable ICC-ES standards and specifications
4. Design and fabricate trusses and connections to withstand snow, wind and all dead loads.
5. Fabricate trusses in plant, using mechanical or hydraulic fixtures as required to bring members into contact. Install plates in accordance with manufacturer's instructions.

C. Baseboards
1. No. 1 Southern Yellow Pine
2. Pressure treated with wood preservative to a retention in compliance with applicable AWPA or ICC-ES standards and specifications and kiln dried after treatment to 19% maximum moisture content

D. Wall girts
1. No. 2 or better SPF.

E. Purlins and truss ties
1. No. 2 or better SPF

F. Wind bracing
1. No. 2 or better SPF.

G. Framing around openings
1. No. 2 or better SPF.

H. Headers
1. Provide built-up headers as required for proper installation.

I. Incidental Framing
1. No. 2 or better SPF

2.03 MATERIALS

A. Corner bracing
1. Provide 1-1/4" wide high tensile steel strapping in all unobstructed corners in an "X" configuration.

B. Sealants, Mastics and Closures: Manufacturer's standard type.
1. Provide at roof panel endlaps, sidelaps, rake, eave, transitions and accessories as required to provide a weather resistant roof system; use tape mastic or gunnable sealant at sidelaps and endlaps.
2. Provide at wall panel rakes, eaves, transitions and accessories.
3. Closures: Formed to match panel profiles; closed cell elastic material, manufacturer's standard color.
4. Tape Mastic: Pre-formed butyl rubber-based, non-hardening, non-corrosive to metal; white or light gray.
5. Gunnable Sealant: Non-skinning synthetic elastomer based material; gray or bronze.

PART 3EXECUTION

3.01 EXAMINATION

A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

3.02 GENERAL

A. Install in accordance with manufacturer's instructions.

3.03 ERECTION - FRAMING

A. Erect framing in accordance with manufacturer's established construction procedures.

B. Make all components and building plumb, square, straight and true to lines, according to industry standards.

C. Provide adequate temporary bracing to assure structure remains plumb and square until permanent bracing is installed.

D. Altering of structural members will not be permitted.

END OF SECTION

This page intentionally left blank

SECTION 13 34 19
PRE-ENGINEERED BUILDINGS

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes a rigid-frame type pre-engineered metal building of the nominal length, width, eave height, and roof pitch indicated. Mechanical equipment, Electrical equipment and piping loads and framing shall be included in the engineering load criteria.
   1. Exterior walls are covered with factory-finished wall panels attached to framing members.
   2. Interior metal liner system is required for roof and exterior walls.
   3. Roof system consists of the manufacturer's standard standing-seam painted roof, over insulation. Provide all roof penetration seals.
   4. Manufacturer's standard building structural components and accessories may be used, provided components, accessories, and complete structure conform to design indicated and specified requirements, including concrete masonry on the elevation.
   5. The intent of this specification section is to provide the manufacturer's standard metal panels that meet or exceed the specifications. In the event a manufacturer's standard panel specification does not comply, the manufacturer is to supply the closest comparable panel products in all aspects.

1.02 SECTION INCLUDES

A. Structural steel frame.

B. Complete roof covering system consisting of the exterior roof panels, panel attachments, sealants, mastics, trim and flashings as required.

C. Complete wall covering system consisting of the exterior wall panels, panel attachments, sealants, mastics, trim and flashings as required for a weathertight assembly.

D. R-Seal Thermal Insulation

1.03 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Foundations and anchor bolts.

B. Section 08 11 13 - Hollow Metal Doors and Frames

C. Section 08 36 13 - Sectional Doors

D. Section 09 90 00 - Paints and Coatings: Finish painting of structural members, doors, roof curbs, etc.

1.04 REFERENCES

A. Section 01 21 00 - Allowances: Payment procedures relating to allowances.

1.05 DESIGN REQUIREMENTS

A. Design structural systems according to professionally recognized methods, standards, and building codes.

B. Design under supervision of professional engineer licensed in Ohio.

C. Design Loads:
   1. Refer to drawings for design loads
   2. Applicable Building Code: Ohio Basic Building Code.

D. Design wall and roof panel system to withstand specified loads with deflection of 240 of span at metal panel, maximum.

E. Anchor Bolts: Furnish design criteria for anchor bolts, to resist the loads induced by the design loads on the structure.

1.06 SUBMITTALS FOR REVIEW

A. Product Data: For each type of metal building system component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
   1. Structural-steel-framing system. Contact Architect and Structural engineer to discuss main structural bay spacing design before issuing submittal.
   2. Insulation and vapor retarder facing
   3. Accessories.

B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.
   1. Anchor-Bolt Plans: Submit anchor-bolt plans and templates before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
   2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
   3. Metal Roof and Wall Panel Layout Drawings: Show layouts of metal panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and special details. Distinguish between factory-and field-assembled work; show locations of exposed fasteners.

C. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer, Registered in the State of Ohio, responsible for their preparation.

1.07 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified erector, manufacturer, and professional engineer.

B. Welding certificates.

C. Metal Building System Certificates: For each type of metal building system, from manufacturer.
   1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
      a. Name and location of Project.
      b. Order number.
      c. Name of manufacturer.
      d. Name of Contractor.
      e. Building dimensions including width, length, height, and roof slope.
      f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
      g. Governing building code and year of edition.
      h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
      i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
      j. Torque requirements for bolted connections.
      k. Building-Use Category: Indicate category of building use and its effect on load importance factors.
      l. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.
      m. Design calculations.

D. Erector Certificates: For each product, from manufacturer, and signed by manufacturer certifying that the erector complies with requirements.

E. Manufacturer Certificates: For each product, from manufacturer, and signed by manufacturer certifying that products comply with requirements.

F. Material Test Reports: For each of the following products:
   1. Structural steel including chemical and physical properties.
   2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
   3. Tension-control, high-strength, bolt-nut-washer assemblies.
   4. Shop primers.
   5. Nonshrink grout.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for insulation and vapor-retarder facings. Include reports for thermal resistance, fire-test-response characteristics, water-vapor transmission, and water absorption.

H. Source quality-control reports.

I. Field quality-control reports.

J. Surveys: Show final elevations and locations of major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.

K. Warranties: Sample of special warranties.

1.08 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

B. Metal Roofing Installation under Section 07 61 00 - Sheet Metal Roofing.
   1. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

1.09 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.
   1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
   2. Engineering responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this project and who is acceptable to manufacturer.
   1. Minimum of 5 years experience in this or similar trade
   2. Five similar installation references in past 3 years

C. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single manufacturer.

D. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1, "Structural Welding Code -Steel."
   2. AWS D1.3, "Structural Welding Code -Sheet Steel."

E. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.
   1. Domestic Steel Certificate: Certify compliance with Section 153.011 of the Ohio Revised Code.

F. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

G. Fire-Resistance Ratings: Where indicated, provide metal panel assemblies identical to those of assemblies tested for fire resistance per ASTM E119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
   2. Combustion Characteristics: ASTM E136.

H. Pre-installation Conference: Conduct conference at Project Site. Contractor, Owner, and Architect of Record shall attend this conference.
   1. Review methods and procedures related to metal building systems including, but not limited to, the following:
      a. Condition of foundations and other preparatory work performed by other trades.
      b. Structural load limitations.
      c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
      d. Required tests, inspections, and certifications.
      e. Unfavorable weather and forecasted weather conditions.
   2. Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:
      a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
      b. Structural limitations of purlins and rafters during and after roofing.
      c. Flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
      d. Temporary protection requirements for metal roof panel assembly during and after installation.
      e. Roof observation and repair after metal roof panel installation.
   3. Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:
      a. a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.
      b. Structural limitations of girts and columns during and after wall panel installation.
      c. c. Flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
      d. d. Temporary protection requirements for metal wall panel assembly during and after installation.
      e. Wall observation and repair after metal wall panel installation.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements:
   1. Established Dimensions for Foundations: Comply with established dimensions on approved anchor-bolt plans, establishing foundation dimensions and proceeding with fabricating structural framing without field measurements. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.
   2. Established Dimensions for Metal Panels: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed

with fabricating metal panels without field measurements, or allow for field trimming metal panels. Coordinate construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.11 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Section 03 3000 - Cast-in-Place Concrete.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations, which are specified elsewhere.

C. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leak-proof, secure, and noncorrosive installation.

D. Coordinate ALL required loads and bracing for building equipment, including but not limited to: monorail hoists, bridge cranes, and mechanical equipment.

1.12 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents

1.13 ATTIC STOCK

A. Maintenance Stock: Pack, protect, and label all excess material and store on site as directed by the Design professional.
   1. Provide 2% excess Nuts, Bolts, Screws, Washers and other required fasteners for each metal building.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:
   1. American Buildings Company
   2. A & S Building Systems, Inc; Division of NCI Building Systems, L.P.
   3. American Steel Building Co., Inc.
   4. Butler Manufacturing Co
   5. Chief Buildings
   6. Ceco Building Systems
   7. Corle Building Systems
   8. Kirby Building Systems
   9. Nucor Building Systems
   10. Star Building Systems
   11. VarcoPruden Buildings

2.02 METAL BUILDING SYSTEMS

A. Description: Provide a complete, integrated set of metal building system manufacturer's standard mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.
   1. Provide metal building system of size and with bay spacing, roof slopes, and spans as indicated in the construction document. Contact Architect and Structural engineer to coordinate main structural bay spacing design.

B. Primary-Frame Type:
   1. Rigid Frame: Solid-member, structural-framing system with or without interior columns as shown on the architectural design.
   2. Lean to: Solid member, structural-framing system without interior columns designed to be partially supported by the main metal building structure.

C. End-Wall Framing: Manufacturer's standard expandable end walls for possible future additions, consisting of load-bearing end-wall and corner columns and rafters.

D. Secondary-Frame Type: Manufacturer's standard purlins and joists and exterior framed bypass girts.

E. Clear Height under Structure: As noted on drawings.

F. Roof Slope: As shown on Drawings.

2.03 METAL BUILDING SYSTEM PERFORMANCE

A. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."
   1. Design Loads: As indicated on Drawings.
   2. Design Loads: As required by Ohio Building Code.
   3. Live Loads: Include vertical loads induced by the building occupancy indicated on Drawings. Include loads induced by maintenance workers, materials, and equipment for roof live loads.
      a. Building Occupancy: As indicated on Drawings.
   4. Roof Snow Loads: Include vertical loads induced by the weight of snow, as determined by Ohio Building Code. Allow for unbalanced and drift loads.
   5. Wind Loads: Include horizontal loads induced by a basic wind speed as required by Ohio Building Code
   6. Collateral Loads: Collateral loads include additional dead loads over and above the weight of the metal building system such as liner system, rigid roof insulation, lighting, sprinkler systems and roof-mounted mechanical systems, make-up air units, canopies. Include not less than **10 LBF/SQ.FT** loading for collateral loading.
      a. Structural Framing and Roof and Siding Panels: Design primary and secondary structural members and exterior covering materials for applicable loads and combinations of loads in accordance with the Metal Building Manufacturers Associations (MBMA) "Design Practices Manual" and the Ohio Building Code. Provide framing to support make-up air units, exhaust fans. Confirm loads with contractors for that work. Design connections to the pre-engineered structure for the masonry exterior walls. For smaller mechanical equipment items, respective mechanical trades Contractor to provide steel supports and connectors, but metal building supplier must provide connection details of hangers to the structure.
      b. Contractors shall confirm weight and dimensions with manufacturer and coordinate final locations.
   7. Auxiliary Loads: Include dynamic live loads, such as those generated by cranes and materials-handling equipment indicated on Drawings.
   8. Load Combinations: Design metal building systems to withstand the most critical effects of load factors and load combinations as required by the Ohio Building Code
   9. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:
      a. Primary framing members: L/ for roof snow load.
      b. Purlins and Rafters: Vertical deflection of L/180 (under Live Load, Snow Load, or Wind Load) and L/120 under Dead Load plus Live Load.
      c. Girts: Horizontal deflection of L/120 at metal panel.

d. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.

10. Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:
    a. Lateral Drift: Maximum of 1/300 of the building height.
11. Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 1592.

B. Seismic Performance: Metal building systems shall withstand the effects of earthquake motions determined according to Ohio Building Code.

C. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

D. Thermal Performance: Provide insulated metal panel assemblies with the following maximum U-factors and minimum R-values for opaque elements when tested according to ASTM C 1363 or ASTM C 518:
1. Metal Roof Insulation:
    a. R-Value: 30 or greater.
    b. U-Factor: .035 or less.
2. Metal Wall Insulation:
    a. R-Value: 24 or greater.
    b. U-Factor: .060 or less.

2.04 FRAMING COMPONENTS

A. Primary Framing: Rigid Frame (RF Series) solid web framing consisting of tapered or uniform depth rafters rigidly connected to tapered or uniform depth columns. Provide a clear span that supports the loads at bay spacings indicated.

B. Endwall Framing : Full frames with endposts, for future expansion.

C. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prime painted with coil coating, to comply with the following:
1. Purlins: C-or Z-shaped sections; fabricated from steel sheet material or structural-steel shapes; 3-inch wide flanges.
    a. Depth: 8 inch depth as indicated on the drawings.
    b. Shall be 100 percent prime painted before shipping to job site.
    c. Purlin bracing tab. Provide purlin bracing tab so that flange brace does not penetrate through the vapor barrier of the metal building insulation facing. Refer to drawings for more details.
2. Girts: C-or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch wide flanges.
    a. Depth: Minimum depth as indicated on the drawings. Greater depth as needed to comply with system performance requirements.
    b. Shall be 100 percent prime painted before shipping to job site.

3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; to provide adequate backup for metal panels.
4. Flange Bracing: Minimum 2-by-2-by-1/8-inch structural-steel angles or 1-inch-diameter, cold-formed structural tubing to stiffen primary-frame flanges.
5. Sag Bracing: Minimum 1-by-1-by-1/8-inch structural-steel angles.
6. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
7. Girt bracing tab. Provide girt bracing tab so that flange brace does not penetrate through the vapor barrier of the metal building insulation facing. Refer to drawings for more details.
8. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
9. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; designed to withstand required loads.

D. Bracing: Provide adjustable wind bracing as follows:
1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50; or ASTM A 529/A 529M, Grade 50; minimum 1/2-inch diameter steel; threaded full length or threaded a minimum of 6 inches at each end.
2. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
3. Fixed-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
4. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.
5. Bracing: Provide wind bracing using any method specified above, at manufacturer's option.

E. Bolts: Provide plain-finish bolts for structural-framing components that are primed or finish painted. Provide hot-dip galvanized bolts for structural-framing components that are galvanized.

F. Materials:
1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
4. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
5. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
6. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55 (205 through 380), or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70 (310 through 480); or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80 (170 through 550), or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70 (310 through 480).
7. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80 (230 through 550), or High-Strength Low-Alloy Steel (HSLAS), Grades 50 through 80 (340 through 550); with G60 (Z180) coating designation; mill phosphatized.
8. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
    a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80 (230 through 550) or High-Strength Low-Alloy Steel (HSLAS), Grades 50 through 80 (340 through 550); with G90 (Z275) coating designation.

9. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts; ASTM A 563 (ASTM A 563M) carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.
    a. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.
10. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
    a. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.
11. **Primary, Secondary and all other structural steel items shall have the following painted primer. Primer: SSPC-Paint 15, Type I, Gray oxide.**

G. Wind Bracing: Portal, torsional, diagonal bracing or diaphragm in accordance with manufacturer's standard design practices; utilizing rods, angles, and other members, with minimum yield strengths as required for design.

H. Primary Frame Flange Bracing: Attached from purlins or girts to the primary framing, minimum yield strength as required for design.

I. Base Angles: 2 inch x 3 inch x 0.059 inch steel angles, with minimum yield strength of 55,000 psi, anchored to the floor slab or grade beam with power driven fasteners or equivalent at a maximum spacing of 3 feet on center and not more than 6 inches from the end of any angle member.

J. Sag Angles and Bridging: Steel angles, with minimum yield strength of 36,000 psi.

K. Fabrication: Fabricate according to manufacturer's standard practice.
1. Fabricate structural members made of welded plate sections by jointing the flanges and webs by continuous automatic submerged arc welding process.
2. Welding operators and processes: Qualified in accordance with AWS D1.1.
3. Field Connections: Prepare members for bolted field connections by making punched, drilled, or reamed holes in the shop.

L. Component Identification: Mark all fabricated parts, either individually or by lot or group, using an identification marking corresponding to the marking shown on the shop drawings, using a method that remains visible after shop painting.

M. Shop Coating: Finish all structural steel members using one coat of manufacturer's standard shop coat, after cleaning of oil, dirt, loose scale and foreign matter.

N. Package building components for shipping by common carrier.

2.05 THERMAL INSULATION

A. WALL INSULATION
1. Polyurethane Foam-Plastic Board Insulation: Manufacturer's standard proprietary composite rigid plyurethane-core board with integral factory-applied exterior and interior fiber reinforced plypropylene scrim facings, with factory-applied tape tabe system for an integral vapor-retarding air barrier membrane; fabricated with tongue & grove edges.
    a. Basis-of-Design Product; Subject to compliance requirements, provide Pacific Insulation Products; R-Seal Board Insulation or comparabe product
    b. Thickness: 3" R-Seal panel
    c. Composite product to have maxiumum flame-spread and smoke-developed indexes of 200 and 150, respectively, when tested in accordance with ASTM E84; and "Passing" in Full-Scale fire test when tested in accordance with UL 1715
    d. Composite Product to have maxium air leakage of 0.04 Cubic Ft. Per Minuter per sq. ft. under a pressure differential of 0.3 inch wg (75 Pa) when tested in accordance with ASTM E2357 (Assembly Test)
    e. Board insulation to be left exposed to interior of the building without an additional thermal barrier

f. Interior Finish to be White Embossed texture finish

B. ROOF INSULATION
1. Polyurethane Foam-Plastic Board Insulation: Manufacturer's standard proprietary composite rigid plyurethane-core board with integral factory-applied exterior and interior fiber reinforced plypropylene scrim facings, with factory-applied tape tabe system for an integral vapor-retarding air barrier membrane; fabricated with Shiplap edges.
a. Basis-of-Design Product; Subject to compliance requirements, provide Pacific Insulation Products; R-Seal Board Insulation or comparabe product
b. Thickness: 4" R-Seal panel
c. Composite product to have maxiumum flame-spread and smoke-developed indexes of 200 and 150, respectively, when tested in accordance with ASTM E84; and "Passing" in Full-Scale fire test when tested in accordance with UL 1715
d. Composite Product to have maxium air leakage of 0.04 Cubic Ft. Per Minuter per sq. ft. under a pressure differential of 0.3 inch wg (75 Pa) when tested in accordance with ASTM E2357 (Assembly Test)
e. Board insulation to be left exposed to interior of the building without an additional thermal barrier
f. Interior Finish to be White Embossed texture finish

2.06 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

2.07 SOURCE QUALITY CONTROL

A. Testing Agency: The Owner or the Architect of Record will employee/engage a qualified testing agency to evaluate/test product.

B. Testing: Test and inspect shop connections for metal buildings according to the following:
1. Bolted Connections: Shop-bolted connections shall be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
2. Welded Connections: In addition to visual inspection, shop-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:
a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
c. Ultrasonic Inspection: ASTM E 164.
d. Radiographic Inspection: ASTM E 94.

C. Product will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

2.08 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.
1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.

2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances and with AISC “Specification for Design, Fabrication, Erection of Structural Steel for Buildings”.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
   1. Make shop connections by welding or by using high-strength bolts.
   2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
   3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
   4. Weld clips to frames for attaching secondary framing.
   5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
   1. Make shop connections by welding or by using non-high-strength bolts.
   2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

2.09 FINISHES

A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

B. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

C. Before erection proceeds, survey elevations and locations of concrete-and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.
   1. Engage professional Surveyor Engineer to perform surveying.

D. Proceed with erection only after unsatisfactory conditions have been corrected.

3.02 GENERAL

A. Install in accordance with manufacturer's instructions.

3.03 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal

in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.04 ERECTION OF STRUCTURAL FRAMING

A. Erect framing in accordance with AISC 360 - Specification for Structural Steel Buildings.

B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.

C. Set column base plates with non-shrink grout to achieve full plate bearing.

D. Do not field cut or alter structural members without approval.

E. After erection, prime welds, abrasions, and surfaces not shop primed.

F. Erect metal building system according to manufacturer's written erection instructions and erection drawings.

G. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

H. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

I. Base and Bearing Plates: Clean concrete-and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
   1. Set plates for structural members on wedges, shims, or setting nuts as required.
   2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
   3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

J. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

K. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
   1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for bolt type and joint type specified.
      a. Building manufacturer to provide torque requirements for high strength bolt connections.
      b. Contractor to coordinate with Owner’s employed third party testing agency confirming bolted connections are installed per metal building manufacturer’s recommendations.

L. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
   1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
   2. Locate and space wall girts to suit openings such as doors and windows.
   3. Locate canopy framing as indicated.
   4. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

M. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
   1. Tighten rod and cable bracing to avoid sag.
   2. Locate interior end-bay bracing only where indicated.

N. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

O. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303-10.

3.05 THERMAL INSULATION INSTALLATION

A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.
   1. Install pre-engineered building insulation system in accordance with manufacturer's installation instructions and the approved shop drawings.
   2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.06 INSTALLATION - ACCESSORIES

A. Install door frames, doors, overhead doors, and windows and glass in accordance with manufacturer's instructions.

B. Seal wall and roof accessories watertight and weather tight with sealant in accordance with Section 07 90 05.

C. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
   1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

D. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.07 TOLERANCES

A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.

3.08 FIELD QUALITY CONTROL

A. Testing Agency: Owner or the Architect of Record will employee/engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:
   1. High-Strength, Field-Bolted Connections: Connections shall be tested and inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
   2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:
      a. Liquid Penetrant Inspection: ASTM E 165.

b. b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
c. Ultrasonic Inspection: ASTM E 164.
d. Radiographic Inspection: ASTM E 94.

