ADDENDUM NO. *2*

TO: PLANS AND SPECIFICATIONS FOR STATE OF MISSOURI

Albany Readiness Center
New Maintenance Building
411 North College,
Albany, MO 64402
PROJECT NO. T2327-01

Bid Opening Date: 1:30 PM, July 22, 2025

Bidders are hereby informed of the following:

SPECIFICATION CHANGES*:*

Section 024119 – Selective Demolition

Added section to Project Manual.

Section 133419 – Metal Building Systems

Paragraph 2.1 been edited to include additional allowable manufacturers.

Appendix

Updated to include pre-bid sign-in sheet and Geotech report.

DRAWING CHANGES:

L-101 – Site Demolition Plan

Revised notes regarding relocation of existing utilities.

Added temporary security fence.

A-100 – First Floor Plan and Reflected Ceiling Plan

Added Detail 3 – Bollard Location Plan to clarify bollard locations.

S-101 – Footing & Foundation Plan

Revised pilaster sizes to allow embedment of bollards at overhead doors.

BIDDER QUESTIONS AND RESPONSES:

1. The plans reference us to verify with the geo-tech report. Please provide this report. This is critical if you plan to enforce Item 7.0 in Section 007300.

Response: Geotech report has been added to the appendix of the Project Manual.

2. Please provide clarifications as to property lines mentioned in the pre-bid meeting.

   Response: The property line location shown on the drawings is accurate. The city has a right-of-way, approximately 40' wide, between Canaday Street and the South property line. MONG is coordinating with the City to reduce the size of the ROW and extend the property line further South. For the purposes of this project the City has given consent that work can occur within the existing ROW. The new building is to be located 5' North of the existing property boundary, however, earthwork, fencing, and utility work will need to occur within the ROW.

3. L-401-Not states that Irrigation is not available at the site and will need to be provided by contractor from an off-site source. Can we utilize surface lawn sprinklers tied into the owners hose bibs for watering? What is the duration expected to water the seed type A?

   Response: There is an existing spigot just inside the basement roll-up door located on the East side of the building. The GC may use the existing spigot, however, due to it being on the interior of the existing building, access will need to be coordinate with owner. Seed Type A shall be watered until satisfactory turf has been established, in accordance with Specification 329200, Paragraphs 3.6 & 3.7.

4. Sheet A-100-Drawing "1" shows interior and exterior pipe bollards without any dimensions in relation to the door openings or the wall line. When you compare the bollards in there assumed position on sheet S101, that puts them in the existing footing/piers. The pre-engineered building erector is not going to want them installed prior to steel erection or siding install. Normally these are installed after the building is erected. Typically, we install them with half of the pipe inside of the door opening (this would reduce your overall opening dimension be 6"). I would like to see a dimension plan on the bollard location. It can't interfere with the location of the trench drain. You may want to push the drain deeper in to the building to make this work out.

   Response: Adjusted sizes of Pilasters at grids 2-D, 3-D and 4-D from 30" x 30" to 46" x 46"to allow for embedment of bollards at overhead doors. Added 24" x 46" Pilasters near grids 1 and 5 along grid D. See Arch (3/A-100) for typical locations of Bollards. Detail 5/S1.01 adjusted per new pilaster sizes at grids 2-D, 3-D and 4-D.

5. Are we to keep the site secure with temporary security fence? If so, are 6' tall panels adequate?

   Response: Yes, refer to revised sheet L-101.

6. Detail 7 on sheet S-301-Grade beam construction doesn't match sections on A-500 or S-101. Specifically, the insulation and filter fabric. Does that condition only occur at an isolated location or everywhere?

   Response: Detail #7 on S-301 is a typical detail that would only occur where the utilities would go through the grade beam.

7. Can we substitute 1/2" plywood (or even 5/8") in lieu of 1/2" gyp board thermal barrier detail 6 & 7/A-500? Would allow us to screw the liner panel to the plywood.

   Response: The layer of gypsum board was included in the project to meet the thermal barrier requirements of IBC Chapter 2603.4 which requires foam plastic to be separated from the interior of the building by ½" gypsum board or some other material tested in accordance with NFPA 275. Standard plywood does not meet the requirements of NFPA 275 and would not be an appropriate substitution.

8. Since there is Fed money involved in this, how much additional paperwork and approvals will this project require?

   Response: Obtain a signed bid bond form, typically AIA Document 310, from your surety. This can then be e-mailed along with your bid form. All bidders must review Section 007333 for additional requirements.

9. Are all existing utilities under new building footprint to be completely removed, then trench line compacted with granular fill or soil fill?

   Response: As shown on the drawings, portions of the existing storm sewer and sanitary sewer will need to be removed and replaced. If the existing water line is located under the proposed building, those portions will need to be relocated per the water service providers requirements. All found existing utilities under new building footprint to be completely removed and/or relocated. The existing trench line to be compacted per earthwork specifications (not granular fill).

10. Can Storm and Sanitary be installed after site demo but prior to pad site prep? Some elevations on new utilities show it being up to 15' deep with 'final grade'. Installing NEW before pad prep would improve safety and efficiency.

    Response: Yes, storm sewer and sanitary sewer can be installed after site demo prior to pad site prep - but only if a minimum of 5’ depth of soil cover is placed over the storm sewer and sanitary sewer lines.

11. Will existing gravel to be removed during the DEMO be suitable fill inside of stem walls under new building pad?

    Response: Existing gravel to be removed during the demo is NOT suitable fill inside of stem walls under new building pad.

12. Irrigation NOTE on L-401 says no irrigation available on-site, so will the contractor be required to bring water from off-site? Is there no possible spigot attached to existing building available for watering new seed?

    Response: There is an existing spigot just inside the basement roll-up door located on the East side of the building. The GC may use the existing spigot, however, due to it being on the interior of the existing building, access will need to be coordinate with owner.

13. On page A-500 detail 3, is the exposed PEMB beams to receive coatings?

    Response: Refer to Section 133419, 2.4H of the Specifications for finish requirements. Members to be factory primed.

14. For the concrete floor I’m going to figure a sealer unless not wanted?

    Response: Refer to Section 033000, 2.7 of the Specifications for floor treatment requirements.

15. As far as paint goes all I’m seeing is the HM doors/slabs and bollards…Exposed PEMB get painted at all or anything else I’m missing?

    Response: Refer to Section 133419, 2.4H of the Specifications for PEMB finish requirements. Additional paint, to match PEMB cladding, required for miscellaneous sheet metal at head and jamb of overhead sectional doors and at poplar cap around building interior.

16. Substitution request: Red Dot Buildings, Pre-Engineered Metal Building

    Response: Section 133419, 2.1A of the Specifications has been updated to include Red Dot Buildings as an acceptable manufacturer.

17. Substitution request: Alliance, Pre-Engineered Metal Building

    Response: Section 133419, 2.1A of the Specifications has been updated to include Alliance as an acceptable manufacturer.

GENERAL:

1. Please contact Paul Girouard, Contract Specialist, at 573-751-4797 or paul.girouard@oa.mo.gov for questions about bidding procedures, MBE\WBE\SDVE Goals, and other submittal requirements.

2. The deadline for technical questions is July 14, 2025, at Noon.

3. Changes to, or clarification of, the bid documents are only made as issued in the addenda.

4. All correspondence with respect to this project must include the State of Missouri project number as indicated above.

5. Current Plan Holders list available online at: *Bid Listing/ Electronic Plans (Projects Currently Bidding) | Office of Administration (mo.gov)* T232701 - Albany Readiness Center-New Maintenance Building, Readiness Center

6. Prospective Bidders contact American Document Solutions, 1400 Forum Blvd Suite 7A, Columbia MO 65203, 573-446-7768 to order official plans and specifications.

7. All bids shall be submitted on the bid form without additional terms and conditions, modifications, or stipulations. Each space on the bid form shall be properly filled including a bid amount for the alternates. Failure to do so will result in rejection of the bid.

8. MBE/WBE/SDVE participation requirements can be found in DIVISION 00. The MBE/WBE/SDVE participation goals are 10%/10%/3%, respectively. Only certified firms as of the bid opening date can be used to satisfy the MBE/WBE/SDVE participation goals for this project. If a bidder is unable to meet a participation goal, a Good Faith Effort Determination Form must be completed. Failure to complete this process will result in rejection of the bid.

ATTACHMENTS:

1. Section 024119
2. Section 133419
3. Geotech Report
4. Pre-bid Sign-In
5. Sheet L-101
6. Sheet A-100
7. Sheet S-101

By the Order of:

Fred L. Decker Jr., Project Manager
Division of Facilities Management,
Design and Construction
July 17, 2025

END ADDENDUM NO. 2

Addendum #2

A 02

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Demolition and removal of selected site elements.
2. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 01 10 00 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 01 73 00 "Execution" for cutting and patching procedures.
3. Section 31 10 00 "Site Clearing" for site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
4. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

C. Predemolition Photographs or Video: Submit before Work begins.

1.7 FIELD CONDITIONS

A. Owner will occupy building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

A. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

B. Existing Services/Systems to Be Remain: Where services and systems that are to remain are impacted by the removal or demolition of other work (i.e. removal of ceiling grid that support lights and/or diffusers), the Contractor shall restore the services and systems back to original operation and/or location using materials, supports, and requirements outlined in the project specifications without additional compensation.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
   2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
   4. Maintain adequate ventilation when using cutting torches.
   5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   6. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
   7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   8. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:

   1. Store items in a secure area until delivery to Owner.
   2. Transport items to Owner's storage area designated by Owner.
   3. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

   1. Clean and repair items to functional condition adequate for intended reuse.
   2. Pack or crate items after cleaning and repairing. Identify contents of containers.
   3. Protect items from damage during transport and storage.
   4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

Addendum #2

SECTION 13 34 19 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Structural-steel framing.
2. Metal roof panels.
3. Metal wall panels.
4. Metal soffit panels.
5. Thermal insulation.
6. Doors and frames.
7. Accessories.

B. Related Sections:
1. Section 08 11 13 "Hollow Metal Doors and Frames."
2. Section 08 36 13 "Sectional Doors."
3. Section 23 37 00 “Air Outlets and Inlets.”

1.3 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.

1.4 ACTION SUBMITTALS

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.
2. Metal roof panels.
3. Metal wall panels.
4. Metal liner panels.
5. Insulation and vapor retarder facings.
6. Flashing and trim.
7. Doors.
8. 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.

    a. Show roof-mounted items including equipment supports, pipe supports, and penetrations.
    b. Show wall-mounted items including doors, louvers, and lighting fixtures.

4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:

    a. Flashing and trim.
    b. Gutters.
    c. Downspouts.
    d. Louvers.

C. Samples for Initial Selection: For units with factory-applied color finish.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below:

1. Metal Panels: Nominal 12 inches long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
2. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.
3. Vapor-Retarder Facings: Nominal 6-inch- square Samples.
4. Accessories: Nominal 12-inch- long Samples for each type of accessory.

E. 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 responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

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

B. Manufacturer Accreditation: Statement that metal building system and components were designed and produced by a manufacturer accredited according to the International Accreditation Service's AC472.

C. Welding certificates.

D. 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. Building-Use Category: Indicate category of building use and its effect on load importance factors.

E. Erector Certificates: For each product, from manufacturer.

F. Manufacturer Certificates: For each product, from manufacturer.

G. 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.

H. 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.

I. Source quality-control reports.

J. Field quality-control reports.

K. Warranties: Sample of special warranties.

1.6 CLOSEOUT SUBMITTALS

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

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.

1. Accreditation: According to the International Accreditation Service's AC472.
2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.

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.

C. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

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

E. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3, "Structural Welding Code - Sheet Steel."

F. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.

G. Preinstallation Conference: Conduct conference at Project site.

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. 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. Flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
    d. Temporary protection requirements for metal wall panel assembly during and after installation.
    e. Wall observation and repair after metal wall panel installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

1.9 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.

1.10 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 30 00 "Cast-in-Place Concrete."

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

1.11 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

   a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
   b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.

1. Warranty Period: 25 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Behlen Building Systems or comparable product by one of the following:

1. Butler Manufacturing Company; a BlueScope Steel company.
2. Nucor Building Systems.
3. Chief Buildings; Division of Chief Industries, Inc.
4. Alliance Steel Building Systems.
5. Red Dot Buildings.
6. Or equal if and as specifically approved by Architect by Addendum during the bidding period.

A 02

2.2 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 spacings, roof slopes, and spans indicated.

B. Primary-Frame Type:

1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.

C. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of primary frame, capable of supporting one-half of a bay design load, and end-wall columns.

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

E. Eave Height: As indicated.

F. Bay Spacing: As indicated.

G. Roof Slope: 1 inch per 12 inches (1:12).

H. Roof System: Manufacturer's standard vertical-rib, standing-seam, concealed fastener metal roof panels with field-installed insulation.

I. Exterior Wall System: Manufacturer's standard tapered-rib, exposed-fastener metal wall panels with field-installed insulation.

2.3 METAL BUILDING SYSTEM PERFORMANCE

A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. 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 and as required by ASCE/SEI 7
2. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:

    a. Main framing members: Vertical deflection of 1/240.
    b. Purlins and Rafters: Vertical deflection of 1/180 of the span.
    c. Girts: Horizontal deflection of 1/180 of the span.
    d. Metal Roof Panels: Vertical deflection of 1/180 of the span.
    e. Metal Wall Panels: Horizontal deflection of 1/180 of the span.
    f. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.

3. Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:

    a. Lateral Drift: Maximum of 1/240 of the building height.

4. 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.

C. Seismic Performance: Metal building systems shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

D. 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, ambient; 180 deg F, material surfaces.

E. Air Infiltration for Metal Roof Panels: Air leakage through assembly of not more than 0.008 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at negative test-pressure difference of 6.24 lbf/sq. ft.

F. Air Infiltration for Metal Wall Panels: Air leakage through assembly of not more than 0.005 cfm/sq. ft. of wall area when tested according to ASTM E 283 at static-air-pressure difference of 6.24 lbf/sq. ft.

G. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 12.0 lbf/sq. ft.

H. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 12.0 lbf/sq. ft.

I. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for Class 90.

J. 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 Panel Assemblies:

    a. U-Factor: R-19 + R11 LS
    b. R-Value: 0.035

2. Metal Wall Panel Assemblies:

    a. U-Factor: 0.050

2.4 STRUCTURAL-STEEL FRAMING

A. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.

    a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.

2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.

B. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:

1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
2. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.

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, prepainted with coil coating, to comply with the following:

1. Purlins: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum 2-1/2-inch- wide flanges.

    a. Depth: As needed to comply with system performance requirements.

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: As required to comply with system performance requirements.

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. Base or Sill Angles: Minimum 3-by-2-inch zinc-coated (galvanized) steel sheet.
7. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
8. Secondary End-Wall Framing: Manufacturer's standard sections fabricated from zinc-coated (galvanized) steel sheet.

9. 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.
10. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

D. Canopy Framing: Manufacturer's standard structural-framing system, designed to withstand required loads; fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide frames with attachment plates and splice members, factory drilled for field-bolted assembly.

1. Type: Purlin-extension type or As indicated

E. Bracing: Provide adjustable wind bracing as follows:
1. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
2. 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.
3. Bracing: Provide wind bracing using any method specified above, at manufacturer's option.

F. 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.

G. Materials:

1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55
3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55
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, or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70; or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80, or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70.
7. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80 or High-Strength Low-Alloy Steel (HSLAS), Grades 50 through 80; with G60 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 or High-Strength Low-Alloy Steel (HSLAS), Grades 50 through 80; with G90 coating designation.
b. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Structural Steel (SS), Grade 50 or 80; with Class AZ50 coating.

9. 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: Plain.

10. Headed Anchor Rods: ASTM F 1554, Grade 36.

    a. Configuration: Straight.
    b. Nuts: ASTM A 563 heavy-hex carbon steel.
    c. Plate Washers: ASTM A 36/A 36M carbon steel.
    d. Washers: ASTM F 436 hardened carbon steel.
    e. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C]

11. Threaded Rods: ASTM A 36/A 36M.

    a. Nuts: ASTM A 563 heavy-hex carbon steel.
    b. Washers: ASTM F 436 hardened carbon steel.
    c. Finish: Plain.

12. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

H. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.

1. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil.

    a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil on each side.

2. Prime galvanized members with specified primer after phosphoric acid pretreatment.
3. Primer: SSPC-Paint 15, Type I, red oxide.

2.5 METAL ROOF PANELS

A. Vertical-Rib, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.

1. Material: Aluminum-zinc alloy-coated steel sheet, 0.028-inch nominal thickness.

    a. Exterior Finish: Fluoropolymer.
    b. Color: As indicated on drawings or as selected by Architect from manufacturer's full range.

2. Clips: Manufacturer's standard, floating type to accommodate thermal movement; fabricated from zinc-coated (galvanized) steel, aluminum-zinc alloy-coated steel, or stainless-steel sheet.
3. Joint Type: Mechanically seamed, folded according to manufacturer's standard.

4. Panel Coverage: 16 inches.
5. Panel Height: 2 inches.
6. Uplift Rating: UL 90.

B. Materials:

1. Metallic-Coated Steel Sheet: Restricted-flatness 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. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 50; structural quality.
b. Surface: Smooth, flat finish.

C. Finishes:

1. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2.6 METAL WALL PANELS

A. Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

1. Material: Aluminum-zinc alloy-coated steel sheet, 24 ga.

a. Exterior Finish: Fluoropolymer.
b. Color: As indicated on drawings or as selected by Architect from manufacturer's full range.

2. Major-Rib Spacing: 12 inches o.c.
3. Panel Coverage: 36 inches.
4. Panel Height: 1.125 inches.

B. Reverse-Rib-Profile, Exposed-Fastener Metal Wall Panels: Formed with recessed, trapezoidal major valleys and intermediate stiffening valleys symmetrically spaced between major valleys; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

1. Material: Aluminum-zinc alloy-coated steel sheet, 24 ga.

a. Exterior Finish: Fluoropolymer.
b. Color: As indicated on drawings or as selected by Architect from manufacturer's full range.

2. Major-Rib Spacing: 12 inches o.c.
3. Panel Coverage: 36 inches.
4. Panel Height: 1.125 inches.

C. Metal Liner Panels: Roll-formed to manufacturer's standard rib profile.

1. Material: Aluminum-zinc alloy-coated steel sheet, 24 ga.

a. Exterior Finish: Siliconized polyester.
b. Color: As selected by Architect from manufacturer's full range.

2. Major-Rib Spacing: 12 inches o.c.
3. Panel Coverage: 36 inches.
4. Panel Height: 1.125 inches.

D. Materials:

1. Metallic-Coated Steel Sheet: Restricted-flatness 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, G90 coating designation; structural quality.
b. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 50; structural quality.
c. Surface: Smooth, flat finish.

E. Finishes:

1. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2.7 METAL SOFFIT PANELS

A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.

B. Metal Soffit Panels: Match profile and material of metal roof panels.

1. Finish: Match finish and color of metal roof panels.

2. Material: Aluminum-zinc alloy-coated steel sheet, 22ga.

a. Exterior Finish: Fluoropolymer.
b. Color: Match color of metal roof panels.

3. Panel Coverage: 12 inches.
4. Panel Height: 1 inch.

2.8 THERMAL INSULATION

A. Faced Metal Building Insulation: ASTM C 991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.

B. Retainer Strips: 0.025-inch nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.

C. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.9 DOORS AND FRAMES

A. Swinging Personnel Doors and Frames: As specified in Section 08 11 13 "Hollow Metal Doors and Frames."

2.10 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.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel sheet.
4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

6. Thermal Spacer Blocks: Where metal panels attach directly to purlins, provide thermal spacer blocks of thickness required to provide 1-inch standoff; fabricated from extruded polystyrene.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or pre-molded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

D. Flashing and Trim: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet pre-painted with coil coating; finished to match adjacent metal panels.

1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
2. Opening Trim: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.

E. Gutters: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished as indicated on drawings. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."

1. Gutter Supports: Fabricated from same material and finish as gutters.
2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

F. Downspouts: Formed from 0.022-inch nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- long sections, complete with formed elbows and offsets.

1. Mounting Straps: Fabricated from same material and finish as gutters.

G. Louvers: Reference 23 37 00 “Air Outlets and Inlets.”

H. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

I. Materials:

1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners

with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.

a. Fasteners for Metal Roof Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless-steel cap or zinc-aluminum-alloy head and EPDM sealing washer.
b. Fasteners for Metal Wall Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws.
c. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
d. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

2. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
3. Metal Panel Sealants:

a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
b. Joint Sealant: ASTM C 920; one-part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.11 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to evaluate product.

B. Special Inspector: Owner will engage a qualified special inspector to perform the following tests and inspections and to submit reports. Special inspector will verify that manufacturer maintains detailed fabrication and quality-control procedures and will review the completeness and adequacy of those procedures to perform the Work.

C. Testing: Test and inspect shop connections for metal buildings according to the following:

1. Bolted Connections: Shop-bolted connections shall be 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.

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

E. Prepare test and inspection reports.

2.12 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.

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.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. 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.

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

3.2 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.

3.3 ERECTION OF STRUCTURAL FRAMING

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

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

C. 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.

D. Base 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.

E. 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.

F. 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. Joint Type: Snug tightened or pretensioned.

G. 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 door openings.
3. Provide supplemental framing at entire perimeter of openings, including doors, louvers, ventilators, and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.

1. Tighten rod to avoid sag.
2. Locate interior end-bay bracing only where indicated.

I. 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.

J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

A. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.

1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

B. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.

a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.

2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

C. Metal Protection: 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 metal roof panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.

1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.

1. Install ridge caps as metal roof panel work proceeds.
2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

1. Install clips to supports with self-drilling or self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
4. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels for fasteners.
5. Provide metal closures at rake edges and each side of ridge caps.

C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

D. Metal Roof Panel Installation Tolerances: Shim and align metal roof panels within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. When two rows of metal panels are required, lap panels 4 inches minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
7. Install screw fasteners in predrilled holes.
8. Install flashing and trim as metal wall panel work proceeds.
9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated; or, if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

C. Insulated Metal Wall Panels: Install insulated metal wall panels on exterior side of girts. Attach panels to supports at each panel joint using concealed clip and fasteners at maximum 42 inches o.c., spaced not more than manufacturer's recommendation. Fully engage tongue and groove of adjacent insulated metal wall panels.

1. Install clips to supports with self-tapping fasteners.
2. Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels as weather seal.

D. Installation Tolerances: Shim and align metal wall panels within installed tolerance of 1/4 inch in 20 feet, non-accumulative, on level, plumb, and on location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 METAL SOFFIT PANEL INSTALLATION

A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.

B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

3.8 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. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.

B. Blanket Roof Insulation: Comply with the following installation method:

1. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Install layer of filler insulation over first layer to fill space formed by metal roof panel standoffs. Hold in place by panels fastened to standoffs.

2. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.

1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

3.9 ACCESSORY INSTALLATION

A. 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.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
1. Tie downspouts to underground drainage system indicated.

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

3.10 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Inspection of fabricators.
2. Steel construction.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

C. Tests and Inspections:

1. High-Strength, Field-Bolted Connections: Connections shall be 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. 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.

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

E. Prepare test and inspection reports.

3.11 CLEANING AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

C. Touchup Painting: Cleaning and touchup painting are specified in Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting."

D. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

E. Doors and Frames: Immediately after installation, sand rusted or damaged areas of prime coat until smooth and apply touchup of compatible air-drying primer.

1. Immediately before final inspection, remove protective wrappings from doors and frames.

F. Louvers: Clean exposed surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

1. Restore louvers damaged during installation and construction period so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

a. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 13 34 19

Addendum #2

Albany Maintenance Building

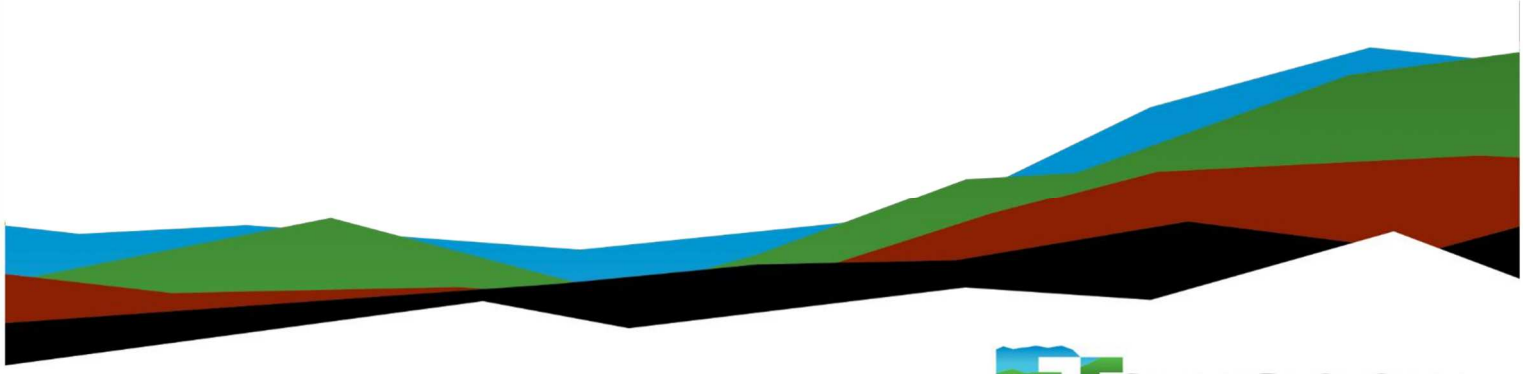
Geotechnical Engineering Report

Albany, Missouri

October 4, 2024 | Terracon Project No. 02245267

Prepared for:

Clark & Enersen
Kansas City, Missouri 64108



Terracon
Explore with us

Nationwide
Terracon.com

- Facilities
- Environmental
- Geotechnical
- Materials

15620 W 113th Street
Lenexa, KS 66219
(913) 492-7777
Terracon.com

October 4, 2024

Clark & Enersen
2020 Baltimore Avenue Suite 300
Kansas City, Missouri 64108

Attn: Maria Comerford
P: (816) 474-8237
E: Maria.Comerford@clarkenersen.com

Re: Geotechnical Engineering Report
Albany Maintenance Building
411 College Street
Albany, Missouri
Terracon Project No. 02245267

Dear Ms. Comerford:

We have completed a subsurface exploration and geotechnical engineering evaluation for the referenced project in general accordance with Terracon Proposal No. P02245267 dated August 7, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, and pavements for the project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

Nathan L. Niederhauser, E.I.T.
Staff Engineer

Jamie M. Klein, P.E.
Senior Engineer
Missouri: PE 2009001099

Table of Contents

Figures

Attachments

Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed maintenance building to be located at 411 College Street in Albany, Missouri. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- IBC seismic site class
- Site preparation and earthwork
- Foundations
- Floor slabs
- Pavements

Drawings showing the site and boring locations are shown on the attached **Site Location Plan** and **Exploration Plan**. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs in **Exploration Results**.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Project Description	A maintenance building will be constructed at the property of the Albany Readiness Center. The proposed construction will be a single-story steel framed building over concrete slab on grade with a footprint of approximately 4,500 sq. ft.
Finished Floor Elevation	The building will have an FFE of 936.5 feet.
Maximum Loads	The following anticipated maximum structural loads were provided by Clark & Enerson ▪ Columns: 15 kips ▪ Walls: 500 pounds per linear foot (plf) ▪ Slabs: 200 pounds per square foot (psf)

Item	Description
Grading	An existing site plan was provided, based on the plan and provided FFE we anticipate no more than 2 feet of cut and fill will be required to develop final grades.
Below-Grade Structures	No basement level or other below-grade areas are planned.
Free-Standing Retaining Walls	No free-standing retaining walls are planned.
Pavements	No information regarding anticipated vehicle types, axle loads, or traffic volumes was provided. We anticipate the pavements will be utilized by primarily light vehicles and up to 10 3-axle Light Medium Tactical Vehicle (LMTV) trucks, often with trailers, per day.

