

INVITATION TO BID (ITB)  
FOR CONSTRUCTION OF A  
MEMBRANE COVERED SALT/SAND  
STORAGE BUILDING

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION  
FARGO YARD

BY

RONALD J. HENKE, P.E.  
DIRECTOR

BIDS MUST BE DELIVERED OR MAILED TO:

CHAD ABRAHAMSON, PE, MAINTENANCE DIVISION  
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION  
608 E. BOULEVARD AVENUE, BISMARCK ND 58505-0700

NO LATER THAN 3:00 P.M. ON THURSDAY, MAY 8, 2025  
FAXED BIDS WILL NOT BE ACCEPTED  
FOR ADDITIONAL INFORMATION CALL 701-328-3614

## ITB FOR FARGO SALT/SAND STORAGE STRUCTURE

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### **CERTIFICATION PAGE**

#### ENGINEER'S CERTIFICATION

I, Chad Abrahamson, a Registered Professional Engineer in the State of North Dakota, hereby certify that the Specifications for the construction of a membrane covered salt/sand storage building, at the NDDOT Fargo yard, were prepared under my supervision and are complete and correct to the best of my knowledge and belief.

Chad Abrahamson, PE

Registered Professional Engineer

ND Registration No. PE-10588

# ITB FOR FARGO SALT/SAND STORAGE STRUCTURE

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## SECTION ONE PERFORMANCE SPECIFICATIONS

### 1 GENERAL

The intent of this solicitation is to secure bids for the construction of a salt and treated sand storage building at North Dakota Department of Transportation (NDDOT) Fargo Yard. The Fargo Yard is located at 503 38<sup>th</sup> Street S, Fargo, ND.

#### Definitions:

1. The term "Owner" means North Dakota Department of Transportation (NDDOT).
2. The term "Contractor" means vendor awarded contract with NDDOT for the prescribed work.

#### 1.01 ITB Schedule

- Last day to submit pre-bid questions April 30
- ITB Opening May 8
- State issues notice of Intent to Award a contract by approximately May 19
- State issues contract by approximately May 30
- Preconstruction meeting approximately two weeks after contract is signed

#### 1.02 Description:

- A. Provide construction for a 10,000 square-foot membrane covered storage structure. Bidder will provide material, delivery, and installation for a clear-span steel frame building with white fabric covers, utilizing cast in place concrete bunker walls for storage of sand and/or salt-type mixes, meeting specifications listed in this ITB.

#### 1.03 ITB Requirements and Conditions:

- A. Owner reserves the right to consider bids for buildings varying in minor respects from any specific requirement herein, but judged to meet the intent of this specification.
- B. Owner will evaluate each bid package and will make a decision based upon lowest responsible bid. Owner reserves the right to waive minor irregularities and to reject any or all bids.
- C. Submittal: In bid package; furnish a set of drawings, indicating in detail all

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features of building being bid. Initial drawings DO NOT need to be stamped by a registered architect or engineer, they are for reference only. In case of prefabricated buildings and proprietary design, submit advertising literature depicting structural system and preliminary building layout. Furnish specifications, material information, project example, and related items that clearly illustrate manufacturer's ability to provide the structure specified and required. Any bid submitted that is not for a pre-approved building or manufacture and does not include the specifications and information that shows the building being submitted meets the required specifications will be rejected.

### D. Bid Guaranty:

1. Bids must be accompanied by a bidder's bond, in a sum equal to five percent of full amount of bid including alternates, and a North Dakota Contractor's license or certification of renewal issued by the secretary of State. The bidder's bond must be executed by the bidder as principal and by a surety company authorized to do business in the State of North Dakota, conditioned that if the principal's bid is accepted and the contract awarded to the principal, the principal, within 10 days after notice of the award, shall execute a contract in accordance with the terms of the bid and the bid bond as required by law and regulations of the Owner. If a successful bidder does not execute a contract within 10 days after notice of the award, the principal and surety will forfeit to Owner the bidder's bond accompanying the bid on which there is a default. The North Dakota Contractor's license must have been in effect at least 10 days prior to the date of the bid opening.
2. All bonds, except those of contractors submitting three lowest responsible bids for each prime contract will be returned to bidders when Department has determined to whom the contract is to be awarded. Bond of the responsible contractor submitting lowest responsible bid will be retained until contract has been awarded and executed properly. Bond of contractors submitting second, and third lowest responsible bids will be returned after contract has been awarded and executed.

### E. Related Work:

1. Site Inspection: All Contractors are invited and recommended to inspect site at the North Dakota Department of Transportation Fargo Yard.

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Inspections can be arranged by contacting Aaron Murra in the NDDOT Fargo District at 701-239-8974.

2. Permits and Inspections: All permits, inspections, licenses, and fees shall be obtained by the Contractor(s) and must be included in the bid price. General Contractor is required to fulfill any plan permitting review requirements of the local jurisdiction, secure building permit(s) from the local jurisdiction, schedule required inspections, and pay required fees.
3. Materials: Contractors shall provide materials that have a proven track record and shall be responsible for all products, components, accessories, and methods used in constructing this building. The NDDOT Fargo District shall perform any required concrete and soils testing with a minimum one week notice from Contractors. Contractors are responsible for any other required testing.
4. Surveying and Construction Staking: The Owner will provide benchmark elevation of the finished floor away from the building location in two corners opposite of each other. Contractors are responsible for providing any other needed surveying and construction staking.
5. Minimum printed code standard requirements of the following organizations for the following regulatory organizations for ADA compliance, life safety, energy efficiency, material quality, fabrication, and installation procedures shall be met or exceeded, for applicable methods employed in building design and construction. The most current adopted version of the following code publications shall be referenced for design and construction of the proposed facility.
  1. International Building Code (IBC)
  2. State and Local Building Codes
  3. ADA compliance - ICC ANSI A117.1
  4. International Existing Building Code (IEBC)
  5. International Mechanical Code (IMC)
  6. National Electrical Code and the North Dakota State Wiring Standards
  7. Uniform Plumbing Code and the North Dakota State Plumbing Standards
  8. International Energy Conservation Code (IECC) if applicable. General Contractor is responsible to complete a COMcheck report if required by local jurisdiction.
  9. International Fire Code (IFC)
  10. National Fire Protection Association (NFPA)

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11. International Fuel Gas Code (IFGC)
12. Air Conditioning, Heating, and Refrigeration Institute (AHRI)
13. American Institute of Steel Construction (AISC)
14. American Concrete Institute (ACI)
15. American Institute of Timber Construction (AITC)
16. American Iron and Steel Institute (AISI)
17. American Welding Society (AWS)
18. American Plywood Association (APA)
19. American Softwood Lumber Standard (ALSC)
20. American Society of Testing Materials (ASTM)

### 1.04 Award and Execution of Contract:

- A. Contractor's Qualifications: Full name and address of business organization shall be stated, and parent company identified if a subsidiary. Contractors shall specify branch office or other subordinate element which will perform, or assist in performing on any business partnerships, and in which state Contractor is incorporated or licensed to operate.
- B. Bid documents of successful Contractor will be incorporated into project contract. Bid documents will become a part of subsequent contractual documents. Failure of Contractor to accept this obligation may result in cancellation of any award. Any damages accruing to Owner, as a result of Contractor's failure to contract, may be recovered from the Contractor.
- C. Successful Contractor shall enter into a contract for performance of work in this ITB. Failure by successful Contractor to execute a Contract and file a successful Contract Bond will be considered cause for annulment of award and forfeiture of Bid Guaranty to Owner. Award may be made to next lowest responsible bid or work re-advertised.
- D. Contract shall incorporate all applicable provisions of this ITB.
- E. Bids will be evaluated and awarded to lowest responsible bidder. Lowest bid will be based on base bid plus alternates, if any, that are accepted.
- F. All costs attributable to preparation of bid documents or any presentation required to supplement or clarify Bid are borne by Contractor.
- G. All bids remain valid for a minimal period of 60 days subsequent to ITB closing date, unless an extension is agreed to by both parties.
- H. To be eligible for award of the project, contractor shall meet all

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requirements of this ITB and present a structure that has shown successful performance in the State of North Dakota (ND).

1. Contractor shall be licensed to do business in State of North Dakota.
  2. Contractor must be licensed for the full amount of the bid including alternates as required by North Dakota Century Code Section 43-07-12. Such license must have been in effect at least 10 days prior to the date of the bid opening and a copy of said license certificate to be included with the contractors bid.
  3. Contractor shall describe general relevant corporate experiences in constructing buildings similar to one described in this ITB.
  4. Failure to provide satisfactory performance data may result in cancellation of award. No bid may be read or considered if it does not fully comply with requirements of North Dakota Century Code Section 48. Any deficient bid submitted will be resealed and returned to the bidder immediately.
- I. Upon execution of Contract, successful bidder shall furnish a Contract Bond on form furnished by Owner in an amount equal to 100% of Contract, issued by a responsible Surety, and approved by Director of NDDOT. If Surety Bond is voided or is no longer in force, Contractor shall obtain another Contract Bond of an amount equal to original. All bonds must be executed and submitted to the Owner prior to the commencement of work.
- 1.05 Submittals: Furnish following information as proof of conformity to design and performance criteria requirements of this specification. Information below (under **Notification of Intent to Award Phase**) shall be stamped with registration seal of a Professional Engineer and/or Architect, licensed in this state, and bearing signature of such Professional Engineer and/or Architect.
- A. **ITB submittal:** As stated earlier, at time of bid submission, furnish a set of plan drawings, indicating all features of the building being bid. Provide a title sheet indicating the project location and code review documenting required applicable Code, ADA, and Life Safety requirements. Structural design factors used shall meet code requirements and be included with the drawings. For proprietary design, submit along with the items listed above, building manufacturer literature with a preliminary floor plan, structural system(s), and building envelope.

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1. Indicate manufacturers and contractors warranties for all products, equipment, materials, systems, and finishes included with the bid.
2. At the time of Bid, the Contractor shall submit a list of materials, equipment, and fixtures to be utilized in the proposed building along with a narrative and associated product information of how each system is to be included, operate, and required training and maintenance.
3. The Owner is not responsible for errors, omissions, or deviations from original materials, equipment, or systems discovered during the construction of this facility. Any replacements or corrections will be at the cost of the Contractor.

B. **Notification of Intent to Award Phase:** Successful General Contractor shall furnish the following within six weeks of notification of award by Owner:

1. Complete design calculations for building and foundation work.
2. For prefabricated structures: original working drawings, or copies of complete fabrication and erection drawings, material lists, and detailed erection instructions.
3. Foundation work: detailed drawings for construction.

C. **Construction phase:**

1. Contractor shall provide all shop drawings, product information, warranty information, and maintenance information of all materials, equipment, fixtures, and systems being utilized in this project prior to purchasing or ordering. Shop drawings, product, warranty, and maintenance information shall be submitted to the NDDOT Maintenance Division for review. Allow Owner two weeks minimum for review. Electronic submittals of all shop drawings and information are preferred.
2. Following construction, provide Operation and Maintenance Manuals including manufacturer's instructions, as-built drawings, final warranty information, and other operation and/or maintenance information.



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- D. Each Bid must be submitted on enclosed Bid Form. List pricing for all or any alternates as indicated on the bid form. Lump sum bid price must be submitted for all labor, materials, and equipment required to build facility described in this ITB. Quantities are intended to describe general scope of work and are not fixed quantities, unless noted otherwise.
- E. **Sealed Bids if mailed shall be sent to address on cover page or they can be hand delivered to NDDOT Maintenance Division in Room 310 & 311 at 608 E Boulevard Ave, Bismarck, no later than 3:00 P.M. CDT, on Thursday, May 8, 2025, at which time bids will be publicly opened and read. Any bid received after that time is deemed non-responsive, will not be opened, and will be returned.**
- F. **Bidder's bond and a copy of the Bidder's license or certificate of renewal shall be placed together in a separate envelope, and this envelope shall be attached to the outside of the envelope containing the bid. The larger envelope shall contain two copies of the Bid Form and Submittals. Bids shall be sealed and endorsed "Sealed Bids for Membrane Covered Salt/Sand Storage Building, Fargo Yard".**
- G. No Bids will be accepted by oral communications, telephone, electronic mail, or facsimile transmission.