C. Product will be considered defective if it does not pass tests and inspections.

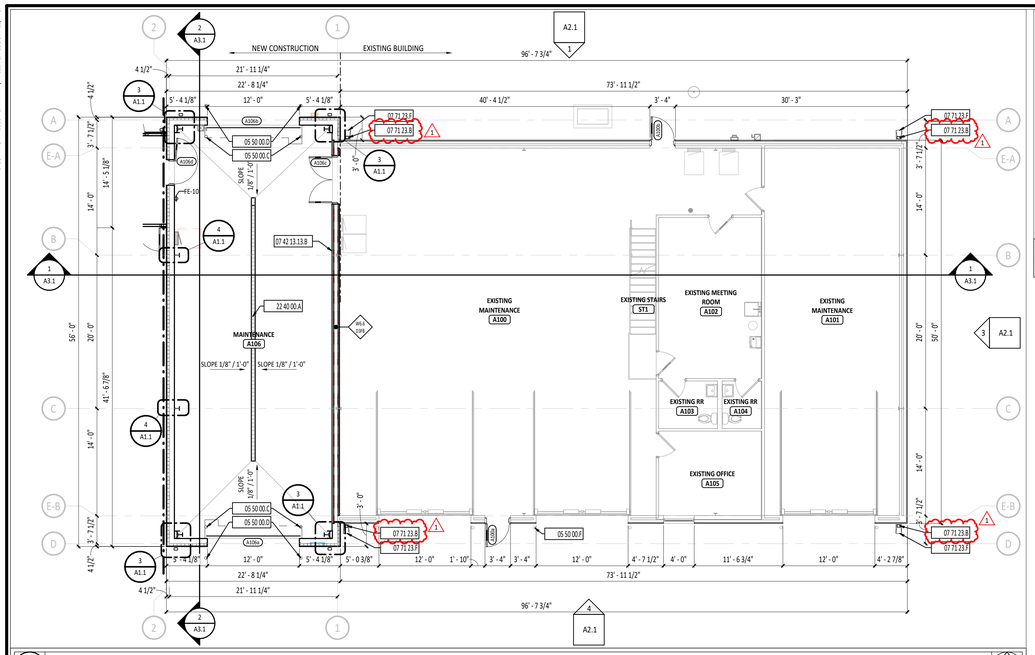
D. Prepare test and inspection reports.

3.09 CLEANING AND PROTECTION

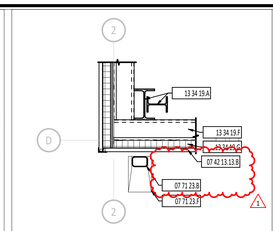
A. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

B. Touchup Painting: Cleaning and touchup painting are as specified in the Construction Document.

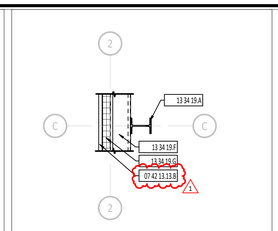
END OF SECTION



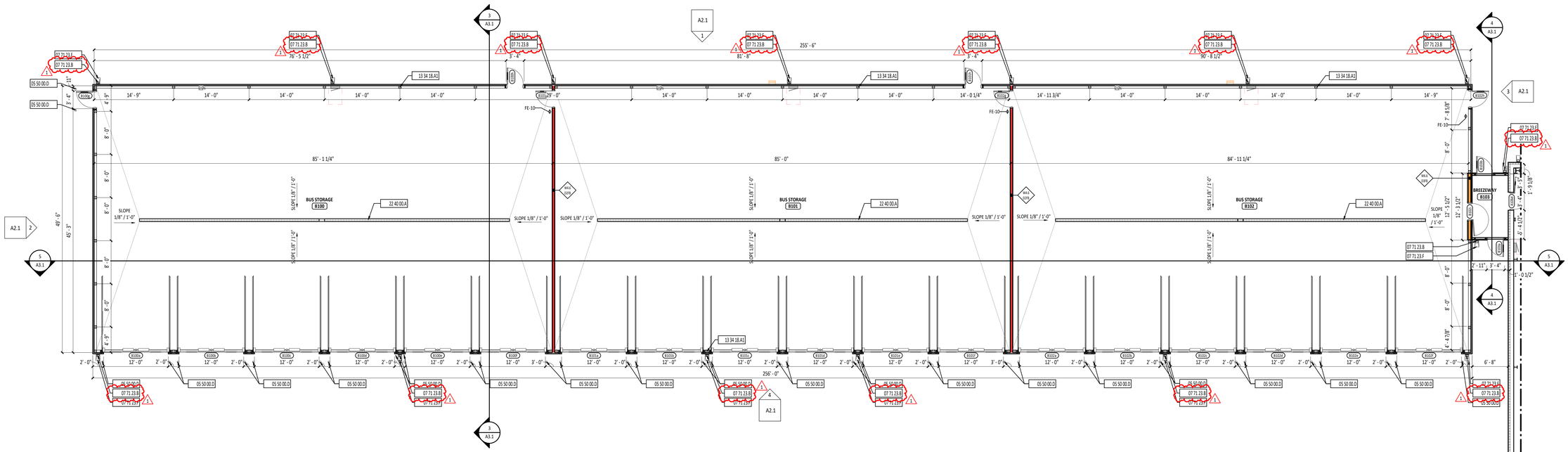
1 A1.1 FIRST FLOOR PLAN - UNIT A
1/8" = 1'-0"



3 A1.1 COLUMN DETAIL
1/2" = 1'-0"



4 A1.1 COLUMN DETAIL
1/2" = 1'-0"



2 A1.1 FIRST FLOOR PLAN - UNIT B
1/8" = 1'-0"

FIRST FLOOR PLAN ROOM INDEX - OVERALL

ROOM NUMBER	ROOM NAME	ID	AREA	OCCUPANCY
A100	EXISTING MAINTENANCE		2,079 SF	7
A101	EXISTING MAINTENANCE		865 SF	3
A102	EXISTING MEETING ROOM		282 SF	4
A103	EXISTING RR		48 SF	
A104	EXISTING RR		32 SF	
A105	EXISTING OFFICE		147 SF	1
A106	MAINTENANCE		1,111 SF	4
B100	BUS STORAGE		4,208 SF	14
B101	BUS STORAGE		4,183 SF	14
B102	BUS STORAGE		4,208 SF	14
B103	BREEZEWAY		77 SF	1
ST1	EXISTING STAIRS		48 SF	

FLOOR PLAN GENERAL NOTES

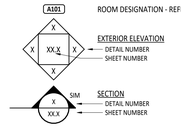
A ALL DIMENSIONS ARE MEASURED TO THE FACE OF MASONRY OR THE FACE OF METAL STUD UNLESS NOTED OTHERWISE.

C INSTALL TREATED WOOD BLOCKING IN WALLS AS REQUIRED TO SECURE ALL EQUIPMENT, ACCESSORIES, HANDRAILS, CASEWORK, ETC. COORDINATE THIS WORK WITH ALL APPROPRIATE CONTRACTORS, SUPPLIERS AND MANUFACTURERS RECOMMENDATIONS.

F HINGE SIDE OF DOOR JAMB AT INTERSECTING WALLS TO BE LOCATED 4" FROM ADJACENT WALL UNLESS NOTED OTHERWISE - REFERENCE FLOOR PLANS.

G IF WALL TYPE IS NOT IDENTIFIED, WALL IS TO RUN FULL HEIGHT TO DECK.

FLOOR PLAN SYMBOLS LEGEND



#	KEYNOTE DESCRIPTION
05 50 00.C	INTERIOR BOLLARD - YELLOW PAINT - REFERENCE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
05 50 00.D	EXTERIOR GALVANIZED BOLLARD - YELLOW PAINT - REFERENCE ARCHITECTURAL, SITE, AND STRUCTURAL DRAWINGS.
05 50 00.F	EXISTING BOLLARD - YELLOW PAINT ONLY
07 42 13.13.B	PREFINISHED FORMED VERTICAL METAL PANEL - SHIM PANELS PLUMB
07 71 23.B	PREFINISHED METAL DOWNSPOUT
07 71 23.F	SPLASH BLOCK
13 34 18.A1	6X6 TREATED POST - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 19.A	PRE-ENGINEERED METAL BUILDING SYSTEM
13 34 19.F	8" Z GIRT PROVIDED BY P.E.M.B. MANUFACTURER
13 34 19.G	3" R-SEAL CONTINUOUS RIGID INSULATION PROVIDED BY P.E.M.B. MANUFACTURER
22 40 00.A	FLOOR DRAIN - REFERENCE PLUMBING DRAWINGS.

FIRE EXTINGUISHER / CABINET SCHEDULE

MARK	DESCRIPTION	NOTES
FE-10	FIRE EXTINGUISHER - 10.0LB - CLASS A:B:C	FURNISHED AND INSTALLED BY GC

PRINTED ON: 6/18/2026 2:16:53 PM

STATE OF OHIO
MATTHEW R. HIBNER
LICENSE #1416052
REGISTERED ARCHITECT

MATTHEW R. HIBNER
LICENSE #1416052
EXPIRATION DATE: 12/31/2027

GARMANN MILLER
MARION, OHIO | COLUMBUS, OHIO | INDIANAPOLIS, INDIANA | FORT WAYNE, INDIANA
mmmgm.com

ADDITION TO:

LAKOTA LOCAL SCHOOLS BUS BUILDING

5186 COUNTY ROAD 13, KENTON, OHIO 43326

ISSUANCES/REVISIONS

	CONSTRUCTION DOCUMENTS	05/27/2026
1	ADDENDUM #02	06/18/2026

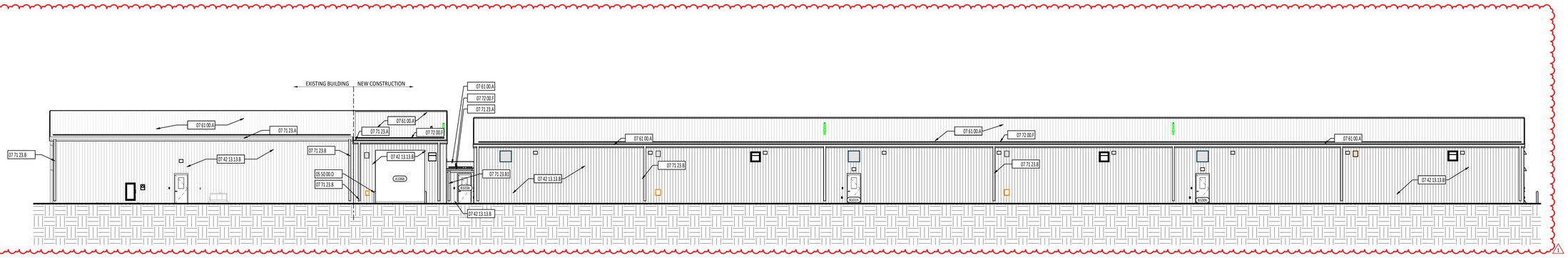
PROJECT NUMBER:	DRAWN BY:	CHECKED BY:
25055.00	BER	RJH

SHEET TITLE:

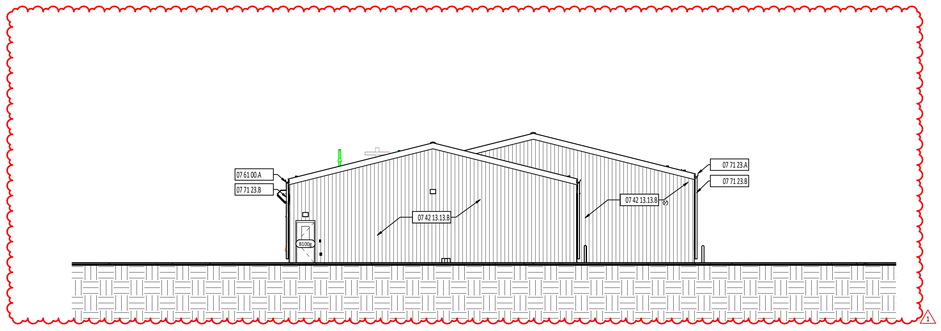
FIRST FLOOR PLANS AND DETAILS

SHEET NUMBER:

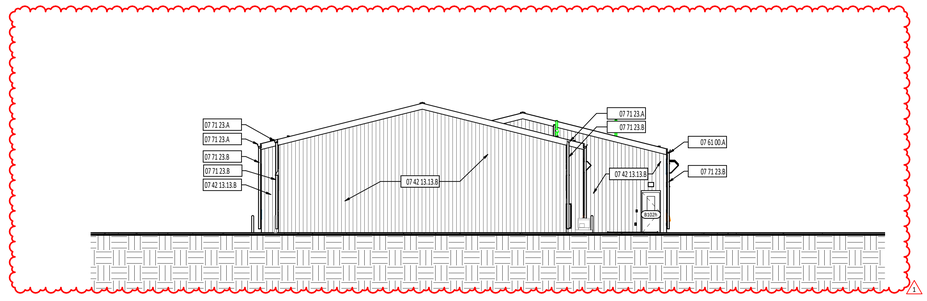
A1.1



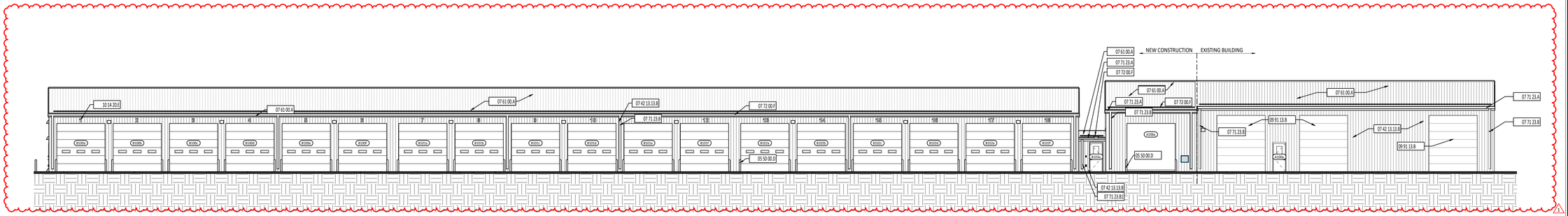
1 A2.1 **NORTH BUILDING ELEVATION**
3/32" = 1'-0"



2 A2.1 **WEST BUILDING ELEVATION**
3/32" = 1'-0"



3 A2.1 **EAST BUILDING ELEVATION**
3/32" = 1'-0"



4 A2.1 **SOUTH BUILDING ELEVATION**
3/32" = 1'-0"

#	KEYNOTE DESCRIPTION
05 50 00.D	EXTERIOR GALVANIZED BOLLARD - YELLOW PAINT - REFERENCE ARCHITECTURAL, SITE, AND STRUCTURAL DRAWINGS.
07 42 13.13.B	PREFINISHED FORMED VERTICAL METAL PANEL - SHIM PANELS PLUMB
07 61 00.A	STANDING SEAM METAL ROOFING SYSTEM WITH CODE COMPLIANT ANCHORAGES, TRIM AND FLASHING AS REQUIRED
07 71 23.A	PREFINISHED METAL GUTTER WITH STRAP AND ANCHORAGES
07 71 23.B	PREFINISHED METAL DOWNSPOUT
07 71 23.B1	4" x 6" PREFINISHED METAL DOWNSPOUT
07 72 00.F	SNOW GUARD - CONTINUOUS ACROSS TOP OF VERTICAL LEGS - REFERENCE ROOF PLAN FOR LOCATIONS.
09 91 13.B	PAINT EXTERIOR OF EXISTING OVERHEAD DOORS TO MATCH THE COLOR OF THE NEW OVERHEAD DOORS.
10 14 20.E	EXTERIOR DOOR SIGNAGE

EXTERIOR ELEVATION SYMBOLS LEGEND

- XXXX — DOOR DESIGNATION - REFERENCE DOOR/OPENING SCHEDULE.
- XX — SIGNAGE DESIGNATION - REFERENCE SIGNAGE DETAILS.
- XX — CURTAIN WALL/STOREFRONT/WINDOW TYPE DESIGNATION
- LEVEL ELEVATION — LEVEL LINE
- X — STRUCTURAL GRID - REFERENCE STRUCTURAL DRAWINGS.
- XX XX XX.XX.XX — DIVISIONAL KEYNOTE DESIGNATION - REFERENCE KEYNOTE SCHEDULE AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
  - KEYNOTE DESIGNATION
  - SPECIFICATION SECTION
- AREA OF DETAIL — SIM — X / XX.X — CALLOUT
  - DETAIL NUMBER
  - SHEET NUMBER
- SIM — X / XX.X — SECTION
  - DETAIL NUMBER
  - SHEET NUMBER

EXTERIOR ELEVATION GENERAL NOTES

PRINTED ON: 6/18/2026 2:17:00 PM

STATE OF OHIO
MATTHEW R. HIBNER
1416052
REGISTERED ARCHITECT

MATTHEW R. HIBNER
LICENSE #1416052
EXPIRATION DATE: 12/31/2027

GARMANN MILLER
MARION, OHIO | COLUMBUS, OHIO | INDIANAPOLIS, INDIANA | FORT WAYNE, INDIANA
mmmgm.com

LAKOTA LOCAL SCHOOLS BUS BUILDING

ADDITION TO:
5185 COUNTY ROAD 13, KANSAS, OHIO 44841

ISSUANCES/REVISIONS

	CONSTRUCTION DOCUMENTS	05/27/2026
1	ADDENDUM #02	06/18/2026

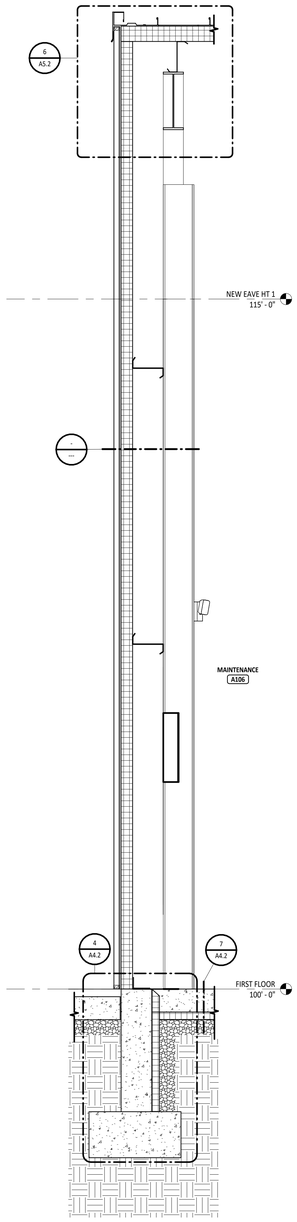
PROJECT NUMBER:	DRAWN BY:	CHECKED BY:
25055.00	BER	RJH

SHEET TITLE:

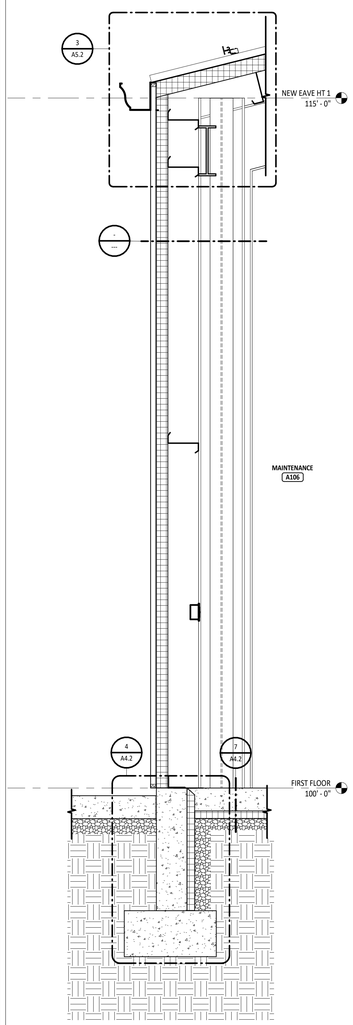
BUILDING ELEVATIONS

SHEET NUMBER:

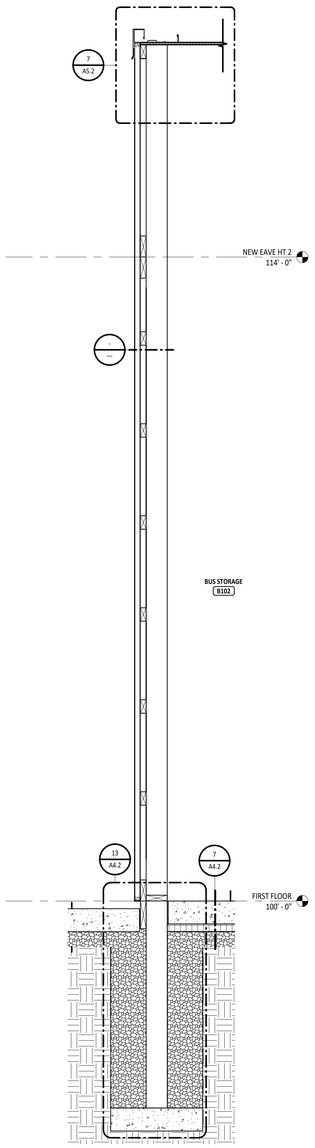
A2.1



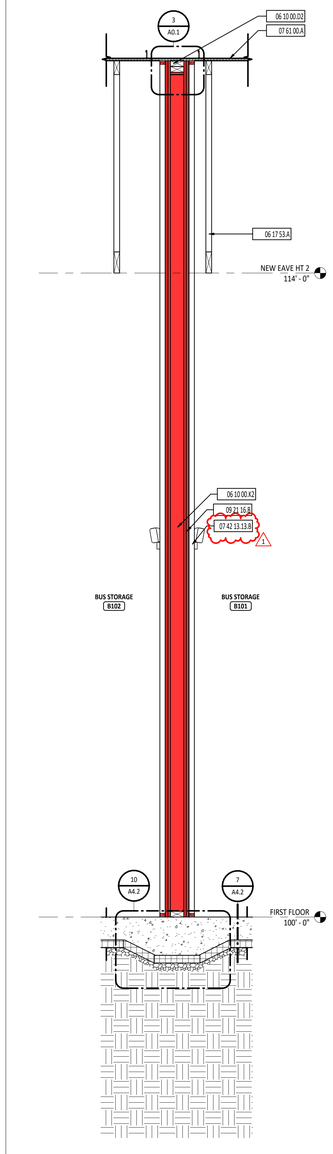
1 A4.1 WALL SECTION 3/4" = 1'-0"



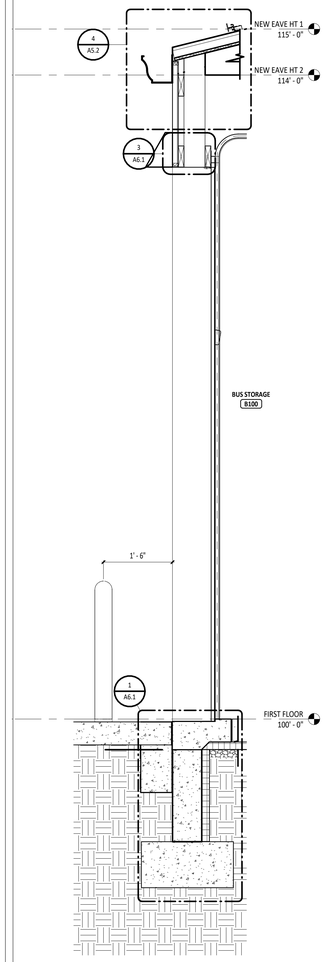
2 A4.1 WALL SECTION 3/4" = 1'-0"



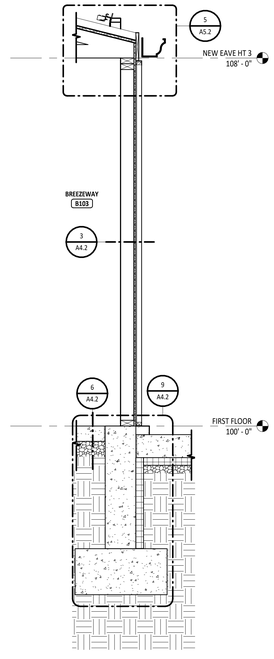
3 A4.1 WALL SECTION 3/4" = 1'-0"