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration.

Item	Description
Parcel Information	The project is located at 411 College Street in Albany, Missouri. Approximate Latitude/Longitude: 40.2505, -94.3247 See **Site Location**
Existing Site Conditions	The area of the proposed building is adjacent to the operational Albany Readiness Center, currently a gravel lot where maintenance vehicles and equipment are staged. The site slopes downwards towards the south from approximately 940 to 934 feet.

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based on the subsurface exploration, laboratory data, geologic setting, and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical evaluation. Conditions observed at each boring location are indicated on the individual

logs. The individual logs are in the **Exploration Results** and the GeoModel is in the **Figures** attachment of this report.

As part of our analyses, we identified the following model layer within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	Gravel	Silty Gravel surface layer, approximately 6 inches thick
2	Glacial Till	Fat Clay or Lean to Fat Clay, with sand, trace gravel, medium stiff to stiff

The borings were observed during drilling and shortly after completion of drilling for the presence and level of water. Groundwater was not encountered in the borings at these times. However, this does not necessarily mean the borings were terminated above groundwater. A longer period of time may be required for groundwater to develop and stabilize in a borehole. Longer term observations in piezometers or observation wells, sealed from the influence of surface water, are often required to define groundwater levels.

Groundwater levels may fluctuate due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were performed. "Perched" water could occur above lower permeability soil layers and "trapped" water could be present within existing fill materials, if present. Therefore, groundwater conditions at other times may be different than the conditions encountered in our exploratory borings. The potential for water level fluctuations and perched water should be considered when developing design and construction plans and specifications for the project.

Seismic Site Class

The seismic design requirements for buildings and other structures are based on Seismic Design Category. The Site Class is required to determine the Seismic Design Category for a structure. The Site Class is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil encountered in our subsurface exploration, **Seismic Site Class D** can be considered for design of the project. The subsurface exploration at this site extended to a maximum depth of 20 feet. The site properties below the maximum boring depth were estimated based on our experience and knowledge of geologic conditions of the general area. Upon request, we could perform deeper borings or geophysical testing to confirm the conditions below the current maximum boring depth.

Geotechnical Overview

Based on conditions encountered at the boring locations, it appears feasible to support the new building on shallow spread footings bearing on medium stiff native clay or engineered fill materials that extend to suitable native soils.

Expansive fat clay soils were encountered at the site. These materials have the potential to shrink and swell with seasonal fluctuations in the soil moisture content. We recommend the floor slabs be supported on at least 24 inches of low volume change (LVC) material. In areas that are currently above or less than 2 feet below the planned bottom of floor slab level, native fat clay soils should be undercut to accommodate placement of LVC material. In areas where more than 2 feet of fill will be placed below the bottom-of-floor-slab level, at least the upper 24 inches of new engineered fill should consist of LVC material. Placement of a layer of LVC material below floor slabs, as recommended in this report, will not eliminate all future subgrade volume change and resultant floor slab movements. However, use of an LVC zone should reduce the potential for subgrade volume change. Details regarding the LVC zone are provided in **Earthwork**.

A gravel layer of approximately 6 inches has been placed over the underlaying glacial till soils. No documentation regarding placement or compaction of this gravel layer was provided for our review. However, we understand this gravel has been utilized by LMTV vehicles, which has likely produced some compactive effort to portions of the onsite gravel. This layer should be removed beneath the building footprint to accommodate placement of LVC zone as described in the previous paragraph. The gravel layer may remain in place below pavements, provided it is thoroughly proofrolled and the owner accepts the risks associated with support of pavements over the undocumented gravel layer in exchange for reduced construction costs. If the owner is not willing to accept the risk, more expensive methods could be used to reduce or eliminate this risk (e.g., complete removal/replacement of the gravel layer). The gravel should not be considered as part of the pavement section as it has likely been fouled with fines/soils while in-place. Gravel with vegetation growing through the layer should be removed during the stripping process.

This report provides recommendations to help mitigate the effects of soil shrinkage and expansion. However, even if these procedures are followed, some movement and at least minor cracking in the structure could still occur. The severity of cracking and other cosmetic damage caused by movement of the floor slabs will probably increase if any modification of the site results in excessive wetting or drying of the expansive soils. Eliminating the risk of movement and cosmetic distress may not be feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction. We would be pleased to discuss other construction alternatives with you upon request.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

Earthwork

Site preparation, excavation, subgrade preparation, and placement of engineered fill should follow the recommendations presented in this section. The recommendations presented for design and construction of earth-supported elements including foundations, slabs, and pavements are contingent upon the recommendations outlined in this section being followed. We recommend earthwork on this project be observed and evaluated by the Geotechnical Engineer. The evaluation of earthwork should include observation and testing of subgrade preparation, engineered fill, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

Site Preparation

Vegetation, topsoil, and any loose, soft, or otherwise unsuitable soils present within the proposed construction areas should be stripped. Based on information obtained at the boring locations, stripping depths on the order of 6 inches should be anticipated to remove the gravel layer beneath the building footprint. However, greater stripping depths may be required in areas not explored by the borings. Organic soils removed during site preparation should not be used as fill beneath the proposed new building and pavement areas.

The soils within the planned building area should be further undercut as necessary to accommodate placement of the recommended 24-inch thick LVC layer below floor slabs. The undercut areas should extend a minimum of 5 feet laterally outside the building wall lines. Undercutting to facilitate placement of the LVC layer would not be necessary in areas where more than 2 feet of fill will be placed to develop the floor slab subgrade level.

Following initial stripping and any necessary undercutting, the exposed soils should be proofrolled. A Terracon representative should observe the proofrolling. Proofrolling can be accomplished using a loaded tandem-axle dump truck with a gross weight of at least 20 tons, or similarly loaded equipment. Areas that display excessive deflection (pumping) or rutting during proofroll operations should be improved by scarification/compaction or by removal and replacement with engineered fill.

Fill Material Types

Fill required to achieve design grade should be classified as engineered fill and general fill. Engineered fill is material used below, or within 10 feet of structures, pavements, or constructed slopes. General fill is material used to achieve grade outside of these areas.

Reuse of On-Site Soil: Excavated on-site soil is not suitable for reuse as engineered fill and should not be placed beneath settlement sensitive structures and within foundation bearing zones. Portions of the on-site soil have an elevated fines content and will be sensitive to moisture conditions (particularly during seasonally wet periods) and may not be suitable for reuse when above optimum moisture content.

Material property requirements for on-site soil for use as engineered fill are noted in the table below:

Fill Type	USCS Classification	Acceptable Location for Placement
Native Fat Clays and/or Lean to Fat Clays (LL≥45 and/or PI≥23)	CH, CL/CH	Pavement areas and at depths greater than 24 inches below building finished grade
Existing Gravel Layer	GM	Pavement areas only. Gravel should be observed, tested and approved by Terracon prior to placement of new fill and/or pavement sections. Organics, rock/rubble fragments larger than 3 inches, debris, or other unsuitable materials should be removed prior to re-use of the existing fill in engineered fill sections.

Imported Fill Materials: Imported fill materials should meet the following material property requirements. Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade.

Fill Type [1]	USCS Classification	Acceptable Location for Placement
Low Volume Change (LVC) material	GM [2] or CL (LL<45 and PI<23)	All locations and elevations, except where free-draining material is required

Fill Type [1]	USCS Classification	Acceptable Location for Placement
Free Draining Granular [3]	GW, GP, SW, SP	Where free-draining material is required

1. Engineered fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade.
2. MoDOT Type 5 or an approved alternate gradation of crushed limestone aggregate
3. Granular materials with less than 5 percent fines (material passing the #200 sieve), such as ASTM C33 Size No. 57 aggregate or an approved alternate gradation

Fill Placement and Compaction Requirements

Engineered fill and general fill should meet the following compaction requirements.

Item	Engineered Fill	General Fill
Maximum Lift Thickness	8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e., a jumping jack or plate compactor) is used	Same as engineered fill
Minimum Compaction Requirements [1,2,3]	95% of max. below and above foundations, below floor slabs, and below pavements	92% of max.
Water Content Range [1]	Low plasticity cohesive: -2% to +3% of optimum High plasticity cohesive: 0 to +4% of optimum Granular: -3% to +3% of optimum	As required to achieve min. compaction requirements

Item	Engineered Fill	General Fill

1. Maximum density and optimum water content as determined by the standard Proctor test (ASTM D698).
2. High plasticity cohesive fill should not be compacted to more than 100% of standard Proctor maximum dry density.
3. If the granular material is a coarse sand or gravel, or of a uniform size, or has a low fines content, compaction comparison to relative density may be more appropriate. In this case, granular materials should be compacted to at least 70% relative density (ASTM D4253 and D4254). Materials not amenable to density testing should be placed and compacted to a stable condition observed by the Geotechnical Engineer or representative.

Utility Trench Backfill

Any soft or unsuitable materials encountered at the bottom of utility trench excavations should be removed and replaced with engineered fill or bedding material in accordance with public works specifications for the utility being supported. This recommendation is particularly applicable to utility work requiring grade control and/or in areas where subsequent grade raising could cause settlement in the subgrade supporting the utility. Trench excavation should not be conducted below a downward 1:1 projection from existing foundations without engineering review of shoring requirements and geotechnical observation during construction.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the requirements of engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

Utility trenches are a common source of water infiltration and migration. Utility trenches that penetrate beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches, which could migrate below the building. Each trench should be provided with an effective trench plug that extends at least 5 feet from the face of the building exterior. The plug material should consist of cementitious flowable fill or low permeability clay. The trench plug material should be placed to surround the utility line. If clay is used to construct the trench plug, the clay should be placed and compacted in accordance with the water content and compaction recommendations for engineered fill provided in this report.

Grading and Drainage

The site should be graded to provide effective drainage away from the building during and after construction, and these conditions should be maintained throughout the life of the structure. Accumulation of water adjacent to the structure could contribute to significant moisture increases in the subgrade soils and subsequent softening/settlement or expansion/heave, which could result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks.

After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

The Geotechnical Engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation, proofrolling, placement and compaction of engineered fill, backfilling of excavations into completed subgrades, and just prior to construction of foundations, slabs, and pavements.

Care should be taken to avoid disturbance of prepared subgrades. Unstable subgrade conditions can develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. If unstable subgrade conditions develop, stabilization measures will need to be employed. Construction traffic over the completed subgrade should be avoided to the extent practical. If the subgrade becomes frozen, desiccated, saturated, or disturbed, the affected materials should be removed or these materials should be scarified, moisture conditioned, and compacted prior to floor slab construction.

Based on conditions encountered in the borings, significant seepage is generally not expected in excavations for this project (e.g., for footing construction and utility installation). If seepage is encountered in excavations during construction, the contractor is responsible for designing, implementing, and maintaining appropriate dewatering methods to control seepage and facilitate construction. In our experience, dewatering of excavations in clay soils can typically be accomplished using sump pits and pumps.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable

local, state, and federal safety regulations. The contractor should be aware that slope height, slope inclination, and excavation depth should in no instance exceed those specified by these safety regulations. Flatter slopes than those dictated by these regulations may be required depending upon the soil conditions encountered and other external factors. These regulations are strictly enforced and if they are not followed, the owner, contractor, and/or earthwork and utility subcontractor could be liable and subject to substantial penalties. Under no circumstances should the information provided in this report be interpreted to mean that Terracon is responsible for construction site safety or the contractor's activities. Construction site safety is the sole responsibility of the contractor who shall also be solely responsible for the means, methods, and sequencing of the construction operations.

Shallow Foundations

Based on the conditions encountered at the borings, the building can be supported on shallow footing foundations that bear on medium stiff, native clay soils and/or engineered fill that extends to suitable native soils.

