MATANUSKA-SUSITNA BOROUGH

350 East Dahlia Avenue, Palmer, Alaska 99645 – 907-861-7874

PLATTING OFFICER
Fred Wagner

PLATTING
ADMINISTRATIVE SPECIALIST
Theresa Taranto

PLATTING TECHNICIANS
Amy Otto-Buchanan
Matthew Goddard
Chris Curlin

PLATTING ASSISTANT
Kayla Kinneen

ABBREVIATED PLAT AGENDA

ASSEMBLY CHAMBERS
350 EAST DAHLIA AVENUE, PALMER

REGULAR MEETING 8:30 A.M. September 6, 2023

Public Participation: To participate in the Abbreviated Plat Hearing, you can attend in person, or you can submit written comments by email to platting@matsugov.us or by mail to Matanuska-Susitna Borough, Platting Division, 350 E. Dahlia Avenue, Palmer, AK 99645.

1. **INTRODUCTION**
   A. Introduction of Staff

2. **UNFINISHED BUSINESS:**
   (None)

3. **PUBLIC HEARINGS:**

   A. **WASILLA HOLIDAY:** The request is to create two lots from Parcels 1 & 2, MSB Waiver Resolution #96-13-PWm, recorded as 91-60W, to be known as **Wasilla Holiday**, containing 8.98 acres +/-. The property is located directly east of N. Meadow Lakes Loop, south of W. Meadow Lakes Spur, and directly north and west of W. Parks Highway (Tax ID # 17N02W09A014 / 17N02W09A022); within the NE ¼ Section 09, Township 17 North, Range 02 West, Seward Meridian, Alaska. In the Meadow Lakes Community Council and in Assembly District #7. *(Petitioner/Owner: Holiday Alaska, LLC, Staff: Chris Curlin, Case # 2023-092)*

   B. **ECKERT NO. 2 RSB LOT 2:** The request is to create two lots from Lot # 2, Eckert Subdivision No.2, (Plat 66-3), recorded as 1966-000277, to be known as **Eckert No. 2 Lots 2A AND 2B,** containing 9.26 acres +/-. The property is located directly north of E. Browns Avenue, directly south of E. Relaxing Road, and west of N. Tranquility Lane (Tax ID # 2008000L002); within the SW ¼ Section 01, Township 17 North, Range 02 East, Seward Meridian, Alaska. In the Butte Community Council and in Assembly District #1. *(Petitioner/Owner: Steve and Debbie Rowland, Staff: Chris Curlin, Case # 2023-090)*

THE ABBREVIATED PLAT HEARING WILL CONVENE AT **8:30 A.M.** on **September 6, 2023**, in **ASSEMBLY CHAMBERS** at the Dorothy Swanda Jones Building, 350 E. Dahlia Avenue, Palmer, Alaska.

Public Hearing Process

- **Platting Officer states/reads the case/item to be addressed into the record.**
- **Public Hearing Notices**: Secretary states the number of public hearing notices sent out and the date sent.
- **Staff Report:** The Platting Officer gives an overview of the project for the hearing and the public.
- **Public Testimony**: Members of the public are invited to sign in and testify before the officer.
  - 3-minute time limit per person for members of the public.
  - The time limit may be extended at the discretion of the Platting Officer.
- **The public hearing is closed by the Officer.** No further public input is appropriate.
- **Petitioner Comments**: Petitioner, or his/her representative, comes before the officer to discuss staff recommendations and compliance with Title 43 and other applicable regulations.
  - Testimony is limited to five (5) minutes for the petitioner/applicant.
  - The time limit may be extended at the discretion of the Platting Officer
- **Motion to Approve:** Motion to approve is made by the Platting Officer.
  - No further unsolicited input from petitioner is appropriate.
  - Conditions and Findings must be written for all decisions made regarding the action being taken, whether it passed or failed.
  - Decisions are final unless reconsidered by the platting board MSB 43.35.005 or appealed to the board of adjustments and appeals. MSB 43.35.015


3A

STAFF REVIEW AND RECOMMENDATIONS
PUBLIC HEARING
SEPTEMBER 6, 2023

ABBREVIATED PLAT:	HOLIDAY ALASKA
LEGAL DESCRIPTION:	SEC 09, T17N, R02W, SEWARD MERIDIAN AK
PETITIONERS:	HOLIDAY ALASKA, LLC
SURVEYOR/ENGINEER:	EDGE SURVEY & DESIGN / NELSON ENGINEERING
ACRES: 8.98 ±	PARCELS: 2
REVIEWED BY:	CHRIS CURLIN CASE #: 2023-092

REQUEST: The request is to create two lots from Parcels 1 & 2, MSB Waiver Resolution #96-13-PWm, recorded as 91-60W, to be known as WASILLA HOLIDAY, containing 8.98 acres +/-. The property is located directly east of N. Meadow Lakes Loop, south of W. Meadow Lakes Spur, and directly north and west of W. Parks Highway; within the NE ¼ Section 09, Township 17 North, Range 02 West, Seward Meridian, Alaska.

EXHIBITS

Vicinity Map and Aerial Photos	**EXHIBIT A** – 4 pgs
As-built and Topo	**EXHIBIT B** – 1 pg
Soils Report	**EXHIBIT C** – 138 pgs

AGENCY COMMENTS

ADOT&PF	**EXHIBIT D** – 2 pgs
MSB Development Services	**EXHIBIT E** – 1 pg
Utilities	**EXHIBIT F** – 1 pg

DISCUSSION: The proposed subdivision is creating two lots. Lot 1 will be 2.70 acres and Lot 2 will be 6.28 acres. Proposed lots will take access from N. Meadow Lakes Loop, a Borough owned and maintained road.

Soils Report: A geotechnical report was submitted (**Exhibit C**), pursuant to MSB 43.20.281(A). Clinton J. Banzhaf, P.E. with Northern Geotechnical Engineering, Inc., d.b.a. Terra Firma Testing, notes that based on subsurface explorations completed at the project site that each lot will have 10,000 square feet of contiguous usable building area and at least 10,000 square feet of contiguous useable septic area as required by MSB 43.20.281 Area.
A total of 14 test holes were drilled on the subject property and one test hole was drilled on nearby lot 23A. Depths ranged from 9.0 to 31.5 feet. Sieve analysis results are listed in appendix B of the soils report.

Comments:

ADOT&PF **(Exhibit D)** Notes no direct access will be granted. All proposed lots must take access from Meadow Lakes Loop. Subsequent development and utilities are required to continue to take access from Meadow Lakes Loop.

MSB Development Services **(Exhibit E)** Have the applicant show the common access easement on the plat, not just a note of it.

Utilities: **(Exhibit F)** GCI has no comments or objections. ENSTAR advises that there is an existing natural gas service line which appears to cross proposed Lot 1 to serve proposed Lot 2. Attached is an as-built for your reference. ENSTAR objects to this pat unless one of the following scenarios is met:

1. Add a note which says, "There is a ten foot (10 FT) wide natural gas easement centered on existing service line." And add, "location of natural gas main and centerline of ten foot (10 FT) wide natural gas easement" to the depiction of the referenced service line.
2. Owner signs an ENSTAR Natural Gas Easement document for a ten foot (10 FT) wide natural gas easement, centered on the service line at this location.
   MEA and MTA did not respond.
   Staff recommends petitioner record a natural gas easement and note easement on final plat.

Public: At the time of this write-up there were no comments from the public in response to the Notice of Public Hearing.

At the time of staff report write-up, there were no responses to the Request for Comments from ADF&G; USACE; Meadow Lakes Community Council; Fire Service Area #136 West Lakes; Road Service Area #027 Meadow Lakes; MSB Community Development or Emergency Services; MEA or MTA.

CONCLUSION: The abbreviated plat of Wasilla Holiday is consistent with AS 29.40.070 Platting Regulations and MSB 43.15.025 Abbreviated Plats. There were no objections from any federal or state agencies, Borough departments, GCI, MTA, or MEA. There were no objections to the plat from the public in response to the Notice of Public Hearing. Legal and physical access exists to the proposed lots, consistent with MSB 43.20.100 Access Required, MSB 43.20.120 Legal Access and MSB 43.20.140 Physical Access. Frontage for the subdivision exists, pursuant to MSB 43.20.320 Frontage. A soils report was submitted, pursuant to MSB 43.20.281(A)(1).

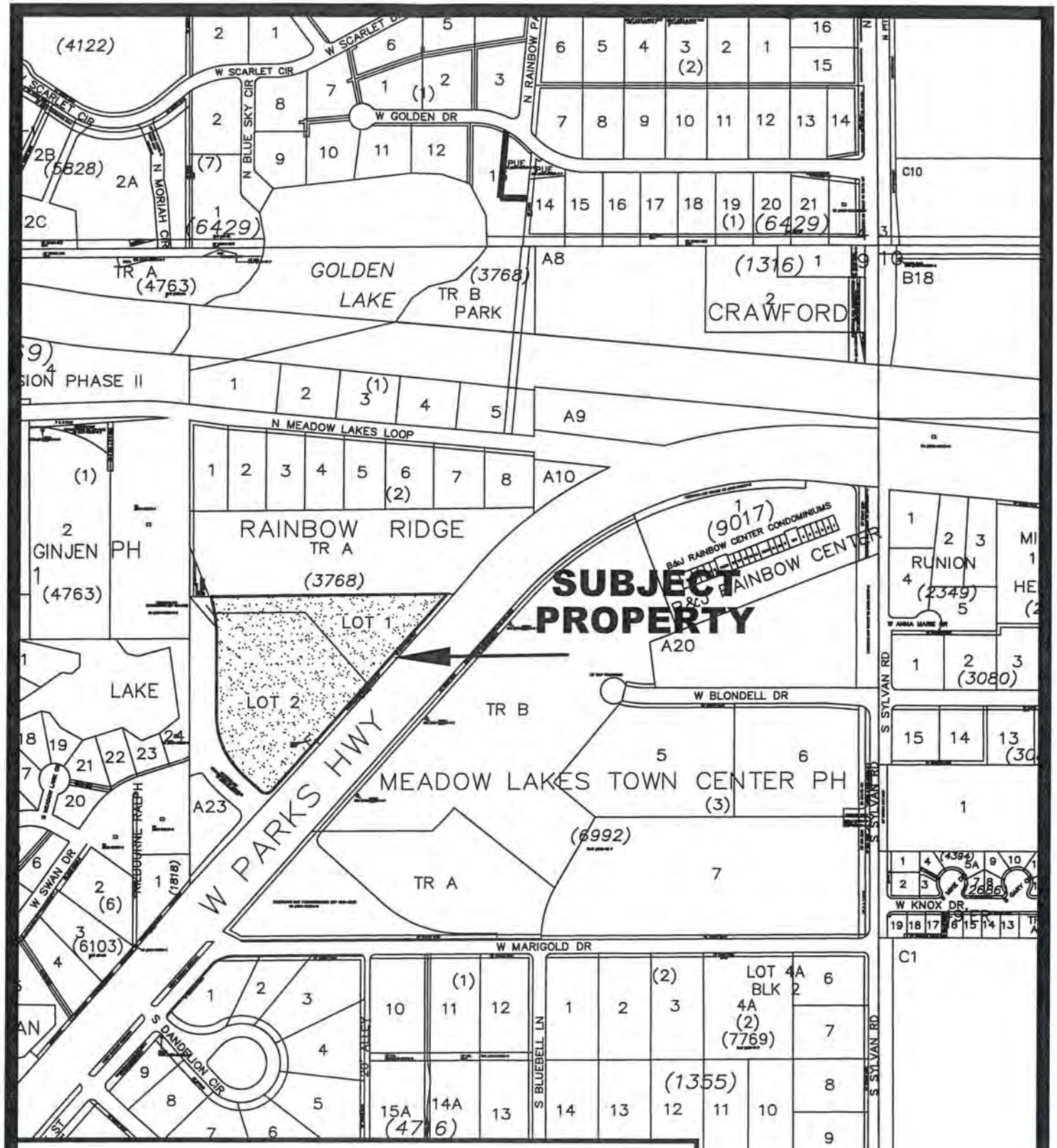
FINDINGS OF FACT

1. The plat of Wasilla Holiday is consistent with AS 29.40.070 Platting Regulations and MSB 43.15.025 Abbreviated Plats.
2. A soils report was submitted, pursuant to MSB 43.20.281(A)(1).
3. All lots will have legal and physical access consistent with MSB 43.20.100, MSB 43.20.120 and MSB 43.20.140.
4. Each lot has the required frontage pursuant to MSB 43.20.320.
5. At the time of staff report write-up, there were no responses to the Request for Comments from ADF&G; USACE; Meadow Lakes Community Council; Fire Service Area #136 West Lakes; Road Service Area #027 Meadow Lakes; MSB DPW Pre-design and Engineering or Emergency Services; MEA or MTA.

6. There were no objections from any federal or state agencies, or Borough departments.

RECOMMENDATIONS OF CONDITIONS OF APPROVAL for the abbreviated plat of Wasilla Holiday, Section 9, Township 17 North, Range 02 West, Seward Meridian, Alaska, contingent on staff recommendations:

1. Taxes and special assessments must be paid in full for the year of recording, pursuant to MSB 43.15.053(F) and AS 40.15.020. Pay taxes and special assessments (LIDs), by CERTIFIED FUNDS OR CASH.
2. Provide updated Certificate to Plat executed within seven (7) days of recording of plat and submit Beneficiary Affidavit for any holders of a beneficial interest.
3. Show common access easement on final plat.
4. Apply for a driveway permit for the N. Meadow Lakes Loop access and provide a copy of the application to Platting Staff.
5. Pay postage and advertising fees.
6. Show all easements of record on final plat.
7. Submit recording fees, payable to Department of Natural Resources (DNR).
8. Submit final plat in full compliance with Title 43.



VICINITY MAP

FOR PROPOSED WASILLA HOLIDAY SUBDIVISION
LOCATED WITHIN
SECTION 09, T17N, R02W, SEWARD MERIDIAN
ALASKA

H010 MAP

EXHIBIT A -1

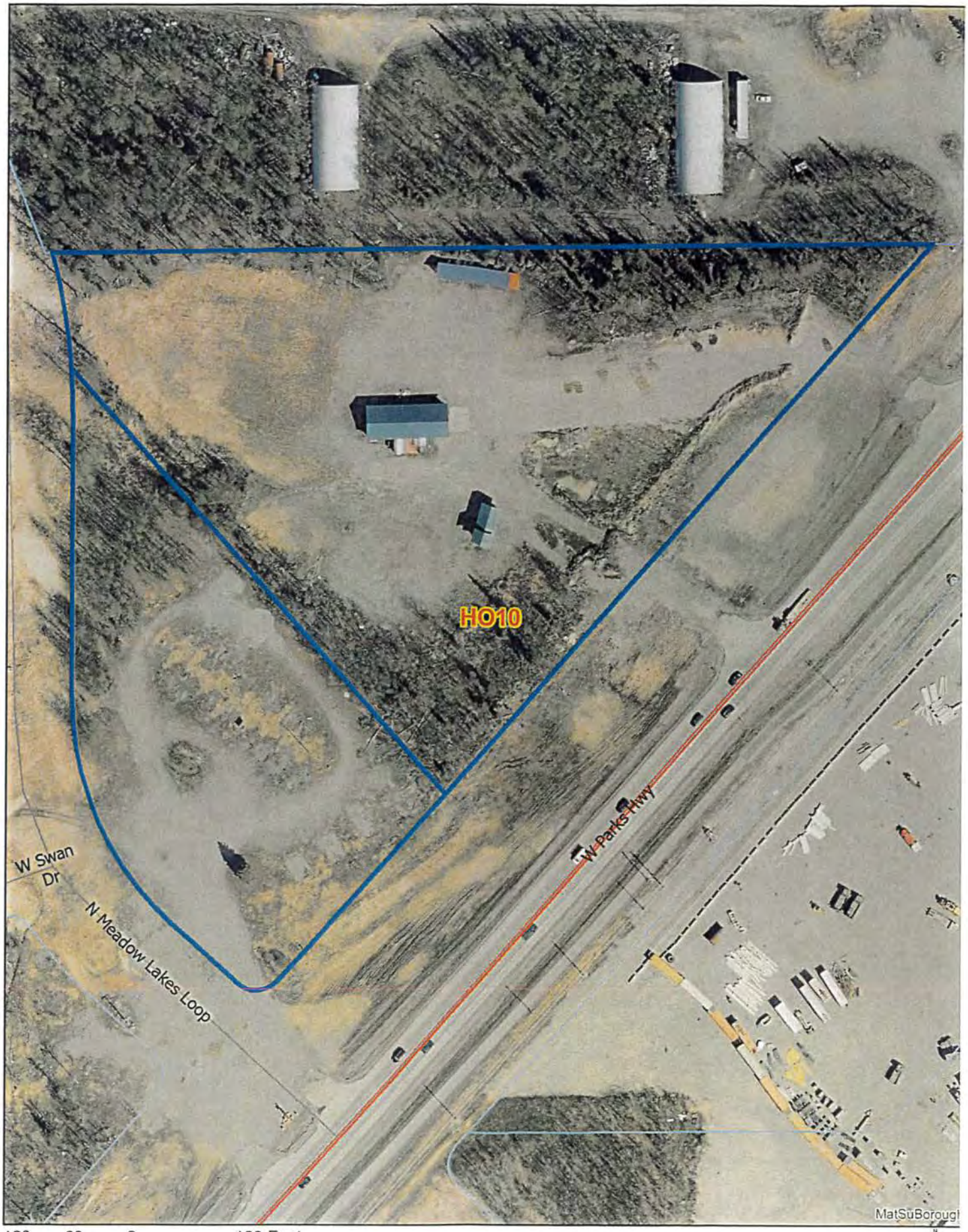
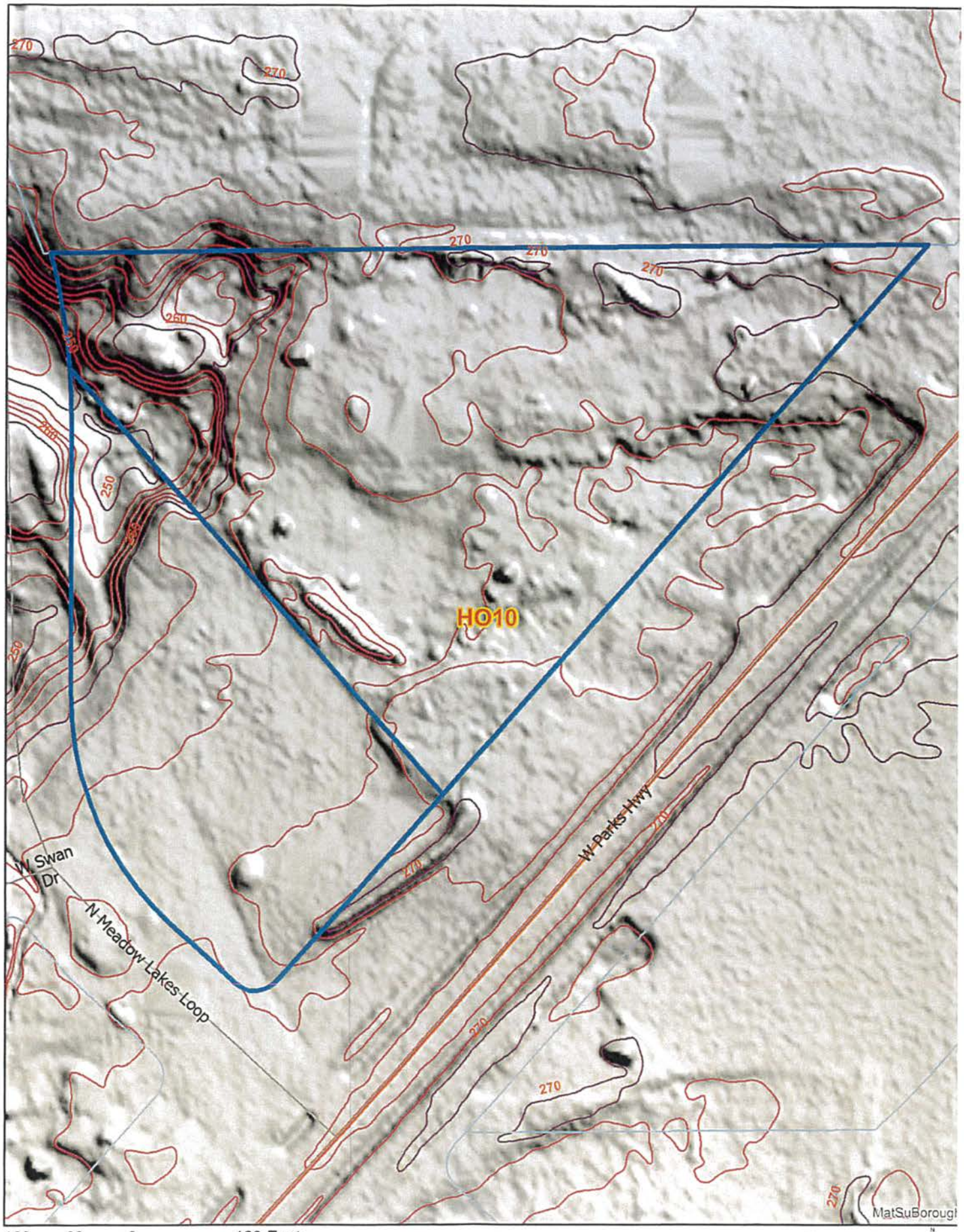

HO10
W Swan Dr
N Meadow Lakes Loop
W Parks Hwy
MatSuBorough
120 60 0 120 Feet

EXHIBIT A-2

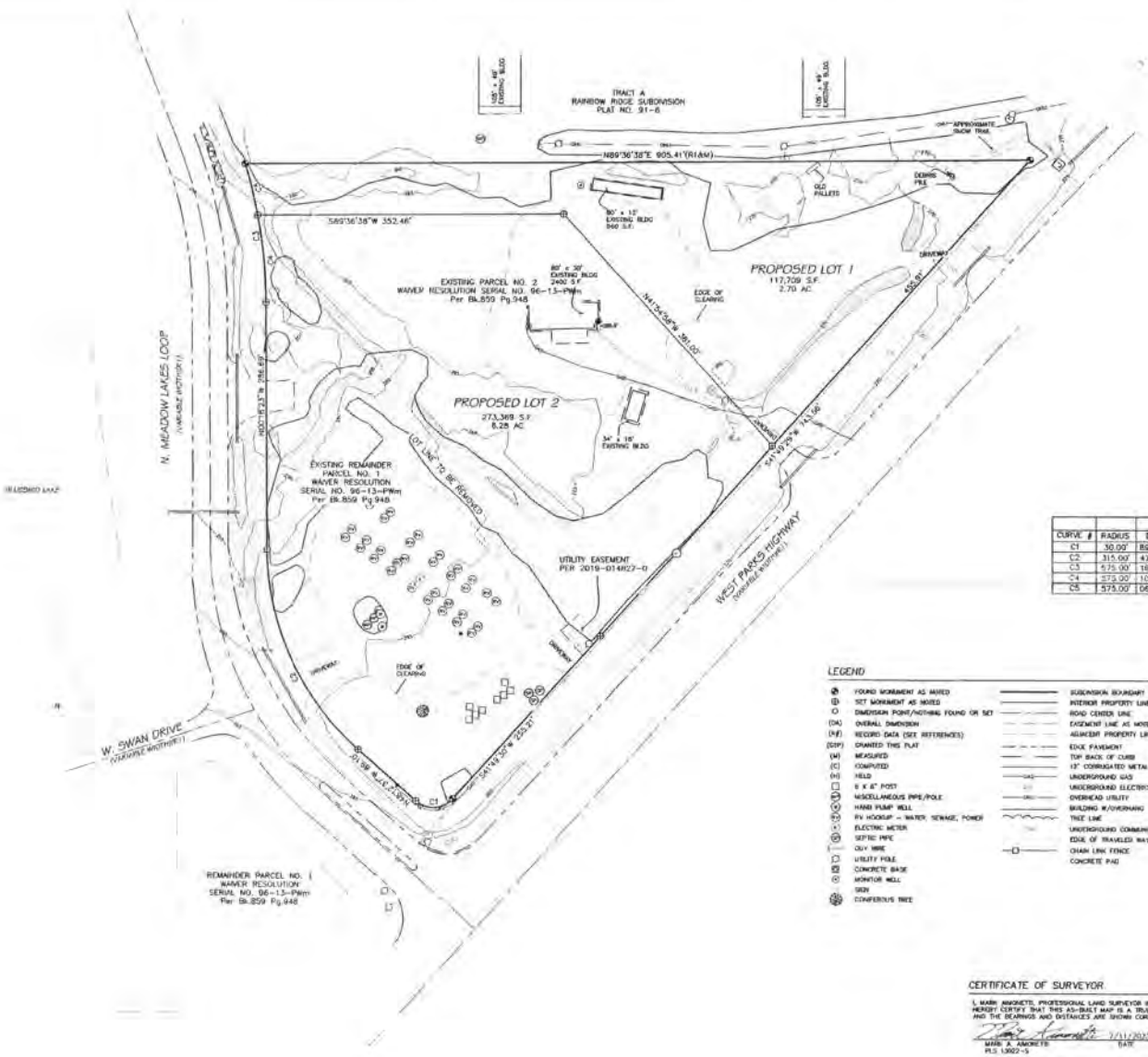
375 187.5 0 375 Feet

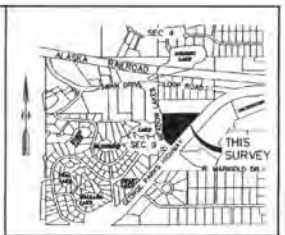
EXHIBIT A-3



120 60 0 120 Feet

EXHIBIT A-4





CURVE TABLE						
CURVE #	RADIUS	DELTA	LENGTH	CHORD DIRECTION	CHORD LENGTH	TANGENT
C1	30.00'	89°57'53"	47.11'	S85°48'28"W	42.41'	29.98'
C2	315.00'	47°34'11"	261.37'	N24°15'28"W	255.77'	139.93'
C3	575.00'	18°17'55"	183.57'	N06°22'29"W	182.80'	92.34'
C4	575.00'	10°09'32"	101.92'	N05°23'04"W	101.79'	51.09'
C5	575.00'	06°08'33"	61.64'	N13°31'01"W	61.61'	30.84'

LEGEND

- FOUND MONUMENT AS NOTED
- SET MONUMENT AS NOTED
- DIMENSION POINT/NOTHING FOUND OR SET
- (DA) OVERALL DIMENSION
- (M&R) RECORD DATA (SEE REFERENCES)
- (DDH) GRANTED THIS PLAT
- (M) MEASURED
- (C) COMPUTED
- (H) HELD
- 6 X 6" POST
- MISCELLANEOUS PIPE/POLE
- HAND PUMP WELL
- RV HOOKUP – WATER, SEWAGE, POWER
- ELECTRIC METER
- SEPTIC PIPE
- GUY WIRE
- UTILITY POLE
- CONCRETE BASE
- MONITOR WELL
- SIGN
- CONIFEROUS TREE
- SUBDIVISION BOUNDARY
- INTERIOR PROPERTY LINE
- ROAD CENTER LINE
- EASEMENT LINE AS NOTED
- ADJACENT PROPERTY LINE
- EDGE PAVEMENT
- TOP BACK OF CURB
- 12" CORRUGATED METAL PIPE
- UNDERGROUND GAS
- UNDERGROUND ELECTRIC
- OVERHEAD UTILITY
- BUILDING W/OVERHANG
- TREE LINE
- UNDERGROUND COMMUNICATION
- EDGE OF TRAVELED WAY
- CHAIN LINK FENCE
- CONCRETE PAD

NOTES

1. THERE MAY BE FEDERAL, STATE, OR LOCAL REQUIREMENTS GOVERNING LAND USE. THE INDIVIDUAL PARCEL OWNER SHALL OBTAIN A DETERMINATION WHETHER THESE REQUIREMENTS APPLY TO THE DEVELOPMENT OF PARCELS SHOWN ON THIS PLAT.
2. DIMENSIONS ON THIS PLAT ARE EXPRESSED IN U.S. SURVEY FEET AND DECIMAL PARTS THEREOF UNLESS OTHERWISE NOTED.
3. THE BASIS OF COORDINATES FOR THIS SURVEY IS ALASKA STATE PLANE, ZONE 4, (2011), EPOCH 2010.000 IN U.S. FEET BASED ON AN OPUS DERIVED POSITION OF CONTROL POINT 19. ALL BEARINGS SHOWN ARE TRUE BEARINGS AS MEASURED. ELEVATIONS ARE NAVD 88 ORTHOMETRIC HEIGHTS AS DETERMINED BY OPUS SOLUTION HOLDING GEOID 12B
4. BY GRAPHIC PLOTTING ONLY, THIS PROPERTY DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD AREA AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY. THIS PROPERTY IS IN ZONE X AN AREA THAT IS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN. FLOOD INSURANCE RATE MAP IDENTIFIED AS MAP NO. 02170C0510E BEARING AN EFFECTIVE DATE OF MARCH 17, 2011 WAS USED TO DETERMINE THE FLOOD ZONE. EXACT DESIGNATION CAN ONLY BE DETERMINED BY AN ELEVATION CERTIFICATE.

RECEIVED
JUL 11 2023
PLATTING

CERTIFICATE OF SURVEYOR

I, MARK A. AMONETTE, PROFESSIONAL LAND SURVEYOR IN THE STATE OF ALASKA DO HEREBY CERTIFY THAT THIS AS-BUILT MAP IS A TRUE AND CORRECT REPRESENTATION AND THE BEARINGS AND DISTANCES ARE SHOWN CORRECTLY.

MARK A. AMONETTE — DATE 7/11/2023
PLS. 13022-S

STATE OF ALASKA — 49TH — Mark A. Amonette — No. 13022 — S — 7/11/2023 — REGISTERED LAND SURVEYOR

AS-BUILT & TOPOGRAPHY OF
PROPOSED WASILLA HOLIDAY SUBDIVISION

A SUBDIVISION OF PARCELS 1 & 2 OF MSB PARCEL WAIVER 96-13,PWM RECORDED IN BK.859 PG.948 AND LOCATED WITHIN THE SW1/4 NE1/4 OF SECTION 9, T.17N., R.2W., S.M. IN THE PALMER RECORDING DISTRICT, THIRD JUDICIAL DISTRICT, STATE OF ALASKA

CONTAINING 9.98 ACRES, MORE OR LESS

EDGE SURVEY AND DESIGN, LLC
(907) 344-5595 Fax (907) 344-7704
WWW.EDGESURVEY.NET

DRAWN BY: WLB	PROJECT # 21-240	PLAT CASE # 2023-XXX	
CHECKED BY: MA	DATE: 6/5/2023	SCALE: 1"=60'	SHEET 1 OF 1

EXHIBIT B

GEOTECHNICAL ENGINEERING REPORT

for the proposed improvements to

7699 and 7751 W. PARKS HWY
WASILLA, ALASKA

Prepared for:

Holiday Stationstores
4567 American Boulevard W.
Bloomington, MN. 55437

Prepared by:

Northern Geotechnical Engineering, Inc. *d.b.a.* Terra Firma Testing

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AUGUST 2023

EXHIBIT C

NGE-TFT Project # 6216-21R1

August 18, 2023 NGE-TFT Project # 6216-21R1

Holiday Stationstores
4567 American Boulevard W.
Bloomington, MN. 55437

Attn: David A. Edquist - Real Estate Development Manager

RE: GEOTECHNICAL ENGINEERING ASSESSMENT OF PROPOSED IMPROVEMENTS TO THE PROPERTY LOCATED AT 7699 AND 7751 WEST PARKS HIGHWAY, WASILLA, ALASKA.

David,

We (Northern Geotechnical Engineering, Inc. *d.b.a.* Terra Firma Testing) have completed our geotechnical engineering assessment for the aforementioned project. This report is a revised and updated report from our original report titled "GEOTECHNICAL ENGINEERING ASSESSMENT OF PROPOSED IMPROVEMENTS TO THE PROPERTY LOCATED AT 7699 AND 7751 WEST PARKS HIGHWAY, WASILLA, ALASKA.", dated October 23, 2021. This report that includes recommendations for lot 7699 West Parks Highway and additional explorations. Our assessment suggests that the project site is generally suitable to support the proposed improvements, provided that appropriate design and construction practices are implemented. We include details of our findings, conclusions, and recommendations in the following report. This report was revised to include statement about contigous useable area for a building area and septic area.

We greatly appreciate the opportunity to provide you with our professional service. Please contact us directly with any questions or comments you may have regarding the information that we present in this report, or if you have any other questions, comments, and/or requests.

Sincerely,
Northern Geotechnical Engineering, Inc. *d.b.a.* Terra Firma Testing

Clinton J. Banzhaf, P.E.
Senior Project Engineer

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EXECUTIVE SUMMARY

We (Northern Geotechnical Engineering, Inc. *d.b.a.* Terra Firma Testing) conducted our geotechnical engineering assessment for the proposed Holiday Stationstore to be constructed at 7699 and 7751 W. Parks Highway (Lot A14, A22, and A23), Wasilla, Alaska. Under our direction Discovery Drilling, Inc. advanced a total of fifteen (15) soil borings, designated B1 through B15, and installed an infiltration test well next to borehole B8 across the project site on October 1 & 2, 2020, and November 5, 2021, to depths ranging from approximately 9.0 to 31.5 feet below the existing ground surface. In this report, we provide a summary of our field and laboratory testing efforts, as well as provide our engineering conclusions and recommendations regarding the geotechnical aspects of the proposed site development.

Based on the findings of our geotechnical engineering analysis efforts, it is our conclusion that the project site is generally suitable to support the proposed improvements; provided that our concerns and recommendations that we present in this report are addressed by the design and construction processes. We summarize our findings and recommendations as follows:

- Lot A14 (boreholes B9 to B13) is overlain by fill on the northwest corner of the lot with the deepest to the northwest thinning to native surface material to the southeast overlain by sand and gravel deposits to at least the depth of the exploration. During our exploration efforts the fill was encountered to a depth of 15 feet bgs, however may extend deeper in areas. The fill and remainder of Lot A14 is underlain by sand and gravel deposits to at least the depth of the exploration..
- Lot A22 (boreholes B1, B2, B4 to B8, B14, and B15) is overlain by sand and gravel deposits to at least the depth of the exploration. There is a thin layer of organic (approximately two inches in thickness) located on the surface of borehole B8.
- Lot A23 (borehole B3) is overlain by approximately three (3) feet of silt with organic, which is subsequently underlain by sand and gravel deposits to at least 21.5 feet bgs.
- Drilling indicated some cobbles (3 to 12 inches) and potentially some boulders (larger than 12 inches). This should be considered during the design process of the foundations.
- We expect groundwater to occur at approximately 15 to 20 feet bgs across the project site. We did not complete any infiltration tests.
- Based on the subsurface exploraitons completed at the project site, it is our professional opinion that each lot will have at least 10,000 square feet of contiguous usable building area and at least 10,000 square feet of contiguous usable septic area.
- A conventional shallow foundation shall be suitable to support the proposed building and canopy on any native sands and gravels with the proposal burial depth. Concrete foundations placed on either the undisturbed sand and gravel deposits or on structural fill pads (constructed directly above the undisturbed sand and gravel deposits) may be designed for an allowable soil bearing capacity of 3,000 pounds per square foot.

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- As we understand, shallow foundation is preferred, however we can provide pile recommendation as an alternative foundation for the canopy.
- The fill is not suitable for foundations; however, a floating pavement section is provided for parking and driveways in this area.
- Existing utilities appear to have been backfilled with native or similar material, however were not properly compacted. Any trenches located above the existing utilities should be excavated and replaced with structural fill that is properly placed in any areas supporting pavement or foundations.
- Any material removed during the initial site grading and excavation activities, which does not contain any organic/deleterious material, and has relatively low fine content (silt and clay) (less than 15 percent passing the #200 sieve), can be re-used on-site as structural fill. Proper placement and compaction techniques need to be applied during the backfill process.
- All earthworks should be completed with quality control inspection. A qualified geotechnical engineer, geologist, and/or special inspector be on-site during construction activities to provide corrective recommendations for any unexpected conditions revealed during construction.

This report should always be read and/or distributed in its entirety (including all figures, exploration logs, appendices, etc.) so that all of the pertinent information contained within is effectively disseminated. Otherwise, an incomplete or misinterpreted understanding of the site conditions and/or our engineering recommendations may occur. This executive summary is not a replacement of the full report and should be read in its entirety.

Due to the natural variability of earth materials, variations in the subsurface conditions across the project site may exist other than those we identified during the course of our geotechnical assessment. We conducted this evaluation following the standard of care expected of professionals undertaking similar work in the State of Alaska under similar conditions. No warranty, expressed or implied, is made.

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1.0 INTRODUCTION

In this report, we (Northern Geotechnical Engineering, Inc. *d.b.a.* Terra Firma Testing) present the results of our geotechnical engineering assessment that we conducted at 7699 & 7751 W. Parks Highway, Wasilla, Alaska; which we hereafter refer to as "the project site". We provided our professional service in accordance with our service fee proposal #20-190 and #21-207R1 which American Engineering Testing, Inc. (AET) (on behalf of Holiday Stationstores) authorized our proposed scope of services on September 18, 2020 by a signed subcontractor service agreement and via email on October 12, 2021 respectively.

AET contracted us to characterize the subsurface conditions across the project site, in an effort to assess the suitability of the subgrade to support the proposed site improvements which are to be constructed at the project site. In this report, we provide a summary of our field and laboratory testing efforts, as well as provide our engineering conclusions and recommendations regarding the geotechnical aspects of the proposed site development.

2.0 PROJECT OVERVIEW

As we detail in Figure 1 of this report, the project site consists of three lots in Wasilla, Alaska:

- Lot A14, Section 9, Range 2W, Township 17N (7699 West Parks Highway) (Lot A14)
- Lot A22, Section 9, Range 2W, Township 17N (7751 West Parks Highway) (Lot A22)
- Lot A23, Section 9, Range 2W, Township 17N (Loat A23)

The Lots A22 and A23 were previously developed with four single family residential dwellings along the highway frontage property line, which have since been removed. The other portions of Lots A22 and A23 have been previously used as recreation vehicle parking grounds, a laundry mat with the associated utilities and other single family residential dwelling on the western side of the project site.

The proposed improvements to the project site consist of a gas station (building, canopy, and trash enclosure) and the associated underground utilities and paved parking areas/driveways. We present the conceptual site layout in Figure 2 of this report

3.0 SITE CHARACTERIZATION ACTIVITIES

We have completed two at the project site in an effort to characterize the subsurface conditions of the project site as they currently exist. The first phase was focused on Lots A22 and A23 for the original proposed site plan. The current site plan also includes improvements to Lot A14, which was the main reason for the second phase of site characterization activities.

3.1 Subsurface Exploration

We conceived, coordinated, and directed two subsurface exploration program at the project site in an effort to characterize the subsurface conditions of the project site as they currently exist. We

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subcontracted Discovery Drilling, Inc. (DDI) to provide the necessary geotechnical exploration services. A qualified representative from our office was present on-site during the entire exploration program to select the exploration locations, direct the exploration activities, log the geology of each exploration, and collect representative samples for further identification and laboratory analysis. Under our direction DD advanced a total of 15 soil borings at the project site on October 1-2, 2020 and November 5, 2021 to depths ranging from approximately 9.0 to 31.5 feet below the existing ground surface (bgs) using conventional hollow-stem auger drilling and split-spoon sampling methods. The approximate exploration locations are shown on Figure 3 of this report.

Under our direction, DD performed a Modified Penetration Test (MPT) at regular intervals during the drilling of each borehole. A MPT can be used to assess the consistency of a soil interval and to collect representative soil samples. A MPT is performed by driving a 3.0-inch O.D. (2.4-inch I.D.) split-spoon sampler at least 18 inches past the bottom of the advancing augers with blows from a 340-lb drop-hammer, free-falling 30 inches onto an anvil attached to the top of the drill rod stem. Our field representative recorded the hammer blows required to drive the modified split-spoon sampler the entire length of each sample interval, or until sampler refusal was encountered. We have provided the field blow count data for each sample interval (in six-inch increments) on the graphical borehole logs contained in Appendix A of this report.

During the course of our subsurface exploration program, we encountered a physical phenomenon common to hollow-stem auger drilling known as "sand-heave" in boring B1, B2, and B5. Sand-heave typically occurs when sampling saturated sand deposits with hollow stem augers/split-spoon samplers, as the increased hydrostatic pressure outside of the hollow-stem augers forces a sand slurry up into the hollow auger flights when the drill stem is removed (to allow for split-spoon sampling). At times, sand-heave can be significant; filling the inside of the hollow-stem auger flights with several feet of densely-packed sand. As a result, sand-heaving forces disturb the in-situ density of the sand deposit at the tip of the advancing augers and can lead to the collection of unrepresentative blow count data (i.e., soil resistance measurements) and a disturbed split-spoon sample.

Sand-heave can typically be controlled by filling the inside of the augers with an appropriate drilling fluid (e.g., water, drill mud, etc.) which equalizes the hydrostatic pressures inside and outside of the augers. Smaller diameter drill rods and SPT samplers can further help to reduce the effect of sand heave by reducing the potential for sand particles to bind downhole tooling inside of the hollow-stem augers. We have noted on our borehole logs when it was necessary to control sand-heave, along with the methods that DD used to control the sand heave.

We corrected the field blow count data for all 15 boreholes for standard confining pressure, drill rod length, and drop-hammer operation procedure to estimate a standard $(N_1)_{60}$ value for each sample interval. $(N_1)_{60}$ values are a measure of the relative density (compactness) and consistency (stiffness) of cohesionless or cohesive soils, respectively. Our estimate of the $(N_1)_{60}$ values is based

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on the drop-hammer blows required to drive the spilt-spoon sampler the final 12-inches of an 18-inch MPT. We have provided our estimated $(N_1)_{60}$ values for each sample interval on the graphical borehole logs contained in Appendix A of this report. The automatic drop-hammer that DD used for this project is not standard, so we applied a correction factor of 1.1 to the $(N_1)_{60}$ values to account for the efficiency of the automatic drop-hammer used. We have provided a graphical plot of the field blow count corrections that we used to correct for confining pressure and drill rod length in Figure 4 of this report.

We did not report the $(N1)_{60}$ values on the borehole logs where sand-heave occurred, as the $(N1)_{60}$ values obtained for those sample intervals are not representative of the in-situ material.

Our field representative sealed each sample that they collected during our subsurface exploration program inside of an air-tight bag and/or container, to help preserve the moisture content of each sample, and then submitted each sample to our laboratory for further identification and analysis.

We directed DD to install three-inch diameter, open-ended PVC pipe from the ground surface down to the bottom of borehole IT1 (adjacent to borehole B8) in order to provide conduits (i.e., test wells) for future infiltration testing. DD then placed approximately two inches of washed, 3/8-inch gravel (a.k.a. pea gravel) at the bottom of each test well to protect the bottom from water scour during infiltration testing. We then directed the DD to backfill the annulus of the test well borehole with drill cuttings up to a depth of approximately three feet bgs. DD then backfilled the monitoring well annulus with bentonite chips to approximatly one foot bgs and subsequently hydrated the bentonite chips with clean water to form a seal against surface water infiltration. The remaining portion of the monitoring well annulus was backfilled with cutting to the ground surface.

We directed DD to install one-inch diameter, open-ended PVC pipe from the ground surface down to the bottom of boreholes B1, B3, B5, B7, and B8 in order to provide a conduit (i.e., monitoring wells) for future groundwater level monitoring. As per our instruction, DD hand-slotted the bottom 10 to 15 feet of the monitoring well casing prior to installation and then backfilled the annulus of each monitoring well borehole with drill cuttings up to a depth of approximately three feet bgs. DD then backfilled the monitoring well annulus with bentonite chips to approximatly one foot bgs and subsequently hydrated the bentonite chips with clean water to form a seal against surface water infiltration. The remaining portion of the monitoring well annulus was backfilled with cutting to the ground surface. Construction diagrams for each groundwater monitoring well are presented on the graphical borehole logs contained in Appendix A of this report.

3.2 Groundwater Level Monitoring

We conducted groundwater level monitoring efforts at the project site on October 6, 2020 to check for the presence of groundwater. We used an electronic water level meter (with 0.01-foot increments) to measure the relative depth of the groundwater surface (below the existing ground surface) at each monitoring well location. We have included the groundwater level measurements

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that we collected at the project site on the graphical borehole logs contained in Appendix A of this report.

4.0 LABORATORY TESTING

We collected a total of 97 soil samples from the 15 boreholes that DD advanced at the project site and submitted all of the soil samples to our laboratory for further identification and geotechnical analysis. We tested select soil samples in accordance with the respective ASTM standard test methods including:

- moisture content analysis (ASTM D-2216);
- determination of fines content (a.k.a. P200 – ASTM D-1140);
- grain size sieve and hydrometer analysis (ASTM D-6913 & D-7928); and
- organic content (ASTM D2974).

It is important to note that ASTM test method D-6913 requires that any soil sample specimen which is to be submitted for gradational analysis (by ASTM D-7928 or other methods) must satisfy a minimum mass requirement based on the maximum particle size of the sample specimen. Split-spoon sampling techniques (standard or modified), as well as other small-diameter soil sampling techniques (e.g., macro-core, etc.), typically recover anywhere from approximately 1 to 10 pounds of sample specimen. The amount of sample specimen recovered can be influenced by (amongst other variables) the soil gradation, soil density, sample interval, sampler tooling, and soil moisture content. As a result, samples of coarse-grained soils (with individual soil particles greater than approximately 0.75 inches in diameter) collected with small-diameter sampling methods (e.g., split-spoons, macro-core, etc.) may not meet the minimum mass requirement specified by Table 2 of ASTM D-6913. This may result in gradational and frost classification results which are not representative of the actual (i.e., in-situ) soil gradation and/or frost classification. The use of small-diameter sampling devices in coarse-grained soils (e.g., sand and gravel) can result in the collection of unrepresentative samples due to: the exclusion of oversized particles (larger than the opening of the sampler) from the sample; and the mechanical breakdown/degradation of coarse-grained particles by the sampling process (producing an unrepresentative increase in smaller-diameter particles in the sample). Both of these sampling biases can skew laboratory test results towards the fine-grained end of the gradational spectrum.

The laboratory test results, along with the observations we made during our subsurface exploration efforts, aid in our evaluation of the subsurface conditions at the project site and help us to assess the suitability of the subsurface materials located at the project site to support the proposed improvements. We have included the results of our geotechnical laboratory analyses on the graphical exploration logs contained in A of this report and on the laboratory data sheets contained in Appendix B of this report.

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5.0 DESCRIPTION OF SUBSURFACE CONDITIONS

We compiled our field observations with the results from our laboratory analyses to produce graphical logs of each subsurface exploration (Appendix A). The graphical exploration logs depict the subsurface conditions that we identified at each exploration location and help us to interpret/extrapolate the subsurface conditions for areas adjacent to, and immediately surrounding, each exploration location across the project site.

5.1 General Subsurface Profile

Lot A14, characterized by boreholes B9 – B13. The northeast corner of the Lot A14 as is overlain by very loose to loose fill ranging from silty sand to silty gravel. The fill is underlain by a small layer of native organics that was not removed entirely prior to the placement of the fill. The fill extended as deep as 15 feet bgs in our exploration however may be deeper in areas depending on the native elevation. Moving southeast on the project site the fill thins to native gravel with sand to the surface for the remainder of the cleared area of Lot A14. The native gravel material consists of gravel with sand to the depth of our explorations.

Lot A22, characterized by boreholes B1, B2, B4 to B8, B14, & B15, is overlain by medium dense to dense sand and gravel deposits to at least 31.5 feet bgs. There is a thin layer of organics (approximately two inches in thickness) located on the surface of borehole B8. At borehole B15, loose sand and gravel were encountered to approximatly 15 feet bgs.

Lot A23, characterized by borehole B3, is overlain by approximately three (3) feet of soft silt with organics, which is subsequently underlain by medium dense sand and gravel deposits to at least 21.5 feet bgs.

Drilling indicated some cobbles and potentially some boulders in all of the borings. On Figure 3 of the report, we prevent the estimated boundary of the fill on Lot A14.

The near surface sand and gravel deposits classify as possibly to slightly frost susceptible (PFS to S1) on the USACOE Unified Soil Classification System (USCS) Frost Classification Scale. The near surface fill classifies as moderate to highly frost susceptible (F3 to F4) on the USCS Frost Classification Scale.

5.2 Groundwater

We observed indication of groundwater at approximately 15 to 20 feet bgs at the project site during our field exploration effort. We recorded groundwater at approximately 18 to 20 feet bgs at the groundwater monitoring wells on October 6, 2020. We expect groundwater to occur at similar elevation across the project site.

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5.3 Frozen Soils

We did observe some seasonally frozen soils at the ground surface during our second phase of subsurface exploration activities and we do not expect permafrost conditions to occur anywhere across the project site.

6.0 ENGINEERING CONCLUSIONS

6.1 General Site Conclusions

Based on the findings of our field and laboratory testing efforts, it is our conclusion that the existing undisturbed native sand and gravel deposits which we observed across the project site are generally suitable to support the proposed improvements; provided that our concerns and recommendations that we present in this report are addressed by the design and construction processes.

6.2 Earthworks

Any existing organic and/or fill materials which are located within the footprint of any foundations and/or gravity-fed utilities will need to be completely removed and be replaced with properly placed structural fill to achieve the planned footing/utility grade. Native material has been used as backfill material over existing utilities therefore above any existing utilities may appear as native but was not properly backfilled, therefore will need to be removed and replaced with proper compaction techniques withing the footprint of any foundations.

Any of the existing coarse-grained materials which are excavated from the project site can be re-used as structural fill onsite as long as they are free of any organic materials, have relatively low silt content (less than approximately 15 percent passing the #200 sieve), and are placed using proper placement and compaction techniques. We discuss our earthworks recommendations in more detail in Sections 7.1 and 8.1 of this report. The native soils exposed at the bottom of the footing excavation should be compacted to a minimum of 95 percent of the modified Proctor density prior to backfill and/or foundation construction.

Based on the subsurface exploraitons completed at the project site, it is our professional opinion that each lot will have at least 10,000 square feet of contiguous usable building area and at least 10,000 square feet of contiguous usable septic area.

6.3 Foundations

A conventional shallow foundation is suitable to support the proposed improvement assuming that the subsurface conditions encountered are similar across the project site and that our recommendations are followed. Primarily, foundation configurations and minimum burial depths will be a function of the frost susceptibility of the subgrade soils and whether or not the foundation subgrade will be allowed to freeze during winter months.

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We provide detailed recommendations regarding the design and construction of any shallow foundation on the gravel deposits at the project site in Sections 7.2 and 8.2 of this report.

6.4 Underground Utilities

In general, the soils in which deep, gravity-fed utility trenches (6 to 10 feet bgs) are to be constructed in, are composed of relatively dense native sand and gravel deposits. Buried utilities can be founded directly onto the undisturbed, native sand and gravel deposits and/or structural fill, assuming proper placement and compaction techniques are employed. We provide more detailed recommendations for underground utility design and construction in Sections 7.3 and 8.4 of this report.

6.5 Pavement

We encountered loose/soft silt rich fill on the northwest corner of Lot A14. The shallow fill material classifies as moderately to highly frost susceptible (F3 - F4) on the USCS frost classification scale. As such, we recommend utilizing a floating pavement section to distribute the vehicle loads in areas that have fill. The remainder of the project site consist of possibly frost susceptible (PFS) on the USCS frost classification scale. We provide more detailed recommendations for pavement section design in Section 7.5 of this report.

6.6 Settlements

Settlements for shallow foundations should be within tolerable limits, provided that they are placed directly on a reinforced gravel structural pad placed directly onto the undisturbed native silt. We anticipate a total settlement for shallow concrete foundations placed on a reinforced gravel structural pad placed directly onto the undisturbed native silt (as we discuss in Section 7.1 and 7.2 of this report) to be less than three-quarters (3/4) of an inch, with differential settlements comprising about one-half (1/2) of the total anticipated settlement. Settlement amounts could increase substantially if the structural fill material used to bring any foundation pads to grade is not properly compacted. Most of the settlements should occur as the building loads are applied, such that additional long-term settlements should be relatively small and within tolerable limits. Settlements for deep foundations (as we discuss in Section 7.3 of this report) should be negligible.

Settlements under driveways, parking areas, and street sections are expected to be vary more than under any buildings, especially where utility trenches are located. Proper earthwork is necessary to help reduce the settlement potential. The settlement potential can be reduced by performing all utility excavation and backfill efforts as early in the construction schedule as possible and placing any pavement as last in the construction schedule as possible.

6.7 Seismic Design Parameters

The International Building Code (IBC) 2018 is slowly being adopted by various state and local governmental regulatory agencies throughout Alaska. However, the on-line seismic site design

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query tool that we use to estimate seismic site design parameters has not been updated from IBC 2015 to IBC 2018. Additionally, IBC 2018 does not explicitly state that any changes have been made to the 2015 IBC seismic design code for locations with site specific geotechnical information. As such, we feel comfortable using the seismic site design parameters using IBC 2015.

We have assumed that the seismic risk category for the proposed structure will be Category II. The seismic site classification for the project site is E based on the consistency and density of the soils encountered. The IBC 2015 seismic design parameters are F_a = 1.0 (S_s = 2.072 g) and F_v = 1.5 (S_1 = 1.016 g). A copy of the SEAOC Design Maps report for the project site is contained in Appendix C of this report.

Given the encountered material being medium to dense gravel, we expect there to be no to little potential for soil liquefaction, earthquake-induced lateral spreading, and/or the development of seismically-induced pressure ridges at the project site.

7.0 DESIGN RECOMMENDATIONS

We have presented our design recommendations in the general order that the project site will most likely be developed. Our design recommendations can be used in parts (as needed) for the final design configuration.

7.1 Earthworks

Our recommendations assume that any shallow foundations (i.e., poured-concrete footings) will be founded either directly onto the undisturbed native sand and gravel deposits or compacted structural fill pads constructed directly above the undisturbed native sand and gravel deposits. Any structural fill materials used on-site should be compacted to a minimum of 95 percent of the modified Proctor density.

Any slopes built/constructed at the project site should not exceed a 2:1 slope. If fill is placed onto an existing slope, the fill needs to be properly keyed into the native slope. We can provide more detailed recommendations for keying into the slope upon request. All fill material should be compacted to a minimum of 95% of the modified Proctor density as determined by ASTM D-1557. Additionally, erosion control should be placed on all slopes.

Any material removed during the initial site grading and excavation activities, which does not contain any organic/deleterious material, and has relatively low silt content (less than 15 percent passing the #200 sieve), can be re-used on-site as structural fill. Proper placement and compaction techniques need to be applied during the backfill process (see Section 8.1 of this report for more details). Additional laboratory testing may be required to verify the frost susceptibility of any excavated soil for use in shallow fill applications.

All earthworks should be completed with quality control inspection, including: bottom-of-hole inspections; fill gradation classification; and in-situ compacting testing. A bottom-of-hole

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inspection should be conducted by a qualified geotechnical engineer, geologist, or special inspector following site excavation activities (and before any foundation construction begins) in order to visually confirm the findings of this report and provide recommendations for any non-conforming conditions encountered during the excavation activities.

7.2 Shallow Foundations

For the purposes of this report, we consider a shallow foundation to be any foundation which is shallower than ten (10) feet bgs. We have separated our recommendations for warm (i.e., heated) and cold (i.e., unheated) shallow foundations into Sections 7.2.1 and 7.2.2 of this report.

7.2.1 Warm Shallow Foundations

For the purposes of this report, we consider a warm foundation to be any foundation located within an enclosed, climate-controlled space that maintains an internal ambient air temperature above 40°F.

7.2.1.1 Soil Bearing Capacity

Concrete foundations placed on either the undisturbed native sand and gravel or on structural fill pads (constructed directly above the undisturbed native sand and gravel) may be designed for an allowable soil bearing capacity of 3,000 pounds per square foot (psf) at the burial depths of a perimeter footing as described in Section 7.2.1.3. The soil bearing capacity may be increased by one-third (1/3) to accommodate short-term wind and/or seismic loads.

7.2.1.2 Continuous Strip Footings and Spread Footings

Continuous strip footings and/or spread footings can be founded directly onto either: 1) the undisturbed native sand and gravel, or 2) properly placed structural fill (located directly above the undisturbed native sand and gravel). There is no minimum requirement for structural fill thickness for this project. The minimum horizontal dimension for continuous strip footings should be 16 inches. The minimum horizontal dimension for individual spread footings should be 24 inches.

7.2.1.3 Footing Burial Depths

Shallow foundation footings need to be buried sufficiently deep and/or be adequately insulated so as to reduce the potential for freezing of the foundation subgrade and any associated frost heaving forces. Any interior footings need to be buried sufficiently deep to achieve the recommended allowable soil bearing capacity and help resist any lateral forces. For the project site, the minimum burial depth for any uninsulated shallow foundation footings should be as follows (measured from the bottom of the foundation footing):

1. 12 inches (D_I in Figure 5) for interior footings located entirely within an enclosed, continuously heated space* (measured from the bottom of the footing to the surface of the interior finished grade or bottom of the floor slab) and

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2. 42 inches (D_2 in Figure 5) for foundation footings located along the perimeter of an enclosed, continuously heated space* (measured from the bottom of the footing to the exterior finished grade).

**The temperature of an enclosed, continuously heated space must be maintained above 40 °F and allow for adequate heat transfer to foundation soils in order for our recommendations to apply.*

Artificial insulation can be used to decrease minimum burial depths for warm by helping to reduce the potential for freezing of foundation soils, as well as help increase heating efficiency for a given structure. In terms of insulating properties, one inch of rigid board insulation can be considered equivalent to one foot of NFS fill. We have provided our recommended insulation configurations for both shallow strip/spread footings and thickened edge slab foundations in Figure 6 of this report. For this project site, we recommend using insulation configurations A or B (Figure 6) for warm shallow foundations. Insulation may be placed beneath of interior floors/slabs. However, no insulation should be placed directly underneath of any perimeter footings, as this can promote freezing of the foundation soils by preventing adequate heat transfer from the interior of the structure to the foundation soils. Alternatively, insulation should be placed along the exterior of the footing/stem wall to prevent freezing (and associated frost heaving) of the foundation soils along the perimeter of the foundation. We have provided our recommended insulation configurations for insulated floors/slabs in Figure 6 of this report (configurations C and D).

As foundation burial depth may be reduced by adequately insulating the foundation, the allowable bearing capacity may be reduced, as such we should be consulted for the allowable bearing capacities for depths other than described in Section 7.4.2 of this report.

Other shallow foundation insulation configurations do exist, and we should be consulted if alternative foundation insulation configurations are to be utilized for this project so that we can evaluate their suitability as it pertains to the existing site conditions and proposed foundation.

7.2.1.4 Thickened Edge Slab Foundations and Floor Slabs

Thickened edge slab foundations and/or floor slabs can also be founded directly onto the undisturbed native sand and gravel or properly placed structural fill located directly above the undisturbed native sand and gravel with adequate amount of insulation and/or NFS structural fill to provide frost protection. The required amount of insulation and/or NFS fill is described in detail in Section 7.2.4 of this report. Thickened slab edges (i.e., perimeter slab footings) should extend a minimum of 16 inches below the finished exterior grade to achieve the recommended allowable soil bearing capacity and help resist any lateral forces. As we mention in Section 7.1 of this report, the upper structural fill material (at or above the footing grade) used to construct the structural pad for a heated building should be relatively free draining (sands and gravels) with less than 15% of the fill material passing through a #200 sieve. Furthermore, the top four to six inches of the structural pad located beneath the slabs should be free draining, with less than 3% passing the #200 sieve. This "blanket" will serve as a capillary break to help maintain a dry slab.

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Concrete slabs constructed directly on the undisturbed sand and gravel deposits or on properly constructed granular fill pads (located directly above the undisturbed sand and gravel deposits), as we described above, may be designed using a modulus of subgrade reaction of k_1=150 pci (k_1 is the value for a 1-ft × 1-ft rigid plate). For this project, the following equations can be used (with standard English units) to calculate the appropriate modulus of subgrade reaction for load footprints bearing onto the undisturbed sand and gravel deposits or on properly placed granular structural fill located directly above the undisturbed sand and gravel deposits:

$$k_{(B\,x\,B)} = k_1\left(\frac{B+1}{2B}\right)^2 \quad (1)$$

Where:

B = the load footprint width of a square load in feet
k_1 = the modulus of subgrade reaction for a 1-ft × 1-ft rigid plate in pci
$k_{(B\,x\,B)}$ = the modulus of subgrade reaction for a square load footprint of width B in pci

The following equation (2) can be used for a rectangular load having the dimensions $B \times L$ (in feet) with similar bearing soils as the square footprint loading equation above (1).

$$k_{(B\,x\,L)} = \frac{k_{(B\,x\,B)}\left(1+0.5\frac{B}{L}\right)}{1.5} \quad (2)$$

Where:

$k_{(B\,x\,B)}$ = the modulus of subgrade reaction for a $B \times B$ square load footprint
$k_{(B\,x\,L)}$ = the modulus of subgrade reaction for $B \times L$ rectangular load footprint
B = the least horizontal dimension of a rectangular load footprint
L = the larger horizontal dimension of a rectangular load footprint

7.2.2 Cold Shallow Foundations

For the purposes of this report, we consider a cold foundation to be any foundation whose subgrade is subjected to freezing temperatures for any amount of time.

It is difficult to predict the depth of frost penetration and extent of ice lens formation at any given site. Therefore, we do not recommend the construction of cold shallow foundations as the formation of ice lenses in the foundation subgrade can result in deformation to the overlying foundation. If cold shallow foundations cannot be avoided, we have provided our recommendations in the following Subsections of this report.

Deep foundation systems such as driven piling, helical piers, under-reamed concrete piers, or other deep foundation systems can serve as an alternative means of cold foundation support, as they can provide the uplift resistance needed to counteract any frost heaving/jacking forces (assuming proper embedment depths, footing sizes, etc. are achieved). Cost and constructability will typically

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be the driving force behind which type of cold foundation is ultimately selected for a given project. We can provide specific deep cold foundation recommendations once a foundation system has been selected and loading criteria established.

7.2.2.1 Soil Bearing Capacity

The bearing capacity of shallow cold foundations will be a function of both the configuration (i.e., dimensions) and burial depth of the foundation. We can provide allowable bearing capacities for various footing burial depths once a foundation configuration has been determined. The warm shallow foundation bearing capacity may be used for a cold shallow foundation; however, it is expected that a cold shallow foundation will be buried deeper which could increase the soil bearing capacity.

7.2.2.2 Footing Burial Depths

If the subgrade soils of shallow foundations are allowed to freeze (for any amount of time), then soil ice can form in the subgrade and result in a phenomena known as "frost heaving". Frost heaving forces can generate significant footing uplift loads which can damage shallow foundations. As such, footings need to be buried sufficiently deep and/or be adequately insulated so as to reduce the potential for freezing of the foundation subgrade and any associated frost heaving forces.

For the project site, the minimum burial depth for any uninsulated cold foundation footings should be 60 inches (D_3 in Figure 5), measured from the bottom of the footing to the lowest elevation of either the interior or exterior finished grade – including any floor slabs).

The minimum footing burial depth for any cold foundation may be reduced, if the foundation is placed onto a granular structural pad constructed of NFS fill material. NFS material should have less than 3% of the material finer than 0.02 mm in diameter. The minimum foundation burial for a cold foundation bearing onto a structural NFS fill pad should be the same as our minimum recommended burial depth for a warm foundation (D_2 in Figure 5), however, the NFS fill subgrade must extend a minimum of 60 inches below the planned finished grade (interior or exterior - whichever is lower) in order to adequately protect the foundation from forts heaving forces.

