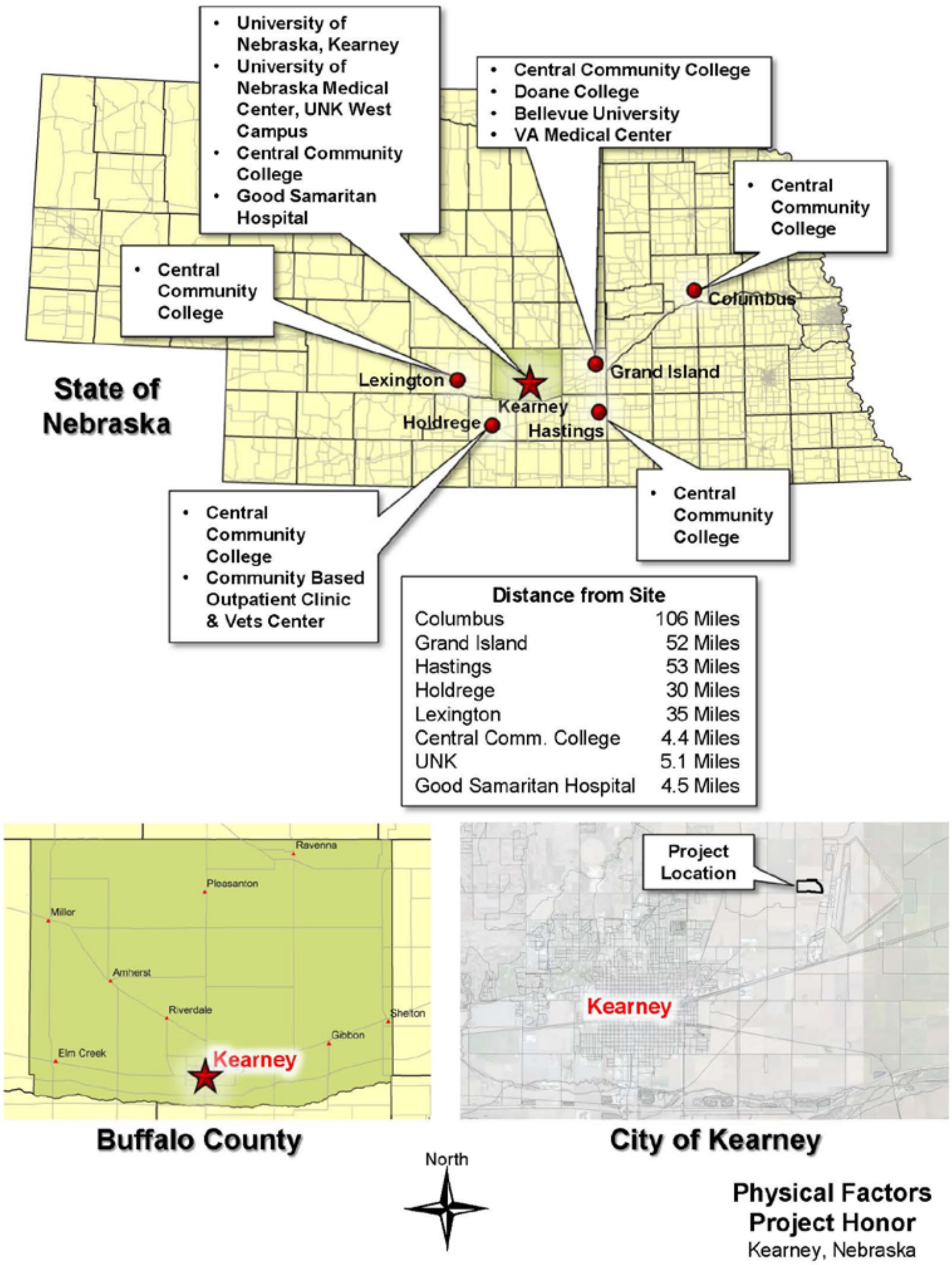
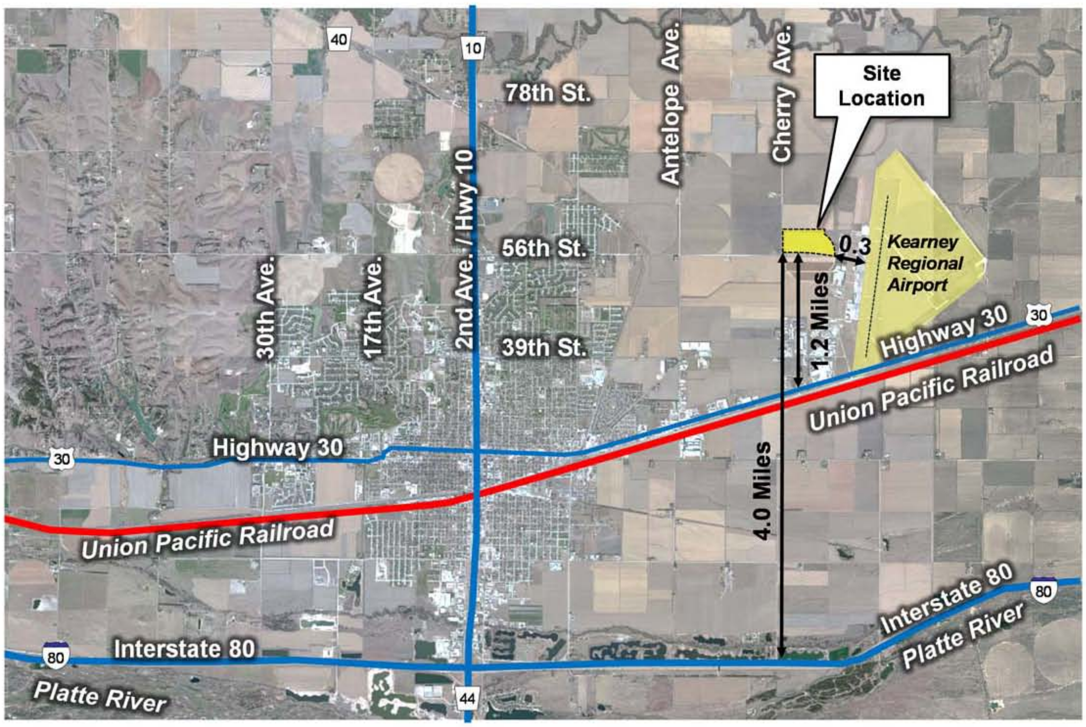
2.a.. Physical Factors – General Map

General Map: Provide map showing proposed site location within the State and County, depicting road(s) accessing the site.

i. Provide information depicting the location and distance to the following: (1) Nearest VA Medical Center, VA Community Based Outpatient Clinic (CBOC) and Vets Center; 2) Distance from community or communities providing Services (Category 5) and Support (Category 8); (3) Distance from Workforce Education institutions (Category 7).



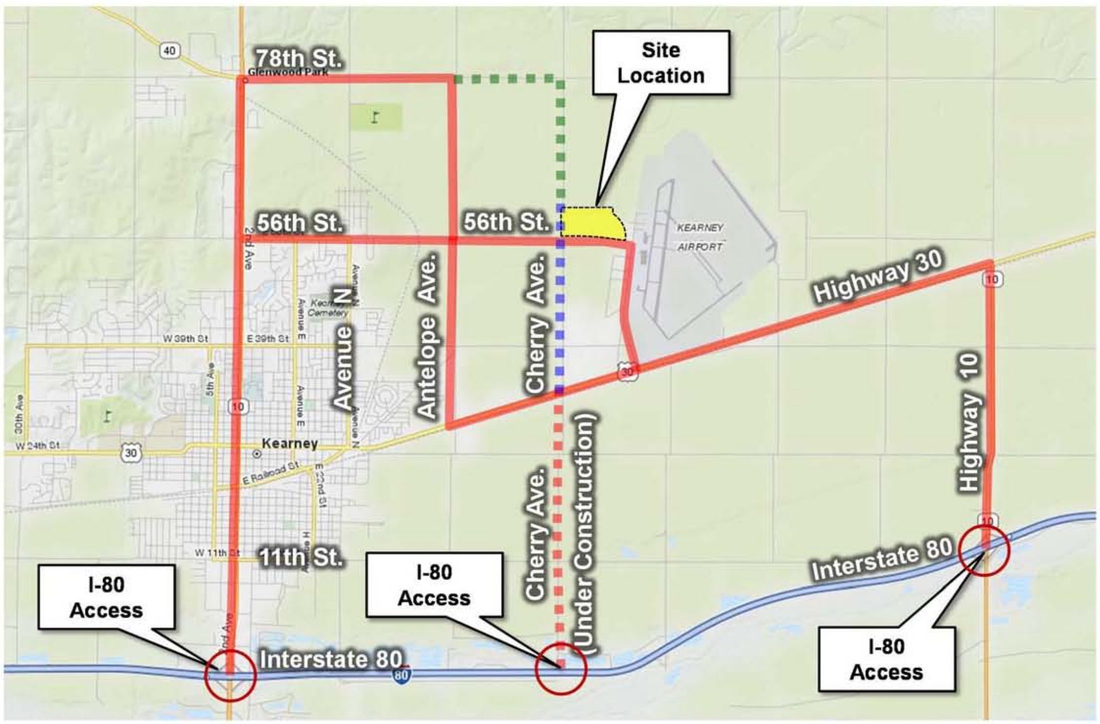
2.a.. Physical Factors – General Map





**Proximity Map**
**Physical Factors**
**Project Honor**
Kearney, Nebraska

2.a.. Physical Factors – General Map



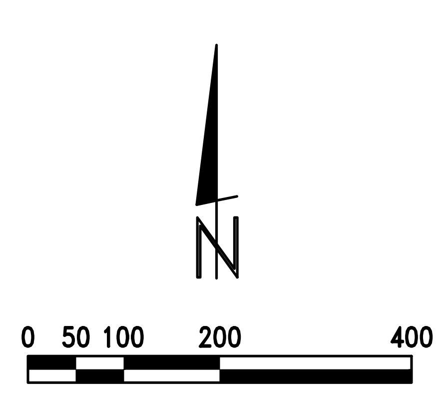

North

**Access to Site**
**Physical Factors**
**Project Honor**
Kearney, Nebraska

2.b. Physical Factors – Aerial Photograph

*Provide a current aerial photograph (1”:200’ scale) of the proposed site.*

Please see attached aerial photograph map, prepared June 6, 2013 by Miller & Associates.

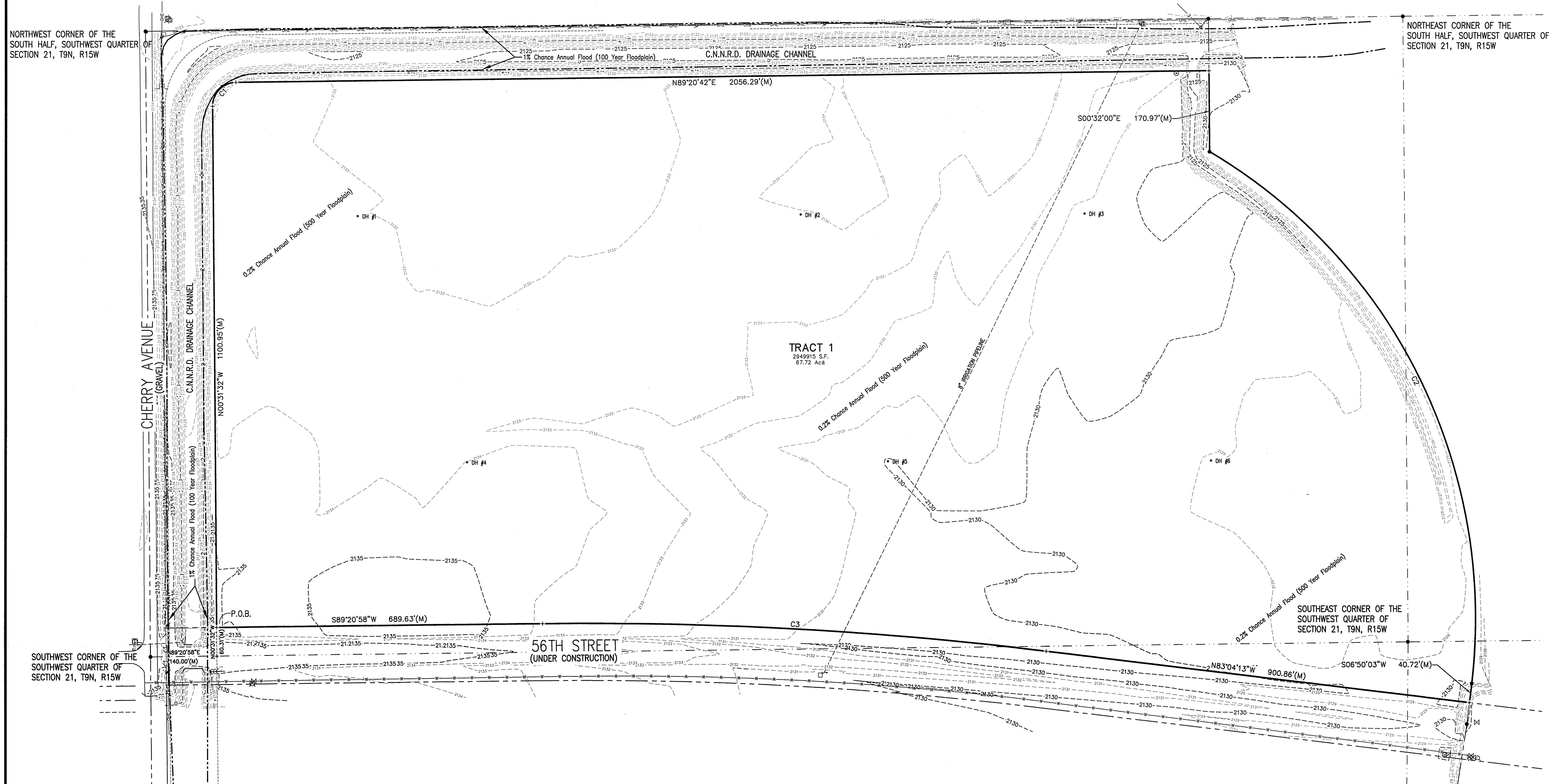




Aerial Photograph
Project Honor
Kearney, Nebraska

2.c. Physical Factors – Survey

Provide a boundary survey of the proposed site prepared by a licensed Nebraska land surveyor. The survey shall include the location of all improvements, fences, easements and rights of way on or adjacent to the property, total acreage with a metes and bound description. Include depiction of 100 and 500 year floodplain. Minimum standard for the survey is the 2011 Minimum Standard Detail Requirements for American Land Title Association (ALTA)/ American Congress on Surveying and Mapping (ACSM) Land Title Surveys.