Shallow Foundation Design Parameters

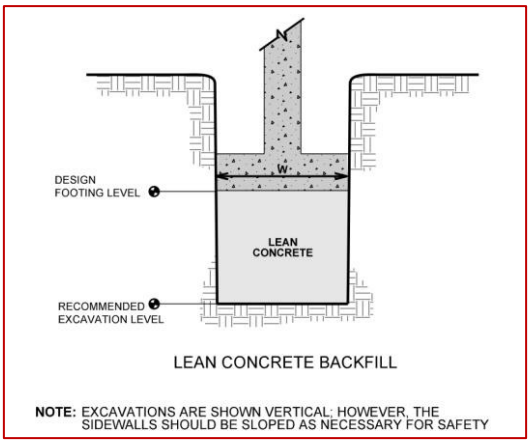
Item	Description
Maximum Net Allowable Bearing Pressure [1, 2, 3]	1,500 psf
Minimum Foundation Dimensions	Per IBC 1809.7
Minimum Embedment below Finished Grade [4]	3 feet
Estimated Total Settlement from Structural Loads [2]	On the order of 1 inch
Estimated Differential Settlement [2, 5]	About 1/2 to 2/3 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation.
2. Values provided are for maximum loads noted in **Project Description**. Additional geotechnical consultation will be necessary if higher loads are anticipated.
3. Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented in **Earthwork**.
4. Embedment necessary to minimize the effects of frost and/or seasonal water content variations
5. Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 50 feet.

Foundation Construction Considerations

The base of all foundation excavations should be free of water and loose soil prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. If the soils at the bearing level become excessively dry, disturbed, saturated, or frozen, the affected soil should be removed prior to placing concrete. If the excavations must remain open overnight or for an extended period of time, placement of a lean concrete mud-mat over the bearing soils should be considered.

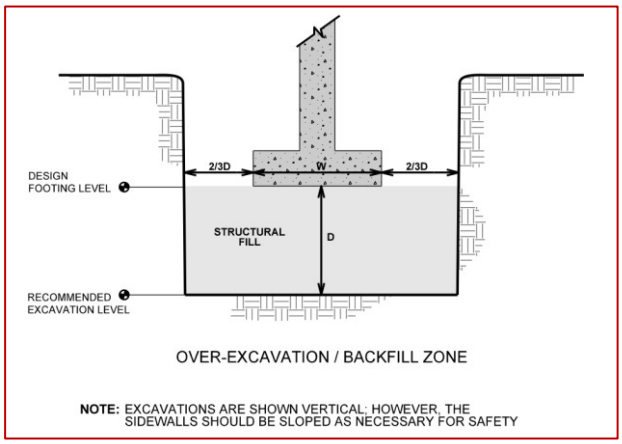
The bearing materials at the base of each footing excavation should be evaluated by a representative of the Geotechnical Engineer. If unsuitable bearing materials are observed, the excavation should be extended deeper to suitable soils. The footings could bear directly on suitable soils at the lower level or on lean concrete backfill as shown on the following figure.



LEAN CONCRETE BACKFILL

NOTE: EXCAVATIONS ARE SHOWN VERTICAL; HOWEVER, THE SIDEWALLS SHOULD BE SLOPED AS NECESSARY FOR SAFETY

The footings could also bear on properly compacted engineered fill extending down to suitable soils as shown in the following figure. Overexcavation for compacted engineered fill placement below footings should extend laterally beyond all edges of the footings at least 8 inches per foot of overexcavation depth below footing elevation. The overexcavation should then be backfilled up to the footing base elevation with well graded granular material (e.g., MoDOT Type 5 aggregate or an approved alternate gradation) placed and compacted as recommended in the **Earthwork** section.



Floor Slabs

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

Floor Slab Design Parameters

Item	Description
Floor Slab Support[1]	At least 24 inches of low volume change (LVC) material
Granular Leveling Course Layer Thickness [2, 3]	4 inches (minimum)
Estimated Modulus of Subgrade Reaction [4]	100 pounds per square inch per inch (psi/in) for point loads

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. Well graded crushed stone (e.g., MoDOT Type 5) or open-graded crushed stone (e.g., ASTM C33, Size No. 57 aggregate) can be used as the leveling course.
3. These granular materials can be considered part of the LVC zone.
4. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads, the modulus of subgrade reaction would be lower.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Joints should be placed in slabs at regular intervals as recommended by ACI to help control the locations of cracks. Joints or any cracks that develop in the floor slab should be sealed with a waterproof, non-extruding compressible compound.

If floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing, or other means.

Floor Slab Construction Considerations

The subgrade should be maintained within the moisture content range recommended for engineered fill until the floor slab is constructed. If the subgrade becomes desiccated prior to construction of the floor slab, the affected material should be removed or the materials should be scarified, moistened, and compacted. Upon completion of grading operations in the building area, care should be taken to maintain the subgrade within the moisture content and density ranges recommended for engineered fill prior to construction of the building floor slab.

On most project sites, the site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic, desiccation, rainfall etc. As a result, the floor slab subgrade soils may not be suitable for placement of the granular course and/or concrete at the time of building construction, and corrective action may be required.

The Geotechnical Engineer should observe the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Pavements

Pavement Subgrade Preparation

Pavement subgrades are expected to consist of on-site native clay soils. The pavement subgrades should be proofrolled as recommended in **Earthwork**. If soft or otherwise unsuitable areas are observed, additional overexcavation and replacement will be needed.

Grading and paving are commonly performed by separate contractors and there is often a time lapse between the end of grading operations and the commencement of paving. Subgrades prepared early in the construction process may become disturbed by construction traffic. Non-uniform subgrades often result in poor pavement performance and local failures relatively soon after pavements are constructed. Depending on the paving equipment used by the contractor, measures may be required to improve subgrade strength to greater depths for support of heavily loaded concrete/asphalt trucks.

We recommend the moisture content and density of the subgrade be evaluated and the pavement subgrades be proofrolled (using a loaded tandem-axle dump truck with a minimum gross weight of 20 tons or similarly loaded rubber-tire equipment) within two days prior to commencement of actual paving operations. Areas not in compliance with the required ranges of moisture or density should be scarified, moisture conditioned, and compacted. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the materials with properly compacted fills. The subgrade should be in its finished form at the time of the final review.

Support characteristics of subgrade for pavement design do not account for shrink/swell movements of an expansive clay subgrade, such as soils observed on this project. Thus, the pavement may be adequate from a structural standpoint, yet still experience cracking and deformation due to shrink/swell related movement of the subgrade.

Opinions of Minimum Pavement Thicknesses

The pavement sections provided here should be considered for cost estimating purposes only. These thicknesses are based on the project assumptions (summarized below) and limited information available at the time this report was prepared. Development of a more specific pavement thickness design would require specific information about the anticipated traffic volumes, vehicle types, axle loads, and design period for each pavement area and pavement surfacing type.

Pavement thickness depends upon many factors including but not limited to:

- applied wheel/axle loads and number of repetitions
- subgrade and pavement material characteristics
- climate conditions
- site and pavement drainage

Specific information regarding anticipated vehicle types, axle loads, and traffic volumes was not provided at the time of this report. The "Parking Lots" pavement section considers 4-tire, 2-axle personal vehicle traffic only (cars, vans, pickups, and SUVs). The "Drives" pavement section considers personal vehicle traffic and up to 10 LMTV trucks/trash collection trucks per day. Our recommendations for asphaltic cement concrete (ACC) pavement and portland cement concrete (PCC) pavement sections are outlined in the following table.

Opinions of Minimum Pavement Thickness

Pavement Type	Parking Lots	Drives
ACC	2 inches ACC surface 2 inches ACC base 6 inches aggregate base (MoDOT Type 5 or similar)	2 inches ACC surface 4 inches ACC base 6 inches aggregate base (MoDOT Type 5 or similar)
PCC	5 inches PCC 4 inches aggregate base (MoDOT Type 5 or similar)	7 inches PCC 4 inches aggregate base (MoDOT Type 5 or similar)

1. For trash container pads, we recommend a PCC pavement section be used consisting of 7 inches (minimum) of PCC over 4 inches (minimum) aggregate base (MoDOT Type 5 or similar) on a compacted soil subgrade. The trash container pad should be large enough to support the container and the tipping axle of the collection truck.

PCC pavements will perform better than ACC in areas where short radius turning and braking are expected (i.e., entrance/exit aprons) due to better resistance to rutting and shoving. In addition, PCC pavement will perform better in areas subject to heavy static loads.

Construction traffic on the pavements was not considered in developing our opinions of minimum pavement thickness. If the pavements will be subject to construction equipment/vehicles, the pavement sections should be revised to consider the additional loading.

Pavements and subgrades will be subject to freeze-thaw cycles and seasonal fluctuations in moisture content. Pavement thickness design methods are intended to provide adequate thickness of structural materials over a particular subgrade such that wheel loads are reduced to a level that the subgrade can support. The subgrade support parameters for pavement thickness design do not account for shrink/swell movements of a subgrade constructed of expansive clay soils. Therefore, the pavement may be adequate from a structural standpoint, yet still experience cracking and deformation due to shrink/swell related movement of the subgrade.

The pavement sections provided above consider that the subgrade soils will not experience significant increases in moisture content. Paved areas should be sloped to provide rapid drainage of surface water and to drain water away from the pavement edges. Pavements should be designed so water does not accumulate on or adjacent to the pavement, since this could saturate and soften the subgrade soils and subsequently accelerate pavement deterioration.

Periodic maintenance of the pavements will be required. Cracks should be sealed, and areas exhibiting distress should be repaired promptly to help prevent further deterioration. Even with periodic maintenance, some movement and related cracking may still occur and repairs may be required.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between boring locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Support of pavements above an existing gravel layer is discussed in this report. Even with the construction observation/testing recommended in this report, the owner must accept the risk that unsuitable materials within or buried by the gravel will not be discovered. This may result in larger than normal settlement and damage to slabs and pavements supported above existing gravel, requiring additional maintenance. This risk cannot be eliminated without removing the existing gravel from below the pavement areas, but it can be reduced by thorough observation and testing as discussed herein.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, cost estimating, excavation support, and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

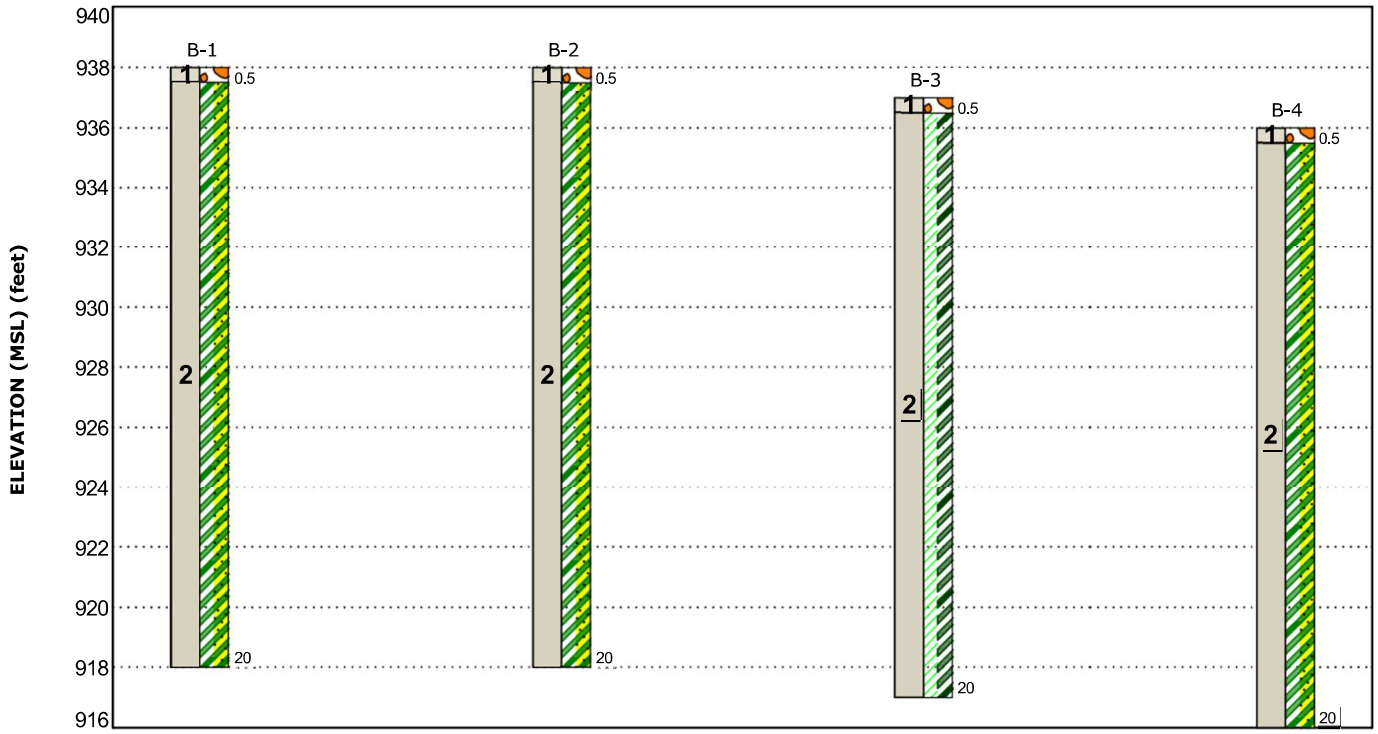
Figures

Contents:

Albany Maintenance Building
411 College Street | Albany, MO
Terracon Project No. 02245267

Terracon
15620 W 113th St
Lenexa, KS

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Gravel Surface**	Silty Gravel surface layer, approximately 6 inches thick
2	**Glacial Till**	Fat Clay or Lean to Fat Clay, with sand, trace gravel, medium stiff to stiff

Legend

Poorly-graded Gravel
Fat Clay with Sand
Lean Clay/Fat Clay

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
4	20	Within the proposed building area

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal precision of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were interpolated from a site specific, topographic site plan.