Insulation may be incorporated into the cold foundation design to help protect the foundation soils from freezing. Insulation may be used in lieu of some of the NFS backfill. In terms of insulating properties, one inch of rigid board insulation can be considered equivalent to one foot of NFS fill. A minimum of 18 inches of NFS fill must be present between the bottom of any footing and the top of any insulation to help protect the insulation from damage. We have detailed our recommended insulation configurations for cold shallow foundations in Figure 6 of this report (configurations E and F). We do not recommend the construction of a cold (unheated) thickened edge slab foundation unless it is supported by an appropriately constructed NFS/insulated structural pad (as we discuss above).

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Other shallow foundation insulation configurations do exist, and we should be consulted if alternative foundation insulation configurations are to be utilized for this project so that we can evaluate their suitability as it pertains to the existing site conditions and proposed foundation.

7.2.2.3 Grade-level Design Elements

Any cold foundation design elements which are to exist at (or very close to) grade level (e.g., grade beams, connecting structural members, exterior siding, etc.) should be designed to accommodate a minimum of six (6) inches of vertical ground movement due to potential frost heave. If planned grade-level design elements cannot withstand any vertical movements, then they should not be used with a cold foundation, as frost heaving forces can damage these elements and/or result in failures at foundation connections. We recommend that a minimum air gap of six (6) inches be maintained between the ground surface and any structural members that span between cold isolated foundations. We should be consulted in the event that the design cannot accommodate our recommended air gap so that we can evaluate the frost heaving pressures that may develop, so that they can be accounted for by the structural design.

7.2.3 Footing Uplift

Foundations should be buried sufficiently deep so as to resist any anticipated uplift/overturning forces (e.g. wind, seismic, frost jacking, etc.). The uplift capacity of a foundation is a function of its weight, configuration, and depth. The ultimate uplift capacity can be calculated by using 80 percent of the weight of the foundation plus 80 percent of the weight of the effective soil mass located above the footing. In Figure 7 of this report, we illustrate the impact that effective soil mass has on the uplift capacity of a shallow foundation footing. An effective unit weight of 130 pcf can be used for granular structural backfill material. The ultimate uplift load includes any short-term load factors, so no increase in uplift capacity should be added for short-term loading. Shallow foundation footings should extend laterally a minimum of one-eighth (1/8) of the footing width beyond any foundation walls to help resist any anticipated uplift/overturning forces (Figure 7).

We can calculate the uplift capacity for other foundation configurations upon request and once we have been provided with a general foundation design.

7.2.4 Foundation Insulation

Any subsurface insulation should consist of extruded polystyrene such as DOW Styrofoam™ Highload or UC Industries Foamular. Any subsurface insulation used under structural slabs should be closed cell, board stock with a minimum compressive strength of 60 psi at five percent deflection. Subsurface insulation around foundations should have a minimum compressive strength of 25 psi at five percent deflection. The insulation should not absorb more than two percent water per ASTM Test Method C-272. The thermal conductivity (k) of the insulation should not exceed 0.25 BTU-in/hr-ft^2-°F when tested at 75°F. Proper bedding material should be used to provide a flat, smooth surface for the insulation.

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7.2.5 Lateral Loads for Foundation and Retaining Walls

Retaining walls (such as perimeter foundation stem walls for buildings with basements or crawl spaces) must be designed to resist lateral earth pressures. The magnitude of the pressure exerted on a retaining wall is dependent upon several factors, including:

1) whether the top of the wall is allowed to deflect after placement of backfill;
2) the type of backfill used;
3) compaction effort; and
4) wall drainage provisions.

Any foundation stem walls that are not designed to carry lateral loads should be backfilled on both sides simultaneously to prevent differential lateral loading of the foundation stem wall. We developed the unit weights provided in Table 1 of this report assuming that structural fill (containing less than ten percent fines) is used as backfill, and that the fill is compacted to at least 90 percent of the modified Proctor density.

An active-earth pressure condition will prevail (under static loading) if a retaining wall is allowed to deflect or rotate a minimum of 0.001 times by the wall height. An at-rest pressure condition will prevail if a retaining wall is restrained at the top and cannot move at least 0.002 times the wall height. Lateral forces exerted by wind or seismic activity may be resisted by passive-earth pressures against the sides of the foundation footings, exterior walls (below grade), and grade beams. Therefore, interior footings should extend a minimum of 12 inches below the finished floor grade (assuming a continuously heated building is maintained during winter months) to help resist any lateral forces.

In order to prevent water accumulation against the outside of any foundation or retaining wall, the wall must have a perimeter drainage system connected to an outlet that will not freeze closed at any time of the year. The top of the drainage piping must be located below the top of the footing for the foundation and/or retaining wall. Backfill used against the wall (and extending a minimum of one foot beyond the wall) must be free-draining with less than three percent fines. The top one-foot of backfill against the outside of a foundation and/or retaining wall should consist of relatively impermeable (fine-grained) material and be tightly compacted such that surface water is directed away from the foundation and/or retaining wall. A permeable geotextile fabric may be useful to prevent mixing of the impermeable (fine-grained) overburden and underlying free-draining (coarse-grained) backfill. Furthermore, the finished surface should slope away from any foundation and/or retaining wall with a grade between 1 to 2 percent, such that surface water is directed away from the foundation and/or retaining wall.

Seismic loading on foundation and/or retaining walls generally increases the lateral pressures on the wall and decreases the passive resistance. For foundation systems where the building foundation is continuous, the differential lateral movement between the soil and foundation is very

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small, and as such, essentially no excess lateral loading on the foundation wall is experienced. Foundation walls with a differential in backfill heights of over six feet (basements, crawl spaces, etc.) will experience seismic lateral loading from the inertial effects of seismic waves passing through the foundation.

The lateral soil pressures can be represented by equivalent fluid pressures. The pressure distribution is a function of wall restraint, seismic loading, and drainage conditions. In Figure 8 of this report, we provide distribution diagrams for various loading conditions. In Table 1 of this report, we provide the unit weights to be used with the pressure distribution diagrams included in Figure 8 of this report.

Table 1: Equivalent Fluid Specific Weight for Lateral Loading Design

LOADING CONDITION	DRAINED EQUIVALENT FLUID SPECIFIC WEIGHT		UN-DRAINED EQUIVALENT FLUID SPECIFIC WEIGHT	
	SPECIFIC WEIGHT (pcf)	**SYMBOL**	**SPECIFIC WEIGHT (pcf)**	**SYMBOL**
ACTIVE	35	t_1	24	t_2
AT-REST	59	t_3	37	t_4
PASSIVE	400	t_5	250	t_6
SEISMIC	16 **(UNRESTRAINED)**	t_7	9 **(RESTRAINED)**	t_8

Lateral forces may also be resisted by friction between the concrete foundations and the underlying soil. The frictional resistance may be calculated using a coefficient of friction of 0.4 between the concrete and soil.

7.3 Underground Utilities

In general, the soils in which deep utility trenches (6-10 feet bgs) are to be constructed are composed of native sand and gravel. Any gravity-fed utility trenches extending into the native sand and gravel should be a minimum of three feet wide at the bottom with the utility piping located in the center of the trenches. Structural fill should be used to bring the gravity-fed utilities to the proper installation grade. Utilities that are not sensitive to settlement may be placed in the existing fill material.

Underground utilities which are susceptible to damage from freezing need to be frost-protected by sufficient amounts of backfill, insulation, and/or active freeze protection systems (e.g., heat tape, thaw wire, etc.); or some combination of the above. Any utilities which are susceptible to damage from freezing that are planned to be constructed less than eight feet below the planned finished grade should contain some level of additional frost-protection (e.g., insulation, active freeze protection systems, or a combination of both).

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Any insulation used should conform to the specifications detailed in Section 7.2.4 of this report and should extend a minimum of two feet (and a maximum of four feet) perpendicular to either side of the proposed utility alignment. The thickness of the insulation used will be a function of the burial depth. In general one inch of insulation is equal to approximately 12 inches of compacted NFS backfill. Underground utilities which are susceptible to damage from freezing should not be constructed within four feet of the planned finished grade (regardless of insulation measures or active freeze-protection systems).

7.1 Underground Tanks

Groundwater was encountered between 15 and 20 feet bgs and is expected to fluctuate few feet throughout the year. It is recommended that if any tank installed deeper than 12 feet bgs be evaluated for buoyancy effects.

7.2 Pavement Sections

Construction of the pavement section for the proposed improvements will be guided (in part) by the amount of cut/fill needed to achieve the final street grade. The composition, structure, and thickness of the pavement section will be further controlled by the frost susceptibility of, and overall potential for ice lens development within, the subgrade soils. Based on our laboratory testing efforts, the native sand and gravel soils are slightly frost susceptible (S1) expect the near boreholes B3 and B8 on the USACOE USCS frost classification scale. In the areas surrounding B8, the S1 material is relatively shallow. The existing fill is highly frost susceptible (F3-F4) on the USACOE USCS frost classification scale. Any native backfill above utilities will need to be replaced with properly placed structural fill that is S1 frost classification or better. The native dense slight frost susceptible subgrade will only require leveling course layer as there is little to no potential for ice lens development in the subgrade soils at the project site. Due to the increased frost susceptibility of the loose fill subgrade, an appropriately engineered floating pavement section will be required to help reduce the potential for frost-related pavement damage. We have provided both a light duty (50,000 ESAL) and heavy duty (200,000 ESAL) pavement section with a design life of 20 years in Table 2 and 3 of this report or S1 subgrade and a floating pavement section, respectively. The pavement will require maintenance throughout the design life.

Table 2: Recommended Pavement Section for S1 subgrade

LIGHT DUTY SECTION THICKNESS	HEAVY DUTY SECTION THICKNESS	MATERIAL
2 INCHES	3 INCHES	ASPHALT PAVEMENT
2 INCHES	2 INCHES	NFS CRUSHED AGGREGATE BASE (A.K.A. "D-1")
N/A	N/A	GEOTEXTILE FABRIC (OPTIONAL)
N/A	N/A	S1 SUBGRADE (UNDISTRUBED NATIVE OR STRUCTURAL FILL)

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Table 3: Recommended Floating Pavement Section

LIGHT DUTY SECTION THICKNESS	HEAVY DUTY SECTION THICKNESS	MATERIAL
2 INCHES	3 INCHES	ASPHALT PAVEMENT
2 INCHES	2 INCHES	NFS CRUSHED AGGREGATE BASE (A.K.A. "D-1")
14 INCHES	18 INCHES	TYPE C-1
18 INCHES	24 INCHES	TYPE C
N/A	N/A	GEOTEXTILE FABRIC (REQUIRED)
N/A	N/A	F3 LOOSE FILL

The results of the confirmation frost classification testing can be used to ensure that the proper pavement section is used for the soil conditions exposed. If the conformation testing indicates that the frost classification of the subgrade soils is higher than USACOE USCS S1, then alternative pavement section designs, including thicker structural sections and/or the use of artificial insulation may be required.

A permeable geotextile fabric is required for the floating pavement design at this project site. For the project site, we recommend a Type A, Class 2 (i.e., separation) geotextile fabric. The geotextile fabric may be either: 1) woven, or 2) non-woven with perforations. We have provided the various strengths for both a woven and non-woven Type A, Class 2 geotextile fabric in Table 4 of this report.

Table 4: Type A, Class 2 Geotextile Fabric Strengths

FABRIC PROPERTY	ASTM STANDARD USED TO DETERMINE STRENGTH	WOVEN FABRIC STRENGTH	NON-WOVEN FABRIC STRENGTH
GRAB STRENGTH	D4632	250	160
SEWN SEAM STRENGTH	D4632	225	140
TEAR STRENGTH	D4533	90	56
PUNCTURE STRENGTH	D6241	495	310

Note: Units in lbs per foot.

The leveling course, Type C, and Type C-1 materials used should conform to the specifications we provide in Figure 9 of this report. Any leveling course used should be NFS in order to maintain a low potential for ice lens development within the leveling course. It is our experience that the "D-1" leveling course material currently available in Wasilla area may not be NFS following

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compaction, because the compaction with a vibratory compactor further increases the frost susceptibility of the leveling course by increasing the percentage of fine-grained material (due to degradation of the soil particles from the impact of the compaction equipment). As such, we recommend the use of two inches of recycled asphalt pavement (RAP) for the leveling course, as RAP has a low frost susceptibility. Otherwise, the leveling course thickness should be kept to two inches or less to reduce the potential for ice lens formation in the leveling course. All of these materials should be placed in thin lifts and each lift should be compacted to a minimum of 95 percent of the modified Proctor density.

7.3 Surface Drainage

After the property is brought to grade it should be relatively flat, such that storm water will tend to accumulate and flow off the site slowly. Water accumulation will have a detrimental effect on foundations, retaining structures, and pavement sections. Provisions should be included in the design to collect runoff and divert it away from any foundations, retaining structures, and pavement sections. The ground surface surrounding the proposed developments should be graded such that surface runoff is channeled away from foundations, retaining walls, and pavement sections. The soils on the surface should be tightly compacted to help reduce surface runoff infiltration. Roof, parking lot, and driveway drainage should be directed away from foundations. If storm sewer is available, tight-line connections from roof drain collectors should be made.

8.0 CONSTRUCTION RECOMMENDATIONS

We have presented our construction recommendations in the general order that the project site will most likely be developed. Our construction recommendations are intended to aid the construction contractor(s) during the construction process.

8.1 Earthwork

Any and all fill material used should be placed at 95 percent of the modified Proctor density as determined by ASTM D-1557, unless specifically stated otherwise in other sections of this report. The thickness of individual lifts will be determined based on the equipment used, the soil type, and existing soil moisture content. Typically, fill material will need to be placed in lifts of less than one-foot in thickness. All earthworks should be completed with quality control inspection.

In our professional experience, structural fill should have less than approximately 10 to 15 percent passing the #200 sieve for ease of placement. Soils with higher silt contents can be used within the foundation footprint. However, the effort required to achieve proper compaction of silt-rich soils may be more costly than purchasing better grade materials. The time of year, existing moisture content, rainfall, air temperature, and fill temperature can all have an impact on the effort required to adequately compact silt-rich material.

Any excavated fill or native sand and gravel soils (which are free of organic material and have relatively low silt contents) which are stockpiled on-site (for later use as structural backfill) should

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be protected from additional moisture inputs (precipitation, etc.) through the use of plastic tarps, etc. Additional moisture inputs can have detrimental effects on the effort needed to achieve proper compaction rates.

8.2 Warm Shallow Foundations

Care should be taken during foundation excavation activities to limit the disturbance of the bottom of any foundation excavations. The bottom of any foundation excavation should be moisture conditioned and proof-rolled as necessary to return the exposed soils to their original in-situ density.

In general, the soils in which the proposed foundation pads are to be constructed consist primarily of sands and gravels. As such, any surface water (*e.g.,* from precipitation, snowmelt, etc.) that enters into foundation excavations will tend to sand and gravels. Excess water will have a negative impact on any backfill and compaction efforts. Therefore, if surface water does accumulate in any open foundation excavations it can be controlled by excavating a shallow drainage trench around the perimeter of the excavation. The drainage trench will collect surface water and direct it to a sump area, which should be located outside of the foundation footprint. The excess water can then be pumped from the sump area and be discharged at an appropriate location away from the excavation and any other existing foundations.

It is imperative that shallow building foundations for heated structures remain in a thawed state for the entire construction period; even when dealing with soils that have little to no frost susceptibility. Foundation soils that are allowed to freeze during the initial construction (before the building is enclosed and heated) may be compromised by the development of ice lenses. Upon thawing, which may take several weeks or months, potential differential settlements could distort the structure resulting in damaged foundations, cracked sheetrock, skewed door frames, and broken windows. If construction extends into the winter months, temporary enclosures should be constructed which completely enclose warm foundations and heat should be applied to the enclosure to prevent freezing of the soils located beneath any warm foundation and/or floor slab.

8.3 Cold Shallow Foundations

The frost susceptibility of the sand and gravel (as we describe in Section 5.1 of this report) in area of the proposed foundation range from PSF to S1. Therefore, the frost susceptible material is unsuitable to support any cold (unheated) shallow foundations without freeze protection, as they may experience ice lens development and/or thaw-weakening, which could result in damages to the proposed foundations. As we mention in Section 7.2.2.2 of this report, the minimum cold foundation burial depth (D_3) can be reduced, if the foundation is placed on a structural pad constructed of NFS fill. The NFS structural pad thickness may be reduced by using insulation at a rate of one inch of insulation to one foot of NFS material.

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8.4 Underground Utilities

We expect that utility trench wall stability in the sands and gravels will be moderate, especially where utility trenches are above the groundwater table. The contractor should be responsible for trench safety and regulation compliance. If groundwater is encountered during utility trench excavation, then dewatering efforts may be required to facilitate proper utility installation and trench backfill.

All piping should be bedded per the manufacturer's recommendations, with the bedding material compacted to provide pipe support. Above the bedding materials, the backfill should be similar to, and compacted to the approximate density of, the surrounding soils.

8.5 Pavement

All of the earthwork within any areas to be paved should be completed as early in the construction schedule as possible, and the pavement placed as late in the construction schedule as possible. This will give the subgrade soils time to settle, compress, and stabilize prior to placement of the pavement. Any structural fill used should be placed in thin lifts (less than one foot in thickness) and each lift should be compacted to a minimum of 95 percent of the modified Proctor density. Prior to paving, any surface fill material should be re-leveled and re-compacted. All backfill and paving materials should be inspected and tested for material specification compliance and compaction.

Underground utility piping should be installed prior to construction of any pavement sections such that trenching is done through the subgrade soils only. This will help ensure that a uniform pavement section is maintained, which will reduce the potential for differential settlements along underground utility trench alignments.

The minimum thickness for any asphalt concrete (AC) pavement surfaces is two inches. The minimum thickness of any Portland cement concrete (PCC) pavement surfaces will be a function of the reinforcement required. All applicable ACI and IBC standards should be followed.

8.6 Insulation

The satisfactory performance of any subsurface insulation is in part controlled by the details of construction including: 1) the care taken to ensure that the board stock lies flat on a smooth, level surface; and 2) the adjoining ends of the insulation are closely butted together. Any vertical joints should be staggered where more than one layer of insulation is used.

8.7 Winter Construction

Proper placement and compaction of structural fill is not possible when fill material is frozen, and as such, frozen fill material should never be used for structural support unless it has been subsequently thawed and compacted to 95 percent of the modified Proctor density (throughout its

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vertical extent). Furthermore, subgrade soils (fill or native) need to be completely thawed prior to the placement and compaction of additional lifts of thawed fill material. In our professional experience, ambient soil temperatures need to be above 37 °F in order to achieve efficient compaction. It is extremely difficult to achieve compaction levels equal to 95 percent of the modified Proctor density in fill material that is between 32 °F to 37 °F.

9.0 THE OBSERVATIONAL METHOD

A comprehensive geoprofessional service (e.g., geotechnical, geological, civil, and/or environmental engineering, etc.) should consist of an interdependent, two-part process comprised of:

Part I - pre-construction site assessment, engineering, and design; and

Part II - continuous construction oversight and design support.

This process, commonly referred to in the geoprofessional industry as "The Observational Method", was developed to reduce the costs required to complete a construction project, while simultaneously reducing the overall risk associated with the design and construction of the project.

In geotechnical engineering, Part I of the Observational Method (OM) begins with a geotechnical assessment of the site, which typically consists of some combination of literature research, site reconnaissance, subsurface exploration, laboratory testing, and geotechnical engineering. These efforts are usually documented in a formal report (e.g., such as this report) that summarizes the findings of the geotechnical assessment, and presents provisional geotechnical engineering recommendations for design and construction. Geotechnical assessment reports (and the findings and recommendations contained within) are considered provisional due to the fact that their contents are typically based primarily on limited subsurface information for a site. Most conventional geotechnical exploration programs only physically characterize a very small percentage of a given site, as it is typically cost prohibitive to conduct extensive (i.e. high density/frequency) exploration programs. As an alternative, geoprofessionals use the subsurface information available for a site to extrapolate subsurface conditions between exploration locations and develop appropriate provisional recommendations based on the inferred site conditions. As a result, the geoprofessional of record cannot be certain that the provisional recommendations will be wholly applicable to the site, as subsurface conditions other than those identified during the geotechnical assessment may exist at the site which could present obstacles and/or increased risk to the proposed design and construction.

Part II of the OM is employed by geoprofessionals to help reduce the risk associated with unidentified and/or unexpected subsurface conditions. Geoprofessionals accomplish Part II of the OM by providing construction oversight (e.g., construction observation, inspection, and testing). Part II of the OM is a valuable service, as the geoprofessional of record is available if unexpected conditions are encountered during the construction process (e.g., during excavation, fill placement,

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etc.) to make timely assessments of the unexpected conditions and modify their design and construction recommendations accordingly; thus reducing considerable cost resulting from potential construction delays and reducing the risk of future problems resulting from inappropriate design and construction practices.

Oftentimes, a client may be persuaded to use an alternative geoprofessional firm to conduct Part II of the OM for a given project; as some geoprofessional firms offer the same services at discounted prices in order to help them obtain the overall construction materials engineering and testing (CoMET) commission. The geoprofessional industry as a whole recommends against this practice. An alternative geoprofessional firm cannot provide the same level of service as the geoprofessional of record. The geoprofessional of record has (amongst other things) a unique familiarity with the project including; an intimate understanding of the subsurface conditions, the proposed design, and the client's unique concerns and needs, as well as other factors that could impact the successful completion of a construction project. An alternative geoprofessional firm is not aware of the inferences made and the judgment applied by the geoprofessional of record in developing the provisional recommendations, and may overlook opportunities to provide extra value during Part II of the geoprofessional service.

Clients that prevent the geoprofessional of record from performing a complete service can be held solely liable for any complications stemming from engineering omissions as a result of unidentified conditions. The geoprofessional of record may not be liable for any resulting complications that occur, as the geoprofessional of record was not able to complete their services. Furthermore, the replacement geoprofessional firm may also be found to have no liability for the same reasons.

We are available at any time to discuss the OM in more detail, or to provide you with an estimate for any additional construction observation and testing services required.

10.0 CLOSURE

We (Northern Geotechnical Engineering, Inc. d.b.a. Terra Firma Testing) prepared this report exclusively for the use AET and their consultants/contractors/etc. for use in the design and construction of the proposed improvements. We should be notified if significant changes are to occur in the nature, design, or location of the proposed improvements in order that we may review our conclusions and recommendations that we present in this report and, if necessary, modify them to satisfy the proposed changes.

This report should always be read and/or distributed in its entirety (including all figures, exploration logs, appendices, etc.) so that all of the pertinent information contained within is effectively disseminated. Otherwise, an incomplete or misinterpreted understanding of the site conditions and/or our engineering recommendations may occur. Our recommended best practice is to make this report accessible, in its entirety, to any design professional and/or contractor working on the project. Any part of this report (e.g., exploration logs, calculations, material values,

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etc.) which is presented in the design/construction plans and/or specifications for the project should have an adequate reference which clearly identifies where the report can be obtained for further review.

Due to the natural variability of earth materials, variations in the subsurface conditions across the project site may exist other than those we identified during the course of our geotechnical assessment. Therefore, a qualified geotechnical engineer, geologist, and/or special inspector be on-site during construction activities to provide corrective recommendations for any unexpected conditions revealed during construction (see our discussion of the Observational Method in Section 9.0 of this report for more detail). Furthermore, the construction budget should allow for any unanticipated conditions that may be encountered during construction activities.

We conducted this evaluation following the standard of care expected of professionals undertaking similar work in the State of Alaska under similar conditions. No warranty, expressed or implied, is made.

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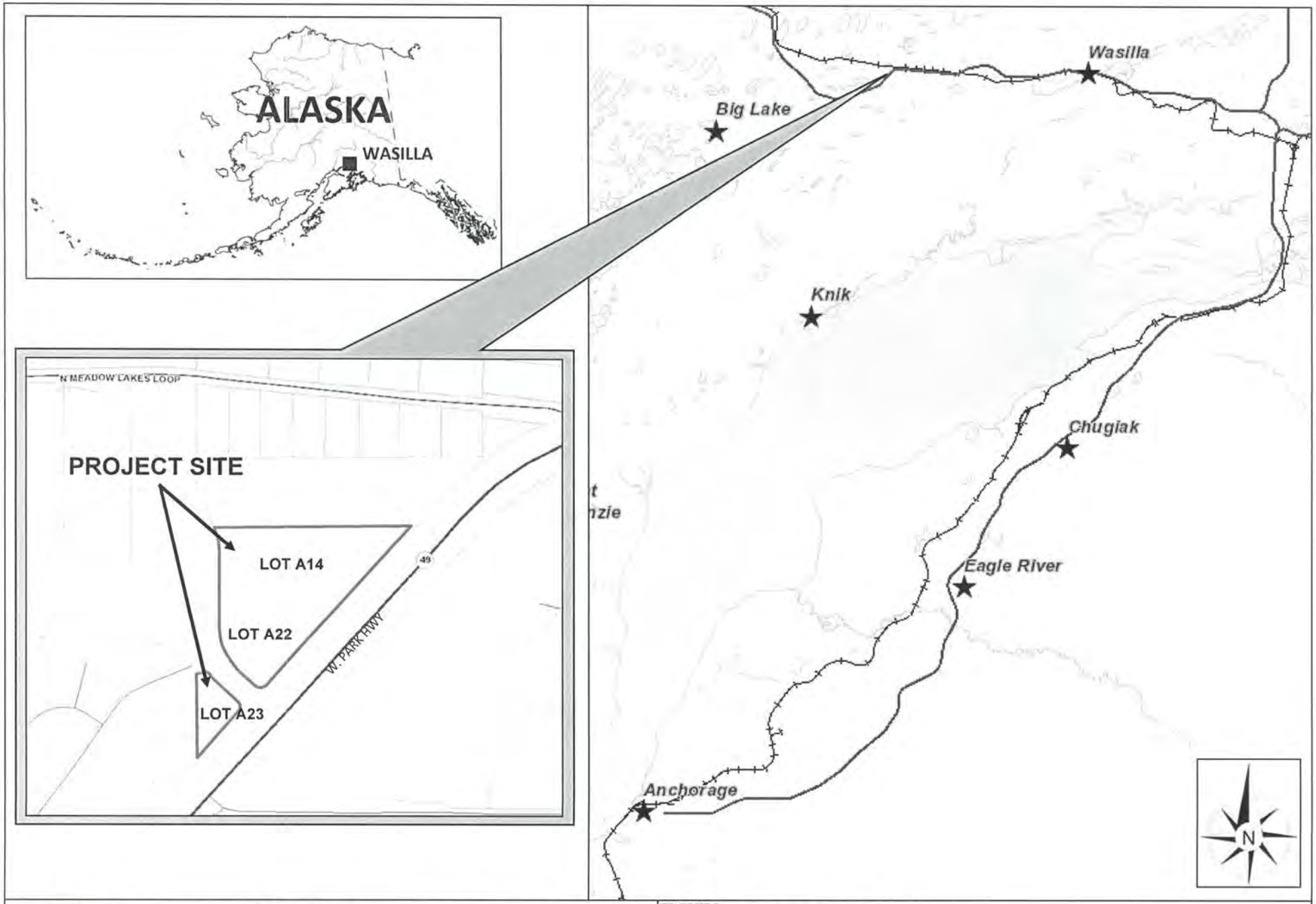
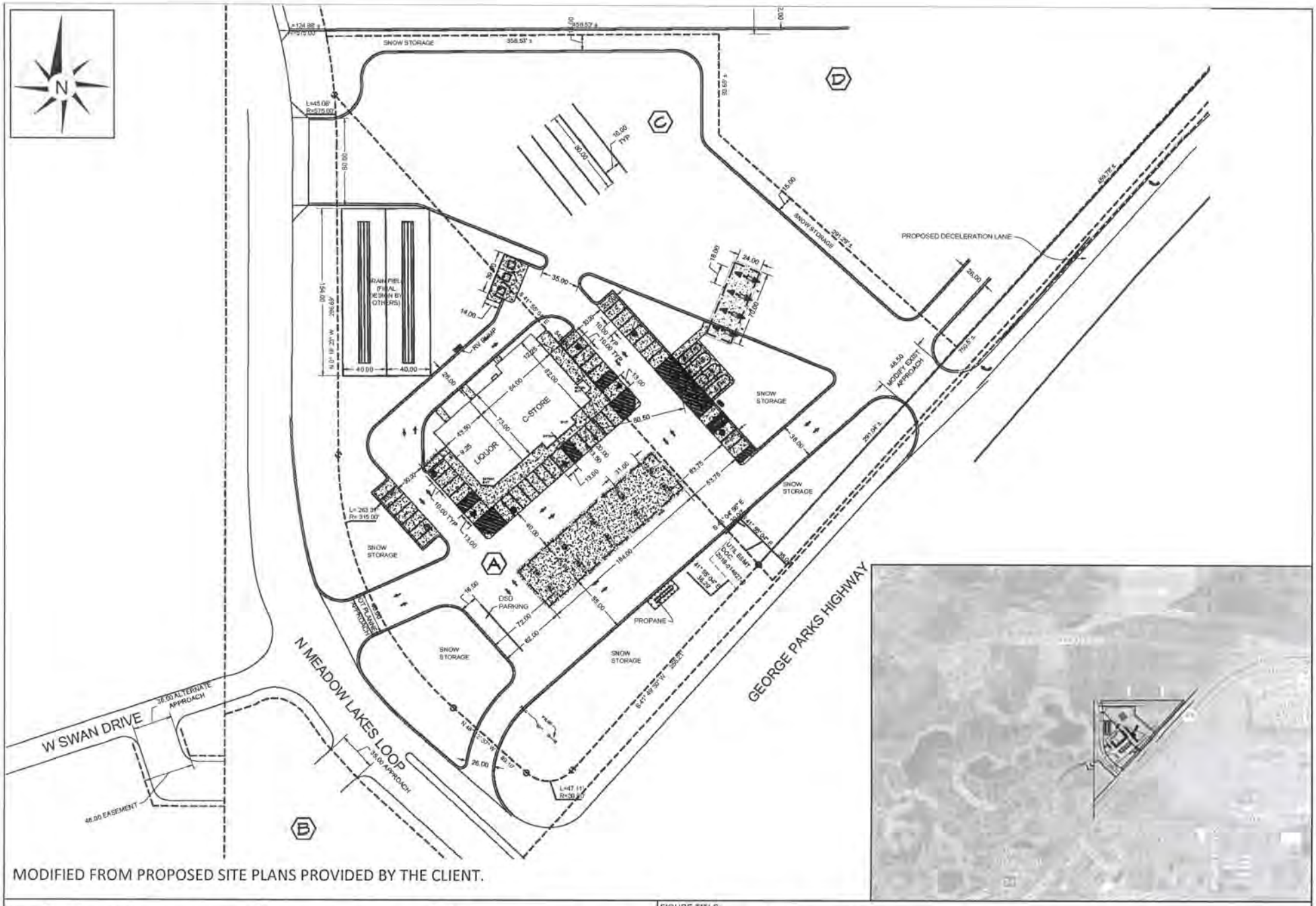
REPORT
FIGURES



NORTHERN GEOTECHNICAL ENGINEERING, INC.
TERRA FIRMA TESTING

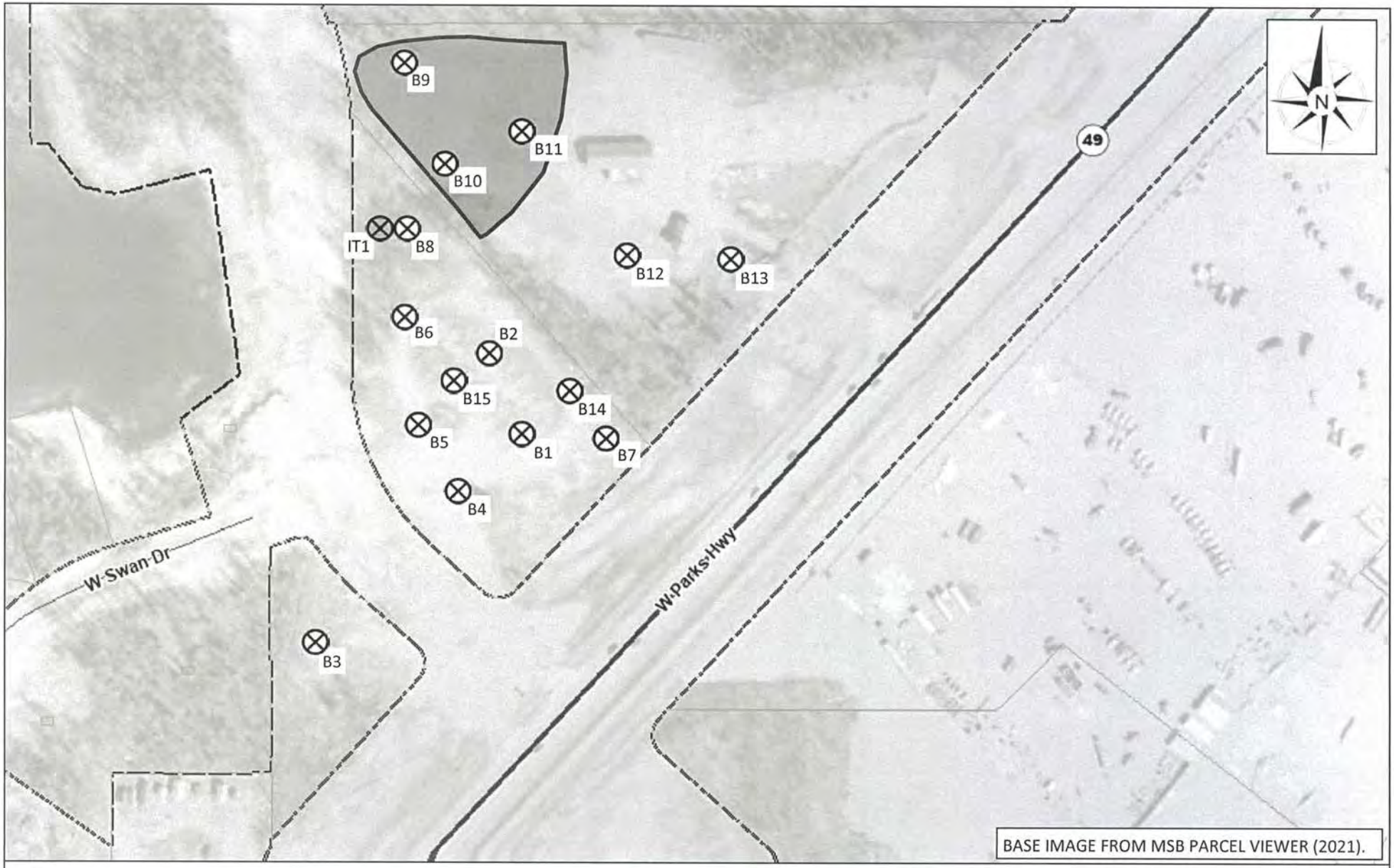
FIGURE TITLE: PROJECT SITE LOCATION MAP	
PROJECT NAME: 7699 AND 7751 W PARKS HWY	PROJECT ID: 6216-21
PROJECT LOCATION: WASILLA, ALASKA	FIGURE NUMBER: 1



MODIFIED FROM PROPOSED SITE PLANS PROVIDED BY THE CLIENT.

NORTHERN GEOTECHNICAL ENGINEERING, INC.
TERRA FIRMA TESTING

FIGURE TITLE: CONCEPTUAL SITE LAYOUT	
PROJECT NAME: 7699 AND 7751 W PARKS HWY	PROJECT ID: 6216-21
PROJECT LOCATION: WASILLA, ALASKA	FIGURE NUMBER: 2



⊗ = APPROXIMATE LOCATION OF EXPLORATION SOIL BORING

⊗ = APPROXIMATE LOCATION OF INFILTRATION TEST

▽ = APPROXIMATE LOCATION OF FILL

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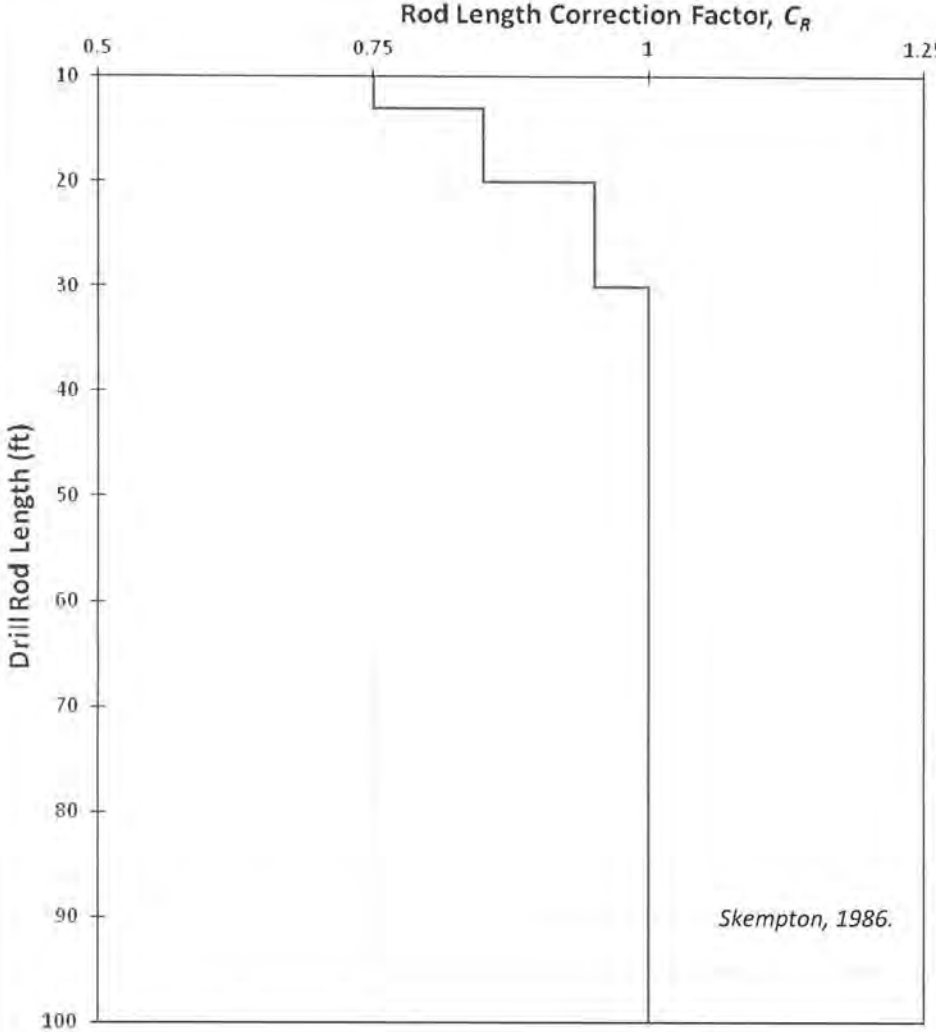
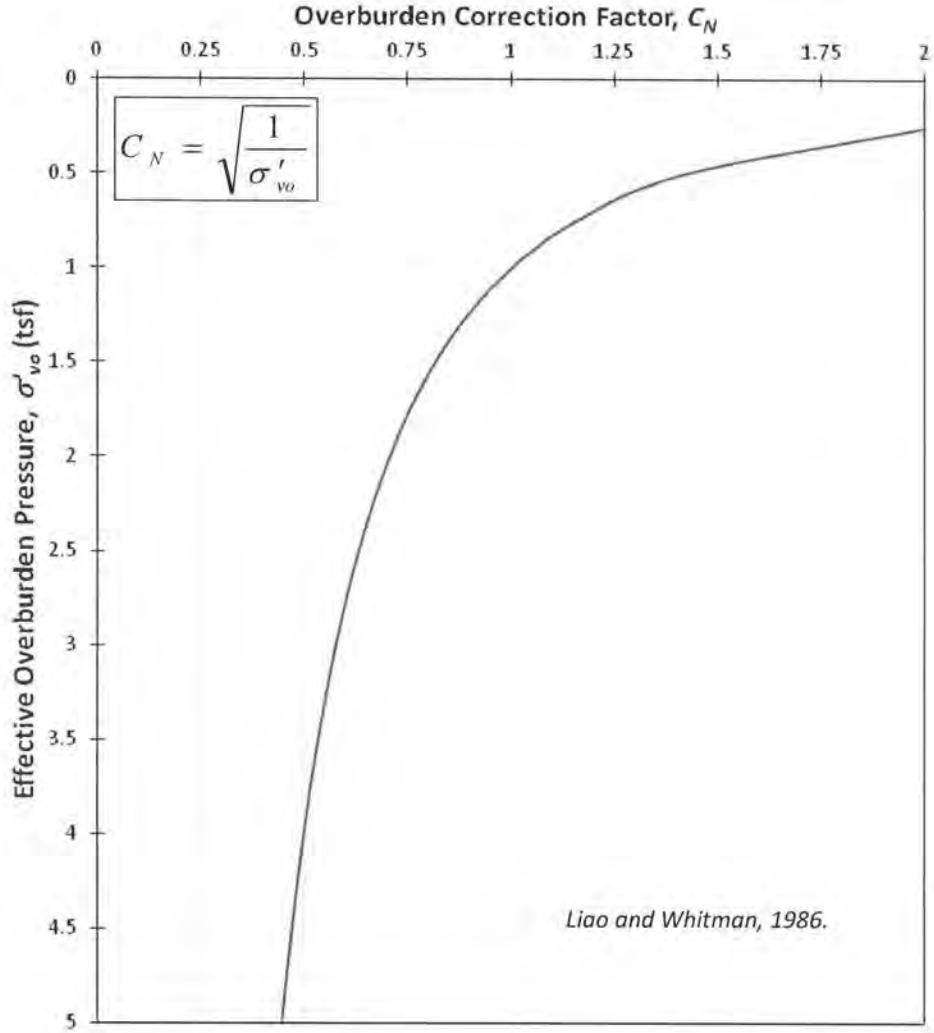
FIGURE TITLE: SUBSURFACE EXPLORATION LOCATION MAP		
PROJECT NAME: 7699 AND 7751 W PARKS HWY		PROJECT ID: 6216-21
PROJECT LOCATION: WASILLA, ALASKA		FIGURE NUMBER: 3





Notes:

- OVERBURDEN CORRECTION FACTOR IS USED ONLY FOR COHESIONLESS SOILS
- C_N IS THE RATIO OF THE MEASURED BLOW COUNT TO WHAT THE BLOW COUNT WOULD BE AT AN OVERBURDEN PRESSURE OF 1 TON/FT^2
- Σ'_{VO} IS THE EFFECTIVE OVERBURDEN PRESSURE AT THE POINT OF MEASUREMENT (TON/FT^2)

NORTHERN GEOTECHNICAL ENGINEERING, INC.
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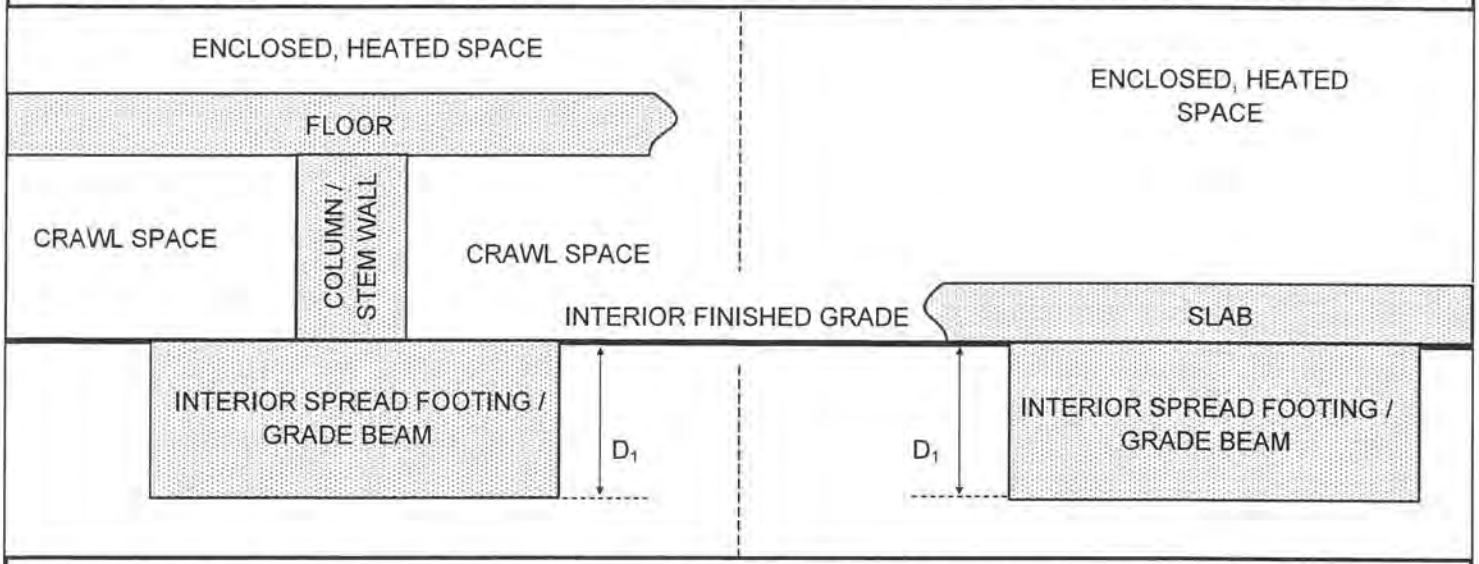
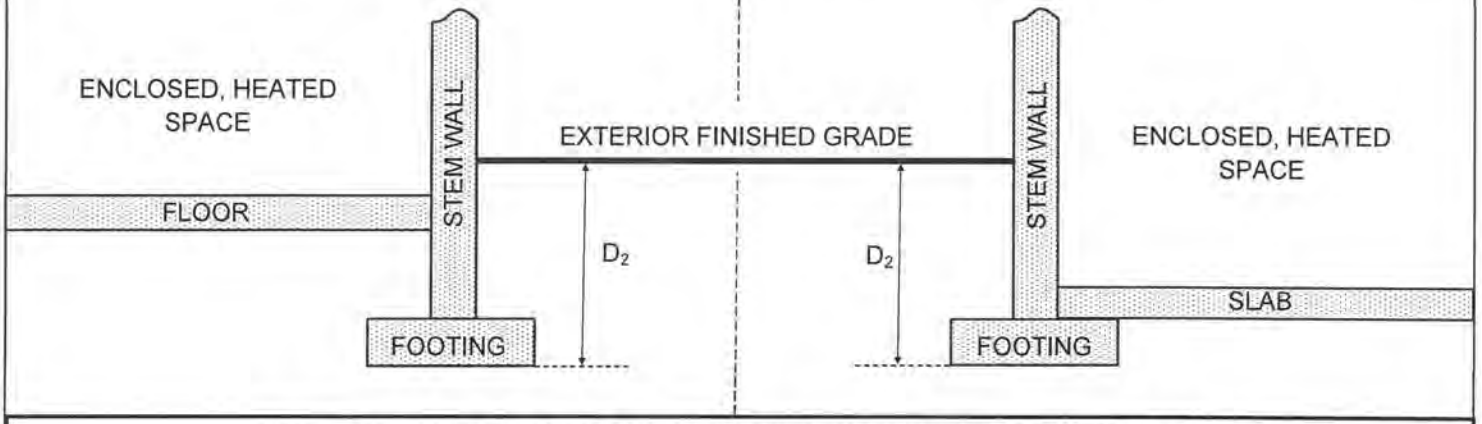
FIGURE TITLE: BLOW COUNT CORRECTIONS	
PROJECT NAME: 7699 AND 7751 W PARKS HWY	PROJECT ID: 6216-21
PROJECT LOCATION: WASILLA, ALASKA	FIGURE NUMBER: 4

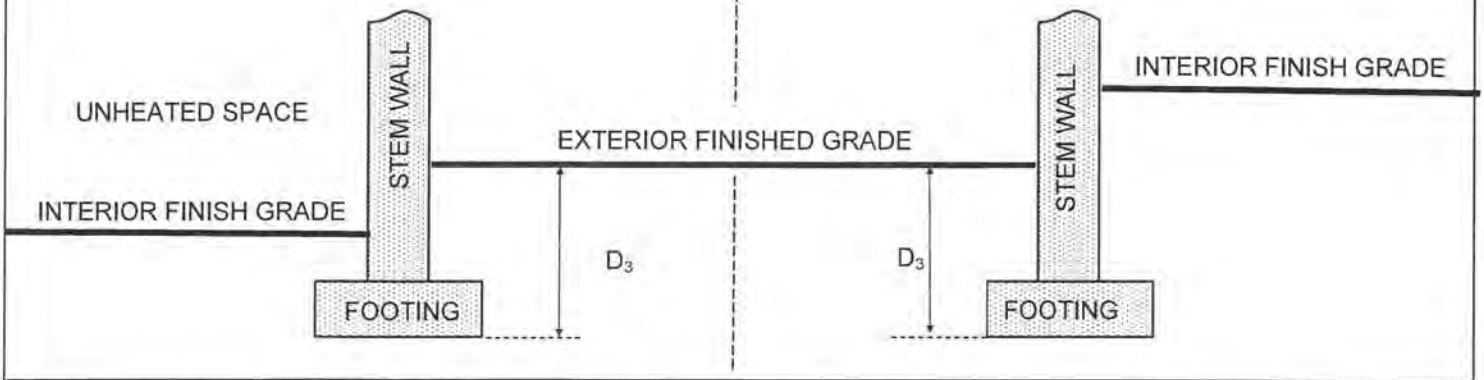
SHALLOW FOUNDATION FOOTING LOCATED ENTIRELY WITHIN AN ENCLOSED, CONTINUOUSLY HEATED SPACE*



SHALLOW FOUNDATION FOOTING LOCATED ALONG THE PERIMETER OF AN ENCLOSED, CONTINUOUS HEATED SPACE*



SHALLOW FOUNDATION FOOTING EXPOSED TO FREEZING TEMPERATURES



*HEATED FOUNDATION TEMPERATURE MUST BE CONTINUOUSLY MAINTAINED AT/ABOVE 40°F

DRAWING NOT TO SCALE

NORTHERN GEOTECHNICAL ENGINEERING, INC.
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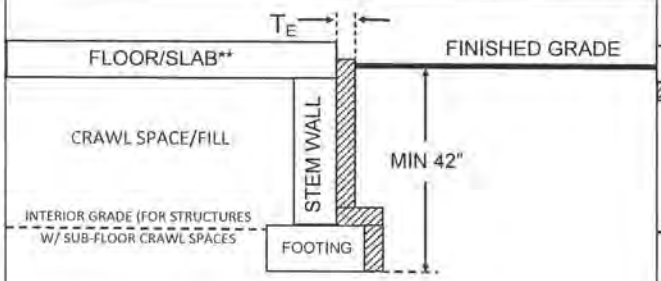
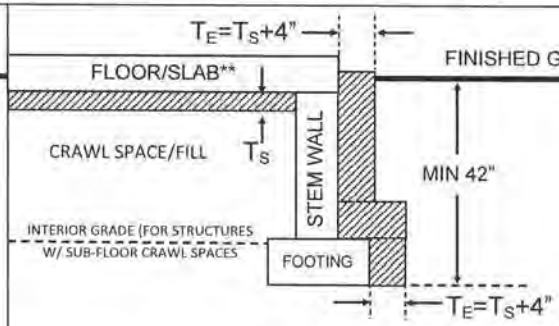
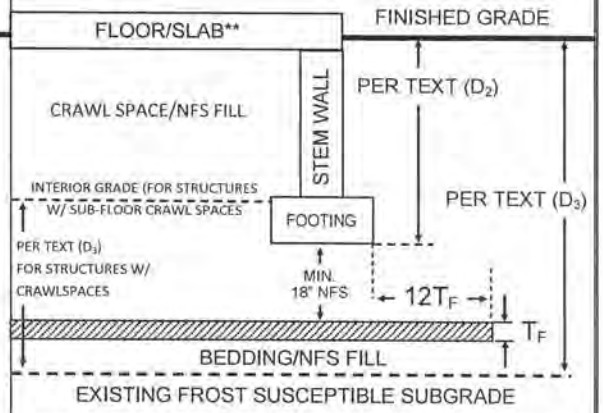
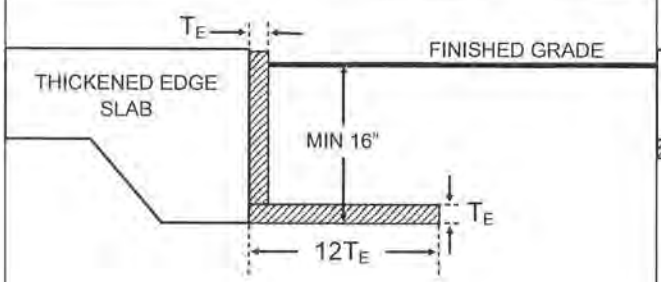
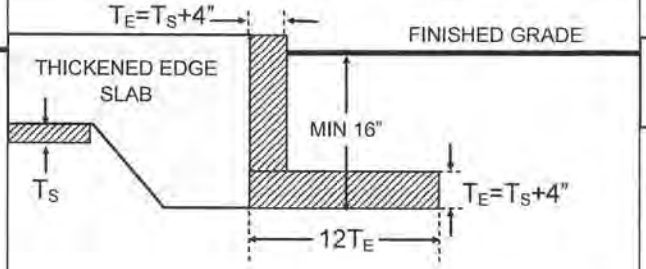
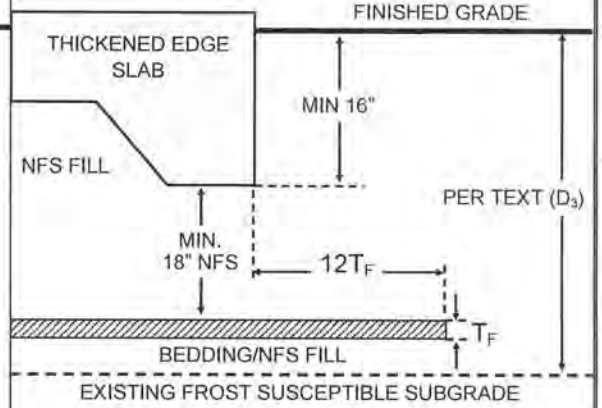
FIGURE TITLE: UNINSULATED SHALLOW FOUNDATION CONFIGURATIONS	
PROJECT NAME: 7699 AND 7751 W PARKS HWY	PROJECT ID: 6216-21
PROJECT LOCATION: WASILLA, AK	FIGURE NUMBER: 5

	HEATED FOUNDATIONS (CONTINUOUSLY HEATED INTERIOR SPACE)*		COLD (UNHEATED) FOUNDATIONS
STRIP FOOTING/STEM WALL	 SOILS PREPARED AS DESCRIBED IN TEXT NOTE: INSULATION FOR HEATING EFFICIENCY PURPOSES ONLY. IF INSULATION IS PLACED UNDER FLOOR/SLAB USE CONFIGURATION C. T_E CAN BE ANY THICKNESS **CONFIGURATION A**	 SOILS PREPARED AS DESCRIBED IN TEXT NOTE: DO NOT INSULATE BOTTOM OF FOOTING. T_S CAN BE ANY THICKNESS. EXTERIOR INSULATION NOT REQUIRED IF FLOOR IS NOT INSULATED (SEE CONFIGURATION A) **CONFIGURATION C**	 NOTE: INSULATION OPTIONAL TO REDUCE DEPTH OF NFS FILL AT A RATE OF 1" INSULATION TO 12" NFS FILL. T_F MIN. = 1" **CONFIGURATION E**
THICKENED EDGE SLAB	 SOILS PREPARED AS DESCRIBED IN TEXT NOTE: IF INSULATION IS PLACED UNDER SLAB USE CONFIGURATION D. T_E MINIMUM = 2". **CONFIGURATION B**	 SOILS PREPARED AS DESCRIBED IN TEXT NOTE: DO NOT INSULATE BOTTOM OF THICKENED EDGE FOOTING. T_S CAN BE ANY THICKNESS. **CONFIGURATION D**	 NOTE: INSULATION OPTIONAL TO REDUCE DEPTH OF NFS FILL AT A RATE OF 1" INSULATION TO 12" NFS FILL. T_F MIN. = 1" **CONFIGURATION F**

T_F = INSULATION THICKNESS UNDER ENTIRE FOUNDATION (INCHES)
T_S= INSULATION THICKNESS UNDER FLOOR/SLAB ONLY (INCHES)
T_E = INSULATION ALONG EXTERIOR OF FOUNDATION (INCHES)

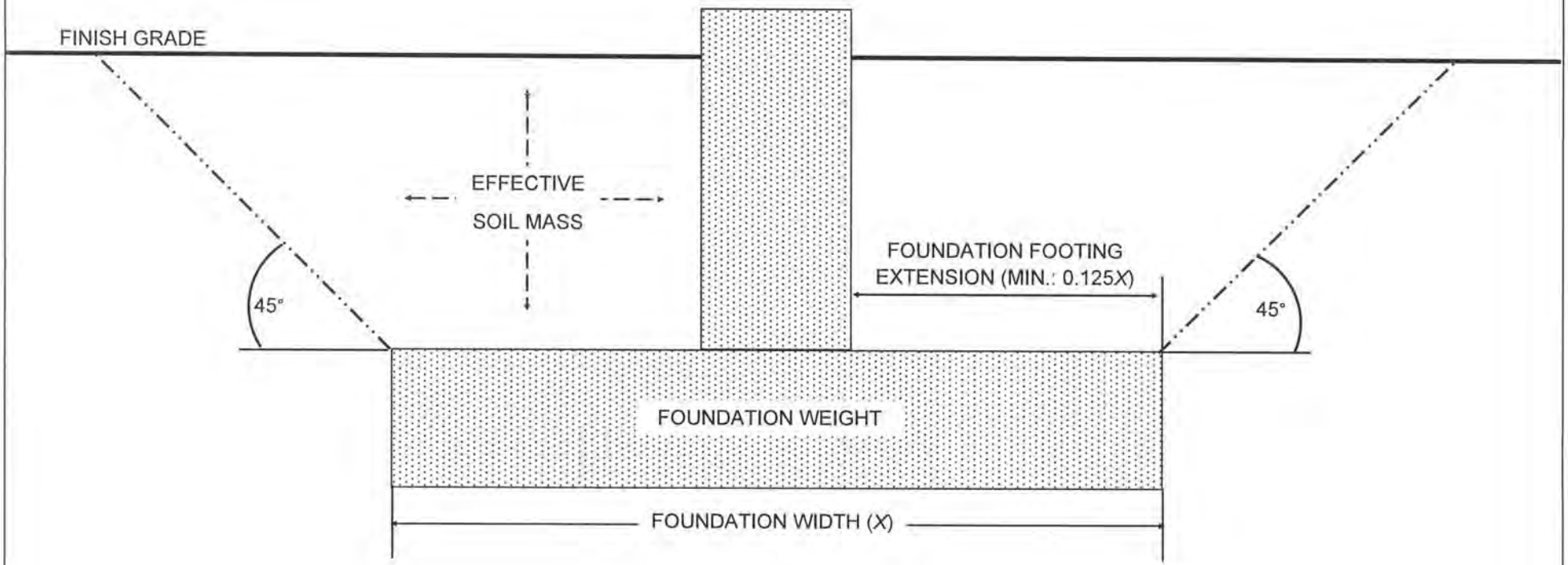
*HEATED FOUNDATION TEMPERATURE MUST BE CONTINUOUSLY MAINTAINED AT/ABOVE 40°F
**FLOOR SYSTEM CAN BE STRUCTURAL (W/ CRAWLSPACE) OR SLAB-ON-GRADE
▨ = RIGID BOARD INSULATION

DRAWING NOT TO SCALE

NORTHERN GEOTECHNICAL ENGINEERING, INC.
TERRA FIRMA TESTING

FIGURE TITLE: INSULATED SHALLOW FOUNDATION CONFIGURATIONS
PROJECT NAME: 7699 AND 7751 W PARKS HWY
PROJECT ID: 6216-21
PROJECT LOCATION: WASILLA, ALASKA
FIGURE NUMBER: 6

UPLIFT CAPACITY = 0.8 × (EFFECTIVE SOIL WEIGHT + WEIGHT OF FOUNDATION)



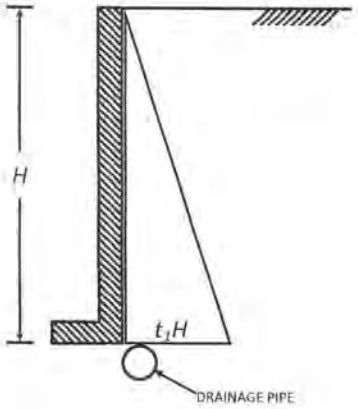
= FOOTING / STEM WALL

DRAWING NOT TO SCALE

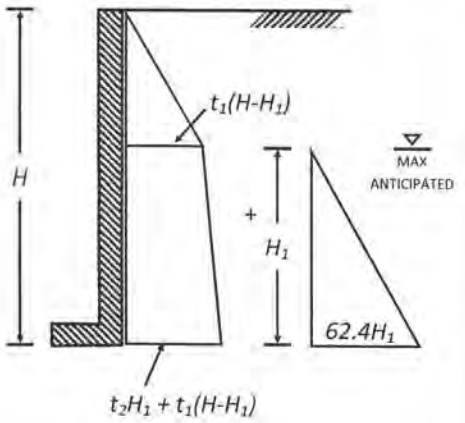
NORTHERN GEOTECHNICAL ENGINEERING, INC.
TERRA FIRMA TESTING

FIGURE TITLE: FOOTING UPLIFT CAPACITY DIAGRAM	
PROJECT NAME: 7699 AND 7751 W PARKS HWY	PROJECT ID: 6216-21
PROJECT LOCATION: WASILLA, ALASKA	FIGURE NUMBER: 7

ACTIVE PRESSURE CONDITION

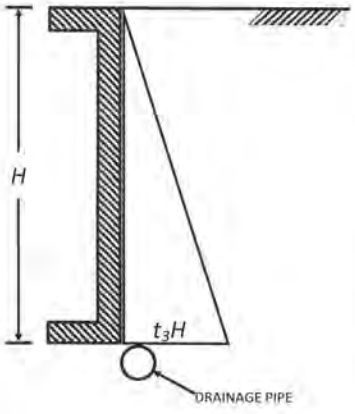


WITH DRAINAGE

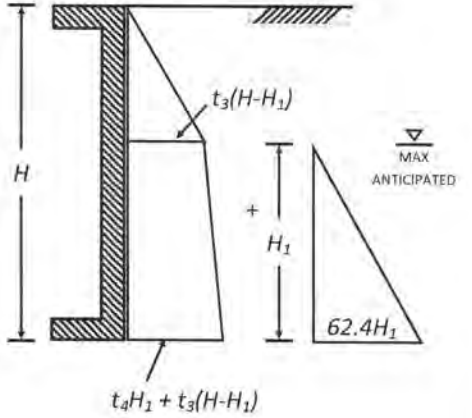


WITHOUT DRAINAGE

AT-REST PRESSURE CONDITION

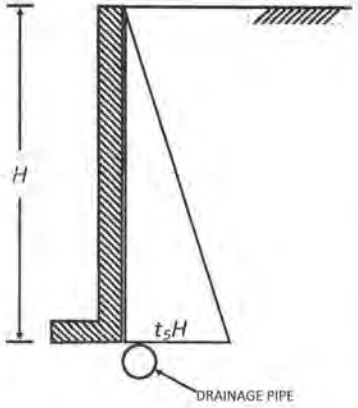


WITH DRAINAGE

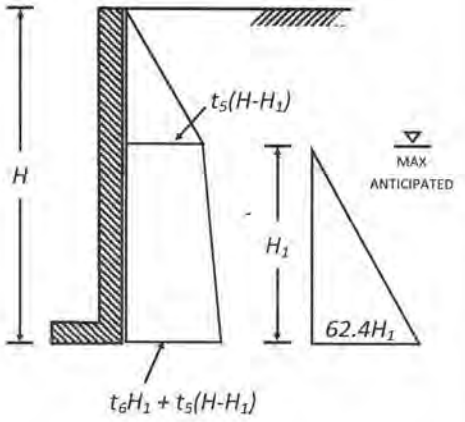


WITHOUT DRAINAGE

PASSIVE PRESSURE CONDITION



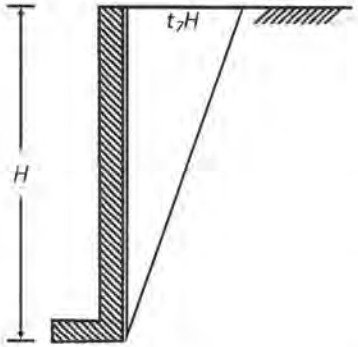
WITH DRAINAGE



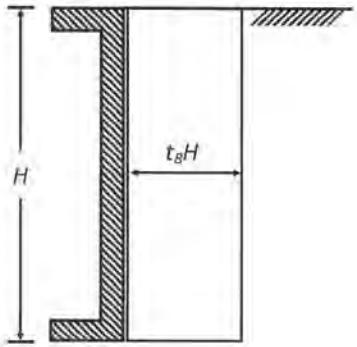
WITHOUT DRAINAGE

NOTE: WALLS CAN BE EITHER FREE OR RESTRAINED AT THE TOP FOR THE PASSIVE PRESSURE CONDITION. EQUATIONS ARE ONLY VALID FOR UNITS OF $t_{1\text{-}8}$ (PCF) AND $H\text{-}H_1$(FT).