See Attached ALTA Survey



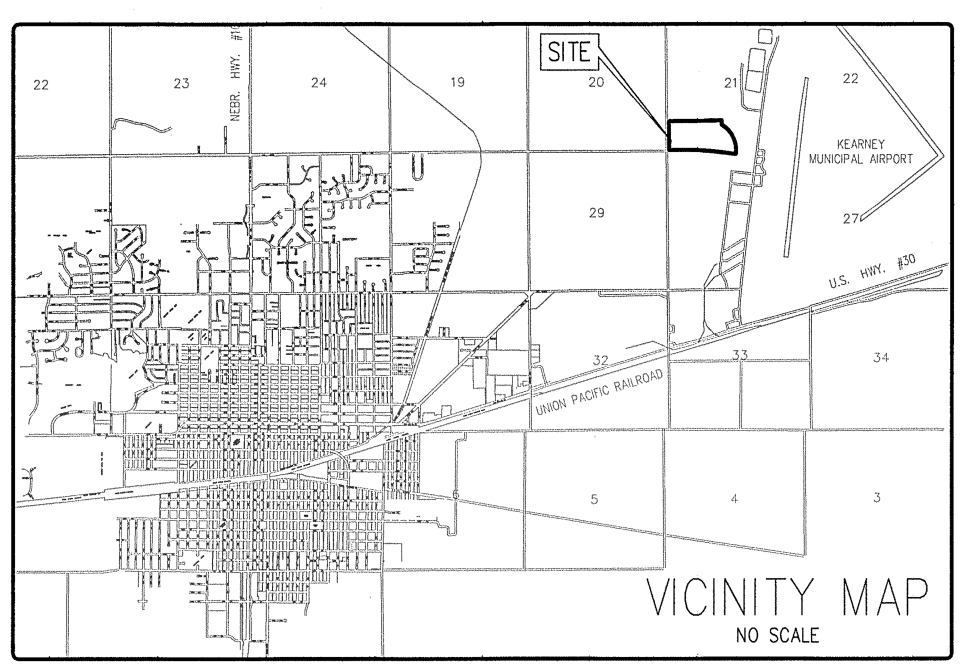

## LEGAL DESCRIPTION

LEGAL DESCRIPTION

A tract of land located in part of the South Half of the Southwest Quarter (S ½, SW ¼) and part of the Southwest Quarter of the Southeast Quarter (SW ¼, SE ¼) of Section Twenty-one (21), and part of the North Half of the Northwest Quarter (N ½, NW ¼) and part of the Northwest Quarter of the Northeast Quarter (NW ¼, NE ¼) of Section Twenty-eight (28), all in Township Nine (9) North, Range Fifteen (15) West of the Sixth Principal Meridian, Buffalo County, Nebraska, more particularly described as follows:

Referring to the Southwest Corner of said South Half of the Southwest Quarter and assuming the South Line of said Southwest Quarter as bearing N89°20'58"E and all other bearings shown hereon relative thereto; thence N89°20'58"E on said South line a distance of 140.00 feet to a point on the Easterly line of a Central Nebraska Natural Resources District Drainage Tract as recorded in the Office of the Register of Deeds of Buffalo County, Nebraska; thence N00°31'32"W on said Easterly line and parallel with the West line of said Southwest Quarter a distance of 60.31 feet to the ACTUAL POINT OF BEGINNING; thence continuing N00°31'32"W on said Easterly line and parallel with the West line of said Southwest Quarter a distance of 1100.95 feet to the beginning of a tangent curve to the right, having a central angle of 89°52'14", a radius of 50.00 feet. and an arc length of 78.43 feet; thence N89°20'42"E on the Southerly line of said C.N.N.R.D. Drainage Tract and parallel with the North line of said South Half of the Southwest Quarter a distance of 2056.29 feet; thence leaving said Southerly line S00°32'00"E a distance of 170.97 feet to the beginning of a non-tangent curve to the right, having a central angle of 66°08'54", a radius of 1147.68 feet, an arc length of 1325.01 feet and a chord bearing S26°19'44"E a distance of 1252.64 feet; thence tangent to said curve S06°50'03"W a distance of 40.72 feet to a point on the Northerly Right-of-Way of 56th Street as recorded in said County; thence N83°04'13"W on said Northerly Right-of-Way a distance of 900.86 feet to the beginning of a tangent curve to the left, having a central angle of 7°34'48". a radius of 8060.00 feet, and an arc length of 1066.31 feet; thence continuing on said Northerly Right-of-Way S89°20'58"W tangent to said curve and parallel with said South line of the Southwest Quarter a distance of 689.63 feet to the Point of Beginning. Containing 67.72 acres, more or less.

| CURVE DATA | | | | | |
|---|---|---|---|---|---|
| NUMBER | DELTA | RADIUS | LENGTH | CHORD LENGTH | BEARING |
| C1 | 89°52'14" | 50.00 | 78.43 | 70.63 | N44°24'35"E |
| C2 | 66°08'54" | 1147.68 | 1325.01 | 1252.64 | S26°19'44"E |
| C3 | 7°34'48" | 8060.00 | 1066.31 | 1065.53 | N86°51'37"W |




## ZONING INFORMATION

SITE RESTRICTIONS

According to the City of Kearney, Buffalo County, Nebraska this area is zoned M-1 - Limited Industrial District as defined in the Zoning Ordinance of the City of Kearney, Nebraska, Chapter 31-101.

All zoning information obtained form Lance Lang, City Planner, City of Kearney, Nebraska, 18 E. 22nd Street, Kearney, NE 68847, phone-(308)233-3254

## UTILITY INFORMATION

UTILITY INFORMATION

The underground utilities are shown in approximate locations as best defined from field survey information, from existing drawings and/or from physical locating by utility companies.

The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from the information available.

Contact all utility companies for exact locations prior to any construction or excavation at Digger's Hotline of Nebraska (800) 331-5666.

## NOTES CORRESPONDING TO TITLE REPORT

NOTES CORRESPONDING TO BARNEY ABSTRACT & TITLE COMPANY'S TITLE REPORT DATED JUNE 6, 2013 @ 8:00 AM

a. Easement given to American Telephone and Telegraph Company of Nebraska, to construct, operate and maintain a communication system across the SE ¼ SW ¼ of 21-9-15, together with the rights of ingress and egress, dated December 6, 1940 and recorded January 9, 1941 in Misc. Book "P", Page 78. NOTE - Easement has been assigned and is now held by Northwestern Bell Telephone Company. (easement is one rod (16.5') and undefined by description and cannot be graphically shown).

b. Easement given to American Telephone and Telegraph Company of Nebraska, to construct, operate and maintain a communication system across the N ½ SW ¼ and SW ¼ SW ¼ of 21-9-15, together with the rights of ingress and egress, dated December 6, 1940 and recorded January 9, 1941 in Misc. Book "P", Page 78. NOTE - Easement has been assigned and is now held by Northwestern Bell Telephone Company. (easement is one rod (16.5') and undefined by description and cannot be graphically shown).

c. Easement given to Buffalo County Public Power District, to construct, operate and maintain electric transmission lines across Lots 1 and 4, in 28-9-15, together with rights of ingress and egress, dated February 2, 1938 and recorded September 25, 1942 in Misc, Book "Q", Page 416, which was assigned at bottom of said instrument to Dawson County Public Power District, (does not affect this tract).

d. Easement given to Buffalo County Public Power District, to construct, operate and maintain electric transmission lines across E ½ NE ¼ of 21-9-15 and the North 130 acres of the NW ¼ of 28-9-15, together with rights of ingress and egress, dated January 26, 1938 and recorded September 25, 1942 in Misc, Book "Q", Page 417. NOTE - Instrument contains Assignment from Buffalo County Public Power District, to Dawson County Public Power District. (blanket in nature and cannot be graphically shown).

e. Terms, covenants and conditions contained in Quitclaim Deed given by the United States of America, to the City of Kearney, Nebraska, dated June 15, 1950 and recorded July 7, 1950 in Deed Book 151, Page 47. (blanket in nature and cannot be graphically shown).

f. Terms and conditions contained in Deed of Release given by the United States of America, dated May 4, 1962 and recorded May 11, 1962 in Deed Book 179, Page 245. (does not affect this tract).

g. Easement given to Consumers Public Power District to construct, operate and maintain electric lines across the W ½ of 28-9-15, together with rights of ingress and egress, recorded December 15, 1969 in Misc, Book 52, Page 118, (undefined by description and cannot be graphically shown).

h. Terms and conditions contained in Deed of Release given by the United States of America, dated April 12, 1971 and recorded April 29, 1971 in Deed Book 206, Page 377. (blanket in nature and cannot be graphically shown).

i. Terms and conditions contained in Deed of Release given by the United States of America, dated March 31, 1972 and recorded April 13, 1972 in Deed Book 209, Page 106. (does not affect this tract).

j. Easement given to Consumers Public Power District to construct, operate and maintain electric lines across the SW ¼ of 28-9-15, together with rights of ingress and egress, dated June 27, 1972 and recorded July 6, 1972 in Misc, Book 56, Page 64, (does not affect this tract).

k. Terms and conditions contained in Deed of Release given by the United States of America, dated June 5, 1980 and recorded June 10, 1980 on Roll 80, Page 3775. (does not affect this tract).

l. Terms and conditions contained in Deed of Release given by the United States of America, dated June 12, 1980 and recorded June 18, 1980 on Roll 80, Page 3775. (does not affect this tract).

m. Terms and conditions of the Easement Deed and Bill of Sale given by City of Kearney to the Union Pacific railroad Company affecting a 0.74 acres tract located in Government Lot 4 in 28-9-15 and a 5.0 acre tract located in 33-9-15, dated July 22, 1980 and recorded July 25, 1980 on Roll 80, page 4533. (does not affect this tract).

n. Terms and conditions of the Easement Deed and Bill of Sale given by City of Kearney to the Union Pacific railroad Company affecting a 1.84 acres tract located in Government Lots 1 and 4 in 28-9-15, dated August 11, 1982 and recorded August 17, 1982 on Roll 82, page 4563. (does not affect this tract).

o. Terms and conditions contained in Deed of Release given by the United States of America, dated June 8, 1982 and recorded August 17, 1982 on Roll 82, Page 4570. (does not affect this tract).

p. Terms and conditions contained in Deed of Release given by the United States of America, dated March 30, 1982 and recorded August 27, 1982 on Roll 82, Page 4779. (does not affect this tract).

q. Terms and conditions contained in Deed of Release given by the United States of America, dated December 19, 1986 and recorded December 23, 1986 on Roll 86, Page 10357. (does not affect this tract).

r. Railroad right-of-way easement across a tract of land being part of Government Lots 1 and 4 and part of the S ½ NW ¼ and part of the W ½ SW ¼ of 28-9-15, authorized by the Kearney Municipal Airport and the City of Kearney by Resolution No. 96-203 passed and approved November 26, 1996 and recorded December 2, 1996 as Inst. 96-7951. (does not affect this tract).

s. Electric Transmission Line Easement given to Nebraska Public Power District, to construct operate and maintain electric transmission lines across a strip of land in SW ¼ SW ¼ of 21-9-15, together with rights of ingress and egress, dated January 26, 1999 and recorded February 17, 1999 as Inst. 1999-1306. (does not affect this tract).

t. Terms and conditions of the Lease made between the City of Kearney, and the State of Nebraska Military Department, for a 29.35 acre tract of land located in part of Lots 1, 2, 13, 14, Proposed Industrial Subdivision, part of the SE ¼ SW ¼ and part of the SW ¼ SE ¼ of 21-9-15 and part of the NW ¼ NE ¼ of 28-9-15, passed and approved September 22, 1992 and recorded April 6, 2006 as Inst. 2006-2334. (does not affect this tract).

u. Terms and conditions of the Lease made between the City of Kearney, and the State of Nebraska Military Department, for a 29.35 acre tract of land located in part of Lots 1, 2, 13, 14, Proposed Industrial Subdivision, part of the SE ¼ SW ¼ and part of the SW ¼ SE ¼ of 21-9-15 and part of the NW ¼ NE ¼ of 28-9-15, passed and approved November 24, 1992 and recorded April 6, 2006 as Inst. 2006-2335. (does not affect this tract).

v. C.N.N.R.D. Drainage Easement, as shown on the map attached to Ordinance No. 7492 of the City of Kearney, Nebraska, passed and approved December 9, 2008 and recorded December 31, 2008 as Inst. 2008-9048. (abuts tract on west and north sides as shown).

w. The Warranty Deed given by City of Kearney, Buffalo County, Nebraska, recorded May 14, 2013 as Inst. 2013-3777, conveys a strip of land in the S ½ SW ¼ of 21-9-15 to The State of Nebraska, Department of Roads for highway purposes, and creates a controlled access line and restricts access to said highway. (does not affect this tract).

x. The Warranty Deed for the Control of Ingress and Egress given by City of Kearney, Buffalo County, Nebraska, to The State of Nebraska, Department of Revenue, recorded May 14, 2013 as Inst. 2013-3778, creates a controlled access line in the NW ¼ of 28-9-15. (does not affect this tract).