Subsurface Exploration Procedures: We advanced the borings with a truck-mounted rotary drill rig using continuous flight augers. Samples were obtained from the borings using thin-walled tube and split-barrel sampling procedures. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. The borings were backfilled with auger cuttings after their completion.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater was not observed in the boreholes at these times.

Our exploration team prepared field boring logs to record the sampling depths, penetration distances, other sampling information, visual classifications of the materials observed during drilling, and our interpretation of the subsurface conditions between samples. The samples were placed in appropriate containers and taken to our laboratory for testing and classification. The final boring logs provided with this report include modifications based on the results of the laboratory tests and observations of the recovered samples.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following tests on selected samples:

- Moisture Content
- Dry Unit Weight
- Unconfined Compression
- Atterberg Limits

Based on the results of our field and laboratory programs, we described and classified the soil samples in general accordance with the Unified Soil Classification System.

Site Location and Exploration Plans

Contents:

Note: All attachments are one page unless noted above.

Site Location

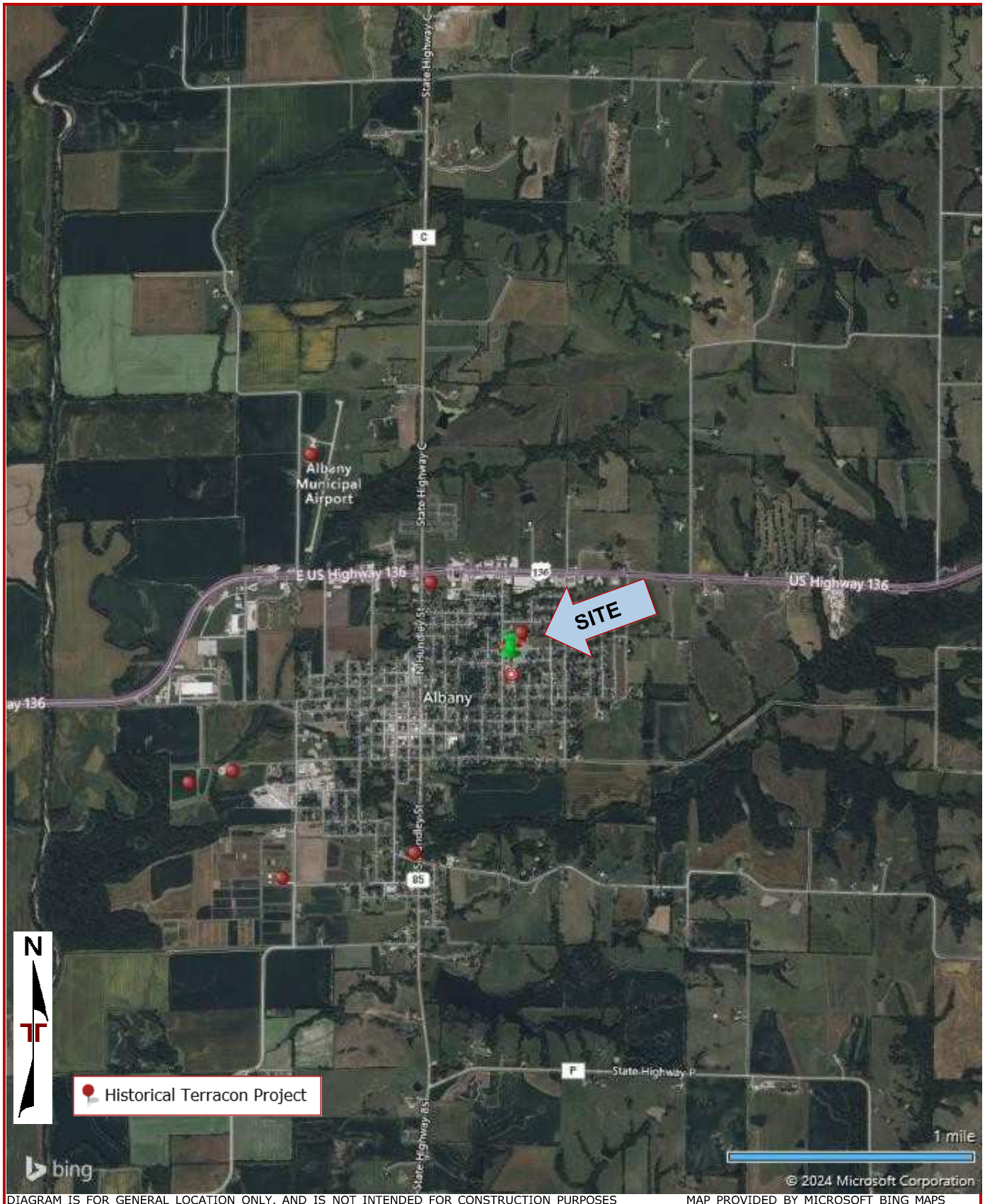


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

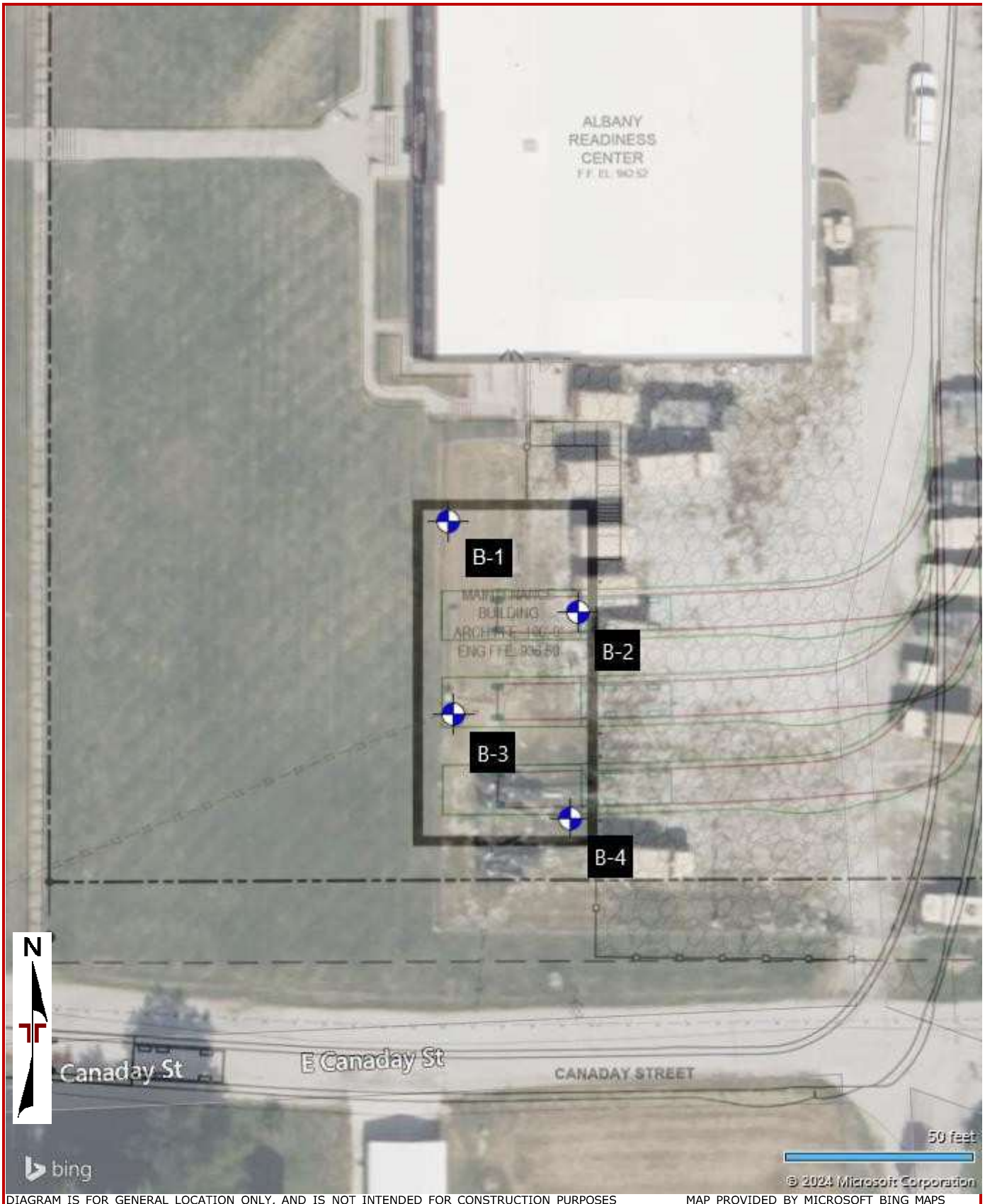


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (B-1 through B-4)

Note: All attachments are one page unless noted above.

Albany Maintenance Building
411 College Street | Albany, MO
Terracon Project No. 02245267

15620 W 113th St
Lenexa, KS

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 40.2503° Longitude: -94.3250°

Depth (Ft.) Elevation: 938 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Description	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (psf)	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.5	**6" GRAVEL LAYER** 937.5									
2			**FAT CLAY WITH SAND (CH)**, trace gravel, reddish brown, medium stiff to stiff									
						2	2-3-4 N=7			13.2		
						16			2890	20.1	103	54-20-34
		5				10	2-2-3 N=5			21.9		
						10	1-3-4 N=7			16.7		
		10										
						16	1-2-3 N=5			19.0		
		15										
						10	1-2-3 N=5			18.4		
		20	20.0 918									
			Boring Terminated at 20 Feet									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
Groundwater not encountered

Drill Rig
CME 75

Hammer Type
Automatic

Driller
LN

Notes

Advancement Method
Solid-Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Logged by
JA

Boring Started
09-09-2024

Boring Completed
09-09-2024

Albany Maintenance Building
411 College Street | Albany, MO
Terracon Project No. 02245267

15620 W 113th St
Lenexa, KS

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 40.2503° Longitude: -94.3249°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 938 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (psf)	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.5	**6" GRAVEL LAYER** 937.5										
2			**FAT CLAY WITH SAND (CH)**, trace gravel, reddish brown, medium stiff				1	2-2-3 N=5			22.6		65-21-44
							3	2-2-2 N=4			19.6		
				5			2	2-1-3 N=4			21.3		
							8	2-2-2 N=4			16.9		
				10									
							4	1-2-3 N=5			20.2		
				15									
							14	1-1-3 N=4			18.9		
		20.0	918	20									
			Boring Terminated at 20 Feet										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
Groundwater not encountered

Drill Rig
CME 75

Hammer Type
Automatic

Driller
LN

Notes

Advancement Method
Solid-Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Logged by
JA

Boring Started
09-09-2024

Boring Completed
09-09-2024

Albany Maintenance Building
411 College Street | Albany, MO
Terracon Project No. 02245267

15620 W 113th St
Lenexa, KS

Boring Log No. B-3

Location: See Exploration Plan

Latitude: 40.2502° Longitude: -94.3250°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 937 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (psf)	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.5	**6" GRAVEL LAYER** 936.5										
2			**LEAN TO FAT CLAY WITH SAND (CH)**, trace gravel, reddish brown, medium stiff to stiff				1	3-2-3 N=5			18.4		
				5			13			2110	21.9	101	43-18-25
							8	1-2-3 N=5			16.2		
				10			8	2-2-8 N=10			18.3		
							8	1-1-4 N=5			18.9		
				15									
							10	2-1-3 N=4			19.1		
		20.0	917	20									
			Boring Terminated at 20 Feet										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
Groundwater not encountered

Drill Rig
CME 75

Hammer Type
Automatic

Driller
LN

Notes

Advancement Method
Solid-Stem Auger

Logged by
JA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Boring Started
09-09-2024

Boring Completed
09-09-2024

Albany Maintenance Building
411 College Street | Albany, MO
Terracon Project No. 02245267

15620 W 113th St
Lenexa, KS

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 40.2501° Longitude: -94.3249°

Depth (Ft.) Elevation: 936 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (psf)	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.5 **6" GRAVEL LAYER** 935.5									
2		**FAT CLAY WITH SAND (CH)**, trace gravel, reddish brown, medium stiff to stiff			2	3-3-3 N=6			21.7		56-19-37
					3	2-3-3 N=6			18.3		
		5			8	3-2-4 N=6			18.9		
					14	3-4-5 N=9			17.7		
		10									
					16	1-3-3 N=6			18.0		
		15									
					16	1-2-4 N=6			18.1		
		20.0 916									
		20 ***Boring Terminated at 20 Feet***									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from a topographic site plan.

Water Level Observations
Groundwater not encountered

Drill Rig
CME 75

Hammer Type
Automatic

Driller
LN

Notes

Advancement Method
Solid-Stem Auger

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Logged by
JA

Boring Started
09-09-2024

Boring Completed
09-09-2024

Supporting Information

Contents:

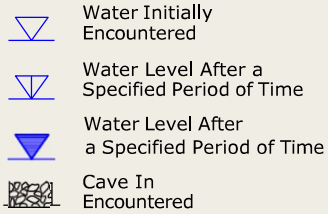
Note: All attachments are one page unless noted above.

