# DESIGN ANALYSIS
## Revised 100% Submittal

# CONSTRUCT NEW PARKING LOT #3, B1000
## Offutt A.F.B., Nebraska

**OAFB Project No. SGBP 24-0018**
Contract No. FA4600-22-D-0003
HGM Project No. 740924

hgm ASSOCIATES INC.

June 9, 2026

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# I. PROJECT DESCRIPTION

# PROJECT DESCRIPTION

The objective of this project is to construct a new parking lot to the south and east of the existing south B1000 parking lot. Parking lot will be asphalt pavement. Handicapped parking stalls will not be needed for this lot. Install lighting matching existing B1000 parking lot lighting. Ensure lot has proper drainage. Install pedestrian access to the lot with a pedestrian path matching surrounding B1000 access paths. Paint the new lot parking stalls to match existing B1000 lot. Ensure the lot can house 232 parking stalls.

# II. DESIGN ANALYSIS

# PARKING LOT 3

The existing south parking lot of the STRATCOM building (B1000) will be expanded to the west and south to add additional parking for the facility. The existing lot is constructed of asphalt pavement with concrete curb & gutters. The existing lot has concrete sidewalks along the north side of it. The proposed parking lot layout includes 249 new parking stalls.

To allow for construction of a reduced size lot addition if bids come in higher than estimated, the parking lot will have two bid options, a Base Bid for just expanding the parking lot to the south (160 parking stalls) and an Alternate Bid for the full expansion to the west and south (249 parking stalls).

## PAVEMENT DESIGN

A geotechnical investigation has been done to determine the existing ground conditions at the site. The geotechnical report is included in the following section of the design analysis. The report also includes the results of a pavement design which was performed utilizing the Pavement-Transportation Computer Assisted Structural Engineering (PCASE) computer program. The PCASE program provided for a minimum of 7.5 inches for the asphalt pavement thickness. Based upon a pavement note on an as-built drawing the existing lot is 9.5 inches thick which an increase in thickness to 12 inches in the drive lanes. This as-built drawing was not the pavement plan and we would like to get as-builts of the pavement plan to verify the note and what was installed.

The pavement thickness was discussed with the Base and based upon the pavement design it was determined to use a uniform 9 inch thick asphalt pavement thickness throughout the parking lot addition.

## STORM DRAINAGE DESIGN

### Existing Site Condition:

The storm drainage from the existing parking lots south and west of B1000 drains into a detention pond at the south end of the site. The existing parking lot also includes rain gardens

with grated area inlets which retain the initial runoff to assist in filtering sediment and trash in the storm runoff and reduce the peak flow entering the detention pond. There are seven separate storm pipe systems which outlet into the detention pond. The water in the detention flows out through two 88" diameter area inlets which tie into a storm drainage system which flows off Base to the south.

**Proposed Site Condition:**

The new parking area will be constructed to the west and south of the southern most parking lot. This new parking area extends into the open area between the existing parking lot and the detention pond. The storm drainage from the new parking lot expansion will be captured by new curb inlets around the perimeter of the parking lot. The inlets will be tied into a hydrodynamic separator to filter the storm runoff. The hydrodynamic separator was chosen because it can accomplish the filtering of the runoff without requiring large areas of potential parking area being taken up for rain gardens.

**Detention Pond Performance**

The Base does not have design calculations or as-built information for the detention pond or the storm drainage system around building B1000. The existing runoff for all the drainage areas contributing to the detention pond will be calculated based upon 8 drainage points, one each for the 7 storm drain outlets into the detention pond as well for the surrounding surface runoff into the pond. Then the runoff for the proposed condition will be calculated for the same 8 points. The existing and proposed runoff will be compared at the 10-year, 50-year and 100-year events.

The detention pond water storage elevation will be determined at the 100-year storm outflow rate for both the existing and proposed conditions to determine the freeboard in the pond and if any adverse impact due to the change in runoff occurs.

The existing drainage network around B1000 has minor detention areas which will have some impact on the peak flow into the detention pond. We do not have all the as-built information needed to model their impact, so the calculated runoff flow to the detention not taking them into effect will be higher and thus more conservative.

**Hydrology:**

The hydrology for the existing and proposed conditions were calculated by the Rational Method utilizing rainfall intensity data from the Omaha Regional Stormwater Design Manual. The rainfall intensity curves and runoff coefficient tables are attached on the following pages. (For drainage area maps see Maps A & B).

**Summary of Pre-Construction and Post Construction Runoff – Rational Method**
(See Table A & B for Calculations)

**At Detention Pond**

| | **10- Year** | **50-Year** | **100-Year** |
|---|---|---|---|
| Existing: | 214 cfs | 324 cfs | 369 cfs |
| Proposed: | 222 cfs | 336 cfs | 382 cfs |

The increase in runoff for the proposed condition is approximately 4%

The detention pond has two 88" diameter area inlets which control the outflow of the detention pond. The maximum storage in the detention pond will be when the water elevation reaches a point where the head over the area inlets provides for the outflow to match the 100-year flow going into the pond.

Looking at the orifice flow for the 2 area inlets, the head needed for the existing and proposed conditions are as follows (see calculations on the following pages):

| | **100- Year Flow** | **Centerline Head** | **Water Surface Elev.** |
|---|---|---|---|
| Existing: | 369 cfs | 7.23 Feet | 973.64 |
| Proposed: | 382 cfs | 7.75 Feet | 974.16 |

(Centerline of inlet orifice elev. = 966.41)

The rise in elevation in the detention pond would be 0.52 feet. The low elevation around the perimeter of the detention pond is 975.3 at the east end of the detention pond. The rise in the 100-year water surface Elevation to 974.16 still leaves over 1 foot of freeboard on the pond. The detention pond has the capacity to accommodate the increased flow.

## LIGHTING

The existing parking lot has light poles spaced through the lot to provide illumination for the parking lot. The light poles and fixtures are the property of OPPD. Lighting requirements for the new parking lot will be analyzed to provide appropriate lumen levels throughout the lot. The light poles, luminaires, concrete bases, underground conduit, and wiring will all be provided and installed by OPPD.

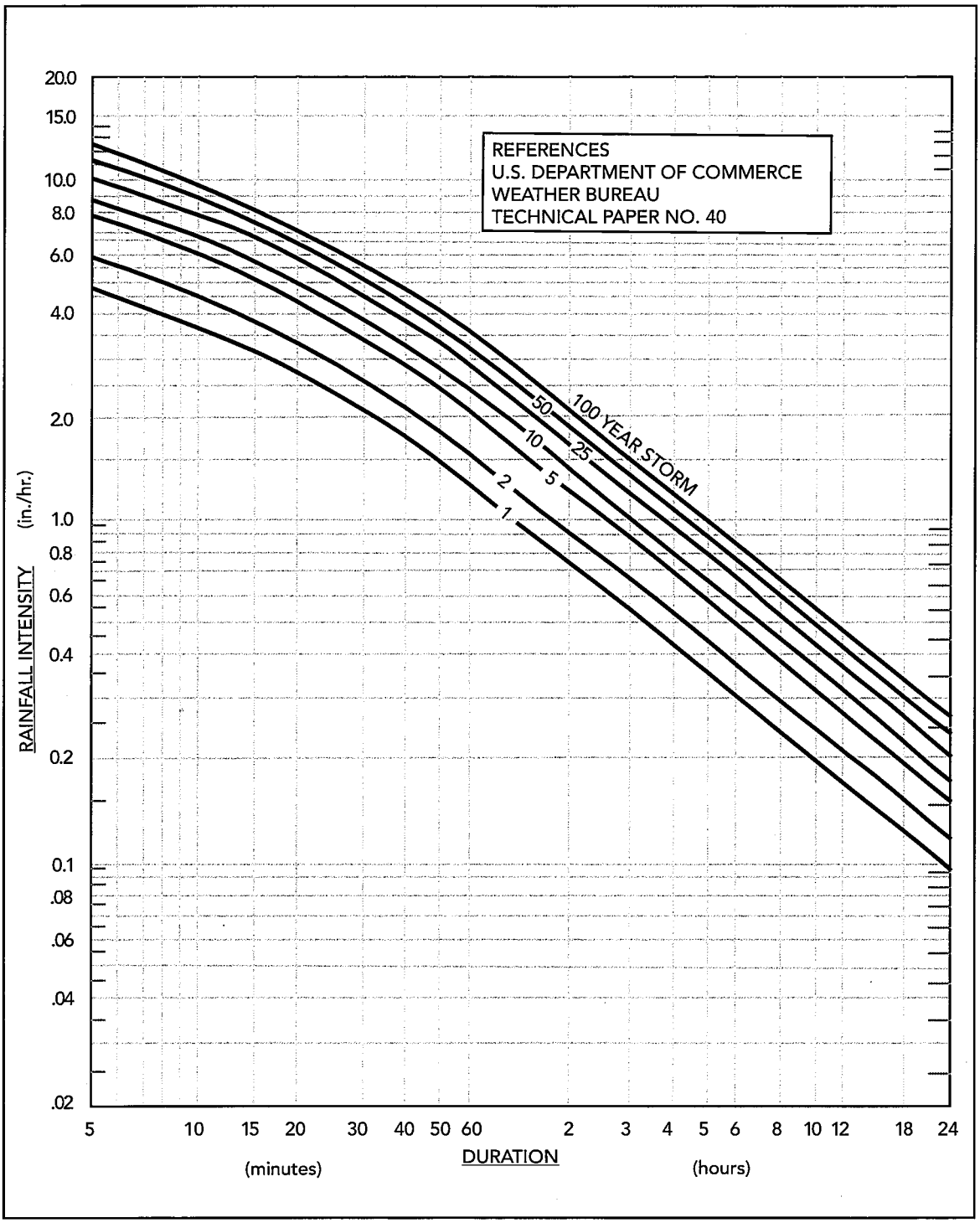



**Figure 2-2 Rainfall Intensity-Duration — Omaha, Nebraska** Source: HEC No. 19, FHWA

It is often desirable to develop a composite runoff coefficient based on the percentage of different types of surface in the drainage area. Composites can be made with Tables 2-3 and 2-4. The composite procedure can be applied to an entire drainage area or to typical "sample" blocks as a guide to selection of reasonable values of the coefficient for an entire area.

**Table 2-3 Recommended Runoff Coefficients**

| Description Of Area | | Runoff Coefficient |
|---|---|---|
| Pavement Areas | Asphaltic and Concrete | 0.95 |
| | Brick | 0.85 |
| | Roofs | 0.95 |
| Business Areas | Downtown | 0.70 to 0.95 |
| Neighborhood | | 0.50 to 0.70 |
| Residential Areas | Single-Family | 0.30 to 0.50 |
| | R-1 and R-2 – 20,000 sq. ft. | 0.49 |
| | R-3 and R-4 – 10,000 sq. ft. | 0.52 |
| | R-5 and R-6 – 8,500 sq. ft. | 0.57 |
| | Multi-units, detached | 0.40 to 0.60 |
| | Multi-units, attached | 0.60 to 0.75 |
| | Suburban | 0.25 to 0.40 |
| | Apartment | 0.50 to 0.70 |
| Industrial Area | Light | 0.50 to 0.80 |
| | Heavy | 0.60 to 0.90 |
| Parks & Cemeteries | | 0.10 to 0.25 |
| Playgrounds | | 0.20 to 0.35 |
| Railroad Yard | | 0.20 to 0.35 |
| Turfed Slope Areas | Flat, 0 to 1% | 0.25 |
| | Average, 1 to 3% | 0.35 |
| | Hilly, 3 to 10% | 0.40 |
| | Steep, 10%+ | 0.45 |
| Cultivated Ground | Flat, 0 to 1% | 0.10 |
| | Average, 1 to 3% | 0.20 |
| | Hilly, 3 to 10%+ | 0.25 |
| | Steep, 10%+ | 0.30 |
| *No Ground Cover | Recently Disturbed Soil | 0.50 to 0.70 |

*This condition is intended to be used only for sizing temporary "construction site" sediment control detention ponds.

hgm ASSOCIATES INC.

Job PARKING LOT #3 B1000
Sheet No. _____ Of _____
Calculated by WJG Date 5/9/25
Checked by _____ Date _____
HGM Project No. _____

## DETENTION POND AREA INLETS

ORIFICE: 88" DIA AREA INLET

CIRCUMFERENCE = $\pi$ (88) = 276"

OPENINGS = 276" − (4 (SUPPORTS) × 12") = 228"

AREA = 228" × 9" = 2052 IN$^2$
(TWO INLETS = 4104 IN$^2$)

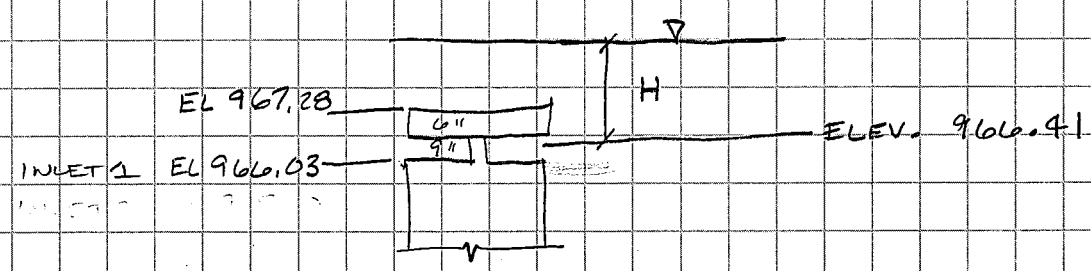
$$Q = C_d A_o \sqrt{2gH}$$

$C_d$ ⇒ DISCHARGE COEF. = 0.6

$g$ ⇒ GRAVITATIONAL CONSTANT 32.2

$H$ ⇒ CENTERLINE HEAD

CL ELEV OF ORIFICE − AREA INLET



## Orifice Equations Design Calculator

Fluid Mechanics Hydraulics Formulas

**Problem:**

EXISTING 100-YR FLOW

Solve for center line head.

$$H = \frac{\left(\frac{Q}{C_d A_0}\right)^2}{2g}$$

**Enter Calculator Inputs:**

| | | |
|---|---|---|
| flow rate (Q) | 369 | foot^3/second |
| discharge coefficient ($C_d$) | .6 | unitless |
| orifice area ($A_0$ | 4104 | inch^2 |
| gravitational constant (g) | 32.2 | foot/second^2 |

Calculate

Can you share this page? Because, it could help others.

**Solution:**

**center line head (H) = 2.2038884396346 meter**

**Solution In Other Units:**

center line head (H)

| | |
|---|---|
| = 2.2038884396346 | meter |
| = 22038884396.346 | angstrom |
| = 2203888439634600000 | attometer |
| = 220.38884396346 | centimeter |
| = 0.1095546229835 | chain |
| = 0.22038884396346 | dekameter |
| = 22.038884396346 | decimeter |
| = 2.2038884396346e-18 | exameter |
| = 2203888439634600 | femtometer |
| = 7.2306051169113 HEAD | foot |
| = 2.2038884396346e-9 | gigameter |
| = 0.022038884396346 | hectometer |
| = 86.767261402935 | inch |
| = 0.0022038884396346 | kilometer |
| = 2.3295616749036e-16 | light year |
| = 10.92656638391 | link |
| = 0.0000022038884396346 | megameter |
| = 2203888.4396346 | micrometer |
| = 2203888.4396346 | micron |
| = 0.0013694327872938 | mile |
| = 2203.8884396346 | millimeter |
| = 2203888439.6346 | nanometer |
| = 7.1423160148655e-17 | parsec |
| = 2.2038884396346e-15 | petameter |
| = 2203888439634.6 | picometer |
| = 0.43821849193402 | rod |
| = 2.2038884396346e-12 | terameter |
| = 2.4102017056371 | yard |

## Orifice Equations Design Calculator

Fluid Mechanics Hydraulics Formulas

**Problem:**

PROPOSED 100-YR FLOW

Solve for center line head.

$$H = \frac{\left(\frac{Q}{C_d A_o}\right)^2}{2g}$$

**Enter Calculator Inputs:**

| | | |
|---|---|---|
| flow rate (Q) | 382 | foot^3/second |
| discharge coefficient ($C_d$) | .6 | unitless |
| orifice area ($A_O$ | 4104 | inch^2 |
| gravitational constant (g) | 32.2 | foot/second^2 |

Calculate

Can you share this page? Because, it could help others.