### 1.06 Proprietary Information:

- A. If a Contractor does not desire proprietary information in bid documents to be disclosed, such Contractor is required to identify all proprietary information in the bid, which identification shall be submitted concurrently with Bid. If Contractor fails to identify proprietary information, they agree, by submission of their Bid, that those sections shall be deemed non-proprietary and made available upon public request.
- B. Contractors are advised that confidentiality of their bid documents will be protected by NDDOT only to the extent specifically permitted by law. Contractors are advised to consider implications of extremely open status of records in NDDOT's possession under North Dakota Open Records Act (see North Dakota Century Code 44-04-18 and subsequent sections). Particularly note implications after bid process has ceased and a contract or contracts have been awarded. While there are provisions to protect proprietary information under the act where Contractor can satisfy certain statutory standards, please note that a ruling on whether standards have been met will be determined, not by NDDOT, but by Attorney General or courts of the state of North Dakota.

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### 1.07 Inquiries:

- A. All telephone, personal, and written communications regarding information concerning this ITB shall be made to:

North Dakota Department of Transportation – Maintenance Division  
Chad Abrahamson, PE, Facilities Engineer  
608 East Boulevard Ave.  
Bismarck, ND 58505-0700  
Phone No.: 701-328-3614  
Email: [cabrahamson@nd.gov](mailto:cabrahamson@nd.gov)

- B. Changes to the ITB will be issued by written addendum and mailed or faxed to parties requesting ITB. Such addenda issued prior to time that bids are received shall be considered part of ITB. Contractor shall be required to consider and acknowledge receipt of such in their Bid Form and on the front of their Bid Envelope.
- C. Contact the NDDOT Facilities Engineer for clarifications, bid changes, and questions. Any irregularities, lack of clarity, requested bid changes, and all questions regarding this bid and the procurement process must be addressed to the NDDOT Facilities Engineer no later than end of business on April 30, 2025. Contact information for the NDDOT Facilities Engineer is listed above in 1.07.A. The bidder is cautioned that the requirement of this solicitation can be altered only by written amendments and that verbal communications from whatever source are of no effect.

### 1.08 Contractor's Agent:

- A. Contractor shall include name, address, and telephone number of person in Contractor's organization authorized to render binding decisions on contract matters.

### 1.09 Time of Completion:

- A. Contractor awarded the project must have new building completed by September 26, 2025.
- B. General contractor will be responsible for coordinating construction activities of all trades throughout project. General contractor shall provide Owner a construction schedule at pre-construction meeting.

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### 1.10 Payment for Work:

- A. Partial payment may be requested once each calendar month at end of month. Retainage will be ten percent of each estimate until project is fifty percent completed with no further retainage during continuance of contract unless unsatisfactory progress or performance is documented. Payment requests will be made to the NDDOT Maintenance Division.

### 1.11 Warranty:

- A. Contractor will provide in the bid documents a **minimum** 20-year warranty on all fabric and steel components. Bid shall list building components warranties and warranty conditions. If manufacturer's standard warranty is for a longer period, it shall apply.
- B. All other materials and workmanship shall have a minimum one year full warranty. Any deficiencies or improper installations shall be replaced by the contractor at the contractor's expense.

### 1.12 Risk Management for Professional Services:

- A. Risk management terms required by NDDOT in the contract are attached; see Risk Management Appendix, Service Contracts with Private Individuals, Companies, Corporations, Etc.

### 1.13 Condition of Work:

- A. Each Contractor must inform themselves of conditions relating to construction of project and employment of labor thereon. Failure to do so will not relieve a successful Contractor of obligation to furnish all material and labor necessary to carry out provisions of the contract.

### 1.14 Contract Coordination:

- A. Prime General Contractor shall provide coordination for all Contractors and trades. All Contractors are required to comply with Prime General Contractor's directions in order that project is completed satisfactorily. Each Contractor must employ such methods or means as will not cause an interruption or interference with work of any other Contractor.
- B. All costs incurred due to lack of coordination of work are the responsibility of Contractor not following construction schedule. Contractor not following schedule or employing methods or means that cause interruption of or

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interference with work of any other Contractor, shall pay all costs for extra work caused by delaying construction sequence.

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## SECTION TWO DESIGN AND CONSTRUCTION CRITERIA

### 2. GENERAL

- 2.01 Contractor shall keep fully informed with, and observe and comply with all Federal and State laws; local laws and ordinances, including legal requirements governing the safety, health, sanitation, storm water pollution prevention plan, and performance of contract in general.
- 2.02 Questions and change order requests regarding design and construction of the building will be approved by NDDOT Maintenance Division. Fargo District will also provide construction inspection and oversight.
- 2.03 Earthwork and Foundation Excavation: Building site is located on an asphalt pad. Contractor is required to remove asphalt material as needed for installation of foundation. Removed asphalt material shall be stockpiled on site at location designated. Contractor shall excavate to required depth for foundation footings and backfill to original grade. Any additional granular materials needed by Contractor will be provided by Owner and stockpiled on site. General contractor shall provide Owner with a quantity and type of fill material required for construction. This request will need to be submitted a minimum thirty (30) days prior to Contractor needing the material.
- 2.04 Final cleanup, grading, and site restoration: Contractor will be responsible for cleanup of site during and after construction is completed, rough grading to original site elevation, and provide for all final grading and site restoration.
- 2.05 Contractor shall take reasonable precautions for safety of and shall provide reasonable protection to prevent damage, injury, or loss to:
  - A. Employees on project site and other persons who may be affected.
  - B. Newly construction building and building components and equipment.
  - C. Materials and equipment, whether in storage on or off site, under care, custody or control of Contractor or Contractor's subcontractors.
  - D. Property at site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
- 2.06 Repair or replacement of building components, building equipment, materials,

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equipment, and property at site or adjacent to objects shall be at the cost of the Contractor.

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## SECTION THREE BUILDING DESIGN CRITERIA

### 3.0 GENERAL

Bidder will provide material, delivery, and installation for a clear-span steel frame building with white membrane covers, utilizing cast in place concrete bunker walls for storage of sand and/or salt-type mixes, meeting specifications listed below. All building component fabrication shall be completed in a US manufacturing facility.

All building widths shall be pre-engineered with appropriate independent engineering stamps. This may be requested prior to award. Preliminary work related to clearing material from site will be done by Owner prior June 1, 2025. Contractor can start on site work on June 1, 2025. Final grading, base, and Asphalt pad will be completed by Contractor. Base material will be provided by owner.

Structure shall be rectangular in shape with rigid frame high arc welded truss main rafters and vertical gable end wall. Interior of structure below bottom chord of main trusses shall be clear span, free of any structural support members and shall provide unobstructed floor space. No exterior purlins, guy ropes or cables shall be used for anchoring structure. Location of building is shown in APPENDIX 3, official location to be staked by the Fargo District.

Building design shall take into account the open end wall on east side of structure. The west end wall is closed. Wind pressure within the building shall be minimized through use of pressure relief panels in west end wall. Size of relief panels shall be determined by manufacturer.

### 3.01 GENERAL CONSTRUCTION

#### 3.02 Minimum Dimensional Requirements for Building:

Base Bid: Nominal Width - 100 feet, Nominal Length - 100 feet

Base bid shall utilize a cast-in-place concrete wall. Minimum clear width from inside to inside of concrete foundation walls shall be approximately 97 feet. Minimum length of foundation wall from inside of endwall to end of foundation at open end shall be approximately 98 feet. Top of concrete wall shall be minimum 10' above finished floor elevation to ensure loading equipment does not impact truss. Foundation walls shall be a minimum eight inches thick and utilize minimum eight inch thick wing walls at maximum 20' spacing (see APPENDIX 2). Building trusses shall be placed on wall or on wings walls. Building manufacture will be responsible

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to provide final foundation design based on their building loads. A minimum interior clearance of 36' from top of finish floor to bottom of truss.

### 3.03 Manufacturers Qualifications:

Manufacturer shall have at least 10 years of successful experience and has designed and supplied at least 10 buildings similar to the specified project structure such as AccuSteel or other equivalent manufacture.

### 3.04 Building Structural Requirements

- A. Provide a rigid, self-supporting structure comprised of structural steel framing components, complete with necessary foundations which are designed to securely and permanently support roof and wall construction. All structural steel framing components shall be hot dipped galvanized after fabrication. Base bid and alternates, if any, shall be constructed with a truss structure.
- B. Building shall meet or exceed the following minimum design criteria:
  - 1. Roof Live Load: As per International Building Code or per local building code whichever is greater.
  - 2. Wind Load: As per International Building Code or per local building code whichever is greater.
  - 3. Ground Snow Load: As per International Building Code or per local building code whichever is greater.

### 3.04 Concrete Foundation and Walls:

- A. Concrete Specifications :
  - 1. Concrete shall have a minimum compressive strength of 4000 PSI at 28 days. NDDOT Fargo District will perform testing to make sure the concrete meets these requirements. Any failing concrete shall be removed and replaced at the contractor's expense.
  - 2. Concrete mix design shall be provided to NDDOT Fargo District a minimum of FOURTEEN (14) days before pouring concrete. Concrete Mix design shall contain a minimum of 20% fly ash up to a maximum of 29%. Fly ash shall meet chemical composition as specified in Section 820 of NDDOT's current Standard



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### Specifications for Road and Bridge Construction.

3. Concrete shall be designed and placed with a maximum water cement (w/c) ratio of 0.47. Water content will include all mixing water and free water on the surface of aggregate, but will not include water absorbed by the aggregate. Fly ash will be included in cement content by actual weight for determination of w/c ratio.
  4. Concrete equipment and placement shall meet the requirements of Section 155 and Section 602 of NDDOT's current Standard Specifications for Road and Bridge Construction. Foundation walls with excessive air pockets (as determined by NDDOT) that will trap and hold water or salt shall be patched and covered with an acceptable concrete patch/rub product. Entire face of walls must be covered inside as well as outside if determine by NDDOT to be necessary. If patching or rub finish product is necessary, it shall be placed at contractor's expense.
  5. Concrete shall be class AE3 concrete as specified in Section 802 of NDDOT's Standard Specifications for Road & Bridge Construction.
- B. Concrete pier foundation for building trusses shall be sized by building manufacturer to support weight of building and any live loads. Foundation must also meet or exceed all local or state building codes, whichever is greater. A typical foundation details is shown in APPENDIX 2. A detailed design drawing of the foundation using loads associated with building being bid must be submitted by contractor within four (4) weeks after receiving the contract. Price bid shall reflect final foundation design, no price adjustments will be allowed if foundation varies ITB.
- C. Foundation design should be based on an assumed allowable soil bearing strength. NDDOT has performed two soil borings. Information from these borings is included in APPENDIX 4 at the end of this bid package. Contractor awarded project will be responsible to have allowable soil bearing pressure determined by a licensed engineer prior to submitting final certified foundation drawings.

### 3.05 Minimum Fabric Specifications for Material Cover:

- A. Fabric for the entire building shall be:
1. Minimum of 12 oz./square yard non-FR High Density Polyethylene (HDPE).
  2. Fabric shall have a minimum 16x16 double weave.