SEISMIC



UNRESTRAINED



RESTRAINED

NOTE: SEISMIC LOADS ARE VALID FOR WALLS RETAINING LESS THAN 8 FEET VERTICAL OF EARTH. THE SEISMIC LOAD IS ADDED TO ACTIVE OR AT-REST CONDITIONS AND IS SUBTRACTED FROM PASSIVE CONDITIONS.

NORTHERN GEOTECHNICAL ENGINEERING, INC.
TERRA FIRMA TESTING

FIGURE TITLE: LATERAL RETAINING WALL PRESSURE SCHEMATICS	
PROJECT NAME: 7699 AND 7751 W PARKS HWY	PROJECT ID: 6216-21
PROJECT LOCATION: WASILLA, ALASKA	FIGURE NUMBER: 8

AGGREGATE GRADATION FOR BASE AND SURFACE COURSE

SIEVE SIZE	GRADATION - % BY MASS PASSING			
	BASE - (C-1)	BASE - (D-1)	SURFACE - (E-1)	SURFACE - (F-1)
1-1/2"	100			
1"	70-100	100	100	100
3/4"	60-90	70-100	70-100	85-100
3/8"	45-75	50-80	50-85	60-100
#4	30-60	35-65	35-65	50-85
#8	22-52	20-50	20-50	40-70
#50	6-30	6-30	15-30	25-45
#200	0-6	0-6	8-15	8-20
0.02	0-3	0-3	0-3	0-3

MATERIALS LISTED ABOVE MUST CONSIST OF CRUSHED STONE OR CRUSHED GRAVEL CONSISTING OF SOUND, TOUGH, DURABLE PEBBLES OR ROCK FRAGMENTS OF UNIFORM QUALITY. MUST BE FREE FROM CLAY BALLS, VEGTABLE MATTER AND OTHER DELETE-

SELECTED MATERIAL

TYPE A. AGGREGATE CONTAINING NO MUCK, FROZEN MATERIAL, ROOTS, SOD OR OTHER DELETERIOUS MATTER AND WITH A PLASTICITY INDEX NOT GREATER THAN 6 AS TESTED BY ATM 204 AND ATM 205. MEET THE FOLLOWING GRADATION AS TESTED BY ATM 304:

SIEVE	% BY MASS PASSING
#4	20-60
#200*	0-6

TYPE B. AGGREGATE CONTAINING NO MUCK, FROZEN MATERIAL, ROOTS, SOD OR OTHER DELETERIOUS MATTER AND WITH A PLASTICITY INDEX NOT GREATER THAN 6 AS TESTED BY ATM 204 AND ATM 205. MEET THE FOLLOWING GRADATION AS TESTED BY ATM 304:

SIEVE	% BY MASS PASSING
#200*	0-10

TYPE C. EARTH, SAND, GRAVEL, ROCK, OR COMBINATIONS THEREOF CONTAINING NO MUCK, PEAT, FROZEN,MATERIAL, ROOTS, SOD, OR OTHER DELETERIOUS MATTER AND IS COMPACTABLE UNDER THE PROVISIONS OF SUBSECTIONS 203-3.04 OR 203-3.05.

* GRADATION SHALL BE DETERMINED ON THAT PORTION PASSING THE 3" SCREEN

AGGREGATE GRADATION FOR SUBBASE

SIEVE SIZE	GRADATION - % BY MASS PASSING				
	A	B	C	D	E
4"	100	--	--	--	--
2"	85-100	100	--	--	--
1"	--	--	100	--	--
3/4"	--	--	--	100	--
#4	15-60	15-60	40-75	45-80	--
#16	--	--	20-43	23-50	--
#200*	0-10	0-6	4-10	4-12	0-6
0.02*	0-3	0-3	0-3	0-3	0-3

* GRADATION SHALL BE DETERMINED ON THAT PORTION PASSING THE 3" SCREEN

MODIFIED FROM SECTIONS 703-2.03, 703-2.07 AND 703-2.9 OF AK DOT & PF STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION - 2015

APPENDIX A

GRAPHICAL BOREHOLE LOG

Northern Geotechnical Engineering and
Terra Firma Testing
11301 Olive Lane
Anchorage, AK 99515
Telephone: 907-344-5934

EXPLORATION B1

NGE-TFT PROJECT NAME: 7751 W Parks Highway
NGE-TFT PROJECT NUMBER: 5862-20
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: A. Fortt
DATE/TIME STARTED: 10/1/2020 @ 9:46:00 AM
DATE/TIME COMPLETED: 10/1/2020 @ 10:48:00 AM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
▽ GROUNDWATER (ATD): Approx. 20.5 ft bgs
▼ GROUNDWATER (10/6/2020 7:40:00 AM): Approx. 18.3 ft bgs
EXPLORATION COMPLETION: See comments at end of log
WEATHER CONDITIONS: Overcast, wind, 54°F

DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES
0	**POORLY GRADED GRAVEL WITH SILT AND SAND** (GP-GM), brown, moist, subrounded to subangular gravel up to 1.5" in diameter		S1	13	3 3 3	10		S1	S1 MC = 4.9% 59.5% gravel, 36.6% sand, 3.9% silt P0.02 = 3.6% FC = S1	Drilling indicated presence of cobbles (3-12" in diameter) and potentially boulders (larger than 12" in diameter) throughout boring.
			S2	12	3 10 9	31		S2	S2 MC = 3.4%	
5			S3	16	11 8 7	19		S3	S3 MC = 2.8%	
			S4	14	10 15 15	32		S4	S4 MC = 2.8% 52.4% gravel, 40.5% sand, 7.1% silt	
10			S5	17	24 36 29	59		S5	S5 MC = 2.9%	
15			S6	14	13 29 17	39		S6	S6 MC = 2.9%	
20	▼ ▽		S7	12	23 6 8	12		S7	S7 MC = 6.6% 51.4% gravel, 39.0% sand, 9.6% silt	Approx. 2 ft sand heave.
25										

Bottom of borehole at 25.0 ft bgs.
Set 1" PVC to BOH. Bottom 10 ft slotted. Backfilled with cuttings from 25-3 ft bgs, then bentonite from 3-1 ft bgs, cuttings to ground surface

Always refer to our complete geotechnical report for this project for a more detailed explanation of the subsurface conditions at the project site and how they may affect any existing and/or prospective project site development.

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Telephone: 907-344-5934

EXPLORATION B2

NGE-TFT PROJECT NAME: 7751 W Parks Highway
NGE-TFT PROJECT NUMBER: 5862-20
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: A. Fortt
DATE/TIME STARTED: 10/1/2020 @ 11:08:00 AM
DATE/TIME COMPLETED: 10/1/2020 @ 12:07:00 PM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
GROUNDWATER (ATD): Approx. 20.5 ft bgs
GROUNDWATER (): N/A
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Overcast, wind, 54°F

DEPTH (ft)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES
0			**WELL GRADED GRAVEL WITH SILT AND SAND** (GW-GM), brown, moist, subrounded to subangular gravel up to 1.5" in diameter		S1	11	2 4 10	23		S1	S1 MC = 4.9% 54.6% gravel, 36.8% sand, 8.6% silt P0.02 = 5.8% FC = S1	Drilling indicated presence of cobbles (3-12" in diameter) and potentially boulders (larger than 12" in diameter) throughout boring.
					S2	9	4 2 2	7		S2		
5					S3	10	2 2 3	6		S3	S2 MC = 6.6% 50.7% gravel, 40.3% sand, 9.0% silt	
					S4	14	3 5 8	14		S4		
10					S5	15	13 11 14	23		S5	S3 MC = 7.1% 59.4% gravel, 36.1% sand, 4.5% silt	
											S4 MC = 3.9%	
15					S6	14	5 12 21	28		S6	S5 MC = 2.8%	Large fractured rock in sampler.
											S6 MC = 1.9%	
20		▽			S7	15	28 12 12	20		S7	S7 MC = 8.6% 37.5% gravel, 50.9% sand, 11.6% silt	Added water to hole to control sand heave.
25			**POORLY GRADED SAND WITH SILT AND GRAVEL** (SP-SM), gray, wet, subrounded to angular gravel up to 1.5" in diameter		S8	12	5 13 12	21		S8	S8 MC = 10.0% 29.8% gravel, 61.7% sand, 8.5% silt	
30					S9	14	14 14 13	23		S9	S9 MC = 11.9%	

Bottom of borehole at 31.5 ft bgs.

Always refer to our complete geotechnical report for this project for a more detailed explanation of the subsurface conditions at the project site and how they may affect any existing and/or prospective project site development.

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Terra Firma Testing
11301 Olive Lane
Anchorage, AK 99515
Telephone: 907-344-5934

EXPLORATION B3

NGE-TFT PROJECT NAME: 7751 W Parks Highway
NGE-TFT PROJECT NUMBER: 5862-20
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: A. Fortt
DATE/TIME STARTED: 10/2/2020 @ 11:56:00 AM
DATE/TIME COMPLETED: 10/2/2020 @ 12:45:00 PM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
▽GROUNDWATER (ATD): Approx. 20.5 ft bgs
▼GROUNDWATER (10/6/2020 7:55:00 AM): Approx. 19.6 ft bgs
EXPLORATION COMPLETION: See comments at end of log
WEATHER CONDITIONS: Overcast, light rain, 55°F

DEPTH (ft)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES	WELL DIAGRAM
0			**SILT / ORGANICS** (ML), dark brown, moist, roots, etc.		S1	10	2 1 1	2		S1	S1 MC = 30.1% 21.2% gravel, 36.0% sand, 42.8% silt P0.02 = 24.4% OC = 10.0% FC = F3	Drilling indicated presence of cobbles (3-12" in diameter) and potentially boulders (larger than 12" in diameter) throughout boring.	
			POORLY GRADED SAND WITH GRAVEL (SP), brown, moist, subrounded to subangular gravel up to 1.5" in diameter		S2	18	6 12 41	87		S2	S2 MC = 2.7% 17.7% gravel, 78.2% sand, 4.1% silt		
5					S3	10	37 20 50 4"	N/A		S3	S3 MC = 2.4% 37.2% gravel, 49.8% sand, 13.0% silt		
					S4	10	10 11 10	24		S4	S4 MC = 1.6%		
10					S5	14	33 9 10	19		S5	S5 MC = 1.9%		
					S6	14	8 15 16	29		S6	S6 MC = 2.1% 28.5% gravel, 63.2% sand, 8.3% silt		
15													
20			▽ **POORLY GRADED SAND WITH SILT** (SP-SM), brown, wet		S7	12	5 9 8	16		S7	S7 MC = 21.1% 1.2% gravel, 93.5% sand, 5.3% silt		

Bottom of borehole at 21.5 ft bgs.
Set 1" PVC to BOH. Bottom 10 ft slotted. Backfilled with cuttings from 21.5-3 ft bgs, then bentonite from 3-1 ft bgs, cuttings to ground surface

Northern Geotechnical Engineering and
Terra Firma Testing
11301 Olive Lane
Anchorage, AK 99515
Telephone: 907-344-5934

EXPLORATION B4

NGE-TFT PROJECT NAME: 7751 W Parks Highway
NGE-TFT PROJECT NUMBER: 5862-20
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: A. Fortt
DATE/TIME STARTED: 10/2/2020 @ 10:13:00 AM
DATE/TIME COMPLETED: 10/2/2020 @ 11:40:00 AM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
▽ GROUNDWATER (ATD): N/E
▼ GROUNDWATER (): N/A
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Overcast, light rain, 55°F

DEPTH (ft)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES
0			**POORLY GRADED GRAVEL WITH SILT AND SAND** (GP-GM), brown, moist, subrounded to subangular gravel up to 1.5" in diameter		S1	14	5 11 11	36		S1	S1 MC = 2.3% 52.4% gravel, 40.5% sand, 7.1% silt P0.02 = 4.5% FC = S1	Drilling indicated presence of cobbles (3-12" in diameter) and potentially boulders (larger than 12" in diameter) throughout boring.
					S2	18	13 16 18	56		S2	S2 MC = 2.4%	
5					S3	16	10 16 18	42		S3	S3 MC = 2.1%	
					S4	17	9 12 15	29		S4	S4 MC = 2.1%	
10					S5	14	8 14 12	24		S5	S5 MC = 2.1% 49.1% gravel, 38.7% sand, 12.2% silt	
15					S6	13	7 8 12	17		S6	S6 MC = 1.7%	

Bottom of borehole at 16.5 ft bgs.

Always refer to our complete geotechnical report for this project for a more detailed explanation of the subsurface conditions at the project site and how they may affect any existing and/or prospective project site development.

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EXPLORATION B5

NGE-TFT PROJECT NAME: 7751 W Parks Highway
NGE-TFT PROJECT NUMBER: 5862-20
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: A. Fortt
DATE/TIME STARTED: 10/1/2020 @ 1:23:00 PM
DATE/TIME COMPLETED: 10/1/2020 @ 2:25:00 PM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
▽ GROUNDWATER (ATD): Approx. 20.5 ft bgs
▼ GROUNDWATER (10/6/2020 7:50:00 AM):
EXPLORATION COMPLETION: See comments at end of log
WEATHER CONDITIONS: Overcast, wind, 54°F

DEPTH (ft)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES	WELL DIAGRAM
0			**WELL GRADED GRAVEL WITH SILT AND SAND** (GW-GM), brown, moist, subrounded to subangular gravel up to 1.5" in diameter		S1	12	3 4 3	12		S1	S1 MC = 6.7% 62.4% gravel, 31.3% sand, 6.3% silt P0.02 = 4.0% FC = S1	Drilling indicated presence of cobbles (3-12" in diameter) and potentially boulders (larger than 12" in diameter) throughout boring.	
5					S2	10	4 3 6	15		S2	S2 MC = 11.6% 49.1% gravel, 36.2% sand, 14.7% silt		
					S3	18	12 12 14	32		S3	S3 MC = 4.3% 57.8% gravel, 36.5% sand, 5.7% silt		
10					S4	15	9 19 14	35		S4	S4 MC = 3.6%		
					S5	15	6 14 24	34		S5	S5 MC = 3.9%	Fractured rocks in sampler.	
15					S6	15	5 13 18	26		S6	S6 MC = 3.6%		
20		▽			S7	15	6 9 11	17		S7	S7 MC = 7.7% 45.1% gravel, 42.6% sand, 12.3% silt	Added water to hole to control sand heave.	
25			**POORLY GRADED SAND WITH SILT AND GRAVEL** (SP-SM), gray, wet, subrounded to angular gravel up to 1.5" in diameter		S8	18	7 11 10	18		S8	S8 MC = 7.7% 31.7% gravel, 60.5% sand, 7.8% silt		
30					S9	16	41 20 15	29		S9	S9 MC = 9.4% 36.2% gravel, 56.3% sand, 7.5% silt		

Bottom of borehole at 31.5 ft bgs.
Set 1" PVC to BOH. Bottom 15 ft slotted. Backfilled with cuttings from 31.5-3 ft bgs, then bentonite from 3-1 ft bgs, cuttings to ground surface

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EXPLORATION B6

NGE-TFT PROJECT NAME: 7751 W Parks Highway
NGE-TFT PROJECT NUMBER: 5862-20
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: A. Fortt
DATE/TIME STARTED: 10/1/2020 @ 3:00:00 PM
DATE/TIME COMPLETED: 10/1/2020 @ 3:58:00 PM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
▽ GROUNDWATER (ATD): Approx. 15.0 ft bgs
▼ GROUNDWATER (): N/A
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Overcast, wind, 54°F

DEPTH (ft)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES
0												
			WELL GRADED GRAVEL WITH SILT AND SAND (GW-GM), brown, moist, subrounded to subangular gravel up to 1.5" in diameter		S1	9	3 4 4	13		S1	S1 MC = 4.9% 64.3% gravel, 28.6% sand, 7.1% silt P0.02 = 4.3% FC = S1	Drilling indicated presence of cobbles (3-12" in diameter) and potentially boulders (larger than 12" in diameter) throughout boring. Fractured rock in sampler.
					S2	16	4 8 9	28		S2		
5					S3	12	8 14 10	30		S3	S2 MC = 7.2% 53.7% gravel, 35.5% sand, 10.8% silt P0.02 = 6.0% FC = S1	
			SILTY SAND WITH GRAVEL (SM), brown, moist, subrounded to angular gravel up to 1.5" in diameter		S4	15	11 11 14	27		S4		
10					S5	4	10 23 21	44		S5	S3 MC = 2.4%	
											S4 MC = 3.1% 27.7% gravel, 61.0% sand, 11.3% silt	
15			▽									
			POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), gray, wet, subrounded to angular gravel up to 1.5" in diameter		S6	14	8 15 10	23		S6	S5 MC = 2.3% 29.0% gravel, 53.7% sand, 17.3% silt	
20					S7	13	17 10 9	18		S7	S6 MC = 5.1% 61.5% gravel, 33.3% sand, 5.2% silt	Fractured rock in sampler.
25					S8	15	14 14 14	23		S8	S7 MC = 6.5%	
			Bottom of borehole at 26.5 ft bgs.								S8 MC = 12.7%	

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EXPLORATION B7

NGE-TFT PROJECT NAME: 7751 W Parks Highway
NGE-TFT PROJECT NUMBER: 5862-20
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: A. Fortt
DATE/TIME STARTED: 10/2/2020 @ 10:17:00 AM
DATE/TIME COMPLETED: 10/2/2020 @ 10:50:00 AM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
GROUNDWATER (ATD): Approx. 20.0 ft bgs
GROUNDWATER (10/6/2020 7:35:00 AM): Approx. 19.1 ft bgs
EXPLORATION COMPLETION: See comments at end of log
WEATHER CONDITIONS: Overcast, light rain, 55°F

DEPTH (ft)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES	WELL DIAGRAM
0			**POORLY GRADED GRAVEL WITH SILT AND SAND** (GP-GM), brown, moist, subrounded to subangular gravel up to 1.5" in diameter		S1	13	2 3 6	15		S1	S1 MC = 3.7% 55.0% gravel, 43.0% sand, 2.0% silt	Drilling indicated presence of cobbles (3-12" in diameter) and potentially boulders (larger than 12" in diameter) throughout boring.	
					S2	15	6 8 12	33		S2	S2 MC = 3.8%		
5					S3	15	7 19 17	45		S3	S3 MC = 2.6%		
					S4	14	5 15 50 5"	N/A		S4	S4 MC = 2.5% 28.7% gravel, 54.2% sand, 17.1% silt		
10					S5	15	10 17 20	34		S5	S5 MC = 2.1%		
15					S6	16	10 19 20	33		S6	S6 MC = 2.4%		
20					S7	15	8 12 14	22		S7	S7 MC = 6.1%		

Bottom of borehole at 21.5 ft bgs.
Set 1" PVC to BOH. Bottom 10 ft slotted. Backfilled with cuttings from 21.5-3 ft bgs, then bentonite from 3-1 ft bgs, cuttings to ground surface.

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EXPLORATION B8

NGE-TFT PROJECT NAME: 7751 W Parks Highway
NGE-TFT PROJECT NUMBER: 5862-20
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: A. Fortt
DATE/TIME STARTED: 10/2/2020 @ 9:20:00 AM
DATE/TIME COMPLETED: 10/2/2020 @ 9:40:00 AM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
▽ GROUNDWATER (ATD): N/E
▼ GROUNDWATER (10/6/2020 7:45:00 AM): N/E
EXPLORATION COMPLETION: See comments at end of log
WEATHER CONDITIONS: Overcast, light rain, 55°F

DEPTH (ft)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES	WELL DIAGRAM
0			**ORGANICS** dark brown **SILTY SAND WITH GRAVEL** (SM), light brown, moist, trace organics (roots, etc.)		S1	14	2 2 1 1	2		S1	S1 MC = 8.4% 21.3% gravel, 43.1% sand, 35.6% silt P0.02 = 23.7% OC = 3.2% FC = F3	Drilling indicated presence of cobbles (3-12" in diameter) and potentially boulders (larger than 12" in diameter) throughout boring.	
5					S2	10	3 2 1 1	2		S2	S2 MC = 12.6% 15.5% gravel, 55.6% sand, 28.9% silt		
10			**POORLY GRADED GRAVEL WITH SAND** (GP), brown, moist, subrounded to subangular gravel up to 1.5" in diameter		S3	16	15 14 16 14	32		S3	S3 MC = 1.4% 67.0% gravel, 29.0% sand, 4.0% silt		
15					S4	20	8 14 14 13	22		S4	S4 MC = 4.5% 51.3% gravel, 38.8% sand, 9.9% silt		

Bottom of borehole at 15.0 ft bgs.
Set 1" PVC to BOH. Bottom 10 ft slotted. Backfilled with cuttings from 15-3 ft bgs, then bentonite from 3-1 ft bgs, cuttings to ground surface

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EXPLORATION B9

NGE-TFT PROJECT NAME: 7699 W Parks Highway
NGE-TFT PROJECT NUMBER: 6216-21
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: Truck-mounted CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: C. Banzhaf
DATE/TIME STARTED: 11/5/2021 @ 10:30:00 AM
DATE/TIME COMPLETED: 11/5/2021 @ 10:55:00 AM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
GROUNDWATER (ATD): N/E
GROUNDWATER (): N/E
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Cloudy, 30°F

DEPTH (ft bgs)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS
0			*FILL*, **SILTY GRAVEL** (GM), loose, brown, moist		S1	12	3 6 6	N/R		S1	
				O	S2	0	2 3 2	8		S2	
5			**SANDY SILT** (ML), trace gravel, soft, brown to orange		S3	14	2 3 10	4		S3	
			POORLY GRADED GRAVEL (GP), medium dense to dense, brown, moist		S4	10	10 14 13	29		S4	

Bottom of borehole at 9.0 ft bgs.

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EXPLORATION B10

NGE-TFT PROJECT NAME: 7699 W Parks Highway
NGE-TFT PROJECT NUMBER: 6216-21
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: Truck-mounted CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: C. Banzhaf
DATE/TIME STARTED: 11/5/2021 @ 11:00:00 AM
DATE/TIME COMPLETED: 11/5/2021 @ 11:45:00 AM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
GROUNDWATER (ATD): N/E
GROUNDWATER (): N/E
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Cloudy, 30°F

DEPTH (ft bgs)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS
0			**ORGANICS**		S1	14	2 2 2	N/R		S1	
			FILL, **SILTY GRAVEL** (GM), very loose, brown, moist								
			FILL, **SILT WITH GRAVEL** (ML), very loose, brown, moist								
			FILL, **SILTY GRAVEL** (GM), very loose, brown, moist		S2	10	1 2 1	5		S2	
			FILL, **POORLY GRADED GRAVEL** (GP), very loose, brown, moist								
5			*FILL*, **SILT** (ML), trace organics, very loose, brown, moist		S3	16	1 0 1	1		S3	
			FILL, **PEAT** (PT), very loose, dark brown, moist		S4	18	1 1 1	2		S4	
			FILL, **SILTY GRAVEL WITH ORGANICS** (GM), very loose, brown, moist								
10					S5	14	1 1 1	2		S5	
15			*NATIVE*, **SILT WITH ORGANICS** (ML), soft, dark brown, moist								
			SILTY GRAVEL (GM), medium dense, dark brown, moist		S6	10	5 6 8	13		S6	
			POORLY GRADED GRAVEL (GP), medium dense to dense, brown, moist to wet								
20					S7	14	29 18 24	35		S7	

Bottom of borehole at 21.5 ft bgs.

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EXPLORATION B11

NGE-TFT PROJECT NAME: 7699 W Parks Highway
NGE-TFT PROJECT NUMBER: 6216-21
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: Truck-mounted CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: C. Banzhaf
DATE/TIME STARTED: 11/5/2021 @ 11:50:00 AM
DATE/TIME COMPLETED: 11/5/2021 @ 12:20:00 PM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
GROUNDWATER (ATD): N/E
GROUNDWATER (): N/E
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Cloudy, 30°F

DEPTH (ft bgs)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS
0			**ORGANICS**		S1	8	1 2 3	N/R		S1	
			POORLY GRADED GRAVEL WITH SILT (GP-GM), very loose, brown, moist								
			SILTY GRAVEL (GM), trace organics, very loose, brown and orange, moist		S2	18	2 3 2	4		S2	
5			**WELL GRADED GRAVEL WITH SAND** (GW), medium dense to dense, brown, moist		S3	14	8 8 8	21		S3	
					S4	6	12 10 50	N/R		S4	
10					S5	0	10 50 4"	N/R		S5	

Bottom of borehole at 10.8 ft bgs.

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EXPLORATION B12

NGE-TFT PROJECT NAME: 7699 W Parks Highway
NGE-TFT PROJECT NUMBER: 6216-21
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: Truck-mounted CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: C. Banzhaf
DATE/TIME STARTED: 11/5/2021 @ 12:25:00 PM
DATE/TIME COMPLETED: 11/5/2021 @ 1:10:00 PM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
▽ GROUNDWATER (ATD): N/E
▼ GROUNDWATER (): N/E
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Cloudy, 30°F

DEPTH (ft bgs)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES
0			**SILTY GRAVEL** (GM), dark brown, moist		S1	10	4 6 7	N/R		S1		
			POORLY GRADED GRAVEL WITH SAND (GP), medium dense to dense, brown, moist		S2	10	8 6 7	21		S2		
5					S3	12	13 12 14	32		S3		
					S4	8	16 26 21	N/R		S4		Freshly fractured rocks.
10					S5	12	46 22 26	N/R		S5		Freshly fractured rocks.
15					S6	10	37 16 13	24		S6		

Bottom of borehole at 16.5 ft bgs.

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EXPLORATION B13

NGE-TFT PROJECT NAME: 7699 W Parks Highway
NGE-TFT PROJECT NUMBER: 6216-21
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: Truck-mounted CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: C. Banzhaf
DATE/TIME STARTED: 11/5/2021 @ 1:15:00 PM
DATE/TIME COMPLETED: 11/5/2021 @ 1:40:00 PM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
GROUNDWATER (ATD): N/E
GROUNDWATER (): N/E
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Cloudy, 30°F

DEPTH (ft bgs)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES
0			**SILT** (ML), brown and orange		S1	12	3 5 20	N/R		S1		
5			**WELL GRADED GRAVEL WITH SAND** (GW), medium dense to dense, brown, moist		S2	6	6 9 8	N/R		S2		Freshly fractured rock.
					S3	14	5 7 10	22		S3		
10					S4	10	28 12 12	N/R		S4		Freshly fractured rock.
					S5	10	5 12 13	25		S5		

Bottom of borehole at 11.5 ft bgs.

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EXPLORATION B14

NGE-TFT PROJECT NAME: 7699 W Parks Highway
NGE-TFT PROJECT NUMBER: 6216-21
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: Truck-mounted CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: C. Banzhaf
DATE/TIME STARTED: 11/5/2021 @ 1:50:00 PM
DATE COMPLETED: 11/5/2021
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
▽ GROUNDWATER (ATD): N/E
▼ GROUNDWATER (): N/E
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Cloudy, light snow

DEPTH (ft bgs)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS	REMARKS/NOTES
0			**POORLY GRADED GRAVEL WITH SAND** (GP), medium dense to dense, brown, moist		S1	18	3 8 9	N/R		S1		
					S2	14	26 21 25	N/R		S2		Freshly fractured rock.
5					S3	12	16 27 31	N/R		S3		Freshly fractured rock.
					S4	10	30 20 20	43		S4		
10					S5	12	30 17 19	33		S5		
15					S6		32 16 15	26		S6		

Bottom of borehole at 16.5 ft bgs.

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EXPLORATION B15

NGE-TFT PROJECT NAME: 7699 W Parks Highway
NGE-TFT PROJECT NUMBER: 6216-21
PROJECT LOCATION: Wasilla, AK
EXPLORATION CONTRACTOR: Discovery Drilling, Inc.
EXPLORATION EQUIPMENT: Truck-mounted CME 75
EXPLORATION METHOD: Hollow Stem Auger
SAMPLING METHOD: MPT w/ 340lb autohammer
LOGGED BY: C. Banzhaf
DATE/TIME STARTED: 11/5/2021 @ 4:10:00 PM
DATE/TIME COMPLETED: 11/5/2021 @ 5:00:00 PM
EXPLORATION LOCATION: See report Figure 2
GROUND ELEVATION: Not Known
▽ GROUNDWATER (ATD): Approx. 17.0 ft bgs
▼ GROUNDWATER (): N/E
EXPLORATION COMPLETION: Backfilled with cuttings
WEATHER CONDITIONS: Cloudy, 34°F

DEPTH (ft bgs)	GRAPHIC LOG	FROZEN SOILS	MATERIAL DESCRIPTION	SAMPLE TYPE	FIELD SAMPLE ID	RECOVERY (in)	FIELD BLOWS	$(N_1)_{60}$	SAMPLE INT. COLLECT	LAB SAMPLE ID	LAB RESULTS
0			**SILTY GRAVEL** (GM), loose, brown, moist		S1	16	4 4 3	N/R		S1	
			SILTY SAND WITH GRAVEL (SM), loose, brown, moist		S2	4	1 2 1	5		S2	
5			**POORLY GRADED GRAVEL WITH SAND** (GP), loose, brown, moist		S3	4	1 2 2	5		S3	
			SILT (ML), trace gravel, soft, brown		S4	10	1 1 1	2		S4	
10			**POORLY GRADED SAND WITH ORGANICS** (SP), very loose, brown, moist		S5	10	1 0 1	1		S5	
15			*NATIVE*, **POORLY GRADED GRAVEL WITH SAND** (GP), medium dense, brown, moist to wet ▽		S6	10	8 11 12	22		S6	
20					S7	10	4 11 15	24		S7	

Bottom of borehole at 21.5 ft bgs.

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EXPLORATION LEGEND

CLIENT Holiday Stationstores

NGE-TFT PROJECT NAME 7699 W Parks Highway

NGE-TFT PROJECT NUMBER 6216-21

PROJECT LOCATION Wasilla, AK

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)

- GM: USCS Silty Gravel
- GP: USCS Poorly-graded Gravel
- GP-GM: USCS Poorly-graded Gravel with Silt
- GPS: Sandy Gravel
- GWS: USCS Well-graded Sandy Gravel
- ML: USCS Silt
- MLG: USCS Gravelly Silt
- OH: USCS High Plasticity Organic silt or clay
- PEAT: Peat
- SM: USCS Silty Sand
- SP: USCS Poorly-graded Sand

SAMPLER SYMBOLS

- Modified Penetration Test
- No Recovery

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
MC - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
P200 - PERCENT PASSING NO. 200 SIEVE
P0.02 - PERCENT PASSING 0.02mm SIEVE
PP - POCKET PENETROMETER (tons/ft^2)
S/U - CASING STICK-UP

▽ Water Level at Time Drilling, or as Shown

▼ Water Level After 24 Hours, or as Shown

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION
N/E - NOT ENCOUNTERED
NR - NOT REPRESENTATIVE
N/A - NOT APPLICABLE

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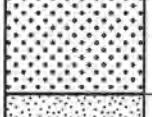
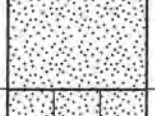
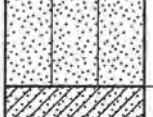
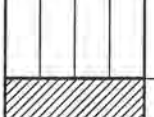
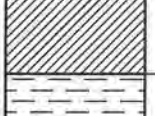
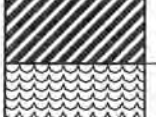
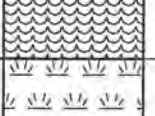
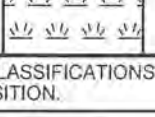
SOIL CLASSIFICATION CHART

CLIENT Holiday Stationstores **PROJECT NAME** 7699 W Parks Highway

NGE-TFT PROJECT NUMBER 6216-21 **PROJECT LOCATION** Wasilla, AK

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.
DIAGONAL LINES INDICATE UNKNOWN DEPTH OF SOIL TRANSITION.

Northern Geotechnical Engineering, Inc.
and Terra Firma Testing
11301 Olive Lane
Anchorage, AK 99515
Telephone: 907-344-5934

EXPLORATION LOG KEY

CLIENT Holiday Stationstores **PROJECT NAME** 7699 W Parks Highway

NGE-TFT PROJECT NUMBER 6216-21 **PROJECT LOCATION** Wasilla, AK

SAMPLER SYMBOLS


SPT w/ 140# Hammer
30" Drop and 2.0" O.D. Sampler


Modified SPT w/ 340# Hammer
30" Drop and 3.0 O.D. Sampler


Grab Sample


Shelby Tube Sample


Rock Core Sample


Direct Push Sample


No Recovery

N/E Not Encountered

WELL SYMBOLS


1" Slotted Pipe
Backfilled with Silica Sand


1" PVC Pipe
Backfilled with Auger Cuttings


1" PVC Pipe
with Bentonite Seal


Capped Riser

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No. 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No. 4 (4.5 mm)
Sand	No. 4 (4.5 mm) to No. 200
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace	1-5%
Few	5-10%
Little	10-20%
Some	20-35%
And	35-50%

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch
DAMP	Some perceptible moisture; below optimum
MOIST	No visible water; near optimum moisture content
WET	Visible free water, usually soil is below water table

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALUE

COHESIONLESS SOILS			COHESIVE SOILS		
DENSITY	N (BLOWS/FT)	APPROXIMATE RELATIVE DENSITY (%)	CONSISTENCY	N (BLOWS/FT)	APPROXIMATE UNDRAINED SHEAR STRENGTH (PSF)
VERY LOOSE	0-4	0-15	VERY SOFT	0-1	< 250
LOOSE	5-10	15-35	SOFT	2-4	250-500
MEDIUM DENSE	11-25	35-65	MEDIUM STIFF	5-8	500-1000
DENSE	26-50	65-85	STIFF	9-15	1000-2000
VERY DENSE	> 50	85-100	VERY STIFF	16-30	2000-4000
			HARD	> 30	> 4000

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EXPLORATION LOG KEY

CLIENT Holiday Stationstores **PROJECT NAME** 7699 W Parks Highway

NGE-TFT PROJECT NUMBER 6216-21 **PROJECT LOCATION** Wasilla, AK

FROST DESIGN SOIL CLASSIFICATION

FROST GROUP (USACOE)	FROST GROUP (M.O.A.)	SOIL TYPE	% FINER THAN 0.02mm BY MASS	TYPICAL SOIL TYPES UNDER UNIFIED SOIL CLASSIFICATION SYSTEM
NFS*	NFS*	(A) GRAVELS CRUSHED STONE CRUSHED ROCK (B) SANDS	0 - 1.5 0 - 3	GW, GP SW, SP
PFS*	NFS*	(A) GRAVELS CRUSHED STONE CRUSHED ROCK	1.5 - 3	GW, GP
	F2	(B) SANDS	3 - 10	SW, SP
S1	F1	GRAVELLY SOILS	3 - 6	GW, GP, GW-GM, GP-GM
S2	F2	SANDY SOILS	3 - 6	SW, SP, SW-SM, SP-SM
F1	F1	GRAVELLY SOILS	6 - 10	GM, GW-GM, GP-GM
F2	F2	(A) GRAVELLY SOILS (B) SANDS	10 - 20 6 - 15	GM, GW-GM, GP-GM SM, SW-SM, SP-SM
F3	F3	(A) GRAVELLY SOILS (B) SANDS, EXCEPT VERY FINE SILTY SANDS (C) CLAYS, PI>12	Over 20 Over 15 ------	GM, GC SM, SC CL, CH
F4	F4	(A) ALL SILTS (B) VERY FINE SILTY SANDS (C) CLAYS, PI<12 (D) VARVED CLAYS AND OTHER FINE GRAINED, BANDED SEDIMENTS	------ Over 15 ------ ------	ML, MH SM CL, CL-ML CL & ML; CL, ML, & SM; CL, CH, & ML; CL, CH, ML, & SM

*Non-frost susceptible
†Possibly frost susceptible, but requires lab testing to determine frost design soils classification.

ICE CLASSIFICATION SYSTEM

GROUP	ICE VISIBILITY	DESCRIPTION		SYMBOL	
N	SEGREGATED ICE NOT VISIBLE BY EYE	POORLY BONDED OR FRIABLE		Nf	
		WELL BONDED	NO EXCESS ICE	Nb	Nbn
			EXCESS MICROSCOPIC ICE		Nbe
V	SEGREGATED ICE IS VISIBLE BY EYE AND IS ONE INCH OR LESS IN THICKNESS	INDIVIDUAL ICE CRYSTALS OR INCLUSIONS		Vx	
		ICE COATINGS ON PARTICLES		Vc	
		RANDOM OR IRREGULARY ORIENTED ICE		Vr	
		STRATIFIED OR DISTINCTLY ORIENTED ICE		Vs	
		UNIFORMLY DISTRIBUTED ICE		Vu	
ICE	ICE IS GREATER THAN ONE INCH IN THICKNESS	ICE WITH SOILS INCLUSIONS		ICE + Soil Type	
		ICE WITHOUT SOILS INCLUSIONS		ICE	

APPENDIX B

LABORATORY TEST RESULTS

Summary of Laboratory Test Results

7751 W Parks Hwy., Wasilla, AK

NGE-TFT Project #:5862-20

Exploration ID	Sample Number	Depth Interval (ft) Top	Depth Interval (ft) Bottom	Moisture Content ASTM D2216 (% By Dry Mass)	Atterberg Limits ASTM D4318 LL	PL	PI	Particle Size Analysis ASTM C136/D7928/D6913 (% By Mass) Gravel	Sand	Silt/Clay	Passing 0.02mm ASTM D7928 (% By Mass)	Frost Class.	Organic Content (ASTM D2974) (% By Mass)	Unified Soil Classification ASTM D2487
B1	S1	0.0	1.5	4.9				59.5	36.6	3.9	3.6	S1		(GP) Poorly-graded gravel w/ sand
B1	S2	2.5	4.0	3.4										
B1	S3	5.0	6.5	2.8										
B1	S4	7.5	9.0	2.8				52.4	40.5	7.1	N/A	N/A		(GP-GM) Poorly-graded gravel w/ silt and sand
B1	S5	10.0	11.5	2.9										
B1	S6	15.0	16.5	2.9										
B1	S7	20.0	21.5	6.6				51.4	39.0	9.6	N/A	N/A		(GW-GM) Well-graded gravel w/ silt and sand
B2	S1	0.0	1.5	4.9										
B2	S2	2.5	4.0	6.6				54.6	36.8	8.6	5.8	S1		(GW-GM) Well-graded gravel w/ silt and sand
B2	S3	5.0	6.5	7.1				50.7	40.3	9.0	N/A	N/A		(GP-GM) Poorly-graded gravel w/ silt and sand
B2	S4	7.5	9.0	3.9				59.4	36.1	4.5	N/A	N/A		(GW) Well-graded gravel w/ sand
B2	S5	10.0	11.5	2.8										
B2	S6	15.0	16.5	1.9										
B2	S7	20.0	21.5	8.6				37.5	50.9	11.6	N/A	N/A		(SP-SM) Poorly-graded sand w/ silt and gravel
B2	S8	25.0	26.5	10.0				29.8	61.7	8.5	N/A	N/A		(SP-SM) Poorly-graded sand w/ silt and gravel
B2	S9	30.0	31.5	11.9										
B3	S1	0.0	1.5	30.1				21.2	36.0	42.8	24.4	F3	10.0	(SM) Silty sand w/ gravel
B3	S2	3.0	4.0	2.7				17.7	78.2	4.1	N/A	N/A		(SP) Poorly-graded sand w/ gravel
B3	S3	5.0	6.5	2.4				37.2	49.8	13.0	N/A	N/A		(SM) Silty sand w/ gravel
B3	S4	7.5	9.0	1.6										
B3	S5	10.0	11.5	1.9										
B3	S6	15.0	16.5	2.1				28.5	63.2	8.3	N/A	N/A		(SW-SM) Well-graded sand w/ silt and gravel
B3	S7	20.0	21.5	21.1				1.2	93.5	5.3	N/A	N/A		(SP-SM) Poorly-graded sand w/ silt
B4	S1	0.0	1.5	2.3										
B4	S2	2.5	4.0	2.4				52.4	40.5	7.1	4.5	S1		(GW-GM) Well-graded gravel w/ silt and sand
B4	S3	5.0	6.5	2.4										
B4	S4	7.5	9.0	2.1										
B4	S5	10.0	11.5	2.1				49.1	38.7	12.2	N/A	N/A		(GM) Silty gravel w/ sand
B4	S6	15.0	16.5	1.7										
B5	S1	0.0	1.5	6.7				62.4	31.3	6.3	4.0	S1		(GW-GM) Well-graded gravel w/ silt and sand
B5	S2	2.5	4.0	11.6				49.1	36.2	14.7	N/A	N/A		(GM) Silty gravel w/ sand
B5	S3	5.0	6.5	4.3				57.8	36.5	5.7	N/A	N/A		(GW-GM) Well-graded gravel w/ silt and sand
B5	S4	7.5	9.0	3.6										
B5	S5	10.0	11.5	3.9										
B5	S6	15.0	16.5	3.6										
B5	S7	20.0	21.5	7.7				45.1	42.6	12.3	N/A	N/A		(GM) Silty gravel w/ sand
B5	S8	25.0	26.5	7.7				31.7	60.5	7.8	N/A	N/A		(SP-SM) Poorly-graded sand w/ silt and gravel
B5	S9	30.0	31.5	9.4				36.2	56.3	7.5	N/A	N/A		(SP-SM) Poorly-graded sand w/ silt and gravel
B6	S1	0.0	1.5	4.9				64.3	28.6	7.1	4.3	S1		(GW-GM) Well-graded gravel w/ silt and sand
B6	S2	2.5	4.0	7.2				53.7	35.5	10.8	6.0	S1		(GW-GM) Well-graded gravel w/ silt and sand
B6	S3	5.0	6.5	2.4										
B6	S4	7.5	9.0	3.1				27.7	61.0	11.3	N/A	N/A		(SP-SM) Poorly-graded sand w/ silt and gravel
B6	S5	10.0	11.5	2.3				29.0	53.7	17.3	N/A	N/A		(SM) Silty sand w/ gravel
B6	S6	15.0	16.5	5.1				61.5	33.3	5.2	N/A	N/A		(GP-GM) Poorly-graded gravel w/ silt and sand
B6	S7	20.0	21.5	6.5										
B6	S8	25.0	26.5	12.7										
B7	S1	0.0	1.5	3.7				55.0	43.0	2.0	N/A	N/A		(GP) Poorly-graded gravel w/ sand
B7	S2	2.5	4.0	3.8										
B7	S3	5.0	6.5	2.6										
B7	S4	7.5	9.0	2.5				28.7	54.2	17.1	N/A	N/A		(SM) Silty sand w/ gravel
B7	S5	10.0	11.5	2.1										
B7	S6	15.0	16.5	2.4										
B7	S7	20.0	21.5	6.1										
B8	S1	0.5	2.0	8.4				21.3	43.1	35.6	23.7	F3	3.2	(SM) Silty sand w/ gravel
B8	S2	4.0	6.0	12.6				15.5	55.6	28.9	N/A	N/A		(SM) Silty sand w/ gravel
B8	S3	9.0	11.0	1.4				67.0	29.0	4.0	N/A	N/A		(GP) Poorly-graded gravel w/ sand
B8	S4	13.0	15.0	4.5				51.3	38.8	9.9	N/A	N/A		(GW-GM) Well-graded gravel w/ silt and sand

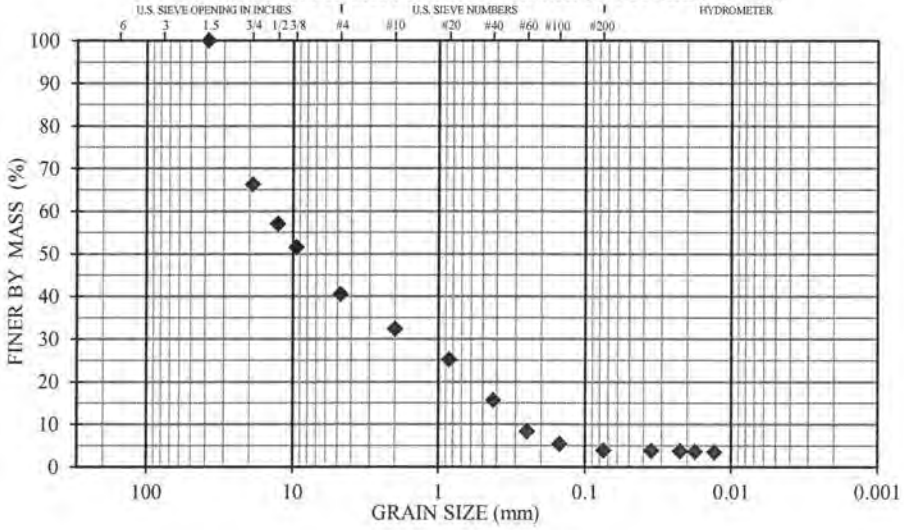
NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

Laboratory Testing · Geotechnical Engineering · Instrumentation · Construction Monitoring Services · Thermal Analysis

PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B1
NUMBER/ DEPTH:	S1 / 0 - 1.5'
DESCRIPTION:	Poorly-graded gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	59.5	USCS	GP
% SAND	36.6	USACOE FC	S1
% SILT/CLAY	3.9	% PASS. 0.02 mm	3.6
% MOIST. CONTENT	4.9	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		50.9	
COEFFICIENT OF GRADATION (C_c)		0.6	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT, (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136

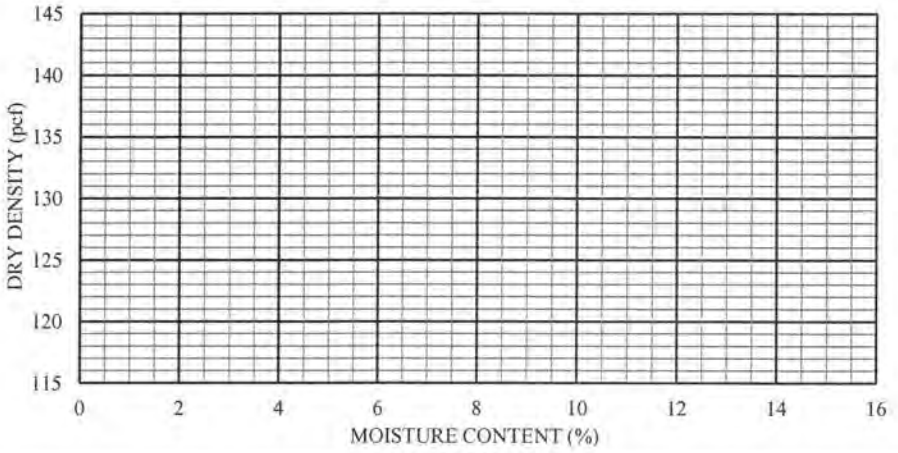


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	66	
12.70	1/2"	57	
9.50	3/8"	52	
4.75	#4	41	
2.00	#10	32	
0.85	#20	25	
0.43	#40	16	
0.25	#60	8	
0.15	#100	5	
0.075	#200	3.9	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2	0.0354	3.8
5	0.0224	3.7
8	0.0177	3.6
15	0.0131	3.5
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

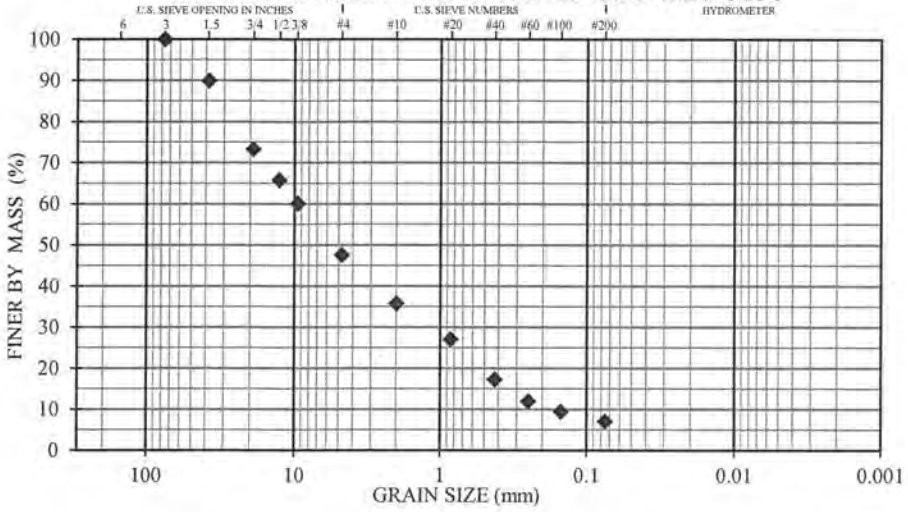
Laboratory Testing | Geotechnical Engineering | Instrumentation | Construction Monitoring Services | Thermal Analysis

PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B1
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Poorly-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	52.4	USCS	GP-GM
% SAND	40.5	USACOE FC	N/A
% SILT/CLAY	7.1	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.8	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	55.3
COEFFICIENT OF GRADATION (C_c)	1.0
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

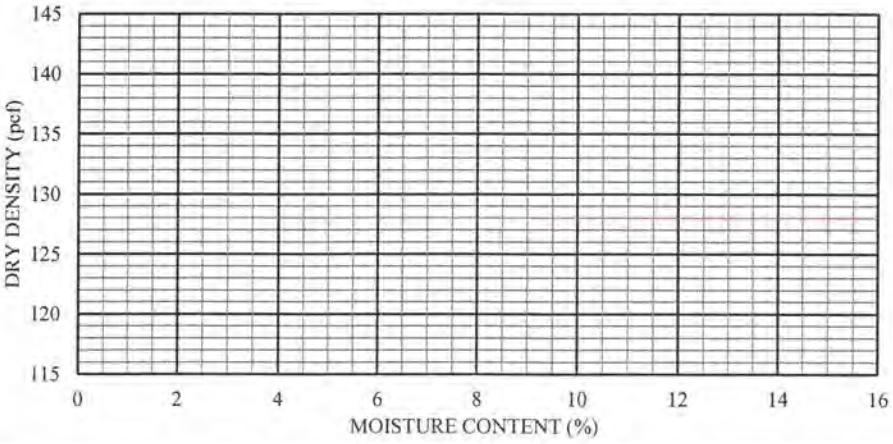
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	90	
19.00	3/4"	73	
12.70	1/2"	66	
9.50	3/8"	60	
4.75	#4	48	
2.00	#10	36	
0.85	#20	27	
0.43	#40	17	
0.25	#60	12	
0.15	#100	9	
0.075	#200	7.1	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

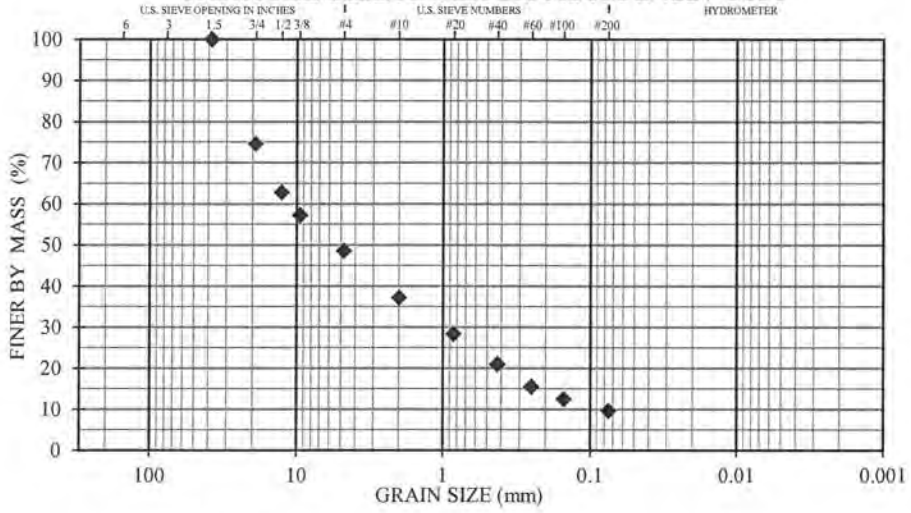
Laboratory Testing · Geotechnical Engineering · Instrumentation · Construction Monitoring Services · Thermal Analysis

PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B1
NUMBER/ DEPTH:	S7 / 20 - 21.5'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	51.4	USCS	GW-GM
% SAND	39.0	USACOE FC	N/A
% SILT/CLAY	9.6	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	6.6	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	130.6
COEFFICIENT OF GRADATION (C_c)	1.2
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

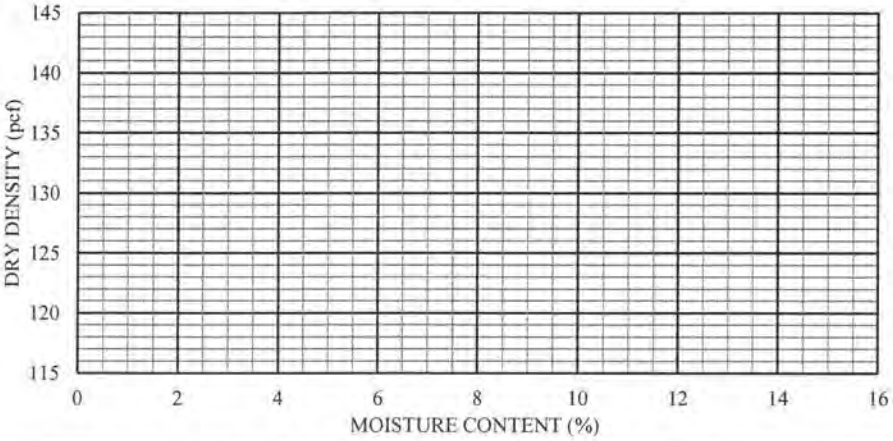
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	75	
12.70	1/2"	63	
9.50	3/8"	57	
4.75	#4	49	
2.00	#10	37	
0.85	#20	28	
0.43	#40	21	
0.25	#60	15	
0.15	#100	13	
0.075	#200	9.6	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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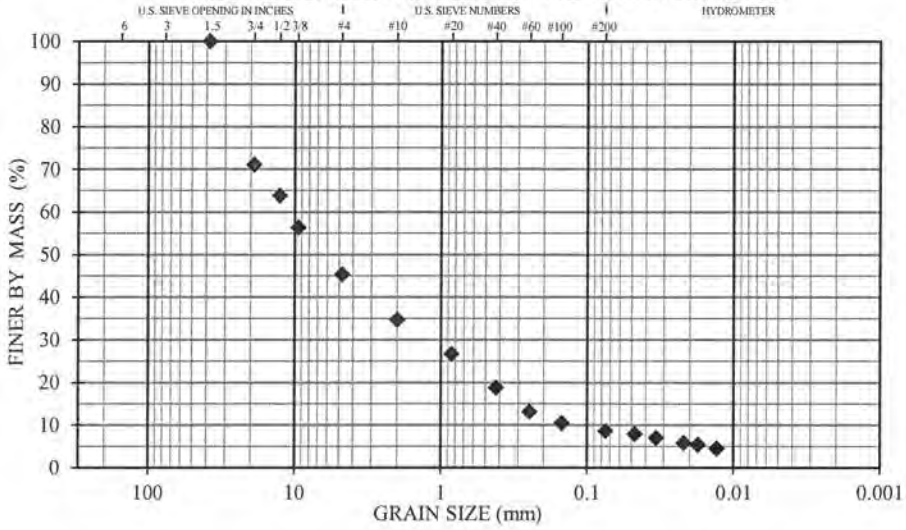
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B2
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	54.6	USCS	GW-GM
% SAND	36.8	USACOE FC	S1
% SILT/CLAY	8.6	% PASS. 0.02 mm	5.8
% MOIST. CONTENT	6.6	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		83.9	
COEFFICIENT OF GRADATION (C_c)		1.2	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136

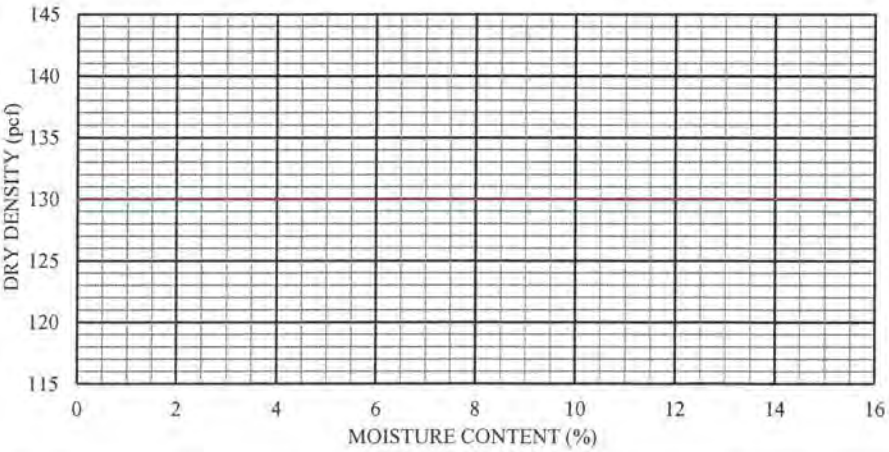


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	71	
12.70	1/2"	64	
9.50	3/8"	56	
4.75	#4	45	
2.00	#10	35	
0.85	#20	27	
0.43	#40	19	
0.25	#60	13	
0.15	#100	10	
0.075	#200	8.6	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0475	7.9
2	0.0340	7.0
5	0.0219	5.8
8	0.0175	5.4
15	0.0131	4.5
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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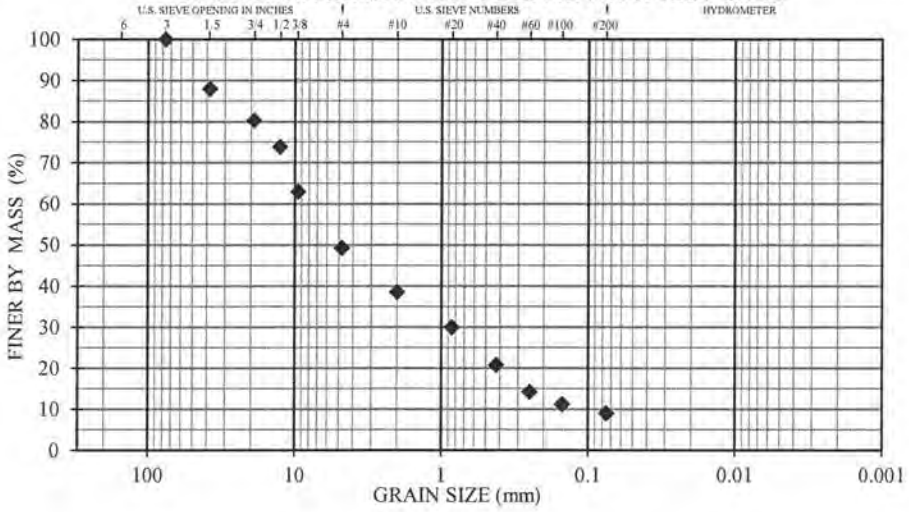
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B2
NUMBER/ DEPTH:	S3 / 5 - 6.5'
DESCRIPTION:	Poorly-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	50.7	USCS	GP-GM
% SAND	40.3	USACOE FC	N/A
% SILT/CLAY	9.0	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	7.1	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		77.0	
COEFFICIENT OF GRADATION (C_c)		0.8	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

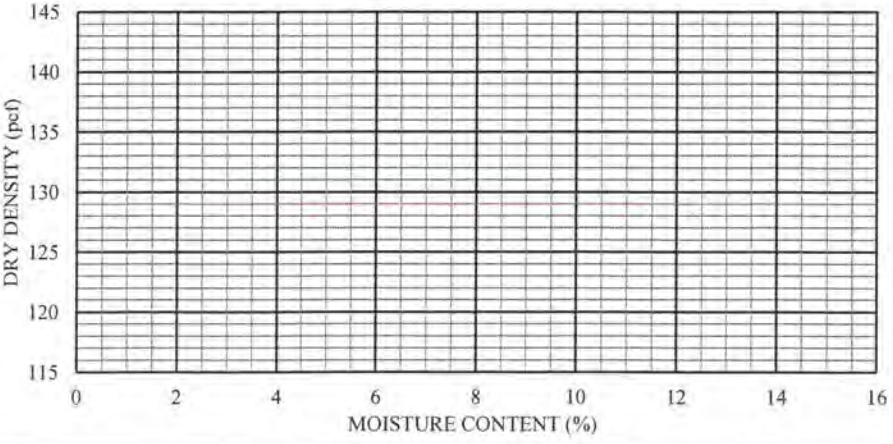
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	88	
19.00	3/4"	80	
12.70	1/2"	74	
9.50	3/8"	63	
4.75	#4	49	
2.00	#10	39	
0.85	#20	30	
0.43	#40	21	
0.25	#60	14	
0.15	#100	11	
0.075	#200	9.0	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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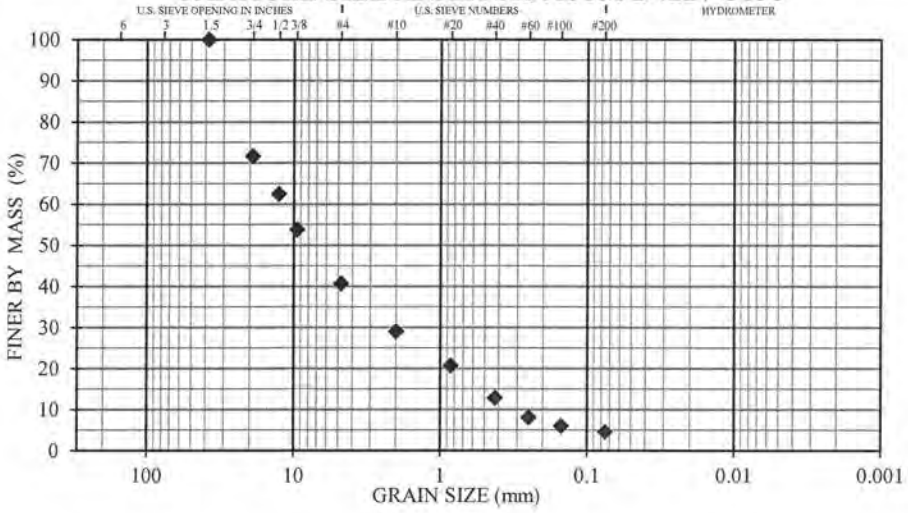
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B2
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Well-graded gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	59.4	USCS	GW
% SAND	36.1	USACOE FC	N/A
% SILT/CLAY	4.5	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	3.9	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	36.8
COEFFICIENT OF GRADATION (C_c)	1.3
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