**Solution:**

**center line head (H) = 2.3619113892027 meter**

**Solution In Other Units:**

center line head (H)

| | |
|---|---|
| = 2.3619113892027 | meter |
| = 23619113892.027 | angstrom |
| = 2361911389202700000 | attometer |
| = 236.19113892027 | centimeter |
| = 0.11740989566943 | chain |
| = 0.23619113892027 | dekameter |
| = 23.619113892027 | decimeter |
| = 2.3619113892027e-18 | exameter |
| = 2361911389202700 | femtometer |
| = 7.7490531141822 HEAD | foot |
| = 2.3619113892027e-9 | gigameter |
| = 0.023619113892027 | hectometer |
| = 92.988637370186 | inch |
| = 0.0023619113892027 | kilometer |
| = 2.4965956319992e-16 | light year |
| = 11.710021761045 | link |
| = 0.0000023619113892027 | megameter |
| = 2361911.3892027 | micrometer |
| = 2361911.3892027 | micron |
| = 0.0014676236958678 | mile |
| = 2361.9113892027 | millimeter |
| = 2361911389.2027 | nanometer |
| = 7.6544335173305e-17 | parsec |
| = 2.3619113892027e-15 | petameter |
| = 2361911389202.7 | picometer |
| = 0.46963958267771 | rod |
| = 2.3619113892027e-12 | terameter |
| = 2.5830177047274 | yard |

SGBP 24-0018
Parking Lot #3 B1000
Offutt AFB

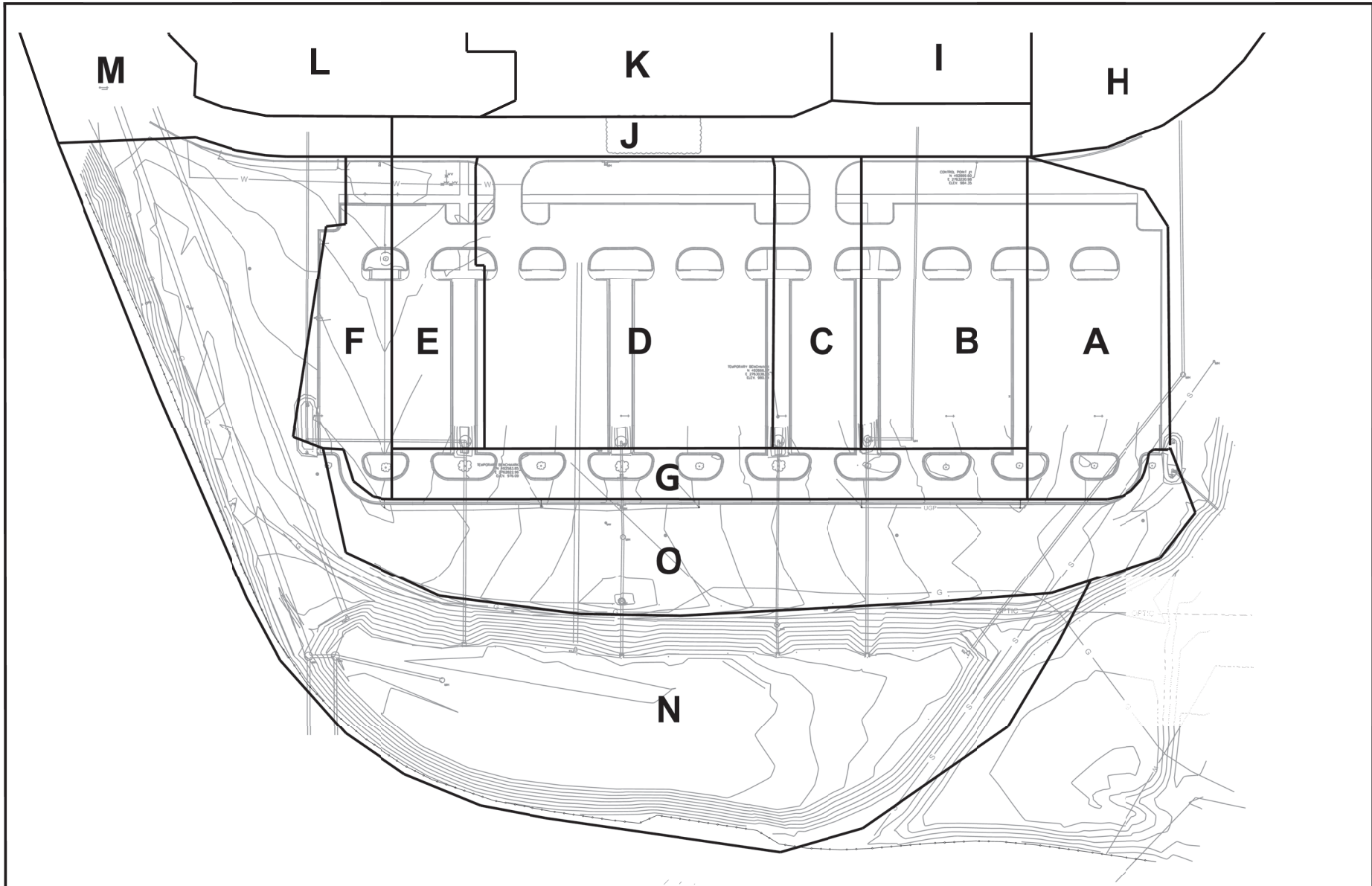
# Table A
# Existing Condition

| Basin | Map Areas | Impervious Area(Ac) | Turf Area(Ac) | Total Area(Ac) | C Impervious | C Turf | Composite C | Time of Concentration | Intensity (in/hr) | Frequency Factor | Q (cfs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **10 Yr** | | | | | | | | | | | |
| E1 | M | 12.66 | 7.87 | 20.53 | 0.95 | 0.35 | 0.72 | 12.53 | 6.50 | 1.00 | 96.08 |
| E2 | E - F - L | 1.59 | 0.61 | 2.20 | 0.95 | 0.35 | 0.78 | 5.00 | 8.90 | 1.00 | 15.34 |
| E3 | J - K | 2.98 | 2.64 | 5.62 | 0.95 | 0.35 | 0.67 | 5.00 | 8.90 | 1.00 | 33.42 |
| E4 | D - G - O | 1.69 | 2.26 | 3.95 | 0.95 | 0.35 | 0.61 | 5.00 | 8.90 | 1.00 | 21.33 |
| E5 | C | 0.35 | 0.15 | 0.50 | 0.95 | 0.35 | 0.77 | 5.00 | 8.90 | 1.00 | 3.43 |
| E6 | B - I | 1.36 | 0.99 | 2.35 | 0.95 | 0.35 | 0.70 | 5.00 | 8.90 | 1.00 | 14.58 |
| E7 | H | 1.11 | 2.23 | 3.34 | 0.95 | 0.35 | 0.55 | 5.00 | 8.90 | 1.00 | 16.33 |
| E8 | N | 0 | 4.37 | 4.37 | 0.95 | 0.35 | 0.35 | 5.00 | 8.90 | 1.00 | 13.61 |
| Total | | 21.74 | 21.12 | 42.86 | | | | | | | 214.12 |
| | | | | | | | | | | | |
| **50 Yr** | | | | | | | | | | | |
| E1 | M | 12.66 | 7.87 | 20.53 | 0.95 | 0.35 | 0.72 | 12.53 | 8.30 | 1.20 | 147.22 |
| E2 | E - F - L | 1.59 | 0.61 | 2.20 | 0.95 | 0.35 | 0.78 | 5.00 | 11.10 | 1.20 | 22.96 |
| E3 | J - K | 2.98 | 2.64 | 5.62 | 0.95 | 0.35 | 0.67 | 5.00 | 11.10 | 1.20 | 50.02 |
| E4 | D - G - O | 1.69 | 2.26 | 3.95 | 0.95 | 0.35 | 0.61 | 5.00 | 11.10 | 1.20 | 31.92 |
| E5 | C | 0.35 | 0.15 | 0.50 | 0.95 | 0.35 | 0.77 | 5.00 | 11.10 | 1.20 | 5.13 |
| E6 | B - I | 1.36 | 0.99 | 2.35 | 0.95 | 0.35 | 0.70 | 5.00 | 11.10 | 1.20 | 21.82 |
| E7 | H | 1.11 | 2.23 | 3.34 | 0.95 | 0.35 | 0.55 | 5.00 | 11.10 | 1.20 | 24.44 |
| E8 | N | 0 | 4.37 | 4.37 | 0.95 | 0.35 | 0.35 | 5.00 | 11.10 | 1.20 | 20.37 |
| Total | | 21.74 | 21.12 | 42.86 | | | | | | | 323.89 |
| | | | | | | | | | | | |
| **100 Yr** | | | | | | | | | | | |
| E1 | M | 12.66 | 7.87 | 20.53 | 0.95 | 0.35 | 0.72 | 12.53 | 9.00 | 1.25 | 166.29 |
| E2 | E - F - L | 1.59 | 0.61 | 2.20 | 0.95 | 0.35 | 0.78 | 5.00 | 12.20 | 1.25 | 26.29 |
| E3 | J - K | 2.98 | 2.64 | 5.62 | 0.95 | 0.35 | 0.67 | 5.00 | 12.20 | 1.25 | 57.26 |
| E4 | D - G - O | 1.69 | 2.26 | 3.95 | 0.95 | 0.35 | 0.61 | 5.00 | 12.20 | 1.25 | 36.55 |
| E5 | C | 0.35 | 0.15 | 0.50 | 0.95 | 0.35 | 0.77 | 5.00 | 12.20 | 1.25 | 5.87 |
| E6 | B - I | 1.36 | 0.99 | 2.35 | 0.95 | 0.35 | 0.70 | 5.00 | 12.20 | 1.25 | 24.99 |
| E7 | H | 1.11 | 2.23 | 3.34 | 0.95 | 0.35 | 0.55 | 5.00 | 12.20 | 1.25 | 27.98 |
| E8 | N | 0 | 4.37 | 4.37 | 0.95 | 0.35 | 0.35 | 5.00 | 12.20 | 1.25 | 23.32 |
| Total | | 21.74 | 21.12 | 42.86 | | | | | | | 368.56 |

SGBP 24-0018
Parking Lot #3 B1000
Offutt AFB

# Table B
# Proposed Condition

| Basin | Map Areas | Impervious Area(Ac) | Turf Area(Ac) | Total Area(Ac) | C Impervious | C Turf | Composite C | Time of Concentration | Intensity (in/hr) | Frequency Factor | Q (cfs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **10 Yr** | | | | | | | | | | | |
| P1 | M - X | 13.99 | 8.01 | 22.00 | 0.95 | 0.35 | 0.73 | 12.53 | 6.50 | 1.00 | 104.61 |
| P2 | E - L | 1.15 | 0.49 | 1.64 | 0.95 | 0.35 | 0.77 | 5.00 | 8.90 | 1.00 | 11.25 |
| P3 | J - K | 2.98 | 2.64 | 5.62 | 0.95 | 0.35 | 0.67 | 5.00 | 8.90 | 1.00 | 33.42 |
| P4 | D - Y - Z | 2.86 | 1.11 | 3.97 | 0.95 | 0.35 | 0.78 | 5.00 | 8.90 | 1.00 | 27.64 |
| P5 | C | 0.35 | 0.15 | 0.50 | 0.95 | 0.35 | 0.77 | 5.00 | 8.90 | 1.00 | 3.43 |
| P6 | B - I | 1.36 | 0.99 | 2.35 | 0.95 | 0.35 | 0.70 | 5.00 | 8.90 | 1.00 | 14.58 |
| P7 | H | 1.11 | 2.23 | 3.34 | 0.95 | 0.35 | 0.55 | 5.00 | 8.90 | 1.00 | 16.33 |
| P8 | N | 0 | 3.46 | 3.46 | 0.95 | 0.35 | 0.35 | 5.00 | 8.90 | 1.00 | 10.78 |
| Total | | 23.80 | 19.08 | 42.88 | | | | | | | 222.04 |
| | | | | | | | | | | | |
| **50 Yr** | | | | | | | | | | | |
| P1 | M - X | 13.99 | 8.01 | 22.00 | 0.95 | 0.35 | 0.73 | 12.53 | 8.30 | 1.20 | 160.30 |
| P2 | E - L | 1.15 | 0.49 | 1.64 | 0.95 | 0.35 | 0.77 | 5.00 | 11.10 | 1.20 | 16.84 |
| P3 | J - K | 2.98 | 2.64 | 5.62 | 0.95 | 0.35 | 0.67 | 5.00 | 11.10 | 1.20 | 50.02 |
| P4 | D - Y - Z | 2.86 | 1.11 | 3.97 | 0.95 | 0.35 | 0.78 | 5.00 | 11.10 | 1.20 | 41.37 |
| P5 | C | 0.35 | 0.15 | 0.50 | 0.95 | 0.35 | 0.77 | 5.00 | 11.10 | 1.20 | 5.13 |
| P6 | B - I | 1.36 | 0.99 | 2.35 | 0.95 | 0.35 | 0.70 | 5.00 | 11.10 | 1.20 | 21.82 |
| P7 | H | 1.11 | 2.23 | 3.34 | 0.95 | 0.35 | 0.55 | 5.00 | 11.10 | 1.20 | 24.44 |
| P8 | N | 0 | 3.46 | 3.46 | 0.95 | 0.35 | 0.35 | 5.00 | 11.10 | 1.20 | 16.13 |
| Total | | 23.80 | 19.08 | 42.88 | | | | | | | 336.04 |
| | | | | | | | | | | | |
| **100 Yr** | | | | | | | | | | | |
| P1 | M - X | 13.99 | 8.01 | 22.00 | 0.95 | 0.35 | 0.73 | 12.53 | 9.00 | 1.25 | 181.06 |
| P2 | E - L | 1.15 | 0.49 | 1.64 | 0.95 | 0.35 | 0.77 | 5.00 | 12.20 | 1.25 | 19.28 |
| P3 | J - K | 2.98 | 2.64 | 5.62 | 0.95 | 0.35 | 0.67 | 5.00 | 12.20 | 1.25 | 57.26 |
| P4 | D - Y - Z | 2.86 | 1.11 | 3.97 | 0.95 | 0.35 | 0.78 | 5.00 | 12.20 | 1.25 | 47.36 |
| P5 | C | 0.35 | 0.15 | 0.50 | 0.95 | 0.35 | 0.77 | 5.00 | 12.20 | 1.25 | 5.87 |
| P6 | B - I | 1.36 | 0.99 | 2.35 | 0.95 | 0.35 | 0.70 | 5.00 | 12.20 | 1.25 | 24.99 |
| P7 | H | 1.11 | 2.23 | 3.34 | 0.95 | 0.35 | 0.55 | 5.00 | 12.20 | 1.25 | 27.98 |
| P8 | N | 0 | 3.46 | 3.46 | 0.95 | 0.35 | 0.35 | 5.00 | 12.20 | 1.25 | 18.47 |
| Total | | 23.80 | 19.08 | 42.88 | | | | | | | 382.27 |




DRAINAGE AREA MAP - EXISTING

SCALE: 1" = 40'

N

Offutt
Air Force Base

APPROVED

| SIGNATURE | OFFICE |
|---|---|
| BASE CIVIL ENGINEER | |
| CHIEF OF ENGINEERING | |
| CHIEF OF DESIGN | |
| PROJECT MANAGER | |

COORDINATION

| | |
|---|---|
| FIRE DEPARTMENT | |
| SAFETY | |
| FORCE PROTECTION | |
| ENVIRONMENTAL (CEA) | |
| COMMUNICATION | |
| USING AGENCY | |

"SIGNING OF THE COVER SHEET CONSTITUTES COORDINATION OF ALL DRAWINGS IN THIS PROJECT; SUBSEQUENT SHEETS NEED NOT BE SIGNED."