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3. Coated on two sides with Low Density Polyethylene (LDPE). LDPE shall be minimum 4 mil thick each side.
  4. Material must be UV stabilized.
  5. Fabric shall be manufactured by approved and reputable supplier with demonstrated long-term performance.
  6. Fabric color for entire building shall be white.
- B. Integrated fabric mesh vents
- C. Fabric shall be continuously attached to each framing truss using a “Keder” track system or equal. Include weatherproof cover over track system.
- D. Fabric cover shall utilize a stainless steel cable and stainless steel interior ratchet tie-down system with a series of 10,000-pound lashing winches and zero-stretch belting.
- E. Provide minimum 20 year pro-rated warranty on Fabric Cover. If manufacturer’s standard warranty is for a longer period, it shall apply. Include detailed warranty information in bid package.
- 3.06 Building Steel Framework:
- A. **All steel post components shall be hot-dipped galvanized after fabrication.**
- B. Steel tubing shall be minimum 14 gauge, tensile strength of 55,000 psi with interior and exterior corrosion resistant coatings. Integrity of coatings must be maintained at all joints and welds to withstand salt stored in the building.
1. Clear Span Structural Steel Tubing – ASTM A500 / ASTM A513
  2. Minimum allowable tubing thickness - 14 gauge or .083”
  3. Minimum 50 KSI Yield – 55 KSI Tensile ASTM A500
  4. End Wall Framework – Engineered “C”, “Z”, & “L”
  5. Minimum allowable thickness – 14 gauge or .083”
  6. End Wall Framework - Galvanized Sheet G-90 Material

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- 7. Plate or Bar Stock – ASTM A36
  - 8. All fasteners must be structural ASTM A325 or Grade 5 or Grade 8
  - 9. All cables and accessories to be made from Stainless Steel
  - C. All structures shall withstand minimum 90 MPH wind requirements.
  - D. Black max road tar or equivalent to be used on connection points between building and foundation.
  - E. All welds and field welds must conform to American Welding Standards and all field welds be approved by manufacturer. All field welds shall be sandblasted and finished with a molten-zinc corrosion-resistant process to fully restore weld zones to original service life of steel tubing.
  - E. Provide minimum 20 year pro-rated warranty on all Steel. If manufacturer's standard warranty is for a longer period, it shall apply. Include detailed warranty information in bid package.
- 3.07 Asphalt Floor and Apron:
- A. Provide and install Geosynthetic Type G, Section 709 of the 2024 North Dakota Standard Specifications.
  - B. Provide Class 5 or salvage base according to Section 320 "Aggregate Base and Surface Course" of the 2024 North Dakota Standard Specification with the following addition.
    - 1. Compact aggregate to at least 90 percent of the maximum dry density with a moisture content at the time of compaction not less than 2.0 percentage points below, nor more than 3.0 percentage points above the optimum moisture content. The Engineer will determine the maximum dry density and optimum moisture content as specified in ND T180.
  - C. Provide FAA 43 asphalt mix with a PG 58H-34 binder that meets with requirements of Section 430 of the 2024 North Dakota Standard Specifications. Compact the asphalt in lift thickness of between the minimum 1.5 inches to a maximum of 3 inches of material. Compact material according to Section 430.04 I.3

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“Ordinary Compaction.” Include a tack coat between each lift of asphalt.

### 3.08 Pre-Approval of Building:

#### A. Buildings approved for bidding are:

Accusteel has been preapproved. Any other equivalent building submitted shall include specifications and information that proves the submitted building meets the specifications of this document. Bids that do not include this information for non-preapproved buildings will be rejected. Pre-approved building manufacturer typically have several building models with different specifications as well as a variety of load conditions. Contractor shall verify that building they are bidding does meet requirements of this ITB.

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### BID FORM

In accordance with the provisions of the Bid, the undersigned hereby agrees to furnish all labor, equipment and materials per the enclosed specifications for the construction of a Salt/Sand Storage Structure to be constructed at the North Dakota Department of Transportation Fargo Yard.

**Base Bid (100' X 100' w/ cast in place walls):** \$ \_\_\_\_\_

Building Manufacture: \_\_\_\_\_

Building Model: \_\_\_\_\_

Bidder Suggested Alternates:

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

Receipt of the following addenda to the ITB, by date, is acknowledged:

\_\_\_\_\_

SIGNED: \_\_\_\_\_

FULL NAME: \_\_\_\_\_  
(Please Print)

TITLE: \_\_\_\_\_

FIRM NAME: \_\_\_\_\_

FIRM ADDRESS: \_\_\_\_\_

FIRM PHONE NUMBER: \_\_\_\_\_

All of the above bids shall remain firm for 60 days from date set for opening of bids. Bids may be withdrawn at any time prior to bid date. Signatory agrees that NDDOT has the right to reject any or all bids for any reason.

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Risk Management Appendix

APPENDIX 1

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## RISK MANAGEMENT APPENDIX

### Service Contracts with Private Individuals, Companies, Corporations, Etc.:

Contractor agrees to defend, indemnify, and hold harmless the state of North Dakota, its agencies, officers and employees (State), from and against claims based on the vicarious liability of the State or its agents, but not against claims based on the State's contributory negligence, comparative and/or contributory negligence or fault, sole negligence, or intentional misconduct. The legal defense provided by Contractor to the State under this provision must be free of any conflicts of interest, even if retention of separate legal counsel for the State is necessary. Contractor also agrees to defend, indemnify, and hold the State harmless for all costs, expenses and attorneys' fees incurred if the State prevails in an action against Contractor in establishing and litigating the indemnification coverage provided herein. This obligation shall continue after the termination of this agreement.

Contractor shall secure and keep in force during the term of this agreement, from insurance companies, government self-insurance pools or government self-retention funds authorized to do business in North Dakota, the following insurance coverages:

- 1) **Commercial general liability and automobile liability** insurance – minimum limits of liability required are **\$500,000 per person** and **\$2,000,000 per occurrence**.
- 2) **Workers compensation** insurance meeting all statutory limits.
- 3) The State of North Dakota, its agencies, officers, and employees (State) shall be endorsed as an **additional insured** on the commercial general liability and automobile liability policies. The State of North Dakota shall have all the benefits, rights and coverages of an additional insured under these policies that shall not be limited to the minimum limits of insurance required by this agreement or by the contractual indemnity obligations of the Contractor.
- 4) Said endorsements shall contain a **"Waiver of Subrogation"** in favor of the state of North Dakota.
- 5) The policies and endorsements may not be canceled or modified without **thirty (30) days prior written notice** to the undersigned State representative.

**Contractor shall furnish a certificate of insurance evidencing the requirements in 1, 3, and 4, above to the undersigned State representative prior to commencement of this agreement.**

The State reserves the right to obtain complete, certified copies of all required insurance documents, policies, or endorsements at any time. Any attorney who represents the State under this contract must first qualify as and be appointed by the North Dakota Attorney General as a Special Assistant Attorney General as required under N.D.C.C. Section 54-12-08.

When a portion of a Contract is sublet, the Contractor shall obtain insurance protection (as outlined above) to provide liability coverage to protect the Contractor and the State as a result of work undertaken by the Subcontractor. In addition, the Contractor shall ensure that any and all parties performing work under the Contract are covered by public liability insurance as outlined above. All Subcontractors performing work under the Contract are required to maintain the same scope of insurance required of the Contractor. The Contractor shall be held responsible for ensuring compliance with those requirements by all Subcontractors.

Contractor's insurance coverage shall be primary (i.e., pay first) as respects any insurance, self-insurance or self-retention maintained by the State. Any insurance, self-insurance or self-retention maintained by the State shall be excess of the Contractor's insurance and shall not contribute with it. The insolvency or bankruptcy of the insured Contractor shall not release the insurer from payment under the policy, even when such insolvency or bankruptcy prevents the insured Contractor from meeting the retention limit under the policy. Any deductible amount or other obligations under the policy(ies) shall be the sole responsibility of the Contractor. This insurance may be in a policy or policies of insurance, primary and excess, including the so-called umbrella or catastrophe form and be placed with insurers rated "A-" or better by A.M. Best Company, Inc. The State will be indemnified, saved, and held harmless to the full extent of any coverage actually secured by the Contractor in excess of the minimum requirements set forth above.

RM Consulted 2007  
Revised 07-23



## ITB FOR FARGO SALT/SAND STORAGE STRUCTURE

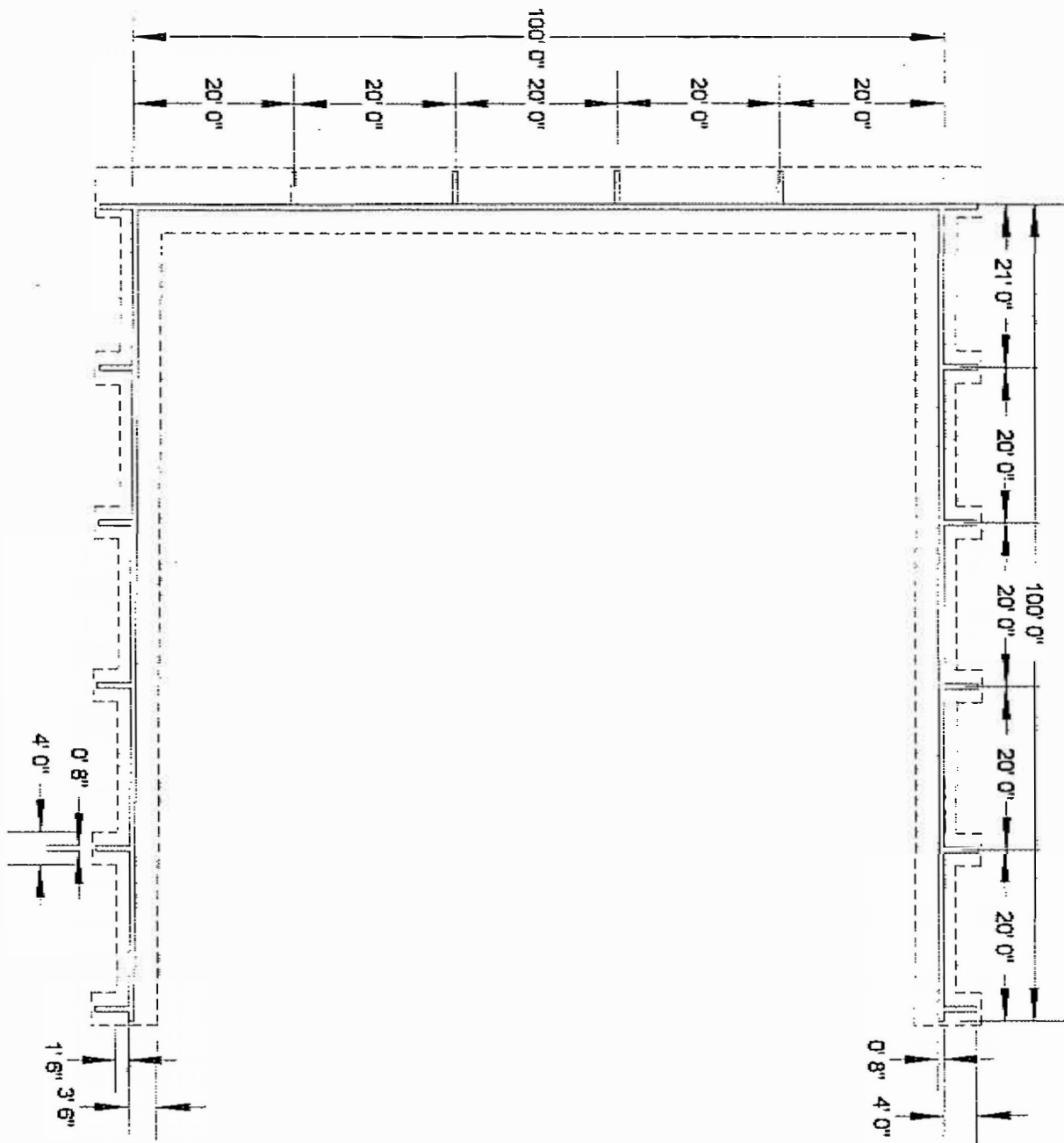
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APPENDIX 2