## SURVEYOR'S CERTIFICATE

SURVEYOR'S CERTIFICATE

To **City of Kearney, Nebraska, a Municipal Corporation**
**Barney Abstract & Title Co.**

This is to certify that this map or plat and the survey on which it is based were made on the date shown below of the premises described in **Barney Abstract & Title Company** Title Report No. **2013-200** dated **June 6, 2013 @ 8:00 AM**, and in accordance with "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys," jointly established and adopted by ALTA, ACSM and NSPS in 2011, as defined therein. Table A items 3, 4, 6a, 7a, 8, 11a, 16, 18 are included and it meets the accuracy requirements of an Urban Survey, as defined therein.

The Property lies within Flood Zones X, as designated by current Federal Emergency Management Agency Maps which make up a part of the National Flood Insurance Administration Report; Community Panel No. **31019C0610D** dated **November 26, 2010.**

The survey correctly shows (i) the zoning classification for the property, (ii) the permitted uses within such classification, and (iii) the sources of such information. If the existing use if a non-conforming but permitted use, the survey also includes such statements of the surveyor as the surveyor can make to assure the addressees of this certificate that the current use is "grandfathered" or permitted by any special approval, the date of that approval, the name of the body that issued such approval, and the source of such information.

The subject property has ingress and egress to and from **Cherry Avenue** which is a graveled, public right-of-way.

Ronald G. Ridgway

By [signature]

Date 06/10/13

Nebraska Professional Registered Land Surveyor No. 568

Date of Survey: 06/06/13
Date of Last Revision: 06/10/13

(Seal: NEBRASKA REGISTERED LAND SURVEYOR LS-568 RONALD G. RIDGWAY)

N

0 100 200
SCALE IN FEET

- ● = CORNERS FOUND AS INDICATED
- + = TEMPORARY POINT
- (P) = PLATTED DISTANCES
- (M) = MEASURED DISTANCES
- —OHE— = OVERHEAD ELECTRIC LINE
- —E—E— = UNDERGROUND ELECTRIC LINE
- = POWER OR TELEPHONE POLE
- = LIGHT POLE
- = ELECTRIC TRANSFORMER
- = ELECTRIC BOX
- = GUY ANCHOR
- —T—T— = UNDERGROUND TELEPHONE LINE
- = TELEPHONE PEDESTAL
- = GAS METER OR RISER
- —G— = GAS LINE
- —x—x—x— = FENCE
- = SIGN
- —W—W—W— = WATER LINE
- = FIRE HYDRANT
- = WATER VALVE
- —Stm—Stm— = STORM SEWER LINE
- —San—San— = SANITARY SEWER LINE
- = MANHOLE
- = HANDICAP PARKING STALL
- ● = CONCRETE RIGHT-OF-WAY MARKER

# "ALTA/ACSM TITLE SURVEY"

PROJECT HONOR
KEARNEY
BUFFALO COUNTY, NEBRASKA

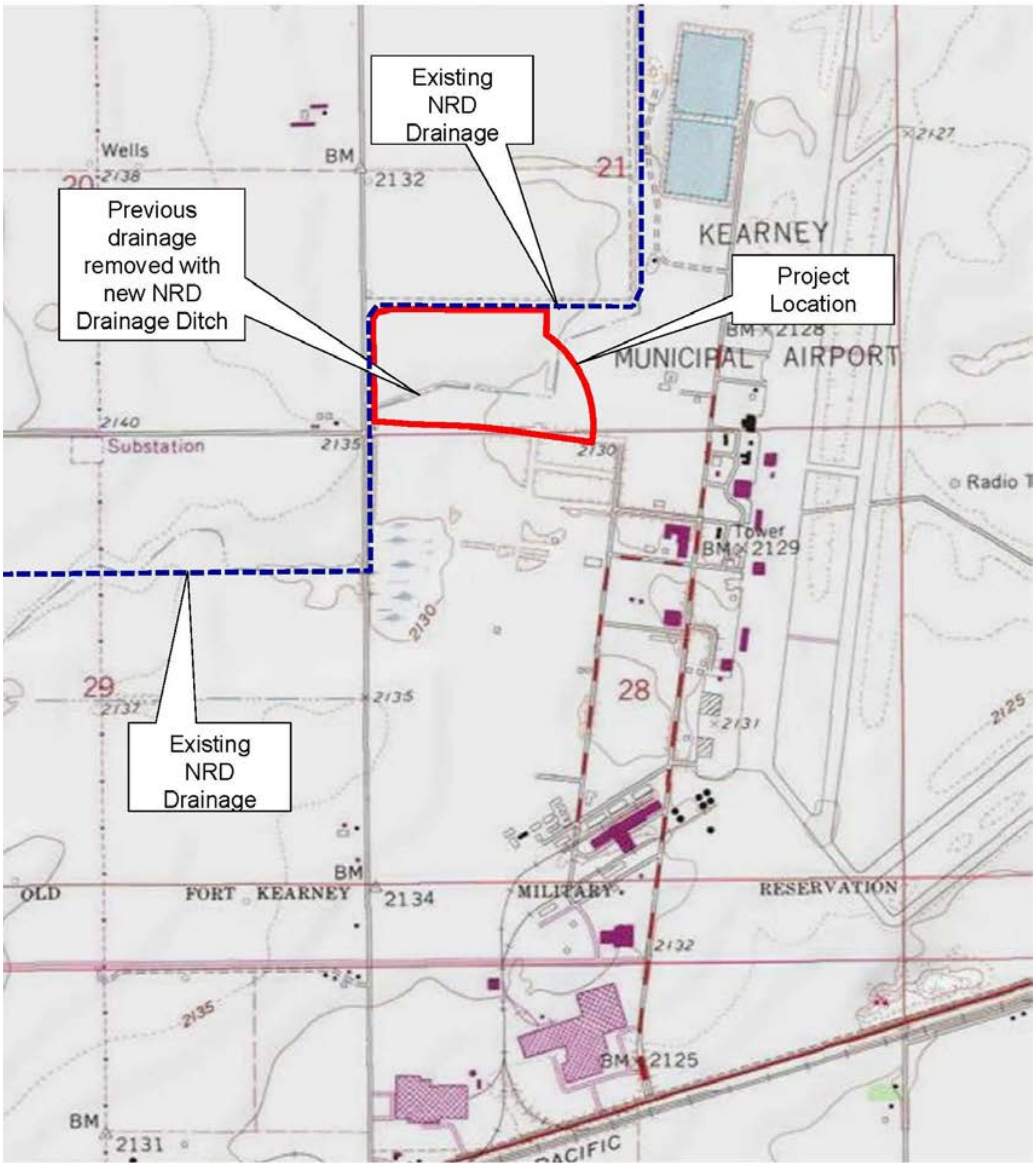
| | |
|---|---|
| PARTY CHIEF: | CHAD A. DIXON |
| | P.R.L.S. 672 |
| SURVEY COMPLETED: | JUNE 6, 2013 |
| DRAWN BY: | RGR |
| REVISIONS: | 04/03/12 |

Miller & Associates
1111 CENTRAL AVENUE
KEARNEY, NE 68847-6833
Tel: 308-234-6456
Fax: 308-234-1146

SHEET 1 OF 1 SHEETS

2.d. Physical Factors – Grade Contours

Provide a United States Geological Survey (USGS) 7.5 Minute Series topographical map, with the property boundaries outlined, which indicates patterns of drainage on and off the proposed site. Note any limiting factors (flood plain, creeks and other off-site drainage passing through property) which would limit construction or location of improvements on the site.




North

**USGS 7.5 Minute Map**
**Physical Factors**
**Project Honor**
Kearney, Nebraska

## 2.e. Physical Factors – Soil Survey

Provide Web Soil Survey with types of topsoil and subsoil extracted from digital soil survey database maintained by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)/National Cooperative Soil Survey. Soil survey shall indicate whether infertile topsoil would require replacement, whether there would be a need for over-excavation of unsuitable soil or subsoil and replacement with surcharge for construction.

See attached Soil Survey reference USDA NRCS

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

# Custom Soil Resource Report for

# Buffalo County, Nebraska

## Project Honor Site


June 6, 2013

# Preface

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

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

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

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

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

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

# Contents

# How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

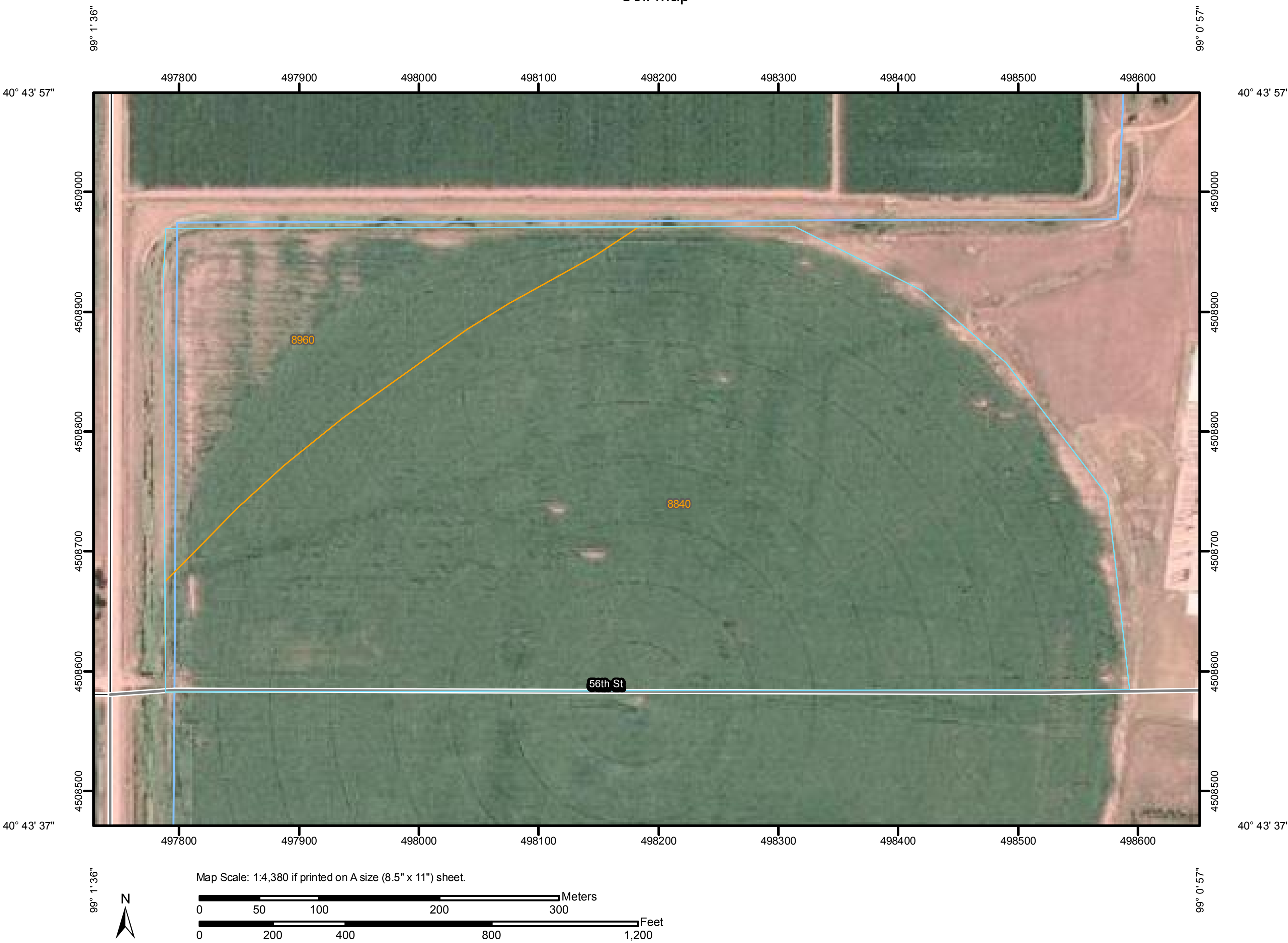
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

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

# Soil Map




Map Scale: 1:4,380 if printed on A size (8.5" x 11") sheet.

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Units

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

**Special Line Features**
- Gully
- Short Steep Slope
- Other

**Political Features**
- Cities

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:4,380 if printed on A size (8.5" × 11") sheet.