DESIGN FIRM

hgm ASSOCIATES INC.
ENGINEERING ARCHITECTURE SURVEYING
council bluffs omaha

90% SUBMITTAL
MAY 29, 2025

NOT FOR CONSTRUCTION

| Designer | Project Manager WJG |
|---|---|
| Drafter | Date 05-29-25 |

| REVISION | BY/DATE |
|---|---|
| | |

SHEET TITLE

DRAINAGE AREA MAP - EXISTING

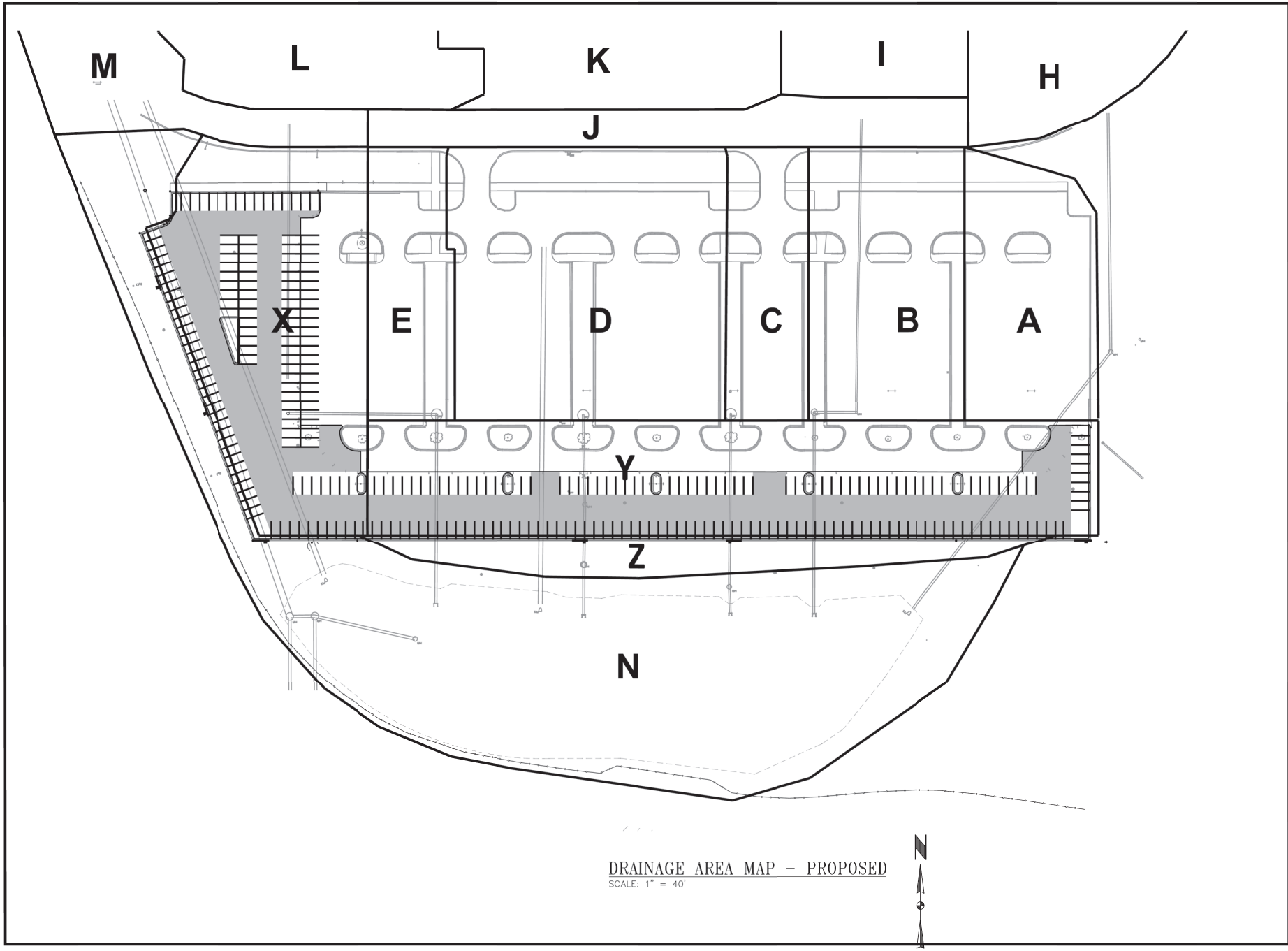
SHEET 1 OF 2

PROJECT TITLE

CONSTRUCT NEW PARKING LOT 3, B1000

Project Number SGBP-24-0018

| Drawing Number | Facility Number |
|---|---|
| OFF-B-6524 | B1000 |




DRAINAGE AREA MAP - PROPOSED

SCALE: 1" = 40'

Offutt
Air Force Base

APPROVED

| SIGNATURE | OFFICE |
|---|---|
| BASE CIVIL ENGINEER | |
| CHIEF OF ENGINEERING | |
| CHIEF OF DESIGN | |
| PROJECT MANAGER | |

COORDINATION

| | |
|---|---|
| FIRE DEPARTMENT | |
| SAFETY | |
| FORCE PROTECTION | |
| ENVIRONMENTAL (CEA) | |
| COMMUNICATION | |
| BASE AGENCY | |

"SIGNING OF THE COVER SHEET CONSTITUTES COORDINATION OF ALL DRAWINGS IN THIS PROJECT; SUBSEQUENT SHEETS NEED NOT BE SIGNED."

DESIGN FIRM

hgm ASSOCIATES INC.
ENGINEERING ARCHITECTURE SURVEYING
council bluffs omaha

90% SUBMITTAL
MAY 29, 2025

NOT FOR CONSTRUCTION

| | |
|---|---|
| Designer | Project Manager WJG |
| Drafter | Date 05-29-25 |

| REVISION | BY/DATE |
|---|---|
| | |

SHEET TITLE

DRAINAGE AREA MAP - PROPOSED

SHEET 2 OF 2

PROJECT TITLE

CONSTRUCT NEW PARKING LOT 3, B1000

Project Number SGBP-24-0018

Drawing Number OFF-B-6524 | Facility Number B1000

# III. GEOTECHNICAL ENGINEERING AND PAVEMENT DESIGN REPORT

# Offutt Parking Lot 3, B1000

## Geotechnical Engineering Report

## Bellevue, Nebraska

November 25, 2024 | Terracon Project No. 05245152

**Prepared for:**

HGM Associates Inc.
450 Regency Parkway, Ste. 120
Omaha, Nebraska 68144

PROFESSIONAL CIVIL ENGINEER
MICHAEL D RINGLER
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11/25/2024
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**Contractor Registration Certificate**

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**Registration # 25992-24**
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November 25, 2024

HGM Associates Inc.
450 Regency Parkway, Ste. 120
Omaha, Nebraska 68144

Attn: Mr. Bill Glismann, P.E.
P: (402) 819-7341
E: bglismann@hgmonline.com

Re: Geotechnical Engineering Report
Offutt Parking Lot 3, B1000
Offutt Air Force Base
Bellevue, Nebraska
Terracon Project No. 05245152

Dear Mr. Glismann:

We have completed the scope of geotechnical engineering services for the referenced project in general accordance with Terracon Proposal No. P05245152 authorized September 12, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of vehicular-use (non-airfield) pavements for the project.

We appreciate the opportunity to work with you on this project. Please contact us with any questions concerning this report or if we may be of further service.

Sincerely,

**Terracon**

Caleb C. Craven, E.I.
Senior Staff Engineer

Michael D. Ringler, P.E.
Senior Engineer

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

Refer to each individual Attachment for a listing of contents.

# Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed parking lot expansion located on the Offutt Air Force Base (OAFB) in Bellevue, Nebraska. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Pavement design and construction

The geotechnical engineering scope of services for this project included conducting field exploration (soil borings, dynamic cone penetrometer), laboratory testing, engineering evaluations, and preparation of this report.

Drawings showing the site and boring locations are provided on **Site Location** and **Exploration Plan**, respectively. The results of the laboratory testing performed on soil samples obtained from the borings are included on the boring logs and as separate graphs in **Exploration and Laboratory Results**.

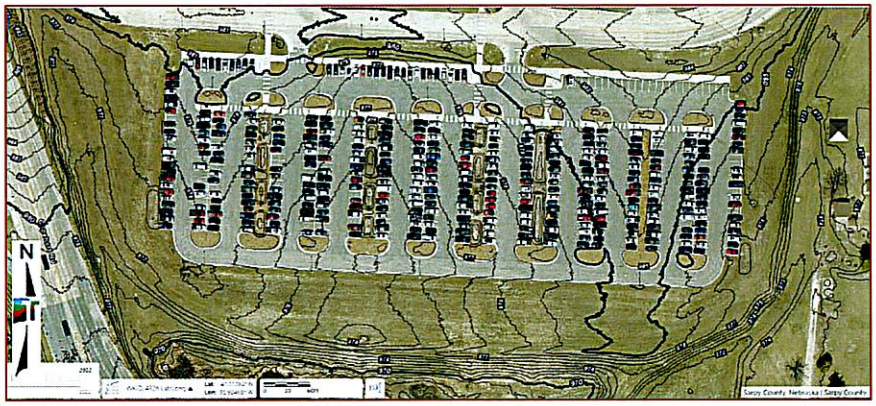
# Project Description

Our understanding of the project follows:

| Item | Description |
|---|---|
| **Information Provided** | HGM provided the following in an email: Lot 3 Site Plan, Aerial Site Location Diagram, Utility Plan, & Task Order Project Scope. |
| **Project Description** | The project consists of constructing a new full-depth asphalt parking lot adjoining the existing parking lot. The new lot has about 58,000 sf of pavement and will add 232 parking stalls. |
| **Grading / Slopes** | Grading plan not provided. Based on conversations with HGM, we understand grading will consist of cuts and fills less than 2 feet.<br>Final slopes are planned with a maximum an inclination of 3H:1V (Horizontal: Vertical) or flatter. |
| **Design References** | Unified Facilities Criteria (UFC) Pavement Design for Roads and Parking Areas, UFC 3-250-01, dated November 14, 2016 |
| **Vehicular Traffic** | We understand vehicular traffic will consist of pedestrian vehicles only. No special military vehicles or truck traffic will travel the new pavement. Pavement design criteria (vehicle frequency, design life, etc.) has not been provided. We have assumed design criteria summarized in **Pavements**. |

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

# Site Conditions

| Item | Description |
|---|---|
| **Parcel Information** | As shown in **Site Location**, the project is located on the OAFB east of the Fort Crook Road S and Gemini Boulevard intersection in Bellevue, Nebraska. |
| **Existing Pavement** | HGM reports pedestrian vehicle parking and drive areas of the adjacent lot are paved with 9.5 inches of full-depth asphalt (no aggregate base). Where truck traffic lanes are present, the pavement is 12 inches of full-depth asphalt. |
| **Current Ground Cover** | Grass surfacing at proposed parking lot expansion areas. |
| **Existing Topography** | As shown on the Sarpy County GIS snippet below, the surface elevations generally range from 974 feet to 981 feet in the new pavement areas.  |

# Geotechnical Characterization

## GeoModel

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting, and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical evaluations. Conditions observed at each exploration point are indicated on the individual logs. The GeoModel and individual boring logs can be found in **Exploration and Laboratory Results**.

We identified the following model layers within the subsurface profile. Refer to the GeoModel and individual boring logs for more information.

| Model Layer | Layer Name | General Description |
|---|---|---|
| **1** | **Existing Fill** | Lean Clay, Lean Clay with Sand |
| **2** | **Loess** | Lean Clay |

Variations can occur between boring locations and across the site. Previous grading and construction may have created additional variations.

### Groundwater Conditions

Groundwater was not observed in the borings during or shortly after completion of drilling operations. At the time the borings were drilled, the groundwater table at the boring locations was apparently below the maximum drilling depth. However, fluctuations in the groundwater table can occur and perched water can develop over low permeability soil strata following periods of heavy or prolonged precipitation. This possibility should be considered when developing design and construction plans and specifications for the project. Long term monitoring in cased holes or piezometers would be necessary to accurately evaluate groundwater conditions.

## Geotechnical Overview

**Existing Fill:** Each boring encountered existing fill in the upper 3 feet to 10 feet (termination depth) below existing grade. The fill generally consisted of low-plasticity clay and contained variable amounts of concrete fragments. We were not involved, nor have we been provided any documentation of the fill placement (e.g., observation reports, moisture and compaction testing, etc.). Any such records would aid in our evaluation of the existing fill.

Support of pavements on or above existing fill materials presents the risk for the owner that compressible fill, rubble fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill.

However, based on our laboratory test results, most of the tested samples are compacted to at least 90% of the material's maximum dry density (MDD) using modified effort (modified proctor) as recommended for subgrade materials described in **Earthwork** and in general accordance with the recommendations in UFC 3-250-01. While isolated fill samples below a depth of 5 feet (B-2 @ 5'-7', B-3 @ 5'-7' and 8'-10', and B-5 @ 8'-10') are compacted to less than 90% (86% to 89%), it is our opinion the risk(s) associated with existing fill are low and can be further reduced by observing and

testing the existing fill during construction. Further site and subgrade preparation recommendations for pavements are provided in **Earthwork**.

**Pavements:** Pavement designs for this project have been based on the use of the Pavement-Transportation Computer Assisted Structural Engineering (PCASE) computer program, which performs layered elastic-based structural analysis to calculate design thicknesses for pavements under pedestrian vehicular traffic loading.

The UFC 3-250-01 outlines general design procedures using PCASE for parking lots of this type (similar use/traffic conditions); however, because no special military traffic is expected on these pavements, the UFC permits pavement design to be in accordance with state-specific DOT design (e.g., AASHTO 1993). If state specific DOT design is preferred, we should be notified to modify the recommendations in this report accordingly.

Further, UFC 3-250-01 requires aggregate drainage and separation layers below pavements. However, because the existing parking lot pavement is supported directly on cohesive subgrade, we assume substituting the aggregate drainage and separation layers with a greater thickness of asphalt is acceptable to the federal reviewer. If the reviewer requires the pavement be supported above an aggregate base, we should be notified to adjust our recommendations as appropriate.

Information regarding the design and construction of the parking lot pavements are included in **Pavements**.

**General:** The recommendations contained in this report are based upon the results of the field exploration and laboratory testing, engineering evaluations, and our understanding of the proposed project. **General Comments** provides an understanding of the report limitations.

# Earthwork

## Site and Subgrade Preparation

Prior to placing fill, existing vegetation, root mats, and topsoil should be removed from the new pavement areas. A typical stripping depth of about 6 to 9 inches is expected to be adequate in most areas to remove vegetation and root mat. However, isolated areas of both deeper and shallower stripping are expected. Site and subgrade preparation procedures should extend at least 2 feet beyond pavement edges.

We understand that several utilities traverse the pavement areas. It has been our experience that poorly compacted backfill is commonly found in utility line trenches. Poorly compacted backfill above existing utility lines should be reworked and recompacted where feasible to mitigate damages to the exterior hardscape.

In cut areas, the exposed subgrade after reaching subgrade level should be proofrolled with a fully-loaded tandem-axle dump truck, or similar equipment providing equivalent loading. The proofrolling should be performed under the observation of the Geotechnical Engineer or geotechnical representative. Soft, unstable, or poorly compacted fill areas should be delineated and corrected. Excessively wet or dry material should either be removed, or moisture conditioned and recompacted.