4 A4.1 WALL SECTION 3/4" = 1'-0"



5 A4.1 WALL SECTION 3/4" = 1'-0"



7 A4.1 WALL SECTION 3/4" = 1'-0"

WALL SECTION SYMBOLS LEGEND

- XXXX — DOOR DESIGNATION - REFERENCE DOOR/OPENING SCHEDULE.
- A101 — ROOM DESIGNATION - REFERENCE ROOM INDEX.
- X1 — CURTAIN WALL/STOREFRONT/WINDOW TYPE DESIGNATION
- LEVEL ELEVATION — LEVEL LINE
- X — STRUCTURAL GRID - REFERENCE STRUCTURAL DRAWINGS.
- XX XX XX.XX.XX — DIVISIONAL KEYNOTE DESIGNATION - REFERENCE KEYNOTE SCHEDULE AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
  - KEYNOTE DESIGNATION
  - SPECIFICATION SECTION
- AREA OF DETAIL — X / XX.X — SIM — CALLOUT
  - DETAIL NUMBER
  - SHEET NUMBER
- X / XX.X — SIM — SECTION
  - DETAIL NUMBER
  - SHEET NUMBER

#	KEYNOTE DESCRIPTION
06 10 00.D2	2X WOOD BLOCKING/NAILER
06 10 00.K2	2X6 WOOD FRAMING AT 16" OC
06 17 53.A	SHOP-FABRICATED WOOD TRUSS - REFERENCE STRUCTURAL DRAWINGS.
07 42 13.13.B	PREFINISHED FORMED VERTICAL METAL PANEL - SHIM PANELS PLUMB
07 61 00.A	STANDING SEAM METAL ROOFING SYSTEM WITH CODE COMPLIANT ANCHORAGES, TRIM AND FLASHING AS REQUIRED
09 21 16.B	TYPE "X" GYPSUM WALLBOARD

1

STATE OF OHIO
MATTHEW R. HIBNER 1416052
REGISTERED ARCHITECT
MATTHEW R. HIBNER
LICENSE #1416052
EXPIRATION DATE: 12/31/2027

GARMANN MILLER
MARION, OHIO | COLUMBUS, OHIO | INDIANAPOLIS, INDIANA | FORT WAYNE, INDIANA
mmmgm.com

ADDITION TO:

LAKOTA LOCAL SCHOOLS BUS BUILDING

5186 COUNTY ROAD 13, KANSAS, OHIO 44841

ISSUANCES/REVISIONS

	CONSTRUCTION DOCUMENTS	05/27/2026
1	ADDENDUM #02	06/18/2026

PROJECT NUMBER:	DRAWN BY:	CHECKED BY:
25055.00	BER	RJH

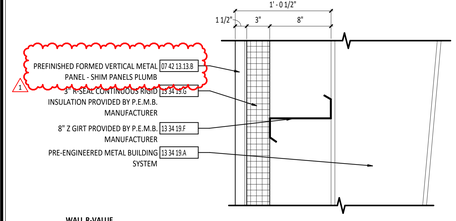
SHEET TITLE:

WALL SECTIONS

SHEET NUMBER:

A4.1

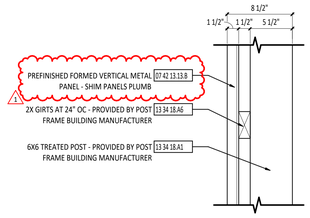
PRINTED ON: 6/18/2026 2:17:01 PM



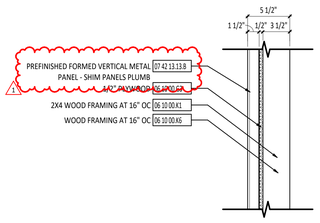
WALL R-VALUE

- INTERIOR AIR FILM	0.68
- PEMB FRAMING	0.00
- BOARD INSULATION - 3"	22.50
- METAL WALL PANEL - 1 1/2"	0.61
- EXTERIOR AIR FILM	0.17
TOTAL R-VALUE	**23.96**

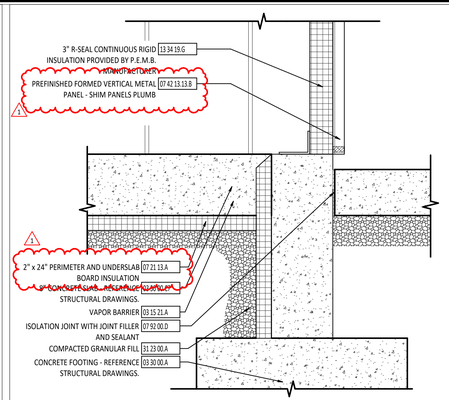
1 A4.2 PRE-ENGINEERED METAL BUILDING EXTERIOR WALL ASSEMBLY
1 1/2" = 1'-0"



2 A4.2 POST BUILDING EXTERIOR WALL ASSEMBLY
1 1/2" = 1'-0"

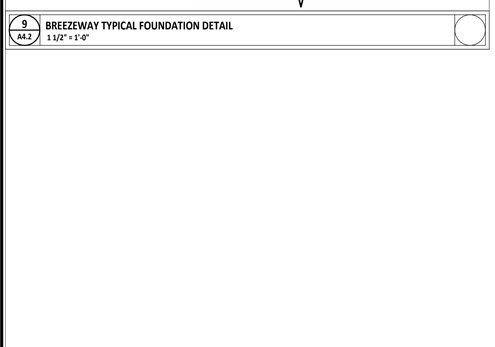


3 A4.2 BREEZEWAY EXTERIOR WALL ASSEMBLY
1 1/2" = 1'-0"

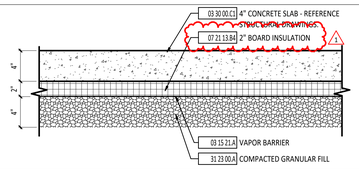


4 A4.2 PRE-ENGINEERED METAL BUILDING TYPICAL FOUNDATION DETAIL
1 1/2" = 1'-0"

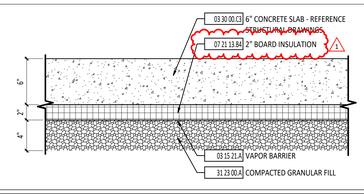
#	KEYNOTE DESCRIPTION
03 15 21.A	VAPOR BARRIER
03 30 00.A	CONCRETE FOOTING - REFERENCE STRUCTURAL DRAWINGS.
03 30 00.C1	4" CONCRETE SLAB - REFERENCE STRUCTURAL DRAWINGS.
03 30 00.C3	6" CONCRETE SLAB - REFERENCE STRUCTURAL DRAWINGS.
03 30 00.C7	8" CONCRETE SLAB - REFERENCE STRUCTURAL DRAWINGS.
04 05 23.L	BOND BREAK
05 50 00.C	INTERIOR BOLLARD - YELLOW PAINT - REFERENCE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
05 50 00.D	EXTERIOR GALVANIZED BOLLARD - YELLOW PAINT - REFERENCE ARCHITECTURAL, SITE, AND STRUCTURAL DRAWINGS.
06 10 00.D2	2X WOOD BLOCKING/NAILER
06 10 00.G3	1/2" PLYWOOD
06 10 00.K1	2X4 WOOD FRAMING AT 16" OC
06 10 00.K6	WOOD FRAMING AT 16" OC
07 21 13.A	2" x 24" PERIMETER AND UNDERSLAB BOARD INSULATION
07 21 13.B4	2" BOARD INSULATION
07 42 13.13.B	PREFINISHED FORMED VERTICAL METAL PANEL - SHIM PANELS PLUMB
07 92 00.D	ISOLATION JOINT WITH JOINT FILLER AND SEALANT
13 34 18.A1	6X6 TREATED POST - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A2	2X6 GIRT - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A3	2X8 TREATED SKIRT BOARD - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A4	2X6 WOOD NAILER - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A6	2X GIRTS AT 24" OC - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A22	CONCRETE FOOTING - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 19.A	PRE-ENGINEERED METAL BUILDING SYSTEM
13 34 19.F	8" Z GIRT PROVIDED BY P.E.M.B. MANUFACTURER
13 34 19.G	3" R-SEAL CONTINUOUS RIGID INSULATION PROVIDED BY P.E.M.B. MANUFACTURER
31 23 00.A	COMPACTED GRANULAR FILL



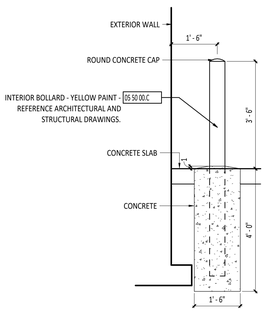
5 A4.2 POST BUILDING TYPICAL FOUNDATION DETAIL
1 1/2" = 1'-0"



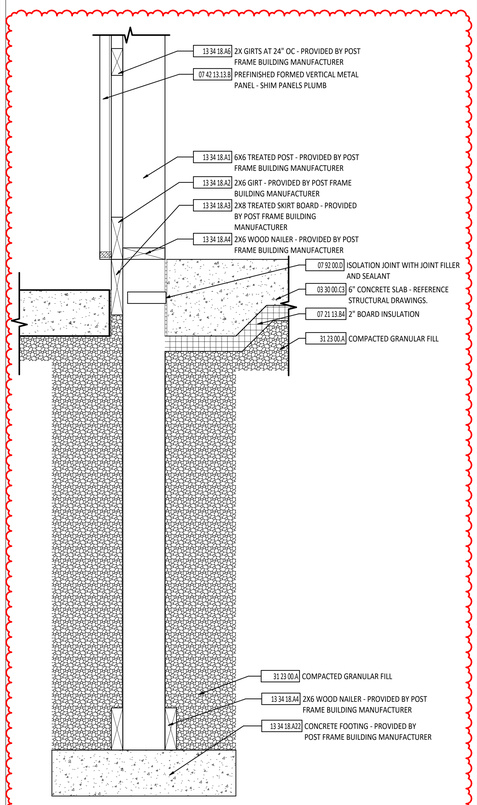
6 A4.2 BREEZEWAY CONCRETE SLAB ASSEMBLY
1 1/2" = 1'-0"



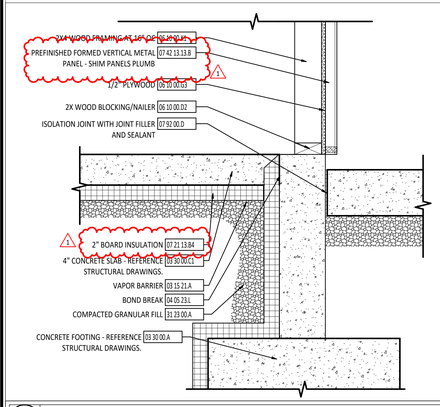
7 A4.2 POST BUILDING CONCRETE SLAB ASSEMBLY
1 1/2" = 1'-0"



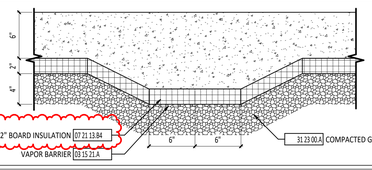
8 A4.2 TYPICAL INTERIOR BOLLARD
1/2" = 1'-0"