Terracon
15620 W 113th St
Lenexa, KS

General Notes

Sampling

Water Level



Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

Field Tests

N	Standard Penetration Test Resistance (Blows/Ft.)
(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
UC	Unconfined Compressive Strength
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils
(More than 50% retained on No. 200 sieve.)
Density determined by Standard Penetration Resistance

Relative Density	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 50
Very Dense	> 50

Consistency of Fine-Grained Soils
(50% or more passing the No. 200 sieve.)
Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance

Consistency	Unconfined Compressive Strength Qu (psf)	Standard Penetration or N-Value (Blows/Ft.)
Very Soft	less than 500	0 - 1
Soft	500 to 1,000	2 - 4
Medium Stiff	1,000 to 2,000	4 - 8
Stiff	2,000 to 4,000	8 - 15
Very Stiff	4,000 to 8,000	15 - 30
Hard	> 8,000	> 30

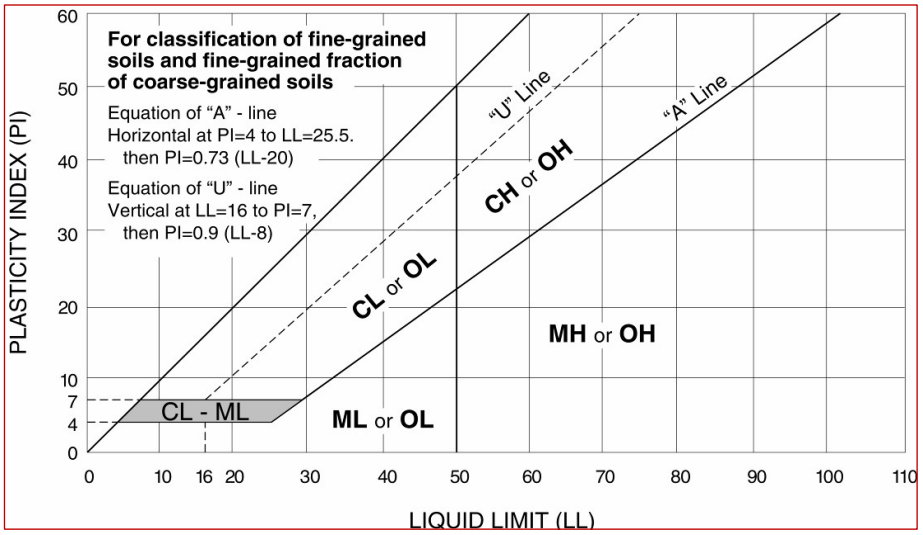
Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

SiltyUnified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N] Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P] Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



ALBANY READINESS CENTER - CONST. NEW MAINTENANCE BLDG.

SIGN-IN SHEET T-2327-01

1) FRED L. DECKER JR. OA-FMDC 573-751-8521 FRED.DECKER@OA.MO.GOV
2) Ryan Taylor - Business Manager - 573-441-0365 ryan.Taylor@brownandroot.com
3) Steve Kelley - Project Manager - 816-585-3753 Steve.Kelley@brownandroot.com
4) Cooper Wiley - 816-304-0746 Cooper.Wiley@brownandroot.com
5) Ron Moutray Jr. - 816 279-7919 ronjr_lgc@sbcglobal.net
6. Matt Woodruff 913-469-0560 Matt@cbsikc.com
7 Kevin Fidler 573-310-7405 Kevinf@wayne contracting.com
8 Justin Shieve 816-232-4551 Herner Const. justin@hernerconstruction.com
9 Dennis Truman 816-546-4564 Basepoint Building Automations dtruman@basepointbg.com
10 Billy Edwards 573-638-9534 MONG billy.j.edwards66.NFG@Army.mil
11 MARIA COMERFORD MARIA.comerford@clarkenersen.com 816-474-8237
12 ROGER STULL ROGER.STULL@clarkenersen.com 816-550-1891

SGT Robert Pester - 660-953-1172
Site contact

SYMBOLS LEGEND

- 1071 — EXISTING CONTOUR
- OHE — OVERHEAD ELECTRIC LINE
- W — WATER LINE
- S — STORM SEWER LINE
- SS — SANITARY SEWER LINE

DEMO LEGEND:

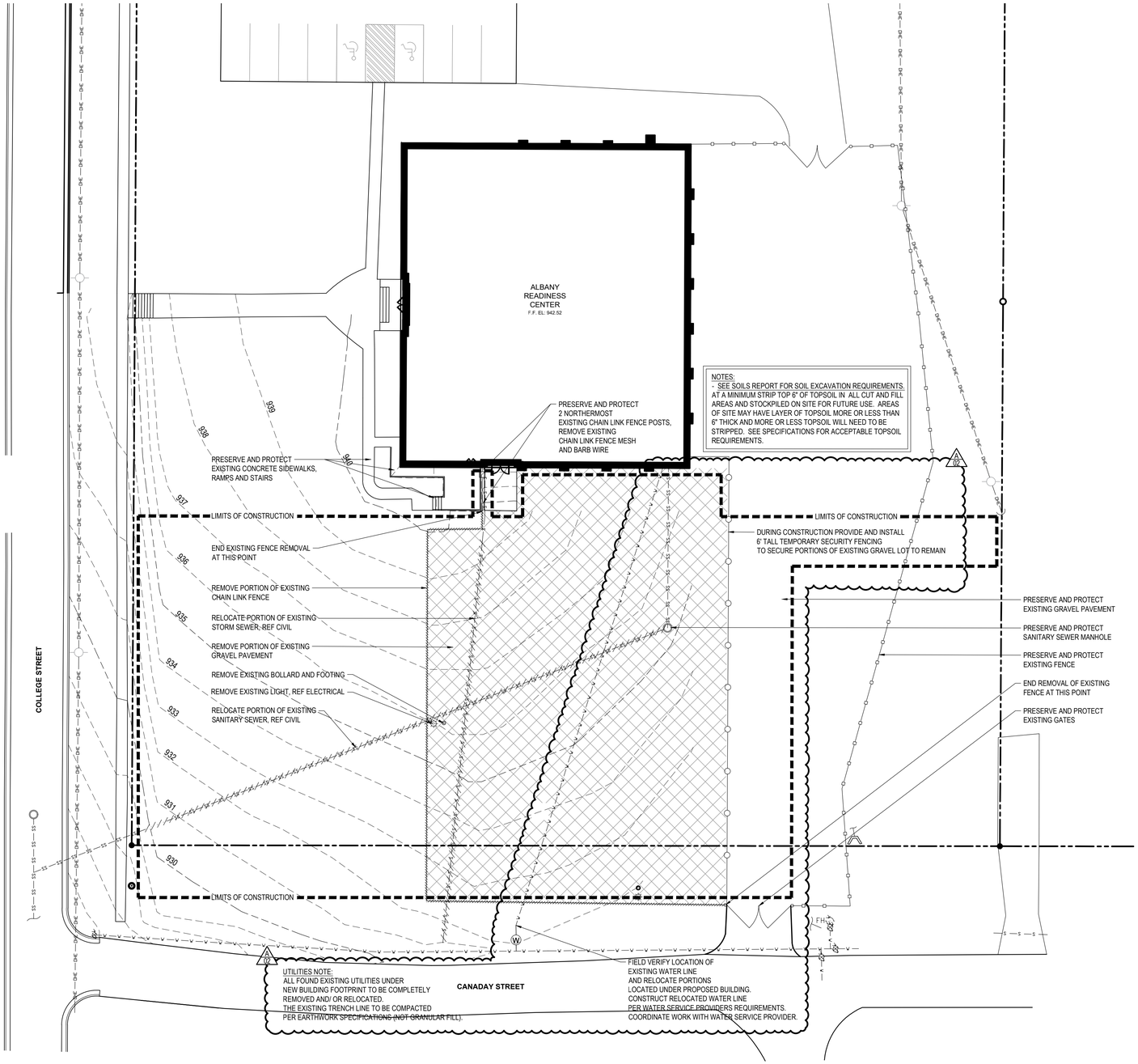
EXISTING GRAVEL PAVEMENT

GENERAL NOTES & INFORMATION

1. THE SURVEY WAS COMPLETED BY -. PHONE: -.
2. EXISTING UTILITIES DEPICTED ON THESE PLANS ARE BASED ON FIELD MEASUREMENTS AND AVAILABLE RECORDS; THEREFORE, LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE ADDITIONAL UTILITIES, THE EXISTENCE OF WHICH, AT PRESENT, IS NOT KNOWN. VERIFICATION OF THE LOCATIONS OF UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, UTILITY LOCATES WILL BE REQUIRED PRIOR TO CONSTRUCTION. CONTACT THE MISSOURI ONE CALL SYSTEM AT 1-800-DIG-RITE (1-800-344-7483) PRIOR TO EXCAVATION OR DEMOLITION.
3. HORIZONTAL & VERTICAL CONTROL WERE DERIVED FROM THE MISSOURI DEPARTMENT OF TRANSPORTATION'S REAL-TIME NETWORK. THE HORIZONTAL CONTROL IS UTILIZING THE MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE, CONVERTED TO U.S. SURVEY FEET AND THE VERTICAL CONTROL IS BASED FROM NAVD88 DATUM.
4. CITY OF ALBANY ASSISTED WITH THE DEPTH OF THE SANITARY SEWER MANHOLE IN COLLEGE STREET AND THE SERVICE LINE TIE IN LOCATION (AS NOTED ON DRAWINGS).
5. RECORD DRAWINGS WERE REFERENCED ON THE NORTH AND EAST SIDE OF BUILDING WITH MINIMAL FIELD DATA. THE SOUTH SIDE AND WEST SIDE OF THE BUILDING (AREA WITH EXISTING CONTOURS) IS DEPICTED FROM UTILIZING FIELD DATA.
6. THE CONTRACTOR SHALL VERIFY ALL EXISTING SITE CONDITIONS SHOWN ON PLAN, ANY DISCREPANCIES NOTICED IN FIELD SHALL BE RELAYED TO LANDSCAPE ARCHITECT / OWNER PRIOR TO COMMENCEMENT OF ANY WORK.
7. THE GENERAL CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES TO REMAIN DURING CONSTRUCTION.
8. THE GENERAL CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING PLANTING BEDS, SHRUBS AND TREES TO REMAIN ON SITE. DO NOT PARK, DRIVE OR STACK CONSTRUCTION MATERIALS IN THESE AREAS.
9. THE GENERAL CONTRACTOR SHALL NOT REMOVE OR ALTER ANY PROTECTION FENCING WITHOUT PRIOR WRITTEN CONSENT FROM OWNER AND LANDSCAPE ARCHITECT.

DEMOLITION NOTES

1. CONTRACTOR TO PRESERVE ALL SURVEY CONTROL POINTS.
2. CONTRACTOR MUST PROTECT THE PUBLIC AT ALL TIMES WITH FENCING, SIGNING, BARRICADES, ENCLOSURES, ETC. TO THE BEST PRACTICES AND APPROVED BY THE OWNER AND THE CITY OF ALBANY, MO.
3. DAMAGE TO ALL EXISTING CONDITIONS TO REMAIN WILL BE REPLACED AT CONTRACTOR'S EXPENSE.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DEMOLITION, REMOVAL, AND DISPOSING IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES OF FENCE, FLUMES, FOUNDATIONS, DRIVES, DRAINAGE STRUCTURES, UTILITIES, ETC. (EXCEPT WHERE NOTED BY ENGINEER). SUCH THAT THE IMPROVEMENTS SHOWN ON THE REMAINING PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER SPECIFICATIONS.
5. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEBRIS FROM THE SITE AND DISPOSING THE DEBRIS IN A LAWFUL MANNER. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR THE DEMOLITIONS AND DISPOSAL.
6. ALL EXISTING SEWERS, PIPING AND UTILITIES SHOWN ARE NOT TO BE INTERPRETED AS THE EXACT LOCATION, OR AS THE ONLY OBSTACLES THAT MAY OCCUR ON THE SITE. VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED FEATURES. GIVE NOTICE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES AND CAP ALL LINES BEFORE PROCEEDING WITH THE WORK. UTILITIES DETERMINED TO BE ABANDONED AND LEFT IN PLACE SHALL BE GROUTED IF UNDER BUILDING.
7. ELECTRICAL, TELEPHONE, CABLE, WATER, FIBER OPTIC CABLE AND/OR GAS LINES NEEDING TO BE REMOVED, RELOCATED, AND/OR ABANDONED SHALL BE COORDINATED WITH THE AFFECTED UTILITY COMPANY. ADEQUATE TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY IS NECESSARY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE. CONTRACTOR SHALL PAY CLOSE ATTENTION TO EXISTING UTILITIES WITHIN THE CONSTRUCTION LIMITS DURING CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANY'S FORCES.
8. ALL SIDEWALK & PAVEMENT TO REMAIN SHALL BE PROTECTED IN PLACE INCLUDING PROTECTION FROM DAMAGE CAUSED BY REMOVAL OF ABUTTING CONCRETE. THE CONTRACTOR SHALL SAW CUT, FULL DEPTH AT NEAREST JOINT.
9. DO NOT DISRUPT UTILITY SERVICES TO ADJACENT BUSINESSES OR RESIDENCES WITHOUT PRIOR WRITTEN APPROVAL BY THE ARCHITECT OR OWNER.