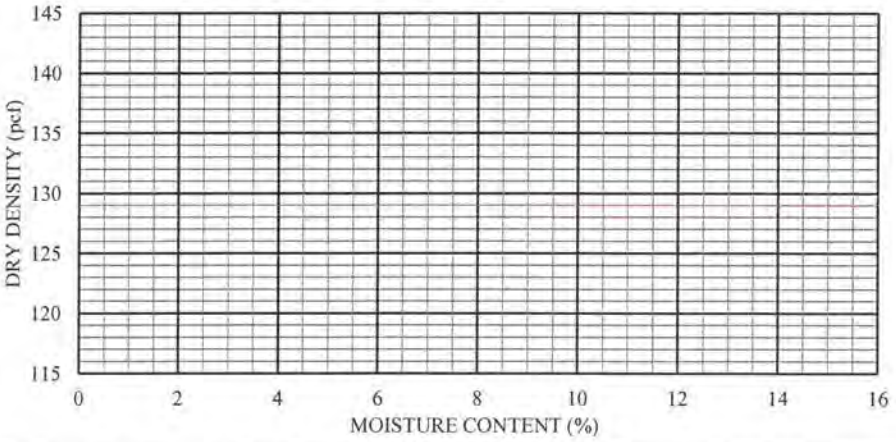


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	72	
12.70	1/2"	62	
9.50	3/8"	54	
4.75	#4	41	
2.00	#10	29	
0.85	#20	21	
0.43	#40	13	
0.25	#60	8	
0.15	#100	6	
0.075	#200	4.5	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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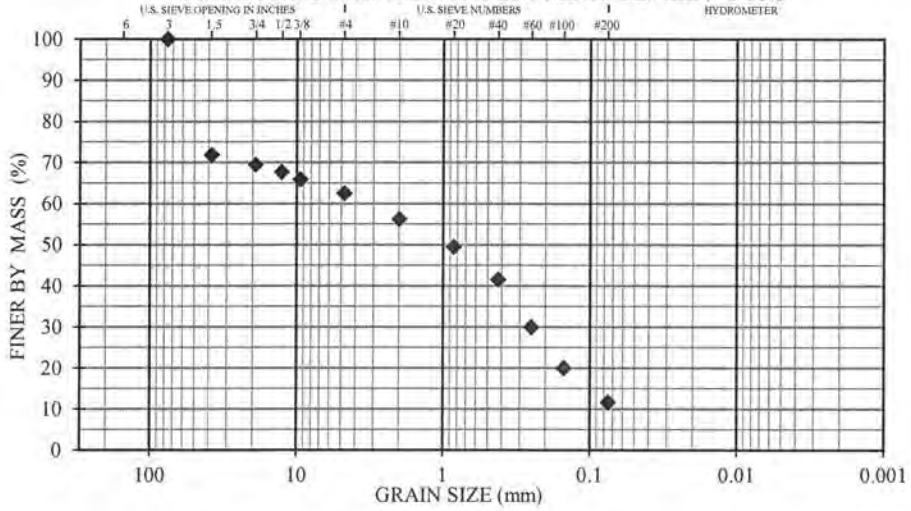
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B2
NUMBER/ DEPTH:	S7 / 20 - 21.5'
DESCRIPTION:	Poorly-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	37.5	USCS	SP-SM
% SAND	50.9	USACOE FC	N/A
% SILT/CLAY	11.6	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	8.6	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)			UNKNOWN
COEFFICIENT OF GRADATION (C_c)			UNKNOWN
ASTM D1557 (uncorrected)			N/A
ASTM D4718 (corrected)			N/A
OPTIMUM MOIST. CONTENT. (corrected)			N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

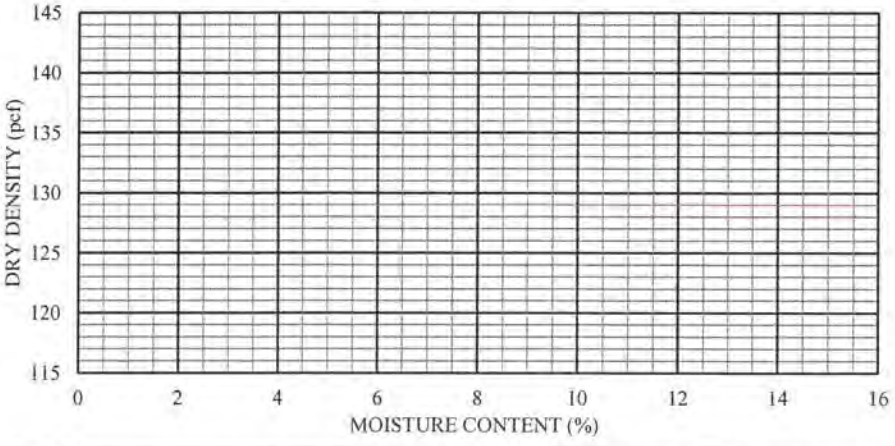
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	72	
19.00	3/4"	69	
12.70	1/2"	68	
9.50	3/8"	66	
4.75	#4	62	
2.00	#10	56	
0.85	#20	49	
0.43	#40	41	
0.25	#60	30	
0.15	#100	20	
0.075	#200	11.6	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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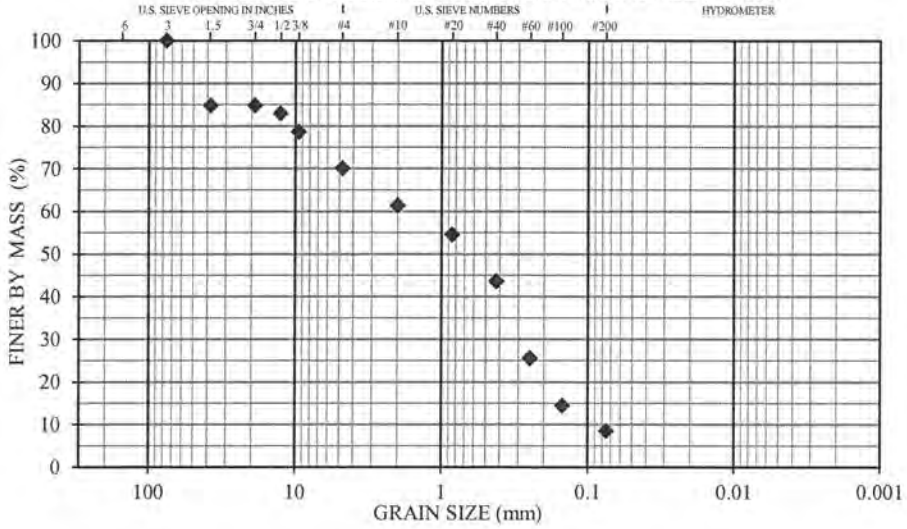
PROJECT CLIENT:	**American Engineering Testing, Inc.**
PROJECT NAME:	**7751 W Parks Hwy., Wasilla, AK**
PROJECT NO.:	**5862-20**
SAMPLE LOC.:	**B2**
NUMBER/ DEPTH:	**S8 / 25 - 26.5'**
DESCRIPTION:	**Poorly-graded sand w/ silt and gravel**
DATE RECEIVED:	**10/5/2020**
TESTED BY:	**EA**
REVIEWED BY:	**CJB**

% GRAVEL	**29.8**	USCS	**SP-SM**
% SAND	**61.7**	USACOE FC	**N/A**
% SILT/CLAY	**8.5**	% PASS. 0.02 mm	**N/A**
% MOIST. CONTENT	**10.0**	% PASS. 0.002 mm	**N/A**
UNIFORMITY COEFFICIENT (C_u)		**18.9**	
COEFFICIENT OF GRADATION (C_c)		**0.5**	
ASTM D1557 (uncorrected)		**N/A**	
ASTM D4718 (corrected)		**N/A**	
OPTIMUM MOIST. CONTENT. (corrected)		**N/A**	

PARTICLE SIZE ANALYSIS ASTM D422 / C136

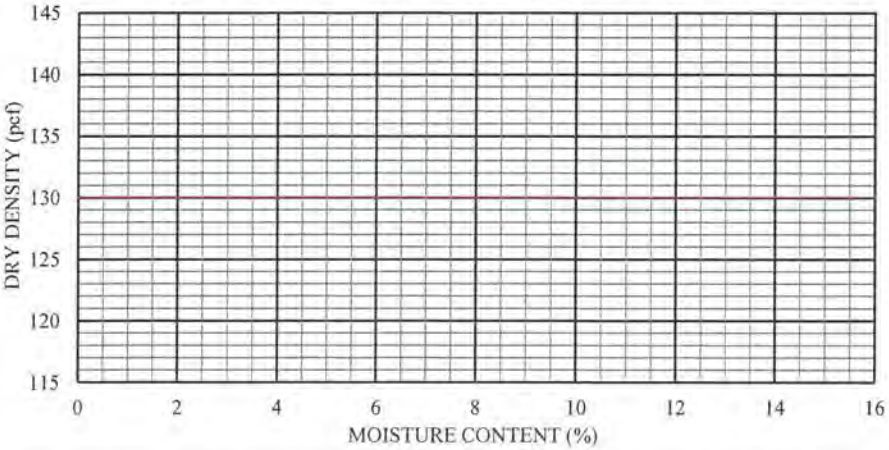


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	**100**	
38.10	1.5"	**85**	
19.00	3/4"	**85**	
12.70	1/2"	**83**	
9.50	3/8"	**79**	
4.75	#4	**70**	
2.00	#10	**61**	
0.85	#20	**55**	
0.43	#40	**44**	
0.25	#60	**26**	
0.15	#100	**14**	
0.075	#200	**8.5**	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	**N/A**
DEGRADATION (ATM T-313)	**N/A**
PLASTICITY INDEX ASTM 4318	**N/A**

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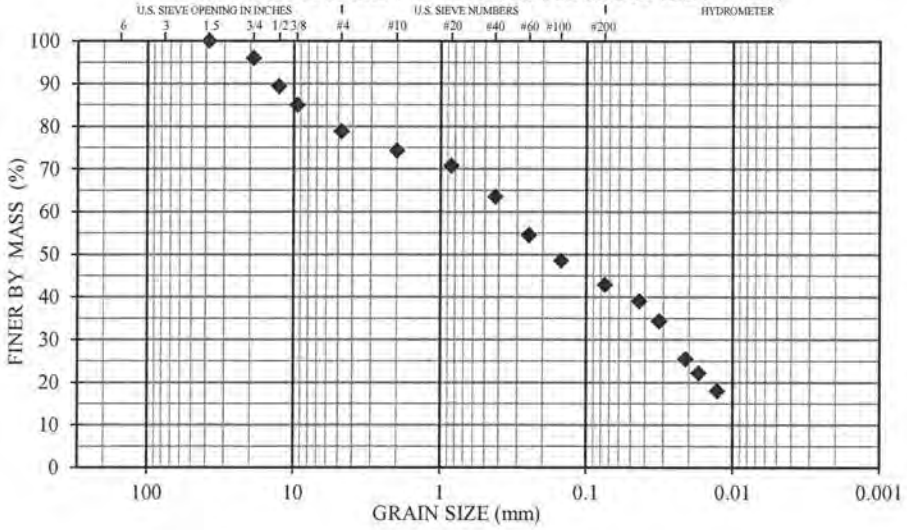
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B3
NUMBER/ DEPTH:	S1 / 0 - 1.5'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	21.2	USCS	SM
% SAND	36.0	USACOE FC	F3
% SILT/CLAY	42.8	% PASS. 0.02 mm	24.4
% MOIST. CONTENT	30.1	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)			UNKNOWN
COEFFICIENT OF GRADATION (C_c)			UNKNOWN
ASTM D1557 (uncorrected)			N/A
ASTM D4718 (corrected)			N/A
OPTIMUM MOIST. CONTENT. (corrected)			N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

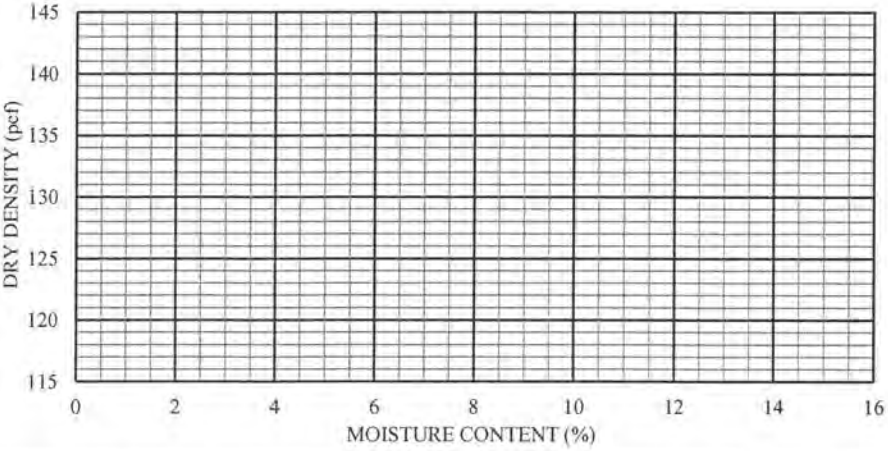
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	96	
12.70	1/2"	89	
9.50	3/8"	85	
4.75	#4	79	
2.00	#10	74	
0.85	#20	71	
0.43	#40	64	
0.25	#60	55	
0.15	#100	49	
0.075	#200	42.9	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0436	39.1
2	0.0321	34.4
5	0.0212	25.5
8	0.0172	22.2
15	0.0128	18.0
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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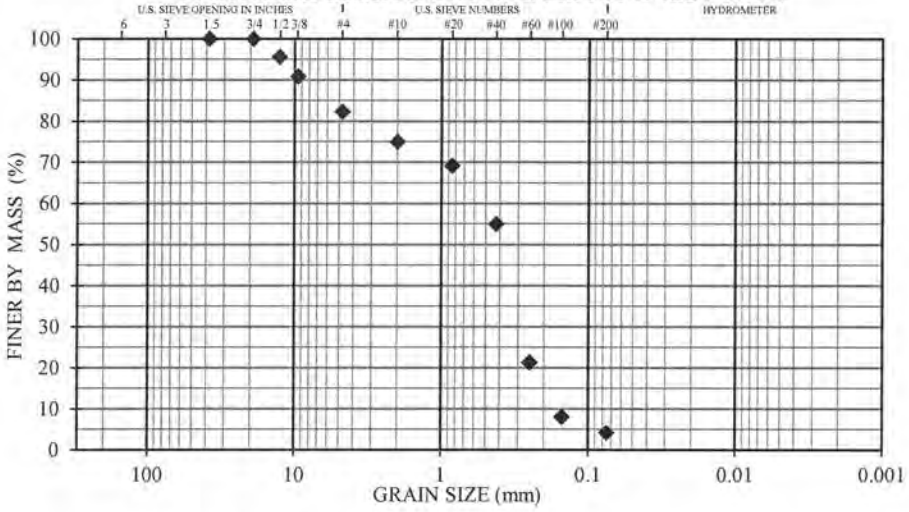
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B3
NUMBER/ DEPTH:	S2 / 3 - 4'
DESCRIPTION:	Poorly-graded sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	17.7	USCS	SP
% SAND	78.2	USACOE FC	N/A
% SILT/CLAY	4.1	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.7	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	3.5
COEFFICIENT OF GRADATION (C_c)	0.9
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

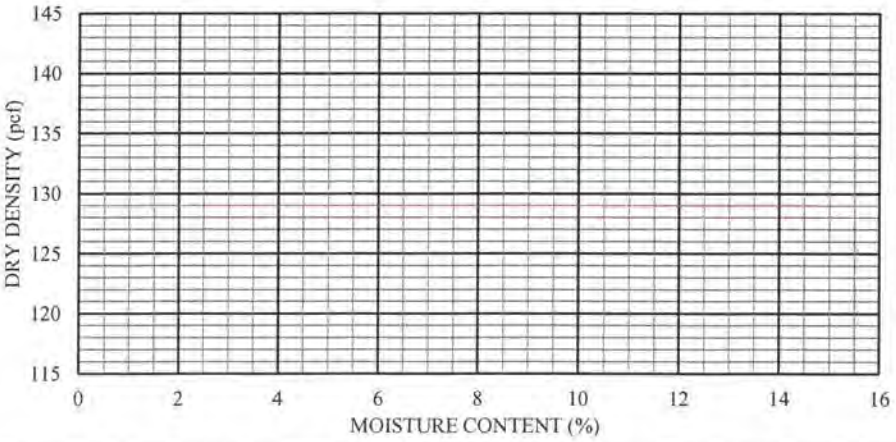
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	100	
12.70	1/2"	96	
9.50	3/8"	91	
4.75	#4	82	
2.00	#10	75	
0.85	#20	69	
0.43	#40	55	
0.25	#60	21	
0.15	#100	8	
0.075	#200	4.1	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

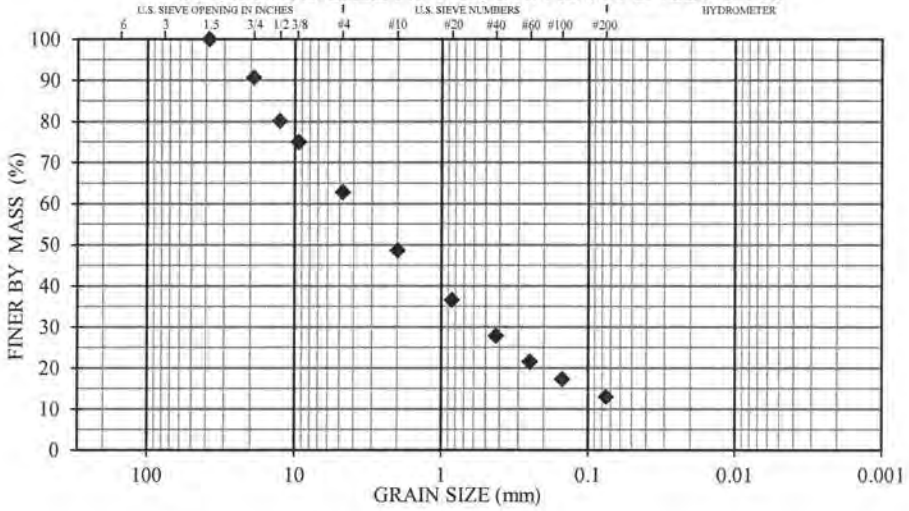
Laboratory Testing · Geotechnical Engineering · Instrumentation · Construction Monitoring Services · Thermal Analysis

PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B3
NUMBER/ DEPTH:	S3 / 5 - 6.5'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	37.2	USCS	SM
% SAND	49.8	USACOE FC	N/A
% SILT/CLAY	13.0	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.4	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

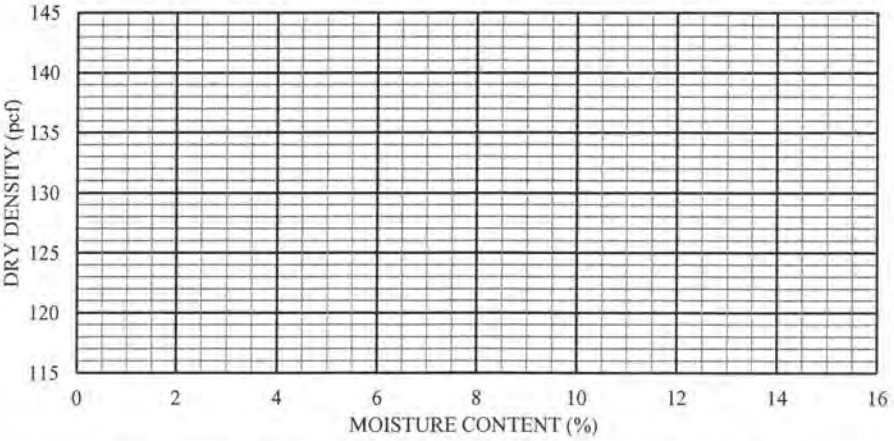
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	91	
12.70	1/2"	80	
9.50	3/8"	75	
4.75	#4	63	
2.00	#10	49	
0.85	#20	37	
0.43	#40	28	
0.25	#60	22	
0.15	#100	17	
0.075	#200	13.0	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

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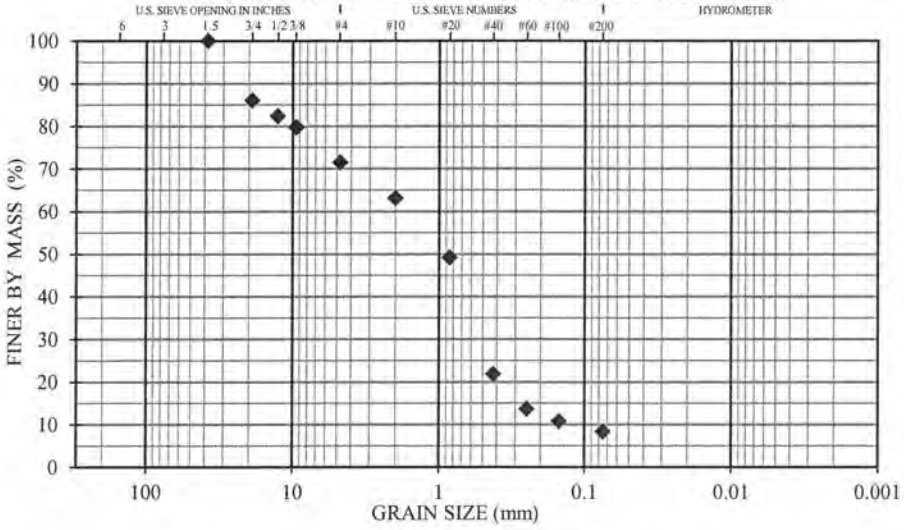
PROJECT CLIENT:	**American Engineering Testing, Inc.**
PROJECT NAME:	**7751 W Parks Hwy., Wasilla, AK**
PROJECT NO.:	**5862-20**
SAMPLE LOC.:	**B3**
NUMBER/ DEPTH:	**S6 / 15 - 16.5'**
DESCRIPTION:	**Well-graded sand w/ silt and gravel**
DATE RECEIVED:	**10/5/2020**
TESTED BY:	**EA**
REVIEWED BY:	**CJB**

% GRAVEL	**28.5**	USCS	**SW-SM**
% SAND	**63.2**	USACOE FC	**N/A**
% SILT/CLAY	**8.3**	% PASS. 0.02 mm	**N/A**
% MOIST. CONTENT	**2.1**	% PASS. 0.002 mm	**N/A**

UNIFORMITY COEFFICIENT (C_u)	**13.9**
COEFFICIENT OF GRADATION (C_c)	**1.4**
ASTM D1557 (uncorrected)	**N/A**
ASTM D4718 (corrected)	**N/A**
OPTIMUM MOIST. CONTENT. (corrected)	**N/A**

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

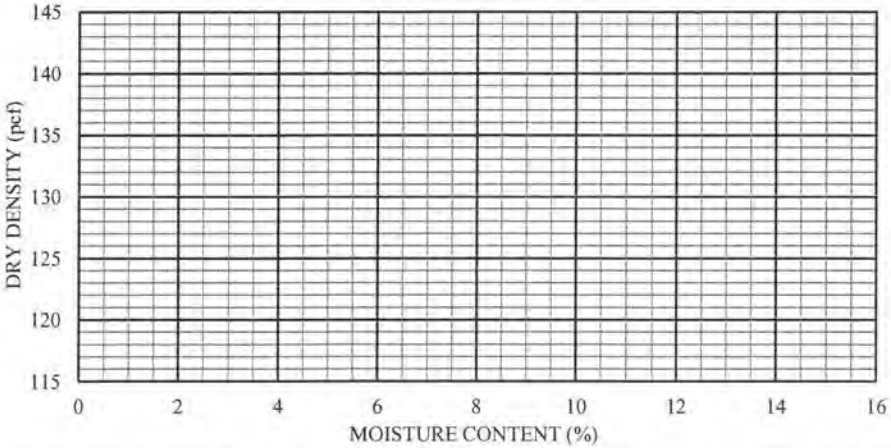
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	**100**	
19.00	3/4"	**86**	
12.70	1/2"	**82**	
9.50	3/8"	**80**	
4.75	#4	**71**	
2.00	#10	**63**	
0.85	#20	**49**	
0.43	#40	**22**	
0.25	#60	**14**	
0.15	#100	**11**	
0.075	#200	**8.3**	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	**N/A**
DEGRADATION (ATM T-313)	**N/A**
PLASTICITY INDEX ASTM 4318	**N/A**

The testing services reported herein have been performed to recognized industry standards, unless otherwise noted. No other warranty is made. Should engineering interpretation or opinion be required, NGE-TFT will provide upon written request.

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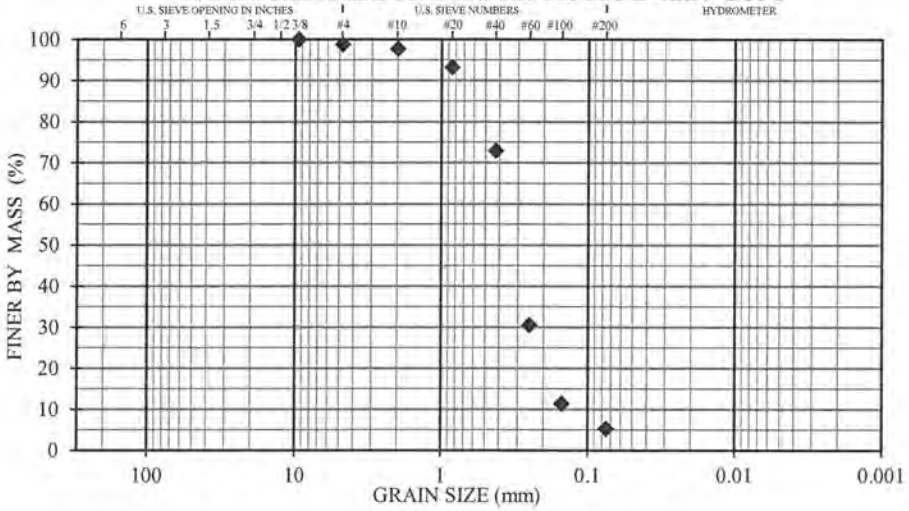
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B3
NUMBER/ DEPTH:	S7 / 20 - 21.5'
DESCRIPTION:	Poorly-graded sand w/ silt
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	1.2	USCS	SP-SM
% SAND	93.5	USACOE FC	N/A
% SILT/CLAY	5.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	21.1	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		2.8	
COEFFICIENT OF GRADATION (C_c)		1.2	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136

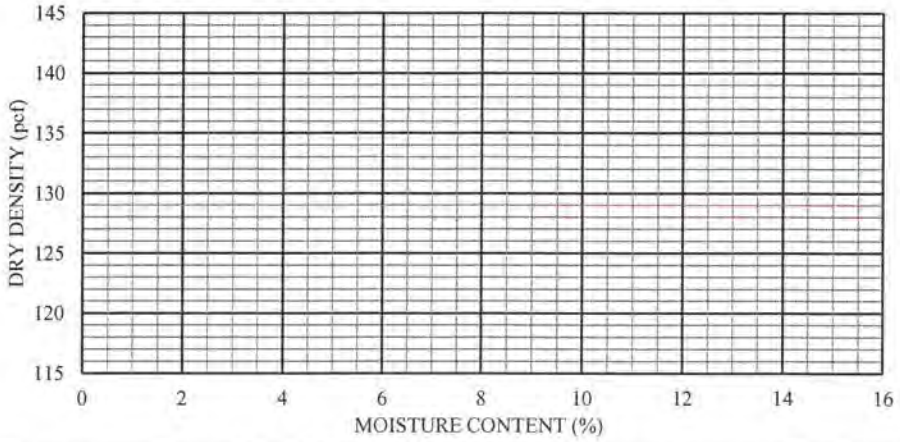


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"		
19.00	3/4"		
12.70	1/2"		
9.50	3/8"	100	
4.75	#4	99	
2.00	#10	98	
0.85	#20	93	
0.43	#40	73	
0.25	#60	31	
0.15	#100	11	
0.075	#200	5.3	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

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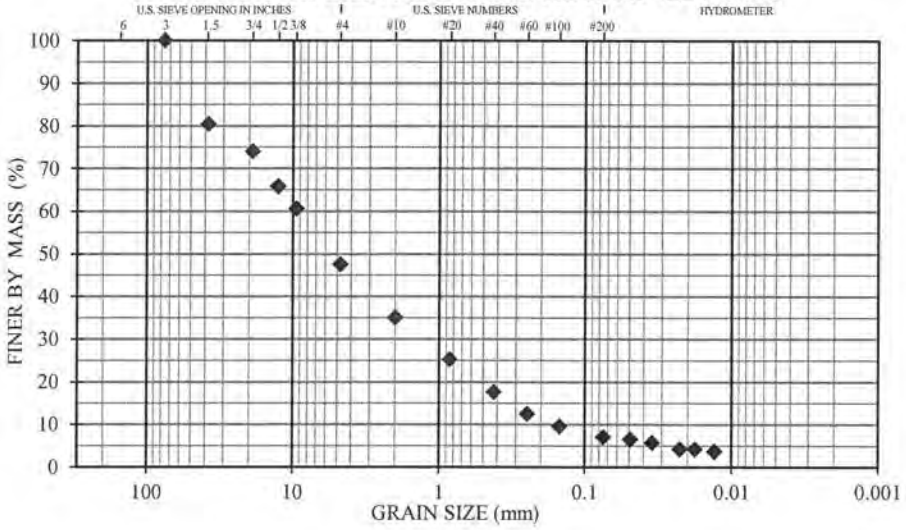
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B4
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	52.4	USCS	GW-GM
% SAND	40.5	USACOE FC	S1
% SILT/CLAY	7.1	% PASS. 0.02 mm	4.5
% MOIST. CONTENT	2.4	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	56.4
COEFFICIENT OF GRADATION (C_c)	1.3
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

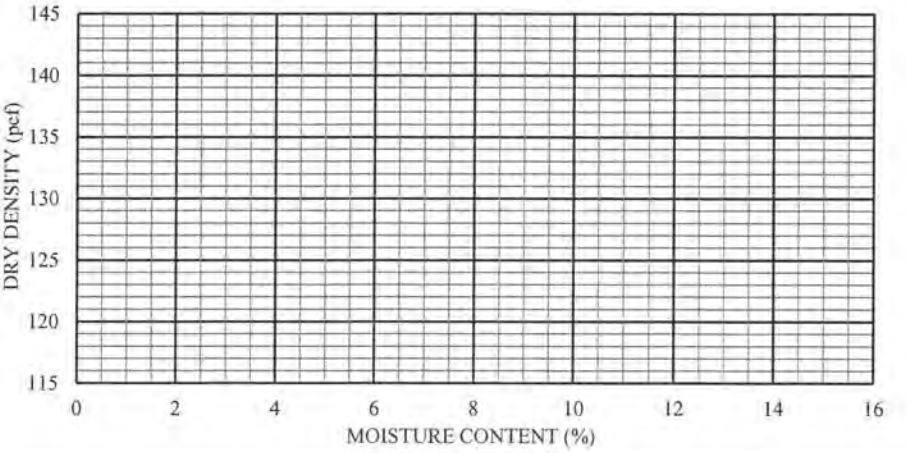


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	80	
19.00	3/4"	74	
12.70	1/2"	66	
9.50	3/8"	61	
4.75	#4	48	
2.00	#10	35	
0.85	#20	25	
0.43	#40	18	
0.25	#60	13	
0.15	#100	10	
0.075	#200	7.1	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0490	6.5
2	0.0349	5.8
5	0.0226	4.3
8	0.0179	4.3
15	0.0131	3.7
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

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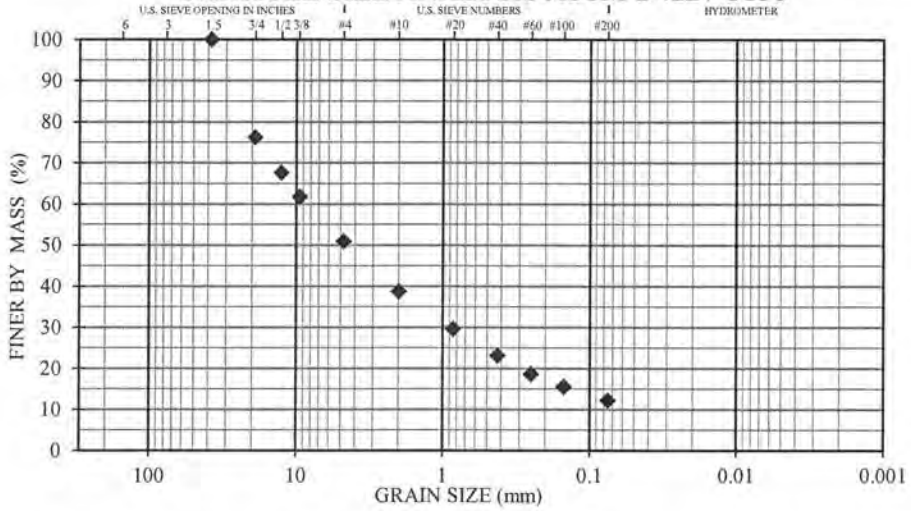
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B4
NUMBER/ DEPTH:	S5 / 10 - 11.5'
DESCRIPTION:	Silty gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	49.1	USCS	GM
% SAND	38.7	USACOE FC	N/A
% SILT/CLAY	12.2	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.1	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)			UNKNOWN
COEFFICIENT OF GRADATION (C_c)			UNKNOWN
ASTM D1557 (uncorrected)			N/A
ASTM D4718 (corrected)			N/A
OPTIMUM MOIST. CONTENT. (corrected)			N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

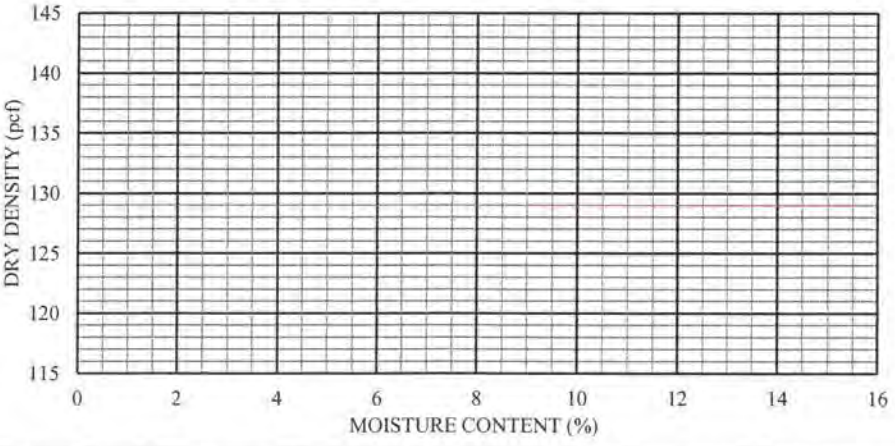
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	76	
12.70	1/2"	68	
9.50	3/8"	62	
4.75	#4	51	
2.00	#10	39	
0.85	#20	30	
0.43	#40	23	
0.25	#60	19	
0.15	#100	16	
0.075	#200	12.2	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

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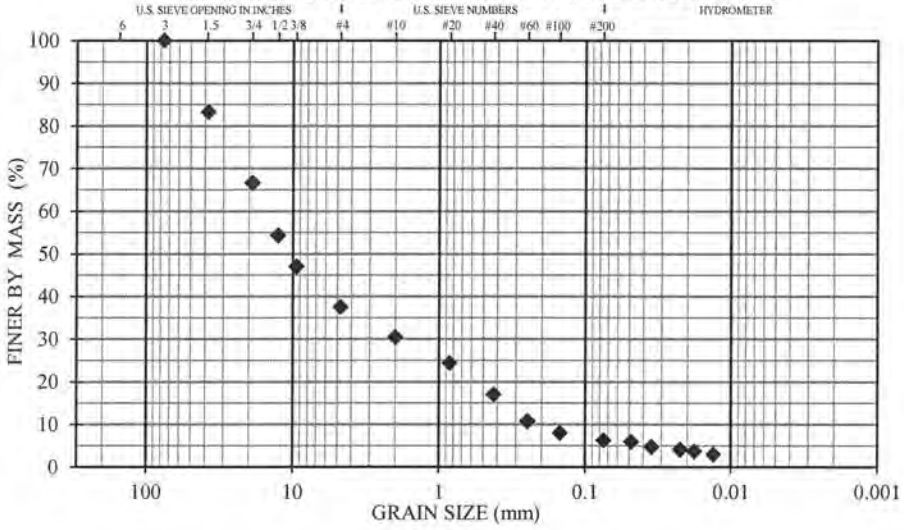
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S1 / 0 - 1.5'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	62.4	USCS	GW-GM
% SAND	31.3	USACOE FC	S1
% SILT/CLAY	6.3	% PASS. 0.02 mm	4.0
% MOIST. CONTENT	6.7	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		70.0	
COEFFICIENT OF GRADATION (C_c)		1.0	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

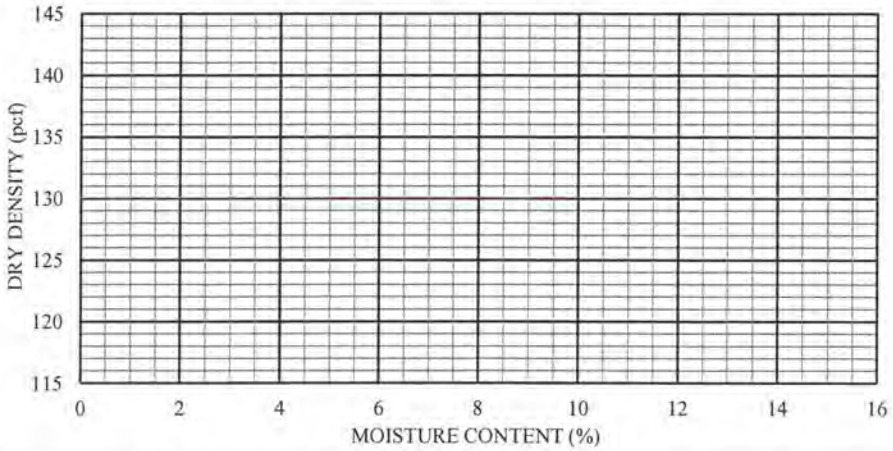
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	83	
19.00	3/4"	67	
12.70	1/2"	54	
9.50	3/8"	47	
4.75	#4	38	
2.00	#10	31	
0.85	#20	24	
0.43	#40	17	
0.25	#60	11	
0.15	#100	8	
0.075	#200	6.3	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0485	5.9
2	0.0351	4.8
5	0.0224	4.1
8	0.0179	3.7
15	0.0132	2.9
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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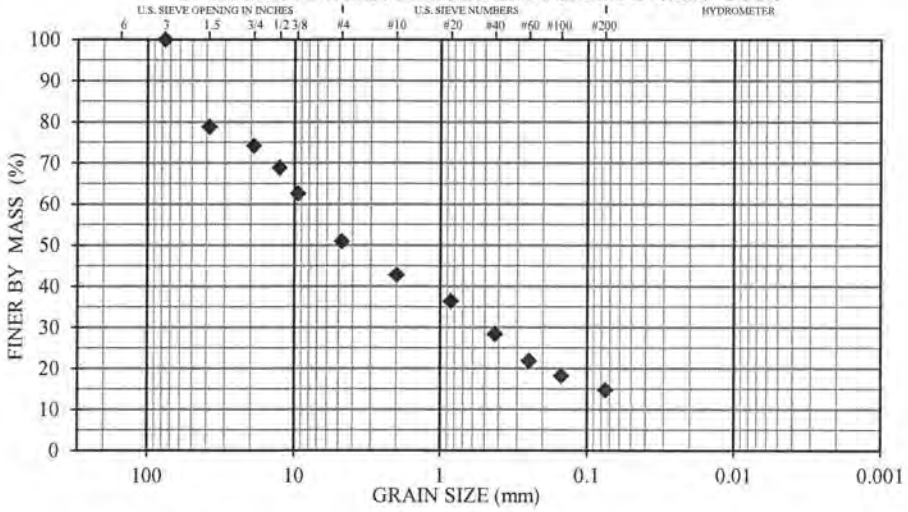
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Silty gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	49.1	USCS	GM
% SAND	36.2	USACOE FC	N/A
% SILT/CLAY	14.7	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	11.6	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)			UNKNOWN
COEFFICIENT OF GRADATION (C_c)			UNKNOWN
ASTM D1557 (uncorrected)			N/A
ASTM D4718 (corrected)			N/A
OPTIMUM MOIST. CONTENT. (corrected)			N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

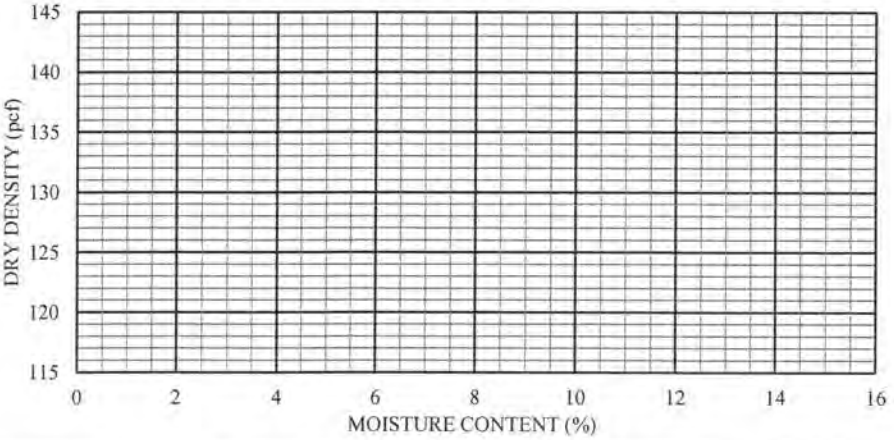
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	79	
19.00	3/4"	74	
12.70	1/2"	69	
9.50	3/8"	63	
4.75	#4	51	
2.00	#10	43	
0.85	#20	36	
0.43	#40	28	
0.25	#60	22	
0.15	#100	18	
0.075	#200	14.7	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

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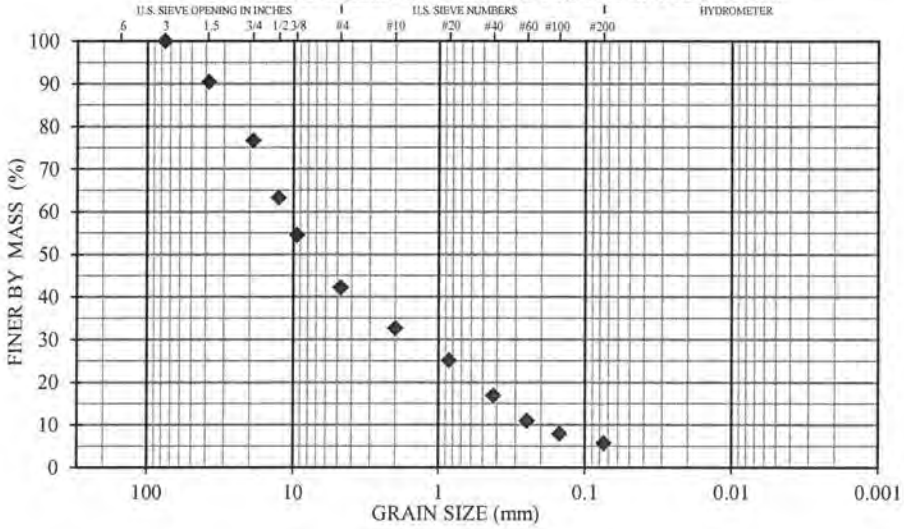
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S3 / 5 - 6.5'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	57.8	USCS	GW-GM
% SAND	36.5	USACOE FC	N/A
% SILT/CLAY	5.7	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	4.3	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		52.8	
COEFFICIENT OF GRADATION (C_c)		1.0	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

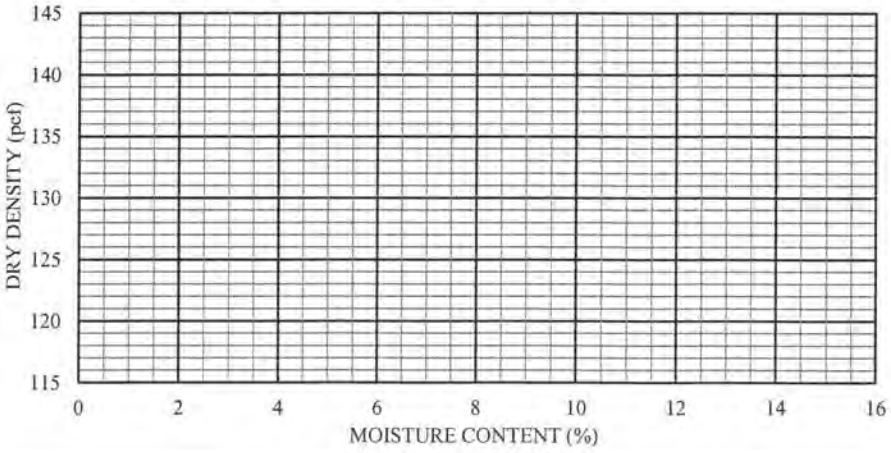
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	90	
19.00	3/4"	77	
12.70	1/2"	63	
9.50	3/8"	55	
4.75	#4	42	
2.00	#10	33	
0.85	#20	25	
0.43	#40	17	
0.25	#60	11	
0.15	#100	8	
0.075	#200	5.7	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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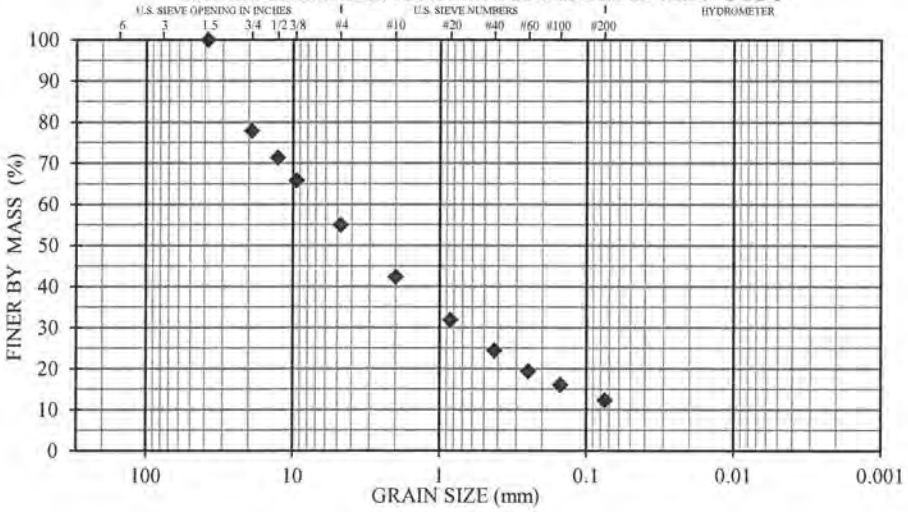
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S7 / 20 - 21.5'
DESCRIPTION:	Silty gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	45.1	USCS	GM
% SAND	42.6	USACOE FC	N/A
% SILT/CLAY	12.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	7.7	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

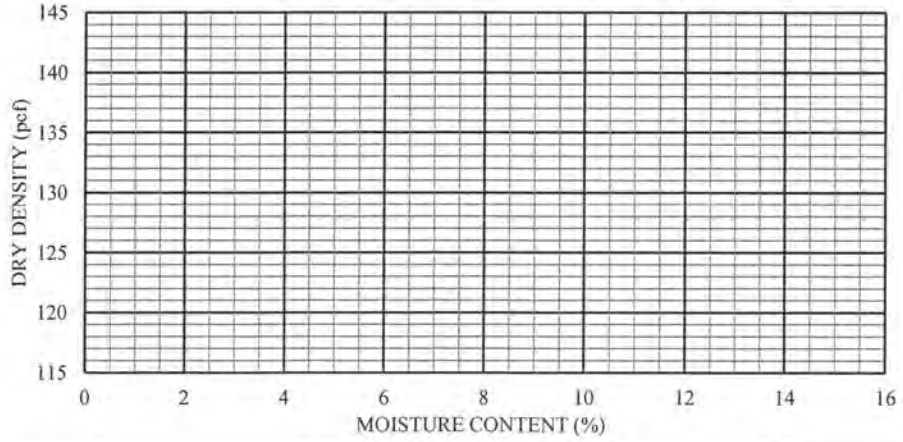


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	78	
12.70	1/2"	71	
9.50	3/8"	66	
4.75	#4	55	
2.00	#10	42	
0.85	#20	32	
0.43	#40	24	
0.25	#60	19	
0.15	#100	16	
0.075	#200	12.3	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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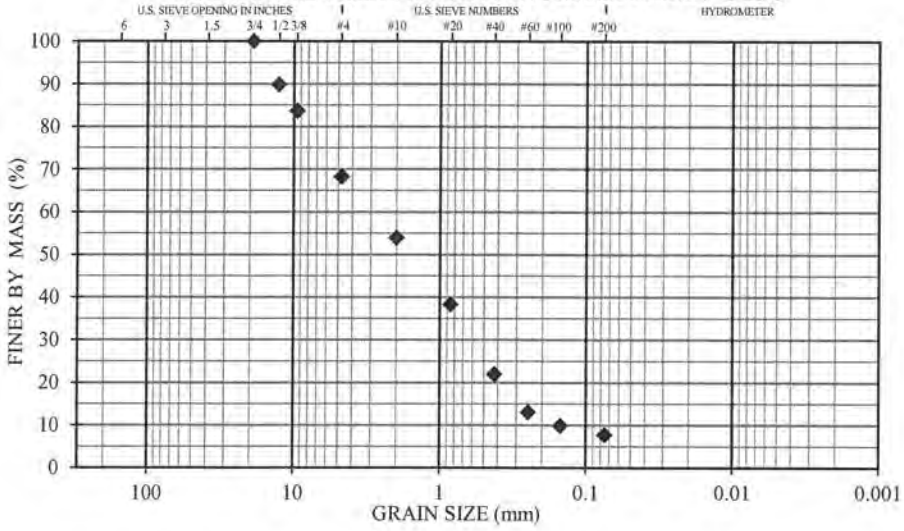
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S8 / 25 - 26.5'
DESCRIPTION:	Poorly-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	31.7	USCS	SP-SM
% SAND	60.5	USACOE FC	N/A
% SILT/CLAY	7.8	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	7.7	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	20.6
COEFFICIENT OF GRADATION (C_c)	0.8
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

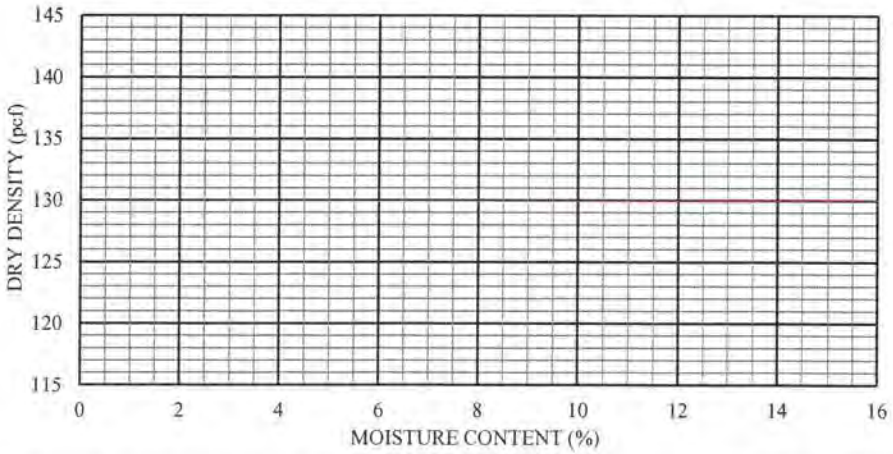


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"		
19.00	3/4"	100	
12.70	1/2"	90	
9.50	3/8"	84	
4.75	#4	68	
2.00	#10	54	
0.85	#20	38	
0.43	#40	22	
0.25	#60	13	
0.15	#100	10	
0.075	#200	7.8	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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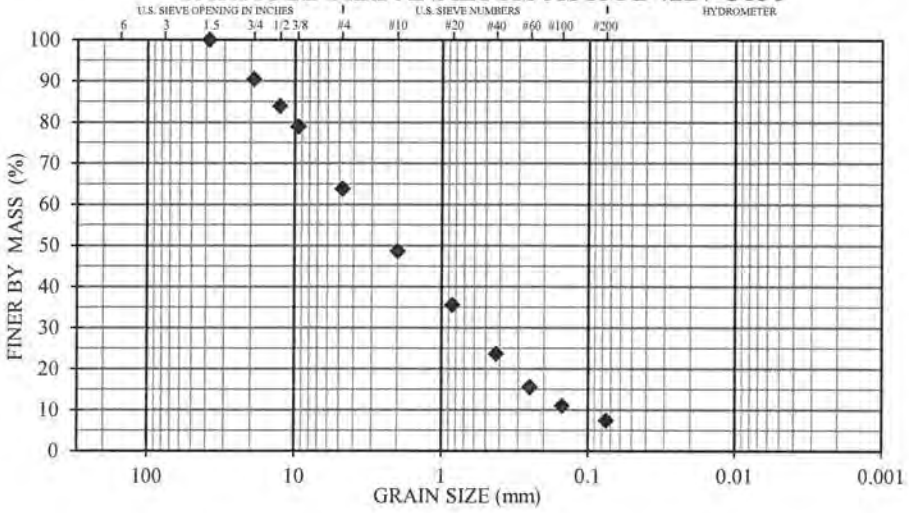
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S9 / 30 - 31.5'
DESCRIPTION:	Poorly-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	36.2	USCS	SP-SM
% SAND	56.3	USACOE FC	N/A
% SILT/CLAY	7.5	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	9.4	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	31.5
COEFFICIENT OF GRADATION (C_c)	0.8
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

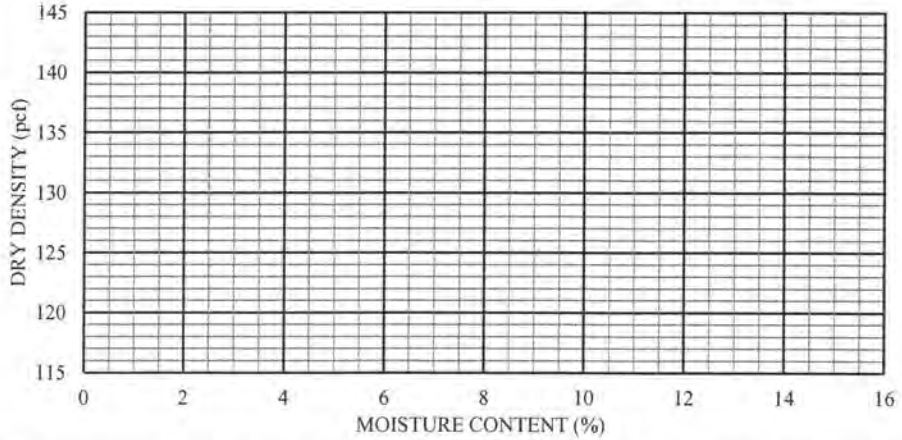


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	90	
12.70	1/2"	84	
9.50	3/8"	79	
4.75	#4	64	
2.00	#10	49	
0.85	#20	36	
0.43	#40	24	
0.25	#60	16	
0.15	#100	11	
0.075	#200	7.5	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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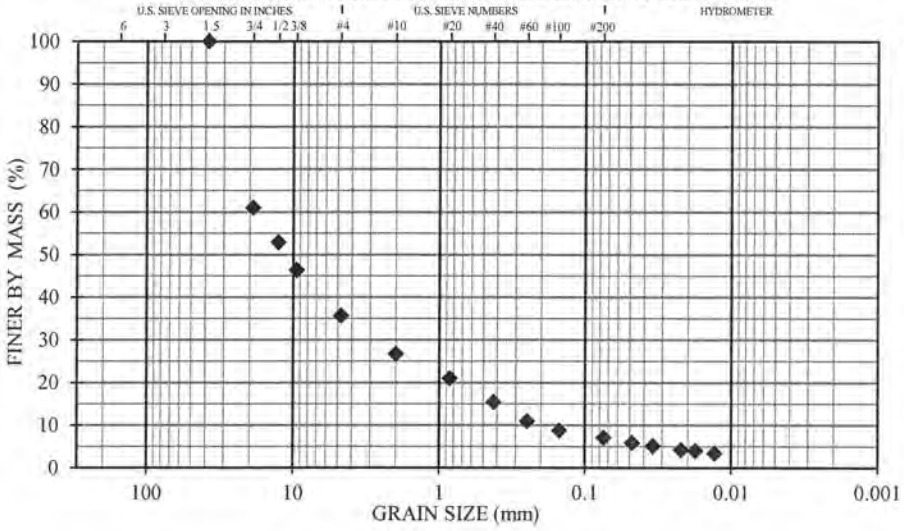
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B6
NUMBER/ DEPTH:	S1 / 0 - 1.5'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	64.3	USCS	GW-GM
% SAND	28.6	USACOE FC	S1
% SILT/CLAY	7.1	% PASS. 0.02 mm	4.3
% MOIST. CONTENT	4.9	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		87.9	
COEFFICIENT OF GRADATION (C_c)		2.4	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136

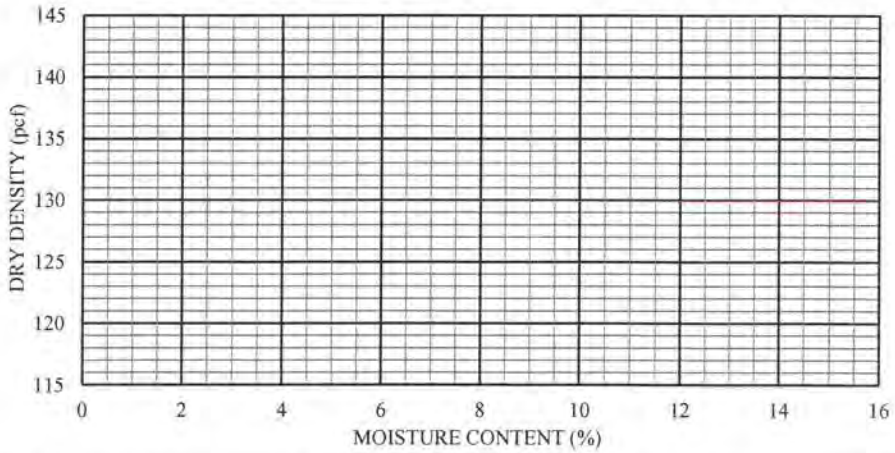


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	61	
12.70	1/2"	53	
9.50	3/8"	46	
4.75	#4	36	
2.00	#10	27	
0.85	#20	21	
0.43	#40	15	
0.25	#60	11	
0.15	#100	9	
0.075	#200	7.1	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0481	5.9
2	0.0347	5.1
5	0.0222	4.3
8	0.0177	4.0
15	0.0131	3.4
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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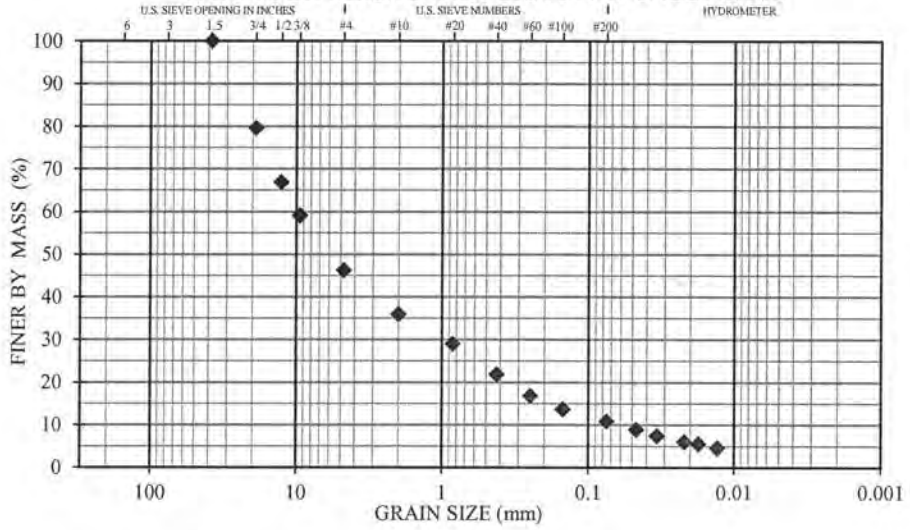
PROJECT CLIENT:	**American Engineering Testing, Inc.**
PROJECT NAME:	**7751 W Parks Hwy., Wasilla, AK**
PROJECT NO.:	**5862-20**
SAMPLE LOC.:	**B6**
NUMBER/ DEPTH:	**S2 / 2.5 - 4'**
DESCRIPTION:	**Well-graded gravel w/ silt and sand**
DATE RECEIVED:	**10/5/2020**
TESTED BY:	**EA**
REVIEWED BY:	**CJB**

% GRAVEL	**53.7**	USCS	**GW-GM**
% SAND	**35.5**	USACOE FC	**S1**
% SILT/CLAY	**10.8**	% PASS. 0.02 mm	**6.0**
% MOIST. CONTENT	**7.2**	% PASS. 0.002 mm	**N/A**
UNIFORMITY COEFFICIENT (C_u)		**156.2**	
COEFFICIENT OF GRADATION (C_c)		**1.7**	
ASTM D1557 (uncorrected)		**N/A**	
ASTM D4718 (corrected)		**N/A**	
OPTIMUM MOIST. CONTENT. (corrected)		**N/A**	

PARTICLE SIZE ANALYSIS ASTM D422 / C136

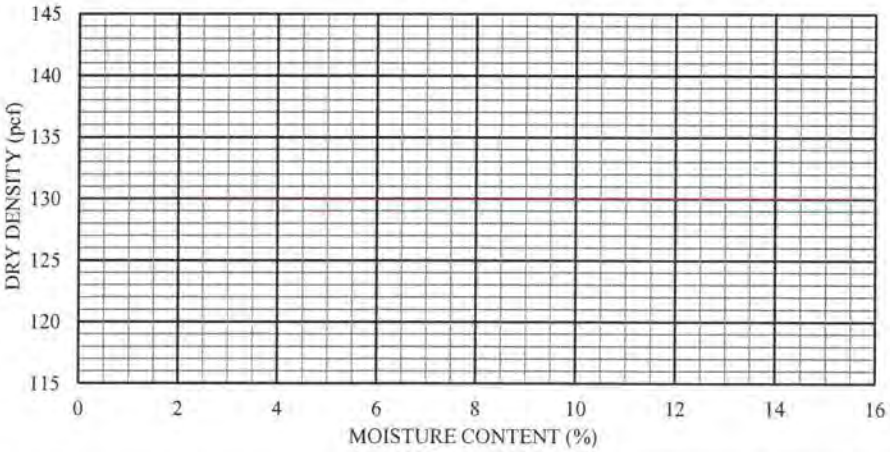


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	**100**	
19.00	3/4"	**80**	
12.70	1/2"	**67**	
9.50	3/8"	**59**	
4.75	#4	**46**	
2.00	#10	**36**	
0.85	#20	**29**	
0.43	#40	**22**	
0.25	#60	**17**	
0.15	#100	**14**	
0.075	#200	**10.8**	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0469	8.8
2	0.0340	7.4
5	0.0219	6.0
8	0.0175	5.6
15	0.0131	4.6
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	**N/A**
DEGRADATION (ATM T-313)	**N/A**
PLASTICITY INDEX ASTM 4318	**N/A**