Similarly in fill areas, the exposed subgrade after stripping should be proofrolled and unsuitable areas identified improved by reworking the material or undercut and replacement. Grade-raise fill may then be placed up to subgrade elevation as described in the following sections.

All pavements should be supported on at least 8 inches of structural fill. In areas where this amount of fill is not placed incidentally as part of grading, the subgrade should be scarified, moisture conditioned, and recompacted. All reworked material and structural fill should be placed in accordance with the recommendations presented in Fill Material Types and Fill Placement and Compaction Recommendations.

## Fill Material Types

Structural fill should meet the material property recommendations in the following table:

| Soil Type [1] | USCS Classification | Placement Location |
|---|---|---|
| Low-Plasticity Cohesive | CL (LL≤45 and 10≤PI≤25) [2] | All locations and elevations |

1. A sample of each material should be submitted to the Geotechnical Engineer for evaluation prior to use.
2. LL=Liquid Limit. PI=Plasticity Index. Fill meeting a PI of 10 to 20 is preferred but is not readily available onsite. Utilizing lean clay soils with a liquid limit of less than 45 percent and a plasticity index between 20 and 25 percent will somewhat increase the risk of shrink-swell movement.

Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. Fill should not contain particles larger than 3 inches in dimension.

**Reuse of On-site Soils:** Based on our laboratory testing on the collected samples, the on-site soil appears suitable for use as low-plasticity, cohesive structural fill as described in the preceding table. We recommend additional laboratory testing consisting of Atterberg Limits and Modified Proctor tests be performed during construction to confirm suitability.

## Fill Placement and Compaction Recommendations

Structural fill should meet the following compaction recommendations:

| Item | Recommendation |
|---|---|
| **Maximum Lift Thickness** | ▪ 8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used<br>▪ 4 to 6 inches in loose thickness when hand-guided equipment (i.e., jumping jack or plate compactor) is used |
| **Minimum Compaction Recommendations**[1] | 90% of max. all locations and elevations |
| **Water Content Range**[1] | Cohesive: 0% to +4% of optimum |

1. Maximum density and optimum water content as determined by the Modified-energy moisture-density relationship (Proctor test, ASTM D 1557).

## Earthwork Construction Considerations

The clay soils on the site will be sensitive to disturbance from construction activity and water seepage. If precipitation occurs immediately prior to or during construction, the near-surface soils could increase in water content and become more susceptible to disturbance.

Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab or pavement construction.

All excavations should comply with OSHA 29 CFR, Part 1926, Subpart P, "Excavations and Trenches" and other applicable codes. The OSHA document states that the excavation safety is the responsibility of the Competent Person as identified by the contractor. Reference to this OSHA requirement should be included in the job specifications.

### Grading and Drainage

All grades must provide effective drainage away from the work areas during and after construction and should be maintained throughout the life of the pavement. Final grades should be verified to document effective drainage has been achieved. Additionally, a maintenance program should be established to effectively seal and maintain joints.

### Construction Observation and Testing

The earthwork efforts should be observed by the Geotechnical Engineer. Observation should include documenting stripping and removal of surficial materials (e.g., vegetation and root mat), removal of existing features such as utility trench backfill, evaluation of subgrade conditions, evaluation of existing fill, and proofrolling.

Each lift of compacted fill should be tested and evaluated by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content.

Retaining Terracon as the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated modifications or design changes.

## Pavements

### Discussion

The pavement design for this project was based on the use of the Pavement-Transportation Computer Assisted Structural Engineering (PCASE) computer program, which performs layered elastic-based structural analysis to calculate design thicknesses for pavements under repeated aircraft traffic loading. In other words, the PCASE program calculates pavement thicknesses that will service the repeated pedestrian traffic conditions until pavement reaches "fatigue" failure for a given design life duration (e.g., 25 years). The output from PCASE was compared to the minimum thicknesses for flexible pavement sections discussed in UFC 3-250-01.

The UFC 3-250-01 outlines general design procedures using PCASE for parking lots of this type (similar use/traffic conditions); however, because no special military traffic is expected on these pavements, the UFC permits pavement design to be in accordance with state specific DOT design (e.g., AASHTO 1993). If state specific DOT design is preferred, we should be notified to modify the recommendations in this report accordingly.

Pavement thickness design is influenced by the subgrade soil support characteristics, the pedestrian vehicular traffic frequency and loading on the pavement, as well as other environmental factors such as the proximity to groundwater and the depth of frost penetration. The following sections describe the design parameters used in the development of our recommended individual pavement structure layer thicknesses and provides our recommendations for pavement layer material selection.

## Parking Lot Pavement Traffic

We understand the parking lot pavement will support pedestrian vehicle traffic only (no military, truck, or forklift/equipment traffic). Frequency of traffic has not been provided for the design analysis. As a result, the pavement sections discussed in this report should be considered preliminary and subject to confirmation/modification once frequencies are developed and provided.

For preliminary pavement design purposes, we have assumed the following pavement design criteria based on PCASE defaults and our understanding of the project:

| Pavement Use | Design Parameters | Value |
|---|---|---|
| Roadway/Parking | Pavement Type | Flexible |
| | Analysis Type | CBR[1] |
| | Design Vehicle | Car – Passenger[2] |
| | Traffic Area | Parking Areas |
| | Design Vehicle Weight (lbs) | 4,335[3] |
| | Number of Pedestrian Vehicle Passes | 4,562,500[4] |
| | AASHTO ESALs | 3,666[5] |

1. PCASE default value upon selection of Pavement Type.
2. PCASE design vehicle identification for pedestrian vehicles.
3. PCASE default value upon selection of Design Vehicle.
4. Total number of pedestrian vehicles passes over a 25-year design life. Number of vehicles per day was estimated using about 2x the number of added parking stalls (240 stalls added), or about 500 passes per day.
5. Generated by PCASE.

Our analysis did not include any evaluations for other vehicle types or equipment. These traffic values should be reviewed by the owner to determine if the traffic presented represents the traffic that will be applied to the pavement(s). Terracon should be contacted if the anticipated traffic is different so revised pavement sections can be prepared.

## Pavement Design Parameters

### Frost Considerations

The detrimental effects of frost action on pavement may include non-uniform heave and a loss of soil strength during the spring-thaw period. The depth of frost penetration for this project was estimated using the following parameters.

| Parameter | Value |
|---|---|
| **Data from Weather Station** | Offutt_AFB_Airport |
| **Mean Annual Temperature** | 53.06 °F |
| **Mean Annual Freezing Degree Days** | 497.2 degree-days |
| **Mean Length of Freezing Season** | 59.7 days |

The depth of frost penetration calculated using the above parameters in PCASE was 25 inches which is greater than the total pavement thicknesses determined by PCASE (non-frost design thickness, reduced subgrade strength, and limited subgrade frost penetration). Complete frost protection would require extending pavement to below the calculate frost depth or supporting pavements on imported, free-draining, non-frost susceptible (NFS) granular soils extending to frost depth. In our opinion, utilizing NFS granular soils to frost depth or installing a 25-inch asphalt section would not provide a significant return on cost (e.g., increased pavement performance and life) commensurate with the cost of installing the NFS granular soils to frost depth. Therefore, we have recommended using a thinner section. While using a thinner section is a cost-savings alternative, it may result in a slight increase of frost action impacts that the owner must be willing to accept.

### Subsurface Drainage

Water has a detrimental effect on pavement performance, primarily by either weakening subsurface materials or eroding material by free water movement. The weakening of the subgrade when saturated with water is one of the main causes of pavement failures, particularly when the subgrade is also composed of frost-susceptible materials and frost forms. Military pavements supported above subgrades with a permeability of less than 20 feet per day (e.g., on-site clays) per the UFC typically include an aggregate subgrade drainage layer and associated drainage system. However, the adjacent existing pavement does not include an aggregate base. Further, local practice typically includes placing automobile parking lot pavement directly on cohesive subgrades.

Therefore, a subsurface drainage layer and drainage system was not considered in our design. If pavement design results in an aggregate layer below the pavement, we should be contacted to provide further recommendations.

To help mitigate the weaking of cohesive subgrades, positive surface drainage should be provided across and away from the edges of pavements, and all pavements should be sloped to provide rapid surface drainage. Pavements should drain toward the edges rather than the center, and perimeter subsurface drains should be installed next to irrigated planters or other areas where surface water could pond.

## Subgrade Support Characteristics

Subgrade beneath asphalt pavements is characterized by the California Bearing Ratio (CBR) of the subgrade soils. As part of our field exploration, we performed a dynamic cone penetrometer (DCP) test at two locations (Borings B-1 and B-4). DCP testing measures penetration resistance of the in-situ soil conditions which can be used to estimate the field CBR of the tested soils. Further, we performed laboratory CBR testing on bulk samples formed from auger cuttings of Borings B-1 and B-4 in the upper 4 feet. Below is a summary of the DCP and CBR test results:

| Location | Estimated CBR[1] | |
|---|---|---|
| | DCP-Correlated CBR[2] | Laboratory CBR[3] |
| **B-1** | 8 | 7 |
| **B-4** | 8 | 10 |

1. CBR values rounded to the nearest whole number.
2. Based on field test dating and correlated using DCP-index value. The minimum DCP-index value was selected for correlated CBR value.
3. Both samples were compacted to 92% of the material's maximum dry density and to moisture contents of about -2% and near optimum for Borings B-1 and B-4, respectively. Moisture and maximum dry densities were determined by the Moisture-Density Relationship test using Modified Effort (Modified Proctor Test).

While our field and laboratory tests indicate CBR values on the order of 7 to 10, it is our experience that cohesive subgrades weaken over the life of the pavement due to the environmental effects described above. As a result, we selected a design CBR value of 3 to account for subgrade weaking.

## Pavement Thickness Design Recommendation

Based on the subgrade support characteristics, vehicle traffic, and our understanding of the project, and provided the subgrade is prepared according to **Earthwork**, the recommended pavement design thicknesses are listed in the table below.

We have prepared two individual design thicknesses in the following table: "PCASE Minimum" and "Recommended" thickness designs. While the thickness as determined by PCASE is thinner than the "Recommended" design, we have recommended a thicker design be used to match the existing parking lot pavement and provide more uniform pavement performance.

| Pavement Design Recommended Thicknesses | |
|---|---|
| **Design Type** | **Asphalt Thickness[1] (in.)** |
| **PCASE Minimum** | 7.5 |
| **Recommended** | 9.5 |

1. Per the UFC, A minimum 2.5-inch surface course is recommended. We recommend asphalt pavements meet the material requirements the current UFC 3-250-01 (which references UFC 3-250-03 and Unified Facilities Guide Specifications (UFGS)) or local City of Omaha Standard Specifications for Public Works Construction.

Terracon has observed dishing in some parking lots surfaced with asphalt cement concrete (ACC). Dishing is usually observed in frequently-used parking stalls and occurs under the wheel footprint in these stalls. The use of higher-grade asphaltic cement or surfacing these areas with PCC is recommended. The dishing is exacerbated by factors such as irrigated islands or planter areas, sheet surface drainage, and placing the ACC directly on a compacted clay subgrade. The use of lower grade asphalt cement is relatively common in this area and may be considered, but would provide lower reliability against rutting and creeping during warm weather.

## Construction Considerations

Construction scheduling often involves grading and paving by separate contractors and can involve a time lapse between the end of grading operations and paving. Disturbance, desiccation or wetting of the subgrade soils between grading and paving can result in deterioration of the previously completed subgrade. A non-uniform subgrade can result in poor pavement performance and local failures relatively soon after pavements are constructed. We recommend the moisture content and density of the subgrade be evaluated within two days prior to commencing paving operations. A proofroll using heavy equipment similar to that recommended for pavement construction should be performed to verify subgrade stability for pavement construction. Scarification and recompaction may be required.

Areas not in compliance with the specified moisture or density should be moisture conditioned and recompacted. If significant precipitation occurs after the evaluation or if the surface becomes disturbed, the subgrade condition should be reviewed by the Geotechnical Engineer immediately prior to paving.

# General Comments

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

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

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

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others.

Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Support of pavements above existing fill soils is discussed in this report. However, even with the recommended construction testing services, there is an inherent risk for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by performing additional testing and evaluation.

Any information we convey prior to the report completion is for informational purposes only and should not be used for decision-making purposes or final design.

PROFESSIONAL CIVIL ENGINEER
MICHAEL D
RINGLER
E-7619
11/25/2024
STATE OF NEBRASKA

# Attachments

# Exploration and Testing Procedures

## Field Exploration

**Layout and Elevations:** We located the borings by field measurements with a GPS device which is capable of locating the exploration points to about 0.5-foot vertical and 5-feet horizontal accuracy. The locations and elevations should be considered accurate only to the degree implied by these methods.

**Subsurface Exploration Procedures:** We advanced the borings with a truck-mounted rotary drill rig using continuous-flight solid-stem augers.

Samples were obtained using thin-walled tube sampling methods. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. Bulk samples of auger cuttings were also collected from Borings B-1 and B-4 from about 0.5 feet to 4 feet below existing grades. The sampling depths and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and review by a Geotechnical Engineer.

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

Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our interpretation of the subsurface conditions between samples. The typed boring logs in **Exploration and Laboratory Results** represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

**Dynamic Cone Penetrometer (DCP):** DCP testing was performed in a separate borehole adjacent (~5′ offset) to Borings B-1 and B-4. DCP testing was performed in general accordance with the guidance in UFC 3-250-01. The results of the DCP testing are summarized in **Pavements**.

## Laboratory Testing

Water content tests and density determinations were performed on the thin-walled samples, and unconfined compression tests were performed on selected thin-walled tube samples. The unconfined compressive strength of many samples was estimated with a hand penetrometer test. The results of these laboratory tests are provided on the boring logs.

The laboratory testing program also included the following tests:

- Atterberg Limits
- Sand content (Passing the No. 200 Sieve)
- Moisture-Density Relationship of Soil using Modified Effort (Modified Proctor)
- California Bearing Ratio (CBR) using ASTM D1883

The test results are plotted and provided in **Exploration and Laboratory Results**.

The samples were reviewed by an engineer based on visual observation and texture. Additional laboratory testing could be performed to more accurately classify the samples. The soil descriptions presented on the boring logs for native soils are in general accordance with the General Notes and Unified Soil Classification System (USCS), both of which are included in **Supporting Information**. The estimated group symbol for the USCS is also shown on the boring logs.