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N NAD83

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

Soil Survey Area: Buffalo County, Nebraska
Survey Area Data: Version 15, Jul 27, 2012

Date(s) aerial images were photographed: 7/16/2006

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

# Map Unit Legend

| Buffalo County, Nebraska (NE019) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| 8840 | Hall silt loam, 0 to 1 percent slopes | 57.1 | 81.6% |
| 8960 | Wood River silt loam, 0 to 1 percent slopes | 12.9 | 18.4% |
| **Totals for Area of Interest** | | **69.9** | **100.0%** |

# Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

# Buffalo County, Nebraska

## 8840—Hall silt loam, 0 to 1 percent slopes

**Map Unit Setting**

*Landscape:* Uplands
*Elevation:* 1,000 to 3,000 feet
*Mean annual precipitation:* 24 to 26 inches
*Mean annual air temperature:* 50 to 54 degrees F
*Frost-free period:* 140 to 160 days

**Map Unit Composition**

*Hall and similar soils:* 100 percent

**Description of Hall**

**Setting**

*Landform:* Flats on interfluves
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loess

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 5 percent
*Available water capacity:* Very high (about 12.2 inches)

**Interpretive groups**

*Farmland classification:* All areas are prime farmland
*Land capability classification (irrigated):* 1
*Land capability (nonirrigated):* 2c
*Hydrologic Soil Group:* C
*Ecological site:* Loamy Lowland (R071XY028NE)
*Other vegetative classification:* Silty Lowland - Veg. zone 3 (071XY050NE_2)

**Typical profile**

*0 to 17 inches:* Silt loam
*17 to 29 inches:* Silty clay loam
*29 to 60 inches:* Silt loam

## 8960—Wood River silt loam, 0 to 1 percent slopes

**Map Unit Setting**

*Landscape:* Valleys

*Elevation:* 2,000 to 2,500 feet
*Mean annual precipitation:* 24 to 26 inches
*Mean annual air temperature:* 50 to 54 degrees F
*Frost-free period:* 140 to 160 days

**Map Unit Composition**

*Wood river and similar soils:* 100 percent

**Description of Wood River**

**Setting**

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Silty alluvium

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Maximum salinity:* Very slightly saline to slightly saline (4.0 to 8.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 20.0
*Available water capacity:* High (about 11.3 inches)

**Interpretive groups**

*Farmland classification:* All areas are prime farmland
*Land capability classification (irrigated):* 2s
*Land capability (nonirrigated):* 2s
*Hydrologic Soil Group:* C
*Ecological site:* Saline Lowland (R071XY052NE)

**Typical profile**

*0 to 11 inches:* Silt loam
*11 to 36 inches:* Silty clay loam
*36 to 60 inches:* Silt loam

# Soil Information for All Uses

## Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

## Construction Materials

Construction materials interpretations are tools designed to provide guidance to users in selecting a site for potential source of various materials. Individual soils or groups of soils may be selected as a potential source because they are close at hand, are the only source available, or they meets some or all of the physical or chemical properties required for the intended application. Example interpretations include roadfill, sand and gravel, topsoil and reclamation material.

### Topsoil Source

Topsoil is used to cover an area so that vegetation can be established and maintained. The surface layer of most soils is generally preferred for topsoil because of its content of organic matter. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. Normal compaction, minor processing, and other standard construction practices are assumed.

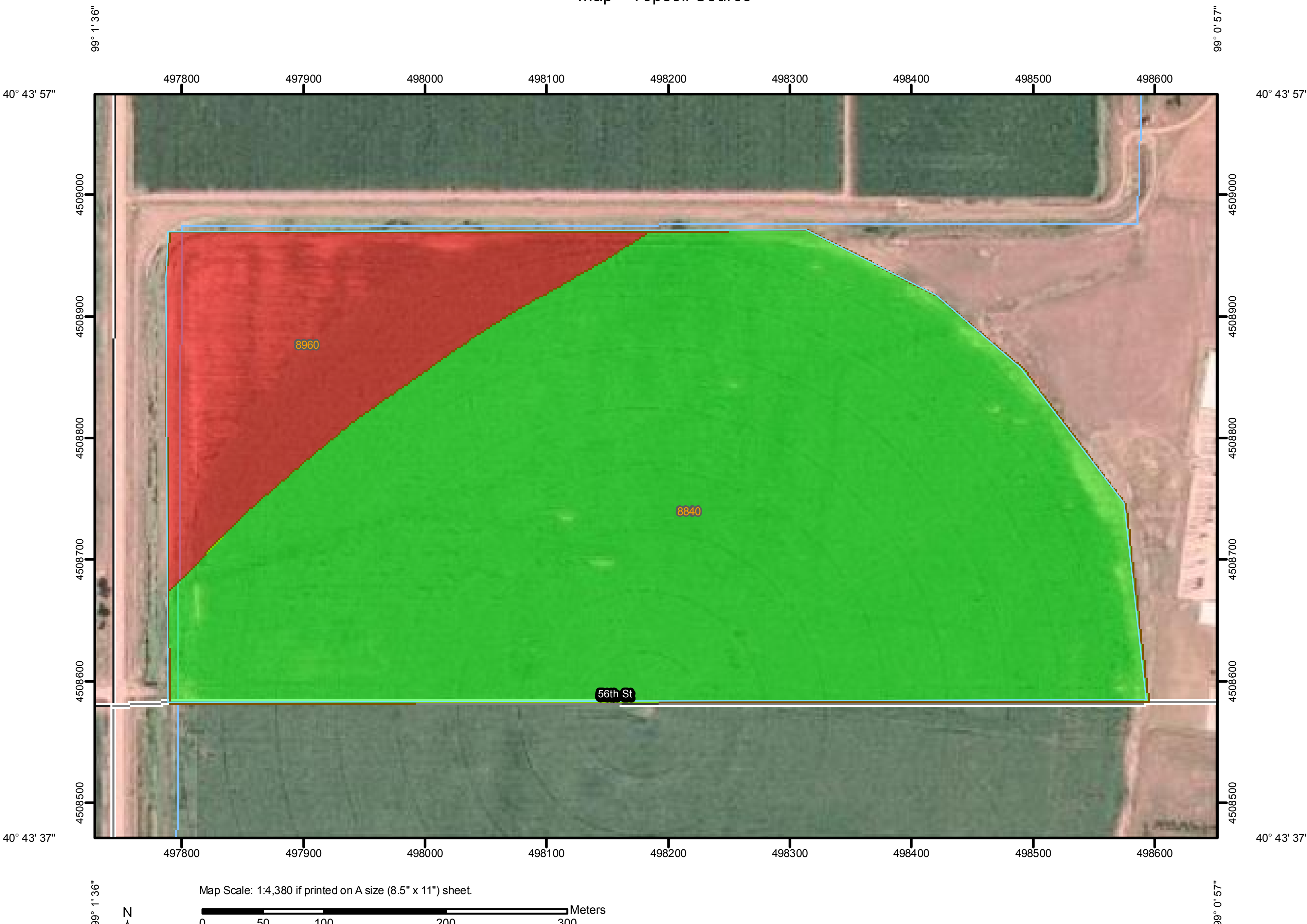
The soils are rated "good," "fair," or "poor" as potential sources of topsoil. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

Numerical ratings between 0.00 and 0.99 are given after the specified features. These numbers indicate the degree to which the features limit the soils as sources of topsoil. The lower the number, the greater the limitation.

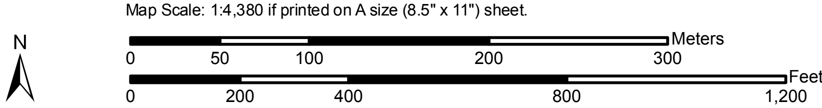
The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Topsoil Source




Map Scale: 1:4,380 if printed on A size (8.5" x 11") sheet.



## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Units

**Soil Ratings**

- Poor
- Fair
- Good
- Not rated or not available

**Political Features**

- Cities

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:4,380 if printed on A size (8.5" × 11") sheet.

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N NAD83

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

Soil Survey Area: Buffalo County, Nebraska
Survey Area Data: Version 15, Jul 27, 2012

Date(s) aerial images were photographed: 7/16/2006

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

## Tables—Topsoil Source

| Topsoil Source— Summary by Map Unit — Buffalo County, Nebraska (NE019) | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| 8840 | Hall silt loam, 0 to 1 percent slopes | Good | Hall (100%) | | 57.1 | 81.6% |
| 8960 | Wood River silt loam, 0 to 1 percent slopes | Poor | Wood River (100%) | Too clayey (0.13) | 12.9 | 18.4% |
| | | | | Sodium content (0.00) | | |
| **Totals for Area of Interest** | | | | | **69.9** | **100.0%** |

| Topsoil Source— Summary by Rating Value | | |
|---|---|---|
| **Rating** | **Acres in AOI** | **Percent of AOI** |
| Good | 57.1 | 81.6% |
| Poor | 12.9 | 18.4% |
| **Totals for Area of Interest** | **69.9** | **100.0%** |

## Rating Options—Topsoil Source

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Lower

# References

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

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

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

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

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United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

## 2.f. Physical Factors – Geotechnical Report

Provide a geotechnical report consisting of at least six (6) soil borings at a minimum of twenty-five (25) feet depth. The report must include information on the existing and normal water table along with data on any known subterranean streams or related conditions along with recommendations and suggestions for the type of foundation.

See attached Geotechnical Report by Mid-State Engineering & Testing dated June 6, 2013.

MID-STATE
ENGINEERING & TESTING

# REPORT OF GEOTECHNICAL INVESTIGATION

## PROJECT HONOR
## FEASIBILITY STUDY
## KEARNEY, NEBRASKA

**M.S. PROJECT NO. 133-01-20**
**JUNE 6, 2013**
**A-7200**

**Prepared for:**

**City of Kearney**
**PO Box 1180**
**Kearney, NE. 68848**

PROFESSIONAL CIVIL ENGINEER
SCOTT K.
E-13769
6/6/13
STATE OF NEBRASKA

PROFESSIONAL CIVIL ENGINEER
JAMES
MUSILEK
6/6/13
STATE OF NEBRASKA

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## APPENDICES

MID-STATE
ENGINEERING &
TESTING, INC.

# REPORT OF GEOTECHNICAL INVESTIGATION

## PROJECT HONOR
## FEASIBILITY STUDY
## KEARNEY, NEBRASKA

## M.S. PROJECT NO. 133-01-20
## JUNE 6, 2013
## A-7200

**INTRODUCTION**

This report presents the results of the feasibility study performed at the site of a proposed Project Honor facility in Kearney, NE. The proposed site is located near the intersection of N. Webb Road and W. Capital Ave. This report was authorized by Mr. Mike Morgan of City of Kearney based on our written proposal dated May 17th, 2013.

Included in this investigation were six (6) soil borings, laboratory testing, and a report of conclusions and recommendations. The scope of our report was limited to the following:

- Identify in-situ soil conditions.
- Evaluating the engineering properties of the subgrade soils.
- Providing preliminary foundation design options.
- Evaluating soil bearing capacity and settlement.
- Providing recommendations for earthwork and soil related construction with respect to the soils encountered.

This report was prepared by Mid-State Engineering and Testing, Inc., by a professional engineer registered in the State of Nebraska. Recommendations are based on the applicable standards of the profession at the time of this study. This study has been prepared for the exclusive use of the City of Kearney for specific application to the planned development. All work was conducted in accordance with generally accepted soil and foundation engineering practices.

## PROPOSED CONSTRUCTION

The proposed new Veterans facility site consists of an approximate 75 acre parcel located east of Cherry Avenue on 56th Street. While exact size, configuration and location of the Veterans Home has not yet been determined, it is assumed the structure will be a one or two story, slab on grade, masonry and/or steel frame structure. Also included in the development will be concrete or asphalt parking and drive areas located around the facility.

At this time, exact floor and foundation loads are not known, however structural loads are not expected to exceed about 150 kips for isolated columns and 6 klf for walls.

The proposed site is relatively level and currently used for row crop production. To provide positive drainage off and away from the facility, it's expected finish floor elevations will be established about 2 to 4 feet above existing grades.

## FIELD WORK

The field investigation was conducted on May 21st, 2013. The exploratory program consisted of six (6) soil borings, each extending to a depth of 25 feet below existing site elevations. Soil borings were completed with a Mobil B-50 truck-mounted rotary drilling rig using 4 ½-inch continuous flight augers. Boring locations are noted on the included Site Plan (Appendix A).

Soil samples were obtained at the sampling intervals noted on the Boring Logs (Appendix B). Recovered samples were extruded in the field, sealed in plastic containers, labeled, and protected for transportation to the laboratory for testing. Undisturbed samples, designated "U" samples were obtained with a 3.0-inch (outside diameter), thin-walled, tube samplers hydraulically pushed in general accordance with ASTM D1587-00 (Thin Walled Tube Sampling of Soils). Split-barrel samples, designated "S" samples, were obtained while performing Standard Penetration Tests (SPT) with a 1.50-inch (inside diameter), thick-walled sampler driven in accordance with ASTM D1586-84 (Penetration Test and Split-Barrel Sampling of Soils). The N-value, reported in blows per foot, equals the number of blows required to drive the split-barrel sampler over the last 12-inches of a normal 18-inch sampling interval.

The field boring logs were prepared by an experienced soils engineer in accordance with ASTM D2488-00, (Description of Soils by the Visual-Manual Procedure). Stratification lines represent the approximate boundary between soil types. In situ, the transition between sediments may be gradual.

## LABORATORY TESTING

The field boring logs were reviewed to outline the depth, thickness, and extent of each soil stratum encountered. Based on site stratigraphy and the construction proposed, a testing program was established to evaluate the engineering properties of the bearing strata. Specific tests performed include:

- Moisture Contents
- Unit Weight Determinations
- Unconfined Compression Tests
- One Dimensional Consolidation Tests
- #200 Washed Sieve Analysis
- Atterberg Limits Testing

All tests were conducted in general accordance with current ASTM or state-of-the-art test procedures. Laboratory test results are presented in Appendix C.

Moisture contents and unit weight determinations were used to determine the overall uniformity/variability of the soils for the evaluation of bearing capacity and settlement.

Unconfined compression tests define the stress versus strain characteristics and related shear strengths of the soil.

The One-Dimensional Consolidation test defines the load/settlement relationship of the bearing soils.