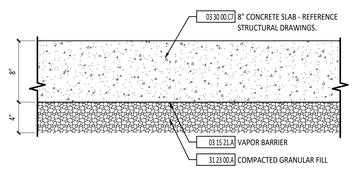
13 A4.2 POST BUILDING TYPICAL FOUNDATION DETAIL AT POST
1 1/2" = 1'-0"



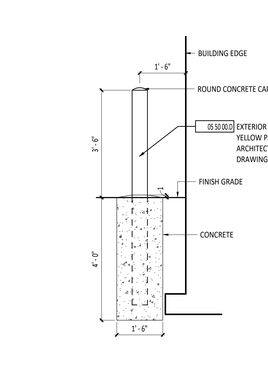
9 A4.2 BREEZEWAY TYPICAL FOUNDATION DETAIL
1 1/2" = 1'-0"



10 A4.2 THICKENED POST BUILDING SLAB ASSEMBLY
1 1/2" = 1'-0"



11 A4.2 PRE-ENGINEERED METAL BUILDING CONCRETE SLAB ASSEMBLY
1 1/2" = 1'-0"



12 A4.2 TYPICAL EXTERIOR BOLLARD
1/2" = 1'-0"

STATE OF OHIO
MATTHEW R. HIBNER 1416052 REGISTERED ARCHITECT
MATTHEW R. HIBNER
LICENSE #1416052
EXPIRATION DATE: 12/31/2027

GARMANN MILLER
AKRON, OHIO | COLUMBUS, OHIO | INDIANAPOLIS, INDIANA | FORT WAYNE, INDIANA
mmhgroup.com

ADDITION TO:

LAKOTA LOCAL SCHOOLS BUS BUILDING

5181 COUNTY ROAD 13, KANSAS, OHIO 44841

ISSUANCES/REVISIONS		
	CONSTRUCTION DOCUMENTS	05/27/2026
1	ADDENDUM #02	06/18/2026

PROJECT NUMBER:	DRAWN BY:	CHECKED BY:
25055.00	BER	RJH

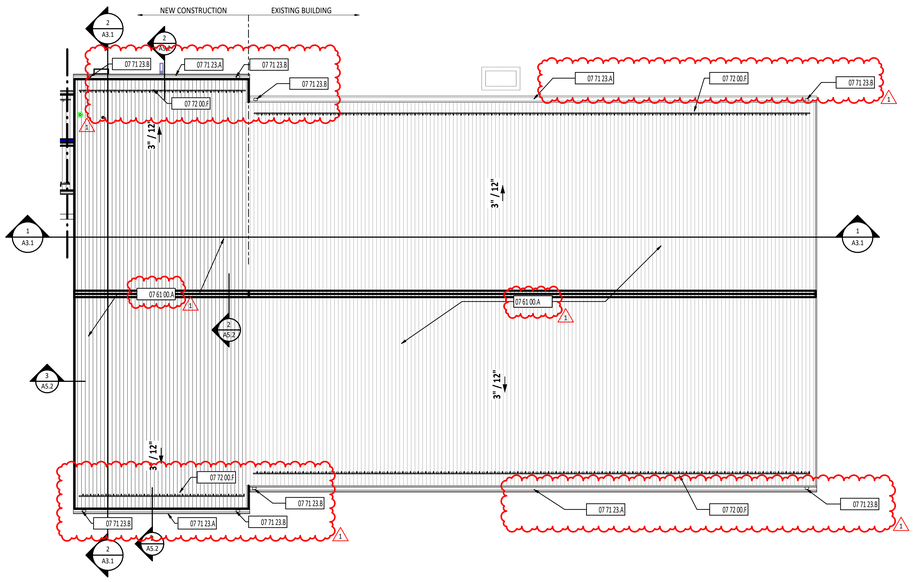
SHEET TITLE:

WALL SECTION DETAILS

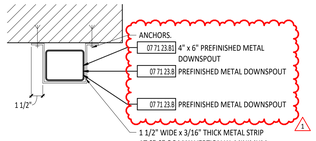
SHEET NUMBER:

A4.2

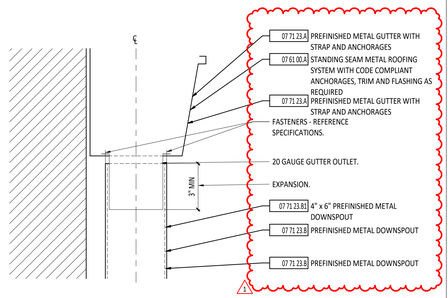
PRINTED ON: 6/18/2026 2:17:02 PM



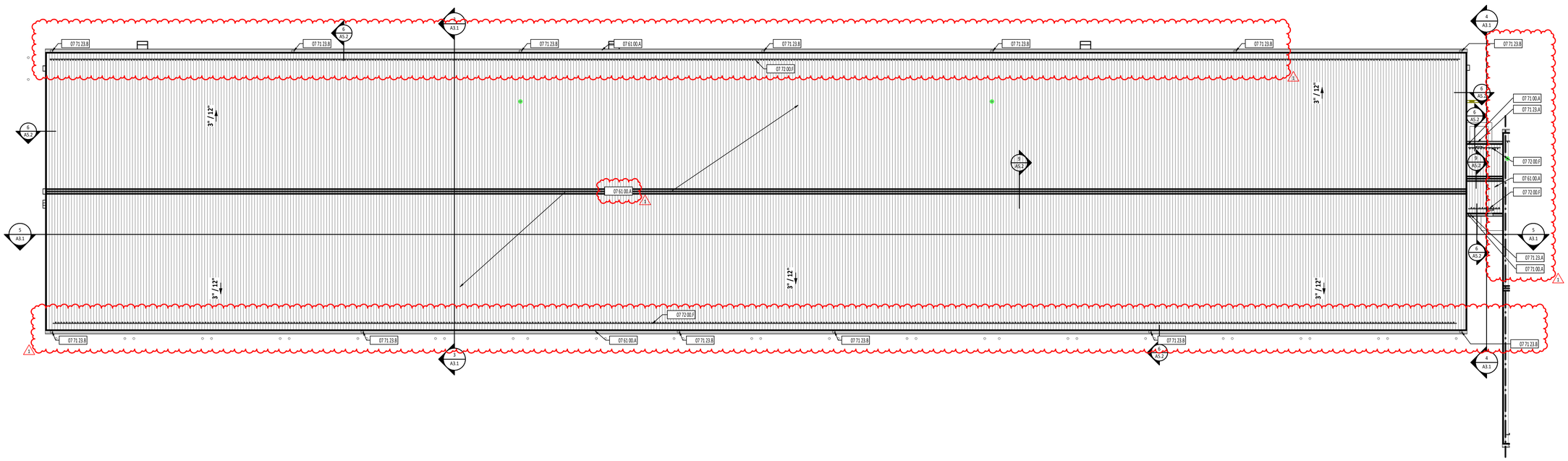
1 A5.1 UNIT A ROOF PLAN
1/8" = 1'-0"



2 A5.1 DOWNSPOUT BRACKET DETAIL
1 1/2" = 1'-0"



3 A5.1 GUTTER/DOWNSPOUT CONNECTION DETAIL
3" = 1'-0"



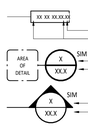
4 A5.1 UNIT B ROOF PLAN
1/8" = 1'-0"

#	KEYNOTE DESCRIPTION
07 61 00.A	STANDING SEAM METAL ROOFING SYSTEM WITH CODE COMPLIANT ANCHORAGES, TRIM AND FLASHING AS REQUIRED
07 71 00.A	TWO-PIECE PREFINISHED FASCIA WITH DRIP EDGE
07 71 23.A	PREFINISHED METAL GUTTER WITH STRAP AND ANCHORAGES
07 71 23.B	PREFINISHED METAL DOWNSPOUT
07 71 23.B1	4" x 6" PREFINISHED METAL DOWNSPOUT
07 72 00.F	SNOW GUARD - CONTINUOUS ACROSS TOP OF VERTICAL LEGS - REFERENCE ROOF PLAN FOR LOCATIONS.

ROOF PLAN SYMBOLS LEGEND

F FLUE DESIGNATION
V VENT DESIGNATION

DIVISIONAL KEYNOTE DESIGNATION - REFERENCE KEYNOTE SCHEDULE AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.



ROOF PLAN MATERIAL PATTERNS LEGEND

TAPERED INSULATION

ROOF PLAN PLAN GENERAL NOTES

A PROVIDE FLASHING IN ACCORDANCE WITH THE SMACNA ARCHITECTURAL SHEET METAL MANUAL LATEST EDITION.
B REFER TO MANUFACTURER FOR ROOF INSTALLATION DETAILS.
C ALL WOOD BLOCKING AT ROOF PENETRATIONS SHALL BE PRESERVATIVE TREATED.
D PROVIDE WELDED CURB FLASHING FOR PENETRATIONS IN METAL ROOF - REFERENCE ROOF DETAILS.
E PROVIDE CRICKETS WITH TAPERED FLASHING AT MECHANICAL OPENINGS.

STATE OF OHIO
MATTHEW R. HIBNER 1416052
REGISTERED ARCHITECT
MATTHEW R. HIBNER
LICENSE #1416052
EXPIRATION DATE: 12/31/2027

GARMANN MILLER
MARION, OHIO | COLUMBUS, OHIO | INDIANAPOLIS, INDIANA | FORT WAYNE, INDIANA
mmmgm.com

ADDITION TO:
LAKOTA LOCAL SCHOOLS BUS BUILDING
5186 COUNTY ROAD 13, KANSAS, OHIO 44841

ISSUANCES/REVISIONS

	CONSTRUCTION DOCUMENTS	05/27/2026
1	ADDENDUM #02	06/18/2026

PROJECT NUMBER:	DRAWN BY:	CHECKED BY:
25055.00	BER	RJH

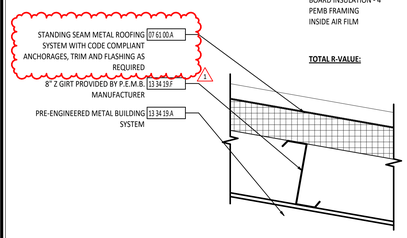
SHEET TITLE:
ROOF PLAN AND DETAILS

SHEET NUMBER:
A5.1

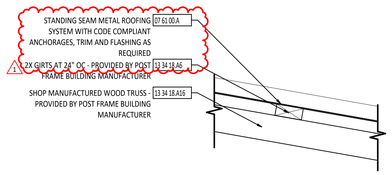
PRINTED ON: 6/18/2026 2:17:05 PM

ROOF R-VALUE:

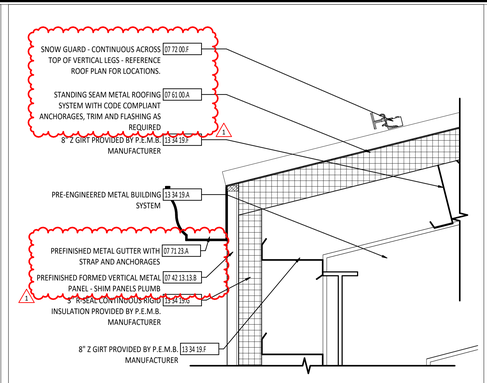
OUTSIDE AIR FILM	0.17
STANDING SEAM METAL ROOF - 2"	0.00
ROOF UNDERLAYMENT	0.00
BOARD INSULATION - 4"	30.00
PEMB FRAMING	0.00
INSIDE AIR FILM	0.61
TOTAL R-VALUE:	**30.77**



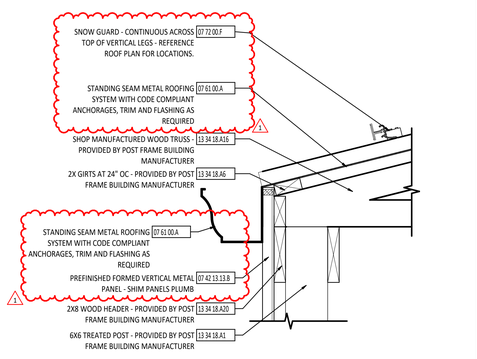
1 A5.2 ROOF ASSEMBLY 1 1/2" = 1'-0"



2 A5.2 ROOF ASSEMBLY 1 1/2" = 1'-0"



3 A5.2 EAVE DETAIL 1 1/2" = 1'-0"



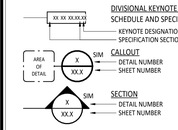
4 A5.2 EAVE DETAIL 1 1/2" = 1'-0"

ROOF PLAN PLAN GENERAL NOTES

A PROVIDE FLASHING IN ACCORDANCE WITH THE SMACNA ARCHITECTURAL SHEET METAL MANUAL LATEST EDITION.
B REFER TO MANUFACTURER FOR ROOF INSTALLATION DETAILS.
C ALL WOOD BLOCKING AT ROOF PENETRATIONS SHALL BE PRESERVATIVE TREATED.
D PROVIDE WELDED CURB FLASHING FOR PENETRATIONS IN METAL ROOF - REFERENCE ROOF DETAILS.
E PROVIDE CRICKETS WITH TAPERED FLASHING AT MECHANICAL OPENINGS.