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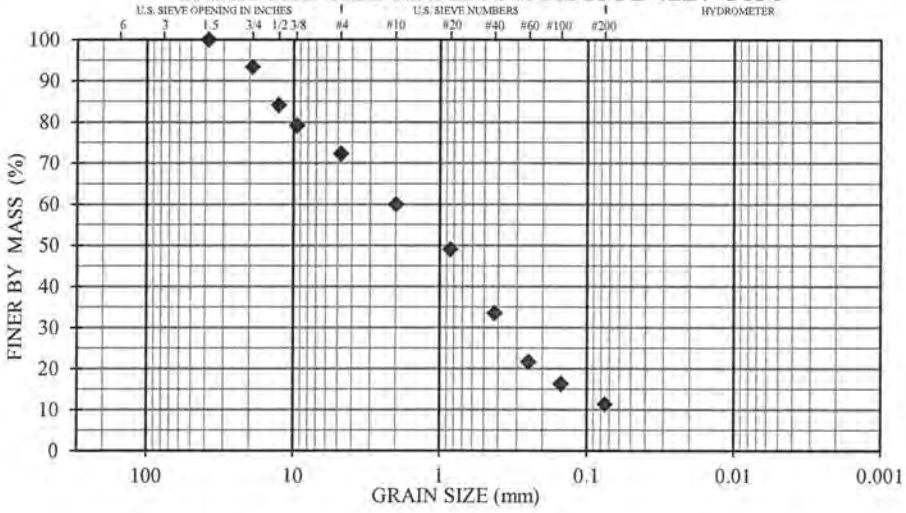
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B6
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Poorly-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	27.7	USCS	SP-SM
% SAND	61.0	USACOE FC	N/A
% SILT/CLAY	11.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	3.1	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

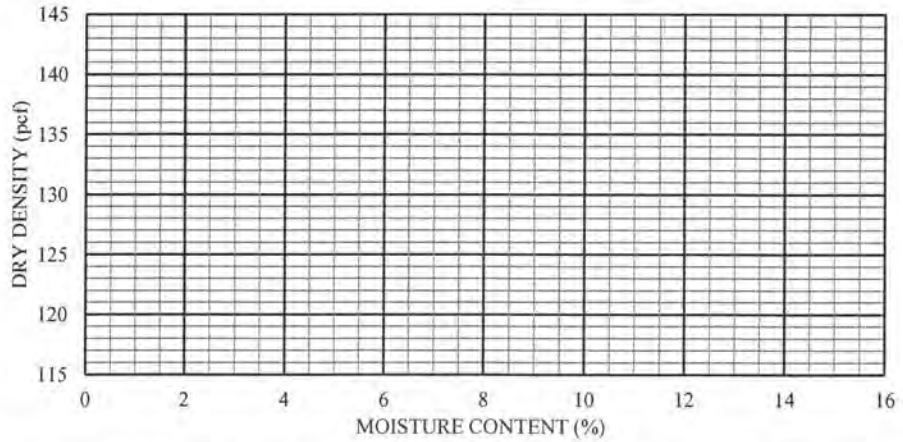


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	93	
12.70	1/2"	84	
9.50	3/8"	79	
4.75	#4	72	
2.00	#10	60	
0.85	#20	49	
0.43	#40	34	
0.25	#60	22	
0.15	#100	16	
0.075	#200	11.3	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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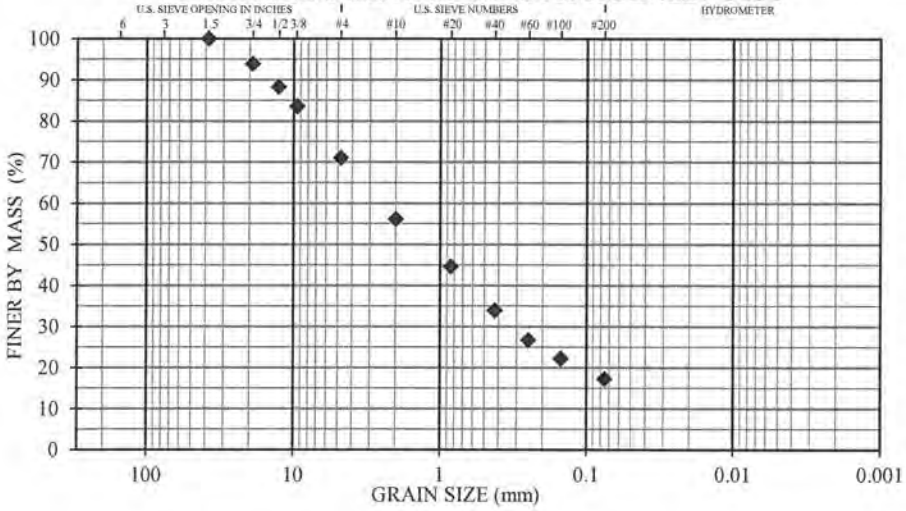
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B6
NUMBER/ DEPTH:	S5 / 10 - 11.5'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	29.0	USCS	SM
% SAND	53.7	USACOE FC	N/A
% SILT/CLAY	17.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.3	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

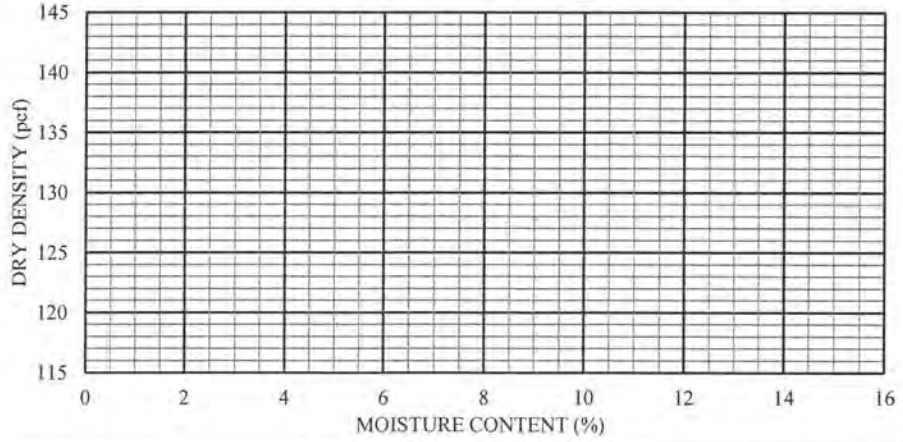


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	94	
12.70	1/2"	88	
9.50	3/8"	84	
4.75	#4	71	
2.00	#10	56	
0.85	#20	45	
0.43	#40	34	
0.25	#60	27	
0.15	#100	22	
0.075	#200	17.3	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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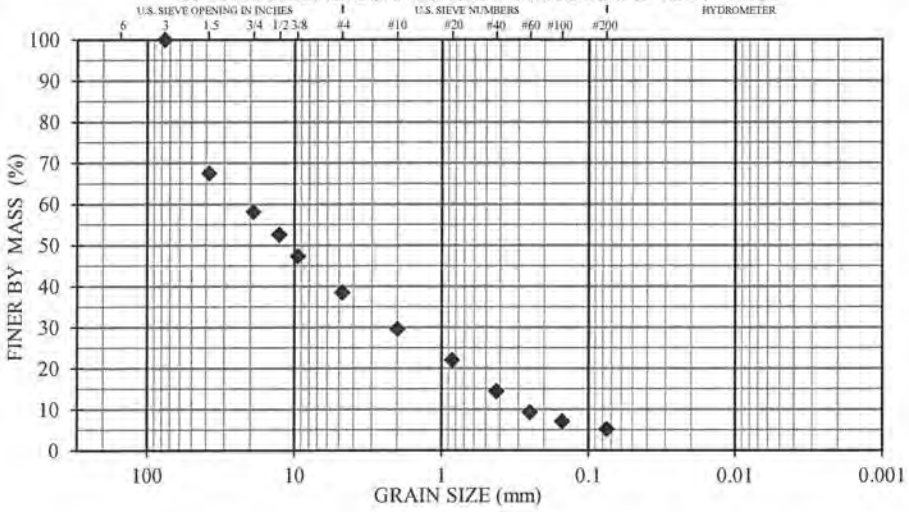
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B6
NUMBER/ DEPTH:	S6 / 15 - 16.5'
DESCRIPTION:	Poorly-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	61.5	USCS	GP-GM
% SAND	33.3	USACOE FC	N/A
% SILT/CLAY	5.2	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	5.1	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		83.5	
COEFFICIENT OF GRADATION (C_c)		0.7	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136

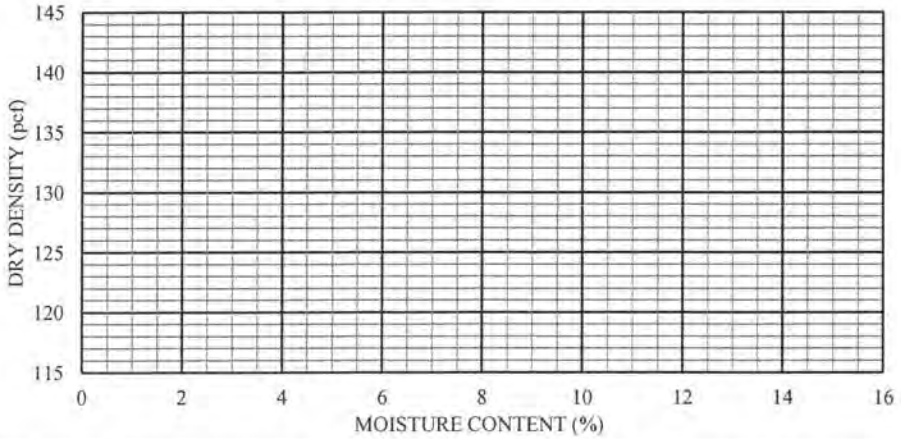


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	68	
19.00	3/4"	58	
12.70	1/2"	53	
9.50	3/8"	47	
4.75	#4	38	
2.00	#10	30	
0.85	#20	22	
0.43	#40	14	
0.25	#60	9	
0.15	#100	7	
0.075	#200	5.2	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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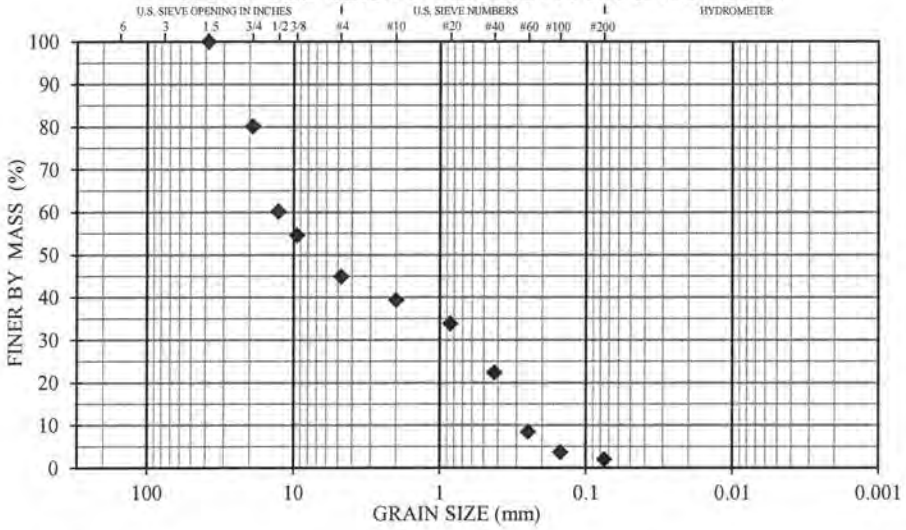
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B7
NUMBER/ DEPTH:	S1 / 0 - 1.5'
DESCRIPTION:	Poorly-graded gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	55.0	USCS	GP
% SAND	43.0	USACOE FC	N/A
% SILT/CLAY	2.0	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	3.7	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	46.8
COEFFICIENT OF GRADATION (C_c)	0.1
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

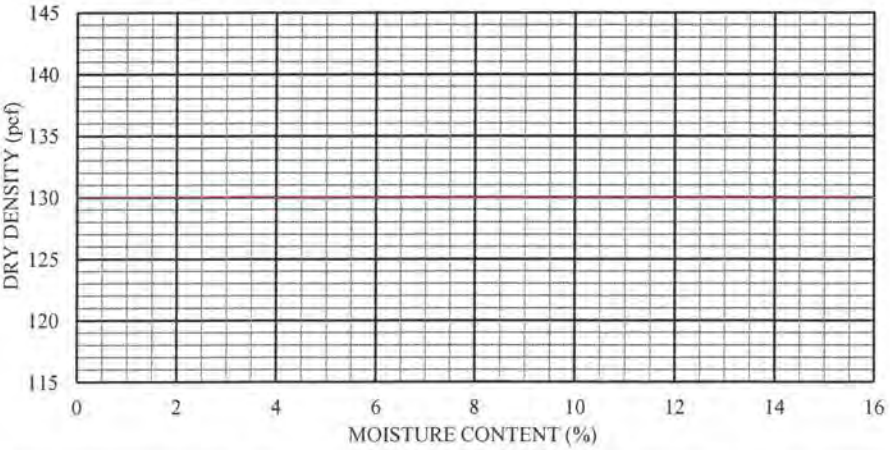
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	80	
12.70	1/2"	60	
9.50	3/8"	55	
4.75	#4	45	
2.00	#10	39	
0.85	#20	34	
0.43	#40	22	
0.25	#60	8	
0.15	#100	4	
0.075	#200	2.0	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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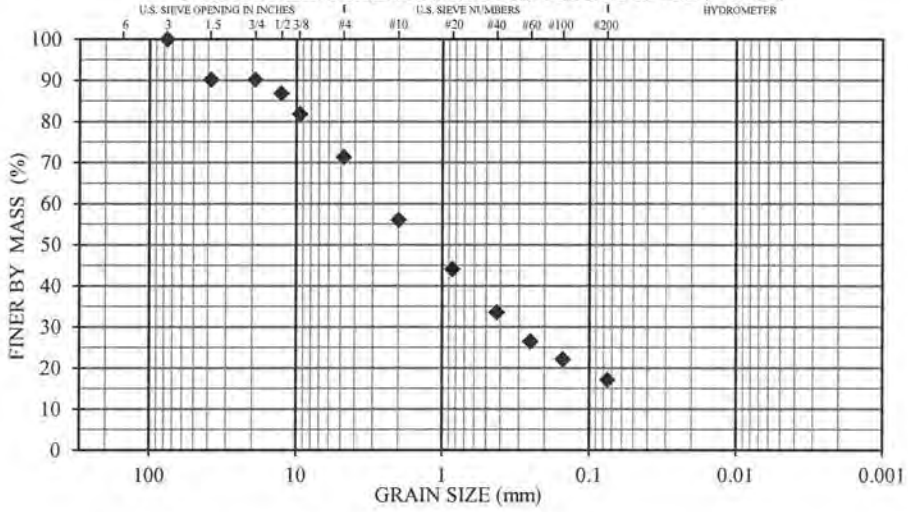
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B7
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	28.7	USCS	SM
% SAND	54.2	USACOE FC	N/A
% SILT/CLAY	17.1	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.4	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)			UNKNOWN
COEFFICIENT OF GRADATION (C_c)			UNKNOWN
ASTM D1557 (uncorrected)			N/A
ASTM D4718 (corrected)			N/A
OPTIMUM MOIST. CONTENT. (corrected)			N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

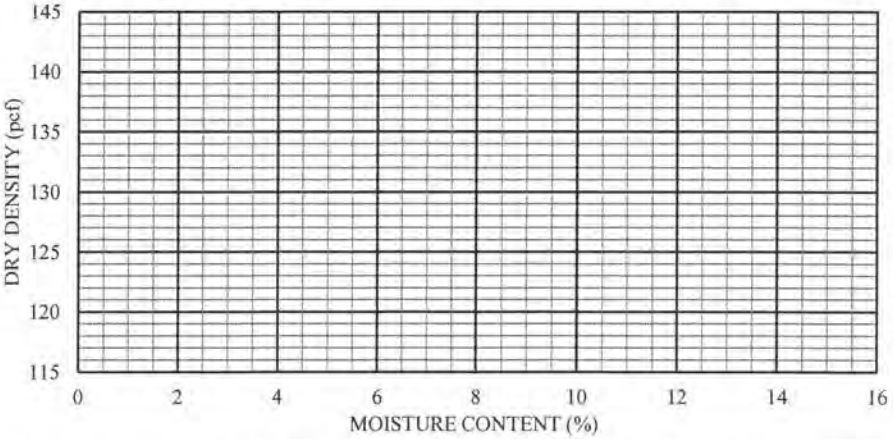
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	90	
19.00	3/4"	90	
12.70	1/2"	87	
9.50	3/8"	82	
4.75	#4	71	
2.00	#10	56	
0.85	#20	44	
0.43	#40	34	
0.25	#60	26	
0.15	#100	22	
0.075	#200	17.1	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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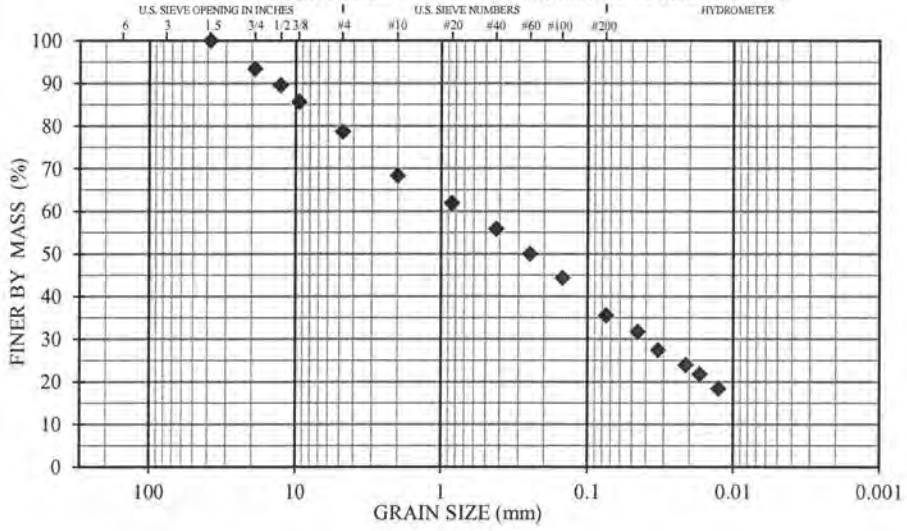
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B8
NUMBER/ DEPTH:	S1 / 0.5 - 2'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	21.3	USCS	SM
% SAND	43.1	USACOE FC	F3
% SILT/CLAY	35.6	% PASS. 0.02 mm	23.7
% MOIST. CONTENT	8.4	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)			UNKNOWN
COEFFICIENT OF GRADATION (C_c)			UNKNOWN
ASTM D1557 (uncorrected)			N/A
ASTM D4718 (corrected)			N/A
OPTIMUM MOIST. CONTENT. (corrected)			N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

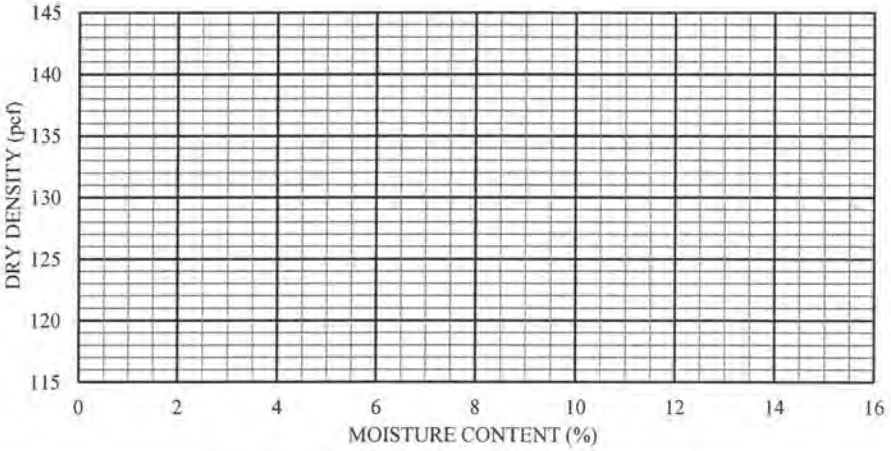


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	93	
12.70	1/2"	90	
9.50	3/8"	86	
4.75	#4	79	
2.00	#10	68	
0.85	#20	62	
0.43	#40	56	
0.25	#60	50	
0.15	#100	44	
0.075	#200	35.6	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0453	31.7
2	0.0328	27.4
5	0.0212	24.0
8	0.0170	21.8
15	0.0127	18.3
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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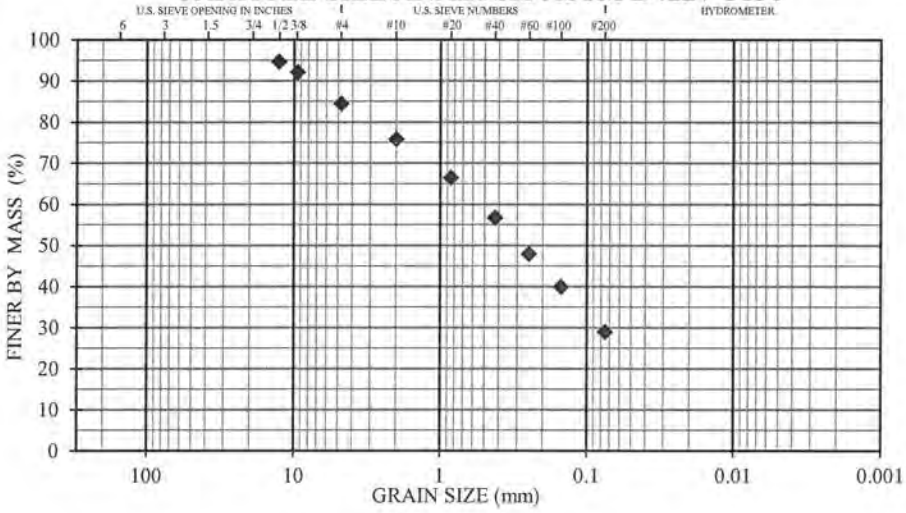
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B8
NUMBER/ DEPTH:	S2 / 4 - 6'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	15.5	USCS	SM
% SAND	55.6	USACOE FC	N/A
% SILT/CLAY	28.9	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	12.6	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)			UNKNOWN
COEFFICIENT OF GRADATION (C_c)			UNKNOWN
ASTM D1557 (uncorrected)			N/A
ASTM D4718 (corrected)			N/A
OPTIMUM MOIST. CONTENT. (corrected)			N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

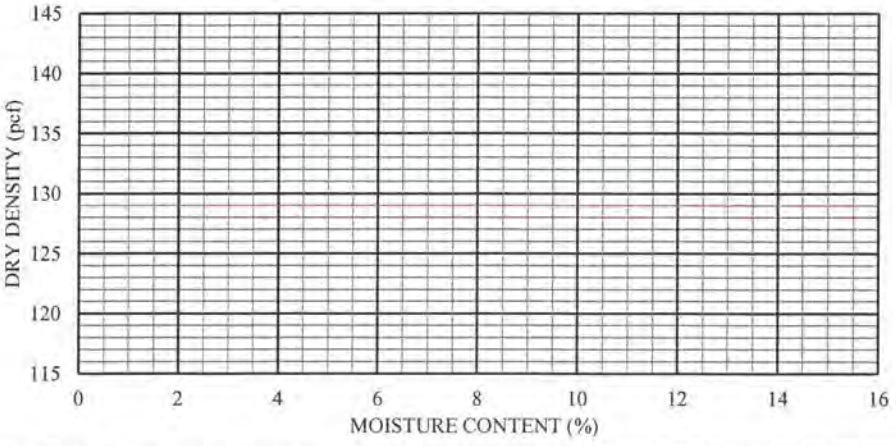


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"		
19.00	3/4"		
12.70	1/2"	95	
9.50	3/8"	92	
4.75	#4	84	
2.00	#10	76	
0.85	#20	66	
0.43	#40	57	
0.25	#60	48	
0.15	#100	40	
0.075	#200	28.9	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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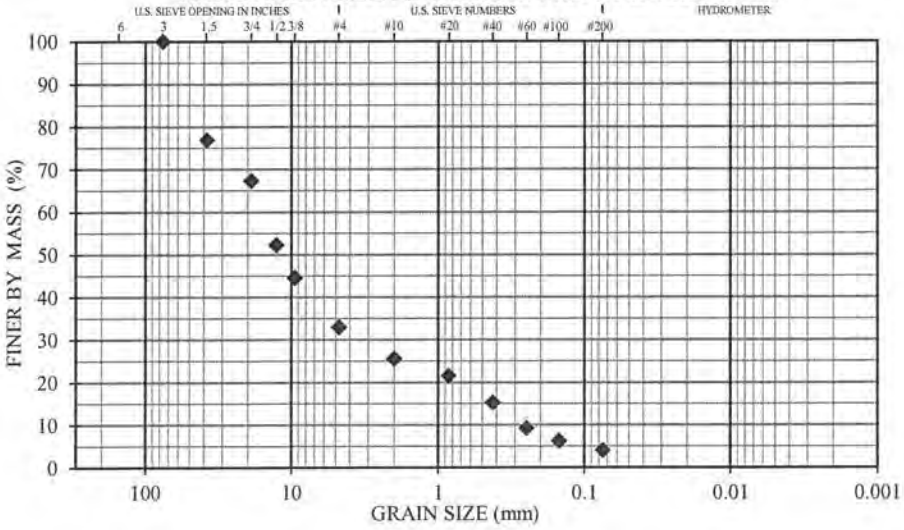
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B8
NUMBER/ DEPTH:	S3 / 9 - 11'
DESCRIPTION:	Poorly-graded gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	67.0	USCS	GP
% SAND	29.0	USACOE FC	N/A
% SILT/CLAY	4.0	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	1.4	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		58.2	
COEFFICIENT OF GRADATION (C_c)		3.1	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

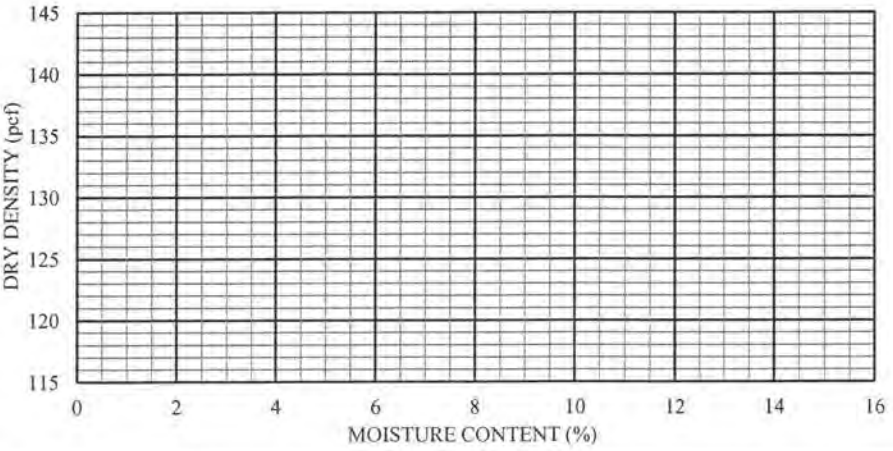
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	77	
19.00	3/4"	67	
12.70	1/2"	52	
9.50	3/8"	45	
4.75	#4	33	
2.00	#10	26	
0.85	#20	22	
0.43	#40	15	
0.25	#60	9	
0.15	#100	6	
0.075	#200	4.0	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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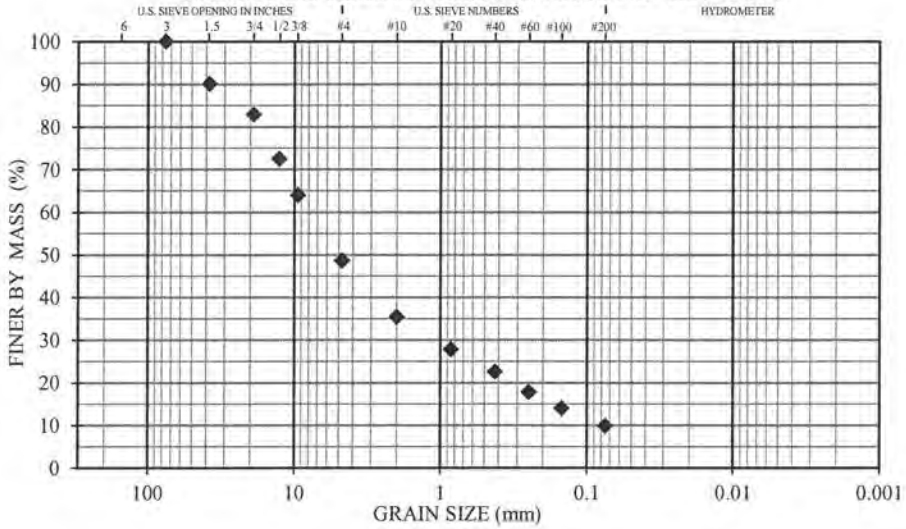
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B8
NUMBER/ DEPTH:	S4 / 13 - 15'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	51.3	USCS	GW-GM
% SAND	38.8	USACOE FC	N/A
% SILT/CLAY	9.9	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	4.5	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		107.6	
COEFFICIENT OF GRADATION (C_c)		2.2	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

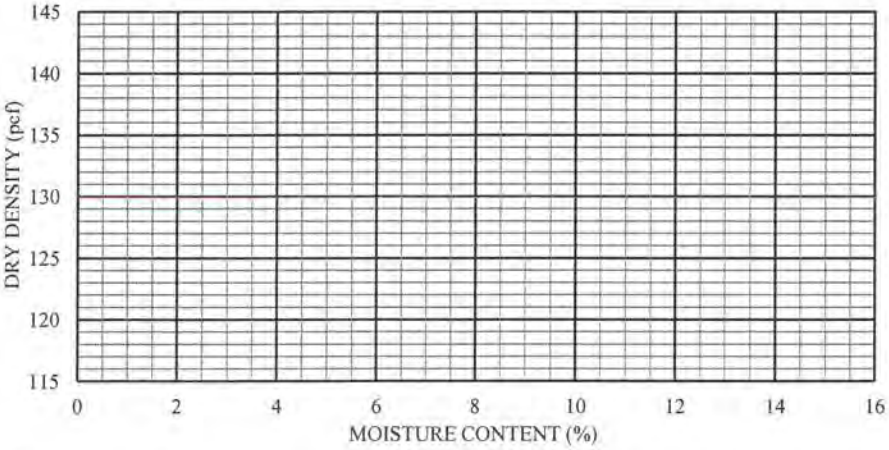
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	90	
19.00	3/4"	83	
12.70	1/2"	73	
9.50	3/8"	64	
4.75	#4	49	
2.00	#10	35	
0.85	#20	28	
0.43	#40	23	
0.25	#60	18	
0.15	#100	14	
0.075	#200	9.9	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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Summary of Laboratory Test Results

7699 W. Parks HWY - Wasilla

NGE-TFT Project #:6216-21

Exploration ID	Sample Number	Depth Interval (ft) Top	Depth Interval (ft) Bottom	Moisture Content ASTM D2216 (% By Dry Mass)	Particle Size Analysis ASTM C136/D7928/D6913 (% By Mass) Gravel	Sand	Silt/Clay	Passing #200 ASTM D1140 (% By Mass)	Passing 0.02mm ASTM D7928 (% By Mass)	Frost Class.	Organic Content (ASTM D2974) (% By Mass)	Unified Soil Classification ASTM D2487
B9	S1	0.0	1.5	8.8								
B9	S2	2.5	4.0									
B9	S3	5.0	6.5	36.4	14.8	24.7	60.5		35.0	F4		(ML) Sandy silt
B9	S4	7.5	9.0	2.5								
B10	S1	0.0	1.5	9.1								
B10	S2	2.5	4.0	13.4								
B10	S3	5.0	6.5	36.1				39.4			8.9	
B10	S4	7.5	9.0	24.2	30.5	38.3	31.2		17.3	F3		(SM) Silty sand w/ gravel
B10	S5	10.0	11.5	46.3								
B10	S6	15.0	16.5	8.9								
B10	S7	20.0	21.5	8.0								
B11	S1	0.0	1.5	7.1								
B11	S2	2.5	4.0	42.6				48.2				
B11	S3	5.0	6.5	3.0	63.0	34.7	2.3		1.0	NFS		(GW) Well-graded gravel w/ sand
B11	S4	7.5	9.0	3.0	54.8	42.8	2.4		N/A	N/A		(GW) Well-graded gravel w/ sand
B11	S5	10.0	11.5									
B12	S1	0.0	1.5	3.2								
B12	S2	2.5	4.0	2.6				1.6				
B12	S3	5.0	6.5	1.7								
B12	S4	7.5	9.0	1.1	78.9	17.0	4.1		2.2	PFS		(GP) Poorly-graded gravel w/ sand
B12	S5	10.0	11.5	1.7								
B12	S6	15.0	16.5	2.8								
B13	S1	0.0	1.5	50.4								
B13	S2	2.5	4.0	2.4	73.5	25.0	1.5		N/A	N/A		(GW) Well-graded gravel w/ sand
B13	S3	5.0	6.5	2.4				1.8				
B13	S4	7.5	9.0	2.8								
B13	S5	10.0	11.5	3.3								
B14	S1	0.0	1.5	3.9								
B14	S2	2.5	4.0	2.4	64.5	32.0	3.5		N/A	N/A		(GP) Poorly-graded gravel w/ sand
B14	S3	5.0	6.5	2.3								
B14	S4	7.5	9.0	2.6				5.3				
B14	S5	10.0	11.5	1.6								
B14	S6	15.0	16.5	1.7								
B15	S1	0.0	1.5	8.0								
B15	S2	2.5	4.0	14.0	34.9	48.1	17.0		8.0	PFS		(SM) Silty sand w/ gravel
B15	S3	5.0	6.5	5.6	44.0	51.7	4.3		N/A	N/A		(SP) Poorly-graded sand w/ gravel
B15	S4	7.5	9.0	10.8								
B15	S5	10.0	11.5	13.7							3.5	
B15	S6	15.0	16.5	4.1								
B15	S7	20.0	21.5	8.1								

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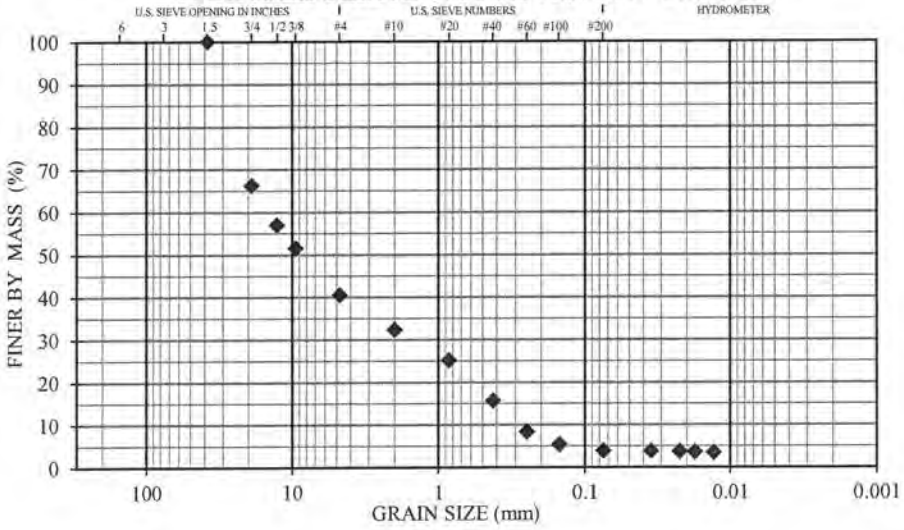
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B1
NUMBER/ DEPTH:	S1 / 0 - 1.5'
DESCRIPTION:	Poorly-graded gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	59.5	USCS	GP
% SAND	36.6	USACOE FC	S1
% SILT/CLAY	3.9	% PASS. 0.02 mm	3.6
% MOIST. CONTENT	4.9	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	50.9
COEFFICIENT OF GRADATION (C_c)	0.6
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

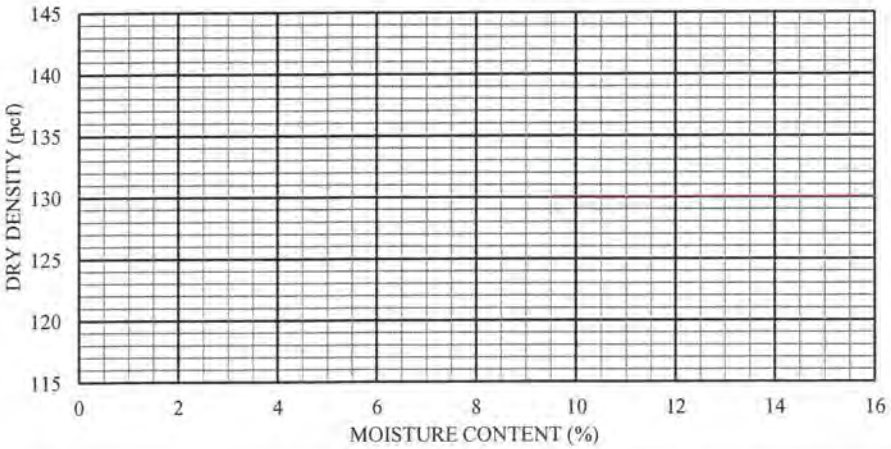


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	66	
12.70	1/2"	57	
9.50	3/8"	52	
4.75	#4	41	
2.00	#10	32	
0.85	#20	25	
0.43	#40	16	
0.25	#60	8	
0.15	#100	5	
0.075	#200	3.9	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2	0.0354	3.8
5	0.0224	3.7
8	0.0177	3.6
15	0.0131	3.5
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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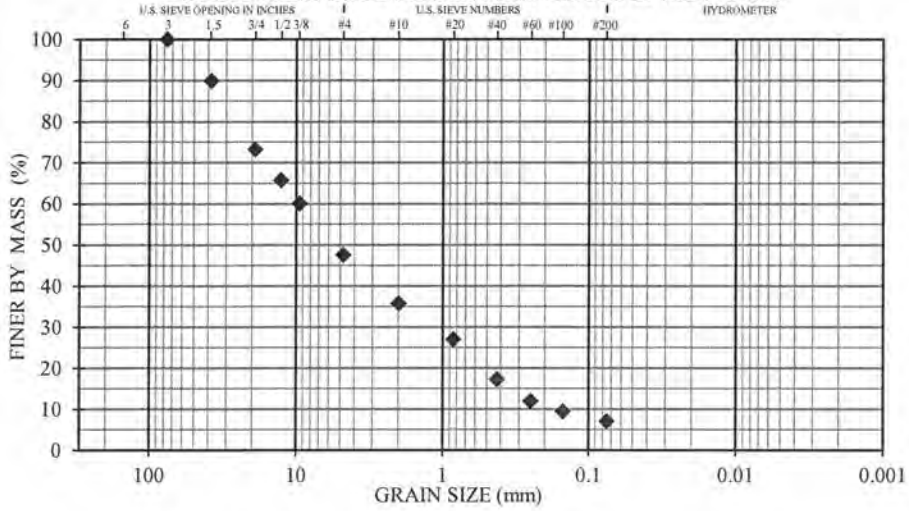
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B1
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Poorly-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	52.4	USCS	GP-GM
% SAND	40.5	USACOE FC	N/A
% SILT/CLAY	7.1	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.8	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		55.3	
COEFFICIENT OF GRADATION (C_c)		1.0	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

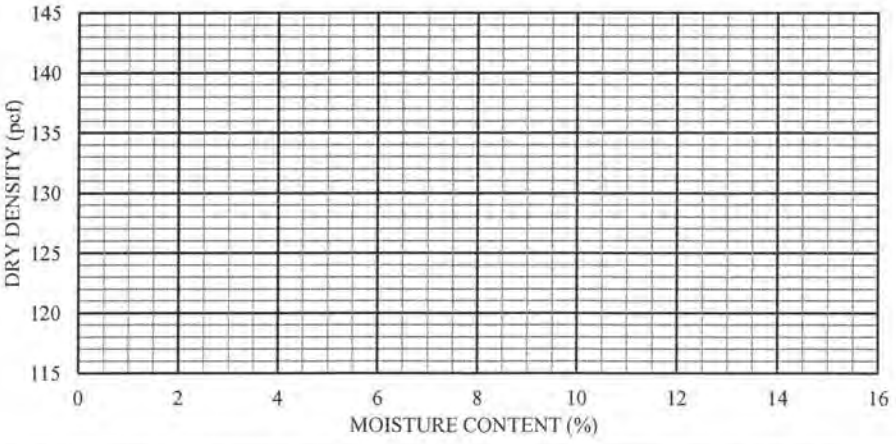
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	90	
19.00	3/4"	73	
12.70	1/2"	66	
9.50	3/8"	60	
4.75	#4	48	
2.00	#10	36	
0.85	#20	27	
0.43	#40	17	
0.25	#60	12	
0.15	#100	9	
0.075	#200	7.1	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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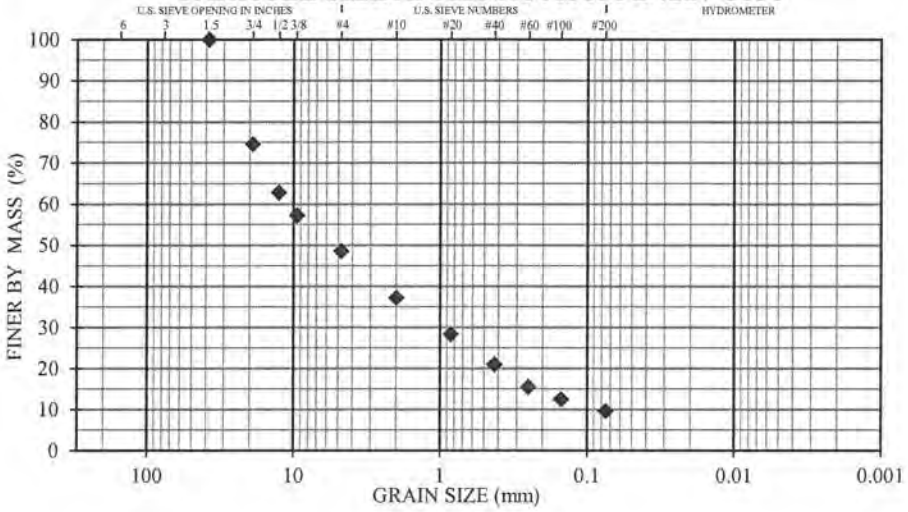
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B1
NUMBER/ DEPTH:	S7 / 20 - 21.5'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	51.4	USCS	GW-GM
% SAND	39.0	USACOE FC	N/A
% SILT/CLAY	9.6	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	6.6	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	130.6
COEFFICIENT OF GRADATION (C_c)	1.2
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

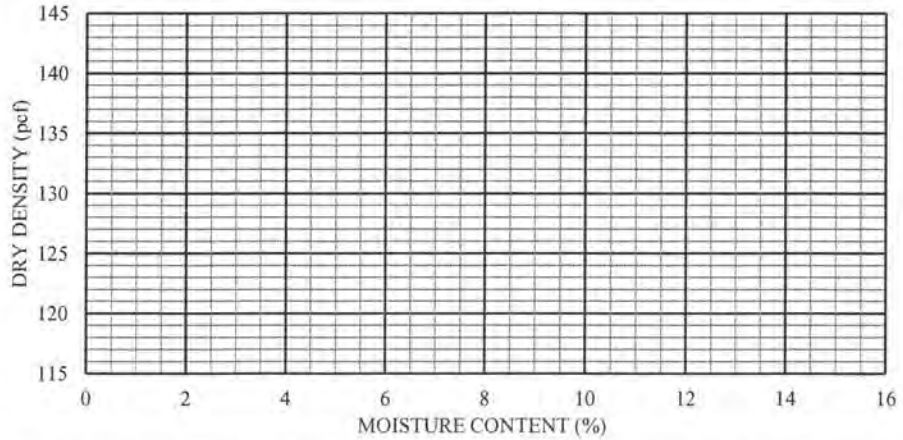


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	75	
12.70	1/2"	63	
9.50	3/8"	57	
4.75	#4	49	
2.00	#10	37	
0.85	#20	28	
0.43	#40	21	
0.25	#60	15	
0.15	#100	13	
0.075	#200	9.6	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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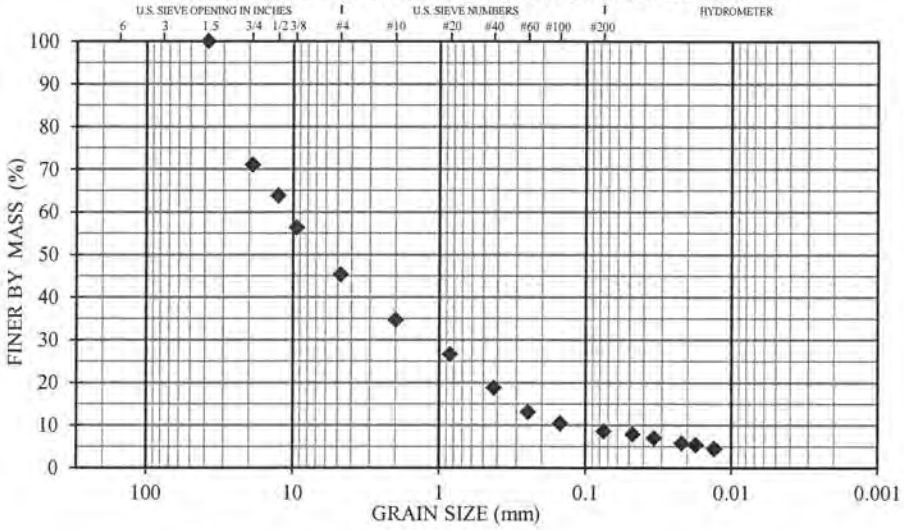
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B2
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	54.6	USCS	GW-GM
% SAND	36.8	USACOE FC	S1
% SILT/CLAY	8.6	% PASS. 0.02 mm	5.8
% MOIST. CONTENT	6.6	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		83.9	
COEFFICIENT OF GRADATION (C_c)		1.2	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

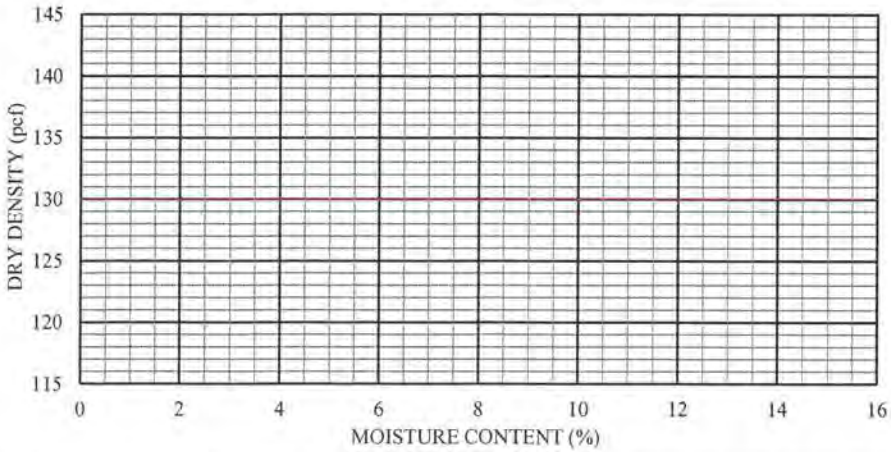
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	71	
12.70	1/2"	64	
9.50	3/8"	56	
4.75	#4	45	
2.00	#10	35	
0.85	#20	27	
0.43	#40	19	
0.25	#60	13	
0.15	#100	10	
0.075	#200	8.6	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0475	7.9
2	0.0340	7.0
5	0.0219	5.8
8	0.0175	5.4
15	0.0131	4.5
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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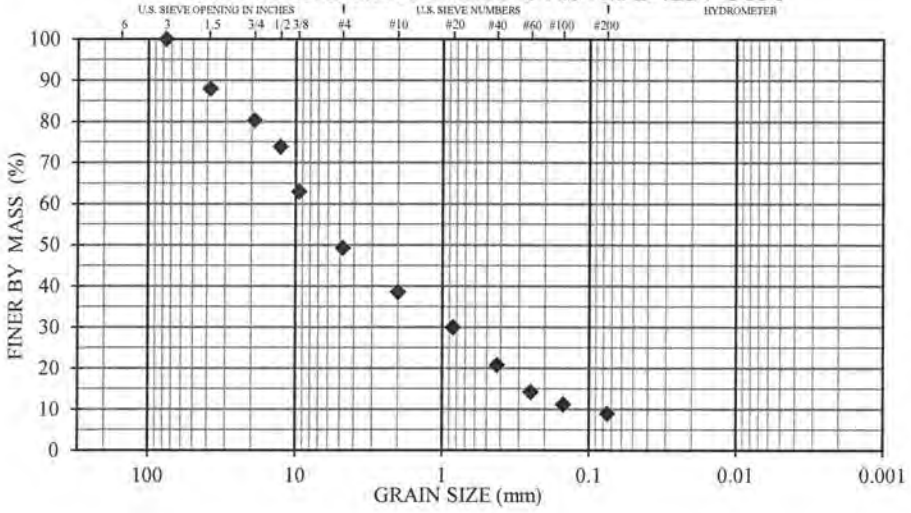
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B2
NUMBER/ DEPTH:	S3 / 5 - 6.5'
DESCRIPTION:	Poorly-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	50.7	USCS	GP-GM
% SAND	40.3	USACOE FC	N/A
% SILT/CLAY	9.0	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	7.1	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	77.0
COEFFICIENT OF GRADATION (C_c)	0.8
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

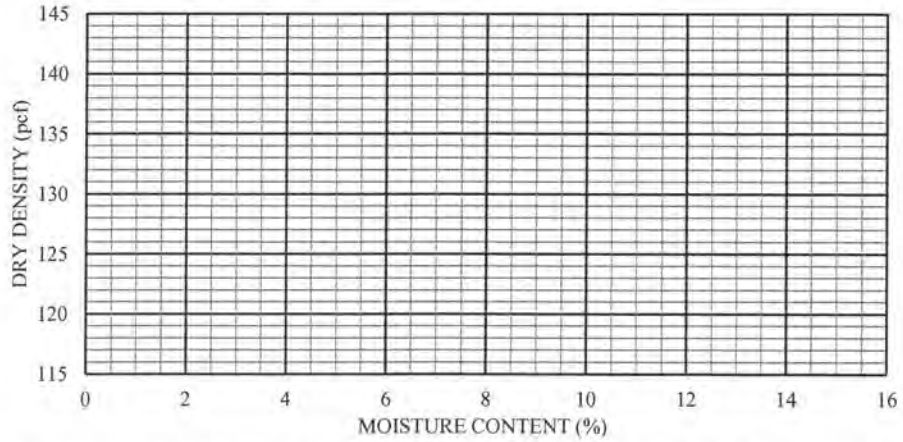
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	88	
19.00	3/4"	80	
12.70	1/2"	74	
9.50	3/8"	63	
4.75	#4	49	
2.00	#10	39	
0.85	#20	30	
0.43	#40	21	
0.25	#60	14	
0.15	#100	11	
0.075	#200	9.0	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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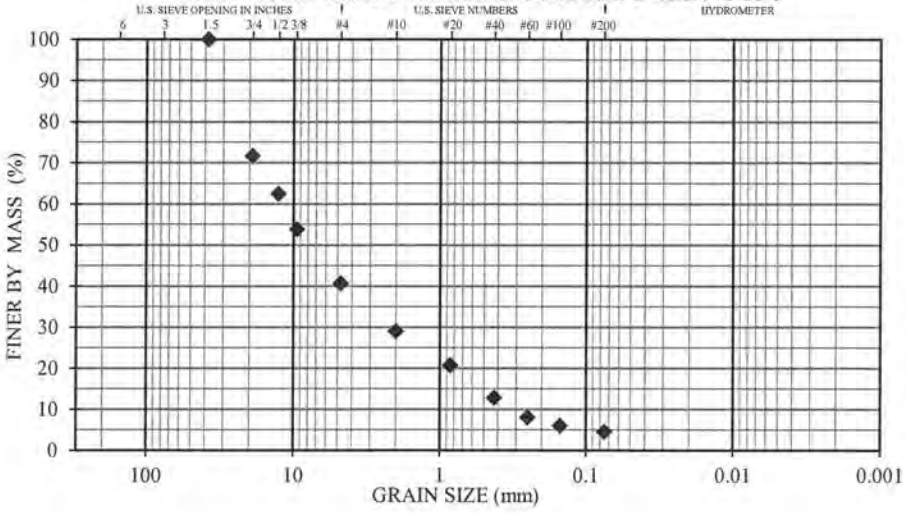
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B2
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Well-graded gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	59.4	USCS	GW
% SAND	36.1	USACOE FC	N/A
% SILT/CLAY	4.5	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	3.9	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	36.8
COEFFICIENT OF GRADATION (C_c)	1.3
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

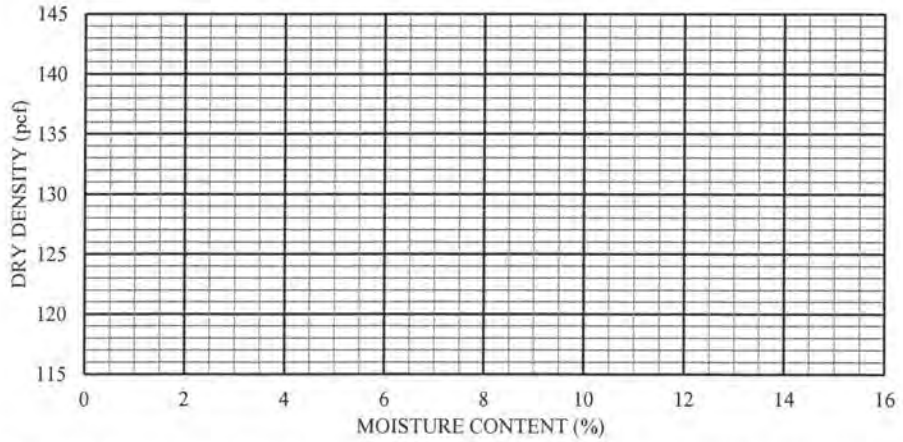


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	72	
12.70	1/2"	62	
9.50	3/8"	54	
4.75	#4	41	
2.00	#10	29	
0.85	#20	21	
0.43	#40	13	
0.25	#60	8	
0.15	#100	6	
0.075	#200	4.5	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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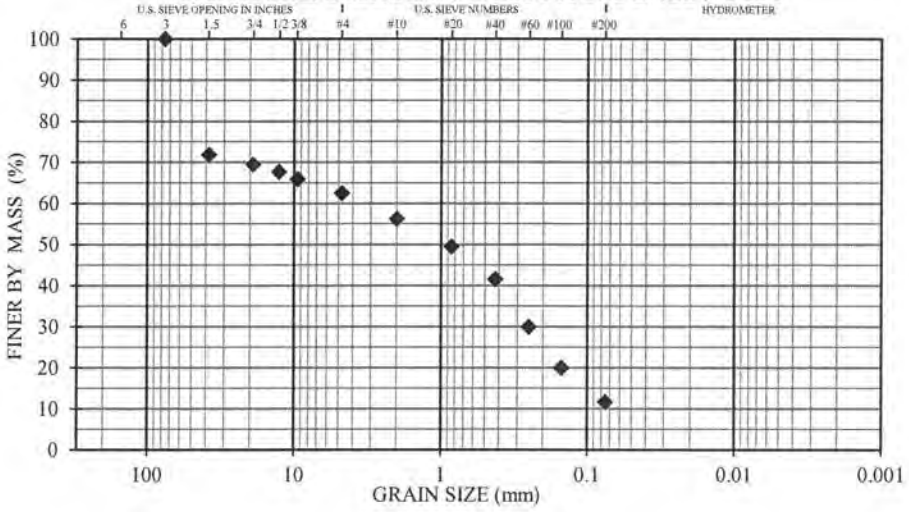
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B2
NUMBER/ DEPTH:	S7 / 20 - 21.5'
DESCRIPTION:	Poorly-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	37.5	USCS	SP-SM
% SAND	50.9	USACOE FC	N/A
% SILT/CLAY	11.6	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	8.6	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

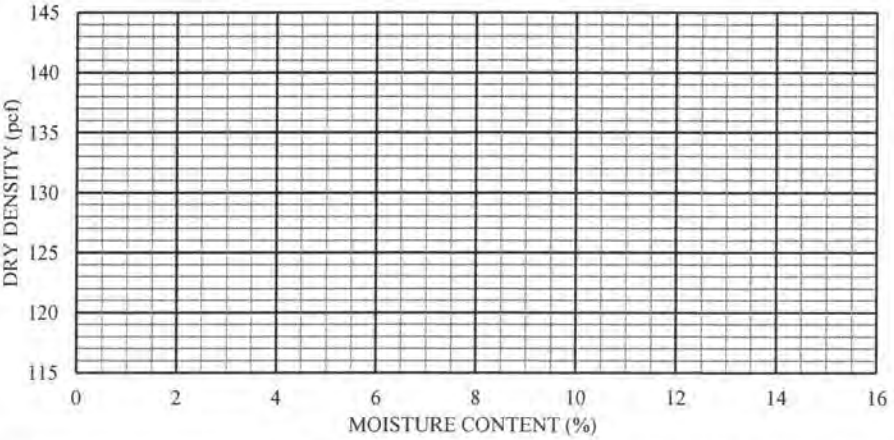


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	72	
19.00	3/4"	69	
12.70	1/2"	68	
9.50	3/8"	66	
4.75	#4	62	
2.00	#10	56	
0.85	#20	49	
0.43	#40	41	
0.25	#60	30	
0.15	#100	20	
0.075	#200	11.6	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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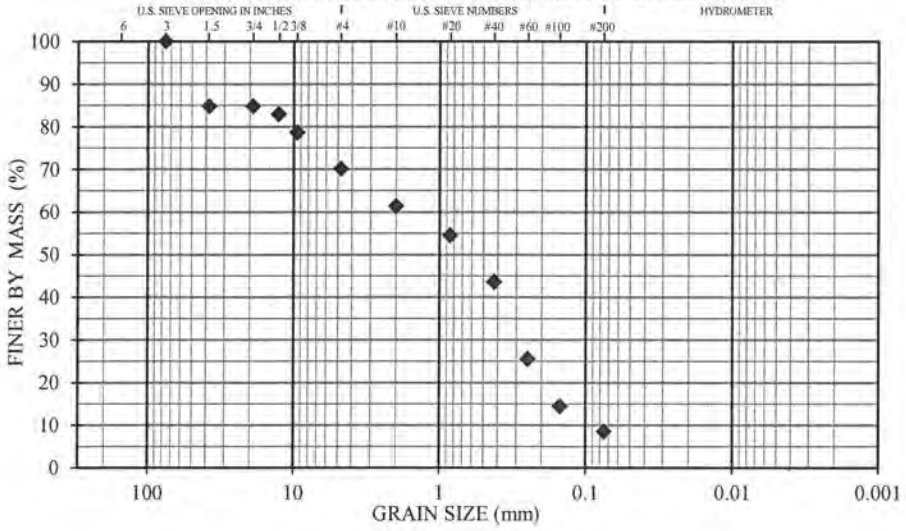
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B2
NUMBER/ DEPTH:	S8 / 25 - 26.5'
DESCRIPTION:	Poorly-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	29.8	USCS	SP-SM
% SAND	61.7	USACOE FC	N/A
% SILT/CLAY	8.5	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	10.0	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	18.9
COEFFICIENT OF GRADATION (C_c)	0.5
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

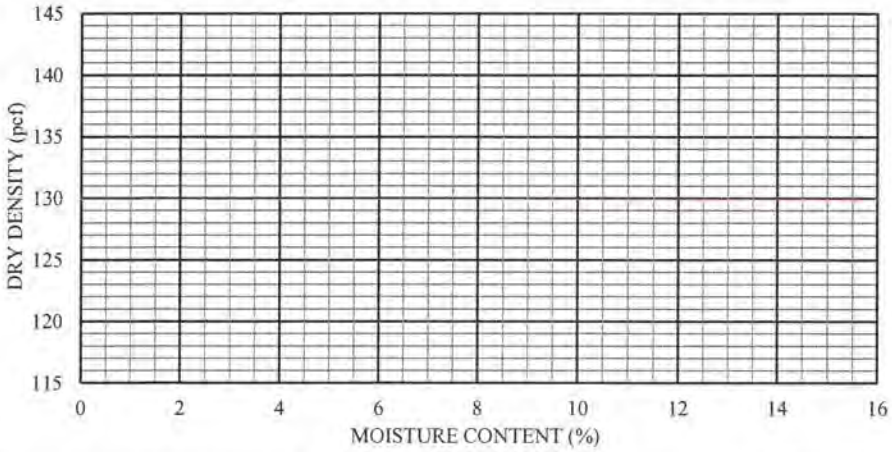
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	85	
19.00	3/4"	85	
12.70	1/2"	83	
9.50	3/8"	79	
4.75	#4	70	
2.00	#10	61	
0.85	#20	55	
0.43	#40	44	
0.25	#60	26	
0.15	#100	14	
0.075	#200	8.5	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

The testing services reported herein have been performed to recognized industry standards, unless otherwise noted. No other warranty is made. Should engineering interpretation or opinion be required, NGE-TFT will provide upon written request.