# ITB FOR MEMBRANE COVERED SALT/SAND STORAGE STRUCTURE

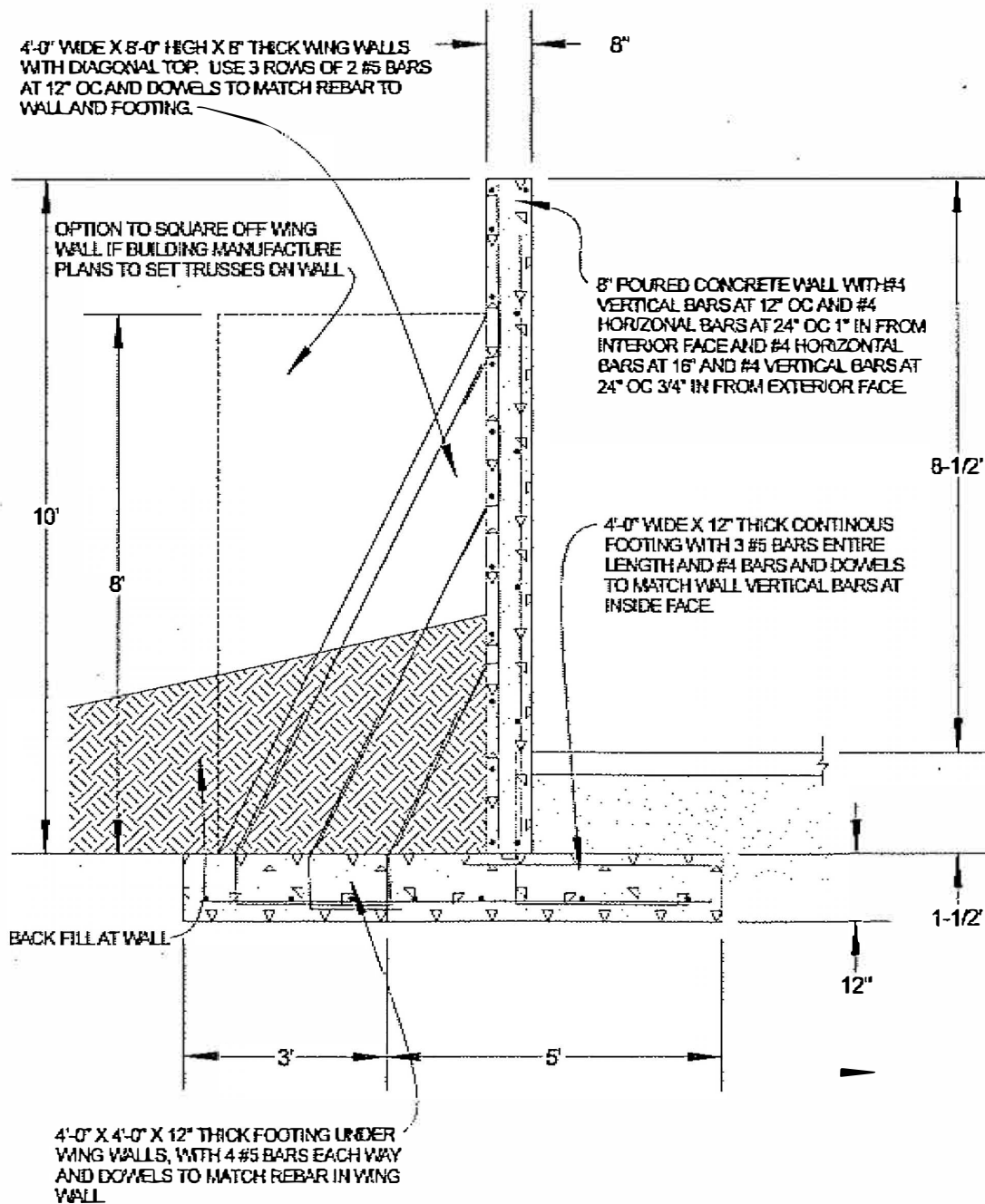
## APPENDIX 2



NDDOT SALT/SALT STORAGE BUILDING  
Fargo North Dakota

# ITB FOR MEMBRANE COVERED SALT/SAND STORAGE STRUCTURE

## APPENDIX 2



NDDOT SALT/SAND STORAGE BUILDING  
 Fargo, North Dakota

# ITB FOR FARGO SALT/SAND STORAGE STRUCTURE

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## APPENDIX 3

Building Location: Outlined in Red



## ITB FOR FARGO SALT/SAND STORAGE STRUCTURE

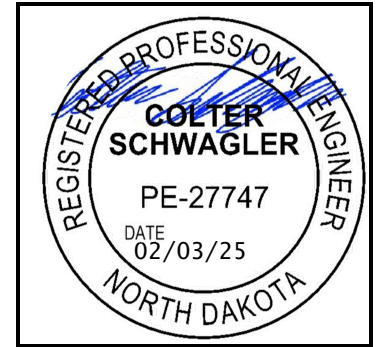
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APPENDIX 4



# FARGO SALT SHED FOUNDATION RECOMMENDATIONS

TO:	File
FROM:	Geotechnical Section
DATE:	02/03/2025
HIGHWAY:	38 <sup>th</sup> St S
PROJECT NUMBER:	BLD801725
LOCATION:	Fargo Salt Shed
SUBJECT:	Foundation Recommendations



## Introduction/Project Description

The geotechnical section was tasked to provide foundation recommendations for the proposed Fargo Salt Shed that is located just east of 40<sup>th</sup> St S and north of 9<sup>th</sup> Ave S in Fargo. Soil samples were taken from the completed borings, and tests were run to identify the stratigraphy of the site and the engineering parameters.

This memo will provide the foundation recommendations for the construction of the new section building. Figure 1 below shows an aerial picture of the proposed Fargo Salt Shed retrieved from Google Earth Pro based on the information received from the NDDOT maintenance division:

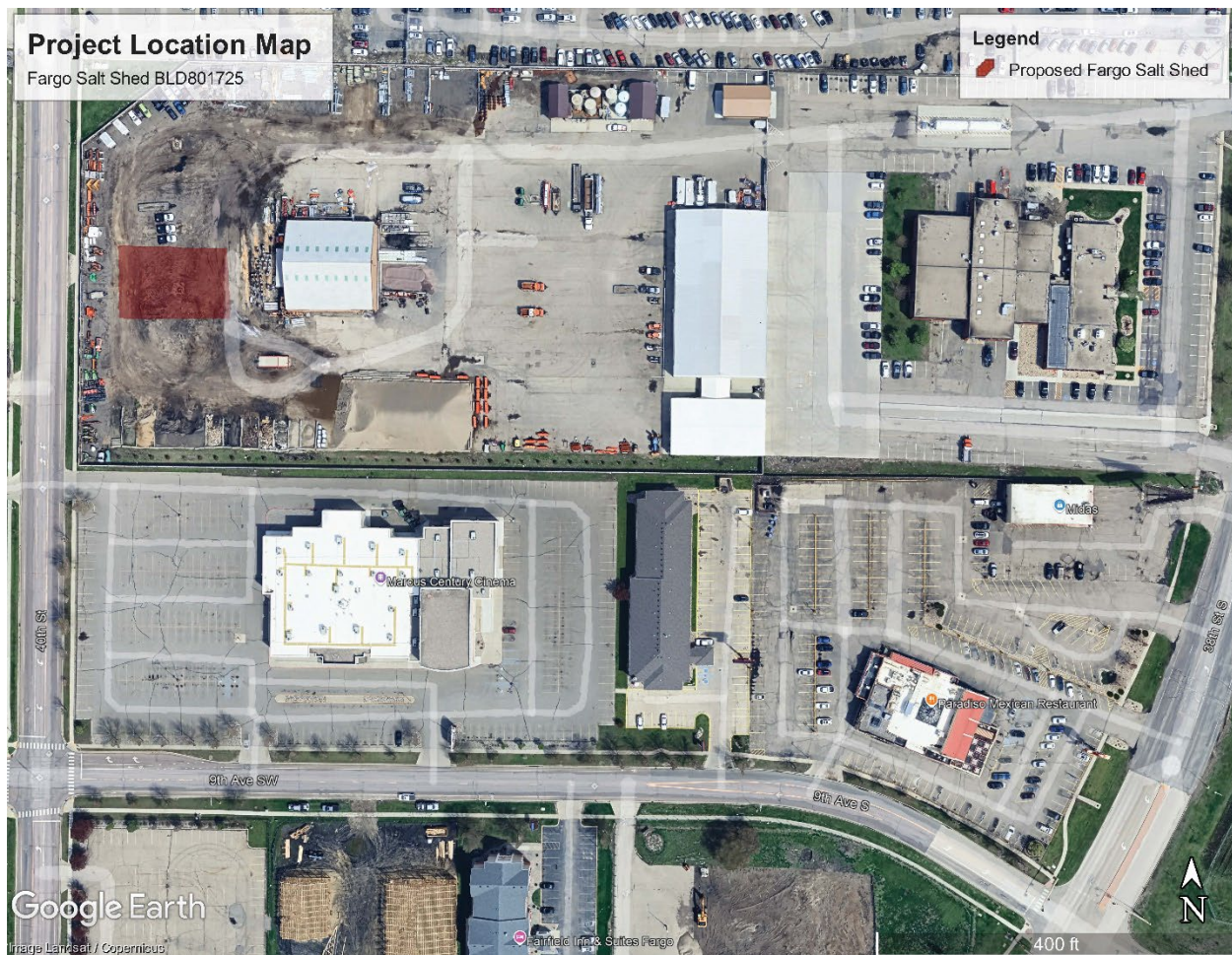
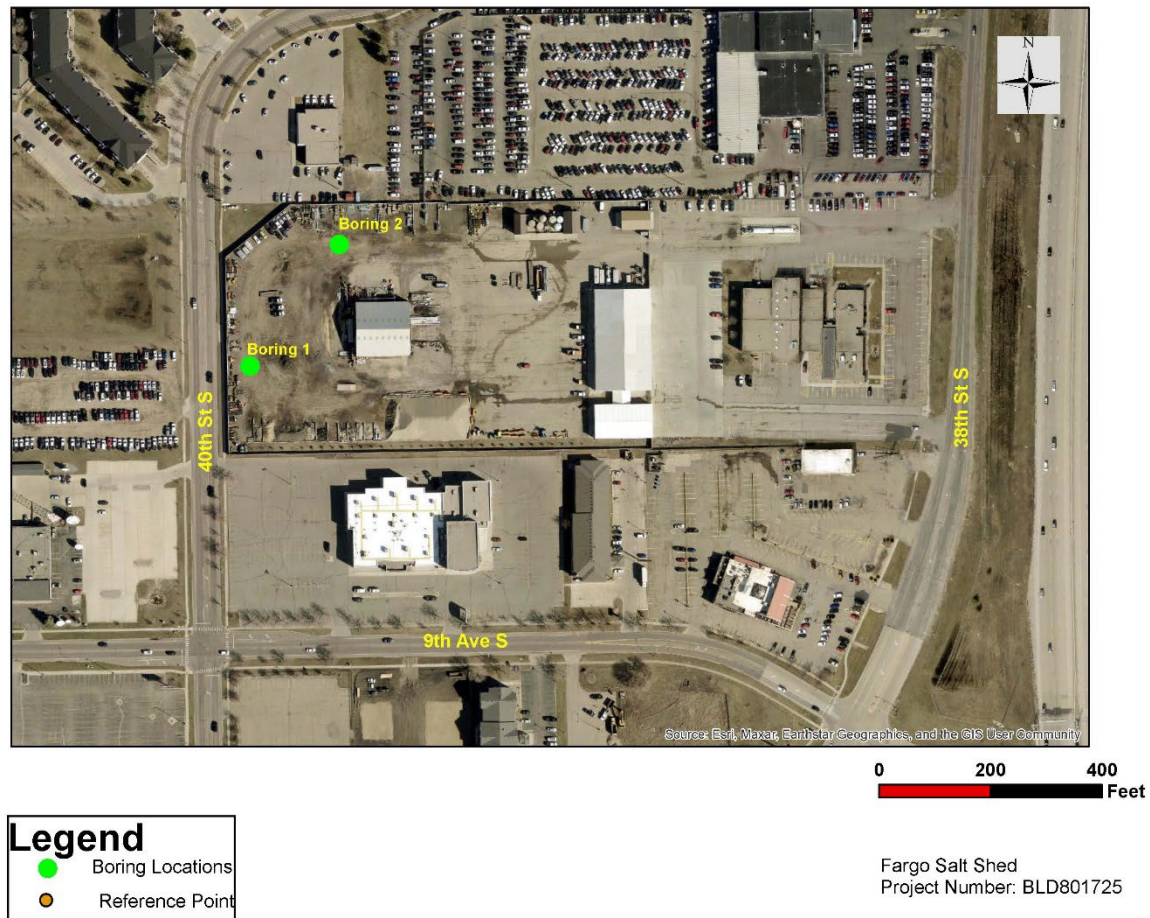