Atterberg limits and the #200 washed sieve analysis were used to determine plasticity characteristics and to classify the soils using the Unified Soil Classification System (USCS).

Based on the results of this testing program, the field logs were reviewed and supplemented as shown in Appendix B. These final logs represent our interpretation of the field logs and reflect the additional information gained from the laboratory testing program.

## SITE CONDITIONS

The proposed parcel is relatively level consisting of ag land currently being used for row crop production. Currently there is approximately 2 feet of variance in elevation across the site, with general site drainage towards the southeast. No sign of prior development was noted on the surface of the site.

## SOIL CONDITIONS

This site is situated just adjacent to the Historic Platte River flood plain. The generalized subsurface profile for this area consists of wind deposited Loessal soils atop water deposited soils of various ages. To the depth investigated, the soils encountered on this site consist of development zone soils (approximately 6 inches) which overlies cohesive Fill material and Colluvial sediments. Below these materials, wind deposited Peorian Age Loess deposits and Aeolian Sands were encountered atop Alluvial Sand.

Fill material was encountered below the development zone in boring locations DH-2 thru DH-5, extending to depths of 5, 3, 1 and 3 feet, respectively. These deposits were described as dark grey brown, grey brown and dark brown, moist, firm to stiff, lean clays with trace amounts of fine sand and gravel. It appears this fill is the result of land leveling performed to allow for gravity irrigation. In the areas sampled these sediments exhibit the following range in in-situ engineering properties:

Moisture Content (%)........................................................ 20 – 24
Dry Unit Weight (pcf)........................................................ 86 - 100
Unconfined Compressive Strength (tsf)................................ 11.4
Plastic Index....................................................................... 21

Based on Atterberg Limits testing and visual evaluation, these deposits classified as moderately plastic lean clays (CL).

Colluvial deposits were encountered directly below the development zone in boring locations DH-1 and DH-6 and the surface fill material in boring location DH-4, extending to depths of about 3 ½, 3 and 4 feet below existing grades. These sediments were described as dark grey brown and dark olive brown, moist, firm, lean clays. These sediments exhibit the following in-situ engineering properties:

Moisture Content (%)........................................................ 24
Dry Unit Weights (pcf)........................................................ 100

These deposits visually classify as moderately plastic lean (CL) soils.

Altered Loess (Peorian Age) deposits were encountered below the Fill material and Colluvial deposits in all 6 borings, extending to depths of 12 to 24 feet below existing grades. These sediments were described as light brown, olive, light grey brown, olive grey and light grey, moist to very moist, firm to stiff, lean clays with trace fine sands. Specific in-situ engineering properties are as follows:

Moisture Contents (%)........................................................ 17 – 32
Dry Unit Weight (pcf)........................................................ 83 – 99
Plastic Index (PI)................................................................ 17
Percent Passing #200 Sieve (%)........................................ 97 – 98
Unconfined Compressive Strength (tsf)................................ 0.6 – 3.4

Based on Atterberg Limits testing and visual evaluation, these deposits classified as low to moderately plastic lean clays (CL) with trace fine sands.

Alluvial sands were encountered below the wind deposited Loessal soils and Aeolian sands and extending, beyond the bottom of the 25 foot borings. These sediments were described as light grey brown and light brown, slightly moist, firm, poorly graded sands. Specific in-situ engineering properties are as follows:

Moisture Contents (%) .......................................................................2
Material Passing #200 Sieve (%)........................................................3
SPT Blow Counts (N)................................................................ 15 – 33

Based on laboratory testing and visual evaluation, these deposits classified non plastic poorly graded fine sand (SP).

## GROUNDWATER

At the time of drilling, groundwater was not encountered within the maximum 25 foot boring depths and consequently not expected to significantly impact the slab on grade construction expected at this time. It must be recognized, however, that fluctuations in groundwater level may occur due to seasonal variations in rainfall, surface runoff, temperature, or other factors not evident at the time measurements were made.

Based on the site proximity to the Platte River, seasonal fluctuation on the order of 2 to 4 feet are typical in this region. Seasonal high groundwater levels typically occur in the spring prior to the start of the irrigation season. Long term monitoring would be required to determine seasonal and historical high water levels.

## CONCLUSIONS AND RECOMMENDATIONS

### GENERAL

Based on the soil conditions indicated, this site appears well suited for the planned development. The site soils are generally capable of supporting most one and two story structures and groundwater was not encountered across the site and is not expected to impact the anticipated construction. Based on the elevation variance across the site, site grading will be required to level the site and provide surface drainage away from the structure.

In summarizing, site stratagraph consist of cohesive soils extending about to 14 feet in the southeastern borings and up to 24 feet in the northwestern borings. The site soils generally consist of cohesive lean clay soil which overlie relatively clean, fine Alluvial sands. Groundwater was not encountered within the 25 foot boring at the time of drilling and is not expected to be a factor for construction of the slab on grade structure.

The primary concern for site development is the surface fill which isn't up to industry standard for commercial development. Depending on the final building location, some removal and replacement may be required. Due to the limited extent of this material it's expected it will have minimal impact on project development. We recommend, all subgrades and excavations should be observed by the engineer prior to placing fill, backfilling excavations or concrete placement. Without detailed loading conditions and an exact location of the structure, generally the primary concerns for site development are the variable soil conditions across the site and the cohesive nature of upper site soils.

While building elevations have not yet been determined, it is anticipated the site will be elevated a minimum of 2 to 3 feet to provide drainage off and away from the proposed structure. Consequently, it appears foundation elements will bear within the cohesive soils present across the site.

Due to the cohesive nature of the upper site soils, clean sand fill is not recommended for use as structural fill below exterior building foundations and parking and drive areas. Any open graded granular fill at the surface can result in perched water within the fill which leads to excessive/progressive frost heave and softening of the bearing soils. While groundwater does not appear to be a major concern, due to the cohesive nature of the site soils, we recommend a perimeter drain tile system and waterproofing be provided for any below grade structures (pools, basements, elevator pit, etc.).

Recommendations regarding these and other aspects of this project are included in the following sections of this report.

## FOUNDATION ANALYSIS

If the recommendations presented in this report are followed, this site appears suitable for use of a conventional shallow foundation system for most one and two story structures. The selection of an allowable soil bearing pressure for foundation design must fulfill two requirements. First, structural loads must be sufficiently less than the ultimate bearing capacity of the foundation to insure stability. Second, settlement must not exceed an amount, which will produce adverse behavior of the superstructure.

In order to meet the previous criteria, we have explored both the bearing capacity and load settlement characteristics of the on-site soil, assuming maximum loads of 6 klf for walls and 150 kips for isolated column footings. A maximum total settlement of 1 inch and differential settlements of ½ to 5/8 inch are generally considered acceptable and were used in our analysis. The allowable bearing pressure is expressed in terms of the net pressure transferred to the soil.

The final foundation design will be dependent on the actual foundation loads and site specific soil conditions. At this time, it appears the majority of the site is capable of supporting most one or two story structure with minimal site improvements. Based on the soil conditions indicated in this preliminary evaluation a soil bearing capacity on the order of 2000 to 3000 psf is indicated for most light to moderate foundation loads (5 klf wall loads and 100 kip column loads). Heavier loads may require several feet of structural fill below the footings to reduce potential settlement and increase the design soil bearing capacity.

We recommend exterior footings and footings in unheated areas be founded at a minimum depth of 40 inches below surrounding grade for frost protection. Interior footings may be placed directly below the floor slab. All footings will require steel reinforcement and should conform to local code sizes.

## EARTHWORK AND EXCAVATIONS

Prior to overall site grading, we recommend all topsoil and vegetation be stripped from site. In addition we recommend an additional 1 foot of old fill material (if encountered) be removed and the resultant subgrade scarified, moisture condition and recompacted in the presence of the Engineer. Any instability detected during performance of this work will need to be addressed as recommended by the soils engineer.

At this time it is unknown weather structural fill for this project will be obtained from an on-site or off-site borrow source. It's expected that all on-site soils will be suitable for use as structural fill for this project. We recommend structural fill for this project consist of select clean lean clay soils having a Plastic Index between 12 and 25.

We recommend fill and backfill material below foundations and floor slabs be placed in loose lifts of 8-inches or less, with each lift compacted with a sheepsfoot type compactor. Based on expected structural loads, we recommend structural fill be compacted to a minimum of 95 percent of the material's standard proctor maximum dry density (ASTM D698-00). For ease of construction, we recommend soil moisture at the time of compaction be controlled within -3 and +3 percent of optimum.

Vertical cuts and excavations may stand for short periods but should not be considered stable in any case. The soils encountered in the soil borings classify as type B and C soils according to OSHA's Construction Standards for Excavations. In general, the maximum allowable slope for shallow excavations in a type B soil is 1H:1V and a type C soil is 1½H:1V. Trenching and excavation activities should conform to federal and local regulations. Based on the soil conditions encountered, vertical excavations will be acceptable for cuts up to six (6) feet.

## FLOOR SLAB SUBGRADES

Based on the soil conditions indicated, we recommend providing a minimum of eighteen (18) inches of select structural fill below floor slabs. Structural fill will need to consist of materials placed as outlined in the "Earthwork and Excavations" section of this report. More stringent requirements may be required if design loads exceed those indicated at this time.

## PAVEMENT SUBGRADES

Pavement performance is directly affected by the degree of compaction, uniformity, and stability of subgrade soils. This is particularly important where heavy traffic is expected. Based on traffic consisting of light truck and car traffic with the occasional heavy truck, we recommend providing a minimum of 18 inches of structural fill below all exterior parking and drive areas.

We recommend structural fill below paving be compacted to a minimum of 95 percent of the material's standard Proctor maximum dry density (ASTM D-698), with soil moisture controlled between +/- 3% of optimum (ASTM D-698). We recommend structural fill consist of materials as outlined in the "Earthwork and Excavations" section of this report.

Based on our experience with similar sites and the proposed site covering a vast area with variable soil conditions (Fill and Natural soils) at the surface, we recommend all excavated subgrades be proof-rolled in the presence of the engineer prior to placing structural fill below pavement sections. Instability issues detected will need to be addressed as directed by the engineer.

For a subgrade consisting of the recommended select lean clay soils, a soaked CBR of four (4) and a corresponding modulus of subgrade reaction (k for pavements) of 125 pci is recommended for pavement design. Pavement thickness should be determined based on traffic volume and standard pavement design procedures. In no instance should concrete paving be less than 6 inches in thickness.

We recommend Portland cement concrete be air-entrained (5 – 7 ½ percent) and have a minimum compressive strength of 4000 psi (600 psi flexural strength). State of Nebraska Type 47B concrete has proven to be very durable in this area.

## SURFACE DRAINAGE

The success of a shallow foundation system is contingent upon keeping the subgrade soils at relatively constant moisture content and by not allowing surface drainage to migrate to bearing soils. Positive surface drainage away from structures must be maintained at all times.

During construction, temporary grades should be established to prevent runoff from entering excavations or footing trenches. Backfill should be placed when structural strength requirements are met and should be graded to drain away from the construction zone. Due to the moisture sensitive nature of bearing soils across this site, sand backfill should not be allowed on this project.

The final grade of foundation backfill and any overlying pavement should have a positive slope away from foundation walls on all sides. A minimum slope of 1-inch per foot for the first 5 to 10 feet is recommended. The slope may be decreased if the ground surface adjacent to foundations is covered with concrete slabs or asphalt pavement. A minimum slope of 2% is recommended for all other areas of the site. Pavements and exterior slabs next to structures should be carefully sealed against moisture intrusion at the joints.

## GENERAL COMMENTS

The intent of this evaluation was to obtain a general representation of the Geologic/Engineering characteristics of the site soils relative to the planned development.

The analysis and recommendations submitted in this report are based, in part, on the data obtained from the six (6) soil borings. The information compiled in this report was conducted in a large parcel of land with no specific building location specified at this time. Based on the variable soil conditions present across the site, we recommend a formal Geotechnical evaluation be completed once a specific design location and structural loads have been determined.