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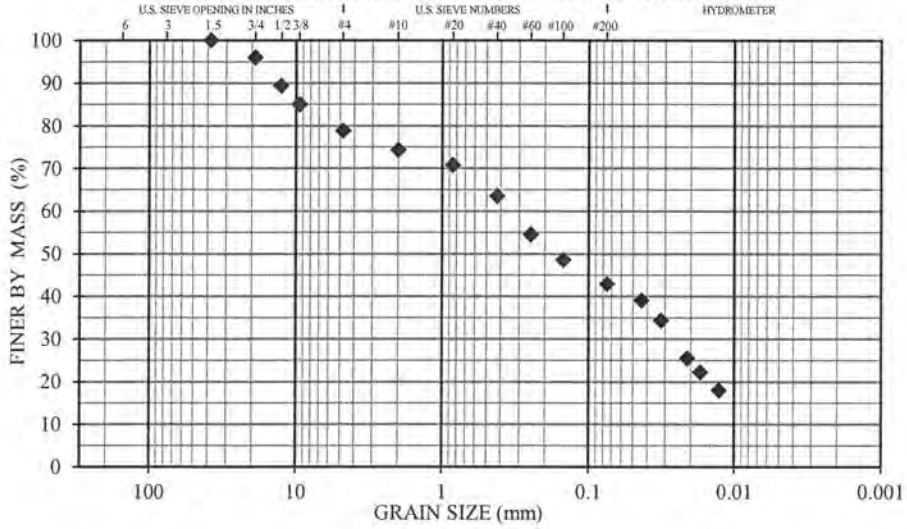
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B3
NUMBER/ DEPTH:	S1 / 0 - 1.5'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	21.2	USCS	SM
% SAND	36.0	USACOE FC	F3
% SILT/CLAY	42.8	% PASS. 0.02 mm	24.4
% MOIST. CONTENT	30.1	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

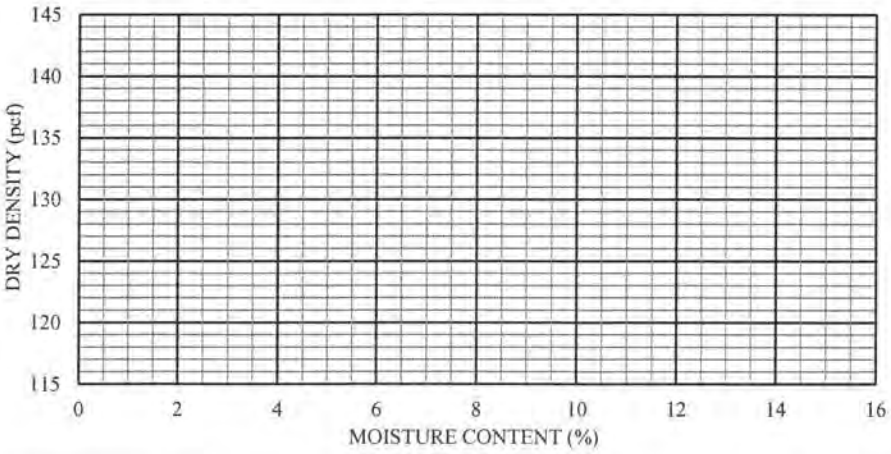


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	96	
12.70	1/2"	89	
9.50	3/8"	85	
4.75	#4	79	
2.00	#10	74	
0.85	#20	71	
0.43	#40	64	
0.25	#60	55	
0.15	#100	49	
0.075	#200	42.9	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0436	39.1
2	0.0321	34.4
5	0.0212	25.5
8	0.0172	22.2
15	0.0128	18.0
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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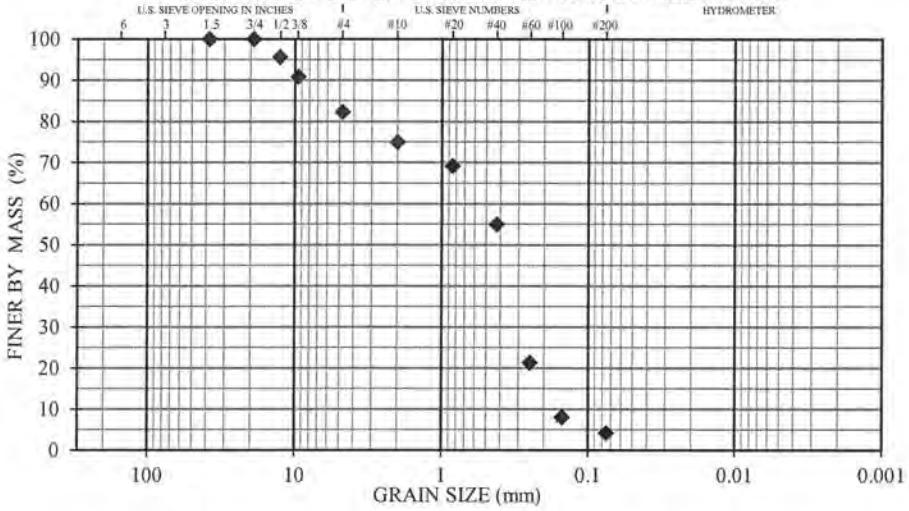
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B3
NUMBER/ DEPTH:	S2 / 3 - 4'
DESCRIPTION:	Poorly-graded sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	17.7	USCS	SP
% SAND	78.2	USACOE FC	N/A
% SILT/CLAY	4.1	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.7	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	3.5
COEFFICIENT OF GRADATION (C_c)	0.9
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

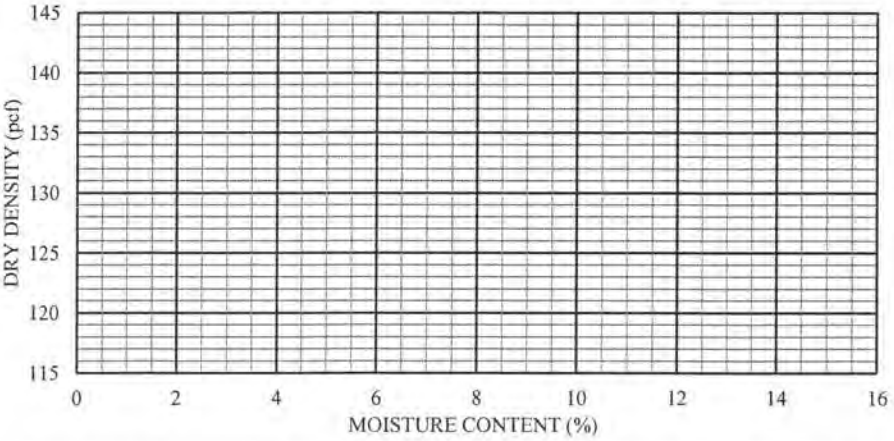


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	100	
12.70	1/2"	96	
9.50	3/8"	91	
4.75	#4	82	
2.00	#10	75	
0.85	#20	69	
0.43	#40	55	
0.25	#60	21	
0.15	#100	8	
0.075	#200	4.1	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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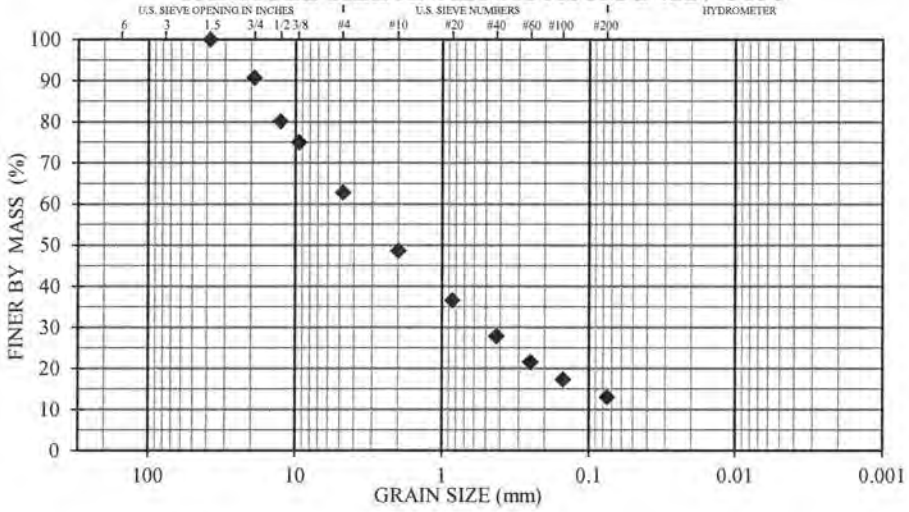
PROJECT CLIENT:	**American Engineering Testing, Inc.**
PROJECT NAME:	**7751 W Parks Hwy., Wasilla, AK**
PROJECT NO.:	**5862-20**
SAMPLE LOC.:	**B3**
NUMBER/ DEPTH:	**S3 / 5 - 6.5'**
DESCRIPTION:	**Silty sand w/ gravel**
DATE RECEIVED:	**10/5/2020**
TESTED BY:	**EA**
REVIEWED BY:	**CJB**

% GRAVEL	**37.2**	USCS	**SM**
% SAND	**49.8**	USACOE FC	**N/A**
% SILT/CLAY	**13.0**	% PASS. 0.02 mm	**N/A**
% MOIST. CONTENT	**2.4**	% PASS. 0.002 mm	**N/A**
UNIFORMITY COEFFICIENT (C_u)			**UNKNOWN**
COEFFICIENT OF GRADATION (C_c)			**UNKNOWN**
ASTM D1557 (uncorrected)			**N/A**
ASTM D4718 (corrected)			**N/A**
OPTIMUM MOIST. CONTENT. (corrected)			**N/A**

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

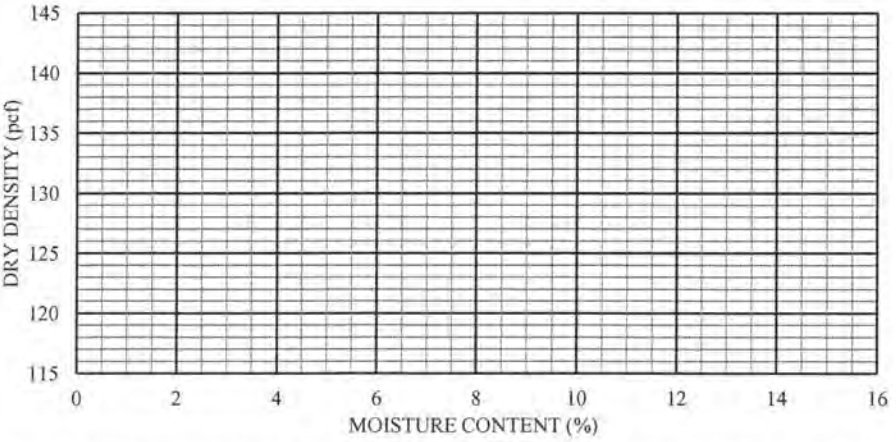
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	**100**	
19.00	3/4"	**91**	
12.70	1/2"	**80**	
9.50	3/8"	**75**	
4.75	#4	**63**	
2.00	#10	**49**	
0.85	#20	**37**	
0.43	#40	**28**	
0.25	#60	**22**	
0.15	#100	**17**	
0.075	#200	**13.0**	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	**N/A**
DEGRADATION (ATM T-313)	**N/A**
PLASTICITY INDEX ASTM 4318	**N/A**

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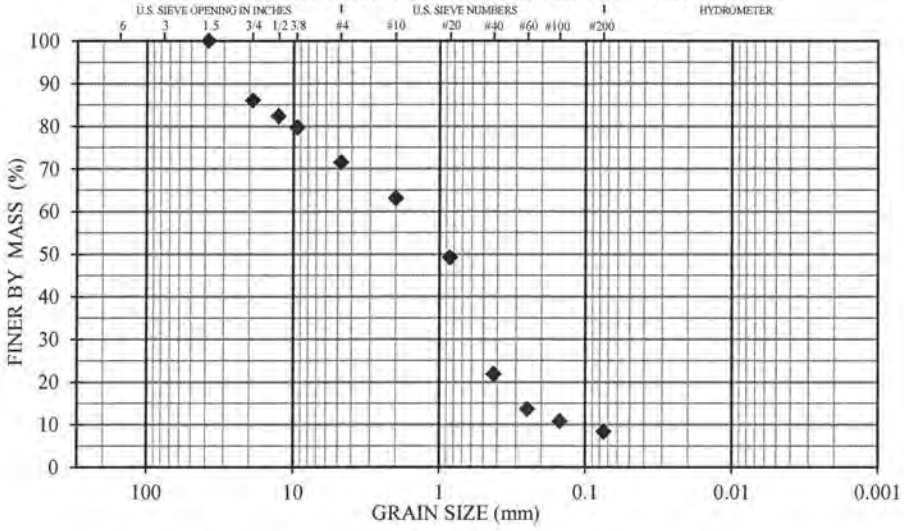
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B3
NUMBER/ DEPTH:	S6 / 15 - 16.5'
DESCRIPTION:	Well-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	28.5	USCS	SW-SM
% SAND	63.2	USACOE FC	N/A
% SILT/CLAY	8.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.1	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	13.9
COEFFICIENT OF GRADATION (C_c)	1.4
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

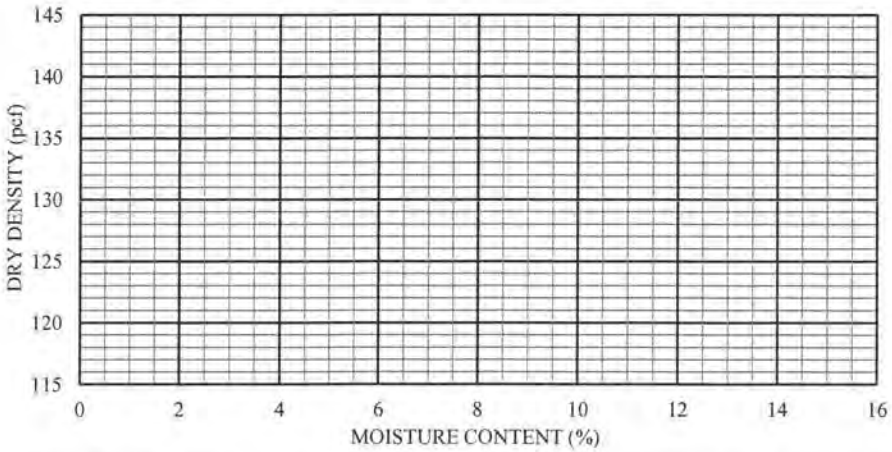
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	86	
12.70	1/2"	82	
9.50	3/8"	80	
4.75	#4	71	
2.00	#10	63	
0.85	#20	49	
0.43	#40	22	
0.25	#60	14	
0.15	#100	11	
0.075	#200	8.3	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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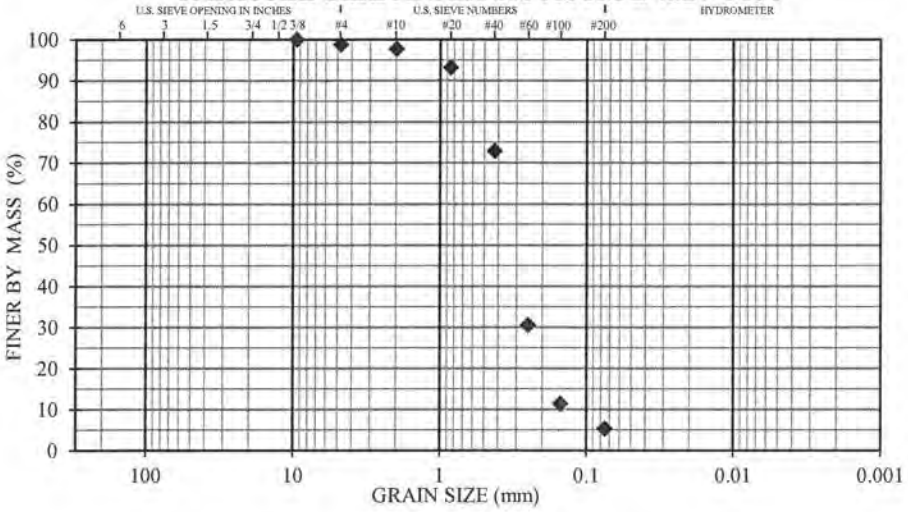
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B3
NUMBER/ DEPTH:	S7 / 20 - 21.5'
DESCRIPTION:	Poorly-graded sand w/ silt
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	1.2	USCS	SP-SM
% SAND	93.5	USACOE FC	N/A
% SILT/CLAY	5.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	21.1	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	2.8
COEFFICIENT OF GRADATION (C_c)	1.2
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

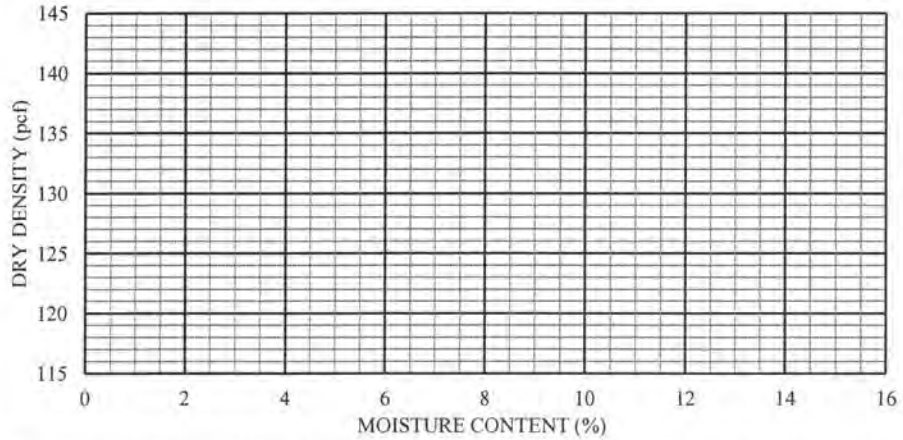


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"		
19.00	3/4"		
12.70	1/2"		
9.50	3/8"	100	
4.75	#4	99	
2.00	#10	98	
0.85	#20	93	
0.43	#40	73	
0.25	#60	31	
0.15	#100	11	
0.075	#200	5.3	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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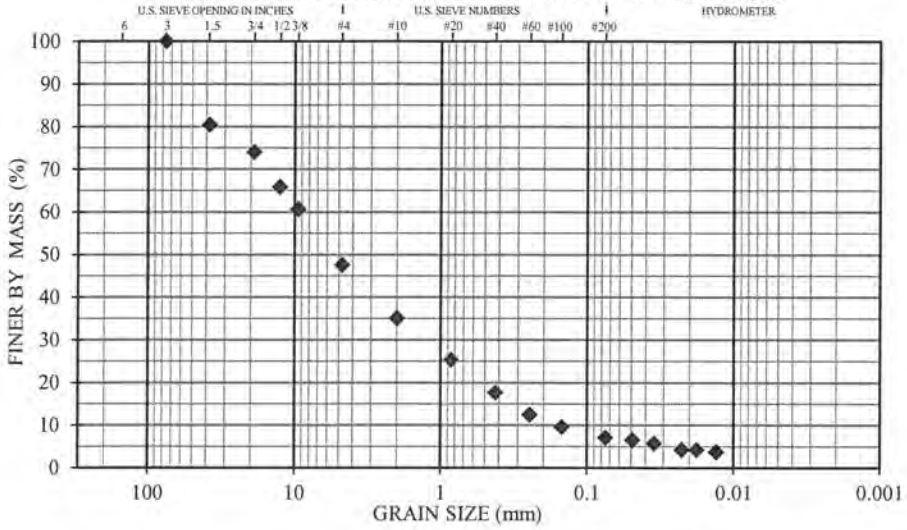
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B4
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	52.4	USCS	GW-GM
% SAND	40.5	USACOE FC	S1
% SILT/CLAY	7.1	% PASS. 0.02 mm	4.5
% MOIST. CONTENT	2.4	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	56.4
COEFFICIENT OF GRADATION (C_c)	1.3
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

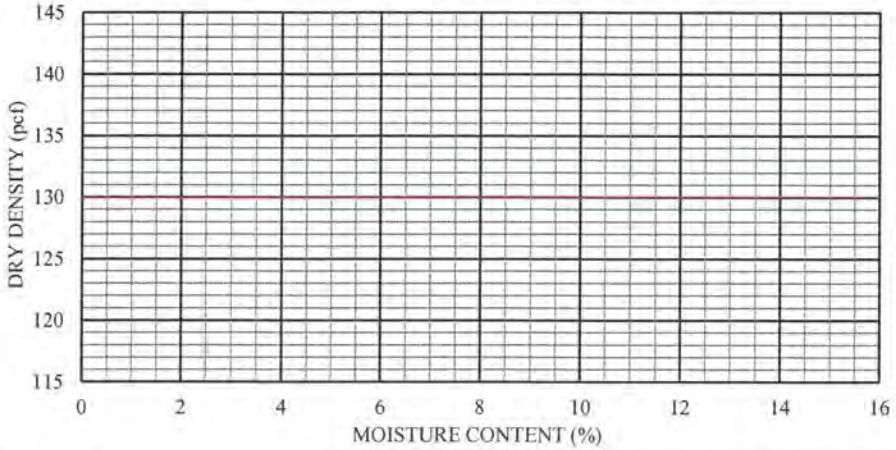
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	80	
19.00	3/4"	74	
12.70	1/2"	66	
9.50	3/8"	61	
4.75	#4	48	
2.00	#10	35	
0.85	#20	25	
0.43	#40	18	
0.25	#60	13	
0.15	#100	10	
0.075	#200	7.1	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0490	6.5
2	0.0349	5.8
5	0.0226	4.3
8	0.0179	4.3
15	0.0131	3.7
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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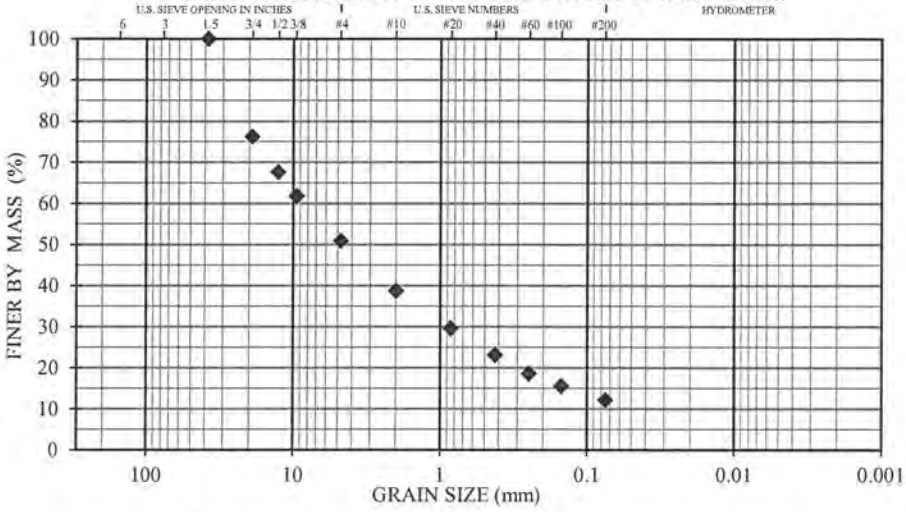
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B4
NUMBER/ DEPTH:	S5 / 10 - 11.5'
DESCRIPTION:	Silty gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	49.1	USCS	GM
% SAND	38.7	USACOE FC	N/A
% SILT/CLAY	12.2	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.1	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

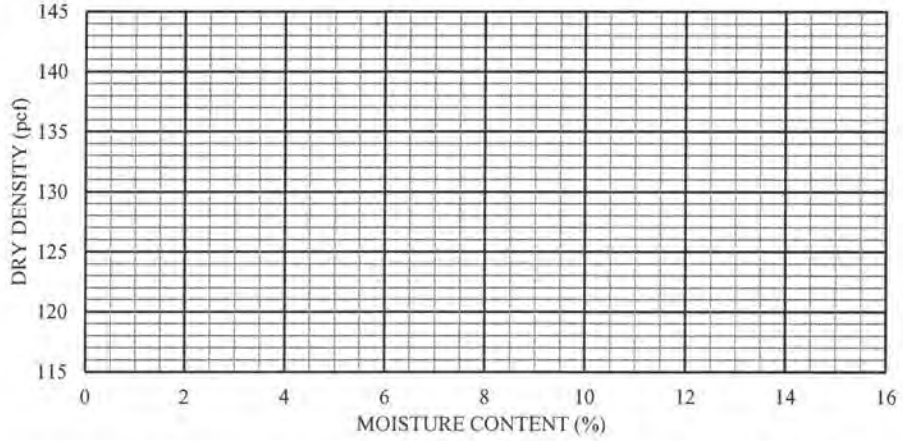
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	76	
12.70	1/2"	68	
9.50	3/8"	62	
4.75	#4	51	
2.00	#10	39	
0.85	#20	30	
0.43	#40	23	
0.25	#60	19	
0.15	#100	16	
0.075	#200	12.2	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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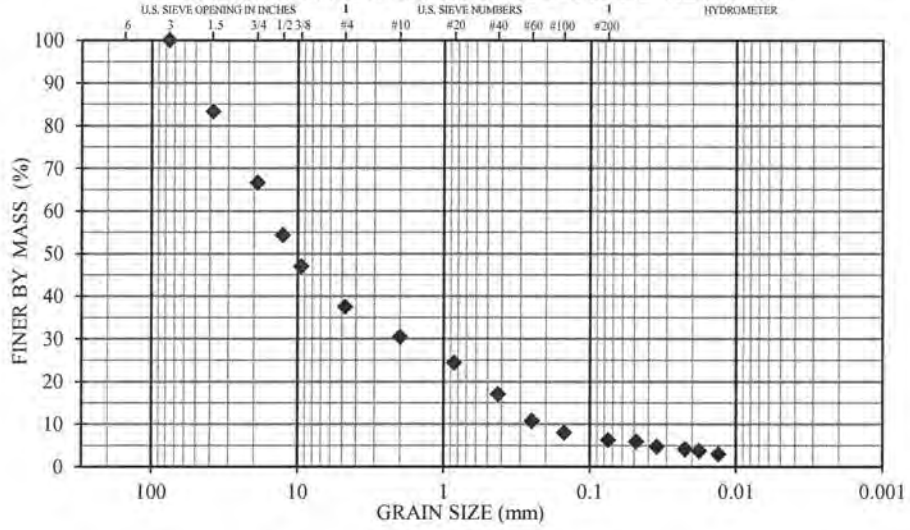
Laboratory Testing · Geotechnical Engineering · Instrumentation · Construction Monitoring Services · Thermal Analysis

PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S1 / 0 - 1.5'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	62.4	USCS	GW-GM
% SAND	31.3	USACOE FC	S1
% SILT/CLAY	6.3	% PASS. 0.02 mm	4.0
% MOIST. CONTENT	6.7	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		70.0	
COEFFICIENT OF GRADATION (C_c)		1.0	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

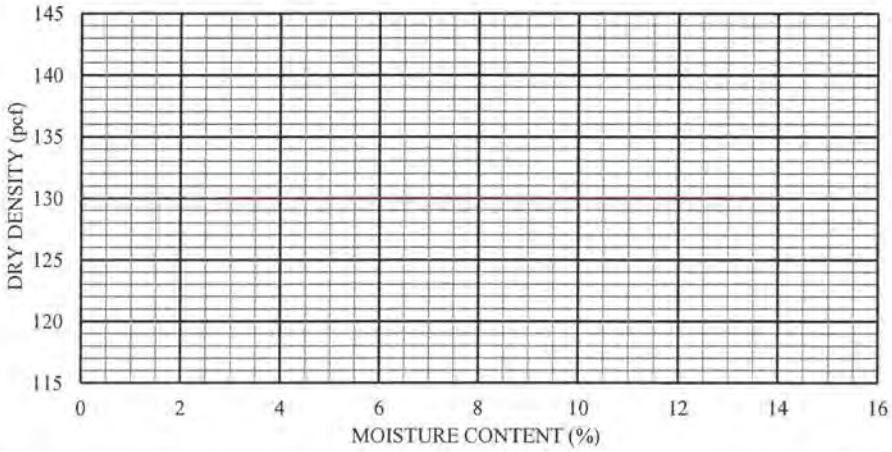
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	83	
19.00	3/4"	67	
12.70	1/2"	54	
9.50	3/8"	47	
4.75	#4	38	
2.00	#10	31	
0.85	#20	24	
0.43	#40	17	
0.25	#60	11	
0.15	#100	8	
0.075	#200	6.3	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0485	5.9
2	0.0351	4.8
5	0.0224	4.1
8	0.0179	3.7
15	0.0132	2.9
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

The testing services reported herein have been performed to recognized industry standards, unless otherwise noted. No other warranty is made. Should engineering interpretation or opinion be required, NGE-TFT will provide upon written request.

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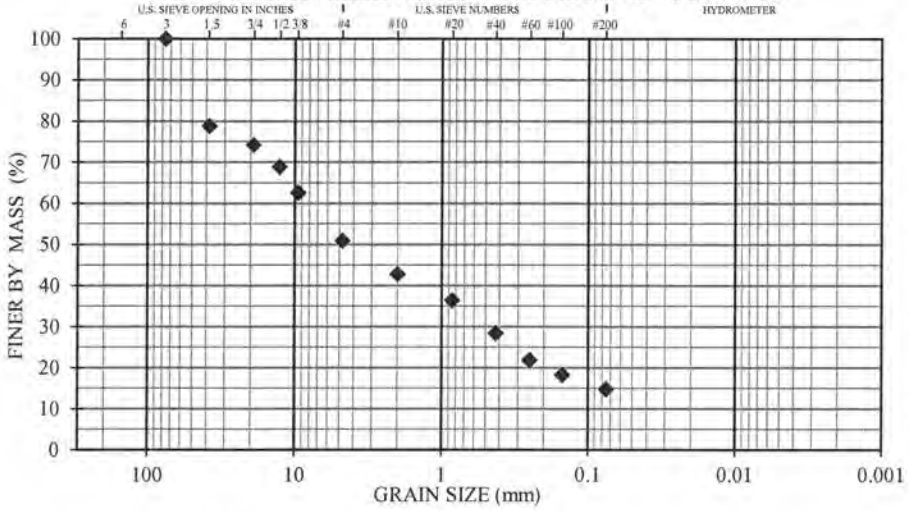
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Silty gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	49.1	USCS	GM
% SAND	36.2	USACOE FC	N/A
% SILT/CLAY	14.7	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	11.6	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

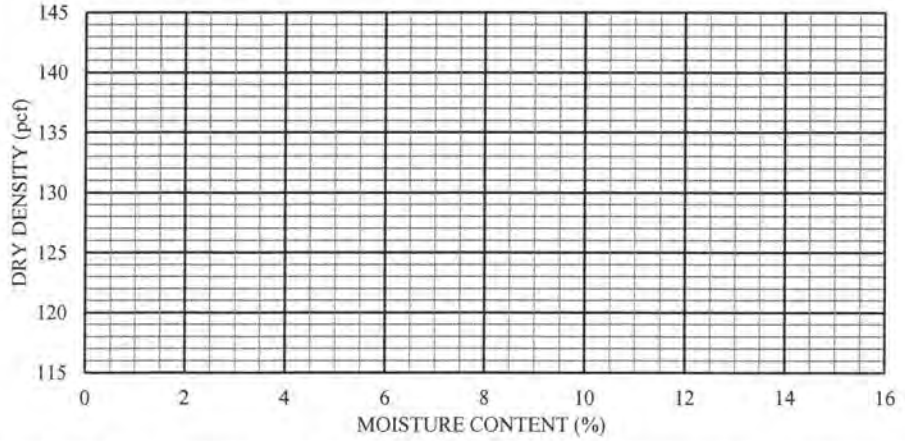


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	79	
19.00	3/4"	74	
12.70	1/2"	69	
9.50	3/8"	63	
4.75	#4	51	
2.00	#10	43	
0.85	#20	36	
0.43	#40	28	
0.25	#60	22	
0.15	#100	18	
0.075	#200	14.7	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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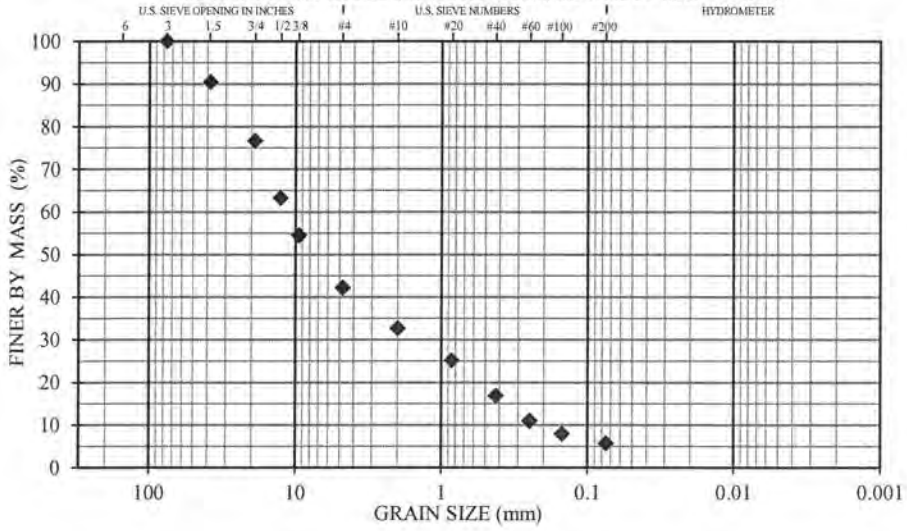
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S3 / 5 - 6.5'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	57.8	USCS	GW-GM
% SAND	36.5	USACOE FC	N/A
% SILT/CLAY	5.7	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	4.3	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		52.8	
COEFFICIENT OF GRADATION (C_c)		1.0	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

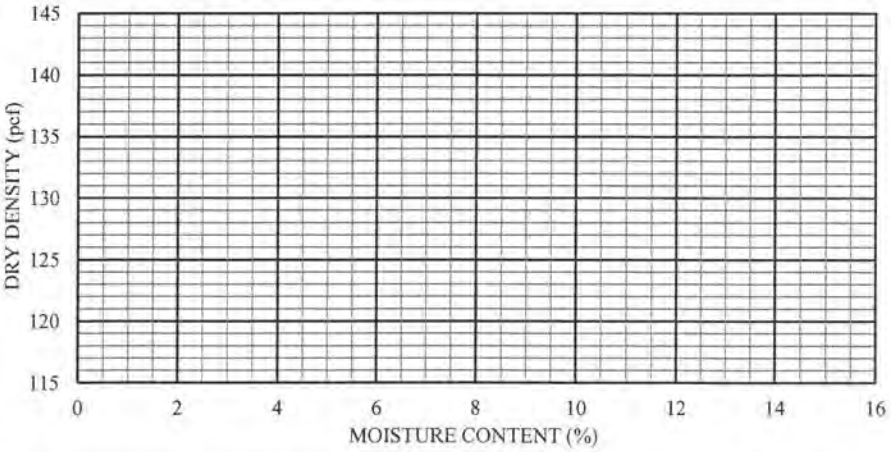
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	90	
19.00	3/4"	77	
12.70	1/2"	63	
9.50	3/8"	55	
4.75	#4	42	
2.00	#10	33	
0.85	#20	25	
0.43	#40	17	
0.25	#60	11	
0.15	#100	8	
0.075	#200	5.7	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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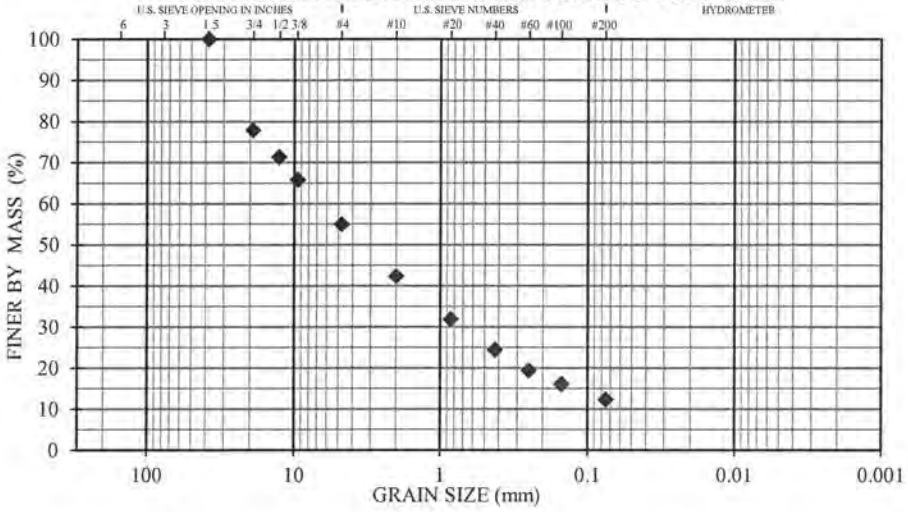
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S7 / 20 - 21.5'
DESCRIPTION:	Silty gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	45.1	USCS	GM
% SAND	42.6	USACOE FC	N/A
% SILT/CLAY	12.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	7.7	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)			UNKNOWN
COEFFICIENT OF GRADATION (C_c)			UNKNOWN
ASTM D1557 (uncorrected)			N/A
ASTM D4718 (corrected)			N/A
OPTIMUM MOIST. CONTENT. (corrected)			N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

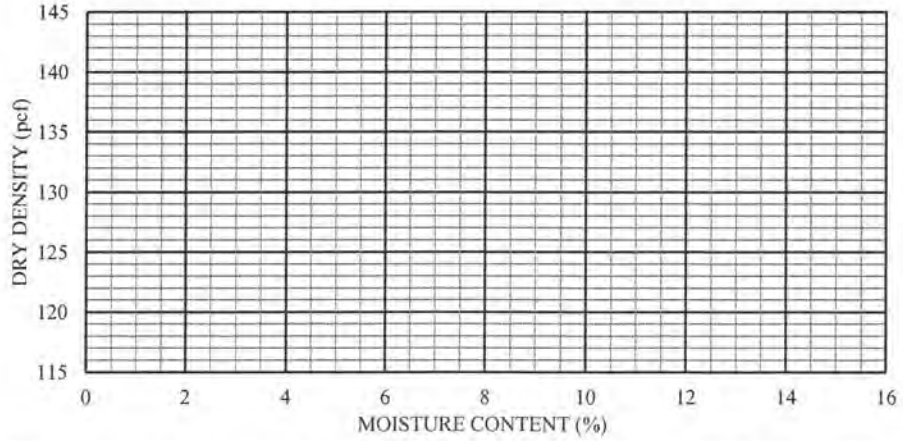


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	78	
12.70	1/2"	71	
9.50	3/8"	66	
4.75	#4	55	
2.00	#10	42	
0.85	#20	32	
0.43	#40	24	
0.25	#60	19	
0.15	#100	16	
0.075	#200	12.3	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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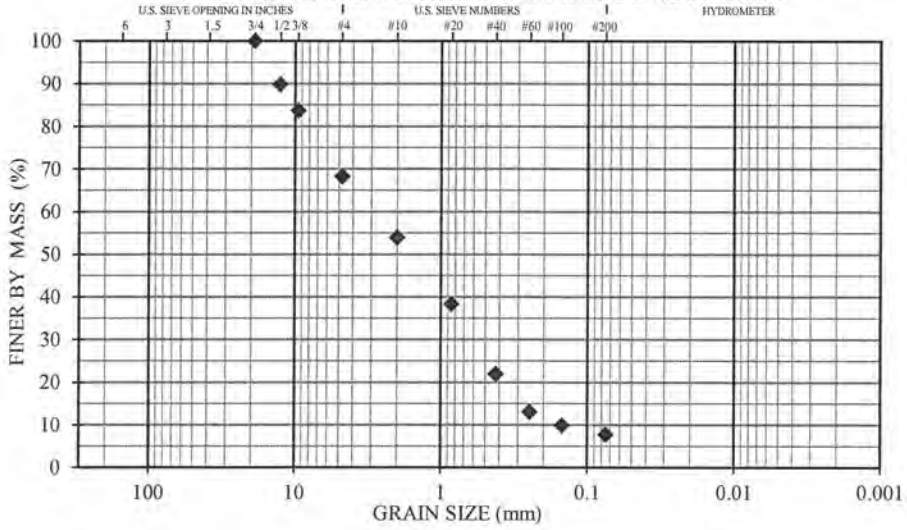
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S8 / 25 - 26.5'
DESCRIPTION:	Poorly-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	31.7	USCS	SP-SM
% SAND	60.5	USACOE FC	N/A
% SILT/CLAY	7.8	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	7.7	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		20.6	
COEFFICIENT OF GRADATION (C_c)		0.8	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

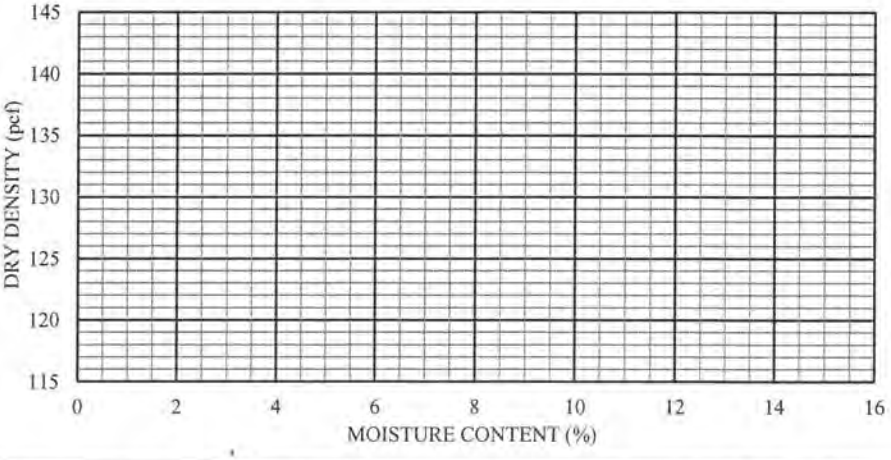
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"		
19.00	3/4"	100	
12.70	1/2"	90	
9.50	3/8"	84	
4.75	#4	68	
2.00	#10	54	
0.85	#20	38	
0.43	#40	22	
0.25	#60	13	
0.15	#100	10	
0.075	#200	7.8	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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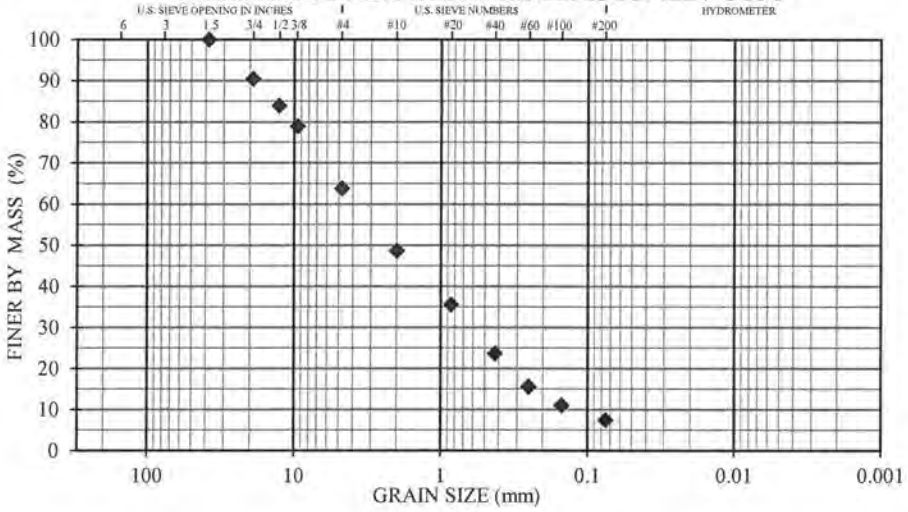
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B5
NUMBER/ DEPTH:	S9 / 30 - 31.5'
DESCRIPTION:	Poorly-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	36.2	USCS	SP-SM
% SAND	56.3	USACOE FC	N/A
% SILT/CLAY	7.5	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	9.4	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	31.5
COEFFICIENT OF GRADATION (C_c)	0.8
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

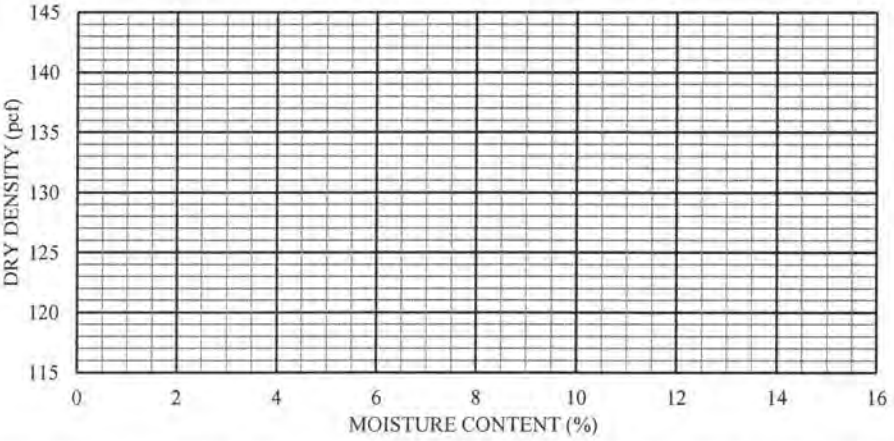
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	90	
12.70	1/2"	84	
9.50	3/8"	79	
4.75	#4	64	
2.00	#10	49	
0.85	#20	36	
0.43	#40	24	
0.25	#60	16	
0.15	#100	11	
0.075	#200	7.5	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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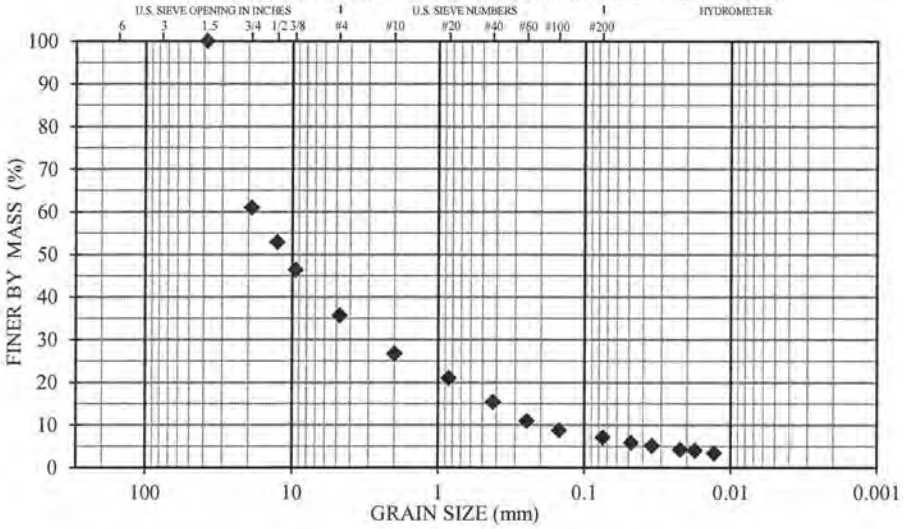
PROJECT CLIENT:	**American Engineering Testing, Inc.**
PROJECT NAME:	**7751 W Parks Hwy., Wasilla, AK**
PROJECT NO.:	**5862-20**
SAMPLE LOC.:	**B6**
NUMBER/ DEPTH:	**S1 / 0 - 1.5'**
DESCRIPTION:	**Well-graded gravel w/ silt and sand**
DATE RECEIVED:	**10/5/2020**
TESTED BY:	**EA**
REVIEWED BY:	**CJB**

% GRAVEL	**64.3**	USCS	**GW-GM**
% SAND	**28.6**	USACOE FC	**S1**
% SILT/CLAY	**7.1**	% PASS. 0.02 mm	**4.3**
% MOIST. CONTENT	**4.9**	% PASS. 0.002 mm	**N/A**
UNIFORMITY COEFFICIENT (C_u)		**87.9**	
COEFFICIENT OF GRADATION (C_c)		**2.4**	
ASTM D1557 (uncorrected)		**N/A**	
ASTM D4718 (corrected)		**N/A**	
OPTIMUM MOIST. CONTENT. (corrected)		**N/A**	

PARTICLE SIZE ANALYSIS ASTM D422 / C136

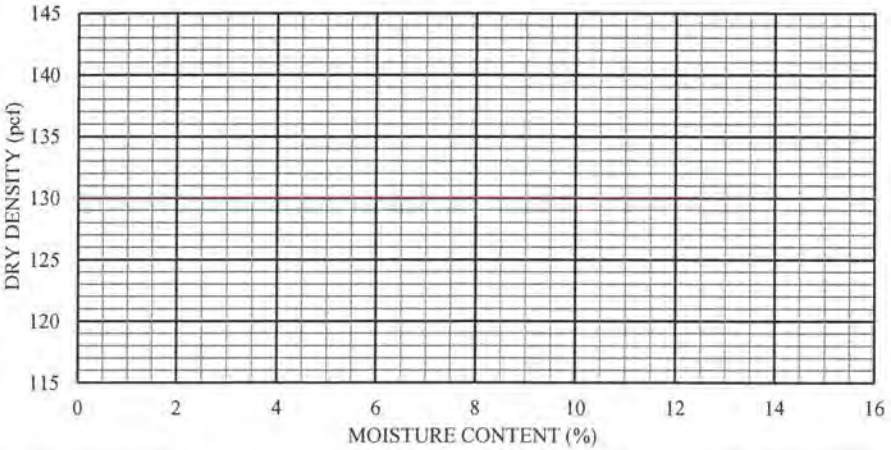


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	**100**	
19.00	3/4"	**61**	
12.70	1/2"	**53**	
9.50	3/8"	**46**	
4.75	#4	**36**	
2.00	#10	**27**	
0.85	#20	**21**	
0.43	#40	**15**	
0.25	#60	**11**	
0.15	#100	**9**	
0.075	#200	**7.1**	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0481	5.9
2	0.0347	5.1
5	0.0222	4.3
8	0.0177	4.0
15	0.0131	3.4
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	**N/A**
DEGRADATION (ATM T-313)	**N/A**
PLASTICITY INDEX ASTM 4318	**N/A**

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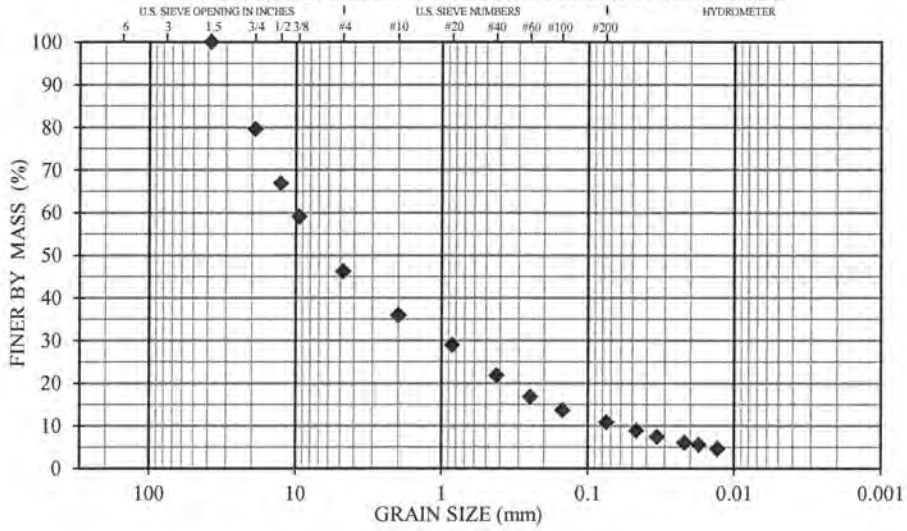
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B6
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	53.7	USCS	GW-GM
% SAND	35.5	USACOE FC	S1
% SILT/CLAY	10.8	% PASS. 0.02 mm	6.0
% MOIST. CONTENT	7.2	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		156.2	
COEFFICIENT OF GRADATION (C_c)		1.7	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

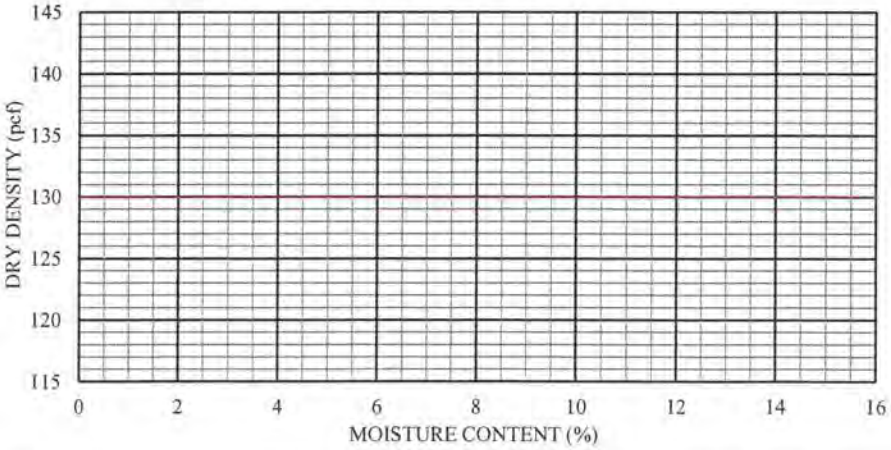
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	80	
12.70	1/2"	67	
9.50	3/8"	59	
4.75	#4	46	
2.00	#10	36	
0.85	#20	29	
0.43	#40	22	
0.25	#60	17	
0.15	#100	14	
0.075	#200	10.8	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0469	8.8
2	0.0340	7.4
5	0.0219	6.0
8	0.0175	5.6
15	0.0131	4.6
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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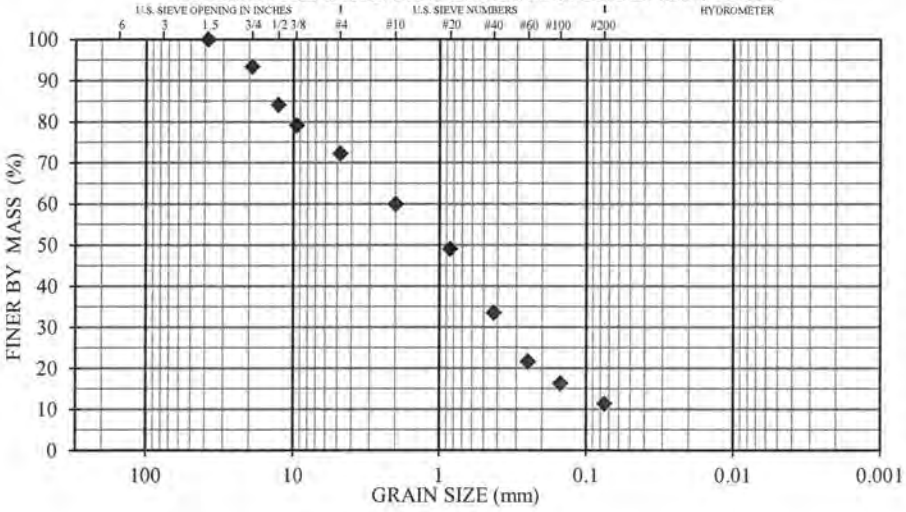
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B6
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Poorly-graded sand w/ silt and gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	27.7	USCS	SP-SM
% SAND	61.0	USACOE FC	N/A
% SILT/CLAY	11.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	3.1	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

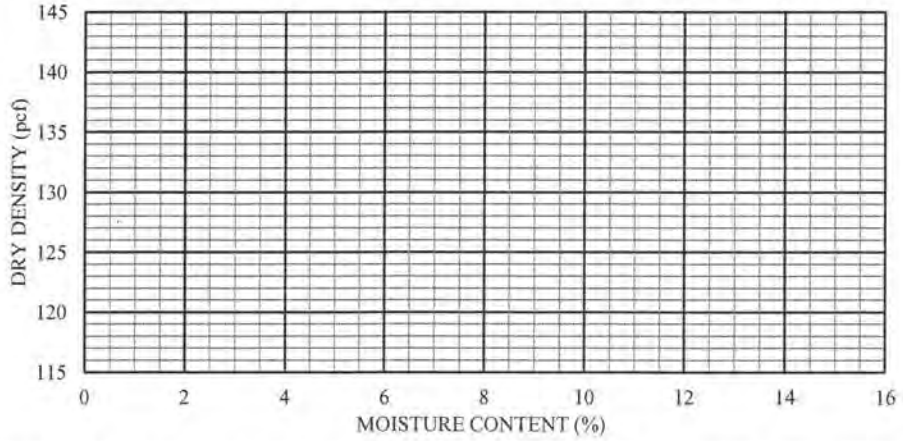


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	93	
12.70	1/2"	84	
9.50	3/8"	79	
4.75	#4	72	
2.00	#10	60	
0.85	#20	49	
0.43	#40	34	
0.25	#60	22	
0.15	#100	16	
0.075	#200	11.3	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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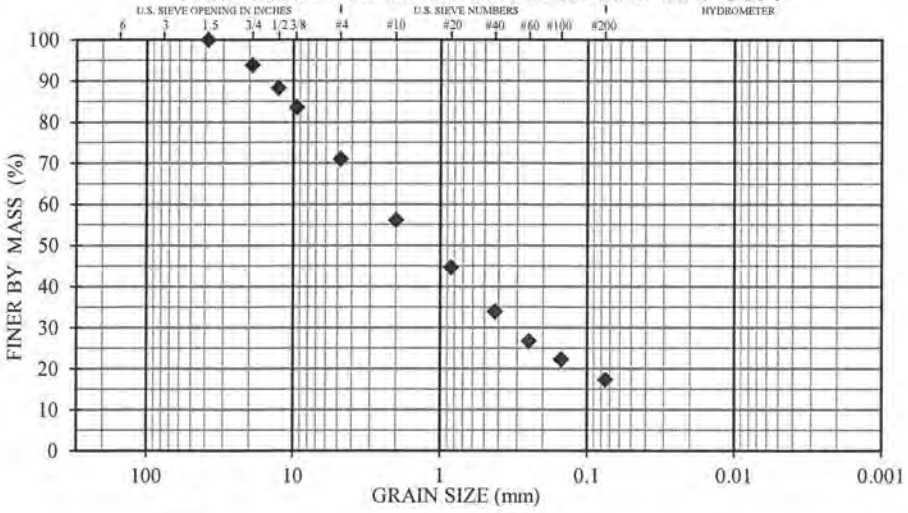
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B6
NUMBER/ DEPTH:	S5 / 10 - 11.5'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	29.0	USCS	SM
% SAND	53.7	USACOE FC	N/A
% SILT/CLAY	17.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.3	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

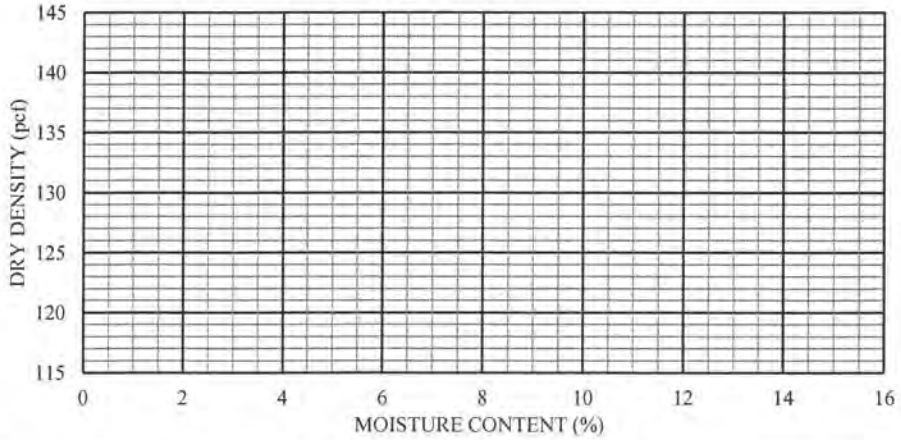
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	94	
12.70	1/2"	88	
9.50	3/8"	84	
4.75	#4	71	
2.00	#10	56	
0.85	#20	45	
0.43	#40	34	
0.25	#60	27	
0.15	#100	22	
0.075	#200	17.3	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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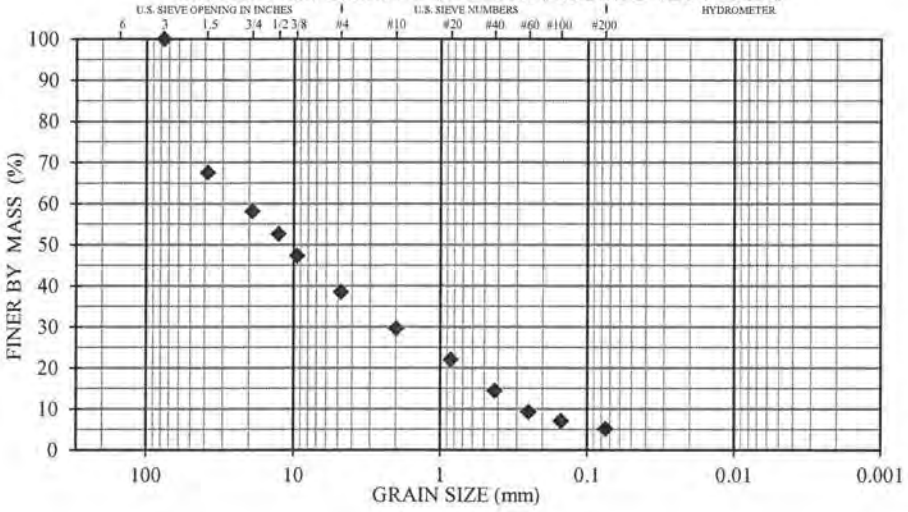
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B6
NUMBER/ DEPTH:	S6 / 15 - 16.5'
DESCRIPTION:	Poorly-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	61.5	USCS	GP-GM
% SAND	33.3	USACOE FC	N/A
% SILT/CLAY	5.2	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	5.1	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	83.5
COEFFICIENT OF GRADATION (C_c)	0.7
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

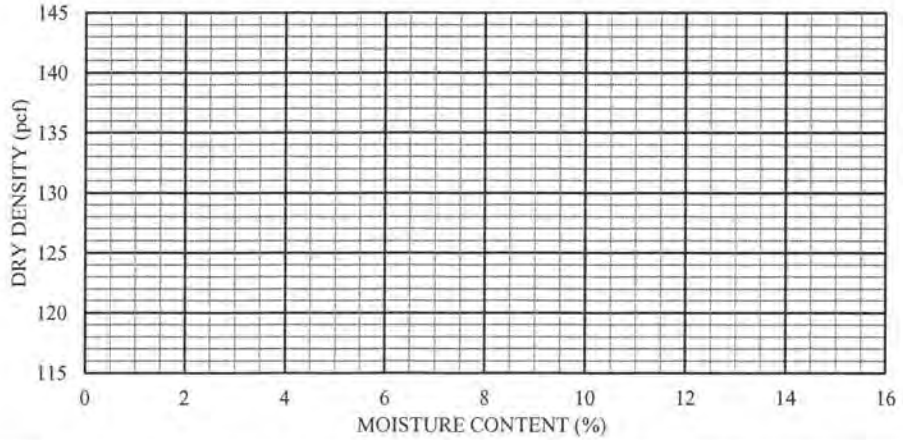
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	68	
19.00	3/4"	58	
12.70	1/2"	53	
9.50	3/8"	47	
4.75	#4	38	
2.00	#10	30	
0.85	#20	22	
0.43	#40	14	
0.25	#60	9	
0.15	#100	7	
0.075	#200	5.2	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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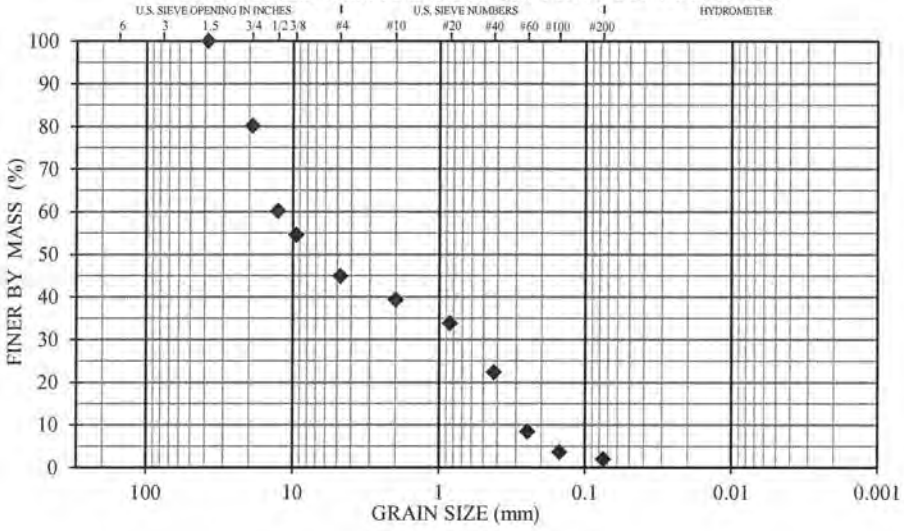
PROJECT CLIENT:	**American Engineering Testing, Inc.**
PROJECT NAME:	**7751 W Parks Hwy., Wasilla, AK**
PROJECT NO.:	**5862-20**
SAMPLE LOC.:	**B7**
NUMBER/ DEPTH:	**S1 / 0 - 1.5'**
DESCRIPTION:	**Poorly-graded gravel w/ sand**
DATE RECEIVED:	**10/5/2020**
TESTED BY:	**EA**
REVIEWED BY:	**CJB**

% GRAVEL	**55.0**	USCS	**GP**
% SAND	**43.0**	USACOE FC	**N/A**
% SILT/CLAY	**2.0**	% PASS. 0.02 mm	**N/A**
% MOIST. CONTENT	**3.7**	% PASS. 0.002 mm	**N/A**

UNIFORMITY COEFFICIENT (C_u)	**46.8**
COEFFICIENT OF GRADATION (C_c)	**0.1**
ASTM D1557 (uncorrected)	**N/A**
ASTM D4718 (corrected)	**N/A**
OPTIMUM MOIST. CONTENT. (corrected)	**N/A**