Figure 1 – Project Location

Figure 2 below shows the location of the soil borings that were completed for the proposed Fargo Salt Shed building:



**Figure 2 –Soil Boring Locations**

### **Soil Borings**

A total of 2 borings were completed near the proposed building. See the soil boring location map above for the approximate boring locations. The soil boring logs can be found in Appendix A.

#### **Boring #1**

Boring #1 has an elevation of approximately 905 feet at the top of the boring and is located near the southwest corner of the proposed building. This boring extends to a depth of 28 feet.

#### **Boring #2**

Boring #2 has an elevation of approximately 906 feet at the top of the boring and is located near the northeast corner of the proposed building. This boring extends to a depth of 28 feet.

The surface elevations of the borings were obtained via Google Earth. The boring logs are only representative of the exact location and time period from which the samples were taken. Fluctuations in the soil conditions may occur due to rainfall, spring thaw, drainage, and other seasonal factors not evident at the time the samples were taken. Construction planning should recognize the possibility of fluctuations. The NDDOT assumes no responsibility if the soil conditions encountered during construction differ from those shown. The boring locations were based on the proposed location of the Fargo Salt Shed.



### **Sampling and Testing Procedures:**

Shelby tube sampling and split spoon sampling were used to extract the samples from a hollow stem auger.

Shelby tube sampling provides an “undisturbed” sample of fine-grained soils for laboratory testing via a thin wall tube that is slowly pushed into the soils to be sampled. Densities were calculated according to AASHTO test method T-296.

Split spoon samplers are utilized during advancement of the boring to perform the Standard Penetration Test (SPT). The samples are considered “disturbed”, due to the driving nature in which they are obtained. The SPT results in an N-value, or number of blows required to drive the split spoon sampler 1 foot. This N-value is used to estimate the friction angle of non-cohesive soils and define the consistency of cohesive soils.

The samples from the split spoon and Shelby tubes are submitted to the laboratory for determination of AASHTO classification, moisture content, dry density, sieve analysis, and Atterberg limits.

### **Design Soil Strengths and Test Results**

The design soil strengths used on the project are listed below:

- Friction Angle = 28°
- Undrained Shear Strength = 985 lb/ft<sup>2</sup>
- Unit Weight = 108.2 lb/ft<sup>3</sup>

The design soil strengths were based on lab testing, published correlations, and engineering judgement.

A summary of the lab analysis has been included in Appendix B.

### **Project Assumptions**

Below are the assumptions used for the project:

- Foundations will be square mat/pier footings or strip footings.
- Others are responsible for all other design aspects including but not limited to eccentricity, sliding, design loads, material testing, etc.

### **Foundation Recommendations**

The bottom of the proposed building foundation is required to be embedded a minimum of 5' (measured from the proposed ground at the foundation) to account for frost depth. The foundation base material must extend a minimum of 6" below the footings and 2' wider than the width of the foundation.

The base material used is required to be NDDOT Class 5 aggregate. The maximum lift thickness of compacted base material is 8 inches. Compact the foundation base according to Section 714.04.A.10 of the 2024 version of the NDDOT specifications.

Construct any embankment material used on the project according to Section 203.04.G.1 of the 2024 version of the NDDOT specifications. Compact embankment material according to section 203.04.G.2 of the 2024 version of the NDDOT specifications.

The bearing capacity was calculated according to AASHTO LRFD 2020. Nominal bearing resistance for this project is as follows:

- $q_n = (C1 * B') + C2$

where:

$q_n$  = the nominal bearing resistance, in lbs per square foot.

$B'$  = the effective bearing width, equal to  $(B - 2e)$ , where  $B$  is the width of the proposed foundation and  $e$  is the eccentricity.

$C1 = 451 \text{ lb/ft}^3$

$C_2 = 3990 \text{ lb/ft}^2$  (Assumed embedment of 5')

$L$  = The length of the foundations used was long enough that it did not make a significant difference in the above calculations.

To find the factored bearing resistance, multiply the nominal bearing resistance,  $q_n$ , by the bearing resistance factor,  $\phi_b$ , which equals 0.50.

Maximum factored bearing resistance allowed is  $2670 \text{ lb/ft}^2$ .

Perform additional bearing resistance checks specific to the materials to be used for this project, and the base widths required for the design engineer's stability checks.

### **Limitations**

This report should be made available to prospective designers and contractors for information on factual data only and not as a warranty of subsurface conditions. This report should not be used without approval if any of the following occurs:

- Conditions change due to natural forces or human activity under, at, or adjacent to the site.
- Assumptions stated in this report have changed.
- Project details change or new information becomes available such that our analyses, conclusions, and recommendations may be affected.
- The site ownership or land use has changed.
- More than 5 years has passed since the date of this report.

Unanticipated soil conditions are commonly encountered and cannot be fully determined by a limited boring and testing program.

Within the limitations of scope, schedule and budget, the analyses, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted professional geotechnical and geological principles and practice in this area at the time this report was prepared. We make no other warranty, either express or implied.

If there are any questions or concerns, please contact Aaron Lehman [alehman@nd.gov](mailto:alehman@nd.gov) or Colter Schwagler [cschwagler@nd.gov](mailto:cschwagler@nd.gov) of the NDDOT Geotechnical Section.



# Appendix A

## Soil Boring Logs



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION  
300 AIRPORT ROAD  
BISMARCK, ND 58504

# LOG OF BORING SB - 1

PAGE 1 OF 1

PROJECT NUMBER BLD801725 - Fargo Salt Shed DATE STARTED 10/24/24 COMPLETED 10/24/24  
PCN \_\_\_\_\_ ELEVATION 905 ft  
LOCATION Cass County Northing 5192762.22 m Easting 664029.97 m  
DRILLED BY Dallan LOGGED BY Jamie RP+Feet ft Offset \_\_\_\_\_  
ENGINEER \_\_\_\_\_ DRILLING METHOD \_\_\_\_\_  
NOTES Coordinate System: NAD 1983 UTM Zone 14N. Surface elevations based off of Google Earth.

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	AASHTO	USCS	SAMPLE TYPE & NUMBER	RECOVERY (%)	© SPT N VALUE	MC		TESTS & REMARKS
									PL	LL	
								20 40 60 80	30 60 90 120		
										CLAY FRACTION (%)	
								20 40 60 80	20 40 60 80		
905	0	0.7' Gravel 904.3 ft	0.7 ft								$\gamma_d = 75.0$ pcf $\gamma = 108.2$ pcf Su=1228 psf
		Brown/Gray Moist Medium Stiff Fat Clay with I.O. and Silt Laminations									
900	5			A-7-6	CH	3TW 655	50		25	74	
				A-7-6	CH	SS 656	75	5	24	79	
895	10			A-7-6	CH	3TW 657	90		24	73	
				A-7-6	CH	SS 658	90	4	23	66	
		891.0 ft	14.0 ft								
890	15	Brown Moist/Wet Loose/Medium Stiff Silt/Lean Clay with Sand and I.O. Deposits, Water Bearing at 16'		A-4	ML	3TW 659	85		0		
				A-6	CL	SS 660	75	4	17	36	
		887.0 ft	18.0 ft								
885	20	Gray Moist to Wet Medium Stiff Fat Clay with Some I.O. and Silt Deposits		A-7-5	CH	3TW 661	65		31	100	
				A-7-5	CH	SS 662	100	5	34	114	
880	25			A-7-5	CH	3TW 663	80		35	106	
				A-7-5	CH	SS 664	95	4	34	98	
		877.0 ft	28.0 ft								

NDDOT LOG LAT/LONG - 20171219.GDT - 2/3/25 15:58 - F:\LAB\PROJECTS\GINT\FARGO SALT SHED B1 & B2.GPJ



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION  
300 AIRPORT ROAD  
BISMARCK, ND 58504

# LOG OF BORING SB - 2

PAGE 1 OF 1

PROJECT NUMBER BLD801725 - Fargo Salt Shed DATE STARTED 10/24/24 COMPLETED 10/24/24  
PCN \_\_\_\_\_ ELEVATION 906 ft  
LOCATION Cass County Northing 5192828.45 m Easting 664079.37 m  
DRILLED BY Dallan LOGGED BY Jamie RP+Feet ft Offset \_\_\_\_\_  
ENGINEER \_\_\_\_\_ DRILLING METHOD \_\_\_\_\_  
NOTES Coordinate System: NAD 1983 UTM Zone 14N. Surface elevations based off of Google Earth.