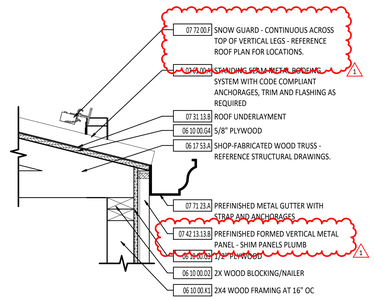
ROOF PLAN SYMBOLS LEGEND

F FLUE DESIGNATION
V VENT DESIGNATION

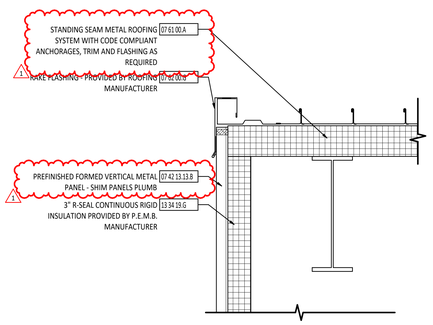


ROOF PLAN MATERIAL PATTERNS LEGEND

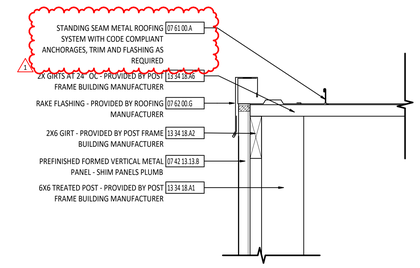
TAPERED INSULATION



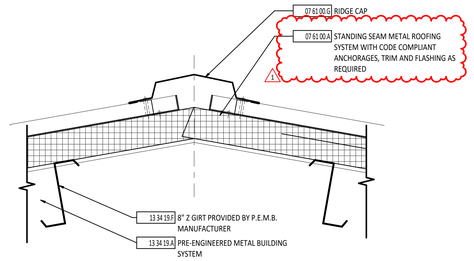
5 A5.2 EAVE DETAIL 1 1/2" = 1'-0"



6 A5.2 RAKE DETAIL 1 1/2" = 1'-0"



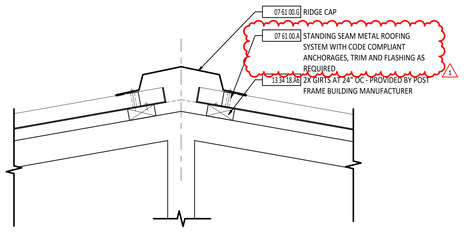
7 A5.2 RAKE DETAIL 1 1/2" = 1'-0"



8 A5.2 RIDGE CAP DETAIL 1 1/2" = 1'-0"

#	KEYNOTE DESCRIPTION
06 10 00.D2	2X WOOD BLOCKING/NAILER
06 10 00.G3	1/2" PLYWOOD
06 10 00.G4	5/8" PLYWOOD
06 10 00.K1	2X4 WOOD FRAMING AT 16" OC
06 17 53.A	SHOP-FABRICATED WOOD TRUSS - REFERENCE STRUCTURAL DRAWINGS.
07 31 13.B	ROOF UNDERLAYMENT
07 42 13.13.B	PREFINISHED FORMED VERTICAL METAL PANEL - SHIM PANELS PLUMB
07 61 00.A	STANDING SEAM METAL ROOFING SYSTEM WITH CODE COMPLIANT ANCHORAGES, TRIM AND FLASHING AS REQUIRED
07 61 00.G	RIDGE CAP
07 62 00.G	RAKE FLASHING - PROVIDED BY ROOFING MANUFACTURER
07 71 23.A	PREFINISHED METAL GUTTER WITH STRAP AND ANCHORAGES
07 72 00.F	SNOW GUARD - CONTINUOUS ACROSS TOP OF VERTICAL LEGS - REFERENCE ROOF PLAN FOR LOCATIONS.
13 34 18.A1	6X6 TREATED POST - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A2	2X6 GIRT - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A6	2X GIRTS AT 24" OC - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A16	SHOP MANUFACTURED WOOD TRUSS - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A20	2X8 WOOD HEADER - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 19.A	PRE-ENGINEERED METAL BUILDING SYSTEM
13 34 19.F	8" Z GIRT PROVIDED BY P.E.M.B. MANUFACTURER
13 34 19.G	3" R-SEAL CONTINUOUS RIGID INSULATION PROVIDED BY P.E.M.B. MANUFACTURER

1



9 A5.2 RIDGE CAP DETAIL 1 1/2" = 1'-0"

PRINTED ON: 6/18/2026 2:17:06 PM

STATE OF OHIO
MATTHEW R. HIBNER
1416052
REGISTERED ARCHITECT
MATTHEW R. HIBNER
LICENSE #1416052
EXPIRATION DATE: 12/31/2027

GARMANN MILLER
AKRON, OHIO | COLUMBUS, OHIO | INDIANAPOLIS, INDIANA | FORT WAYNE, INDIANA
ommgroup.com

ADDITION TO:
LAKOTA LOCAL SCHOOLS BUS BUILDING
5186 COUNTY ROAD 13, KANSAS, OHIO 44841

ISSUANCES/REVISIONS

	CONSTRUCTION DOCUMENTS	05/27/2026
1	ADDENDUM #02	06/18/2026

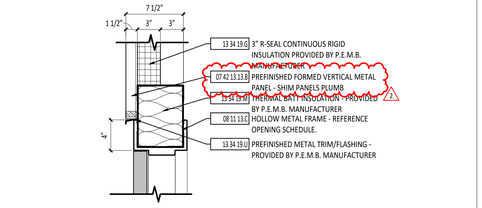
PROJECT NUMBER:	DRAWN BY:	CHECKED BY:
25055.00	BER	RJH

SHEET TITLE:
ROOF DETAILS

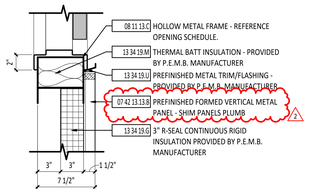
SHEET NUMBER:
A5.2

DOOR/OPENING SCHEDULE

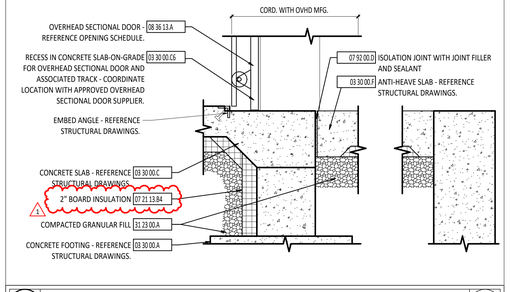
NUMBER	DOOR SIZE	DOOR THK	DOOR MATL	DOOR TYPE	DOOR GLASS	FRAME DEPTH	FRAME MATL	FRAME TYPE	FRAME GLASS	DETAIL NUMBER HEAD	DETAIL NUMBER JAMB	DETAIL NUMBER SILL	HARDWARE SET	ROOM KEY SIDE	FUNCTION	LABEL (MIN)	NOTES
A100a	3'-0" x 7'-0"	1 3/4"	HM	HG	1/4" - TG - SG	9 1/2"	HM	7	-	*Existing*	*Existing*	*Existing*	2	EXTERIOR	Exterior	-	
A100b	3'-0" x 7'-0"	1 3/4"	HM	HG	1/4" - TG - SG	9 1/2"	HM	7	-	*Existing*	*Existing*	*Existing*	2	EXTERIOR	Exterior	-	
A106a	12'-0" x 13'-0"	2"	AL	CD	-	12 1/4"	AL	-	-	7/A6.1	8/A6.1	-	1		Exterior	-	
A106b	12'-0" x 13'-0"	2"	AL	CD	-	12 1/4"	AL	-	-	7/A6.1	13/A6.1	-	1		Exterior	-	
A106c	(2) 3'-0" x 7'-0"	1 3/4"	HM	F	-	9 1/2"	HM	8	-	5/A6.1	8/A6.1	-	3		Interior	90 MIN	
A106d	3'-0" x 7'-0"	1 3/4"	HM	NL	1/4" - TG - SG	9 1/2"	HM	7	-	5/A6.1	6/A6.1	-	6		Exterior	-	
B100a	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B100b	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B100c	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B100d	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B100e	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B100f	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B100g	3'-0" x 7'-0"	1 3/4"	HM	HG	1/4" - TG - SG	9 1/2"	HM	7	-	9/A6.1	10/A6.1	-	2	EXTERIOR	Exterior	-	
B100h	3'-0" x 7'-0"	1 3/4"	HM	HG	1/4" - TG - SG	9 1/2"	HM	7	-	9/A6.1	10/A6.1	-	2	EXTERIOR	Exterior	-	
B101a	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B101b	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B101c	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B101d	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B101e	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B101f	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B101g	3'-0" x 7'-0"	1 3/4"	HM	F	-	7"	HM	1	-	14/A6.1	15/A6.1	-	5		Interior	90 MIN	
B101h	3'-0" x 7'-0"	1 3/4"	HM	HG	1/4" - TG - SG	9 1/2"	HM	7	-	9/A6.1	10/A6.1	-	2	EXTERIOR	Exterior	-	
B102a	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B102b	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B102c	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B102d	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B102e	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B102f	12'-0" x 12'-0"	2"	AL	OHD	1/4" - TG - SG	8 5/8"	AL	-	-	3/A6.1	4/A6.1	-	1		Exterior	-	
B102g	3'-0" x 7'-0"	1 3/4"	HM	F	-	7"	HM	1	-	14/A6.1	15/A6.1	-	5		Interior	90 MIN	
B102h	3'-0" x 7'-0"	1 3/4"	HM	HG	1/4" - TG - SG	9 1/2"	HM	7	-	9/A6.1	10/A6.1	-	2	EXTERIOR	Exterior		
B102i	3'-0" x 7'-0"	1 3/4"	HM	F	-	11"	HM	-	-	14/A6.1	15/A6.1	-	4		Interior	180 MIN	
B103a	3'-0" x 7'-0"	1 3/4"	HM	HG	1/4" - TG - SG	6 1/2"	HM	7	-	12/A6.1	13/A6.1	-	2	EXTERIOR	Exterior		
B103b	3'-0" x 7'-0"	1 3/4"	HM	HG	1/4" - TG - SG	6 1/2"	HM	7	-	12/A6.1	13/A6.1	-	2	EXTERIOR	Exterior		