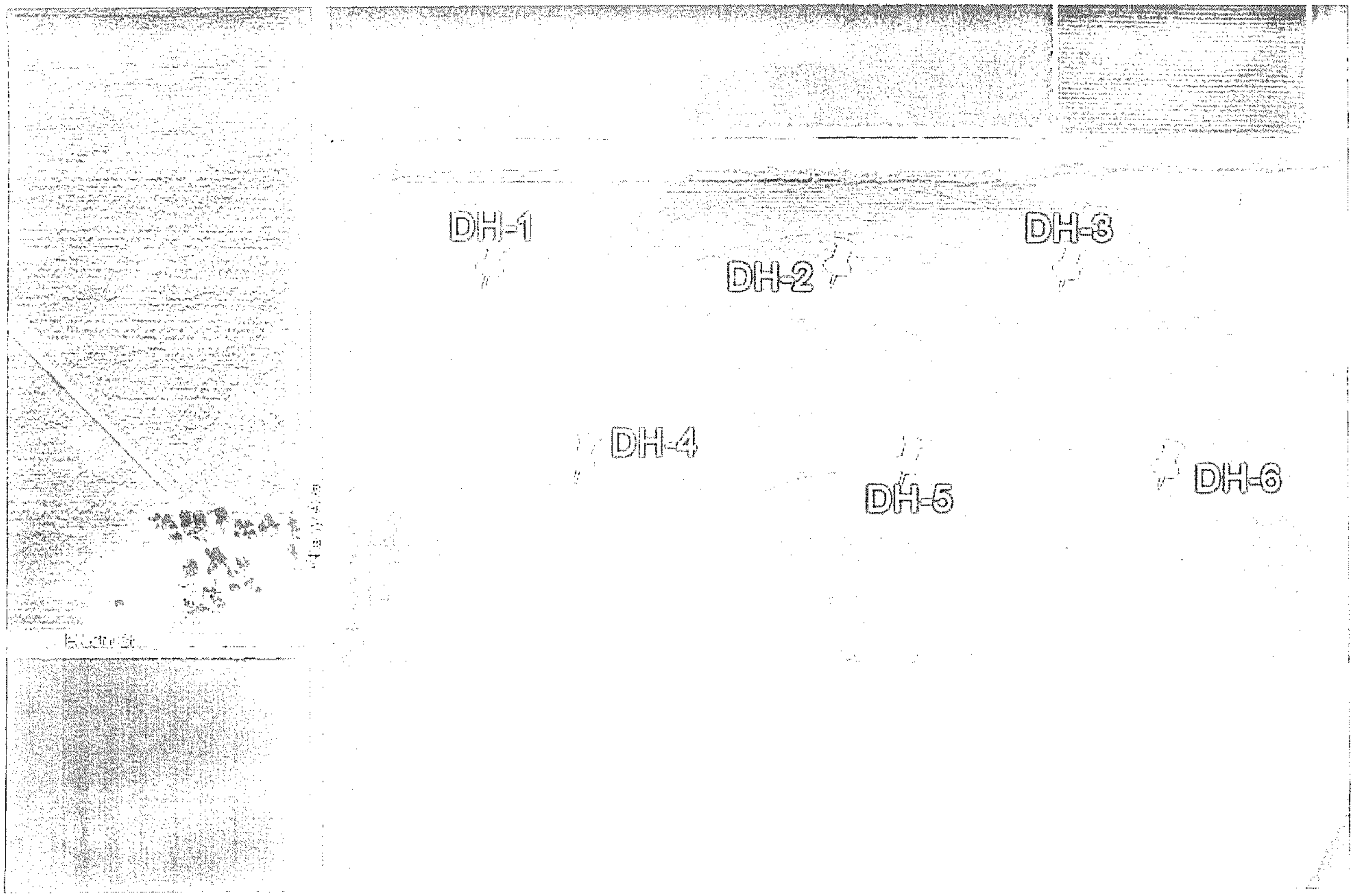
Respectfully submitted,
Mid-State Engineering and Testing, Inc.

Scott A. Barnett, P.E.
Nebraska Reg. #E-13769

Reviewed by;

Jim Musilek, P.E.
Nebraska Reg.# E-5935

# APPENDIX A
# BORING LOCATION PLAN




MID-STATE
ENGINEERING & TESTING
11 EAST 11TH STREET
KEARNEY, NE 68847

BORING LOCATION PLAN
PROPOSED VETERANS HOME
KEARNEY, NEBRASKA
M.S. PROJECT NO. 133-01-20

# APPENDIX B
# BORING LOGS

# MID-STATE ENGINEERING & TESTING, INC.

# BORING LOG

| | |
|---|---|
| PROJECT | Veterans Home |
| LOCATION | Kearney, Nebraska |
| JOB NO. | 133-01-20 |
| DATE | 5/21/2013 |

| DRILL HOLE NO. | LOCATION OF DRILL HOLE | ELEVATION | DATUM | TOTAL DEPTH |
|---|---|---|---|---|
| DH-1 | N 40 43' 50.80" W 99 01' 30.30" | | | 25.0' |

| WATER LEVEL OBSERVATIONS: WHILE DRILLING | END OF DRILLING | HOURS | TYPE OF SURFACE | DRILLER |
|---|---|---|---|---|
| None | | | Corn Field | Mid-State Engineering |
| | | | **DRILLING METHOD** | **LOGGER** |
| | | | 4" Continuous Flight Auger | Jim Musilek |

| DEPTH FT | SAMPLE NO. & TYPE | N° BLOWS / FT | REC % | COLOR | MOIST | CONS. | SOIL TYPE (Class) | GEOLOGIC DESCRIPTION & OTHER REMARKS | MOIST % | DRY WEIGHT PCF | QU TSF | DEPTH FT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Topsoil | | | | |
| | U-1 | | | Dk Gr Brn | Moist | Firm | CL | **COLLUVIAL DEPOSITS** w/ Roots and Root Holes | | | | |
| | | | | Dark Olive Brown | | Stiff | | | | | | |
| | U-2 | | | Light Brn | Moist | Stiff | CL | **ALTERED LOESS (Peorian Age)** w/ Root Holes, Rust Stains, Calcium Concretions | | | | |
| 5 | | | | | | | | | 16.3 | 82.7 | 1.1 | 5 |
| | | | | | Very Moist | | | | | | | |
| 10 | U-3 | | | | | | | | 28.7 | 97.3 | | 10 |
| | | | | | | Firm | | | | | | |
| 15 | U-4 | | | | | | | | 25.6 | 89.3 | | 15 |
| | | | | Olive | | | | w/ More Rust | | | | |
| 20 | U-5 | | | | | | | | 28.9 | | | 20 |
| | | | | Light Grey Brown | Slightly Moist | Firm | SP/SM | **ALLUVIAL SAND** Fine Sand | | | | |
| | | | | | | | SP | | | | | |
| 25 | S-6 | 12/12/14 (26) | | | | | | | | | | 25 |
| | | | | | | | | **Bottom of Hole 25.0'** | | | | |
| 30 | | | | | | | | | | | | 30 |
| 35 | | | | | | | | | | | | 35 |

# MID-STATE ENGINEERING & TESTING, INC.

# BORING LOG

| | |
|---|---|
| PROJECT | Veterans Home |
| LOCATION | Kearney, Nebraska |
| JOB NO. 133-01-20 | DATE 5/21/2013 |

| DRILL HOLE NO. | LOCATION OF DRILL HOLE | ELEVATION | DATUM | TOTAL DEPTH |
|---|---|---|---|---|
| DH-2 | N 40 43' 50.80" W 99 01' 18.20" | | | 25' |

| WATER LEVEL OBSERVATIONS: WHILE DRILLING | END OF DRILLING | HOURS | TYPE OF SURFACE | DRILLER |
|---|---|---|---|---|
| | | | Corn Field | Mid-State Engineering |
| | | | DRILLING METHOD | LOGGER |
| None | | | 4" Continuous Flight Auger | Jim Musilek |

| DEPTH FT. | SAMPLE NO. & TYPE | N" BLOWS / FT | REC % | COLOR | MOIST | CONS. | SOIL TYPE (Class) | GEOLOGIC DESCRIPTION & OTHER REMARKS | MOIST % | DRY WEIGHT PCF | QU TSF | DEPTH FT. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Topsoil | | | | |
| | U-1 | | | Dark Grey Brown | Moist | Stiff | CL | **OLD FILL MATERIAL** w/ Trace Gravel | | | | |
| 5 | U-2 | | | Grey Brn | | | | | 19.5 | 86.2 | 1.4 | 5 |
| | | | | Light Grey Brown | Moist | Stiff | CL | **ALTERED LOESS (Peorian Age)** w/ Rust Stains Carbon Spots | | | | |
| 10 | U-3 | | | | | | | | 24.6 | 92.9 | | 10 |
| 15 | U-4 | | | | | | | | 25.2 | 95.5 | | 15 |
| | | | | Olive Grey | Very Moist | Firm | | More Rust | | | | |
| 20 | U-5 | | | | | | | | 28.5 | 93.9 | | 20 |
| 25 | S-6 | 10/11/13 (24) | | Light Brn | Slightly Moist | Firm | SP | **ALLUVIAL SAND** | | | | 25 |
| | | | | | | | | **Bottom of Hole 25'** | | | | |
| 30 | | | | | | | | | | | | 30 |
| 35 | | | | | | | | | | | | 35 |

# MID-STATE ENGINEERING & TESTING, INC.

# BORING LOG

| | |
|---|---|
| PROJECT | Veterans Home |
| LOCATION | Kearney, Nebraska |
| JOB NO. | DATE |
| 133-01-20 | 5/21/2013 |

| DRILL HOLE NO. | LOCATION OF DRILL HOLE | ELEVATION | DATUM | TOTAL DEPTH |
|---|---|---|---|---|
| DH-3 | N 40 43' 50.70" W 99 01' 1030" | | | 25' |

| WATER LEVEL OBSERVATIONS: WHILE DRILLING | END OF DRILLING | HOURS | TYPE OF SURFACE | DRILLER |
|---|---|---|---|---|
| | | | Corn Field | Mid-State Engineering |
| | | | DRILLING METHOD | LOGGER |
| None | | | 4" Continuous Flight Auger | Jlm Musilek |

| DEPTH FT. | SAMPLE NO. & TYPE | N" BLOWS / FT | REC % | COLOR | MOIST | CONS. | SOIL TYPE (Class) | GEOLOGIC DESCRIPTION & OTHER REMARKS | MOIST % | DRY WEIGHT PCF | QU TSF | DEPTH FT. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Topsoil | | | | |
| | U-1 | | | Dark Brn | Moist | Firm | CL | **OLD FILL MATERIAL** | 24.2 | | | |
| | U-2 | | | Light Grey Brown | Moist | Stiff | CL | **ALTERED LOESS (Peorian Age)**<br>w/ Rust Stains<br>Calcium Concretions<br>Carbon Spots | 22.4 | 95.7 | 1.9 | |
| 5 | | | | | | | | | | | | 5 |
| 10 | U-3 | | | | | | | | 28.6 | | | 10 |
| | | | | Light Brn | Slightly Moist | Firm | SP | **ALLUVIAL SAND**<br>Fine Grained Sand | | | | |
| 15 | S-4 | 8/16/17 (33) | | | | | | | | | | 15 |
| 20 | S-5 | 6/7/8 (15) | | | | | | | 1.6 | | | 20 |
| 25 | S-6 | 8/9/13 (22) | | | | | | | | | | 25 |
| 25 | | | | | | | | Bottom of Hole 25' | | | | |
| 30 | | | | | | | | | | | | 30 |
| 35 | | | | | | | | | | | | 35 |

**MID-STATE ENGINEERING & TESTING, INC.**

# BORING LOG

| | |
|---|---|
| PROJECT | Veterans Home |
| LOCATION | Kearney, Nebraska |
| JOB NO. 133-01-20 | DATE 5/21/2013 |

| DRILL HOLE NO. | LOCATION OF DRILL HOLE | ELEVATION | DATUM | TOTAL DEPTH |
|---|---|---|---|---|
| DH-4 | N 40 43' 45.70 W 99 01' 27.20" | | | 25' |

| WATER LEVEL OBSERVATIONS: WHILE DRILLING | END OF DRILLING | HOURS | TYPE OF SURFACE | DRILLER |
|---|---|---|---|---|
| | | | Corn Field | Mid-State Engineering |
| | | | **DRILLING METHOD** | **LOGGER** |
| None | | | 4" Continuous Flight Auger | Jim Musilek |

| DEPTH FT. | SAMPLE NO. & TYPE | N" BLOWS / FT | REC % | COLOR | MOIST | CONS. | SOIL TYPE (Class) | GEOLOGIC DESCRIPTION & OTHER REMARKS | MOIST % | DRY WEIGHT PCF | QU TSF | DEPTH FT. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Dark Brn | Moist | Firm | CL | Topsoil | | | | |
| | | | | Dark Brn | Moist | Firm | CL | **FILL MATERIAL** | | | | |
| | U-1 | | | Dark Brn | Moist | Firm | CL | **COLLUVIAL DEPOSITS** | | | | |
| | | | | Light Brn Grey | Moist | Stiff | CL | **ALTERED LOESS** (Peorian Age) w/ Rust Stains Carbon Spots | | | | |
| 5 | U-2 | | | | | | | | 20.0 | 99.4 | 3.4 | 5 |
| 10 | U-3 | | | Light Grey | Very Moist | | | | 24.2 | 97.4 | | 10 |
| 15 | U-4 | | | | | | | | 27.8 | | | 15 |
| | | | | Olive Gr | | | | | | | | |
| 20 | U-5 | | | | | | | | 31.5 | 88.8 | | 20 |
| 25 | S-6 | 15/12/13 (25) | | Light Brn | Slightly Moist | Firm | SP | **ALLUVIAL SAND** | | | | 25 |
| | | | | | | | | **Bottom of Hole 25'** | | | | |
| 30 | | | | | | | | | | | | 30 |
| 35 | | | | | | | | | | | | 35 |

# MID-STATE ENGINEERING & TESTING, INC.

# BORING LOG

| | |
|---|---|
| PROJECT | Veterans Home |
| LOCATION | Kearney, Nebraska |
| JOB NO. | 133-01-20 |
| DATE | 5/21/2013 |

| DRILL HOLE NO. | LOCATION OF DRILL HOLE | ELEVATION | DATUM | TOTAL DEPTH |
|---|---|---|---|---|
| DH-5 | N 40 43' 45.60" W 99 01' 15.80" | | | 25' |

| WATER LEVEL OBSERVATIONS: WHILE DRILLING | END OF DRILLING | HOURS | TYPE OF SURFACE | DRILLER |
|---|---|---|---|---|
| | | | Corn Field | Mid-State Engineering |
| | | | DRILLING METHOD | LOGGER |
| None | | | 4" Continuous Flight Auger | Jim Musilek |

| DEPTH FT. | SAMPLE NO. & TYPE | N° BLOWS / FT | REC % | COLOR | MOIST | CONS. | SOIL TYPE (Class) | GEOLOGIC DESCRIPTION & OTHER REMARKS | MOIST % | DRY WEIGHT PCF | QU TSF | DEPTH FT. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CL | **Topsoil** | | | | |
| | U-1 | | | Dark Grey Brown | Moist | Firm | CL | **OLD FILL MATERIAL** w/ Trace Gravel | 24.2 | 99.7 | | |
| 5 | U-2 | | | Light Grey Brown | Very Moist | Firm | CL | **ALTERED LOESS (Peorian Age)** w/ Rust and Carbon Spots | 28.9 | 87.0 | 0.6 | 5 |
| 10 | U-3 | | | | | | | | 30.1 | 89.9 | 0.9 | 10 |
| | | | | Light Brn | Slightly Moist | Firm | SP | **ALLUVIAL SAND** Fine Grained | | | | |
| 15 | S-4 | 8/7/13 (20) | | | | | | | | | | 15 |
| 20 | S-5 | 8/12/18 (30) | | | | | | | | | | 20 |
| 25 | S-6 | 10/10/13 (23) | | | | | | | | | | 25 |
| 25 | | | | | | | | **Bottom of Hole 25'** | | | | |
| 30 | | | | | | | | | | | | 30 |
| 35 | | | | | | | | | | | | 35 |