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	AASHTO	USCS	SAMPLE TYPE & NUMBER	RECOVERY (%)	© SPT N VALUE	PL MC LL 30 60 90 120 CLAY FRACTION (%)	TESTS & REMARKS
	0	0.7' Gravel	0.7 ft							
905		905.3 ft								
		Brown/Gray Moist Medium Stiff Fat Clay with I.O. and Silt Laminations								
	5			A-7-6	CH	3TW 665	30		22 66	
				A-1-b	SP-SM	3TW 665.1	30		0	
900				A-7-6	CH	SS 666	90	8	24 77	
	10			A-7-6	CH	3TW 667	75		24 75	
895				A-7-6	CH	SS 668	90	5	27 82	
		892.0 ft	14.0 ft							
	15	Brown Moist/Wet Loose Sandy Silt with Some I.O. Laminations, Water Bearing at 16'		A-4	ML	3TW 669	85		0	
890		889.0 ft	17.0 ft	A-4	SM	SS 670	100	2	0	
		Gray Moist Soft to Medium Stiff Fat Clay with Some I.O. and Silt Deposits		A-7-6	CH	SS 671	100	2	22 57	
	20			A-7-5	CH	3TW 672	85		34 95	
885				A-7-5	CH	SS 673	95	7	33 113	
	25			A-7-5	CH	3TW 674	85		35 108	
880				A-7-5	CH	SS 675	100	3	32 100	
		878.0 ft	28.0 ft							

Bottom of borehole at 28.0 ft

$\gamma_d = 76.0$  pcf  
 $\gamma = 111.3$  pcf  
 $S_u = 985$  psf

NDDOT LOG LAT/LONG - 20171219.GDT - 2/3/25 15:58 - F:\LAB\PROJECTS\GINT\FARGO SALT SHED B1 & B2.GPJ

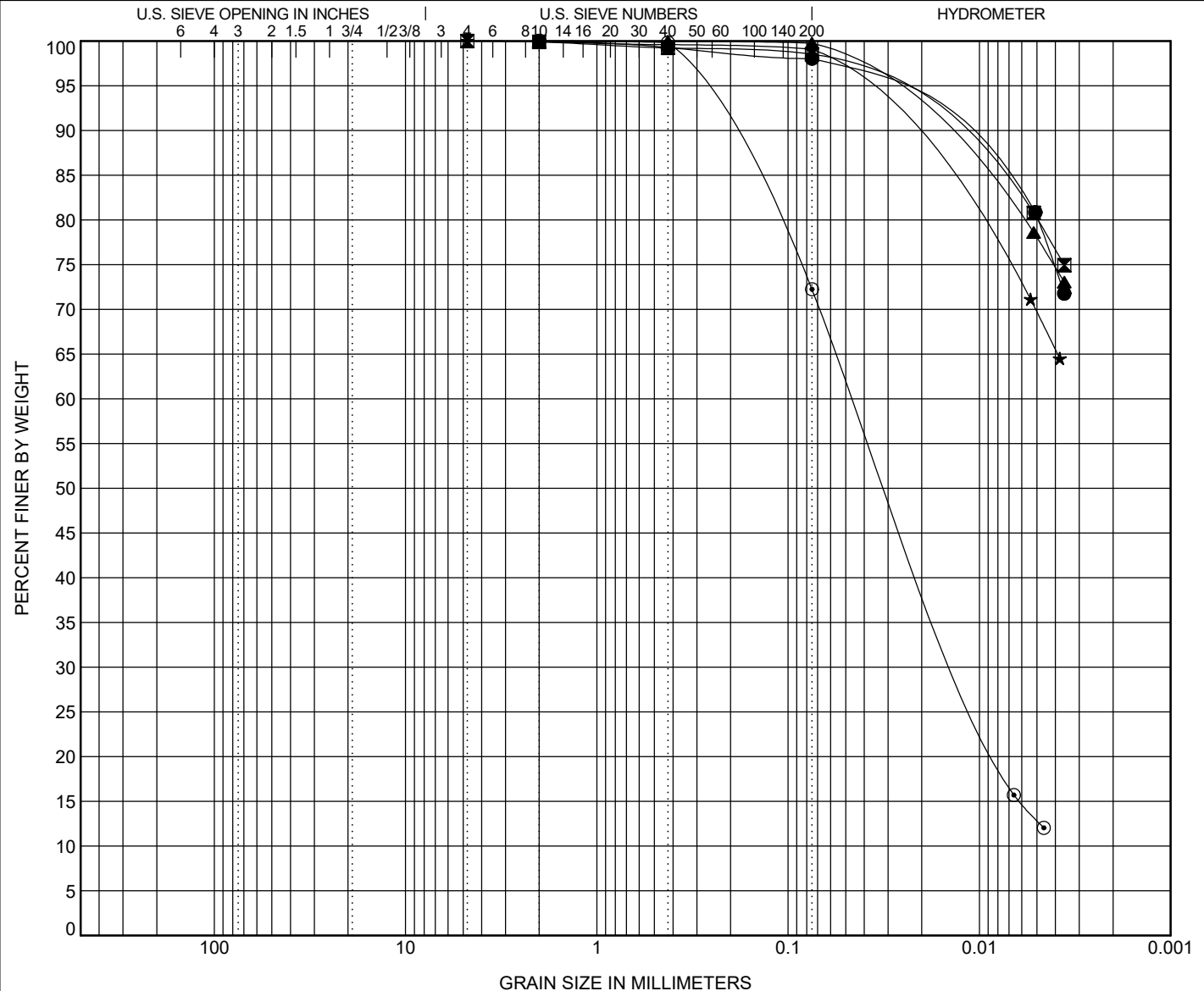
## Appendix B

### Lab Analysis

PROJECT NUMBER BLD801725 - Fargo Salt Shed

LOCATION Cass County

PCN \_\_\_\_\_



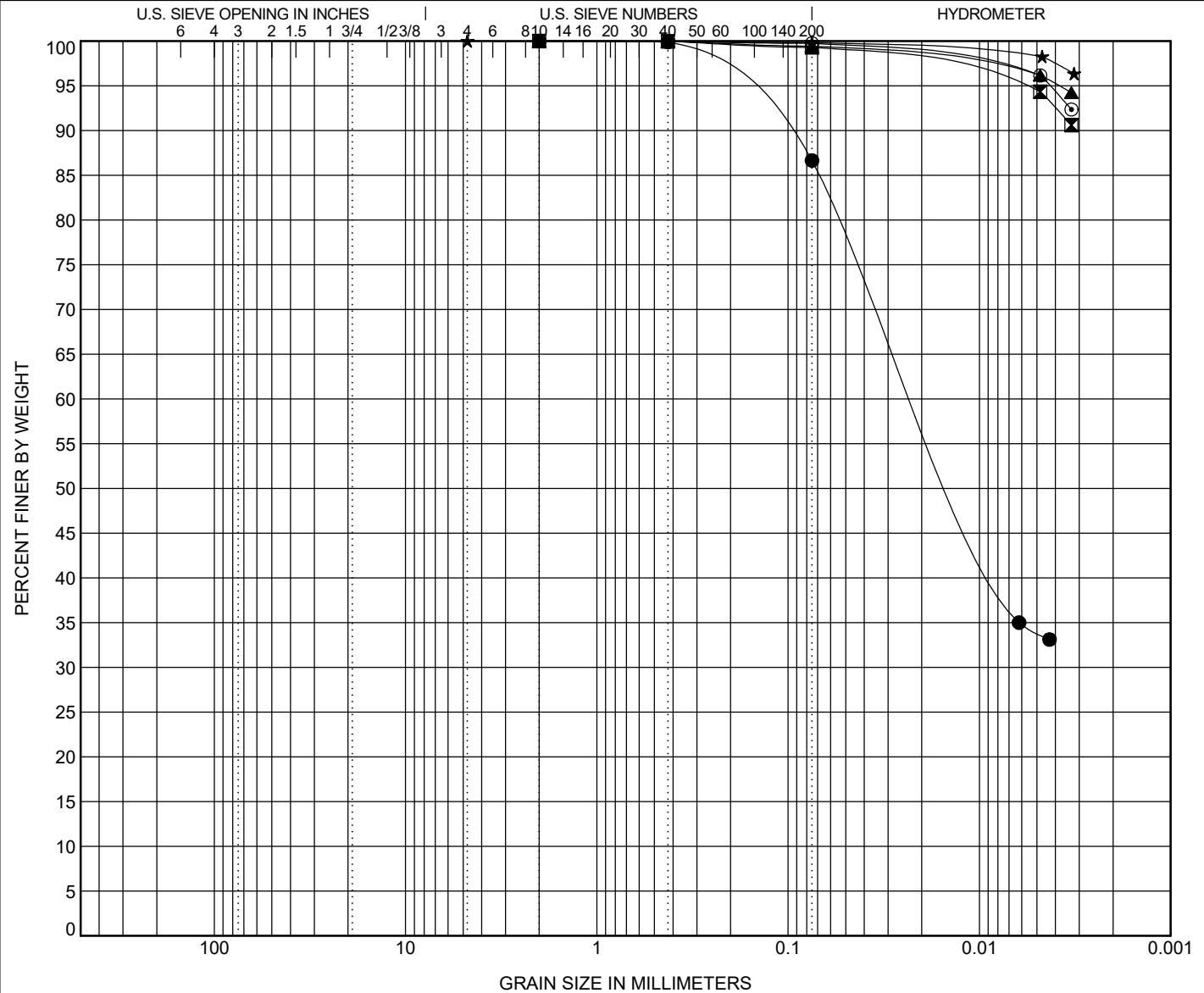
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	AASHTO Classification		USCS Classification		LL	PL	PI	Cc	Cu
● SB - 1	4.0	A-7-6 (56)		CH		74	25	49		
■ SB - 1	6.0	A-7-6 (63)		CH		79	24	55		
▲ SB - 1	9.0	A-7-6 (57)		CH		73	24	49		
★ SB - 1	11.0	A-7-6 (49)		CH		66	23	43		
⊙ SB - 1	14.0	A-4 (0)		ML		NP	NP	NP		
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● SB - 1	4.0	2				0.0	2.0	98.0		
■ SB - 1	6.0	4.75				0.0	1.5	98.5		
▲ SB - 1	9.0	2				0.0	0.2	99.8		
★ SB - 1	11.0	4.75				0.0	0.9	99.1		
⊙ SB - 1	14.0	2	0.044	0.012		0.0	27.7	72.3		