SITE DEMOLITION PLAN

SCALE IN FEET

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

JOSHUA BLAKE SIMPSON
7-16-25
NUMBER
PLA-2020008309
PROFESSIONAL LANDSCAPE ARCHITECT

PROFESSIONAL SEAL

2020 Baltimore Ave.
Suite 300
Kansas City, MO 64108
p. 816-474-8237

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES, MANAGEMENT, DESIGN AND CONSTRUCTION

DEPARTMENT OF PUBLIC SAFETY

MISSOURI ARMY NATIONAL GUARD

CONSTRUCT NEW MAINTENANCE BUILDING

ALBANY READINESS CENTER

411 College St
Albany MO, 64402

PROJECT #: T232701

SITE #: 6251

ASSET #: 8136251003

REVISION: ADDENDUM #2
DATE: 07/16/25
REVISION:
DATE:
REVISION:
DATE:

ISSUE DATE: 11/15/2024

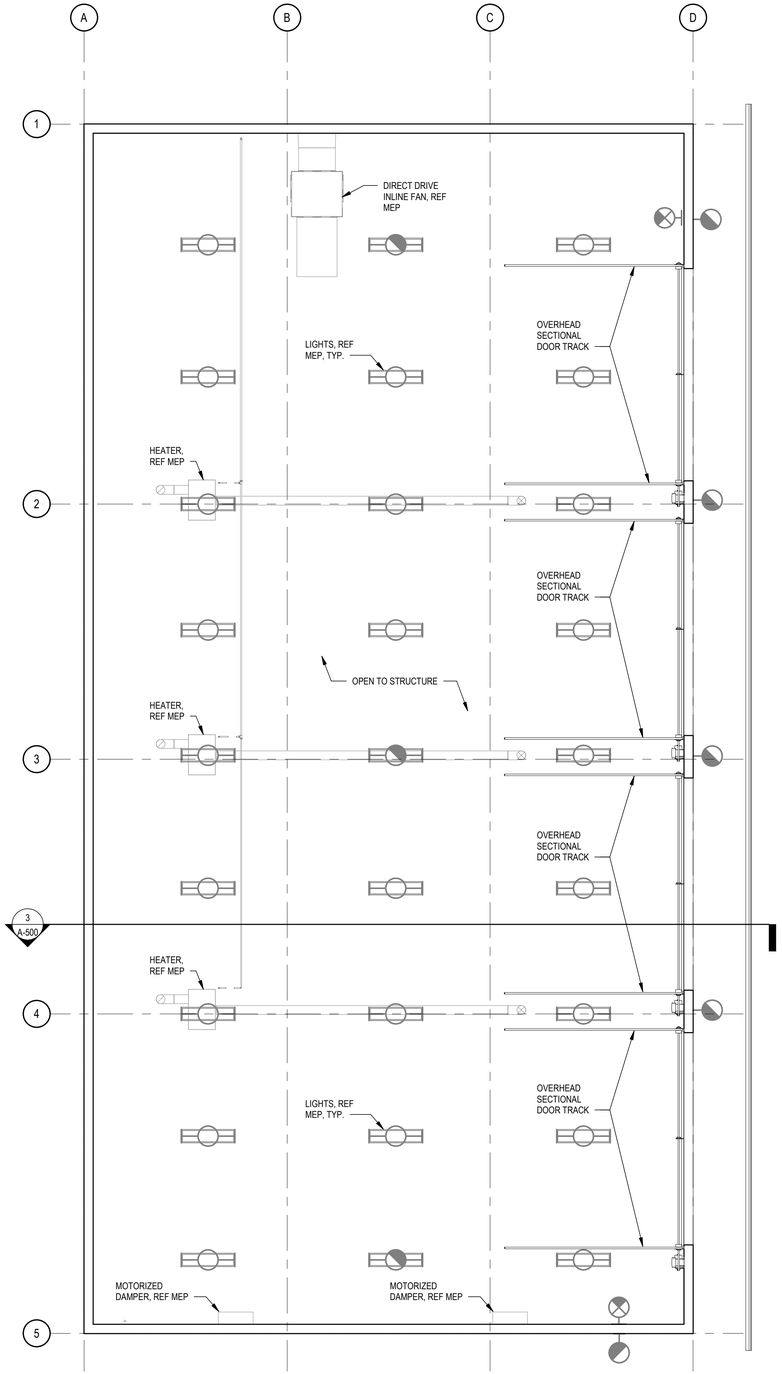
DRAWN BY: JS
CHECKED BY: JS
DESIGNED BY: JS

SHEET TITLE:
Site Demolition Plan

SHEET NUMBER:

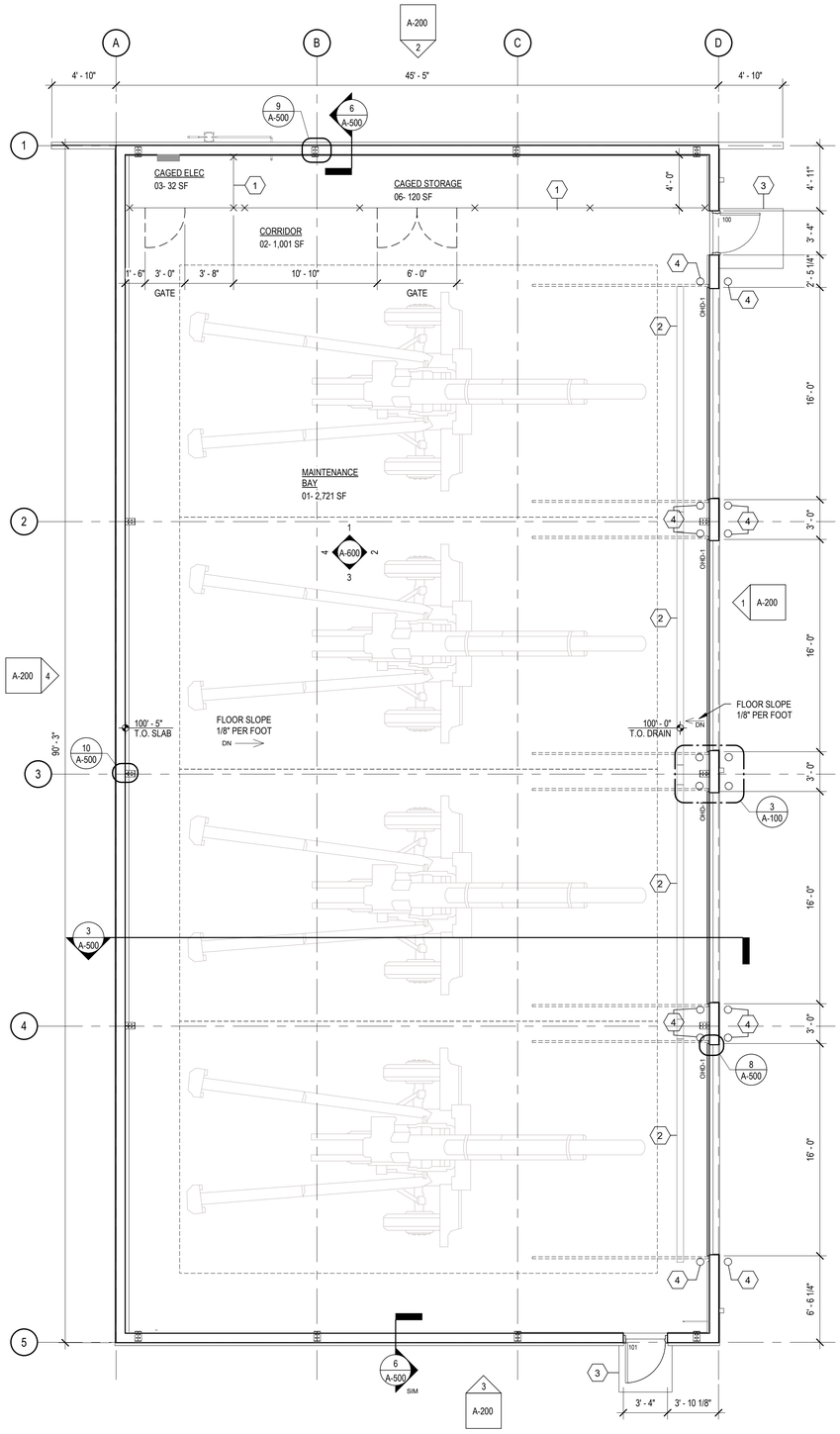
L-101

BID DOCUMENTS
11/15/24



2 FIRST FLOOR RCP

SCALE: 3/16" = 1'-0"



1 FIRST FLOOR PLAN

SCALE: 3/16" = 1'-0"

GENERAL INFORMATION

LOCATION: Albany Maintenance Building
411 College St
Albany MO, 64402

PROJECT DESCRIPTION

A new pre-engineered metal building to be used for non-hazardous equipment storage.

APPLICABLE CODES

2021 - International Building Code (IBC)
2021 - International Plumbing Code (IPC)
2021 - International Mechanical Code (IMC)
2021 - International Fire Code (IFC)
2020 - National Electric Code (NEC)
2021 - International Fuel Gas Code (IFGC)
2010 - NFPA 72 - National Fire Alarm Code
Americans With Disabilities Act Accessibility Guidelines (ADAAG)
American National Standards Institute (ANSI) 117.1 Guidelines for Accessible & Useable Buildings & Facilities

OCCUPANCY/ STRUCTURAL CLASSIFICATION

One-story pre-engineered metal building on slab-on-grade. Exterior walls will be insulated metal panel. Roof structure will be single-slope standing seam.

ENERGY CODE ANALYSIS

Code: International Energy Conservation Code (IECC 2021)

Compliance Path: Prescriptive

Climate Zone: 5A

ACTIVE LIFE SAFETY SYSTEMS:

Fire Alarm:	Required/Provided: Per NFPA 72
Smoke Detection:	Required/Provided: Per NFPA 72
Exit Signs:	Required/Provided
Emergency Lighting:	Required/Provided
Suppression-Automatic:	Not Required
Fire Extinguishers:	Required/Provided: Per NFPA 10

CODE ITEM	
OCCUPANCY CLASSIFICATION:	U
CONSTRUCTION TYPE:	TYPE IIB - UNSPRINKLED
INCIDENTAL USE SEPARATIONS:	NA
BUILDING HEIGHT: (2021 IBC TABLE 504.4)	
ALLOWABLE	3
ACTUAL	1
BLDG. SQ. FT. : (2021 IBC TABLE 506.2)	
ALLOWABLE PER FLOOR	8,500 sf
MODIFIED PER SECTION 506	14,875 sf
ACTUAL	3,880 sf

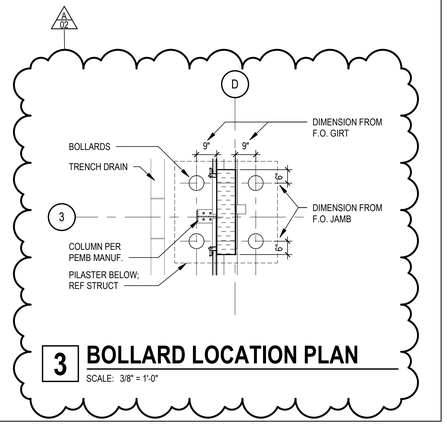
KEY NOTES

(FLOOR PLANS ONLY)

1	CHAIN LINK PARTITION. PROVIDE GATES AS INDICATED ON THE DRAWINGS. REF SECTION 323113.
2	TRENCH DRAIN. REF MEP
3	STOOP. REF STRUCTURAL
4	6" CONCRETE BOLLARDS

GENERAL PLAN NOTES

1. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS SHOWN ON THE PLANS PRIOR TO COMMENCEMENT OF THE WORK. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO COORDINATE INSTALLATION OF NEW WORK WITHIN THESE EXISTING CONDITIONS. ANY DEVIATIONS IN EXISTING CONDITIONS OR DIMENSIONS INDICATED SHALL BE COORDINATED WITH THE ARCHITECT AND OWNER.
2. ALL WALL / GENERAL PLAN DIMENSIONS ARE TO FACE OF MASONRY, FACE OF CONCRETE, FACE OF GYP. BOARD, AND FACE OF METAL PANEL, TYP.
3. CONSTRUCTION OF WALLS ARE DESIGNATED STARTING ON TAG SIDE OF WALL.
4. CONTRACTOR TO COORDINATE SPACING OF STUDS W/MECH. AND ELECTRICAL DRAWINGS.
5. ALL WALL FRAMING THAT DOES NOT EXTEND TO STRUCTURE OR DECK SHALL BE BRACED AT 48" O.C. MIN.