Procedural standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

# Site Location and Exploration Plans

**Contents:**

Site Location Plan
Exploration Plan
- Aerial
- Site Plan Overlay

## Site Location

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

MAP PROVIDED BY MICROSOFT BING MAPS

## Exploration Plan – Aerial

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

MAP PROVIDED BY MICROSOFT BING MAPS

## Exploration Plan – Site Plan Overlay

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

MAP PROVIDED BY MICROSOFT BING MAPS

# Exploration and Laboratory Results

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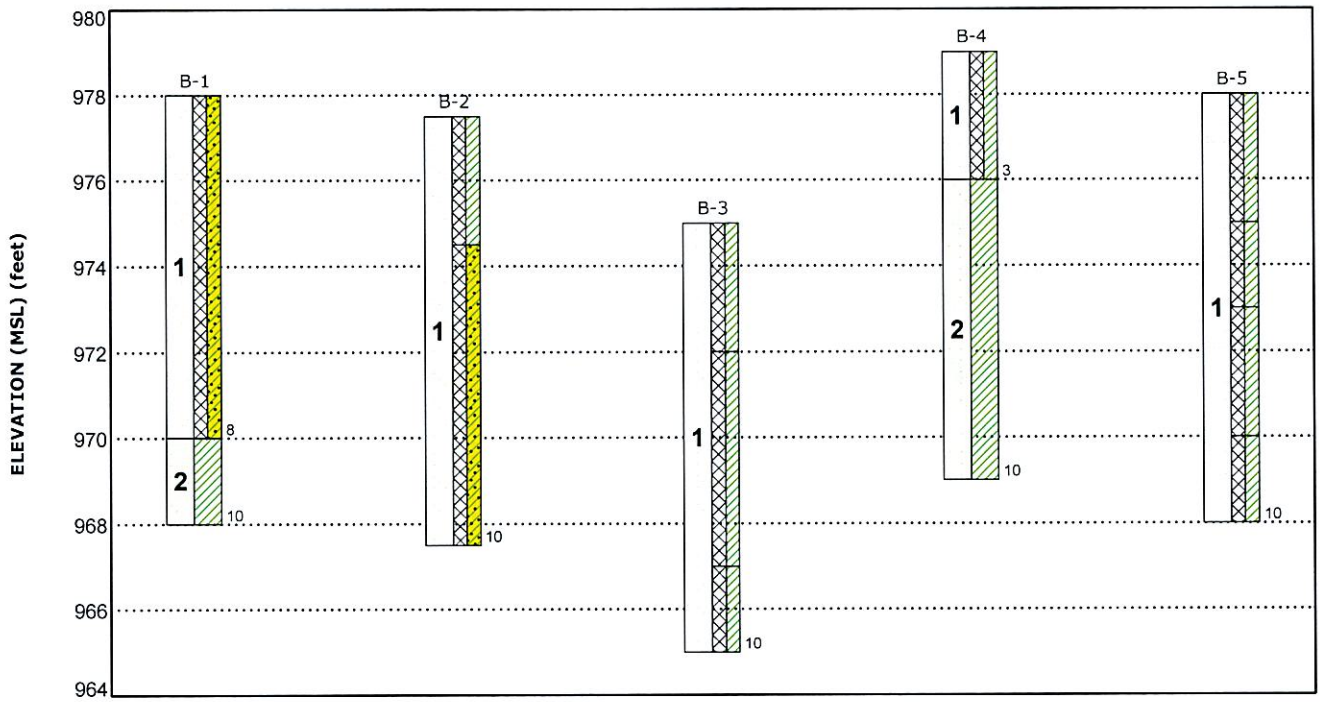
GeoModel
Boring Logs
Atterberg Limits
Moisture-Density Relationship using Modified Effort (Modified Proctor)
CBR Test Report

Offutt Parking Lot 3, B1000
Fort Crook Rd S and Butler Blvd | Omaha, NE
Terracon Project No. 05245152

Terracon
15080 A Cir
Omaha, NE

# GeoModel




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

| Model Layer | Layer Name | General Description | Legend |
|---|---|---|---|
| 1 | **Existing Fill** | Lean Clay, Lean Clay with Sand | Lean Clay with Sand / Lean Clay |
| 2 | **Loess** | Lean Clay | |

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

Offutt Parking Lot 3, B1000
Fort Crook Rd S and Butler Blvd | Omaha, NE
Terracon Project No. 05245152

Terracon
15080 A Cir
Omaha, NE

# Boring Log No. B-1

Location: See Exploration Plan

Latitude: 41.1136° Longitude: -95.9250°

Depth (Ft.) Elevation: 978 (Ft.) +/-

| Model Layer | Graphic Log | Description | Depth (Ft.) | Water Level Observations | Sample Type | HP (psf) | Unconfined Compressive Strength (psf) | Water Content (%) | Dry Unit Weight (pcf) | Atterberg Limits LL-PL-PI |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | Grass at the surface<br>**FILL - LEAN CLAY WITH SAND**, trace gravel, trace crushed concrete, brown to light brown | | | | 9000 (HP) | | 8.6 | 117 | 38-17-21 |
| | | | | | | 9000 (HP) | | 13.2 | 112 | |
| | | 2.5-in. concrete piece around 5 ft. | 5 | | | 9000 (HP) | | 11.7 | 110 | |
| | | 8.0 970 | | | | | | | | |
| 2 | | **LEAN CLAY (CL)**, trace ferrous stains, brown to grayish brown, very stiff | | | | | 4990 | 22.8 | 100 | |
| | | 10.0 968 | 10 | | | | | | | |
| | | ***Boring Terminated at 10 Feet*** | | | | | | | | |

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

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were measured in the field by Terracon using handheld GPS equipment. Measured elevations were rounded to the nearest 0.5-foot.

**Water Level Observations**
Not encountered while drilling

Not encountered at completion of drilling

**Drill Rig**
618

**Hammer Type**
Automatic

**Driller**
J. McGargill

**Logged by**
A. Evens

**Boring Started**
10-22-2024

**Boring Completed**
10-22-2024

**Notes**
Bulk sample of auger cuttings collected from 0.5 ft. to 4 ft.

**Advancement Method**
Power Auger

**Abandonment Method**
Boring backfilled with soil cuttings and bentonite chips upon completion.

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Omaha, NE

# Boring Log No. B-2

Location: See Exploration Plan

Latitude: 41.1131° Longitude: -95.9248°

Elevation: 977.5 (Ft.) +/-

| Model Layer | Graphic Log | Depth (Ft.) | Description | Elevation | Depth (Ft.) | Water Level Observations | Sample Type | HP (psf) | Unconfined Compressive Strength (psf) | Water Content (%) | Dry Unit Weight (pcf) | Atterberg Limits LL-PL-PI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Grass at the surface | | | | | | | | | |
| | | | **FILL - LEAN CLAY**, trace sand and gravel, trace crushed concrete, brown to light brown | | | | | 9000 (HP) | | 7.3 | 111 | |
| | | 3.0 | | 974.5 | | | | | | | | |
| | | | **FILL - LEAN CLAY WITH SAND**, trace concrete fragments, gray and brown, mottled | | | | | 9000 (HP) | | 12.7 | 117 | |
| 1 | | | | | 5 | | | 5500 (HP) | | 17.7 | 108 | |
| | | | Driller's Note: concrete fragments around 9 ft. | | | | | | 5880 | 13.9 | 111 | |
| | | 10.0 | | 967.5 | 10 | | | | | | | |
| | | | ***Boring Terminated at 10 Feet*** | | | | | | | | | |

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

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were measured in the field by Terracon using handheld GPS equipment. Measured elevations were rounded to the nearest 0.5-foot.

**Water Level Observations**
Not encountered while drilling

Not encountered at completion of drilling

**Drill Rig**
618

**Hammer Type**
Automatic

**Driller**
J. McGargill

**Logged by**
A. Evens

**Boring Started**
10-22-2024

**Boring Completed**
10-22-2024

**Notes**

**Advancement Method**
Power Auger

**Abandonment Method**
Boring backfilled with soil cuttings and bentonite chips upon completion.

Offutt Parking Lot 3, B1000
Fort Crook Rd S and Butler Blvd | Omaha, NE
Terracon Project No. 05245152

Terracon
15080 A Cir
Omaha, NE

# Boring Log No. B-3

Location: See Exploration Plan

Latitude: 41.1129° Longitude: -95.9236°

| Model Layer | Graphic Log | Depth (Ft.) | Elevation: 975 (Ft.) +/- | Depth (Ft.) | Water Level Observations | Sample Type | HP (psf) | Unconfined Compressive Strength (psf) | Water Content (%) | Dry Unit Weight (pcf) | Atterberg Limits LL-PL-PI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Grass at the surface | | | | | | | | |
| | | | **FILL - LEAN CLAY**, trace sand and gravel, trace crushed concrete, brown to light brown | | | | 9000 (HP) | | 8.0 | 116 | |
| | | 3.0 | 972 | | | | | | | | |
| | | | **FILL - LEAN CLAY**, trace sand, brown and grayish brown | | | | | 7680 | 14.4 | 112 | |
| 1 | | | | 5 | | | | 8890 | 19.6 | 106 | |
| | | 8.0 | 967 | | | | | | | | |
| | | | **FILL - LEAN CLAY**, trace sand, gray and olive brown and dark brown, mottled | | | | | 3780 | 22.0 | 102 | |
| | | 10.0 | 965 | 10 | | | | | | | |
| | | | ***Boring Terminated at 10 Feet*** | | | | | | | | |

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

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were measured in the field by Terracon using handheld GPS equipment. Measured elevations were rounded to the nearest 0.5-foot.

**Notes**

**Water Level Observations**
Not encountered while drilling

Not encountered at completion of drilling

**Advancement Method**
Power Auger

**Abandonment Method**
Boring backfilled with soil cuttings and bentonite chips upon completion.

**Drill Rig**
618

**Hammer Type**
Automatic

**Driller**
J. McGargill

**Logged by**
A. Evens

**Boring Started**
10-22-2024

**Boring Completed**
10-22-2024

Offutt Parking Lot 3, B1000
Fort Crook Rd S and Butler Blvd | Omaha, NE
Terracon Project No. 05245152

Terracon
15080 A Cir
Omaha, NE

# Boring Log No. B-4

Location: See Exploration Plan
Latitude: 41.1129° Longitude: -95.9228°

| Model Layer | Graphic Log | Depth (Ft.) | Elevation: 979 (Ft.) +/- | Depth (Ft.) | Water Level Observations | Sample Type | HP (psf) | Unconfined Compressive Strength (psf) | Water Content (%) | Dry Unit Weight (pcf) | Atterberg Limits LL-PL-PI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Grass at the surface | | | | | | | | |
| 1 | | | **FILL - LEAN CLAY**, brown to light brown | | | | 9000 (HP) | | 9.7 | 111 | 41-18-23 |
| | | 3.0 | 976 | | | | | | | | |
| 2 | | | **LEAN CLAY (CL)**, brown, stiff | | | | 9000 (HP) | | 16.4 | 106 | |
| | | | | 5 | | | | | | | |
| | | | sandy from about 6 to 7 ft. | | | | | 2910 | 21.8 | 98 | |
| | | | | | | | | 2580 | 24.7 | 98 | |
| | | 10.0 | 969 | 10 | | | | | | | |
| | | | ***Boring Terminated at 10 Feet*** | | | | | | | | |

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

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were measured in the field by Terracon using handheld GPS equipment. Measured elevations were rounded to the nearest 0.5-foot.

**Notes**
Bulk sample of auger cuttings collected from 0.5 ft. to 4 ft.

**Water Level Observations**
Not encountered while drilling

Not encountered at completion of drilling

**Advancement Method**
Power Auger

**Abandonment Method**
Boring backfilled with soil cuttings and bentonite chips upon completion.

**Drill Rig**
618

**Hammer Type**
Automatic

**Driller**
J. McGargill

**Logged by**
A. Evens

**Boring Started**
10-22-2024

**Boring Completed**
10-22-2024

Offutt Parking Lot 3, B1000
Fort Crook Rd S and Butler Blvd | Omaha, NE
Terracon Project No. 05245152

Terracon
15080 A Cir
Omaha, NE

# Boring Log No. B-5

Location: See Exploration Plan

Latitude: 41.1129° Longitude: -95.9220°

| Model Layer | Graphic Log | Depth (Ft.) | Elevation: 978 (Ft.) +/- | Depth (Ft.) | Water Level Observations | Sample Type | HP (psf) | Unconfined Compressive Strength (psf) | Water Content (%) | Dry Unit Weight (pcf) | Atterberg Limits LL-PL-PI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Grass at the surface | | | | | | | | |
| | | | **FILL - LEAN CLAY**, trace sand and gravel, trace crushed concrete, brown to light brown | | | | | | 7.1 | | |
| | | 3.0 | 975 | | | | | | | | |
| | | | **FILL - LEAN CLAY**, trace sand and gravel, dark brown and grayish brown | | | | 9000 (HP) | | 14.9 | 113 | |
| 1 | | 5.0 | 973 | 5 | | | | | | | |
| | | | **FILL - LEAN CLAY**, trace sand, grayish brown and dark brown | | | | | 9070 | 19.9 | 107 | |
| | | 8.0 | 970 | | | | | | | | |
| | | | **FILL - LEAN CLAY**, trace organics, gray to grayish brown | | | | | 4660 | 22.1 | 102 | |
| | | 10.0 | 968 | 10 | | | | | | | |
| | | | ***Boring Terminated at 10 Feet*** | | | | | | | | |

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

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were measured in the field by Terracon using handheld GPS equipment. Measured elevations were rounded to the nearest 0.5-foot.

**Water Level Observations**
Not encountered while drilling

Not encountered at completion of drilling

**Drill Rig**
618

**Hammer Type**
Automatic

**Driller**
J. McGargill

**Logged by**
A. Evens

**Boring Started**
10-22-2024

**Boring Completed**
10-22-2024

**Notes**

**Advancement Method**
Power Auger

**Abandonment Method**
Boring backfilled with soil cuttings and bentonite chips upon completion.

Offutt Parking Lot 3, B1000
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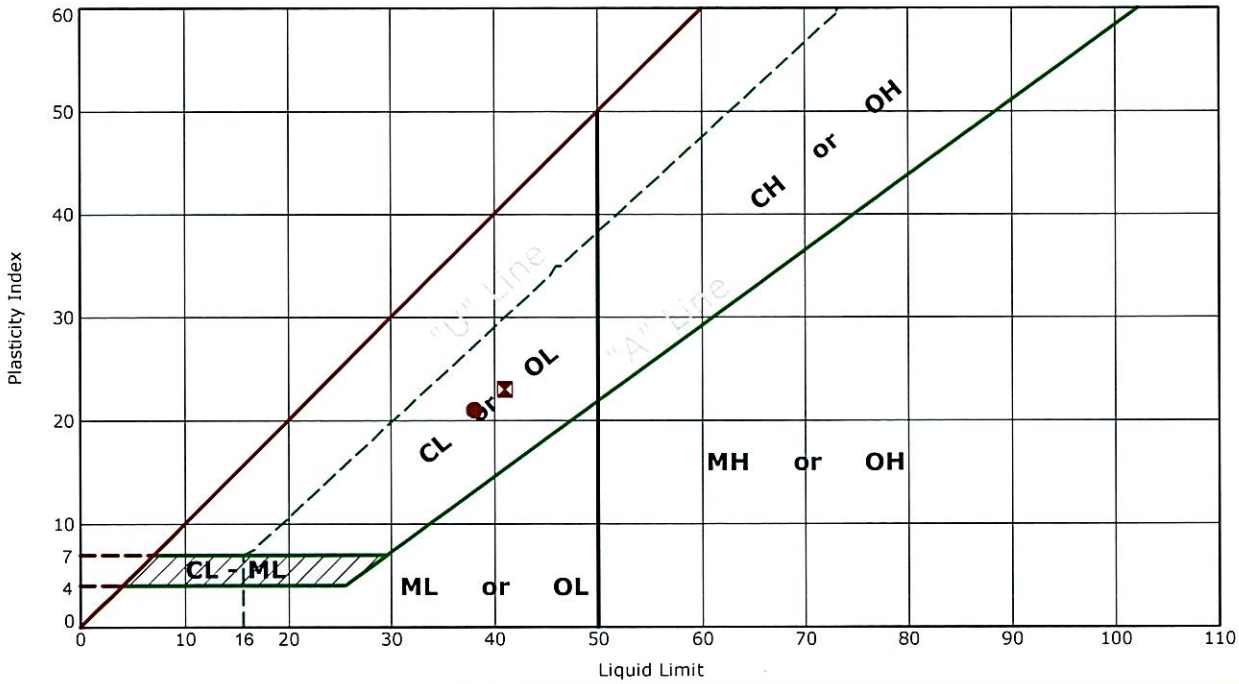
Terracon Project No. 05245152

Terracon
15080 A Cir
Omaha, NE

# Atterberg Limit Results

## ASTM D4318




| | Boring ID | Depth (Ft) | LL | PL | PI | Fines | USCS | Description |
|---|---|---|---|---|---|---|---|---|
| ● | B-1 | 0.5 - 4 | 38 | 17 | 21 | 74.4 | CL | LEAN CLAY WITH SAND |
| ⊠ | B-4 | 0.5 - 4 | 41 | 18 | 23 | | CL | LEAN CLAY |