PROJECT NUMBER BLD801725 - Fargo Salt Shed

LOCATION Cass County

PCN \_\_\_\_\_

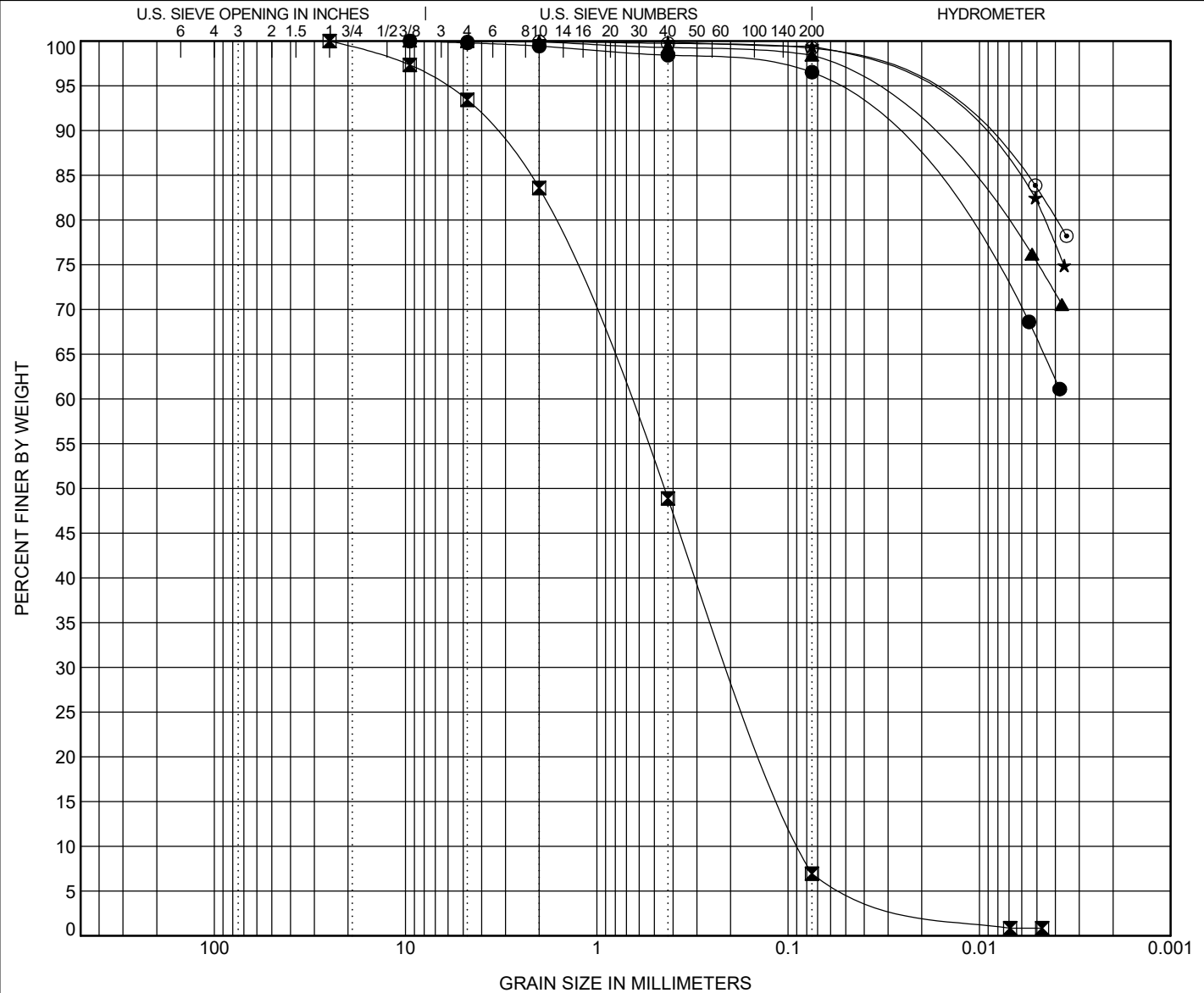


# GRAIN SIZE DISTRIBUTION

PROJECT NUMBER BLD801725 - Fargo Salt Shed

LOCATION Cass County

PCN \_\_\_\_\_



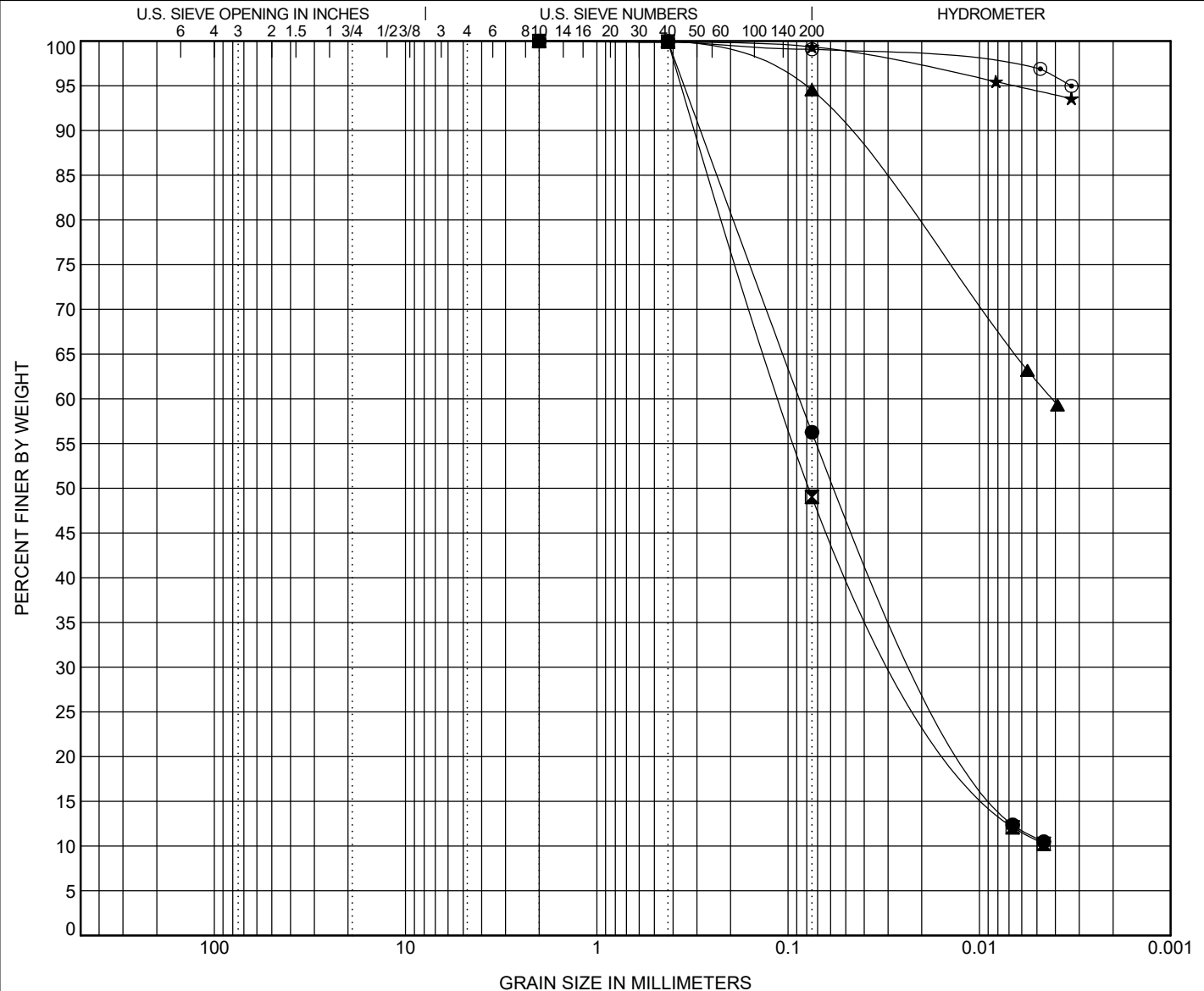
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	AASHTO Classification		USCS Classification		LL	PL	PI	Cc	Cu
● SB - 2	4.0	A-7-6 (48)		CH		66	22	44		
■ SB - 2	4.6	A-1-b (0)		SP-SM		NP	NP	NP	0.64	8.20
▲ SB - 2	6.0	A-7-6 (60)		CH		77	24	53		
★ SB - 2	9.0	A-7-6 (58)		CH		75	24	51		
⊙ SB - 2	11.0	A-7-6 (64)		CH		82	27	55		
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● SB - 2	4.0	9.5				0.2	3.3	96.5		
■ SB - 2	4.6	25	0.698	0.195	0.085	6.6	86.5	6.9		
▲ SB - 2	6.0	9.5				0.1	1.5	98.4		
★ SB - 2	9.0	2				0.0	0.6	99.4		
⊙ SB - 2	11.0	9.5				0.1	0.7	99.2		

PROJECT NUMBER BLD801725 - Fargo Salt Shed

LOCATION Cass County

PCN \_\_\_\_\_



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	AASHTO Classification		USCS Classification		LL	PL	PI	Cc	Cu
● SB - 2	14.0	A-4 (0)		ML		NP	NP	NP		
☒ SB - 2	16.0	A-4 (0)		SM		NP	NP	NP		
▲ SB - 2	17.0	A-7-6 (37)		CH		57	22	35		
★ SB - 2	19.0	A-7-5 (73)		CH		95	34	61		
⊙ SB - 2	21.0	A-7-5 (95)		CH		113	33	80		
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● SB - 2	14.0	2	0.087	0.018		0.0	43.7	56.3		
☒ SB - 2	16.0	2	0.109	0.022		0.0	51.0	49.0		
▲ SB - 2	17.0	2	0.004			0.0	5.5	94.5		
★ SB - 2	19.0	2				0.0	0.6	99.4		
⊙ SB - 2	21.0	2				0.0	0.9	99.1		





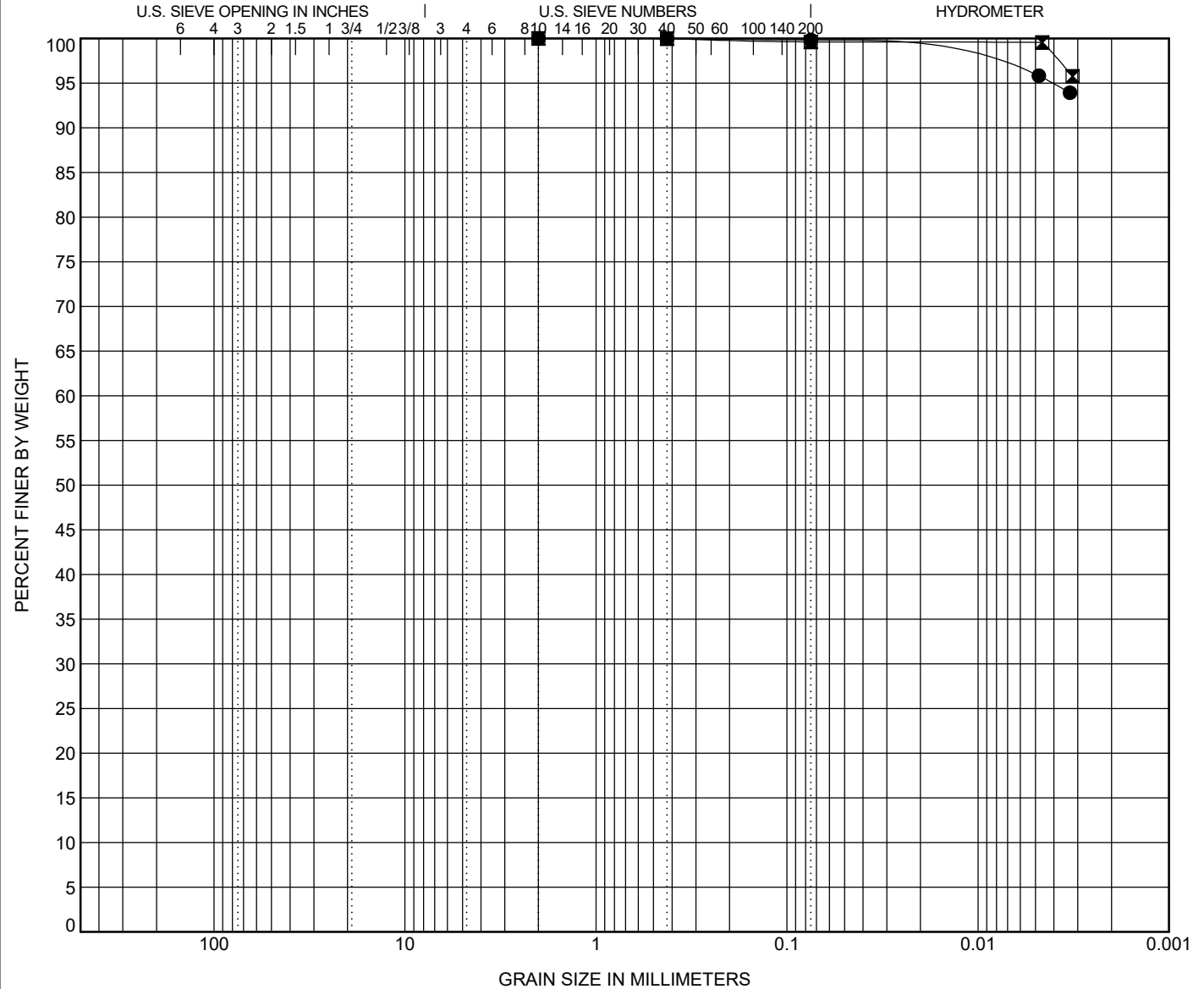
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION  
300 AIRPORT ROAD  
BISMARCK, ND 58504

# GRAIN SIZE DISTRIBUTION

PROJECT NUMBER BLD801725 - Fargo Salt Shed

LOCATION Cass County

PCN



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE		DEPTH	AASHTO Classification			USCS Classification		LL	PL	PI	Cc	Cu
●	SB - 2	24.0	A-7-5 (89)			CH		108	35	73		
☒	SB - 2	26.0	A-7-5 (82)			CH		100	32	68		
BOREHOLE		DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	SB - 2	24.0	2				0.0	0.2	99.8			
☒	SB - 2	26.0	2				0.0	0.4	99.6			