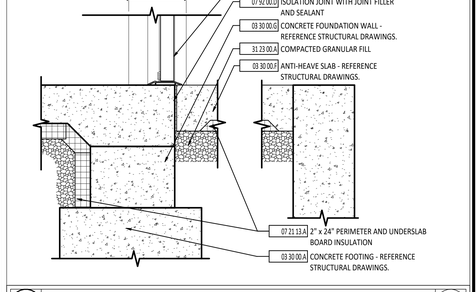
5 A6.1 HEAD DETAIL - EXTERIOR 1 1/2" = 1'-0"



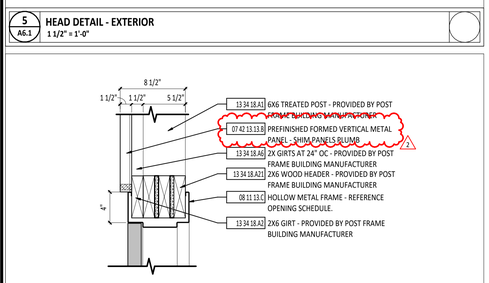
6 A6.1 JAMB DETAIL - EXTERIOR 1 1/2" = 1'-0"



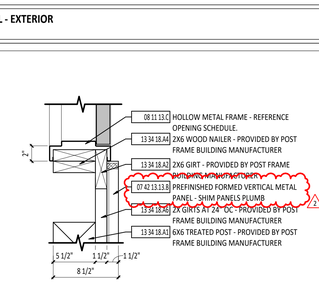
1 A6.1 SILL DETAIL - EXTERIOR 1 1/2" = 1'-0"



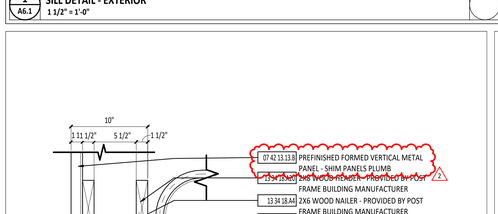
2 A6.1 SILL DETAIL - EXTERIOR 1 1/2" = 1'-0"



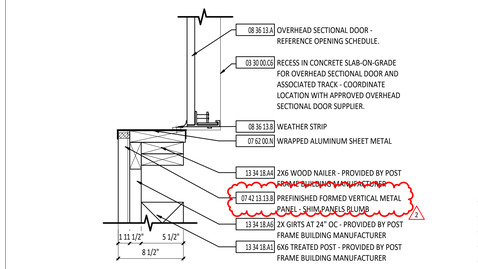
9 A6.1 HEAD DETAIL - EXTERIOR 1 1/2" = 1'-0"



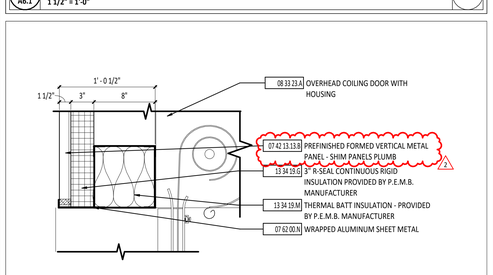
10 A6.1 JAMB DETAIL - EXTERIOR 1 1/2" = 1'-0"



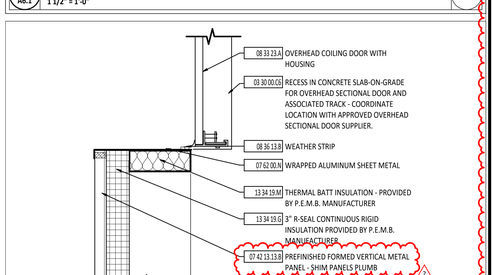
3 A6.1 HEAD DETAIL - EXTERIOR 1 1/2" = 1'-0"



4 A6.1 JAMB DETAIL - EXTERIOR 1 1/2" = 1'-0"



7 A6.1 HEAD DETAIL - EXTERIOR 1 1/2" = 1'-0"

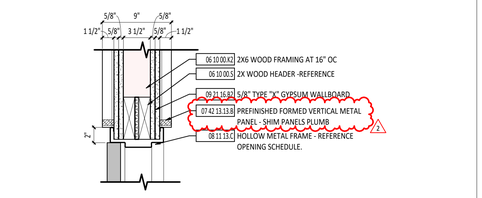


8 A6.1 JAMB DETAIL - EXTERIOR 1 1/2" = 1'-0"

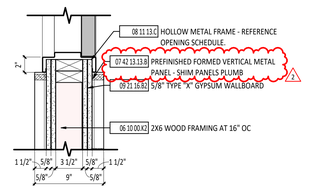
12 A6.1 HEAD DETAIL - EXTERIOR 1 1/2" = 1'-0"

13 A6.1 JAMB DETAIL - EXTERIOR 1 1/2" = 1'-0"

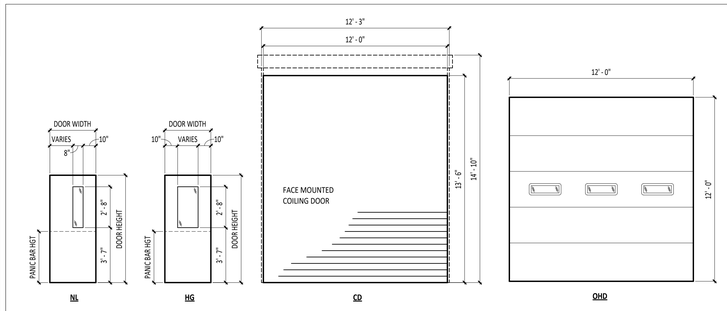
11 A6.1 HOLLOW METAL DOOR FRAME TYPES 1/4" = 1'-0"



14 A6.1 HEAD DETAIL - INTERIOR 1 1/2" = 1'-0"



15 A6.1 JAMB DETAIL - INTERIOR 1 1/2" = 1'-0"



16 A6.1 DOOR TYPES 1/4" = 1'-0"

DOOR GENERAL NOTES

DOOR/OPENING SCHEDULE ABBREVIATIONS

SYMBOL DESCRIPTION

AL	ALUMINUM
CD	COILING DOOR
DG	DIFFUSING GLASS
F	FLUSH
FG	FULL GLASS
FRG	FIRE RATED GLASS
HG	HALF GLASS
HM	HOLLOW METAL
IG	INSULATED GLASS
LG	LAMINATED GLASS
N	NARROW LITE
SG	SAFETY GLASS
TG	TEMPERED GLASS
W	WOOD

DOOR/OPENING SCHEDULE NOTES

SECTIONAL DOOR NUMBERING - ADHERE 12" NUMERIC STICKER TO OUTSIDE FACE OF SECTIONAL DOOR. REFERENCE 4/A2.1. ACTUAL DOOR NUMBER TO BE THE FOLLOWING:
- NUMERIC STICKER "1" AT DOOR 100a
- NUMERIC STICKER "2" AT DOOR 100b
- NUMERIC STICKER "3" AT DOOR 100c
- NUMERIC STICKER "4" AT DOOR 100d
- NUMERIC STICKER "5" AT DOOR 100e
- NUMERIC STICKER "6" AT DOOR 100f
- NUMERIC STICKER "7" AT DOOR 101a
- NUMERIC STICKER "8" AT DOOR 101b
- NUMERIC STICKER "9" AT DOOR 101c
- NUMERIC STICKER "10" AT DOOR 101d
- NUMERIC STICKER "11" AT DOOR 101e
- NUMERIC STICKER "12" AT DOOR 101f
- NUMERIC STICKER "13" AT DOOR 102a
- NUMERIC STICKER "14" AT DOOR 102b
- NUMERIC STICKER "15" AT DOOR 102c
- NUMERIC STICKER "16" AT DOOR 102d
- NUMERIC STICKER "17" AT DOOR 102e
- NUMERIC STICKER "18" AT DOOR 102f

#	KEYNOTE DESCRIPTION
03 30 00.A	CONCRETE FOOTING - REFERENCE STRUCTURAL DRAWINGS.
03 30 00.C	CONCRETE SLAB - REFERENCE STRUCTURAL DRAWINGS.
03 30 00.C6	RECESS IN CONCRETE SLAB-ON-GRADE FOR OVERHEAD SECTIONAL DOOR AND ASSOCIATED TRACK - COORDINATE LOCATION WITH APPROVED OVERHEAD SECTIONAL DOOR SUPPLIER.
03 30 00.F	ANTI-HEAVE SLAB - REFERENCE STRUCTURAL DRAWINGS.
03 30 00.G	CONCRETE FOUNDATION WALL - REFERENCE STRUCTURAL DRAWINGS.
06 10 00.D2	2X WOOD BLOCKING/NAILER
06 10 00.G3	1/2" PLYWOOD
06 10 00.K1	2X4 WOOD FRAMING AT 16" OC
06 10 00.K2	2X6 WOOD FRAMING AT 16" OC
06 10 00.S	2X WOOD HEADER -REFERENCE
07 21 13.A	2" x 24" PERIMETER AND UNDERSLAB BOARD INSULATION
07 21 13.B4	2" BOARD INSULATION
07 42 13.13.B	PREFINISHED FORMED VERTICAL METAL PANEL - SHIM PANELS PLUMB
07 62 00.N	WRAPPED ALUMINUM SHEET METAL
07 92 00.D	ISOLATION JOINT WITH JOINT FILLER AND SEALANT
08 11 13.C	HOLLOW METAL FRAME - REFERENCE OPENING SCHEDULE.
08 33 23.A	OVERHEAD COILING DOOR WITH HOUSING
08 36 13.A	OVERHEAD SECTIONAL DOOR - REFERENCE OPENING SCHEDULE.
08 36 13.B	WEATHER STRIP
08 71 00.A	DOOR THRESHOLD
09 21 16.B2	5/8" TYPE 'X' GYPSUM WALLBOARD
13 34 18.A1	6X6 TREATED POST - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A2	2X6 GIRT - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A4	2X6 WOOD NAILER - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A6	2X GIRTS AT 24" OC - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A20	2X8 WOOD HEADER - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 18.A21	2X6 WOOD HEADER - PROVIDED BY POST FRAME BUILDING MANUFACTURER
13 34 19.G	3" R-SEAL CONTINUOUS RIGID INSULATION PROVIDED BY P.E.M.B. MANUFACTURER
13 34 19.M	THERMAL BATT INSULATION - PROVIDED BY P.E.M.B. MANUFACTURER
13 34 19.U	PREFINISHED METAL TRIM/FLASHING - PROVIDED BY P.E.M.B. MANUFACTURER
31 23 00.A	COMPACTED GRANULAR FILL

MATTHEW R. HIBNER
LICENSE #1416052
EXPIRATION DATE: 12/31/2027

GARMANN MILLER
MARION, OHIO | COLUMBUS, OHIO | INDIANAPOLIS, INDIANA | FORT WAYNE, INDIANA
mmillergm.com

ADDITION TO:
LAKOTA LOCAL SCHOOLS BUS BUILDING
5186 COUNTY ROAD 13, KANSAS, OHIO 44841

ISSUANCES/REVISIONS		
	CONSTRUCTION DOCUMENTS	05/27/2026
1	ADDENDUM #01	06/08/2026
2	ADDENDUM #02	06/18/2026

PROJECT NUMBER:	DRAWN BY:	CHECKED BY:
25055.00	BER	RJH

SHEET TITLE:
DOOR SCHEDULE AND DETAILS

SHEET NUMBER:
A6.1

PRINTED ON: 6/18/2026 2:17:08 PM