3 BOLLARD LOCATION PLAN

SCALE: 3/8" = 1'-0"

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

STATE OF MISSOURI
RICK WISE
NUMBER A-2004029675
ARCHITECT
7.16.25

PROFESSIONAL SEAL

CLARK & ENERSEN
2020 Baltimore Ave.
Suite 300
Kansas City, MO 64108
p. 816-474-8237

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES, MANAGEMENT, DESIGN AND CONSTRUCTION

DEPARTMENT OF PUBLIC SAFETY

MISSOURI ARMY NATIONAL GUARD

CONSTRUCT NEW MAINTENACE BUILDING

ALBANY READINESS CENTER

411 College St
Albany MO, 64402

PROJECT #: T232701

SITE #: 6251

ASSET #: 8136251003

REVISION: ADDENDUM #2
DATE: 07/16/25
REVISION:
DATE:
REVISION:
DATE:

ISSUE DATE: 07/16/2025

DRAWN BY: MC
CHECKED BY: RW
DESIGNED BY: MC

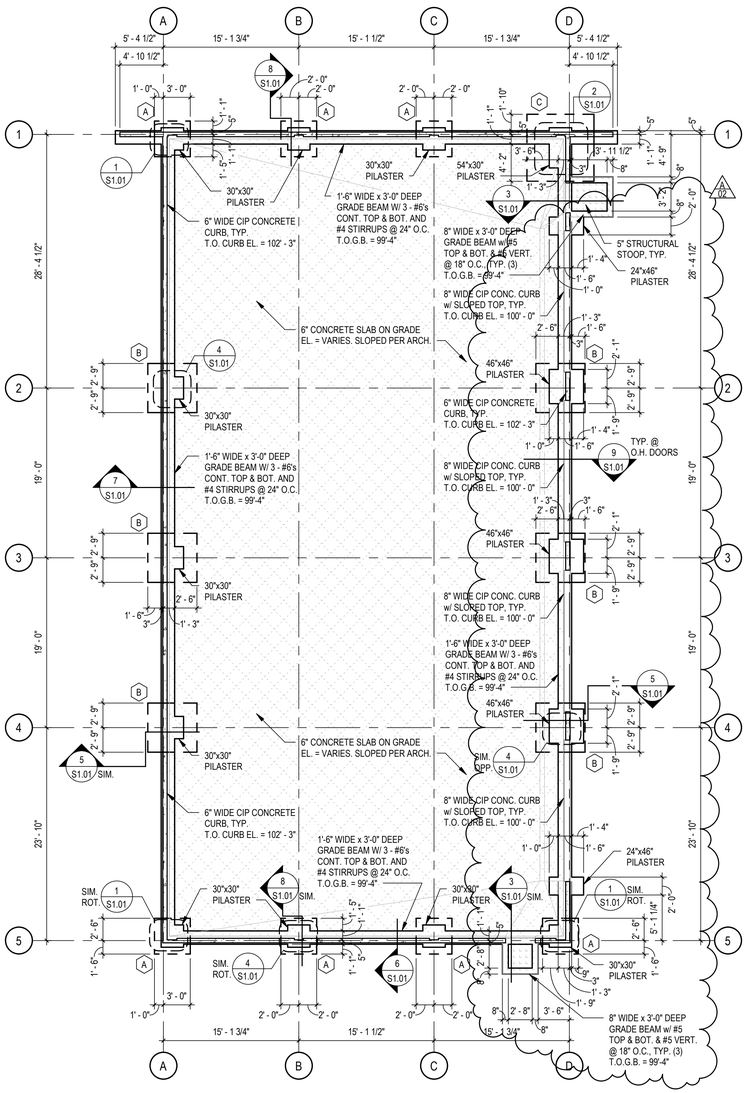
SHEET TITLE:
First Floor Plan & Reflected Ceiling Plan

SHEET NUMBER:
A-100

BID DOCUMENTS
07/16/2025

PAD FOOTING SCHEDULE

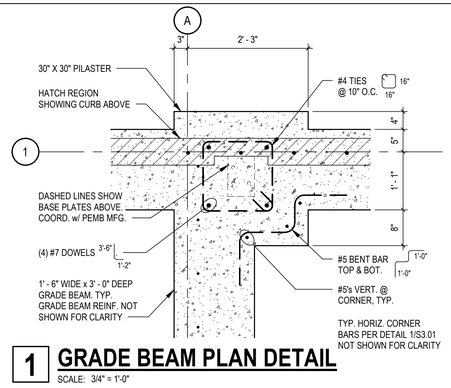
FOOTING MARK	PAD FOOTING SIZE	PAD FOOTING DEPTH	PAD FOOTING REINF.	T.O. PAD FOOTING ELEV.	NOTES:
A	4' - 0" x 4' - 0"	1' - 0"	(5) #4's E.W. @ BOT.	96' - 4"	.
B	5' - 6" x 5' - 6"	1' - 0"	(5) #5's E.W. @ BOT.	96' - 4"	.
C	7' - 6" x 7' - 6"	1' - 6"	(7) #6's E.W. @ BOT.	96' - 4"	.



FOOTING & FOUNDATION PLAN

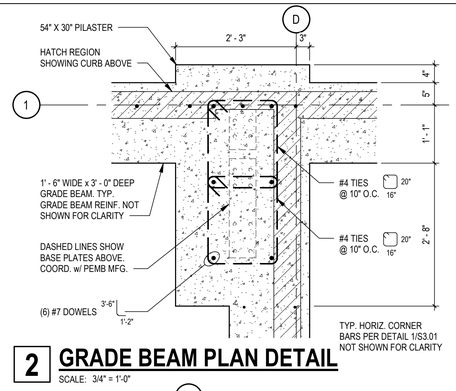
SCALE: 1/8" = 1'-0"

Plan North



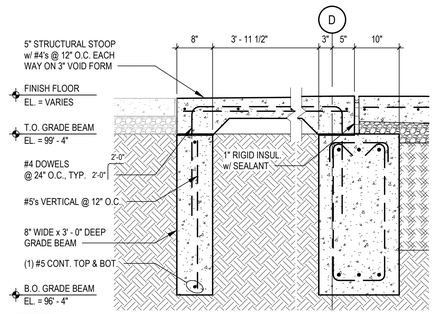
1 GRADE BEAM PLAN DETAIL

SCALE: 3/4" = 1'-0"



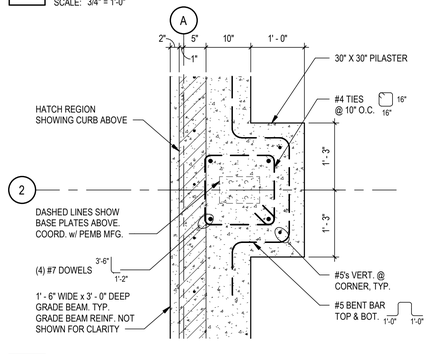
2 GRADE BEAM PLAN DETAIL

SCALE: 3/4" = 1'-0"



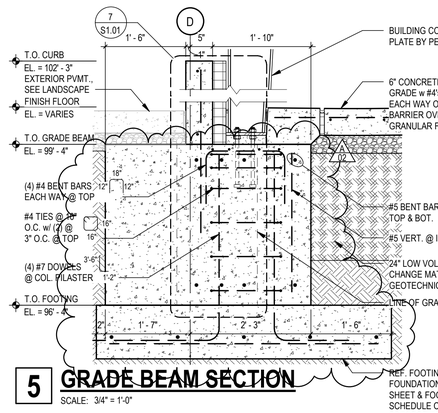
3 STOOP SECTION

SCALE: 3/4" = 1'-0"



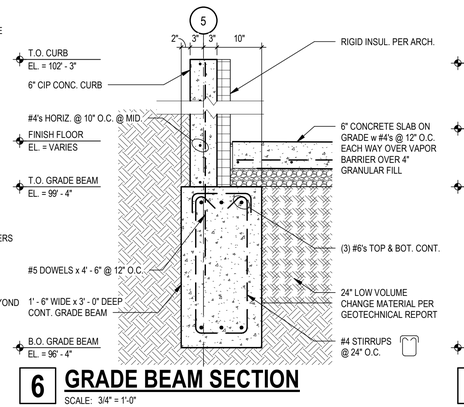
4 GRADE BEAM PLAN DETAIL

SCALE: 3/4" = 1'-0"



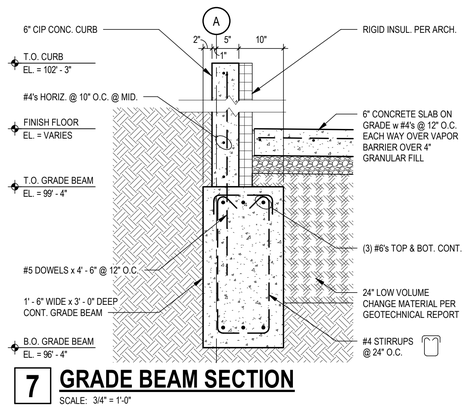
5 GRADE BEAM SECTION

SCALE: 3/4" = 1'-0"



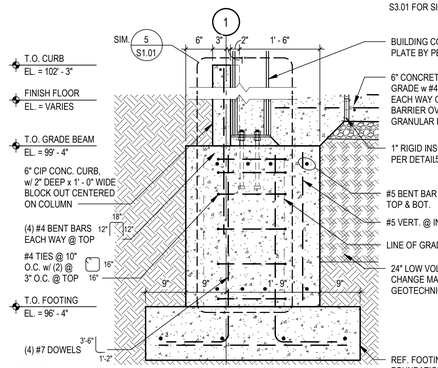
6 GRADE BEAM SECTION

SCALE: 3/4" = 1'-0"



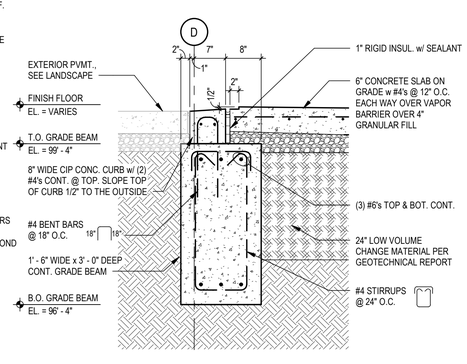
7 GRADE BEAM SECTION

SCALE: 3/4" = 1'-0"



8 GRADE BEAM SECTION

SCALE: 3/4" = 1'-0"



9 GRADE BEAM SECTION

SCALE: 3/4" = 1'-0"

GENERAL FOUNDATION NOTES:

1. SEE GEOTECHNICAL ENGINEERING REPORT INCLUDED IN THE SPECIFICATIONS FOR EARTHWORK AND FOUNDATION PREPARATION REQUIREMENTS. ALL RECOMMENDATIONS GIVEN SHALL BE CONSIDERED PART OF THE CONSTRUCTION DOCUMENT SET.

2. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCEMENT OF THE WORK. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE INSTALLATION OF THE NEW WORK WITHIN THE EXISTING CONDITIONS. ANY DEVIATION IN THE EXISTING CONDITIONS OR DIMENSIONS INDICATED SHALL BE COORDINATED WITH THE ENGINEER/ARCHITECT.

3. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND COORDINATION OF ALL MECHANICAL UNITS W/ OTHER WORK.

4. DO NOT SCALE PLAN FOR DIMENSIONS.

5. SEE CONTROL JOINT DETAIL ON SHEET S3.01 FOR TYPICAL SLAB ON GRADE CONTROL JOINTS. SEE SPECIFICATIONS FOR SPACING REQUIREMENTS.

6. PROVIDE (1) #5 x 5' - 0" LONG BAR @ MID-DEPTH OF SLAB-ON-GRADE AT ALL RE-ENTRANT CORNERS.

7. SEE CONCRETE WALL CONSTRUCTION JOINT DETAIL ON SHEET S3.01 FOR TYPICAL CIP WALL CONSTRUCTION JOINTS. SEE SPECIFICATIONS FOR SPACING REQUIREMENTS.

8. SEE MECHANICAL EQUIPMENT BASE DETAIL ON SHEET S3.01 FOR SLAB ON GRADE MECHANICAL EQUIPMENT BASES. SEE ARCHITECTURAL & MECHANICAL SHEETS FOR EXACT LOCATIONS OF EQUIPMENT BASES.

9. 100'-0" — INDICATES TOP OF FOOTING ELEVATION.

10. TOW-XX'-XX" — INDICATES TOP OF CIP WALL ELEVATION.

11. INDICATES STRUCTURAL SLAB SPAN DIRECTION. LONGITUDINAL BARS SHALL RUN PARALLEL TO SPAN DIRECTION. TRANSVERSE BARS SHALL RUN PERPENDICULAR TO SPAN DIRECTION.

12. XX'-X" — INDICATES TOP OF CONCRETE SLAB ELEVATION.

13. INDICATES 6" CONCRETE SLAB ON GRADE w/ $4's @ 12" O.C. EACH WAY OVER VAPOR RETARDER OVER 4" GRANULAR BASE.

14. INDICATES 5" CONCRETE SLAB w/ $4's @ 12" O.C. EACH WAY OVER 3" VOID FORM.

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

DANIEL BRADLEY
NUMBER
PE-2003027834
PROFESSIONAL ENGINEER
7-16-2025

PROFESSIONAL SEAL

CLARK & ENERSEN

2020 Baltimore Ave.
Suite 300
Kansas City, MO 64108
p. 816-474-8237

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES, MANAGEMENT, DESIGN AND CONSTRUCTION

DEPARTMENT OF PUBLIC SAFETY

MISSOURI ARMY NATIONAL GUARD

MAINTENANCE BUILDING

ALBANY READINESS CENTER

411 College St
Albany MO, 64402

PROJECT #: T232701

SITE #: 6251
ASSET #: 8136251003

REVISION: DATE:
REVISION: DATE:
REVISION: DATE:

ISSUE DATE: 11/15/24

DRAWN BY: DB
CHECKED BY:
DESIGNED BY: DN

SHEET TITLE:
Footing & Foundation Plan

SHEET NUMBER:
S1.01

BID DOCUMENTS
11/15/24