Offutt Parking Lot 3, B1000
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Terracon Project No. 05245152

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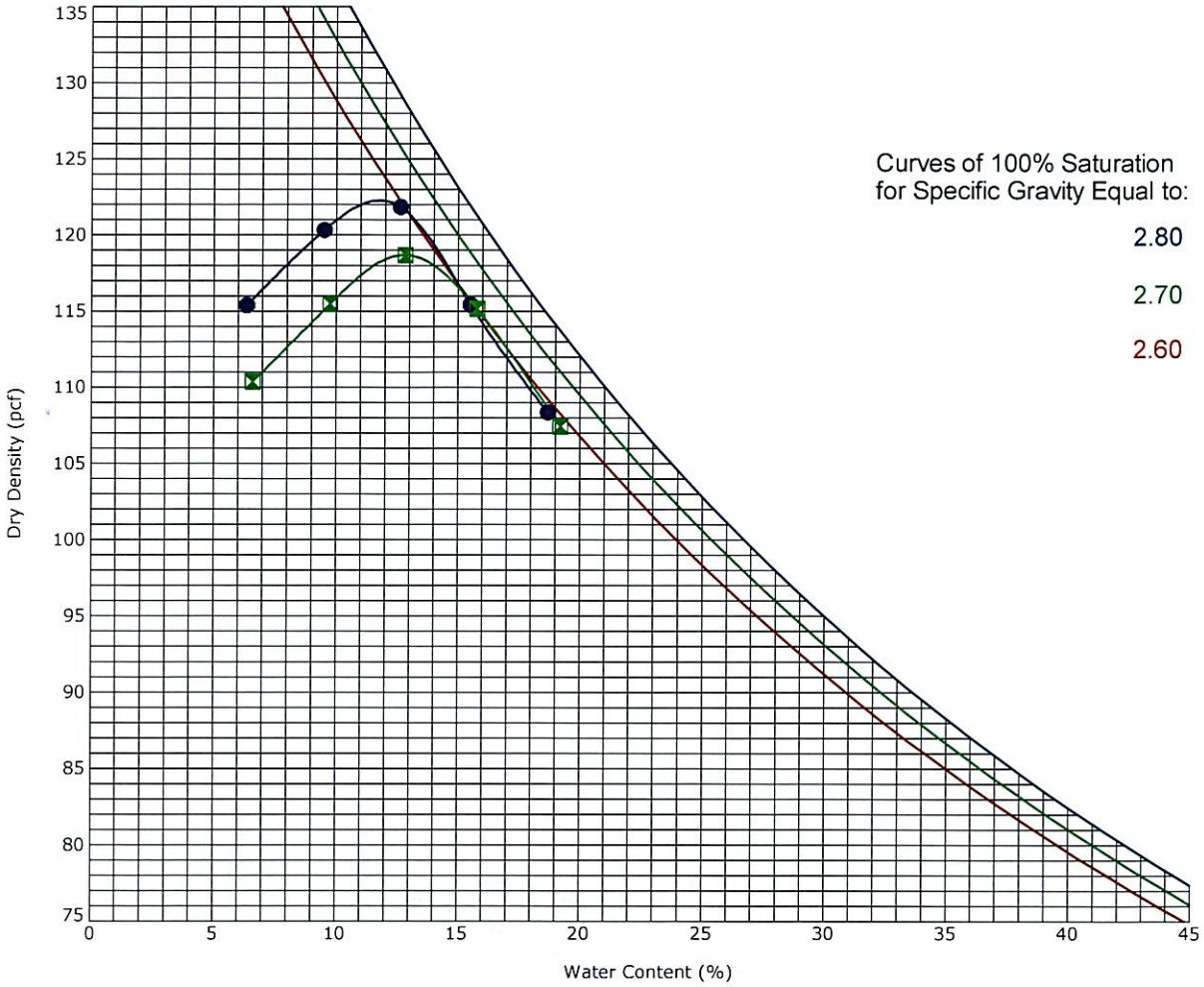
15080 A Cir
Omaha, NE

# Moisture-Density Relationship

## ASTM D1557-Method B




| | Boring ID | Depth (Ft) | Fines (%) | LL | PL | PI | Description of Materials |
|---|---|---|---|---|---|---|---|
| ● | B-1 | 0.5 - 4 | 74 | 38 | 17 | 21 | LEAN CLAY WITH SAND (CL) |
| ⊠ | B-4 | 0.5 - 4 | | 41 | 18 | 23 | LEAN CLAY (CL) |

| | Boring ID | Depth (Ft) | Test Method | Max DD (pcf) | Optimum WC (%) |
|---|---|---|---|---|---|
| ● | B-1 | 0.5 - 4 | ASTM D1557-Method B | 122.3 | 11.8 |
| ⊠ | B-4 | 0.5 - 4 | ASTM D1557-Method B | 118.7 | 12.8 |

# California Bearing Ratio Test (CBR)

Terracon
15080 A Circle
Omaha, Nebraska 68144
(402) 330-2202

| | | | | | |
|---|---|---|---|---|---|
| Client Name: | HGM Associates, Inc | Project No.: | 05245152 | Date: | 11/5/2024 |
| Project Name: | Offutt Parking Lot 3, B1000 | | | | |
| Location: | Fort Crook Road South and Butler Blvd | | | | |
| Boring Number | B-1 | | | | |
| Depth | 0.5'-4.0' | | | | |
| Sample Description: | LEAN CLAY with sand, concrete fragments | | | | |

**Proctor Compaction Data:**

| | | |
|---|---|---|
| Proctor Test Procedure: | D1557 | |
| Maximum Dry Density | 122.3 | pcf |
| Optimum Moisture Content | 11.8 | % |
| USCS Classification | CL | |

**CBR Specimen Compaction Data:**

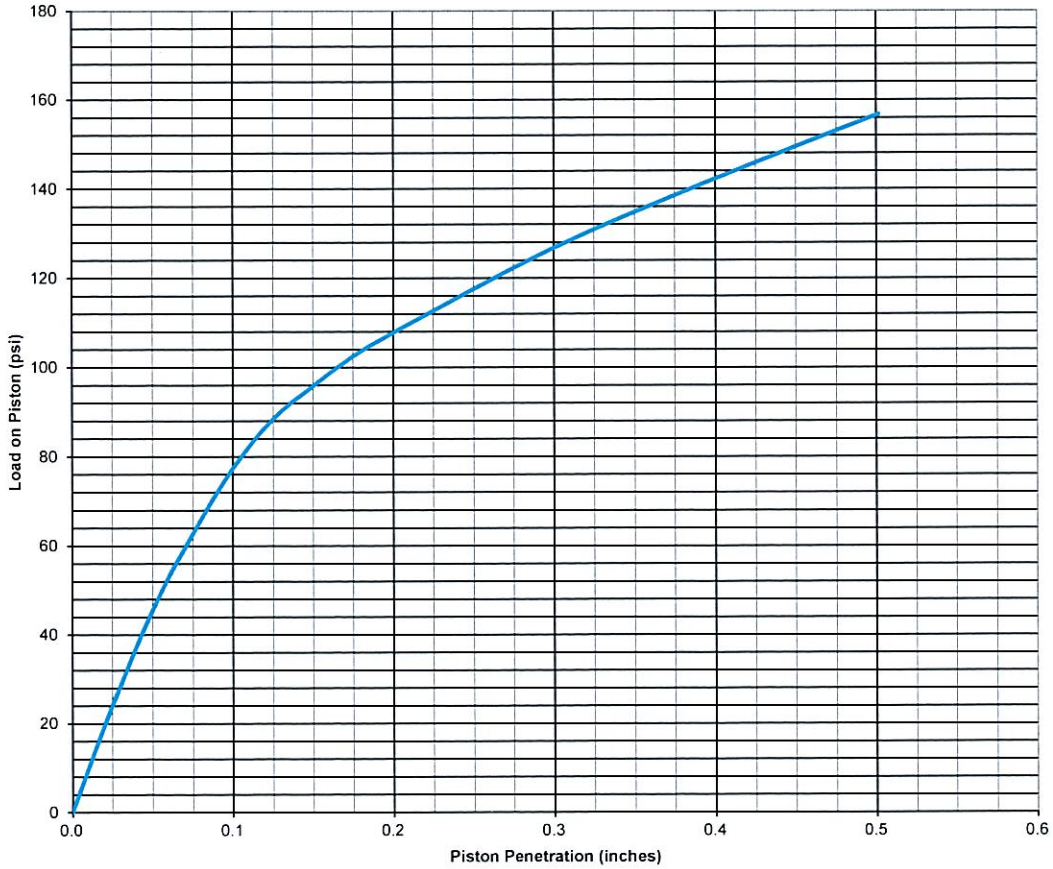
| | | |
|---|---|---|
| CBR Test Procedure: | ASTM D 1883 | |
| Initial Moisture Content | 9.7 | % |
| Dry Density Before Soaking | 112.5 | pcf |
| Percent Compaction | 92.0% | % |
| Moisture Content After Compactio | 9.6 | % |
| Dry Density After Soaking | 108.6 | pcf |
| Moisture Content After Soaking | 20.5 | % |
| CBR at 0.100 inches penetration | 7.7 | % |
| CBR at 0.200 inches penetration | 7.2 | % |

**Soil Index Properties:**

| | | | | |
|---|---|---|---|---|
| Liquid Limit: | 38 | % Passing No. 200 | 74.4 | % |
| Plasticity Index: | 21 | | | |
| Plastic Limit: | 17 | | | |

**Specimen Swell Data:**

| | | |
|---|---|---|
| Surcharge Load | 50.03 | lb |
| Compaction | 88.8 | % |
| Swell (96 Hours) | 2.09 | % |



# California Bearing Ratio Test (CBR)

**15080 A Circle**
**Omaha, Nebraska 68144**
**(402) 330-2202**

| | | | | |
|---|---|---|---|---|
| Client Name: | HGM Associates, Inc | Project No.: | 05245152 | Date: 11/5/2024 |
| Project Name: | Offutt Parking Lot 3, B1000 | | | |
| Location: | Fort Crook Road South and Butler Blvd | | | |
| Boring Number | B-4 | | | |
| Depth | 0.5'-4.0' | | | |
| Sample Description: | LEAN CLAY | | | |

**Proctor Compaction Data:**

| | | |
|---|---|---|
| Proctor Test Procedure: | D1557 | |
| Maximum Dry Density | 118.7 | pcf |
| Optimum Moisture Content | 12.8 | % |
| USCS Classification | CL | |

**CBR Specimen Compaction Data:**

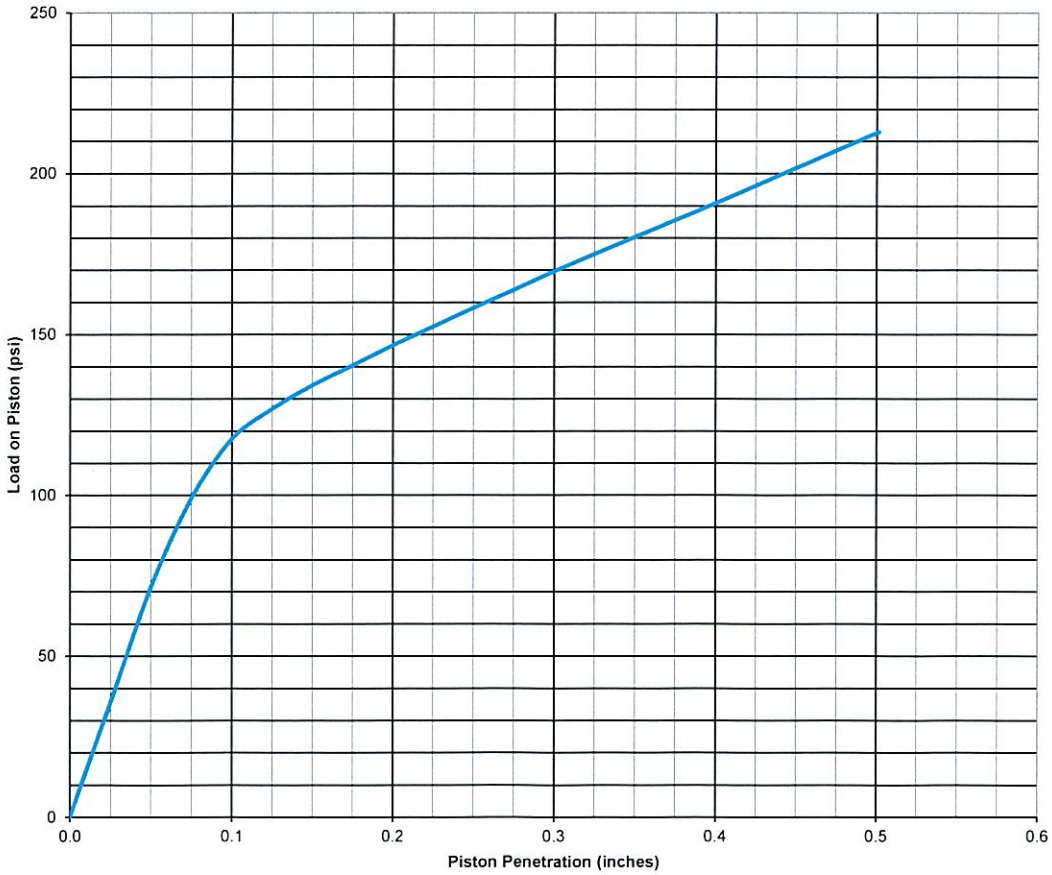
| | | |
|---|---|---|
| CBR Test Procedure: | ASTM D 1883 | |
| Initial Moisture Content | 12.7 | % |
| Dry Density Before Soaking | 109.3 | pcf |
| Percent Compaction | 92.1% | % |
| Moisture Content After Compactio | 12.7 | % |
| Dry Density After Soaking | 106.5 | pcf |
| Moisture Content After Soaking | 20.9 | % |
| CBR at 0.100 inches penetration | 11.7 | % |
| CBR at 0.200 inches penetration | 9.8 | % |

**Soil Index Properties:**

| | | | | |
|---|---|---|---|---|
| Liquid Limit: | 41 | % Passing No. 200 | N/A | % |
| Plasticity Index: | 23 | | | |
| Plastic Limit: | 18 | | | |

**Specimen Swell Data:**

| | | |
|---|---|---|
| Surcharge Load | 50.01 | lb |
| Compaction | 89.7 | % |
| Swell (96 Hours) | 1.16 | % |



# Supporting Information

**Contents:**

General Notes
Unified Soil Classification System

Terracon
15080 A Cir
Omaha, NE

# General Notes

## Sampling

Auger Cuttings

Shelby Tube

## Water Level

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Cave In Encountered

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

## Field Tests

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

## Descriptive Soil Classification

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

## Location And Elevation Notes

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

## Strength Terms

| Relative Density of Coarse-Grained Soils (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance | | Consistency of Fine-Grained Soils (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance | | |
|---|---|---|---|---|
| **Relative Density** | **Standard Penetration or N-Value (Blows/Ft.)** | **Consistency** | **Unconfined Compressive Strength Qu (psf)** | **Standard Penetration or N-Value (Blows/Ft.)** |
| Very Loose | 0 - 3 | Very Soft | less than 500 | 0 - 1 |
| Loose | 4 - 9 | Soft | 500 to 1,000 | 2 - 4 |
| Medium Dense | 10 - 29 | Medium Stiff | 1,000 to 2,000 | 4 - 8 |
| Dense | 30 - 50 | Stiff | 2,000 to 4,000 | 8 - 15 |
| Very Dense | > 50 | Very Stiff | 4,000 to 8,000 | 15 - 30 |
| | | Hard | > 8,000 | > 30 |