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION  
300 AIRPORT ROAD  
BISMARCK, ND 58504

## SUMMARY OF LABORATORY RESULTS

PAGE 1 OF 1

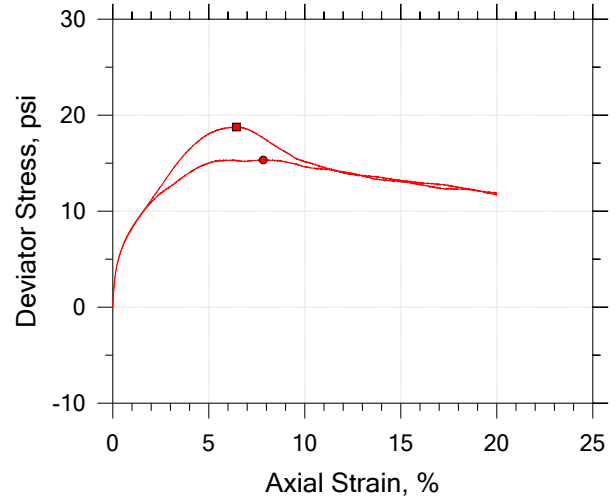
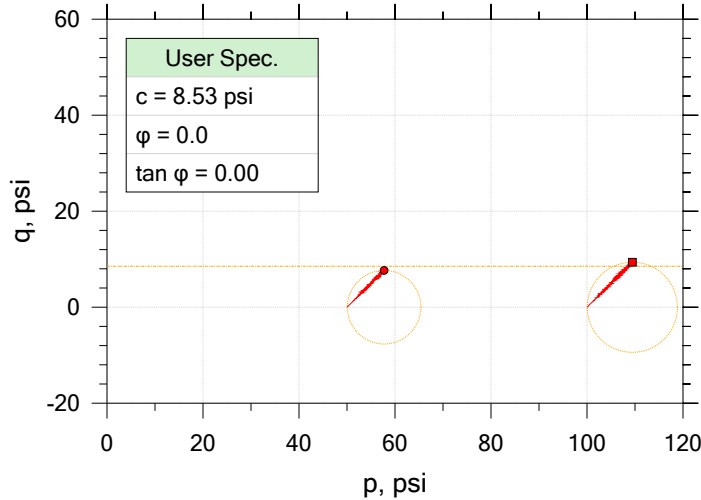
PROJECT NUMBER BLD801725 - Fargo Salt Shed

LOCATION Cass County

PCN

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	AASHTO Classification	USCS Classification	Water Content (%)	Avg. Water Content (%)	Dry Density (pcf)	Saturation (%)	Void Ratio
SB - 1	4.0	74	25	49	2	98	A-7-6 (56)	CH	36.6	36.6			
SB - 1	6.0	79	24	55	4.75	99	A-7-6 (63)	CH	50.4	50.4			
SB - 1	9.0	73	24	49	2	100	A-7-6 (57)	CH	44.4	44.4	75.0		
SB - 1	11.0	66	23	43	4.75	99	A-7-6 (49)	CH	43.7	43.7			
SB - 1	14.0	NP	NP	NP	2	72	A-4 (0)	ML	26.0	26.0			
SB - 1	16.0	36	17	19	2	87	A-6 (16)	CL	41.8	41.8			
SB - 1	19.0	100	31	69	2	99	A-7-5 (82)	CH	40.5	40.5			
SB - 1	21.0	114	34	80	2	99	A-7-5 (95)	CH	53.8	53.8			
SB - 1	24.0	106	35	71	4.75	100	A-7-5 (86)	CH	77.1	77.1			
SB - 1	26.0	98	34	64	2	100	A-7-5 (78)	CH	75.4	75.4			
SB - 2	4.0	66	22	44	9.5	97	A-7-6 (48)	CH	31.8	31.8			
SB - 2	4.6	NP	NP	NP	25	7	A-1-b (0)	SP-SM	4.8	4.8			
SB - 2	6.0	77	24	53	9.5	98	A-7-6 (60)	CH	35.0	35.0			
SB - 2	9.0	75	24	51	2	99	A-7-6 (58)	CH	44.4	44.4			
SB - 2	11.0	82	27	55	9.5	99	A-7-6 (64)	CH	46.7	46.7			
SB - 2	14.0	NP	NP	NP	2	56	A-4 (0)	ML	16.9	16.9			
SB - 2	16.0	NP	NP	NP	2	49	A-4 (0)	SM	34.8	34.8			
SB - 2	17.0	57	22	35	2	95	A-7-6 (37)	CH	38.2	38.2			
SB - 2	19.0	95	34	61	2	99	A-7-5 (73)	CH	46.4	46.4	76.0		
SB - 2	21.0	113	33	80	2	99	A-7-5 (95)	CH	55.6	55.6			
SB - 2	24.0	108	35	73	2	100	A-7-5 (89)	CH	74.6	74.6			
SB - 2	26.0	100	32	68	2	100	A-7-5 (82)	CH	78.0	78.0			

# Unconsolidated Undrained by ASTM D4767

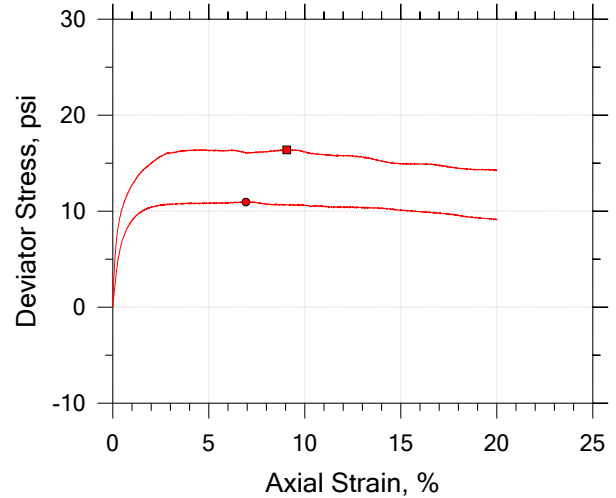
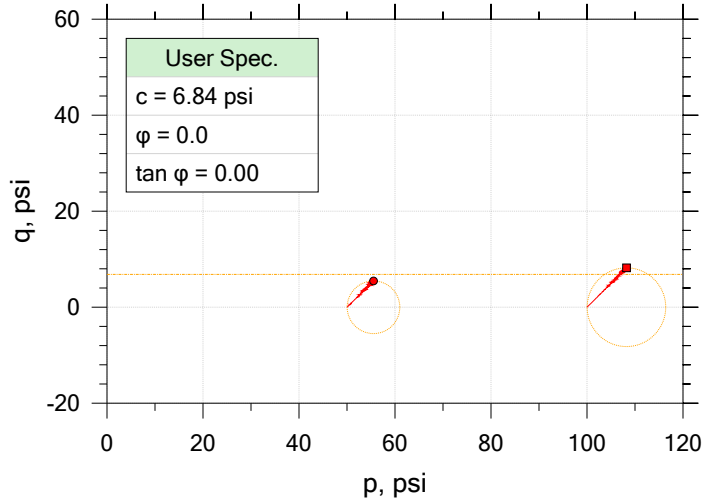


Symbol	■	●		
Sample ID	SS -657- 24	SS -657- 24		
Depth	9.0 - 11.0	9.0 - 11.0		
Test Number	UU -58- 24	UU -59- 24		
Initial				
Height, in	5.764	5.767		
Diameter, in	2.845	2.814		
Moisture Content (from Cuttings), %	44.4	45.6		
Dry Density, pcf	74.6	75.3		
Saturation (Wet Method), %	95.8	99.9		
Void Ratio	1.24	1.22		
Final				
Moisture Content, %	43.5	44.6		
Dry Density, pcf	77.2	76.3		
Cross-Sectional Area (Method A), in <sup>2</sup>	6.215	6.165		
Saturation, %	100.0	100.0		
Void Ratio	1.17	1.19		
Back Pressure, psi	0.0000	0.0000		
Vertical Effective Consolidation Stress, psi	100.0	49.99		
Horizontal Effective Consolidation Stress, psi	100.0	50.00		
Vertical Strain after Consolidation, %	0.0000	0.0000		
Volumetric Strain after Consolidation, %	0.0000	0.0000		
Time to 50% Consolidation, min	0.0000	0.0000		
Shear Strength, psi	9.386	7.669		
Strain at Failure, %	6.44	7.84		
Strain Rate, %/min	1.000	1.000		
Deviator Stress at Failure, psi	18.77	15.34		
Effective Minor Principal Stress at Failure, psi	100.1	50.02		
Effective Major Principal Stress at Failure, psi	118.8	65.36		
B-Value	---	---		

Notes:  
 - Before Shear Saturation set to 100% for phase calculation.  
 - Moisture Content determined by ASTM D2216.  
 - Deviator Stress includes membrane correction.  
 - Values for  $c$  and  $\phi$  determined from best-fit straight line for the specific test conditions.  
 Actual strength parameters may vary and should be determined by an engineer for site conditions.

Project Name: Fargo Section Bldg.	Location: Bismarck, ND	Project Number:
Boring Number: 1	Tester: MD	Checker: DT
Sample Number: SS -657- 24	Test Date: 11/20/24	Depth: 9.0 - 11.0
Test Number: UU -58- 24	Preparation:	Elevation:
Description: 26" Brn Gry Silty Cly with I.O. & Silt Laminations		
Remarks: Sample Test Depth 9.3 - 9.8		

# Unconsolidated Undrained by ASTM D4767



Symbol	■	●		
Sample ID	SS -672- 24	SS -672- 24		
Depth	19.0 - 21.0	19.0 - 21.0		
Test Number	UU -60- 24	UU -61- 24		
Initial				
Height, in	5.749	5.741		
Diameter, in	2.844	2.850		
Moisture Content (from Cuttings), %	46.4	45.0		
Dry Density, pcf	75.5	76.5		
Saturation (Wet Method), %	102.4	101.5		
Void Ratio	1.21	1.19		
Final				
Moisture Content, %	43.3	44.8		
Dry Density, pcf	77.5	76.1		
Cross-Sectional Area (Method A), in <sup>2</sup>	6.246	6.401		
Saturation, %	100.0	100.0		
Void Ratio	1.16	1.20		
Back Pressure, psi	0.0000	0.0000		
Vertical Effective Consolidation Stress, psi	100.0	50.00		
Horizontal Effective Consolidation Stress, psi	100.0	50.00		
Vertical Strain after Consolidation, %	0.0000	0.0000		
Volumetric Strain after Consolidation, %	0.0000	0.0000		
Time to 50% Consolidation, min	0.0000	0.0000		
Shear Strength, psi	8.197	5.480		
Strain at Failure, %	9.06	6.93		
Strain Rate, %/min	1.000	1.000		
Deviator Stress at Failure, psi	16.39	10.96		
Effective Minor Principal Stress at Failure, psi	100.1	50.06		
Effective Major Principal Stress at Failure, psi	116.5	61.02		
B-Value	---	---		

Notes:  
 - Before Shear Saturation set to 100% for phase calculation.  
 - Moisture Content determined by ASTM D2216.  
 - Deviator Stress includes membrane correction.  
 - Values for  $c$  and  $\phi$  determined from best-fit straight line for the specific test conditions.  
 Actual strength parameters may vary and should be determined by an engineer for site conditions.

Project Name: Fargo Section Bldg.	Location: Bismarck, ND	Project Number:
Boring Number: 2	Tester: MD	Checker: DT
Sample Number: SS -672- 24	Test Date: 11/21/24	Depth: 19.0 - 21.0
Test Number: UU -60- 24	Preparation:	Elevation:
Description: 21" Gry Cly with I.O. Deposits		
Remarks: Sample Test Depth 19.6 - 20.1		