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

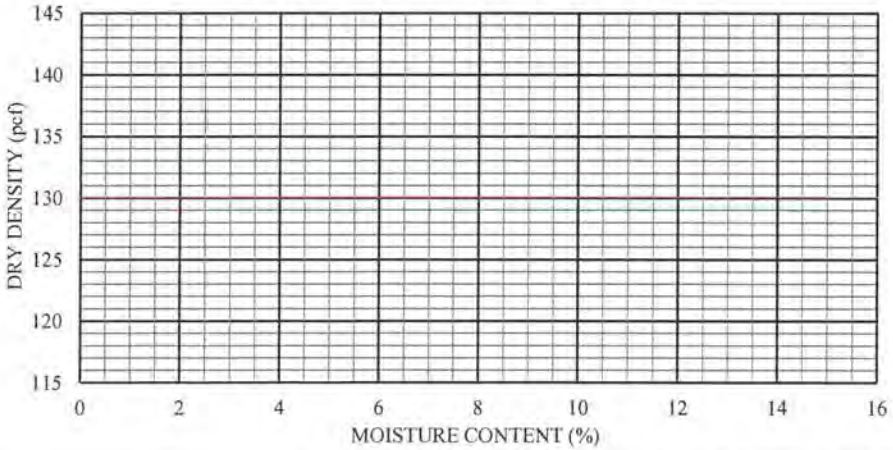
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	**100**	
19.00	3/4"	**80**	
12.70	1/2"	**60**	
9.50	3/8"	**55**	
4.75	#4	**45**	
2.00	#10	**39**	
0.85	#20	**34**	
0.43	#40	**22**	
0.25	#60	**8**	
0.15	#100	**4**	
0.075	#200	**2.0**	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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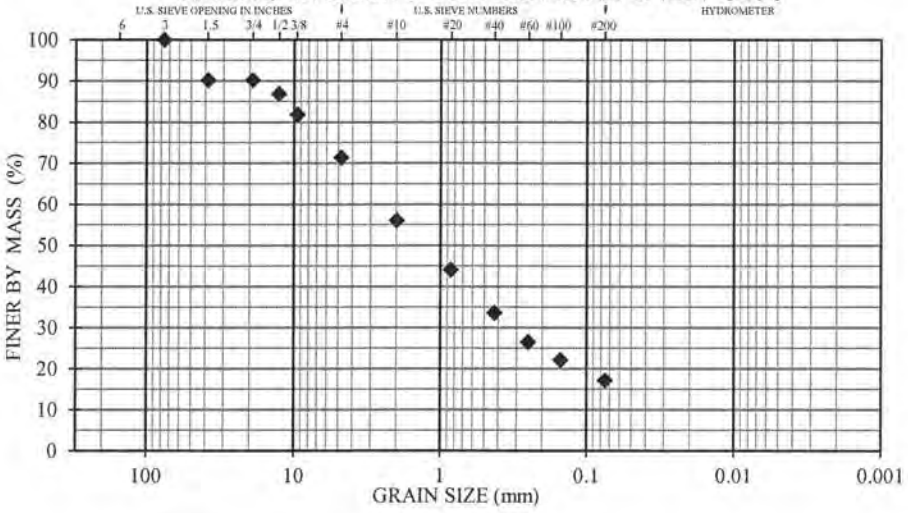
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B7
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	28.7	USCS	SM
% SAND	54.2	USACOE FC	N/A
% SILT/CLAY	17.1	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.4	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

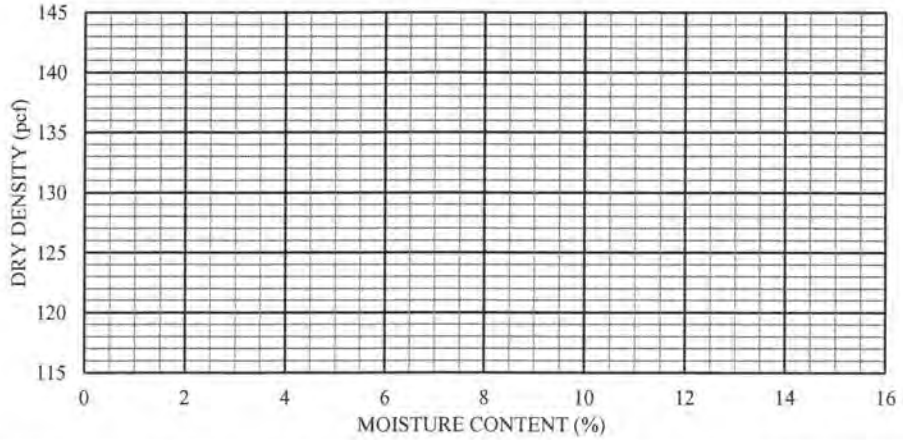
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	90	
19.00	3/4"	90	
12.70	1/2"	87	
9.50	3/8"	82	
4.75	#4	71	
2.00	#10	56	
0.85	#20	44	
0.43	#40	34	
0.25	#60	26	
0.15	#100	22	
0.075	#200	17.1	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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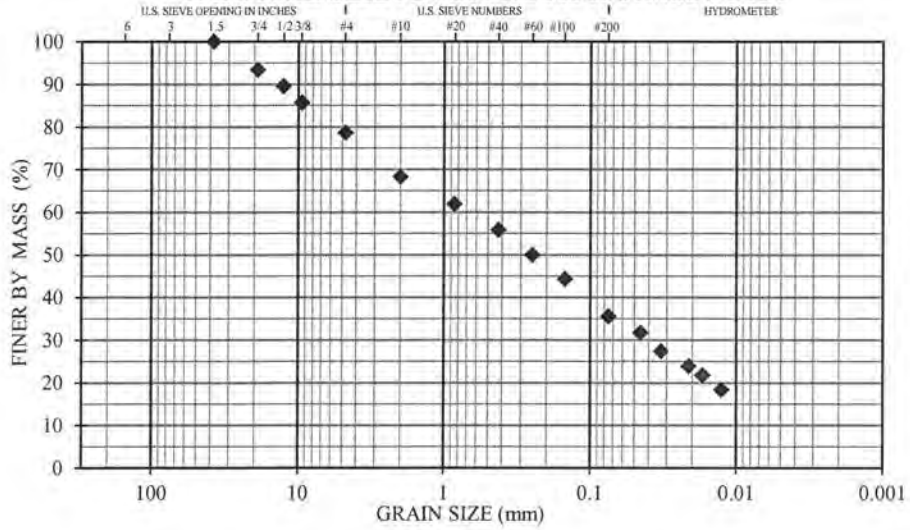
PROJECT CLIENT:	**American Engineering Testing, Inc.**
PROJECT NAME:	**7751 W Parks Hwy., Wasilla, AK**
PROJECT NO.:	**5862-20**
SAMPLE LOC.:	**B8**
NUMBER/ DEPTH:	**S1 / 0.5 - 2'**
DESCRIPTION:	**Silty sand w/ gravel**
DATE RECEIVED:	**10/5/2020**
TESTED BY:	**EA**
REVIEWED BY:	**CJB**

% GRAVEL	**21.3**	USCS	**SM**
% SAND	**43.1**	USACOE FC	**F3**
% SILT/CLAY	**35.6**	% PASS. 0.02 mm	**23.7**
% MOIST. CONTENT	**8.4**	% PASS. 0.002 mm	**N/A**
UNIFORMITY COEFFICIENT (C_u)			**UNKNOWN**
COEFFICIENT OF GRADATION (C_c)			**UNKNOWN**
ASTM D1557 (uncorrected)			**N/A**
ASTM D4718 (corrected)			**N/A**
OPTIMUM MOIST. CONTENT. (corrected)			**N/A**

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

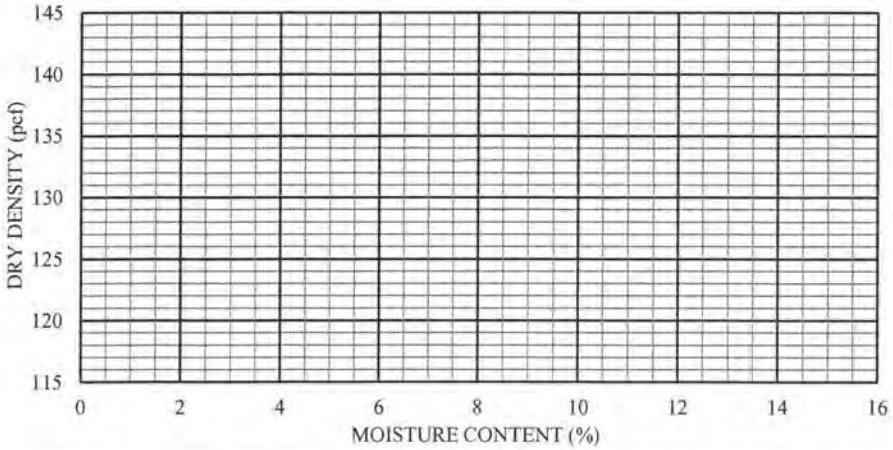
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	**100**	
19.00	3/4"	**93**	
12.70	1/2"	**90**	
9.50	3/8"	**86**	
4.75	#4	**79**	
2.00	#10	**68**	
0.85	#20	**62**	
0.43	#40	**56**	
0.25	#60	**50**	
0.15	#100	**44**	
0.075	#200	**35.6**	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0453	31.7
2	0.0328	27.4
5	0.0212	24.0
8	0.0170	21.8
15	0.0127	18.3
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	**N/A**
DEGRADATION (ATM T-313)	**N/A**
PLASTICITY INDEX ASTM 4318	**N/A**

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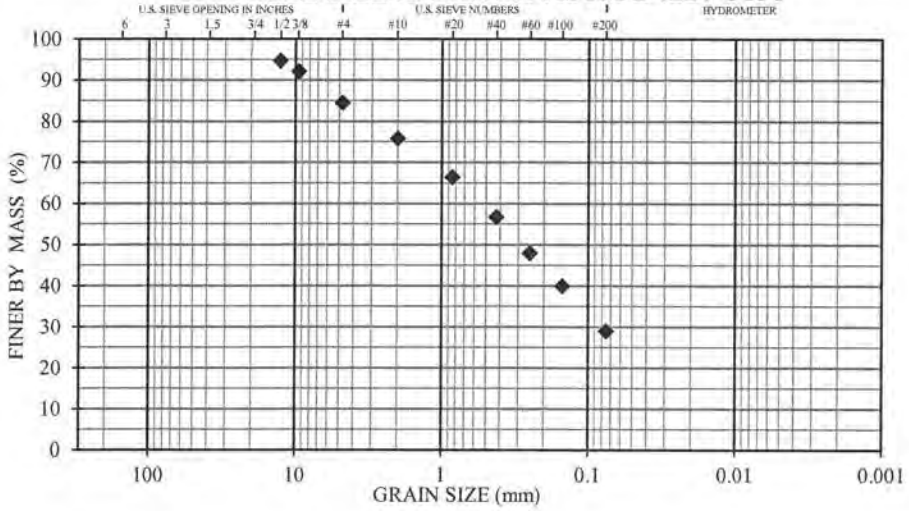
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B8
NUMBER/ DEPTH:	S2 / 4 - 6'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	15.5	USCS	SM
% SAND	55.6	USACOE FC	N/A
% SILT/CLAY	28.9	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	12.6	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

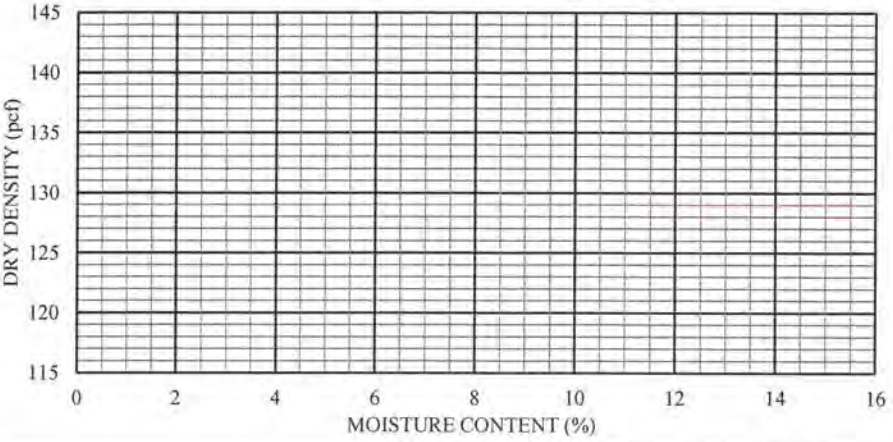
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"		
19.00	3/4"		
12.70	1/2"	95	
9.50	3/8"	92	
4.75	#4	84	
2.00	#10	76	
0.85	#20	66	
0.43	#40	57	
0.25	#60	48	
0.15	#100	40	
0.075	#200	28.9	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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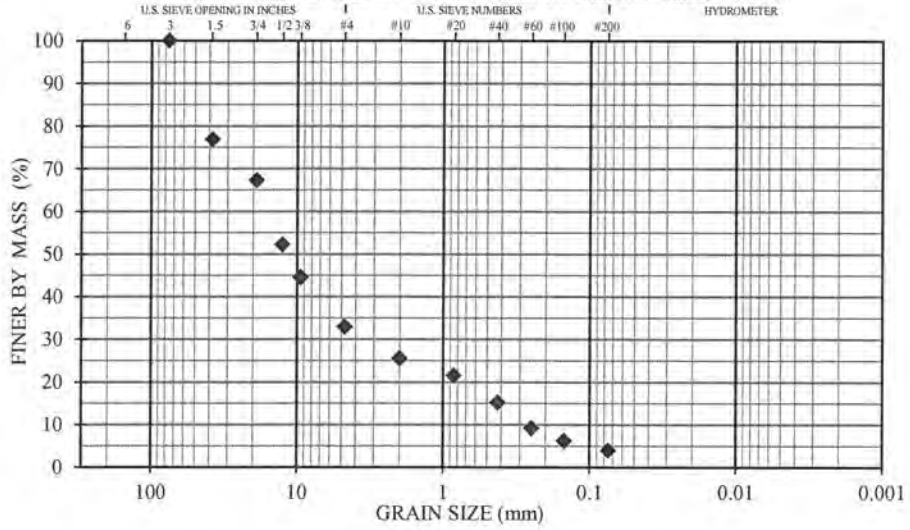
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B8
NUMBER/ DEPTH:	S3 / 9 - 11'
DESCRIPTION:	Poorly-graded gravel w/ sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	67.0	USCS	GP
% SAND	29.0	USACOE FC	N/A
% SILT/CLAY	4.0	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	1.4	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		58.2	
COEFFICIENT OF GRADATION (C_c)		3.1	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D422 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

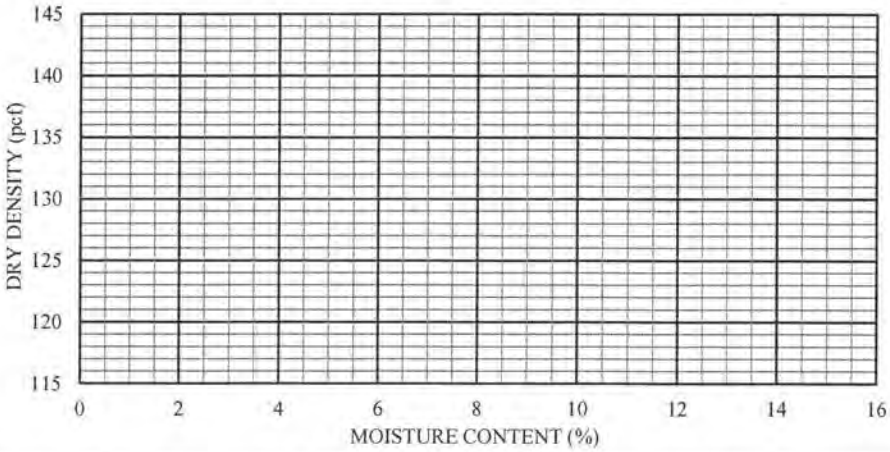
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	77	
19.00	3/4"	67	
12.70	1/2"	52	
9.50	3/8"	45	
4.75	#4	33	
2.00	#10	26	
0.85	#20	22	
0.43	#40	15	
0.25	#60	9	
0.15	#100	6	
0.075	#200	4.0	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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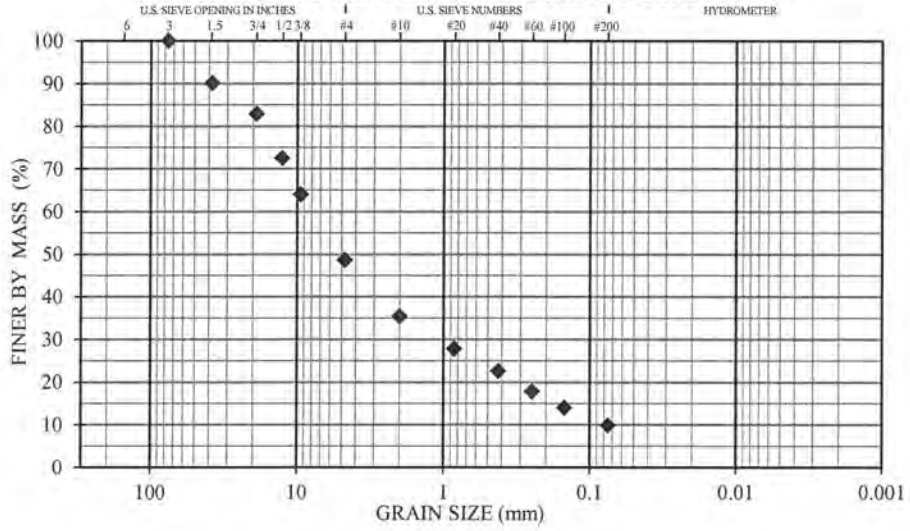
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7751 W Parks Hwy., Wasilla, AK
PROJECT NO.:	5862-20
SAMPLE LOC.:	B8
NUMBER/ DEPTH:	S4 / 13 - 15'
DESCRIPTION:	Well-graded gravel w/ silt and sand
DATE RECEIVED:	10/5/2020
TESTED BY:	EA
REVIEWED BY:	CJB

% GRAVEL	51.3	USCS	GW-GM
% SAND	38.8	USACOE FC	N/A
% SILT/CLAY	9.9	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	4.5	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	107.6
COEFFICIENT OF GRADATION (C_c)	2.2
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D422 / C136

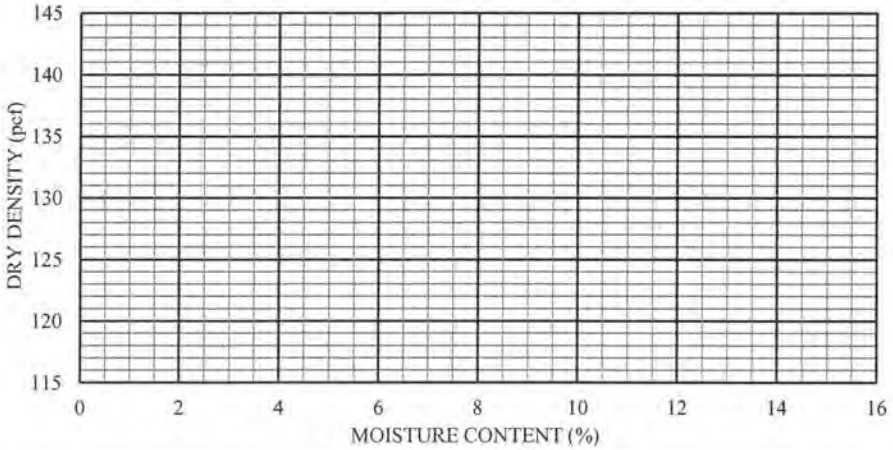


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	90	
19.00	3/4"	83	
12.70	1/2"	73	
9.50	3/8"	64	
4.75	#4	49	
2.00	#10	35	
0.85	#20	28	
0.43	#40	23	
0.25	#60	18	
0.15	#100	14	
0.075	#200	9.9	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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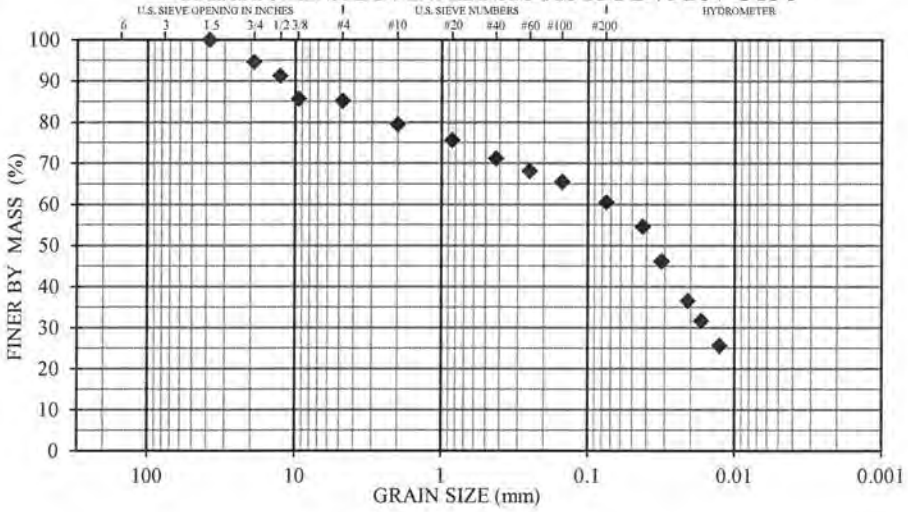
PROJECT CLIENT:	**American Engineering Testing, Inc.**
PROJECT NAME:	**7699 W. Parks HWY - Wasilla**
PROJECT NO.:	**6216-21**
SAMPLE LOC.:	**B9**
NUMBER/ DEPTH:	**S3 / 5 - 6.5'**
DESCRIPTION:	**Sandy silt**
DATE RECEIVED:	**11/8/2021**
TESTED BY:	**Erik Boatwright**
REVIEWED BY:	**CJB**

% GRAVEL	**14.8**	USCS	**ML**
% SAND	**24.7**	USACOE FC	**F4**
% SILT/CLAY	**60.5**	% PASS. 0.02 mm	**35.0**
% MOIST. CONTENT	**36.4**	% PASS. 0.002 mm	**N/A**

UNIFORMITY COEFFICIENT (C_u)	**UNKNOWN**
COEFFICIENT OF GRADATION (C_c)	**UNKNOWN**
ASTM D1557 (uncorrected)	**N/A**
ASTM D4718 (corrected)	**N/A**
OPTIMUM MOIST. CONTENT. (corrected)	**N/A**

PARTICLE SIZE ANALYSIS ASTM D7928 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

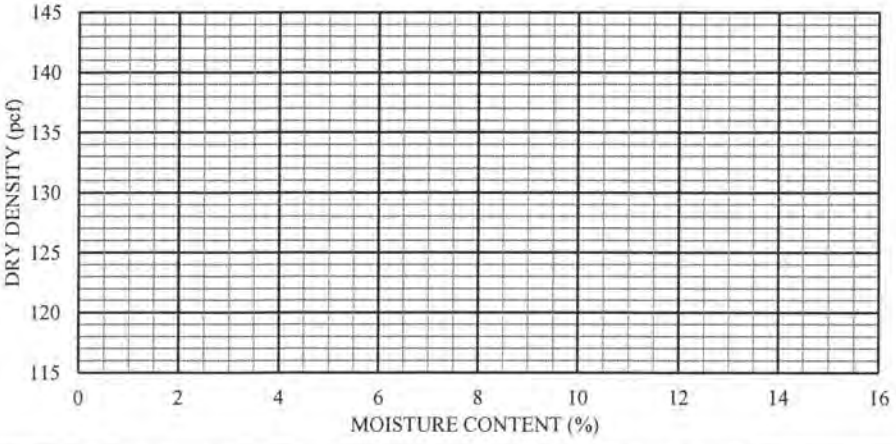
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	**100**	
19.00	3/4"	**95**	
12.70	1/2"	**91**	
9.50	3/8"	**86**	
4.75	#4	**85**	
2.00	#10	**79**	
0.85	#20	**76**	
0.43	#40	**71**	
0.25	#60	**68**	
0.15	#100	**65**	
0.075	#200	**60.5**	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0424	54.6
2	0.0316	46.2
5	0.0210	36.5
8	0.0170	31.7
15	0.0127	25.7
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	**N/A**
DEGRADATION (ATM T-313)	**N/A**
PLASTICITY INDEX ASTM 4318	**N/A**

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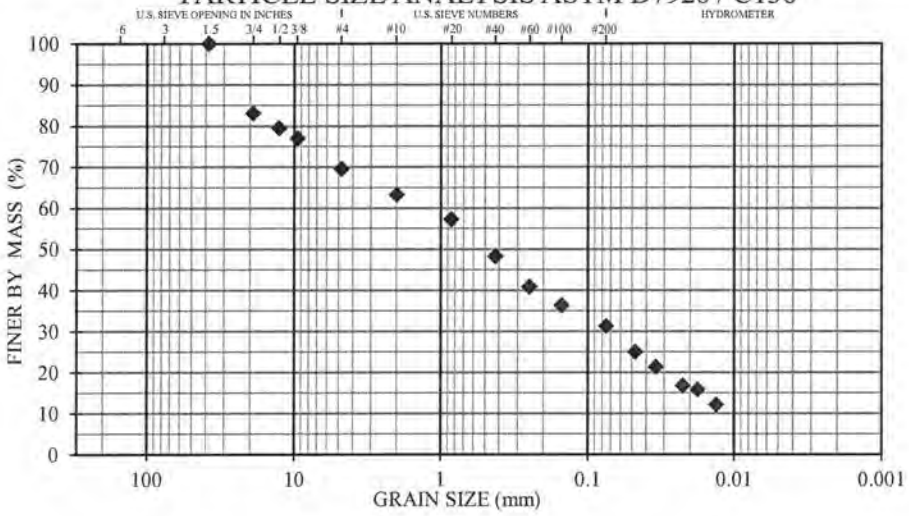
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7699 W. Parks HWY - Wasilla
PROJECT NO.:	6216-21
SAMPLE LOC.:	B10
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	11/8/2021
TESTED BY:	Erik Boatwright
REVIEWED BY:	CJB

% GRAVEL	30.5	USCS	SM
% SAND	38.3	USACOE FC	F3
% SILT/CLAY	31.2	% PASS. 0.02 mm	17.3
% MOIST. CONTENT	24.2	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	UNKNOWN
COEFFICIENT OF GRADATION (C_c)	UNKNOWN
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D7928 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

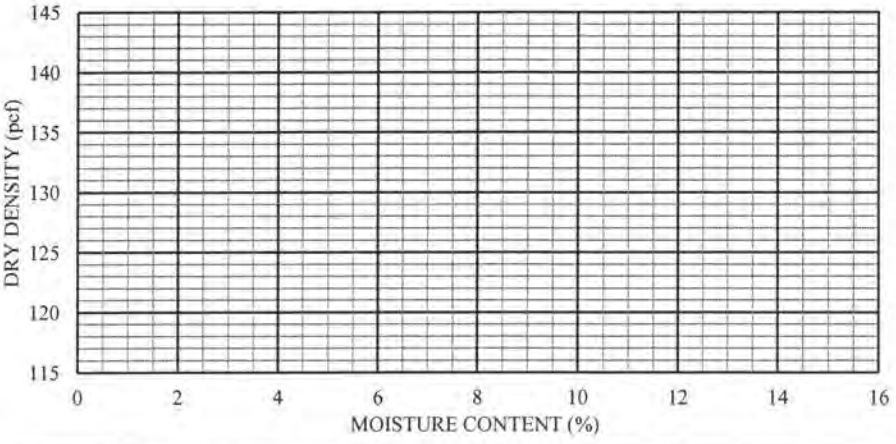
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	83	
12.70	1/2"	80	
9.50	3/8"	77	
4.75	#4	70	
2.00	#10	63	
0.85	#20	57	
0.43	#40	48	
0.25	#60	41	
0.15	#100	36	
0.075	#200	31.2	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0474	25.0
2	0.0344	21.3
5	0.0225	16.7
8	0.0178	15.8
15	0.0132	12.1
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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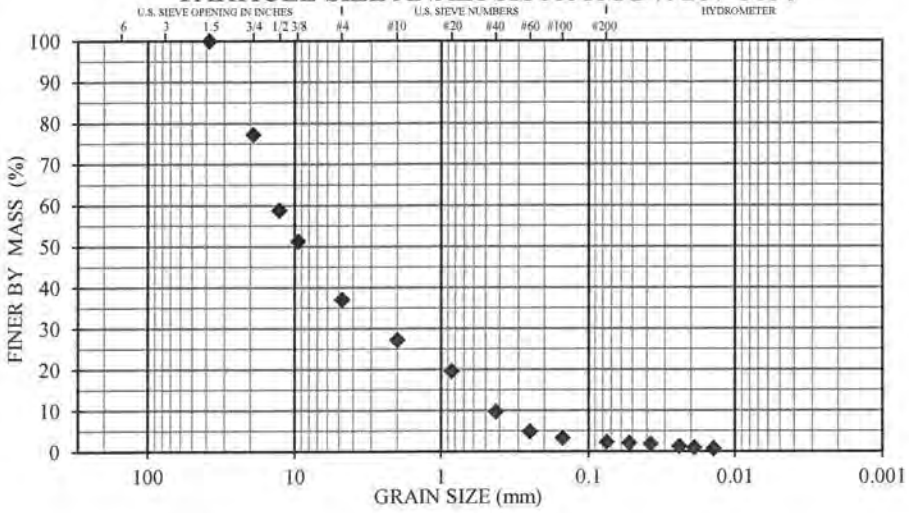
PROJECT CLIENT:	**American Engineering Testing, Inc.**
PROJECT NAME:	**7699 W. Parks HWY - Wasilla**
PROJECT NO.:	**6216-21**
SAMPLE LOC.:	**B11**
NUMBER/ DEPTH:	**S3 / 5 - 6.5'**
DESCRIPTION:	**Well-graded gravel w/ sand**
DATE RECEIVED:	**11/8/2021**
TESTED BY:	**Erik Boatwright**
REVIEWED BY:	**CJB**

% GRAVEL	**63.0**	USCS	**GW**
% SAND	**34.7**	USACOE FC	**NFS**
% SILT/CLAY	**2.3**	% PASS. 0.02 mm	**1.0**
% MOIST. CONTENT	**3.0**	% PASS. 0.002 mm	**N/A**
UNIFORMITY COEFFICIENT (C_u)		**29.9**	
COEFFICIENT OF GRADATION (C_c)		**1.3**	
ASTM D1557 (uncorrected)		**N/A**	
ASTM D4718 (corrected)		**N/A**	
OPTIMUM MOIST. CONTENT. (corrected)		**N/A**	

PARTICLE SIZE ANALYSIS ASTM D7928 / C136

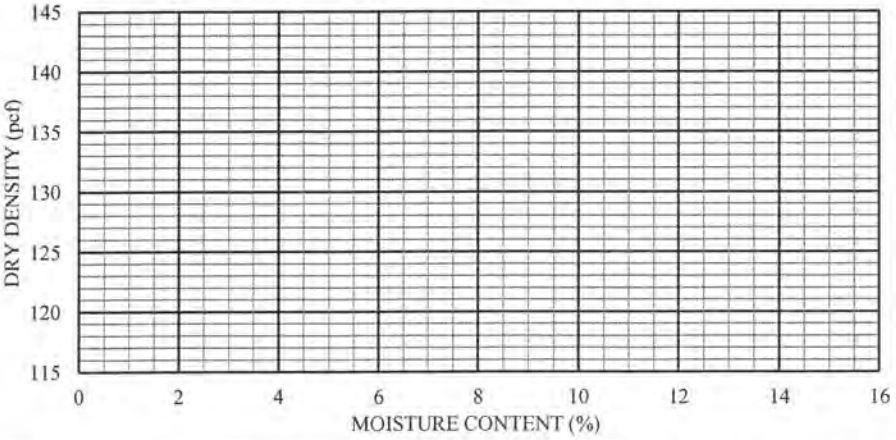


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	**100**	
19.00	3/4"	**77**	
12.70	1/2"	**59**	
9.50	3/8"	**51**	
4.75	#4	**37**	
2.00	#10	**27**	
0.85	#20	**20**	
0.43	#40	**10**	
0.25	#60	**5**	
0.15	#100	**3**	
0.075	#200	**2.3**	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0527	2.1
2	0.0375	1.8
5	0.0240	1.2
8	0.0190	0.9
15	0.0140	0.6
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	**N/A**
DEGRADATION (ATM T-313)	**N/A**
PLASTICITY INDEX ASTM 4318	**N/A**

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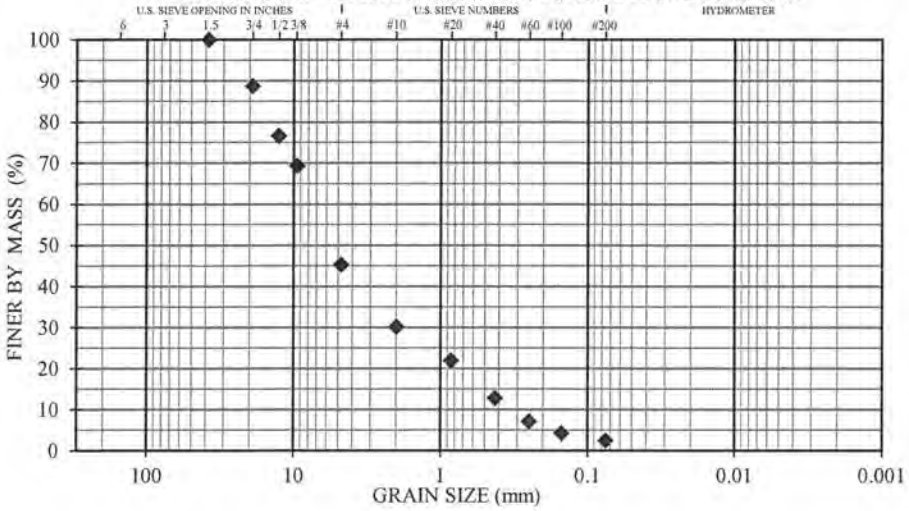
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7699 W. Parks HWY - Wasilla
PROJECT NO.:	6216-21
SAMPLE LOC.:	B11
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Well-graded gravel w/ sand
DATE RECEIVED:	11/8/2021
TESTED BY:	Erik Boatwright
REVIEWED BY:	CJB

% GRAVEL	54.8	USCS	GW
% SAND	42.8	USACOE FC	N/A
% SILT/CLAY	2.4	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	3.0	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	22.5
COEFFICIENT OF GRADATION (C_c)	1.5
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D7928 / C136

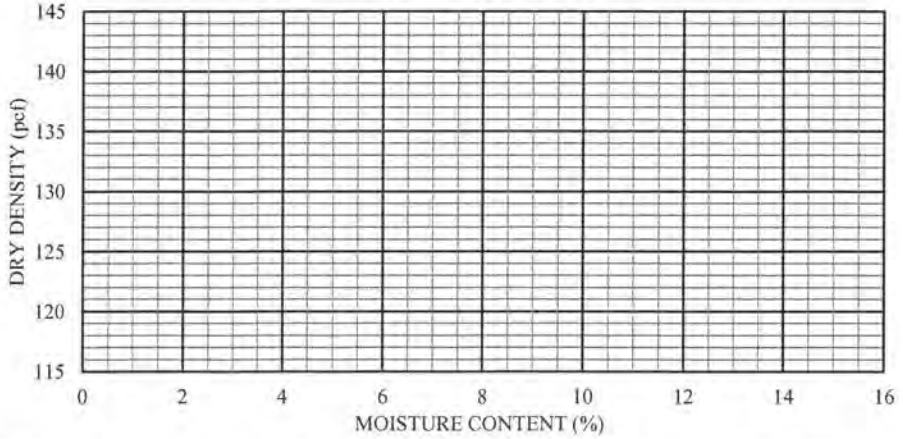


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	89	
12.70	1/2"	77	
9.50	3/8"	69	
4.75	#4	45	
2.00	#10	30	
0.85	#20	22	
0.43	#40	13	
0.25	#60	7	
0.15	#100	4	
0.075	#200	2.4	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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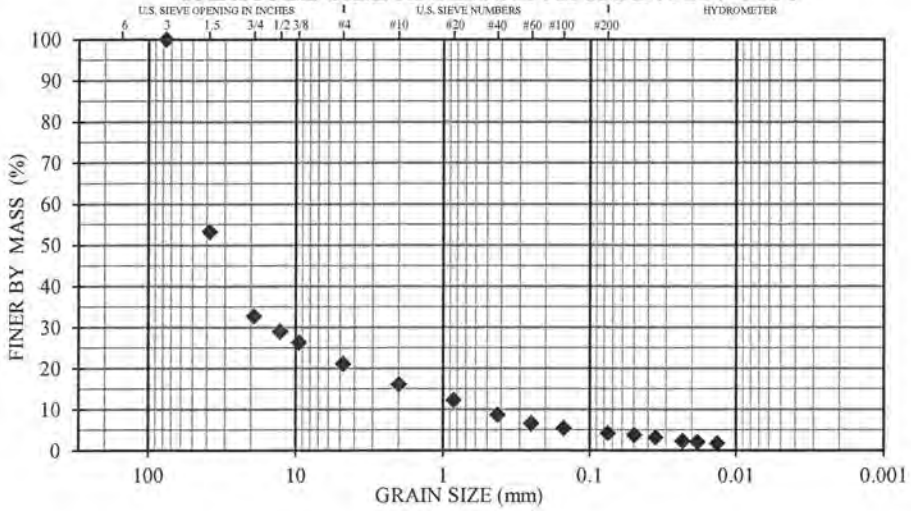
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7699 W. Parks HWY - Wasilla
PROJECT NO.:	6216-21
SAMPLE LOC.:	B12
NUMBER/ DEPTH:	S4 / 7.5 - 9'
DESCRIPTION:	Poorly-graded gravel w/ sand
DATE RECEIVED:	11/8/2021
TESTED BY:	Erik Boatwright
REVIEWED BY:	CJB

% GRAVEL	78.9	USCS	GP
% SAND	17.0	USACOE FC	PFS
% SILT/CLAY	4.1	% PASS. 0.02 mm	2.2
% MOIST. CONTENT	1.1	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	74.4
COEFFICIENT OF GRADATION (C_c)	8.2
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D7928 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

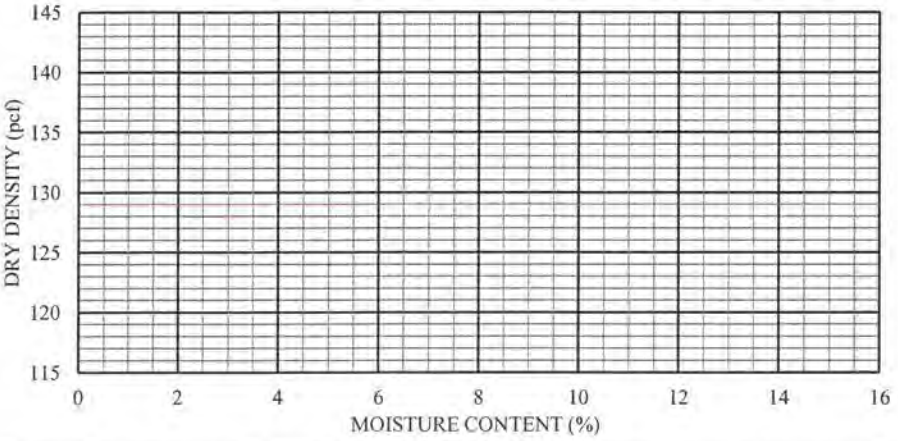
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	53	
19.00	3/4"	33	
12.70	1/2"	29	
9.50	3/8"	26	
4.75	#4	21	
2.00	#10	16	
0.85	#20	12	
0.43	#40	9	
0.25	#60	7	
0.15	#100	5	
0.075	#200	4.1	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0497	3.7
2	0.0355	3.2
5	0.0232	2.3
8	0.0183	2.1
15	0.0135	1.7
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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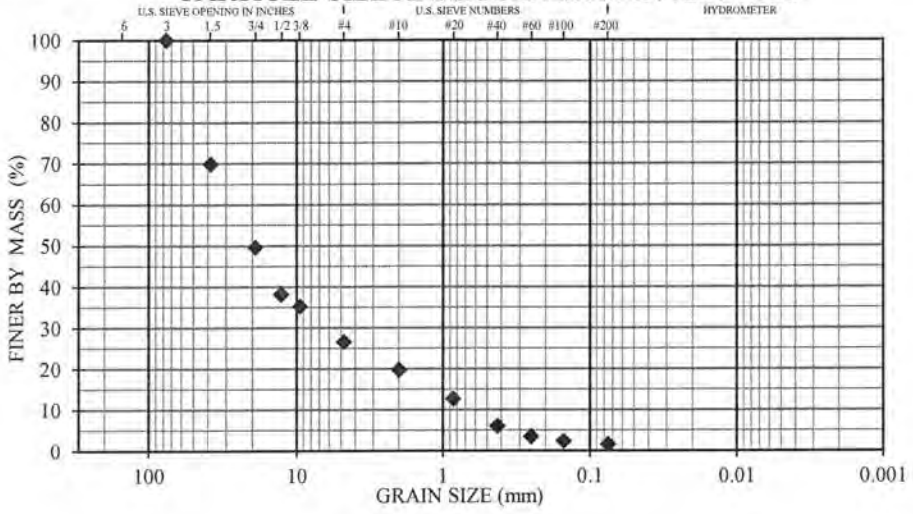
PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7699 W. Parks HWY - Wasilla
PROJECT NO.:	6216-21
SAMPLE LOC.:	B13
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Well-graded gravel w/ sand
DATE RECEIVED:	11/8/2021
TESTED BY:	Erik Boatwright
REVIEWED BY:	CJB

% GRAVEL	73.5	USCS	GW
% SAND	25.0	USACOE FC	N/A
% SILT/CLAY	1.5	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.4	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	42.5
COEFFICIENT OF GRADATION (C_c)	2.3
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D7928 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

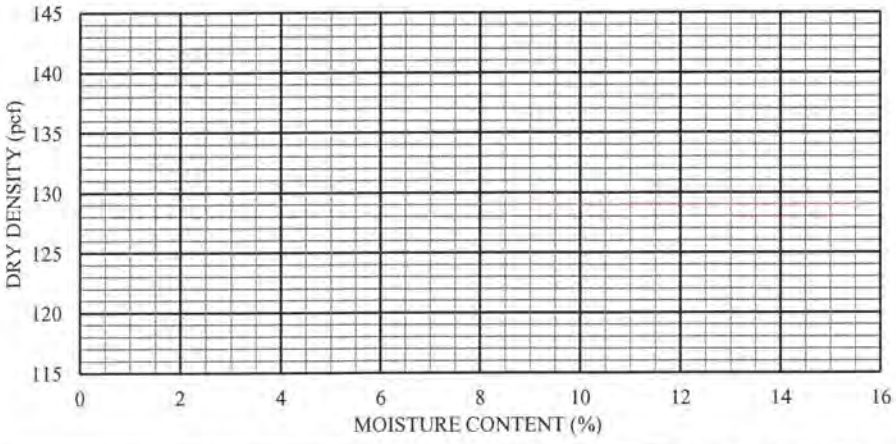
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	70	
19.00	3/4"	50	
12.70	1/2"	38	
9.50	3/8"	35	
4.75	#4	27	
2.00	#10	20	
0.85	#20	13	
0.43	#40	6	
0.25	#60	3	
0.15	#100	2	
0.075	#200	1.5	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

11301 Olive Lane · Anchorage, Alaska 99515 · Phone: 907-344-5934 · Fax: 907-344-5993 · www.nge-tft.com

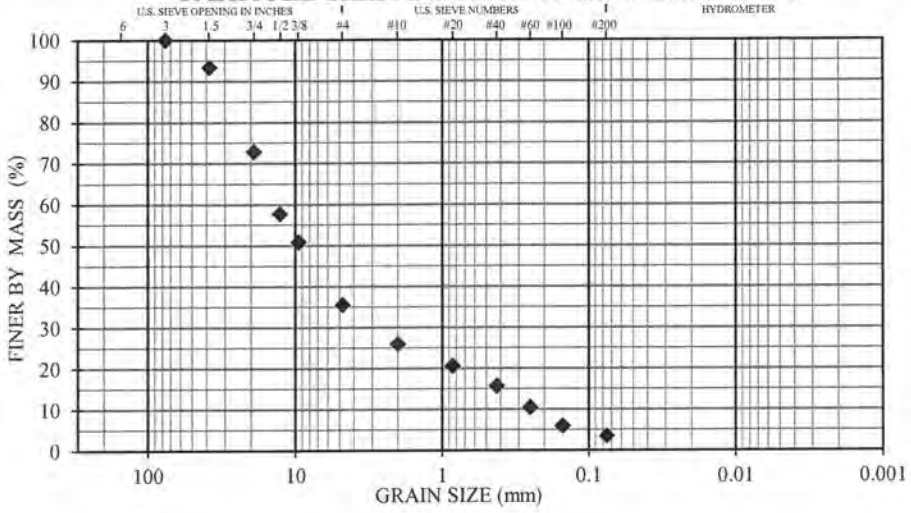
NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

Laboratory Testing | Geotechnical Engineering | Instrumentation | Construction Monitoring Services | Thermal Analysis

PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7699 W. Parks HWY - Wasilla
PROJECT NO.:	6216-21
SAMPLE LOC.:	B14
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Poorly-graded gravel w/ sand
DATE RECEIVED:	11/8/2021
TESTED BY:	Erik Boatwright
REVIEWED BY:	CJB

% GRAVEL	64.5	USCS	GP
% SAND	32.0	USACOE FC	N/A
% SILT/CLAY	3.5	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	2.4	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		56.9	
COEFFICIENT OF GRADATION (C_c)		3.0	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D7928 / C136

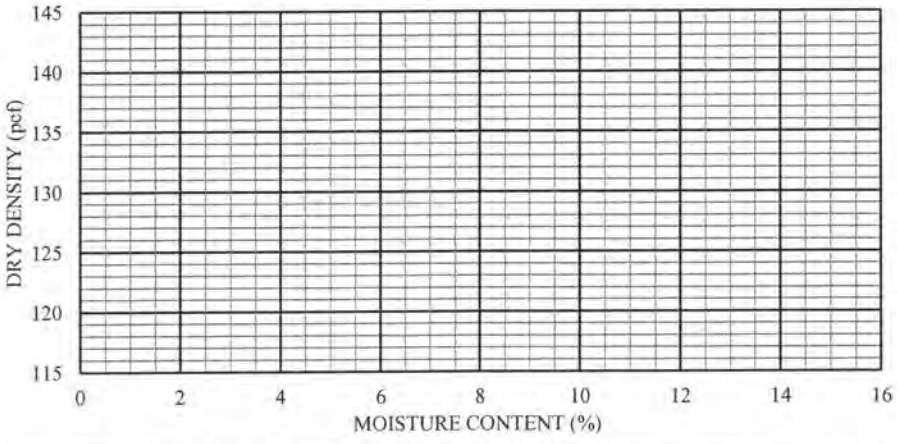


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"	100	
38.10	1.5"	93	
19.00	3/4"	73	
12.70	1/2"	58	
9.50	3/8"	51	
4.75	#4	36	
2.00	#10	26	
0.85	#20	21	
0.43	#40	16	
0.25	#60	10	
0.15	#100	6	
0.075	#200	3.5	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

11301 Olive Lane Anchorage, Alaska 99515 Phone: 907-344-5934 Fax: 907-344-5993 www.nge-tft.com

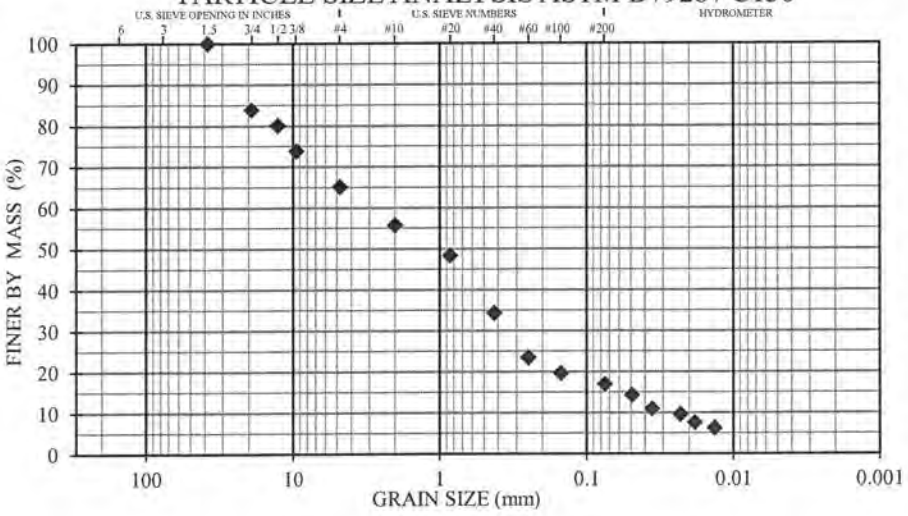
NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

Laboratory Testing · Geotechnical Engineering · Instrumentation · Construction Monitoring Services · Thermal Analysis

PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7699 W. Parks HWY - Wasilla
PROJECT NO.:	6216-21
SAMPLE LOC.:	B15
NUMBER/ DEPTH:	S2 / 2.5 - 4'
DESCRIPTION:	Silty sand w/ gravel
DATE RECEIVED:	11/8/2021
TESTED BY:	Erik Boatwright
REVIEWED BY:	CJB

% GRAVEL	34.9	USCS	SM
% SAND	48.1	USACOE FC	PFS
% SILT/CLAY	17.0	% PASS. 0.02 mm	8.0
% MOIST. CONTENT	14.0	% PASS. 0.002 mm	N/A
UNIFORMITY COEFFICIENT (C_u)		121.6	
COEFFICIENT OF GRADATION (C_c)		1.5	
ASTM D1557 (uncorrected)		N/A	
ASTM D4718 (corrected)		N/A	
OPTIMUM MOIST. CONTENT. (corrected)		N/A	

PARTICLE SIZE ANALYSIS ASTM D7928 / C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

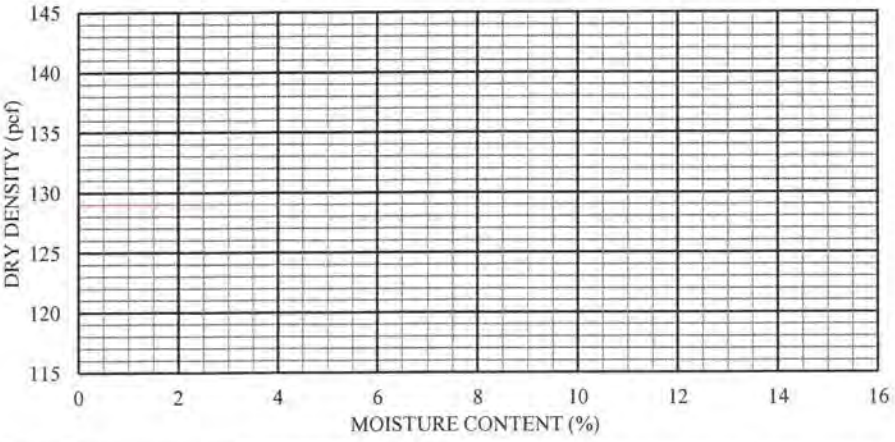
SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	84	
12.70	1/2"	80	
9.50	3/8"	74	
4.75	#4	65	
2.00	#10	56	
0.85	#20	48	
0.43	#40	34	
0.25	#60	23	
0.15	#100	20	
0.075	#200	17.0	

HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1	0.0491	14.3
2	0.0358	10.9
5	0.0229	9.6
8	0.0183	7.6
15	0.0135	6.2
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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NORTHERN GEOTECHNICAL ENGINEERING, INC. / TERRA FIRMA TESTING

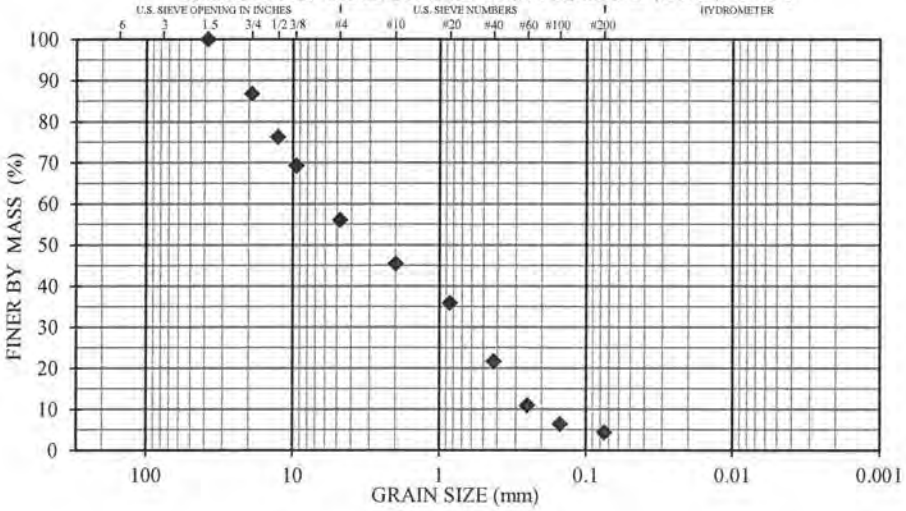
Laboratory Testing · Geotechnical Engineering · Instrumentation · Construction Monitoring Services · Thermal Analysis

PROJECT CLIENT:	American Engineering Testing, Inc.
PROJECT NAME:	7699 W. Parks HWY - Wasilla
PROJECT NO.:	6216-21
SAMPLE LOC.:	B15
NUMBER/ DEPTH:	S3 / 5 - 6.5'
DESCRIPTION:	Poorly-graded sand w/ gravel
DATE RECEIVED:	11/8/2021
TESTED BY:	Erik Boatwright
REVIEWED BY:	CJB

% GRAVEL	44.0	USCS	SP
% SAND	51.7	USACOE FC	N/A
% SILT/CLAY	4.3	% PASS. 0.02 mm	N/A
% MOIST. CONTENT	5.6	% PASS. 0.002 mm	N/A

UNIFORMITY COEFFICIENT (C_u)	27.0
COEFFICIENT OF GRADATION (C_c)	0.3
ASTM D1557 (uncorrected)	N/A
ASTM D4718 (corrected)	N/A
OPTIMUM MOIST. CONTENT. (corrected)	N/A

PARTICLE SIZE ANALYSIS ASTM D7928 / C136

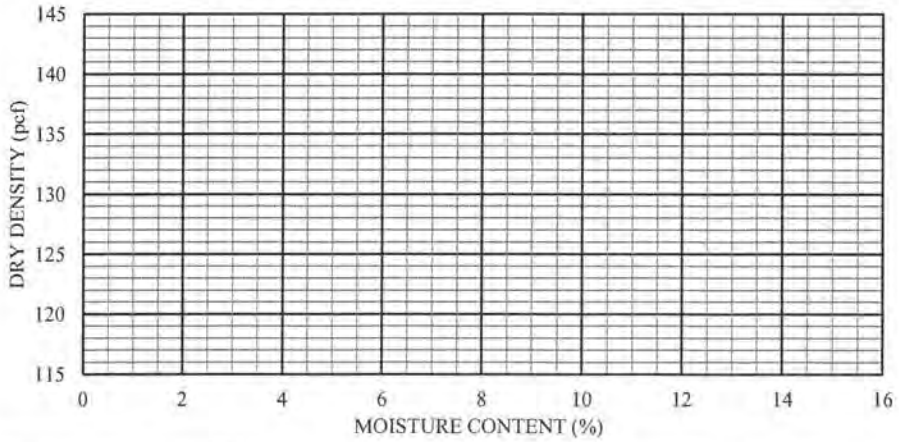


COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

SIEVE SIZE (mm)	SIEVE SIZE (U.S.)	TOTAL % PASSING	SPECIFICATION (% PASSING)
152.40	6"		
76.20	3"		
38.10	1.5"	100	
19.00	3/4"	87	
12.70	1/2"	76	
9.50	3/8"	69	
4.75	#4	56	
2.00	#10	45	
0.85	#20	36	
0.43	#40	22	
0.25	#60	11	
0.15	#100	6	
0.075	#200	4.3	

MOISTURE-DENSITY RELATIONSHIP ASTM D1557



HYDROMETER RESULT

ELAPSED TIME (MIN)	DIAMETER (mm)	TOTAL % PASSING
0		
1		
2		
5		
8		
15		
30		
60		
250		
1440		

HYDRAULIC COND. (ASTM D2434)	N/A
DEGRADATION (ATM T-313)	N/A
PLASTICITY INDEX ASTM 4318	N/A

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APPENDIX C

SEISMIC SITE CLASSIFICATION REPORT

OSHPD

7751 W Parks Hwy, Wasilla, AK 99623, USA

Latitude, Longitude: 61.5789334, -149.6464708

Date	12/3/2021, 10:49:26 AM
Design Code Reference Document	IBC-2015
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
S_S	2.072	MCE_R ground motion. (for 0.2 second period)
S_1	1.016	MCE_R ground motion. (for 1.0s period)
S_{MS}	2.072	Site-modified spectral acceleration value
S_{M1}	1.524	Site-modified spectral acceleration value
S_{DS}	1.381	Numeric seismic design value at 0.2 second SA
S_{D1}	1.016	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	1.5	Site amplification factor at 1.0 second
PGA	0.835	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.835	Site modified peak ground acceleration
T_L	16	Long-period transition period in seconds
SsRT	2.316	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.167	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.072	Factored deterministic acceleration value. (0.2 second)
S1RT	1.016	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	1.015	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	1.109	Factored deterministic acceleration value. (1.0 second)
PGAd	0.861	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	1.069	Mapped value of the risk coefficient at short periods
C_{R1}	1.001	Mapped value of the risk coefficient at a period of 1 s

DISCLAIMER

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THE STATE
of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Transportation and Public Facilities

Program Development and Statewide Planning
Anchorage Field Office

4111 Aviation Avenue
P.O. Box 196900
Anchorage, AK 99519-6900
Main number: 907-269-0520
Fax number: 907-269-0521
Website: dot.alaska.gov

August 21, 2023

Fred Wagner, Platting Officer
Matanuska-Susitna Borough
350 East Dahlia Avenue
Palmer, AK 99645

[Sent Electronically]

Re: Plat Review

Dear Mr. Wagner:

The Alaska Department of Transportation and Public Facilities (DOT&PF) Central Region has reviewed the following plats and have the following comments:

- **Wasilla Holiday, Plat #96-13-PWm (Parks Highway)**
  - No direct access to the Parks Highway will be granted. All proposed lots must take access from Meadow Lakes Loop. Subsequent development and utilities are required to continue to take access from Meadow Lakes Loop.

- **WA 07 Gedz, Plat #75-44 (Wasilla-Fishhook Road)**
  - Only one access to Wasilla-Fishhook Road will be authorized for Lot 6A and Lot 6B. Utilities for Lot 6A and Lot 6B required through singular access. A shared access easement is required. Subsequent development of Lot 6A and Lot 6B requires continued use of the shared access easement for access and utilities. Please add as plat note.
  - Lot 6A and Lot 6B's eastern lot lines are adjacent to a section line. As this section line is developed between Sorrelwood Street and East Pamela Drive, expect Wasilla-Fishhook driveway access to be removed, and access to be required through the section line. Consider this in your site plan development. DOT&PF recommends not to preclude future access to the section line.
  - Please be advised that there is a DOT&PF Pavement Preservation project in design along Wasilla-Fishhook Road from Seldon Road to Tex-Al Drive.

- **PA 12 HLS Hotchkiss, Plat No. 72-31 (Outer Springer Loop)**
  - DOT&PF will authorize one shared access for all three lots – Lot 1, Lot 2, and Lot 3. Subsequent development of Lots 1-3 will continue to require shared access through the shared common access. A shared access easement is required. Please add as plat note.

- Utility access for Lots 1-3 and utility access for subsequent development of Lots 1-3 required through the shared common access easement.

- **HO 14 Shadrach, Tax Parcel B5 (Big Lake Road)**
  - DOT&PF recommends shared access for Tract A and Tract B. Big Lake Road is classified as a minor arterial and is a high use road for business, recreational and residential users. As development continues in this area, an increased numbers of driveway accesses along the road increases the conflict points for all users. Keeping in mind the safety of the traveling public, DOT&PF seeks to reduce the number of conflict points along this corridor by recommending the least amount of access points possible.
  - DOT&PF recommends right of way dedication at the section line on the western lot line of Tract A south of Beaver Lake Road and to take access from Tract A to Big Lake Road here.
  - DOT&PF recommends that Tract B take secondary access through Maplewood Drive.
  - Please be advised that there is a DOT&PF Pavement Preservation project in design along Big Lake Road from MP 0-3.6.

All properties accessing DOT&PF roads must apply to Right of Way for a driveway permit and/or approach road review, subject to provisions listed in 17 AAC 10.020. Any previously issued access permits become invalid once the property undergoes a platting action and must be reissued.

We recommend the petitioner verify all section line easements and DOT&PF road rights-of-way adjacent to their property. For assistance, the petitioner may contact the Engineering group within the Right of Way section in DOT&PF at (907) 269-0700. The petitioner is liable to remove any improvements within the easements and rights-of-way that impede the operation and maintenance of those facilities even if they are not shown on the plat, so it is in the petitioner's best interest to identify the exact locations and widths of any such easements or rights-of-way before they improve the property.

If any section line easements or road rights-of-way exist within the bounds of their plat, we recommend the petitioner dedicate them. If there is an existing right-of-way or easement, the petitioner is unable to develop that portion of the property yet continues to pay property taxes on it; dedicating will remove that cost to the petitioner.

If there are any questions regarding these comments please feel free to contact me at (907) 269-0509 or kristina.huling@alaska.gov.

Sincerely,

Kristina Huling
Mat-Su Area Planner, DOT&PF

cc: Jacob Ciufo, P.E., Regional Hydrologist, DOT&PF
Sean Baski, Chief, Highway Design, DOT&PF
Matt Walsh, Property Management Supervisor, Right of Way, DOT&PF
Devki Rearden, Engineering Associate, DOT&PF
Morris Beckwith, Right of Way, DOT&PF
Brad Sworts, Pre-Design & Engineering Div. Manager, MSB

Jesse Curlin

From: Andy Dean
Sent: Friday, August 11, 2023 11:57 AM
To: Jesse Curlin
Subject: RE: RFC Wasilla Holiday (CC)

Hello Chris,

Have the applicant show the common access easement on the plat and not just a note of it.

Sincerely,

Andy Dean
Matanuska-Susitna Borough
ROW Coordinator

(907) 861-7803
andy.dean@matsugov.us
350 E. Dahlia Avenue
Palmer, AK 99645

From: Jesse Curlin <Jesse.Curlin@matsugov.us>
Sent: Wednesday, August 9, 2023 3:59 PM
To: regpagemaster@usace.army.mil; Melchert, Pamela J - Anchorage, AK <pamela.j.melchert@usps.gov>; tim.swezey@mlccak.org; psfisher@gci.net; information@mlccak.org; camden.yehle@gmail.com; hsfirewise@gmail.com; lana@mtaonline.net; Andrew Fraiser <andrew.fraiser@enstarnaturalgas.com>; James Christopher <james.christopher@enstarnaturalgas.com>; ROW <row@enstarnaturalgas.com>; OSP Design Group <ospdesign@gci.com>; mearow@mea.coop; Right of Way Dept. <row@mtasolutions.com>; Ron Bernier <Ron.Bernier@matsugov.us>; Alex Strawn <Alex.Strawn@matsugov.us>; Andy Dean <Andy.Dean@matsugov.us>; Brad Sworts <Brad.Sworts@matsugov.us>; Charlyn Spannagel <Charlyn.Spannagel@matsugov.us>; Collections <Collections@matsugov.us>; Daniel Dahms <Daniel.Dahms@matsugov.us>; Elaine Flagg <Elaine.Flagg@matsugov.us>; Eric Phillips <Eric.Phillips@matsugov.us>; Fire Code <Fire.Code@matsugov.us>; Fred Wagner <Frederic.Wagner@matsugov.us>; Jamie Taylor <Jamie.Taylor@matsugov.us>; John Aschenbrenner <John.Aschenbrenner@matsugov.us>; Katrina Kline <katrina.kline@matsugov.us>; Marcia vonEhr <Marcia.vonEhr@matsugov.us>; Margie Cobb <Margie.Cobb@matsugov.us>; Planning <MSB.Planning@matsugov.us>; Tammy Simmons <Tammy.Simmons@matsugov.us>; Theresa Taranto <Theresa.Taranto@matsugov.us>; Tom Adams <Tom.Adams@matsugov.us>; David Post <david.post@alaska.gov>; Kristina Huling <kristina.huling@alaska.gov>
Subject: RFC Wasilla Holiday (CC)

The following link is a request for comments on the proposed Wasilla Holiday subdivision.
Please ensure all comments have been submitted by August 21, 2023 so they can be incorporated into the Staff Report that will be presented to the Platting Officer.