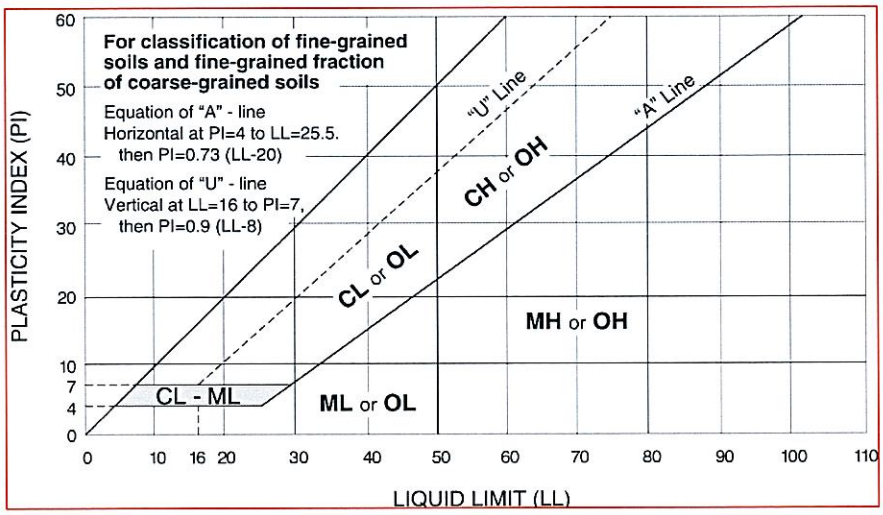
## Relevance of Exploration and Laboratory Test Results

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

# Unified Soil Classification System

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

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



# IV. COST ESTIMATE

# OPINION OF PROBABLE COST SUMMARY

| BASE BID | |
|---|---|
| **Total Construction Cost** | **$1,165,356** |

| ALTERNATE BID | |
|---|---|
| **Total Construction Cost** | **$1,998,395** |

(Project Budget: $4,400,000)

# CONSTRUCTION COST ESTIMATE BREAKDOWN

CONTRACTOR

Address:

CONTRACT FOR (Work to be performed)

**CONSTRUCT NEW PARKING LOT 3, B1000**

PROPOSED TOTAL CONTRACT PRICE

PURCHASE REQUEST NUMBER:

PROJECT NUMBER
SGBP 24-0018

WORK LOCATION
OFFUTT AFB, NE

| LINE NO. | ITEM (1) | UNIT OF MEASURE (2) | QTY (3) | UNIT COST (4) | UNIT COST (5) | TOTAL COSTS (6) | TOTAL COSTS (7) | TOTAL UNIT COST (8) | (9) | LINE TOTAL (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | **BASE BID** | | | | | | | | | |
| 1 | REMOVE CONCRETE CURB & GUTTER | LF | 795 | | | | $15.00 | $11,925.00 | | $11,925.00 |
| 2 | REMOVE INLET | EACH | 1 | | | | $1,000.00 | $1,000.00 | | $1,000.00 |
| 3 | REMOVE TREE (3" DIAMETER) | EACH | 1 | | | | $500.00 | $500.00 | | $500.00 |
| 4 | REMOVE ASPHALT PAVEMENT | SY | 221 | | | | 30.00 | $6,630.00 | | $6,630.00 |
| 5 | EMBANKMENT | CY | 750 | | | | $45.00 | $33,750.00 | | $33,750.00 |
| 6 | EXCAVATION | CY | 360 | | | | $60.00 | $21,600.00 | | $21,600.00 |
| 7 | CURB INLET | EACH | 3 | | | | $4,800.00 | $14,400.00 | | $14,400.00 |
| 8 | 15" REINFORCED CONCRETE PIPE | LF | 17 | | | | $85.00 | $1,445.00 | | $1,445.00 |
| 9 | 18" REINFORCED CONCRETE PIPE | LF | 8 | | | | $180.00 | $1,440.00 | | $1,440.00 |
| 10 | 15" CONCRETE FLARED END SECTION | EACH | 1 | | | | 1,120.00 | $1,120.00 | | $1,120.00 |
| 11 | CONCRETE COLLAR | EACH | 2 | | | | 360.00 | $720.00 | | $720.00 |
| 12 | ASPHALT PAVEMENT - 9" | TONS | 2,876 | | | | $220.00 | $632,720.00 | | $632,720.00 |
| 13 | BUILD 6" CONCRETE CURB AND GUTTER | LF | 1,207 | | | | $40.00 | $48,280.00 | | $48,280.00 |
| 14 | PAVEMENT STRIPING | LS | 1 | | | | $900.00 | $900.00 | | $900.00 |
| 15 | SILT FENCE | LF | 1,052 | | | | $6.00 | $6,312.00 | | $6,312.00 |
| 16 | INLET PROTECTION | EACH | 4 | | | | $500.00 | $2,000.00 | | $2,000.00 |
| 17 | SEEDING & EROSION CONTROL BLANKET | SY | 4,645.0 | | | | $6.50 | $30,192.50 | | $30,192.50 |
| | Total Direct Costs | | | $814,935 | | | | | | |
| | Overhead (%) | | 30% | $244,480 | | | | | | |
| | Subtotal | | | $1,059,415 | | | | | | |
| | Profit (%) | | 10% | $105,941 | | | | | | |
| | TOTAL PRICE | | | $1,165,356 | | | | | | |
| | (Project Budget $4,400,000) | | | | | | | | | |

# CONSTRUCTION COST ESTIMATE BREAKDOWN

CONTRACTOR

Address:

CONTRACT FOR (Work to be performed)

**CONSTRUCT NEW PARKING LOT 3, B1000**

PROPOSED TOTAL CONTRACT PRICE

PURCHASE REQUEST NUMBER:

PROJECT NUMBER
**SGBP 24-0018**

WORK LOCATION
**OFFUTT AFB, NE**

| LINE NO. | ITEM (1) | UNIT OF MEASURE (2) | QTY (3) | UNIT COST (4) | UNIT COST (5) | TOTAL COSTS (6) | TOTAL COSTS (7) | TOTAL UNIT COST (8) | (9) | LINE TOTAL (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | **ALTERNATE BID** | | | | | | | | | |
| 1 | REMOVE CONCRETE CURB & GUTTER | LF | 1,160 | | | | $15.00 | $17,400.00 | | $17,400.00 |
| 2 | REMOVE INLET | EACH | 2 | | | | $1,000.00 | $2,000.00 | | $2,000.00 |
| 3 | REMOVE TREE (3" DIAMETER) | EACH | 2 | | | | $500.00 | $1,000.00 | | $1,000.00 |
| 4 | REMOVE ASPHALT PAVEMENT | SY | 262 | | | | 30.00 | $7,860.00 | | $7,860.00 |
| 5 | EMBANKMENT | CY | 772 | | | | $45.00 | $34,740.00 | | $34,740.00 |
| 6 | EXCAVATION | CY | 524 | | | | $60.00 | $31,440.00 | | $31,440.00 |
| 7 | CURB INLET | EACH | 6 | | | | $4,800.00 | $28,800.00 | | $28,800.00 |
| 8 | AREA INLET | EACH | 1 | | | | 6,000.00 | $6,000.00 | | $6,000.00 |
| 9 | MANHOLE (108" DIAMETER) | EACH | 1 | | | | $12,000.00 | $12,000.00 | | $12,000.00 |
| 10 | 15" REINFORCED CONCRETE PIPE | LF | 245 | | | | $85.00 | $20,825.00 | | $20,825.00 |
| 11 | 24" REINFORCED CONCRETE PIPE | LF | 47 | | | | $150.00 | $7,050.00 | | $7,050.00 |
| 12 | 18" REINFORCED CONCRETE PIPE | LF | 139 | | | | $180.00 | $25,020.00 | | $25,020.00 |
| 13 | 15" CONCRETE FLARED END SECTION | EACH | 1 | | | | 1,120.00 | $1,120.00 | | $1,120.00 |
| 14 | 30" DIAMETER NYLOPLAST RISER EXTENSION | EACH | 1 | | | | 600.00 | $600.00 | | $600.00 |
| 15 | 30" NYLOPLAST MANHOLE RING & COVER | EACH | 1 | | | | 800.00 | $800.00 | | $800.00 |
| 16 | 30" CAST IRON MANHOLE RING & COVER | EACH | 2 | | | | 800.00 | $1,600.00 | | $1,600.00 |
| 17 | CONCRETE COLLAR | EACH | 2 | | | | 360.00 | $720.00 | | $720.00 |
| 18 | ASPHALT PAVEMENT - 9" | TONS | 4,828 | | | | $220.00 | $1,062,160.00 | | $1,062,160.00 |
| 19 | BUILD 6" CONCRETE CURB AND GUTTER | LF | 1,237 | | | | $40.00 | $49,480.00 | | $49,480.00 |
| 20 | 4" CONCRETE SIDEWALK | SF | 1,150 | | | | 12.00 | $13,800.00 | | $13,800.00 |
| 21 | PAVEMENT STRIPING | LS | 1 | | | | $1,250.00 | $1,250.00 | | $1,250.00 |
| 22 | SILT FENCE | LF | 1,052 | | | | $6.00 | $6,312.00 | | $6,312.00 |
| 23 | SEEDING & EROSION CONTROL BLANKET | SY | 5,808.0 | | | | $6.50 | $37,752.00 | | $37,752.00 |
| 24 | INLET PROTECTION | EACH | 8 | | | | $500.00 | $4,000.00 | | $4,000.00 |
| 25 | ADJUST MANHOLE TO GRADE | EACH | 2 | | | | 1,000.00 | $2,000.00 | | $2,000.00 |
| 26 | ADJUST MONITORING WELL TO GRADE | EACH | 1 | | | | 750.00 | $750.00 | | $750.00 |
| | Total Direct Costs | | | $1,376,479 | | | | | | |
| | Overhead (%) | | 30% | $412,944 | | | | | | |
| | Subtotal | | | $1,789,423 | | | | | | |
| | Profit (%) | | 10% | $178,942 | | | | | | |
| | TOTAL PRICE | | | $1,968,365 | | | | | | |
| | (Project Budget $4,400,000) | | | | | | | | | |

# V. MEETING MINUTES

hgm
ASSOCIATES INC.

# MEETING MINUTES
# 35% REVIEW

**PROJECT:** **HGM PROJECT NO:** 741524

## OFFUTT AFB
## CONSTRUCT PARKING LOT #3, B1000
## SGBP 24-0018

**DATE:** January 21, 2025 **TIME:** 2:30 PM

**LOCATION:** **CEO 1 Conference Room B301**

---

**ATTENDEES:**

Representing HGM Associates Inc (HGM) – Bill Glismann, Spencer Ellwanger and Chris Storf. Representing Offutt Air Force Base (OAFB) – Camille Hussmann, 55CES/CENMP: Justin Kobza, 55CES/CEOER; James Funkhouser, 55CES/CEOER and Laura Stemick, 55CONS.

**ITEMS DISCUSSED:**

1. Attendees went through Review Comments received from the 35% review. Comment and Response sheets are attached.

2. Discussed proposed storm drainage system layout of curb inlets around the perimeter of new parking lot expansion that will tie into existing storm sewer that flows to detention pond. Discussed detention pond requirements and need for additional information to determine performance of detention pond

3. Discussed storm runoff requirements for new construction at Base. The existing runoff flow values need to be maintained at the 10-year, 50-year and 100-year storm events.

4. Discussed the current practice of people parking vehicles along the existing south parking lot roadway and reducing it to one lane. HGM mentioned that we could shift on row of parking to be along the south curb line and eliminate open curb to parallel park along. Base preferred to keep the configuration as it is because of utilizing the area south of the lot to dump snow from removal operations. Hopefully the additional parking will alleviate the need for people to park along the curb.

Please submit comments, additions, or corrections to this memo within five (5) days of issuance. If no comments are received this memo will be assumed accurate.

COPY TO: All attendees.

REPORT BY: Bill Glismann, P.E.

hgm
ASSOCIATES INC.

# MEETING MINUTES
# 35% REVIEW

**PROJECT:** **HGM PROJECT NO:** 741524

## OFFUTT AFB
## CONSTRUCT PARKING LOT #3, B1000
## SGBP 24-0018

**DATE:** January 21, 2025 **TIME:** 2:30 PM

**LOCATION:** **CEO 1 Conference Room B301**

---

**ATTENDEES:**

Representing HGM Associates Inc (HGM) – Bill Glismann, Spencer Ellwanger and Chris Storf. Representing Offutt Air Force Base (OAFB) – Camille Hussmann, 55CES/CENMP: Justin Kobza, 55CES/CEOER; James Funkhouser, 55CES/CEOER and Laura Stemick, 55CONS.

**ITEMS DISCUSSED:**

1. Attendees went through Review Comments received from the 35% review.

2. Discussed proposed storm drainage system layout of curb inlets around the perimeter of new parking lot expansion that will tie into existing storm sewer that flows to detention pond. Discussed detention pond requirements and need for additional information to determine performance of detention pond

3. Discussed storm runoff requirements for new construction at Base. The existing runoff flow values need to be maintained at the 10-year, 50-year and 100-year storm events.

4. Discussed the current practice of people parking vehicles along the existing south parking lot roadway and reducing it to one lane. HGM mentioned that we could shift on row of parking to be along the south curb line and eliminate open curb to parallel park along. Base preferred to keep the configuration as it is because of utilizing the area south of the lot to dump snow from removal operations. Hopefully the additional parking will alleviate the need for people to park along the curb.

Please submit comments, additions, or corrections to this memo within five (5) days of issuance. If no comments are received this memo will be assumed accurate.

COPY TO: All attendees.

REPORT BY: Bill Glismann, P.E.

hgm
ASSOCIATES INC.

# MEETING MINUTES
# 65% REVIEW

**PROJECT:** **HGM PROJECT NO:** 741524

## OFFUTT AFB
## CONSTRUCT PARKING LOT #3, B1000
## SGBP 24-0018

**DATE:** April 24, 2025 **TIME:** 2:30 PM

**LOCATION:** **CEO 1 Conference Room B301**

---

**ATTENDEES:**

Representing HGM Associates Inc (HGM) – Bill Glismann, Spencer Ellwanger and Chris Storf. Representing Offutt Air Force Base (OAFB) – Camille Hussmann, 55CES/CENMP: Justin Kobza, 55CES/CEOER; David Lot, 55CES/CENMEM; Brian Coffin, STRATCOM; Laura Stemick, 55CONS; SSgt. Victor Mendoza, 55CONS; A1C Jason Arizmendi, 55CONS; and 2Lt Epati Scanlan, 55CONS.

**ITEMS DISCUSSED:**

1. Attendees went through Review Comments received from the 65% review. Comment and Response sheets are attached.

2. Revisited the current practice of people parking vehicles along the existing south parking lot roadway and reducing it to one lane. At the 35% Review Meeting it was discussed that we could shift one row of parking to be along the south curb line and eliminate an open curb to parallel park along. At that time, the Base preferred to keep the configuration as it is because of utilizing the area south of the lot to dump snow from removal operations. It was now discussed that the parking could be moved and the Base could still do their snow removal operations. The Base was going to confirm with others following the meeting if this parking configuration was the direction they wanted to go. *Camille Hussmann confirmed following the meeting that a row of parking should be moved to the south curb line.*

3. Discussed the need for additional information on the existing storm sewer information around the B1000 complex to see what is draining to the detention pond. There is a lack of as-built information on the system. Offutt will get GIS information of the storm sewer for HGM and they will field verify information

Please submit comments, additions, or corrections to this memo within five (5) days of issuance. If no comments are received this memo will be assumed accurate.

COPY TO: All attendees.

REPORT BY: Bill Glismann, P.E.

hgm
ASSOCIATES INC.