# MID-STATE ENGINEERING & TESTING, INC.

# BORING LOG

| | |
|---|---|
| PROJECT | Veterans Home |
| LOCATION | Kearney, Nebraska |
| JOB NO. 133-01-20 | DATE 5/21/13 |

| DRILL HOLE NO | LOCATION OF DRILL HOLE | ELEVATION | DATUM | TOTAL DEPTH |
|---|---|---|---|---|
| DH-6 | N 40 43' 45.5" W 99 01' 06.90" | | | 25' |

| WATER LEVEL OBSERVATIONS: WHILE DRILLING | END OF DRILLING | HOURS | TYPE OF SURFACE | DRILLER |
|---|---|---|---|---|
| | | | Corn Field | Mid State Engineering |
| | | | DRILLING METHOD | LOGGER |
| None | | | 4" Contiunious Flight Auger | Jim Musilek |

| DEPTH FT. | SAMPLE NO. & TYPE | N" BLOWS / FT | REC % | COLOR | MOIST | CONS. | SOIL TYPE (Class) | GEOLOGIC DESCRIPTION & OTHER REMARKS | MOIST % | DRY WEIGHT PCF | QU TSF | DEPTH FT. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Topsoil | | | | |
| | U-1 | | | Dark Grey Brown | Moist | Firm | CL | **COLLUVIAL DEPOSITS** w/ Carbon and Rust Stains | 26.0 | | | |
| 5 | U-2 | | | Light Grey Brown | Moist | Stiff | CL | **ALTERED LOESS (Peorian Age)** w/ Rust | 25.5 | 92.3 | 1.0 | 5 |
| 10 | U-3 | | | Light Grey | Very Moist | Firm | | | 28.4 | 92.8 | | 10 |
| | | | | | Moist | | | | | | | |
| 15 | U-4 | | | | | | | | 21.8 | 98.9 | | 15 |
| | | | | Light Brn | Slightly Moist | Firm | SP | **ALLUVIAL SAND** Fine Grained | | | | |
| 20 | S-5 | 7/8/11 (19) | | | | | | | | | | 20 |
| 25 | S-6 | 9/10/12 (22) | | | | | | | 20.0 | | | 25 |
| | | | | | | | | **Bottom of Hole 25'** | | | | |
| 30 | | | | | | | | | | | | 30 |
| 35 | | | | | | | | | | | | 35 |

# APPENDIX C
# SUMMARY OF SOILS TEST

**MID-STATE ENGINEERING & TESTING, INC.**

# SUMMARY OF SOILS TESTING

PROJECT: Proposed Veterans Home

LOCATION: Kearney, Nebraska

JOB NO.: 133-01-20 DATE: 5/24/2013

| DRILL HOLE NO. | SAMPLE NO. | SAMPLE DEPTH (ft.) | WATER CONTENT % | DENSITY WET (pcf) | DENSITY DRY (pcf) | VOID RATIO (e) | SAT (%) | UNCONFINED COMPRESSION QU (tsf) | UNCONFINED COMPRESSION Strain (%) | ATTERBERG LIMITS LL | ATTERBERG LIMITS PL | ATTERBERG LIMITS PI | %PASS #200 SIEVE | CLASS. | SPT BLOW COUNTS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DH-1 | U-1 | 1/2 - 2' | | | | | | | | | | | | | | |
| | U-2 | 3 1/2 - 5' | 16.7 | 96.6 | 82.7 | 1.037 | 44 | 1.1 | 0.8 | | | | | | | |
| | U-3 | 8 1/2 - 10' | 23.7 | 120.4 | 97.3 | 0.732 | 87 | | | | | | | | | |
| | U-4 | 13 1/2 - 15' | 25.6 | 112.1 | 89.3 | 0.887 | 78 | | | | | | | | | |
| | U-5 | 18 1/2 - 20' | 28.9 | | | | | | | | | | | | | |
| | S-6 | 23 1/2 - 25' | | | | | | | | | | | | | 26 | |
| | | | | | | | | | | | | | | | | |
| DH-2 | U-1 | 1/2 - 2' | | | | | | | | 41 | 20 | 21 | | CL | | |
| | U-2 | 3 1/2 - 5' | 19.5 | 103.0 | 86.2 | 0.955 | 55 | 1.4 | 1.6 | | | | | | | |
| | U-3 | 8 1/2 - 10' | 24.6 | 115.7 | 92.9 | 0.814 | 82 | | | 38 | 21 | 17 | | CL | | |
| | U-4 | 13 1/2 - 15' | 25.2 | 119.6 | 95.5 | 0.764 | 89 | | | | | | | | | |
| | U-5 | 18 1/2 - 20' | 28.5 | 120.7 | 98.9 | 0.794 | 97 | | | | | | | | | |
| | S-6 | 23 1/2 - 25' | | | | | | | | | | | | | 24 | |
| | | | | | | | | | | | | | | | | |
| DH-3 | U-1 | 1/2 - 2' | 24.2 | | | | | | | | | | | | | |
| | U-2 | 3 1/2 - 5' | 22.4 | 117.2 | 95.7 | 0.761 | 80 | 1.9 | 2.5 | | | | | | | |
| | U-3 | 8 1/2 - 10' | 28.6 | | | | | | | | | | | | | |
| | S-4 | 13 1/2 - 15' | | | | | | | | | | | | | 33 | |
| | S-5 | 18 1/2 - 20' | 1.6 | | | | | | | | | | 3.1 | | 15 | Washed Sieve Analysis |
| | S-6 | 23 1/2 - 25' | | | | | | | | | | | | | 22 | |

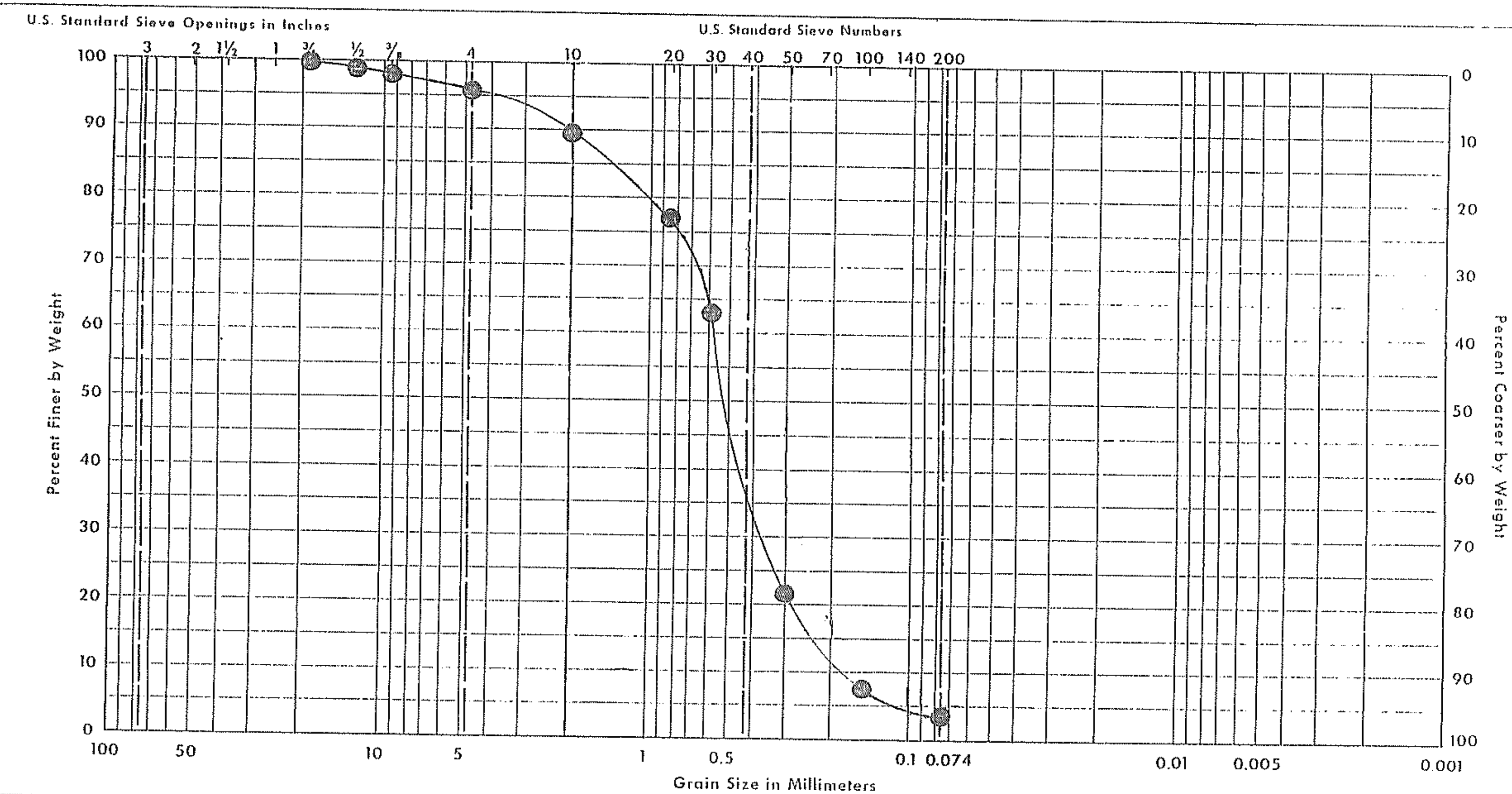
**MID-STATE ENGINEERING & TESTING, INC.**

# SUMMARY OF SOILS TESTING

| | | | |
|---|---|---|---|
| PROJECT | Proposed Veterans Home | | |
| LOCATION | Kearney, Nebraska | | |
| JOB NO. | 133-01-20 | DATE | 5/24/2013 |

| DRILL HOLE NO. | SAMPLE NO. | SAMPLE DEPTH (ft.) | WATER CONTENT % | DENSITY WET (pcf) | DENSITY DRY (pcf) | VOID RATIO (e) | SAT (%) | UNCONFINED COMPRESSION QU (tsf) | UNCONFINED COMPRESSION Strain (%) | ATTERBERG LIMITS LL | ATTERBERG LIMITS PL | ATTERBERG LIMITS PI | %PASS #200 SIEVE | CLASS. | SPT BLOW COUNTS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DH-4 | U-1 | 1/2 - 2' | | | | | | | | | | | | | | |
| | U-2 | 3 1/2 - 5' | 20.0 | 119.3 | 99.4 | 0.695 | 78 | 3.4 | 2.1 | | | | 97.3 | | | |
| | U-3 | 8 1/2 - 10' | 24.2 | 121.0 | 97.4 | 0.730 | 89 | | | | | | | | | |
| | U-4 | 13 1/2 - 15' | 27.8 | | | | | | | | | | | | | |
| | U-5 | 18 1/2 - 20' | 31.5 | 116.8 | 88.8 | 0.897 | 95 | | | | | | | | | |
| | S-6 | 23 1/2 - 25' | | | | | | | | | | | | | 25 | |
| | | | | | | | | | | | | | | | | |
| DH-5 | U-1 | 1/2 - 2' | 24.2 | 123.8 | 99.7 | 0.690 | 95 | | | | | | | | | |
| | U-2 | 3 1/2 - 5' | 28.9 | 112.1 | 87.0 | 0.937 | 83 | 0.6 | 8.0 | | | | 98.4 | | | |
| | U-3 | 8 1/2 - 10' | 30.1 | 117.0 | 89.9 | 0.874 | 93 | 0.9 | 6.3 | | | | | | | |
| | S-4 | 13 1/2 - 15' | | | | | | | | | | | | | 20 | |
| | S-5 | 18 1/2 - 20 | | | | | | | | | | | | | 30 | |
| | S-6 | 23 1/2 - 25 | | | | | | | | | | | | | 23 | |
| | | | | | | | | | | | | | | | | |
| DH-6 | U-1 | 1/2 - 2' | 26.0 | | | | | | | | | | | | | |
| | U-2 | 3 1/2 - 5' | 22.5 | 113.1 | 92.3 | 0.825 | 74 | 1.0 | 1.3 | | | | | | | |
| | U-3 | 8 1/2 -10' | 28.4 | 119.2 | 92.8 | 0.816 | 94 | | | | | | | | | |
| | U-4 | 13 1/2 - 15' | 21.8 | 120.4 | 98.9 | 0.704 | 84 | | | | | | | | | |
| | S-5 | 18 1/2 - 20' | | | | | | | | | | | | | 19 | |
| | S-6 | 23 1/2 - 25' | 2.0 | | | | | | | | | | | | 22 | |

# GRAIN SIZE ANALYSIS CURVES




| UNIFIED | GRAVEL | COARSE SAND | MEDIUM SAND | FINE SAND | FINES | |
|---|---|---|---|---|---|---|
| AASHO | GRAVEL | | COARSE SAND | FINE SAND | SILT | CLAY |