# MEETING MINUTES
# 90% REVIEW

**PROJECT:** **HGM PROJECT NO:** 741524

## OFFUTT AFB
## CONSTRUCT PARKING LOT #3, B1000
## SGBP 24-0018

**DATE:** June 17, 2025 **TIME:** 2:00 PM

**LOCATION:** **CEO 1 Conference Room B301**

---

**ATTENDEES:**

Representing HGM Associates Inc (HGM) – Bill Glismann and Spencer Ellwanger.
Representing Offutt Air Force Base (OAFB) – Camille Hussmann, 55CES/CENMP: Justin Kobza, 55CES/CEOER; Elia Bahwawsi, 55CES/CEN; David Lot, 55CES/CENMEM; Brian Coffin, STRATCOM; Laura Stemick, 55CONS; and A1C Jason Arizmendi.

**ITEMS DISCUSSED:**

1. Attendees went through Review Comments received from the 90% review. Comment and Response sheets are attached.

Please submit comments, additions, or corrections to this memo within five (5) days of issuance. If no comments are received this memo will be assumed accurate.

COPY TO: All attendees.

REPORT BY: Bill Glismann, P.E.

# VI. 65% REVIEW COMMENTS & RESPONSES

| ENGINEERING REVIEW COMMENTS | DATE 7 April | PAGE 1 of 1 PAGES |
|---|---|---|

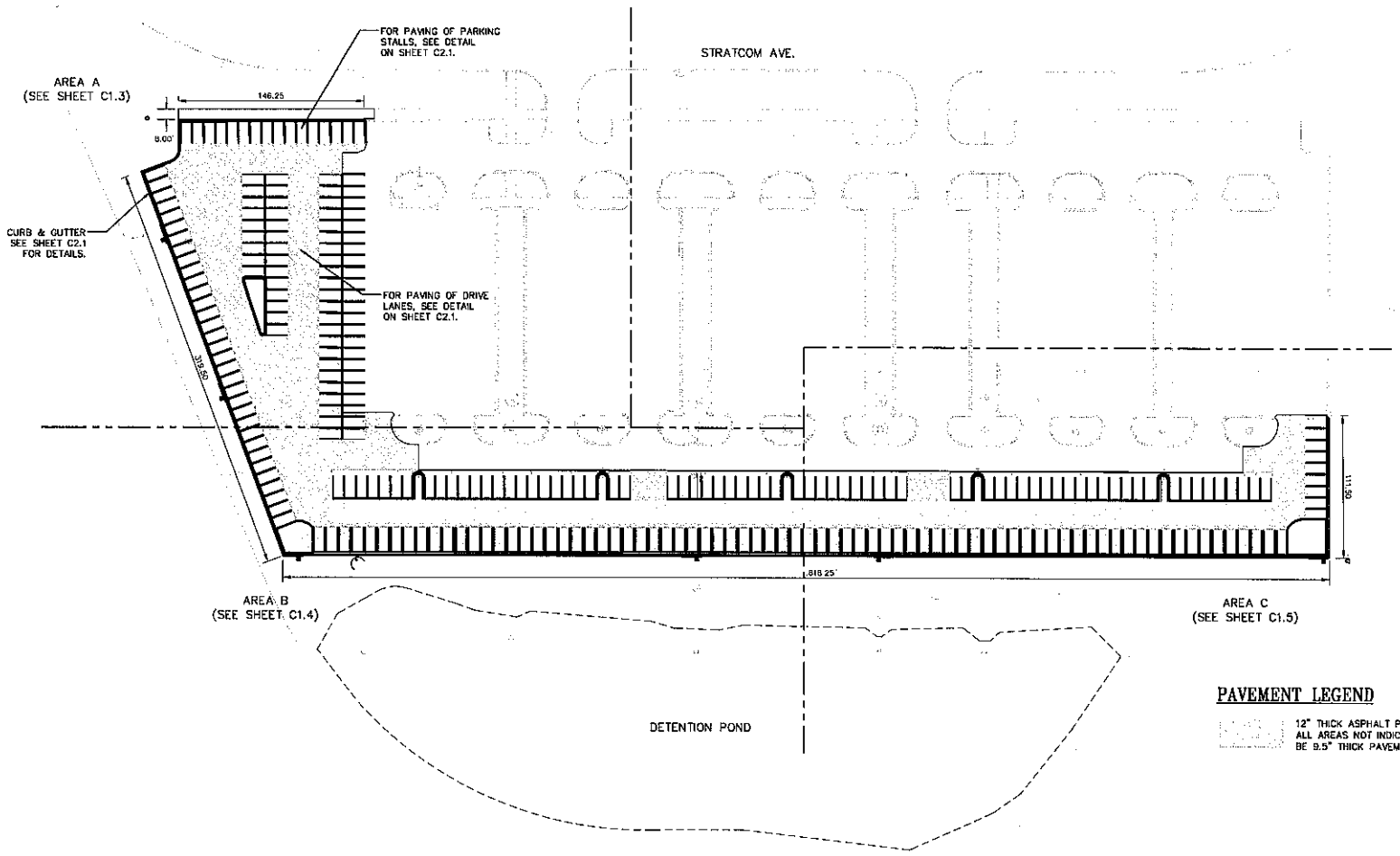
| BASE | PROJECT TITLE | PROJECT NUMBER | FY |
|---|---|---|---|
| Offutt AFB, NE | Sout Lot 3 | 24-0018 | 25 |

| ○ DD FORM 1391 | ○ DRAFT RFP | ○ INT RFP | ○ 35% SUBMITTAL | ◉ 60% SUBMITTAL | ○ 90% SUBMITTAL | ○ IFB |
|---|---|---|---|---|---|---|

| NAME OF REVIEWER | ORGANIZATION / SECTION | PHONE NUMBER | FTS: |
|---|---|---|---|
| Camille Hussmann | CENMP | DSN: 4022945369 | COM: |

| DRAWING or PARAGRAPH # | CMT # | COMMENTS | RESPONSE |
|---|---|---|---|
| Sheet 5 - C1.2 | 1 | During the 35% design review, there was talk of vehicles parking on the south curb preventing the fire truck from having full access to the parking lot. One suggestion was to move the south stalls to the curb. Is this still an option or are there other suggestions. See diagram as an example. | Design will be updated to new configuration shifting south stalls to the curb. |
| Sheet 15 - C2.1 | 2 | Provide layer details | Layer legend will be added to 90% submittal plans. |

**OF FORM 1**




## PAVEMENT LEGEND

12" THICK ASPHALT PAVEMENT IN DRIVE LANES
ALL AREAS NOT INDICATED AS 12" THICK WILL BE 9.5" THICK PAVEMENT.

## SITE PLAN

SCALE: 1" = 40'

N

Offutt
Air Force Base

APPROVED

| SIGNATURE | OFFICE |
|---|---|
| [illegible] | |
| [illegible] | |
| [illegible] | |
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COORDINATION

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| [illegible] | |
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| [illegible] | |
| [illegible] | |
| [illegible] | |
| [illegible] | |

"SIGNING OF THE COVER SHEET CONSTITUTES COORDINATION OF ALL DRAWINGS IN THIS PROJECT; SUBSEQUENT SHEETS NEED NOT BE SIGNED."

DESIGN FIRM

hgm ASSOCIATES INC.
CONSULTING ENGINEERS SURVEYORS
[illegible]

65% SUBMITTAL
MAR. 20, 2025

NOT FOR CONSTRUCTION

| | |
|---|---|
| Designed | Project Manager WJG |
| Drafter | Date 03-20-26 |

| REVISION | BY/DATE |
|---|---|
| | |
| | |
| | |
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| | |

SHEET TITLE
C1.2
SITE PLAN

| SHEET | OF |
|---|---|
| 5 | 21 |

PROJECT TITLE
CONSTRUCT NEW PARKING LOT 3, B1000

Project Number
SGBP-24-0016

| Drawing Number | Facility Number |
|---|---|
| OFF-B-6524 | B1000 |

| ENGINEERING REVIEW COMMENTS | DATE 24 March 2025 | PAGE 1 of 1 PAGES |
|---|---|---|

| BASE | PROJECT TITLE | PROJECT NUMBER | FY |
|---|---|---|---|
| Offutt AFB, NE | Repair S Lot 3, B1000 | 24-0018 | 25 |

| ○ DD FORM 1391 | ○ DRAFT RFP | ○ INT RFP | ○ 35% SUBMITTAL | ◉ 60% SUBMITTAL | ○ 90% SUBMITTAL | ○ IFB |
|---|---|---|---|---|---|---|

| NAME OF REVIEWER | ORGANIZATION / SECTION | PHONE NUMBER | |
|---|---|---|---|
| Clete DeWispelare | 55 CES/CEOER | DSN: 402-294-3243 | FTS:<br>COM: |

| DRAWING or PARAGRAPH # | CMT # | COMMENTS | RESPONSE |
|---|---|---|---|
| SPECS | 1 | Include appropriate electrical specification sections. | Will add to 90% Plans.<br><br>Require contact for OPPD. Camille Hussman will provide contact info for Dave Ortiz and Tom Lewis. |

**OF FORM 1**

# VII. 90% REVIEW COMMENTS & RESPONSES

| ENGINEERING REVIEW COMMENTS | DATE 11 June 2025 | PAGE 1 of 1 PAGES |
|---|---|---|

| BASE | PROJECT TITLE | PROJECT NUMBER | FY |
|---|---|---|---|
| Offutt AFB, NE | Construct New New Parking Lot #3, B1000 | SGBP 24-0018 | 25 |

| DD FORM 1391 | DRAFT RFP | INT RFP | 35% SUBMITTAL | 60% SUBMITTAL | 90% SUBMITTAL | IFB |
|---|---|---|---|---|---|---|
| | | | | | ⊙ | |

| NAME OF REVIEWER | ORGANIZATION / SECTION | PHONE NUMBER | FTS: |
|---|---|---|---|
| Elia D. Bahwawsi | 55 CES/CEN | DSN: 402-294-6864 | COM: |

| DRAWING or PARAGRAPH # | CMT # | COMMENTS | RESPONSE |
|---|---|---|---|
| Specs.: Sec: 033000 Para. 3.13.3.3 | 1 | Remove "or three 4 inch by 8 inch cylinder in reserve. | Will change. |
| Sec: 310000 Para. 3.6 | 2 | Add vibratory before sheepsfoor, pneumatic, and steel wheeled rollers. | Will add. |
| Sec: 321213 Para1.3 | 3 | Add definition to lot. | Will add. |
| Sec: 32.12.16.16 Para 3.8.2 | 4 | Specify type of rollers. | Will specify 8 ton |
| | 5 | Specify minimum sequence of rolling For the asphalt pavement base course specify maximum layers thickness. | 3-4 Passes Use 3" max. layers |
| Sec: 321619 Para 2.1 | 6 | Delete 3500 psi add 4000 psi. | Will revise |
| | 7 | Delete 1-1/2 inches add 1 inches. | Will revise |
| Para 3.1.1 | 8 | After compact add "top 12 inches of subgrade for sidewalk to at least 95% of ASTM D1557". | Will make all changes. |
| | 9 | | |
| Para 3.21 | 10 | Delete 12 hours add 48 hours. | |
| Para 3.3.1 | 11 | Delete "tamping and spading or with" | |
| Para 3.3.2 | 12 | Add followed by curing compound. | |
| Sec.:334000 Para 3.2.1 | 13 | After "at least" Add 95% of ASTM D1557. | Will revise. |
| | 14 | delete 6" add 4". | |
| | 15 | delete 8" add 6". | |
| Drawing: Sheet 15 | 16 | Add Pavement detail section | Will add details. |
| | 17 | Add detail section showing where to apply the prime coat. | |
| | 18 | Asphalt to existing asphalt interface detail. "NEW BASE COURES" add ASPHALT PAVMENT. | |

**OF FORM 1**

| ENGINEERING REVIEW COMMENTS | DATE 12 Jun | PAGE 1 of 1 PAGES |
|---|---|---|

| BASE | PROJECT TITLE | PROJECT NUMBER | FY |
|---|---|---|---|
| Offutt AFB, NE | Construct New Parking Lot 3 | 24-0018 | 25 |

| DD FORM 1391 | DRAFT RFP | INT RFP | 35% SUBMITTAL | 60% SUBMITTAL | 90% SUBMITTAL | IFB |
|---|---|---|---|---|---|---|
| | | | | | ⊙ | |

| NAME OF REVIEWER | ORGANIZATION / SECTION | PHONE NUMBER | FTS: |
|---|---|---|---|
| Brian Coffin | USSTRATCOM J43 | DSN: 912-4300 | COM: |

| DRAWING or PARAGRAPH # | CMT # | COMMENTS | RESPONSE |
|---|---|---|---|
| C1.2 | | - SW corner curbing leaves empty space at the end of the rows. Propose this match the NW and NE corner curbing detail. This will eliminate anyone from trying to park in the dead space.<br><br>- SE corner curbing leaves empty space at the end of the rows. Propose this match the NW and NE corner curbing detail. This will eliminate anyone from trying to park in the dead space. | There are inlets at the corners of the lot. The corners will striped with diagonal cross hatching to show "no parking". |

**OF FORM 1**

| ENGINEERING REVIEW COMMENTS | DATE 6/12/25 | PAGE 1 of 1 PAGES |
|---|---|---|

| BASE | PROJECT TITLE | PROJECT NUMBER | FY |
|---|---|---|---|
| Offutt AFB, NE | Construct New Parking Lot 3, B1000 | 24-0018 | |

| DD FORM 1391 | DRAFT RFP | INT RFP | 35% SUBMITTAL | 60% SUBMITTAL | 90% SUBMITTAL | IFB |
|---|---|---|---|---|---|---|
| | | | | | ⊙ | |

| NAME OF REVIEWER | ORGANIZATION / SECTION | PHONE NUMBER | FTS: |
|---|---|---|---|
| Clete DeWispelare | CES/CEOER | DSN: 402-294-3243 | COM: |

| DRAWING or PARAGRAPH # | CMT # | COMMENTS | RESPONSE |
|---|---|---|---|
| SPECS | 1 | Add applicable electrical specifications. | There are no Specs - OPPD will be doing all light installation. |
| E1.01 | 2 | Add voltage drop calculations. | Will get info from OPPD. |
| E1.01 | 3 | Add lamp load to SITE LIGHTING SCHEDULE (at least for new fixture type 'A'). | Will get info from OPPD. |

**OF FORM 1**

| ENGINEERING REVIEW COMMENTS | DATE 6/12/25 | PAGE 1 of 1 PAGES |
|---|---|---|

| BASE | PROJECT TITLE | PROJECT NUMBER | FY |
|---|---|---|---|
| Offutt AFB, NE | Construct New Parking Lot 3, B1000 | 24-0018 | |

| DD FORM 1391 | DRAFT RFP | INT RFP | 35% SUBMITTAL | 60% SUBMITTAL | 90% SUBMITTAL | IFB |
|---|---|---|---|---|---|---|
| | | | | | ⊙ | |

| NAME OF REVIEWER | ORGANIZATION / SECTION | PHONE NUMBER | |
|---|---|---|---|
| Justin Kobza | CES/CEOER | DSN: 232-1551 | FTS:<br>COM: |

| DRAWING or PARAGRAPH # | CMT # | COMMENTS | RESPONSE |
|---|---|---|---|
| C1.1, note 7 | 1 | It's mentioned to protect the manhole. Is there a comment or detail showing the manhole being adjusted to grade with the addition of the pavement? Add a note to sheet C1.7? | Will add note on grading plan and add detail. |
| C1.1, note 8 | 2 | It's mentioned to protect the monitoring well. Is there a comment or detail showing the monitoring well being adjusted to grade with the addition of the pavement? Add a note to sheet C1.7? | Will add note on grading plan and add detail. |

**OF FORM 1**