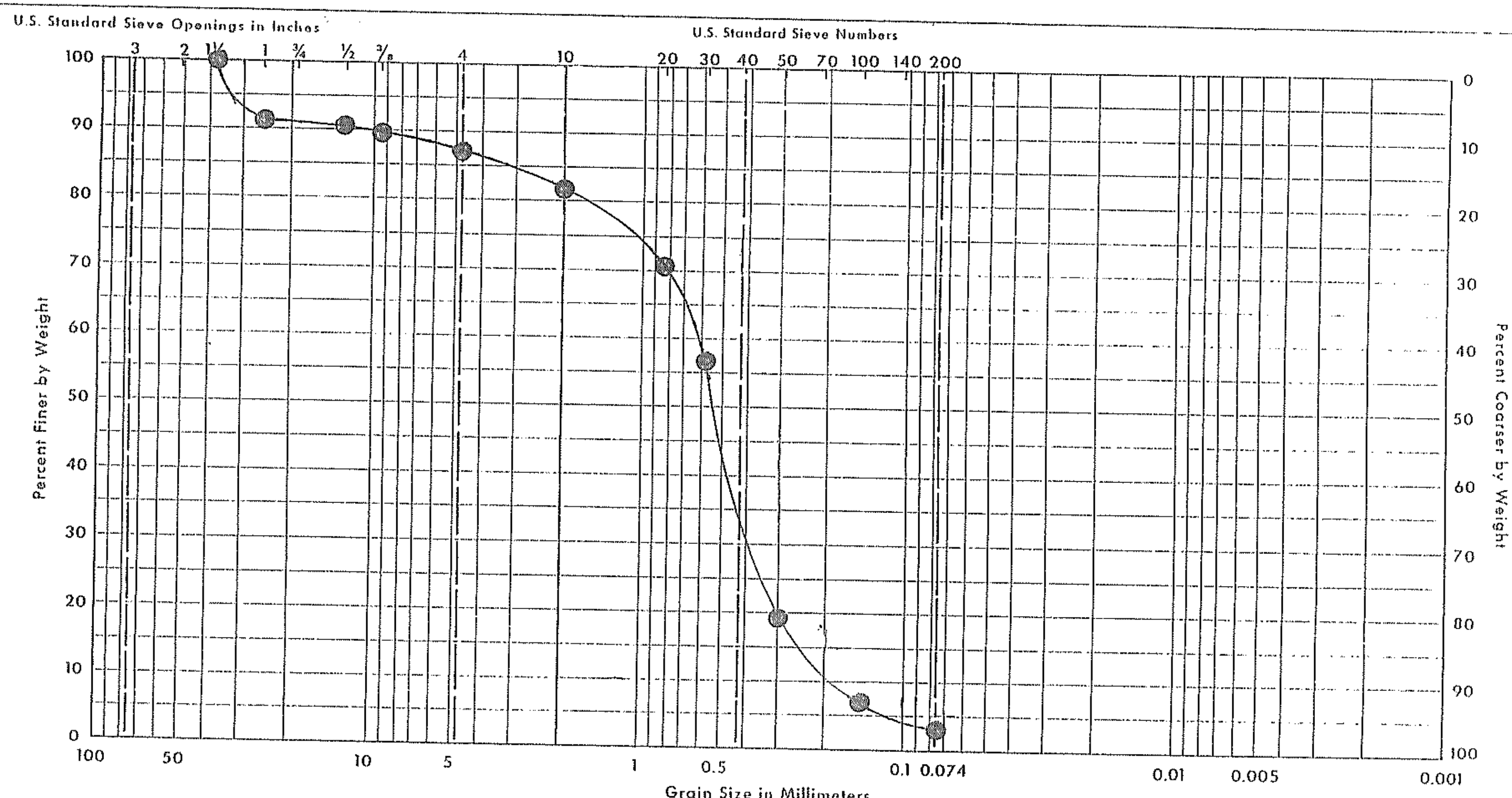
| Drill Hole | Sample No. | Sample Depth | LL | PL | PI | Water Cont.% | Classification |
|---|---|---|---|---|---|---|---|
| DH-3 | S-5 | 18½-20' | NP | NP | NP | 1.6 | w/o 1" Stone |

Project: Veterans Home

Date: 5/24/13 Job No: 133-01-20

MID-STATE

# GRAIN SIZE ANALYSIS CURVES




| | | | | | | |
|---|---|---|---|---|---|---|
| UNIFIED | GRAVEL | COARSE SAND | MEDIUM SAND | FINE SAND | FINES | |
| AASHO | GRAVEL | | COARSE SAND | FINE SAND | SILT | CLAY |

| Drill Hole | Sample No. | Sample Depth | LL | PL | PI | Water Cont.% | Classification |
|---|---|---|---|---|---|---|---|
| DH-3 | S-5 | 18½-20' | NP | NP | NP | 1.6 | w/ 1" Stone |

Project: Veterans Home

Date: 5/24/13 Job No: 133-01-20

MID-STATE

| MID-STATE ENGINEERING & TESTING<br>11 EAST 11TH ST. KEARNEY, NE | Project: Vet Home |
|---|---|
| | Location: Kearney, NE |
| | Job No. 133-01-20 Date: 5/22/2013 |

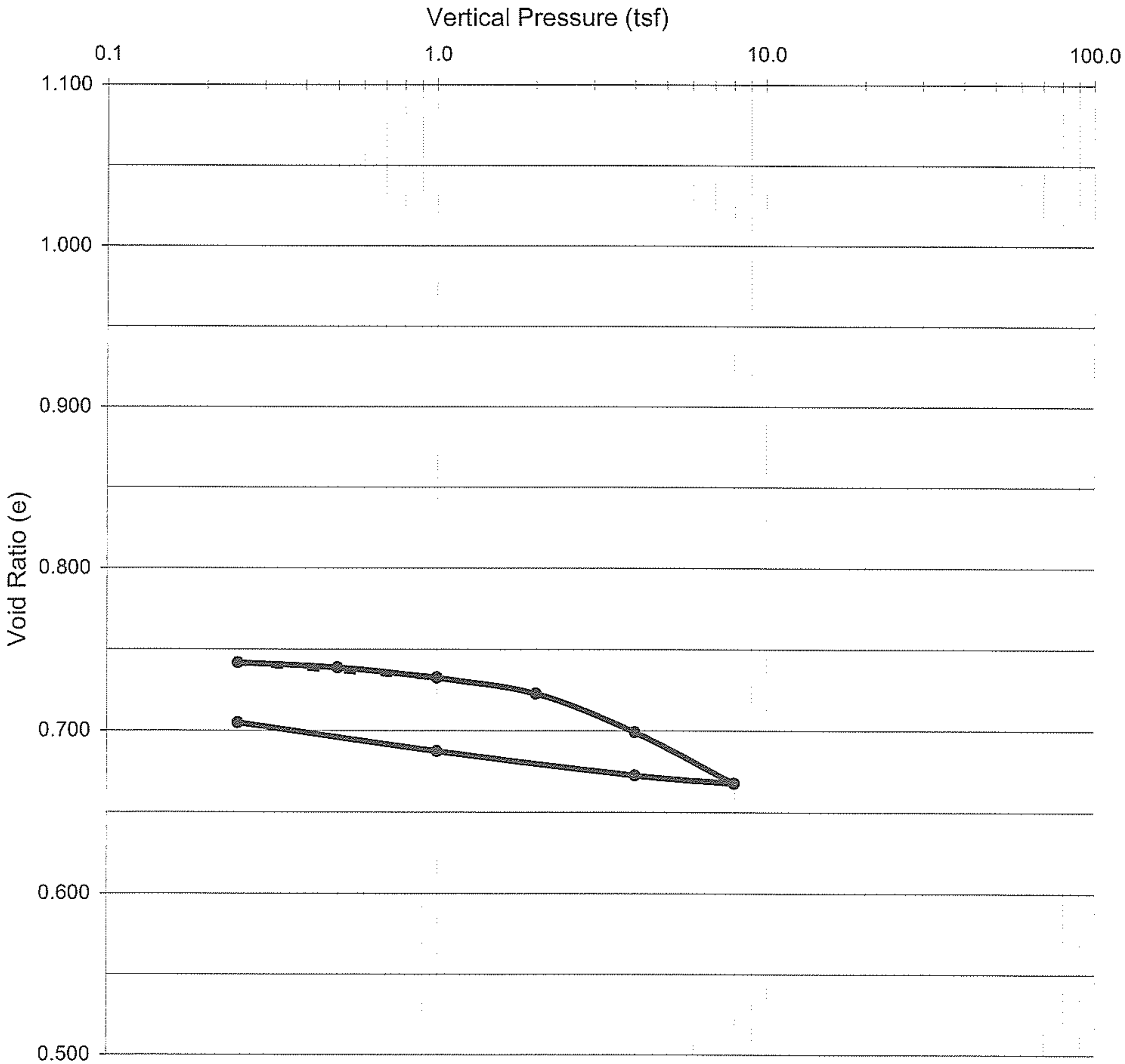
## CONSOLIDATION TEST

Drill Hole # DH-2 Sample # U-3 Sample Depth Interval 8 1/2 - 10'

Sample Description Light Grey Brown Lean Clay w/ mottling, carbon stains, carbonate nodules

| | | | | | |
|---|---|---|---|---|---|
| Initial Water Content (%) | 24.2 | Dry Unit Weight (pcf) | 96.7 | Initial Saturation (%) | 87.8 |
| Final Water Content (%) | 25.1 | Specific Gravity (Assumed) | 2.70 | | |

Liquid Limit 38 Plastic Limit 21 Plasticity Index 17 Classification CL



# MID-STATE

ENGINEERING & TESTING, INC.

279 ROAD 'D', COLUMBUS, NE. 68601


# SOIL PROPERTIES

# UNIFIED SOILS CLASSIFICATION

(Including Identification and Description)

| Group Symbols | Typical Names | Values as Subgrade When No Subject to Frost Action | Potential Frost Action | Compressibility and Expansion | Drainage Characteristics | Compaction Equipment | Compacted Dry Unit Weight (pcf) ASTM-D-698 | Typical Design Values CBR | Typical Design Values Subgrade Modulus k lb. per cu. in. |
|---|---|---|---|---|---|---|---|---|---|
| GW | Well-graded gravels, gravel-Sand mixture, little or no fines | Excellent | None to Very Slight | Almost None | Excellent | Crawler-type tractor, rubber tired roller, steel-wheeled roller | 125-140 | 40-80 | 300-500 |
| GP | Poorly graded gravels, gravel-sand mixtures, little or no fines | Good to Excellent | None to Very Slight | Almost None | Excellent | Crawler-type tractor, rubber tired roller, steel-wheeled roller | 110-140 | 30-60 | 300-500 |
| GM | Silty gravels, gravel-sand-silt mixtures, <50% Silts & Clays | Good to Excellent | Slight to Medium | Slight | Fair to Poor | Rubber-tired roller Sheepfoot roller | 115-135 | 20-60 | 200-500 |
| GC | Clayey gravels, gravel-sand-clay mixtures, <50% Silts & Clays | Good | Slight to Medium | Slight | Poor to Practically Impervious | Rubber-tired roller Sheepfoot roller | 130-145 | 20-40 | 200-500 |
| SW | Well-graded sands, gravely sands, little or no fines | Good | None to Very Slight | Almost None | Excellent | Crawler-type tractor rubber-tired roller | 110-130 | 20-40 | 200-400 |
| SP | Poorly-graded sands, gravely sands, little or no fines | Fair to Good | None to Very Slight | Almost None | Excellent | Crawler-type tractor rubber-tired roller | 105-135 | 10-40 | 150-400 |
| SM | Silty sands, sand-silt mixtures <50% Silts & Clays | Fair to Good | Slight to High | Slight | Fair to Poor | Rubber-tired roller Sheepfoot roller | 120-135 | 15-40 | 150-400 |
| SC | Clayey sands, sand-clay mixtures <50% Silts & Clays | Poor to Fair | Slight to High | Slight to Medium | Poor to Practically Impervious | Rubber-tired roller Sheepfoot roller | 100-135 | 5-20 | 100-300 |
| ML | Inorganic silts and very fine sands rock flour, silty fine sands or clayey silts with slight plasticity | Poor to Fair | Medium to Very High | Slight to Medium | Fair to Poor | Rubber-tired roller Sheepfoot roller, close control of moisture | 100-120 | 15 or Less | 100-200 |
| CL | Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays | Poor to Fair | Medium to High | Medium | Practically Impervious | Rubber-tired roller Sheepfoot roller | 90-130 | 15 or Less | 50-150 |
| OL | Organic silts and organic silty clays of low plasticity | Poor | Medium to High | Medium to High | Poor | Rubber-tired roller Sheepfoot roller | 90-105 | 5 or Less | 50-100 |
| MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts | Poor | Medium to Very High | High | Fair to Poor | Sheepfoot roller Rubber-tired roller | 90-105 | 10 or Less | 50-100 |
| CH | Inorganic clays or high plasticity fat clays | Poor to Fair | High | High | Practically Impervious | Sheepfoot roller Rubber-tired roller | 90-115 | 15 or Less | 50-150 |
| OH | Organic clays of medium to high plasticity, organic silts | Poor to Very Poor | High | High | Practically Impervious | Sheepfoot roller Rubber-tired roller | 80-110 | 5 or Less | 25-100 |
| Pt | Peat and other highly organic soils | Not Suitable | Very High | Very High | Fair to Poor | Compaction Not Practical | | | |