HO 10 Wasilla Holiday

Sincerely,

EXHIBIT E

Jesse Curlin

From: OSP Design Group <ospdesign@gci.com>
Sent: Monday, August 21, 2023 9:32 AM
To: Jesse Curlin
Cc: OSP Design Group
Subject: RE: RFC Wasilla Holiday (CC)
Attachments: RFC Packet.pdf; Agenda Plat (1).PDF

[EXTERNAL EMAIL - CAUTION: Do not open unexpected attachments or links.]
Jesse,

In review GCI has no comments or objections to the plat, attached is the signed plat for your records.

Thanks,
MIREYA ARMESTO
GCI | Technician III, GIS Mapping
m: 907-744-5166 | **w:** www.gci.com

From: Jesse Curlin <Jesse.Curlin@matsugov.us>
Sent: Wednesday, August 9, 2023 3:59 PM
To: regpagemaster@usace.army.mil; Melchert, Pamela J - Anchorage, AK <pamela.j.melchert@usps.gov>; tim.swezey@mlccak.org; psfisher@gci.net; information@mlccak.org; camden.yehle@gmail.com; hsfirewise@gmail.com; lana@mtaonline.net; Andrew Fraiser <andrew.fraiser@enstarnaturalgas.com>; James Christopher <james.christopher@enstarnaturalgas.com>; ROW <row@enstarnaturalgas.com>; OSP Design Group <ospdesign@gci.com>; mearow@mea.coop; Right of Way Dept. <row@mtasolutions.com>; Ron Bernier <Ron.Bernier@matsugov.us>; Alex Strawn <Alex.Strawn@matsugov.us>; Andy Dean <Andy.Dean@matsugov.us>; Brad Sworts <Brad.Sworts@matsugov.us>; Charlyn Spannagel <Charlyn.Spannagel@matsugov.us>; Collections <Collections@matsugov.us>; Daniel Dahms <Daniel.Dahms@matsugov.us>; Elaine Flagg <Elaine.Flagg@matsugov.us>; Eric Phillips <Eric.Phillips@matsugov.us>; Fire Code <Fire.Code@matsugov.us>; Fred Wagner <Frederic.Wagner@matsugov.us>; Jamie Taylor <Jamie.Taylor@matsugov.us>; John Aschenbrenner <John.Aschenbrenner@matsugov.us>; Katrina Kline <katrina.kline@matsugov.us>; Marcia vonEhr <Marcia.vonEhr@matsugov.us>; Margie Cobb <Margie.Cobb@matsugov.us>; Planning <MSB.Planning@matsugov.us>; Tammy Simmons <Tammy.Simmons@matsugov.us>; Theresa Taranto <Theresa.Taranto@matsugov.us>; Tom Adams <Tom.Adams@matsugov.us>; David Post <david.post@alaska.gov>; Kristina Huling <kristina.huling@alaska.gov>
Subject: RFC Wasilla Holiday (CC)

[EXTERNAL EMAIL - CAUTION: Do not open unexpected attachments or links.]

The following link is a request for comments on the proposed Wasilla Holiday subdivision.
Please ensure all comments have been submitted by August 21, 2023 so they can be incorporated into the Staff Report that will be presented to the Platting Officer.

HO 10 Wasilla Holiday

Sincerely,

Jesse C. "Chris" Curlin

EXHIBIT F-(

CERTIFICATE OF OWNERSHIP AND DEDICATION

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED IN THIS PLAN AND THAT I ADOPT THIS PLAN OF SUBDIVISION BY MY FREE CONSENT, DEDICATE ALL RIGHTS-OF-WAY TO THE MATANUSKA-SUSITNA BOROUGH AND GRANT ALL EASEMENTS TO THE USE SHOWN.

GARY BRANT, VICE PRESIDENT OPERATIONS — DATE
HOLIDAY ALASKA, LLC
4567 AMERICAN BOULEVARD W
BLOOMINGTON, MN 55437

NOTARY ACKNOWLEDGEMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS ____ DAY OF ________
2023, FOR ____________

NOTARY FOR THE STATE OF ALASKA

MY COMMISSION EXPIRES

CERTIFICATE OF PAYMENT OF TAXES

I HEREBY CERTIFY THAT ALL CURRENT TAXES AND SPECIAL ASSESSMENTS, THROUGH ________ 20____, AGAINST THE PROPERTY, INCLUDED IN THE SUBDIVISION OR RESUBDIVISION, HEREON HAVE BEEN PAID.

________________ 20____

TAX COLLECTION OFFICIAL (MATANUSKA-SUSITNA BOROUGH)

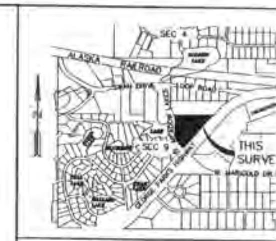
PLANNING AND LAND USE DIRECTOR'S CERTIFICATE

I CERTIFY THAT THIS SUBDIVISION PLAN HAS BEEN FOUND TO COMPLY WITH THE LAND SUBDIVISION REGULATIONS OF THE MATANUSKA-SUSITNA BOROUGH, AND THAT THE PLAT HAS BEEN APPROVED BY THE PLATTING AUTHORITY BY PLAT RESOLUTION NUMBER ________ DATED ________ 20____, AND THAT THIS PLAT HAS BEEN APPROVED FOR RECORDING IN THE OFFICE OF THE RECORDER IN THE PALMER RECORDING DISTRICT, THIRD JUDICIAL DISTRICT, STATE OF ALASKA IN WHICH THE PLAT IS LOCATED.

DATE: ________ PLANNING AND LAND USE DIRECTOR

ATTEST: ________ PLATTING CLERK

		CURVE TABLE				
CURVE #	RADIUS	DELTA	LENGTH	CHORD DIRECTION	CHORD LENGTH	TANGENT
C1	30.00'	89°57'53"	47.11'	S86°48'26"W	42.41'	29.98'
C2	315.00'	47°54'17"	263.37'	N24°15'28"W	255.77'	139.93'
C3	575.00'	16°17'55"	163.57'	N08°27'20"W	163.02'	82.34'
C4	575.00'	10°09'22"	101.92'	N05°23'04"W	101.79'	51.09'
C5	575.00'	06°08'33"	61.64'	N13°32'01"W	61.61'	30.84'



LEGEND

- FOUND MONUMENT AS NOTED
- SET MONUMENT AS NOTED
- DIMENSION POINT/NOTHING FOUND OR SET
- (Ov) OVERALL DIMENSION
- (R#) RECORD DATA (SEE REFERENCES)
- (OTP) GRANTED THIS PLAT
- (M) MEASURED
- (C) COMPUTED
- (H) HELD

SUBDIVISION BOUNDARY — INTERIOR PROPERTY LINE — ROAD CENTER LINE — EASEMENT LINE AS NOTED — ADJACENT PROPERTY LINE

NOTES

1. THERE MAY BE FEDERAL, STATE, OR LOCAL REQUIREMENTS GOVERNING LAND USE. THE INDIVIDUAL PARCEL OWNER SHALL OBTAIN A DETERMINATION WHETHER THESE REQUIREMENTS APPLY TO THE DEVELOPMENT OF PARCELS SHOWN ON THIS PLAT.
2. DIMENSIONS ON THIS PLAT ARE EXPRESSED IN U.S. SURVEY FEET AND DECIMAL PARTS THEREOF UNLESS OTHERWISE NOTED.
3. THE BASIS OF COORDINATES FOR THIS SURVEY IS ALASKA STATE PLANE, ZONE 4, (2011), EPOCH 2010.000 IN U.S. FEET BASED ON AN OPUS DERIVED POSITION OF CONTROL POINT 16. ALL BEARINGS SHOWN ARE TRUE BEARINGS AS MEASURED. ELEVATIONS ARE NAVD 88 ORTHOMETRIC HEIGHTS AS DETERMINED BY OPUS SOLUTION HOLDING GEOID 12B.
4. NO INDIVIDUAL WATER SUPPLY SYSTEM OR SEWAGE DISPOSAL SYSTEM SHALL BE PERMITTED ON ANY LOT UNLESS THE SYSTEM IS LOCATED, CONSTRUCTED, AND EQUIPPED IN ACCORDANCE WITH THE REQUIREMENTS, STANDARDS, AND RECOMMENDATIONS OF THE STATE OF ALASKA, DEPARTMENT OF ENVIRONMENTAL CONSERVATION, WHICH GOVERNS THOSE SYSTEMS.
5. BY GRAPHIC PLOTTING ONLY, THIS PROPERTY DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD AREA AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY; THIS PROPERTY IS IN ZONE X AN AREA THAT IS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN. FLOOD INSURANCE RATE MAP IDENTIFIED AS MAP NO. 02170C8030E BEARING AN EFFECTIVE DATE OF MARCH 17, 2011 WAS USED TO DETERMINE THE FLOOD ZONE. EXACT DESIGNATION CAN ONLY BE DETERMINED BY AN ELEVATION CERTIFICATE.
6. NO ACCESS TO THE PARKS HIGHWAY WILL BE GRANTED UNLESS APPROVED BY THE GOVERNING AGENCY. LOTS 1 & 2 WILL HAVE SHARED ACCESS FROM MEADOW LAKES LOOP.
7. THIS PROPERTY IS SUBJECT TO THE FOLLOWING EASEMENTS THAT ARE BLANKET IN NATURE AND NOT DEPICTED ON THIS MAP:
   - MTA RIGHT-OF-WAY EASEMENT RECORDED JULY 18, 1974 UNDER BK.85 PG.323
   - MEA RIGHT-OF-WAY EASEMENT RECORDED JANUARY 4, 1984 UNDER BK.339 PG.187
   - MEA RIGHT-OF-WAY EASEMENT RECORDED AUGUST 7, 1987 UNDER BK.522 PG.732
   - MEA RIGHT-OF-WAY EASEMENT RECORDED SEPTEMBER 19, 1997 UNDER BK.913 PG.523

REFERENCES

(R1) UNRECORDED AKDOT&PF ROW ACQUISITION MAP ALASKA PROJECT PARKS HIGHWAY MP 48.8 TO 52.3 RECONSTRUCTION – PITTMAN ROAD TO BIG LAKE ROAD.

(R2) MSB PLATTING WAIVER RESOLUTION 96-13PWm RECORDED IN BK.859 PG.948

Agenda Copy

RECEIVED
JUL 11 2023
PLATTING

CERTIFICATE OF SURVEYOR

I, MARK AIMONETTI 13022-S, HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF ALASKA AND THAT THIS PLAT REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT THE MONUMENTS SHOWN ON THE PLAT ACTUALLY EXIST AS DESCRIBED, AND THAT ALL DIMENSIONAL AND OTHER DETAILS ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

PRELIMINARY
MARK A. AIMONETTI — DATE
PLS 13022-S

APPROVED AS SHOWN ☒
CORRECTED ☐
SIGN ________ DATE ________
GCI ENGINEERING & DESIGN

STATE OF ALASKA 49TH PRELIMINARY Mark A. Aimonetti No. 13022-S REGISTERED PROFESSIONAL LAND SURVEYOR

THE PLAT OF
WASILLA HOLIDAY SUBDIVISION

A SUBDIVISION OF PARCELS 1 & 2 OF MSB PARCEL WAIVER 96-13PWM RECORDED IN BK.589 PG.948 AND LOCATED WITHIN THE SW1/4 NE1/4 OF SECTION 9, T.17N., R.2W., S.M. IN THE PALMER RECORDING DISTRICT, THIRD JUDICIAL DISTRICT, STATE OF ALASKA

CONTAINING 8.98 ACRES MORE OR LESS

EDGE SURVEY AND DESIGN, LLC

DRAWN BY: VLB	PROJECT # 21-240	PLAT CASE # 2023-XXX	
CHECKED BY: MA	DATE: 7/10/2023	SCALE: 1"=60'	SHEET 1 OF 1

EXHIBIT F-2

Jesse Curlin

From: James Christopher <James.Christopher@enstarnaturalgas.com>
Sent: Friday, August 11, 2023 9:12 AM
To: Jesse Curlin
Cc: Andrew Fraiser; Sterling Lopez
Subject: RE: RFC Wasilla Holiday (CC)
Attachments: MSB Comment 2023-092.pdf

[EXTERNAL EMAIL - CAUTION: Do not open unexpected attachments or links.]
Hello,

Please see ENSTARS attached letter with comments.
If you have any questions, please let me know.

Thank you,
Jimmy Christopher
Right of Way and Compliance Technician
ENSTAR Natural Gas Company, LLC
401 E. International Airport Rd.
P.O. Box 190288, Anchorage Ak 99519-0288
907-334-7944

From: Jesse Curlin <Jesse.Curlin@matsugov.us>
Sent: Wednesday, August 9, 2023 3:59 PM
To: regpagemaster@usace.army.mil; Melchert, Pamela J - Anchorage, AK <pamela.j.melchert@usps.gov>; tim.swezey@mlccak.org; psfisher@gci.net; information@mlccak.org; camden.yehle@gmail.com; hsfirewise@gmail.com; lana@mtaonline.net; Andrew Fraiser <andrew.fraiser@enstarnaturalgas.com>; James Christopher <james.christopher@enstarnaturalgas.com>; ENSTAR ROW Shared Mailbox <row@enstarnaturalgas.com>; OSP Design Group <ospdesign@gci.com>; mearow@mea.coop; Right of Way Dept. <row@mtasolutions.com>; Ron Bernier <Ron.Bernier@matsugov.us>; Alex Strawn <Alex.Strawn@matsugov.us>; Andy Dean <Andy.Dean@matsugov.us>; Brad Sworts <Brad.Sworts@matsugov.us>; Charlyn Spannagel <Charlyn.Spannagel@matsugov.us>; Collections <Collections@matsugov.us>; Daniel Dahms <Daniel.Dahms@matsugov.us>; Elaine Flagg <Elaine.Flagg@matsugov.us>; Eric Phillips <Eric.Phillips@matsugov.us>; Fire Code <Fire.Code@matsugov.us>; Fred Wagner <Frederic.Wagner@matsugov.us>; Jamie Taylor <Jamie.Taylor@matsugov.us>; John Aschenbrenner <John.Aschenbrenner@matsugov.us>; Katrina Kline <katrina.kline@matsugov.us>; Marcia vonEhr <Marcia.vonEhr@matsugov.us>; Margie Cobb <Margie.Cobb@matsugov.us>; Planning <MSB.Planning@matsugov.us>; Tammy Simmons <Tammy.Simmons@matsugov.us>; Theresa Taranto <Theresa.Taranto@matsugov.us>; Tom Adams <Tom.Adams@matsugov.us>; David Post <david.post@alaska.gov>; Kristina Huling <kristina.huling@alaska.gov>
Subject: RFC Wasilla Holiday (CC)

CAUTION: This email originated outside of ENSTAR/TSU. Do not click links or open attachments unless you recognize the sender and know the content is safe. If you are not sure, use the "Report Phish" button or contact enstar.helpdesk@enstarnaturalgas.com

The following link is a request for comments on the proposed Wasilla Holiday subdivision.

EXHIBIT F-3

ENSTAR Natural Gas Company, LLC
Engineering Department, Right of Way Section
401 E. International Airport Road
P. O. Box 190288
Anchorage, Alaska 99519-0288
(907) 277-5551
FAX (907) 334-7798

August 11, 2023

Matanuska-Susitna Borough, Platting Division
350 East Dahlia Avenue
Palmer, AK 99645-6488

To whom it may concern:

ENSTAR Natural Gas Company, LLC has reviewed preliminary plat **WASILLA HOLIDAY SUBDIVISION (MSB Case # 2023-092)** and advises that there is an existing natural gas service line which appears to cross proposed Lot 1 to serve proposed Lot 2. Attached is an as-built for you reference. ENSTAR objects to this plat unless one of the following scenarios is met:

1. Add a note which says, "There is a ten foot (10 FT) wide natural gas easement centered on the existing service line." And draw in the location of the service line on the map and add, "Location of natural gas main and centerline of ten foot (10 FT) wide natural gas easement".
2. Owner signs an ENSTAR Natural Gas Easement document for a ten foot (10 FT) wide natural gas easement, centered on the service line at this location.

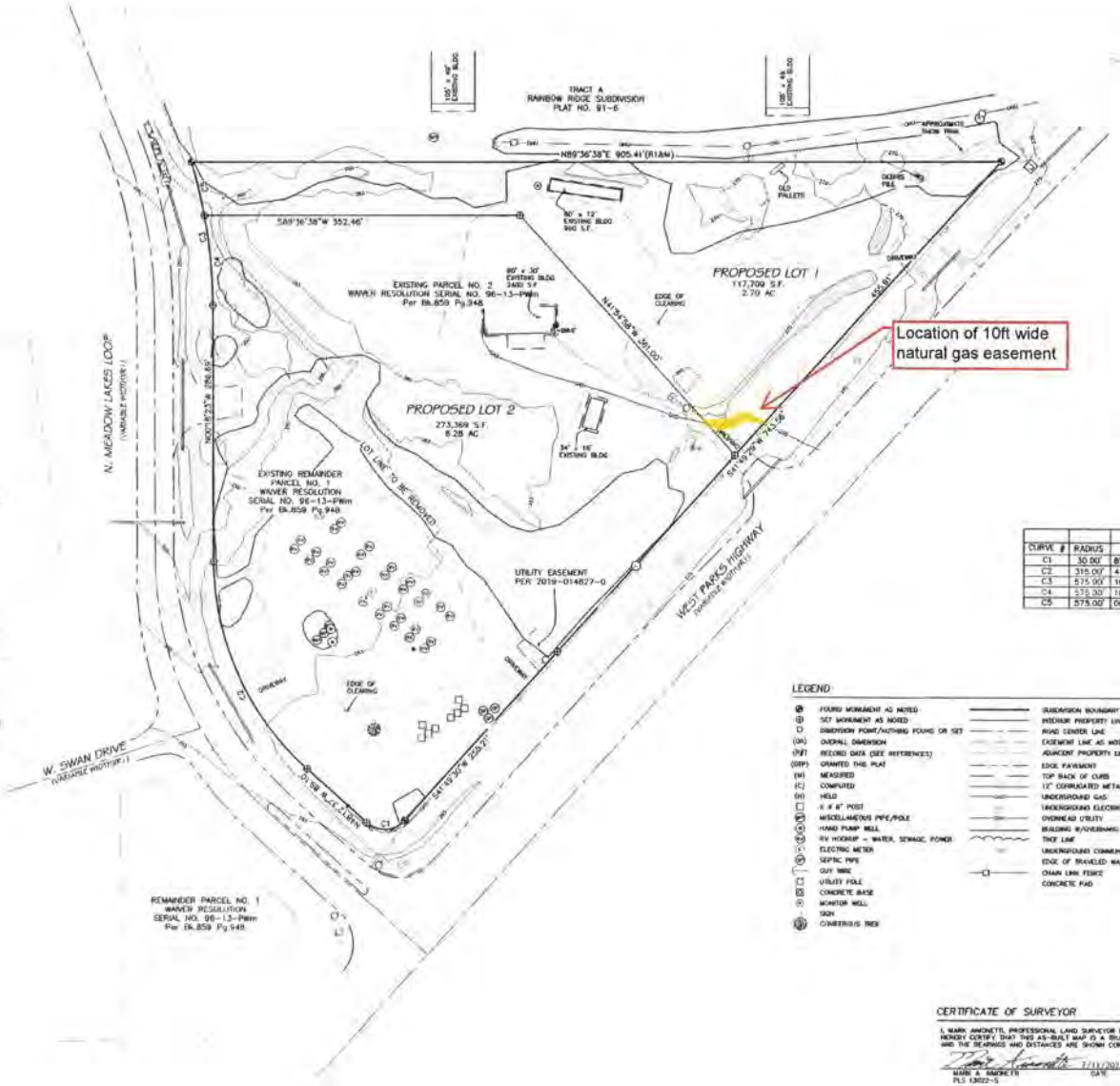
If you have any questions, please feel free to contact me at 334-7944 or by email at james.christopher@enstarnaturalgas.com.

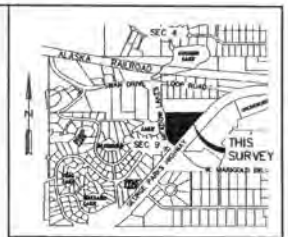
Sincerely,

James Christopher

James Christopher
Right of Way & Compliance Technician
ENSTAR Natural Gas Company, LLC

EXHIBIT F-4





1"= 1/4 mile VICINITY MAP

CURVE TABLE						
CURVE #	RADIUS	DELTA	LENGTH	CHORD DIRECTION	CHORD LENGTH	TANGENT
C1	30.00'	89°57'53"	47.11'	S88°48'26"W	42.41'	29.98'
C2	315.00'	47°54'17"	263.33'	N24°15'25"W	255.77'	139.57'
C3	575.00'	16°17'55"	163.57'	N16°27'29"W	163.02'	82.34'
C4	575.00'	10°09'22"	101.92'	N05°23'04"W	101.79'	51.09'
C5	575.00'	06°08'33"	61.64'	N13°32'01"W	61.61'	30.84'

LEGEND

- FOUND MONUMENT AS NOTED
- SET MONUMENT AS NOTED
- DIMENSION POINT/NOTHING FOUND OR SET
- OVERALL DIMENSION
- RECORD DATA (SEE REFERENCES)
- GRANTED THIS PLAT
- MEASURED
- COMPUTED
- HELD
- 6 X 6" POST
- MISCELLANEOUS PIPE/POLE
- HAND PUMP WELL
- RV HOOKUP – WATER, SEWAGE, POWER
- ELECTRIC METER
- SEPTIC PIPE
- GUY WIRE
- UTILITY POLE
- CONCRETE BASE
- MONITOR WELL
- SIGN
- DIMENSIONS TREE

- SUBDIVISION BOUNDARY
- INTERIOR PROPERTY LINE
- ROAD CENTER LINE
- EASEMENT LINE AS NOTED
- ADJACENT PROPERTY LINE
- EDGE PAVEMENT
- TOP BACK OF CURB
- 12" CORRUGATED METAL PIPE
- UNDERGROUND GAS
- UNDERGROUND ELECTRIC
- OVERHEAD UTILITY
- BUILDING W/OVERHANG
- TREE LINE
- UNDERGROUND COMMUNICATION
- EDGE OF TRAVELED WAY
- CHAIN LINK FENCE
- CONCRETE PAD

NOTES

1. THERE MAY BE FEDERAL, STATE, OR LOCAL REQUIREMENTS GOVERNING LAND USE. THE INDIVIDUAL PARCEL OWNER SHALL OBTAIN A DETERMINATION WHETHER THESE REQUIREMENTS APPLY TO THE DEVELOPMENT OF PARCELS SHOWN ON THIS PLAT.
2. DIMENSIONS ON THIS PLAT ARE EXPRESSED IN U.S. SURVEY FEET AND DECIMAL PARTS THEREOF UNLESS OTHERWISE NOTED.
3. THE BASIS OF COORDINATES FOR THIS SURVEY IS ALASKA STATE PLANE, ZONE 4, (2011), EPOCH 2010.000 IN U.S. FEET BASED ON AN OPUS DERIVED POSITION OF CONTROL POINT 19. ALL BEARINGS SHOWN ARE TRUE BEARINGS AS MEASURED. ELEVATIONS ARE NAVD 88 ORTHOMETRIC HEIGHTS AS DETERMINED BY OPUS SOLUTION HOLDING GEOID 12B
4. BY GRAPHIC PLOTTING ONLY, THIS PROPERTY DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD AREA AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY. THIS PROPERTY IS IN ZONE X AN AREA THAT IS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN. FLOOD INSURANCE RATE MAP IDENTIFIED AS MAP NO. 02170C0305D, BEARING AN EFFECTIVE DATE OF MARCH 17, 2011 WAS USED TO DETERMINE THIS FLOOD ZONE. EXACT DESIGNATION CAN ONLY BE DETERMINED BY AN ELEVATION CERTIFICATE.

RECEIVED
JUL 11 2023
PLATTING

CERTIFICATE OF SURVEYOR

I, MARK A. AMONETTE, PROFESSIONAL LAND SURVEYOR IN THE STATE OF ALASKA DO HEREBY CERTIFY, THAT THIS AS-BUILT MAP IS A TRUE AND CORRECT REPRESENTATION AND THE BEARINGS AND DISTANCES ARE SHOWN CORRECTLY.

7/11/2023
MARK A. AMONETTE DATE
PLS 13022-S

STATE OF ALASKA 49TH
MARK A. AMONETTE
PLS 13022
7/11/2023
REGISTERED LAND SURVEYOR

AS-BUILT & TOPOGRAPHY OF
PROPOSED WASILLA HOLIDAY SUBDIVISION
A SUBDIVISION OF PARCELS 1 & 2 OF MSB PARCEL WAIVER 96-13PWM RECORDED IN BK.589 PG.948 AND LOCATED WITHIN THE SW1/4 NE1/4 OF SECTION 9, T.17N., R.2W., S.M. IN THE PALMER RECORDING DISTRICT, THIRD JUDICIAL DISTRICT, STATE OF ALASKA
CONTAINING 8.98 ACRES, MORE OR LESS.

EDGE SURVEY AND DESIGN, LLC

DRAWN BY: VLB	PROJECT # 21-240	PLAT CASE # 2023-XXX	
CHECKED BY: MA	DATE: 6/9/2023	SCALE: 1"=60'	SHEET 1 OF 1

EXHIBIT F-S

3B

STAFF REVIEW AND RECOMMENDATIONS
PUBLIC HEARING
SEPTEMBER 6 , 2023

ABBREVIATED PLAT:	ECKERT NO.2 RSB L2	
LEGAL DESCRIPTION:	SEC 01, T17N, R02E S.M., AK	
PETITIONERS:	STEVE AND DEBBIE ROWLAND	
SURVEYOR/ENGINEER:	RECON, LLC	
ACRES: 9.26 +/-	PARCELS: 2	
REVIEWED BY:	CHRIS CURLIN	CASE #: 2023-090

REQUEST:
The request is to create two lots from Lot # 2, Eckert Subdivision No.2, (Plat 66-3), recorded as 1966-000277, to be known as **THE ECKERT SUBDIVISION NO. 2 LOTS 2A AND 2B**, containing 9.26 acres +/-. The property is located directly north of E. Browns Avenue, directly south of E. Relaxing Road, and west of N. Tranquility Lane; within the SW ¼ Section 01, Township 17 North, Range 02 East, Seward Meridian, Alaska.

EXHIBITS:

Vicinity Map and Aerial Photos	**Exhibit A** – 4 pgs
Soils Report	**Exhibit B** – 7 pgs
COMMENTS:	
MSB Pre-design and Engineering	**Exhibit C** – 1 pg
MSB Planning	**Exhibit D** – 1 pg
Utilities	**Exhibit E** – 5 pgs

DISCUSSION: The proposed subdivision is creating two lots. Lot 2A will be 2.83 acres and Lot 2B will be 6.43 acres. Proposed Lot 2A will take access from E. Relaxing Road, a Borough owned and maintained road. Lot 2B will take access from E. Browns Avenue, a Borough owned and maintained road.

Soils Report: A geotechnical report was submitted (**Exhibit B**), pursuant to MSB 43.20.281(A). Steven R. Rowland, P.E., notes that test pits were excavated for each of the proposed lots. Test pit locations were selected as a representative of the conditions to be expected throughout the proposed subdivision. The test holes were dug to a depth of 14', no ground water was encountered. The soils consisted of organic material and silt overlying sandy gravel with few cobbles that often included strata or lenses of fine gravel, sand, or silt. The silt (topsoil) layer was found to be of variable thickness and the sandy

gravel extended to the limit of the test pits at a depth of 14 ft. The soils for Test Pit 1 consisted of 0.0 – 0.2' of organic material (OH), .2' – 1.2' of silt (MH), and 1.2' – 14.2' of well-graded gravel and well graded sand in discontinuous layers. (GW & SW) Soils for Test Pit 2 consisted of 0 -0.5' of organics and silt (ML), .5' – 2.2' of silt, (ML), 2.2' – 4.5' of well graded gravel with sand (GW), 4.5' – 5' of silt (ML), 5.0' – 7.8' of well graded gravel with sand (GW), 7.8' 10.5' of silt (ML), and 10.5' -14.0' of well graded gravel with sand (GW). Steve Rowland, PE, RECON, LLC has reviewed the proposed subdivision plan, topographic maps, geologic maps of the immediate area, and soils information of record and on adjacent properties. Based on the subsurface investigation and the engineers traverse of the property and familiarity with soils and geology of the subject area, the engineer has determined that each of the two proposed lots will have at least 10,000 square feet of contiguous usable building area and at least 10,000 square feet of contiguous usable septic area as required by MSB 43.20.281 Area.

COMMENTS:

DPW Pre-design and Engineering **(Exhibit C)** notes a plat note to be added stating that if Lot 2B is further subdivided, Browns Avenue will need to be upgraded to a minimum residential standard as outlined in the 2022 SCM.

MSB Planning **(Exhibit D)** has no objection.

Utilities: (Exhibit E) ENSTAR has no comments. GCI has no comments or objections. MEA and MTA did not respond.

There were no objections received from Borough departments, outside agencies or the public at the time of this staff report.

CONCLUSION

The plat of Eckert Subdivision No.2 Lots 2A and 2B is consistent with AS 29.40.070 *Platting Regulations* and MSB 43.15.025 *Abbreviated Plats*. A soils report was submitted, legal and physical access exist, as-built survey, and topographic information were submitted. There were no objections received from borough departments, outside agencies, utilities, or the public at the time of this staff report.

FINDINGS of FACT:

1. The abbreviated plat of Eckert Subdivision No.2 Lots 2A and 2B is consistent with AS 29.40.070 *Platting Regulations*, and MSB 43.15.025 *Abbreviated Plats.*

2. A soils report was submitted pursuant to MSB 43.20.281(A). All lots have the required usable area.

3. All lots will have the required frontage pursuant to MSB 43.20.320.

4. There were no objections from any borough departments, outside agencies, utilities, or the public.

5. At the time of staff report write-up, there were no responses to the Request for Comments from US Army Corps of Engineers; Community Council #5 Butte; Fire Service Area #2 Butte; Road Service Area #26 Greater Butte; MSB Emergency Services, Community Development, or Assessments; MTA or MEA.

RECOMMENDED CONDITIONS OF APPROVAL:

Staff recommends approval of the abbreviated plat of Eckert Subdivision No. 2 Lots 2A and 2B, contingent on the following recommendations:

1. Taxes and special assessments must be paid in full for the year of recording, pursuant to MSB 43.15.053(F) and AS 40.15.020. Pay taxes and special assessments (LIDs), by CERTIFIED FUNDS OR CASH.

2. Provide updated Certificate to Plat executed within seven (7) days of recording of plat and submit Beneficiary Affidavit for any holders of a beneficial interest.

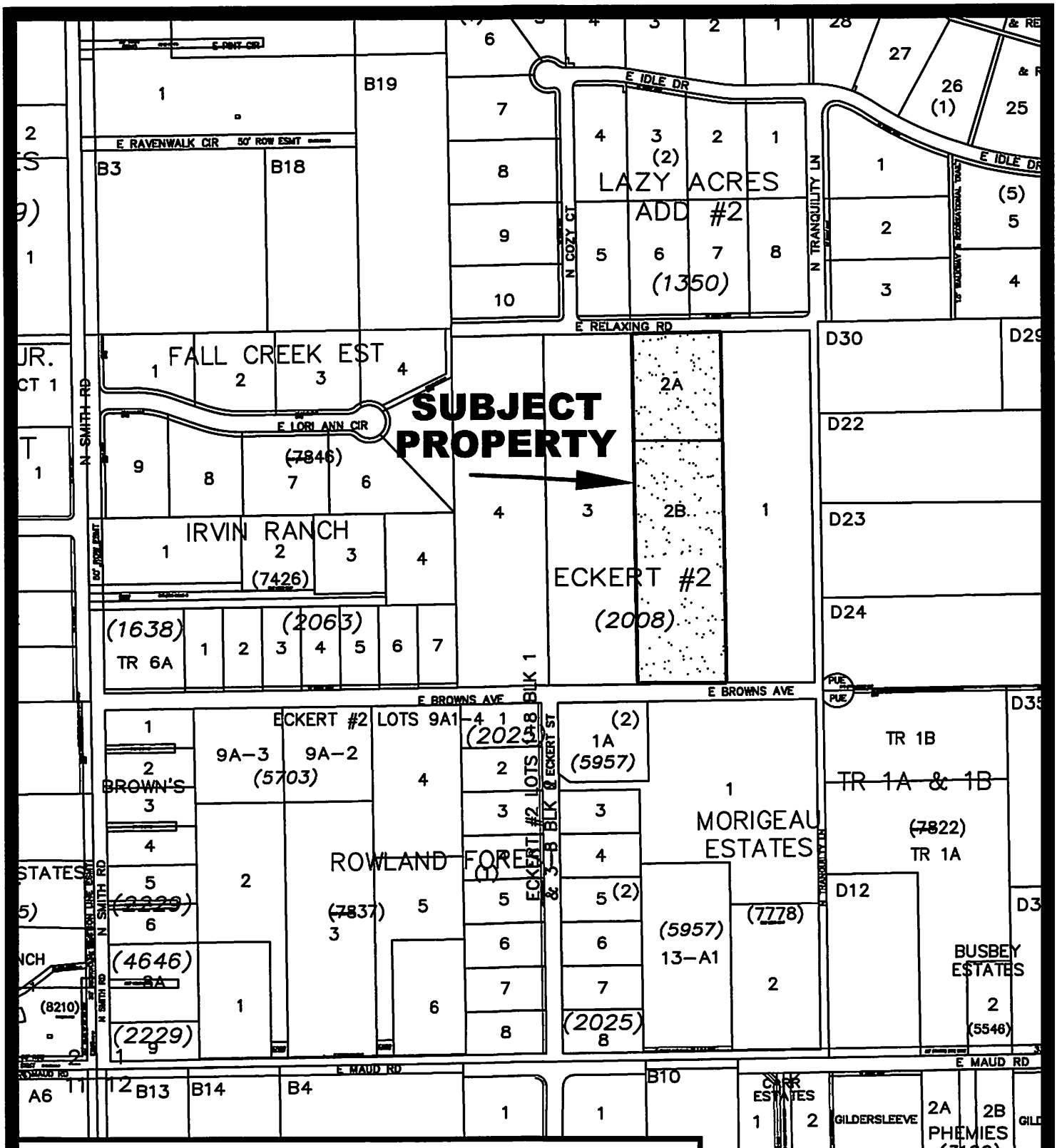
3. Add a plat note stating that if Lot 2B is further subdivided, E. Browns Avenue will need to be upgraded to a minimum residential standard as outlined in the 2022 SCM.

4. Pay postage and advertising fees.

5. Show all easements of record on final plat.

6. Submit recording fees, payable to Department of Natural Resources (DNR).

7. Submit final plat in full compliance with Title 43.



VICINITY MAP

FOR PROPOSED ECKERT NO. 2 RSB L2
SUBDIVISION
LOCATED WITHIN
SECTION 01, T17N, R02E, SEWARD MERIDIAN
ALASKA

PA 11 MAP

EXHIBIT A-1

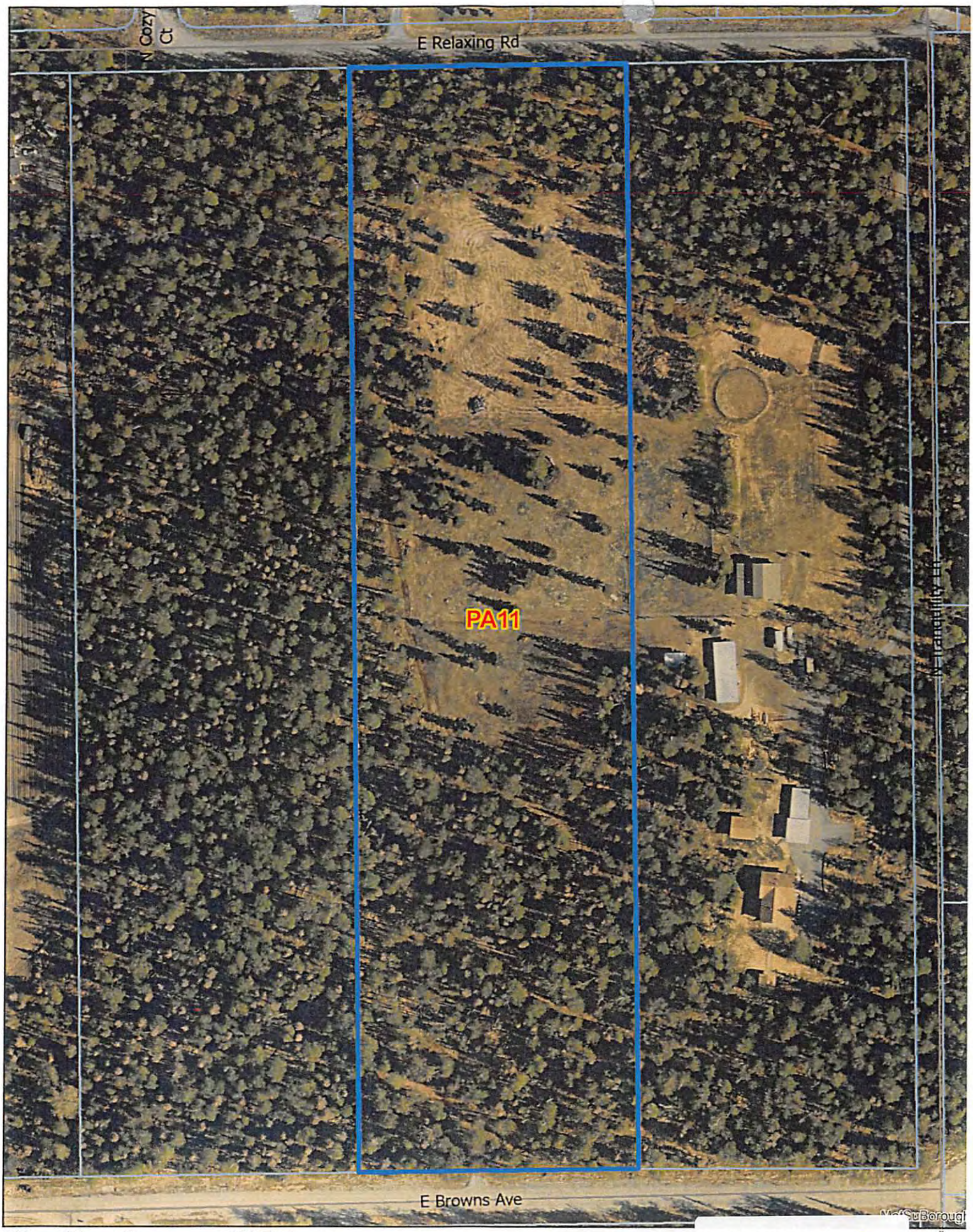


EXHIBIT A - 2

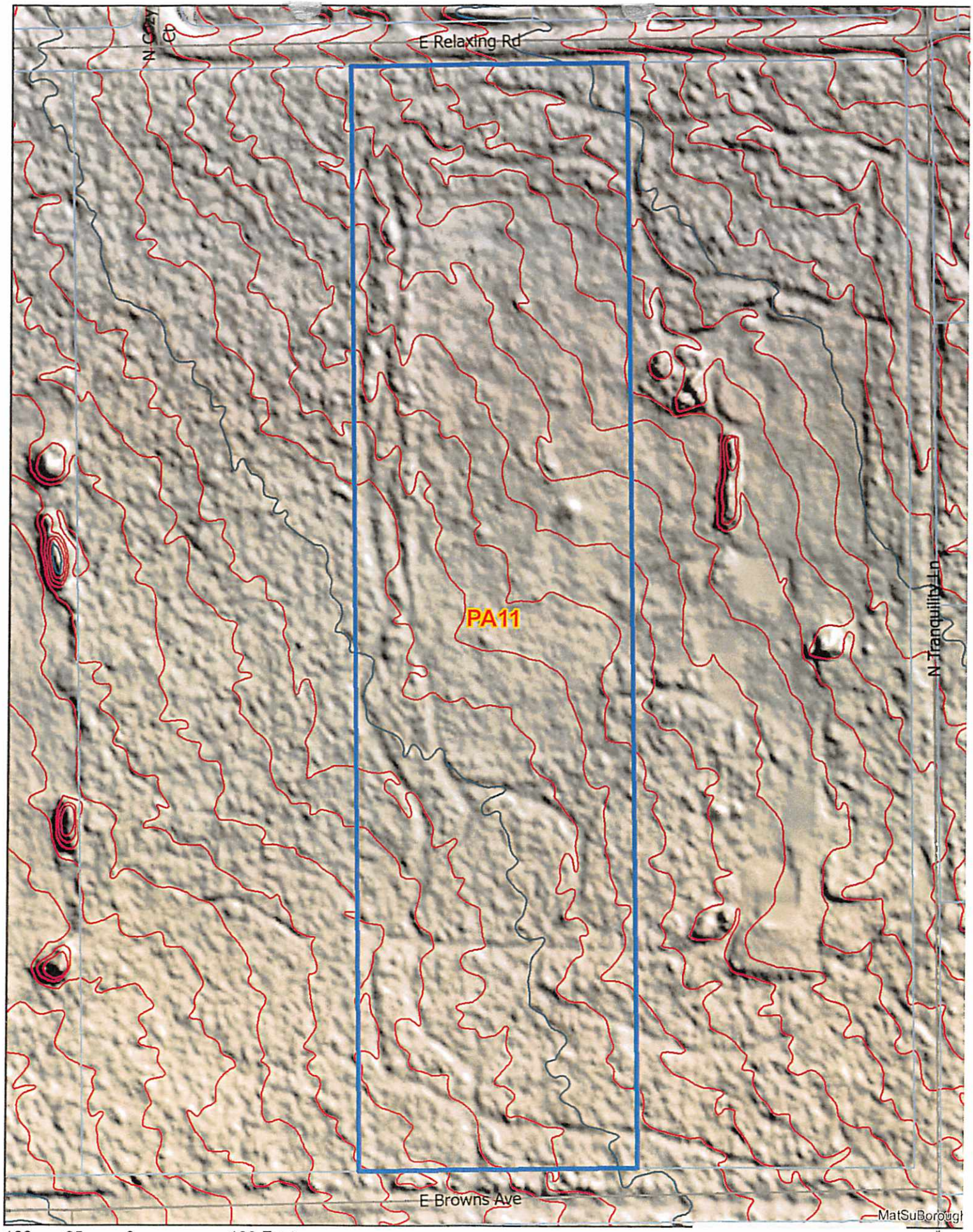
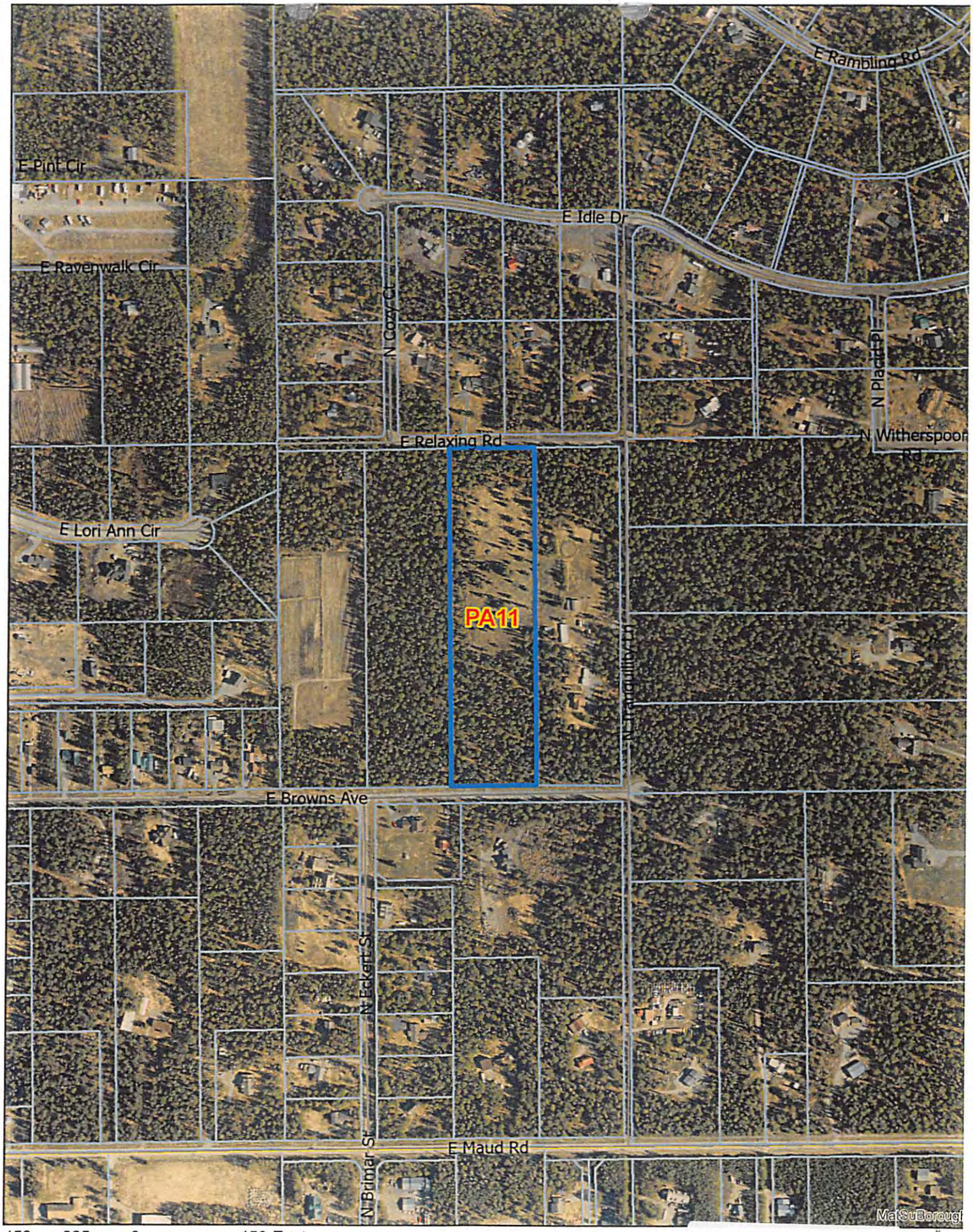

E Relaxing Rd
N Cozy Ct
PA11
N Tranquility Ln
E Browns Ave
MatSuBorough
130 65 0 130 Feet

EXHIBIT A -3



450 225 0 450 Feet

EXHIBIT A -4

RECON

Rowland Engineering Consultants

565 West Recon Circle, · Palmer, Alaska 99645
907.746.3630 steve@reconllc.net

RECEIVED
JUL 19 2023
PLATTING

June 27, 2023

Matanuska-Susitna Borough
Platting Division
350 East Dahlia St.
Palmer, Alaska 99645

Re: Soils Investigation Report for: **Replat of Eckert Subdivision No, 2, Lot 2**, Within NE1/4, SW1/4, Section 1, T 17 N, R 2 E, Seward Meridian, Alaska (MSB Account No. 52008000L002)

Attn: Platting Officer

Introduction

RECON, LLC has completed an assessment of the subject property to determine compliance with MSB requirements for "usable area" as defined in Title 43 of Borough Code. The subject parent parcel, being 9.3 acres, is to be subdivided into two lots. The north lot will have an area of 3.0 acres and the south lot will be 6.3 acres. The parent parcel (Lot 2) is vacant but has been partially cleared and used as pasture. The south lot fronts on E. Browns Avenue, while the North lot fronts on E Relaxing Rd. The proposed lots and existing development are shown in the referenced preliminary plat of Rowland Forest Subdivision prepared by RECON, LLC. Included as Attachment A is a project area map showing the generalized subdivision layout and location of test pits.

On June 24, 2023, Steve Rowland, PE completed an on-site property evaluation and soils investigation sufficient to provide an assessment of suitability for subdivision of the subject property. One test pit was dug on each of the proposed lots. Locations of the test pits were determined to be representative of conditions found on each lot. Included as Attachment B are the test pit logs for each lot.

Project Area Description

Regionally, the subject property is located on an ancient alluvial fan deposit consisting of layered and interbedded well- to poorly graded sand, gravel, and silt deposits overlain by a thin blanket of wind-deposited silt (loess) and fine sand. The subsurface soils present on the subject property are typically excellent for this type of development. Groundwater can be expected at depths more than 100 ft. The author has completed numerous soil test pits in the area of the subject subdivision and has never encountered groundwater within the depth of excavation. Bedrock has been reported in well logs on a few nearby properties at depths from 100 ft to 150 ft. The entire property slopes gently to the southwest at gradients of 2 to 4 percent. Ground surface elevation varies from 252 ft to 282 ft above mean sea level, with the highest point being at the northeast corner of the property. Area drainage is excellent, given natural ground slope and developed ditches along E Relaxing Rd and E. Browns Ave. There are no active drainage ways or streams within the subject property. Any future residential development can be accomplished without adversely affecting area drainage patterns or adjacent properties. The subject property is lightly

EXHIBIT B - 1

RECON
Rowland Engineering Consultants
565 West Recon Circle, · Palmer, Alaska 99645
907.746.3630 steve@reconllc.net

developed with approximately 5 acres of old horse pasture and a trail network. All undeveloped areas are forested with a mixed stand of mature birch and white spruce. Access to the subject property is via E. Browns Avenue for the south lot and E Relaxing Rd for the north lot. Each proposed lot fronts on an MSB maintained residential street. Homes located on adjacent properties utilize on-site wells and conventional wastewater disposal systems. Surrounding properties are mostly developed with single-family homes on 1 to 2.5 acre lots. Both proposed lots are rectilinear with depth to width ratios of approximately 1.2:1 and 2.7:1.

Field Investigation

On June 24, 2023, test pits were excavated on the subject property at locations shown on the map in Attachment A. Test Pit locations were selected as representative of the conditions to be expected throughout the proposed subdivision. Each test pit was logged by Steve Rowland, PE, of RECON, LLC.

Soils Description

Soils observed included a near surface layer of organic material and silt overlying sandy gravel with few cobbles that often included strata or lenses of fine gravel, sand, or silt. The silt (topsoil) layer was found to be of variable thickness and the sandy gravel extended to the limit of the test pits at a depth of 14 ft. In Test Pit 2, there was a 2.7 ft thick layer of stratified silt encountered from 7.8 ft to 10.5 ft, returning to gravel with sand to the bottom of the test pit at 14 ft. The gravel soils have moderately rapid to rapid permeability and are conducive to nearly any type of property use. No groundwater was encountered at the time test pits were excavated and logged. Refer to Attachment B, "Geologic Log of Test Pits."

Summary & Conclusions

In summary, Steve Rowland, PE, of RECON, LLC has reviewed the proposed subdivision plan, topographic maps, geologic maps of the immediate area, and soils information of record and on adjacent properties. Based on the subsurface investigation and the engineer's traverse of the property and familiarity with soils and geology of the subject area, it has been determined that each of the two proposed lots has the required minimum 10,000 square feet of "useable building area" and the required 10,000 contiguous square feet of "useable septic area" as defined in MSB Title 43.20.281. There are no excessive slopes of significant extent that occur within the property, and there is no occurrence of surface water that impacts the proposed subdivision plan.

Sincerely,

Steven R. Rowland, PE

Attachment A: Subdivision Plan and Test Pit Location Map (1 page)

Attachment B: Test Pit Logs (2 pages)

EXHIBIT B - 2

Attachment A

Subdivision Plan and Test Pit Location Map
(1 page)

EXHIBIT B-4

LOT 2, ECKERT NO. 2
SOILS INVESTIGATION

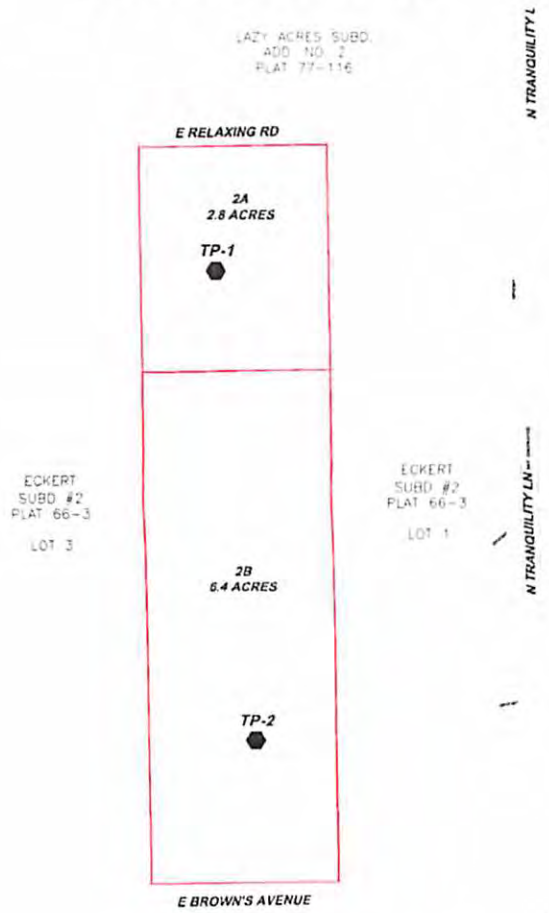


EXHIBIT A

RECON

LEGEND

TP-#

NOTES

SCALE	SHEET NUMBER
1"= 200'	01
PLOT DATE	
7/3/2023	
FILE NAME	
Lot2EckertNo2_PrelimPlat.dwg	

Attachment B

Test Pit Logs
(2 pages)

EXHIBIT B - 5

GEOLOGIC LOG TEST PIT: TP-1

Sample Method | Sample Number | Depth In Feet | Sample Interval | Frozen Interval | Graphic Log

Ground Elev.: 271
Total Depth : 14.2
Bottom Elev.: 256.8
Collar Elev.: NA
Reference:

Vegetation: Grass and low shrub
Remarks:

Location: Lot 2 Eckert No. 2 Subd
17305 E Browns Ave
N: 061.59153
E: −149.01509
Coord.: Lat/Long WGS84

0.0' – 0.2' Organic material (OH)

0.2' – 1.2' SILT, brown – tan, firm dry (ML)

1.2 – 14.2' well–graded GRAVEL w/sand & well–graded Sand w/ Gravel in discontinuous layers, brown to olive, moderately dense, dry (GW & SW)
Includes thin lenses or layers of Silt up to 0.5' thick.

14.2' TD

Notes:
- No groundwater observed at time of excavation.
- Coordinates from hand held GPS.
- Ground elevation from MSB 2019 LiDAR data.
- Terrain is characteristic of a relic alluvial fan deposit.
- TP–1 was excavated near the center of the proposed north parcel in an area previously cleared and grubbed.

RECON, LLC
565 W. Recon Cir.
Palmer, Alaska 99645
Ph: (907) 746–3630

Project No.:
Project Name: Lot 2 Eckert No.2 Subd
Location: Proposed north parcel fronting E Relaxing Rd
Method Used: Excavator + Auger
Logged by: S Rowland
Date Begun: 06/24/23

Sheet 1 of 1 Log #TP–1
Rig Type: NA
Contractor:
Date Comp.: 06/24/23

EXHIBIT B-6

GEOLOGIC LOG TEST PIT: TP-2

Sample Method | Sample Number | Depth In Feet | Sample Interval | Frozen Interval | Graphic Log

Ground Elev.: 260'
Total Depth : 14.0'
Bottom Elev.: 246'
Collar Elev.: NA
Reference:

Vegetation: Mature Birch and Spruce
Remarks:

Location:
Lot 2 Eckert No. 2 Subd
17305 E Browns Ave
N: 061.58931
E: -149.01480
Coord.: Lat/Long WGS84

0.0' – 0.5' Organics and SILT, brown, soft, moist

0.5' – 2.2' SILT, brown to tan, firm, moist. (ML)

2.2' – 4.5' Well graded Gravel w/sand, brown, moderately dense, dry (GW)

4.5' – 5.0' SILT, tan, firm, moist. (ML)

5.0' – 7.8' Well graded Gravel w/sand, brown, moderately dense, dry (GW)

7.8' – 10.5' SILT, tan, firm, moist. (ML)

10.5' – 14.0' Well graded Gravel w/sand, brown, moderately dense, dry (GW)

14.0' TD

Notes:

- No groundwater observed at time of excavation.
- Coordinates from hand held GPS.
- Ground elevation from MSB 2019 LiDAR data.
- Terrain is characteristic of a relic alluvial fan deposit.
- TP-2 was excavated at the south center of the proposed south parcel

RECON, LLC
565 W. Recon Cir.
Palmer, Alaska 99645
Ph: (907) 746-3630

Project No.:
Sheet 1 of 1 Log #TP-02
Project Name: Subd of Lot 2 Eckert No. 2 Subd
Location: South Parcel of proposed Subd.
Method Used: Excavator + Auger
Rig Type:
Logged by: S Rowland
Contractor: RECON
Date Begun: 06/24/23
Date Comp.: 06/24/23

Jesse Curlin

From: Daniel Dahms
Sent: Thursday, August 10, 2023 10:25 AM
To: Jesse Curlin
Cc: Brad Sworts; Jamie Taylor; Tammy Simmons
Subject: RE: RFC Eckert No.2 RSB L2

Chris,

Place note on plat indicating that Lot 2B is further subdivided, Browns Avenue will need to be upgraded to a minimum residential standard as outline in the 2022 SCM.

Daniel Dahms, PE
Department of Public Works
Pre-Design and Engineering Division

From: Jesse Curlin <Jesse.Curlin@matsugov.us>
Sent: Tuesday, August 1, 2023 11:52 AM
To: sarah.myers@alaska.gov; colton.percy@alaska.gov; regpagemaster@usace.army.mil; pamela.j.melchert@usps.gov; butteakcc@gmail.com; snowshark1@hotmail.com; meshie@mtaonline.net; andrew.fraiser@enstarnaturalgas.com; james.christopher@enstarnaturalgas.com; row@enstarnaturalgas.com; ospdesign@gci.com; mearow@mea.coop; timhaledistrict1@gmail.com; Alex Strawn <Alex.Strawn@matsugov.us>; Andy Dean <Andy.Dean@matsugov.us>; Brad Sworts <Brad.Sworts@matsugov.us>; Charlyn Spannagel <Charlyn.Spannagel@matsugov.us>; Collections <Collections@matsugov.us>; Daniel Dahms <Daniel.Dahms@matsugov.us>; Elaine Flagg <Elaine.Flagg@matsugov.us>; Eric Phillips <Eric.Phillips@matsugov.us>; Fire Code <Fire.Code@matsugov.us>; Fred Wagner <Frederic.Wagner@matsugov.us>; Jamie Taylor <Jamie.Taylor@matsugov.us>; John Aschenbrenner <John.Aschenbrenner@matsugov.us>; Katrina Kline <katrina.kline@matsugov.us>; Marcia vonEhr <Marcia.vonEhr@matsugov.us>; Margie Cobb <Margie.Cobb@matsugov.us>; Planning <MSB.Planning@matsugov.us>; Tammy Simmons <Tammy.Simmons@matsugov.us>; Theresa Taranto <Theresa.Taranto@matsugov.us>; Tom Adams <Tom.Adams@matsugov.us>
Subject: RFC Eckert No.2 RSB L2

Hello,

The following link is a request for comments on the proposed Eckert No.2 RSB L2 subdivision.
Please ensure all comments have been submitted by August 11, 2023 so they can be incorporated in the Staff Report that will be presented to the Platting Officer.

Eckert No. 2 RSB L2

Sincerely,

Jesse C. "Chris" Curlin
Platting Technician
Matanuska-Susitna Borough
(907) 861-7873

EXHIBIT C

Jesse Curlin

From: Rick Antonio
Sent: Thursday, August 10, 2023 2:31 PM
To: Jesse Curlin
Cc: Kim Sollien
Subject: Eckert No. 2 RSB L2

The Planning Division has no objection to the proposed action.
Eckert No. 2 RSB L2

Thanks,

Rick Antonio

Planner II

Planning & Land Use Division

Matanuska-Susitna Borough

rick.antonio@matsugov.us

Office- 907.861.7815

Remote- 907.707.4591

EXHIBIT D

Jesse Curlin

From: OSP Design Group <ospdesign@gci.com>
Sent: Thursday, August 10, 2023 7:25 PM
To: Jesse Curlin
Cc: OSP Design Group
Subject: RE: RFC Eckert No.2 RSB L2
Attachments: RFC Packet.pdf; Agenda Plat.PDF

[EXTERNAL EMAIL - CAUTION: Do not open unexpected attachments or links.]
Jesse,

In review GCI has no comments or objections to the plat, attached is the signed plat for your records.

Thanks,
MIREYA ARMESTO
GCI | Technician III, GIS Mapping
m: 907-744-5166 | **w:** www.gci.com

From: Jesse Curlin <Jesse.Curlin@matsugov.us>
Sent: Tuesday, August 1, 2023 11:52 AM
To: sarah.myers@alaska.gov; colton.percy@alaska.gov; regpagemaster@usace.army.mil; pamela.j.melchert@usps.gov; butteakcc@gmail.com; snowshark1@hotmail.com; meshie@mtaonline.net; andrew.fraiser@enstarnaturalgas.com; james.christopher@enstarnaturalgas.com; row@enstarnaturalgas.com; OSP Design Group <ospdesign@gci.com>; mearow@mea.coop; timhaledistrict1@gmail.com; Alex Strawn <Alex.Strawn@matsugov.us>; Andy Dean <Andy.Dean@matsugov.us>; Brad Sworts <Brad.Sworts@matsugov.us>; Charlyn Spannagel <Charlyn.Spannagel@matsugov.us>; Collections <Collections@matsugov.us>; Daniel Dahms <Daniel.Dahms@matsugov.us>; Elaine Flagg <Elaine.Flagg@matsugov.us>; Eric Phillips <Eric.Phillips@matsugov.us>; Fire Code <Fire.Code@matsugov.us>; Fred Wagner <Frederic.Wagner@matsugov.us>; Jamie Taylor <Jamie.Taylor@matsugov.us>; John Aschenbrenner <John.Aschenbrenner@matsugov.us>; Katrina Kline <katrina.kline@matsugov.us>; Marcia vonEhr <Marcia.vonEhr@matsugov.us>; Margie Cobb <Margie.Cobb@matsugov.us>; Planning <MSB.Planning@matsugov.us>; Tammy Simmons <Tammy.Simmons@matsugov.us>; Theresa Taranto <Theresa.Taranto@matsugov.us>; Tom Adams <Tom.Adams@matsugov.us>
Subject: RFC Eckert No.2 RSB L2

[EXTERNAL EMAIL - CAUTION: Do not open unexpected attachments or links.]

Hello,

The following link is a request for comments on the proposed Eckert No.2 RSB L2 subdivision.
Please ensure all comments have been submitted by August 11, 2023 so they can be incorporated in the Staff Report that will be presented to the Platting Officer.

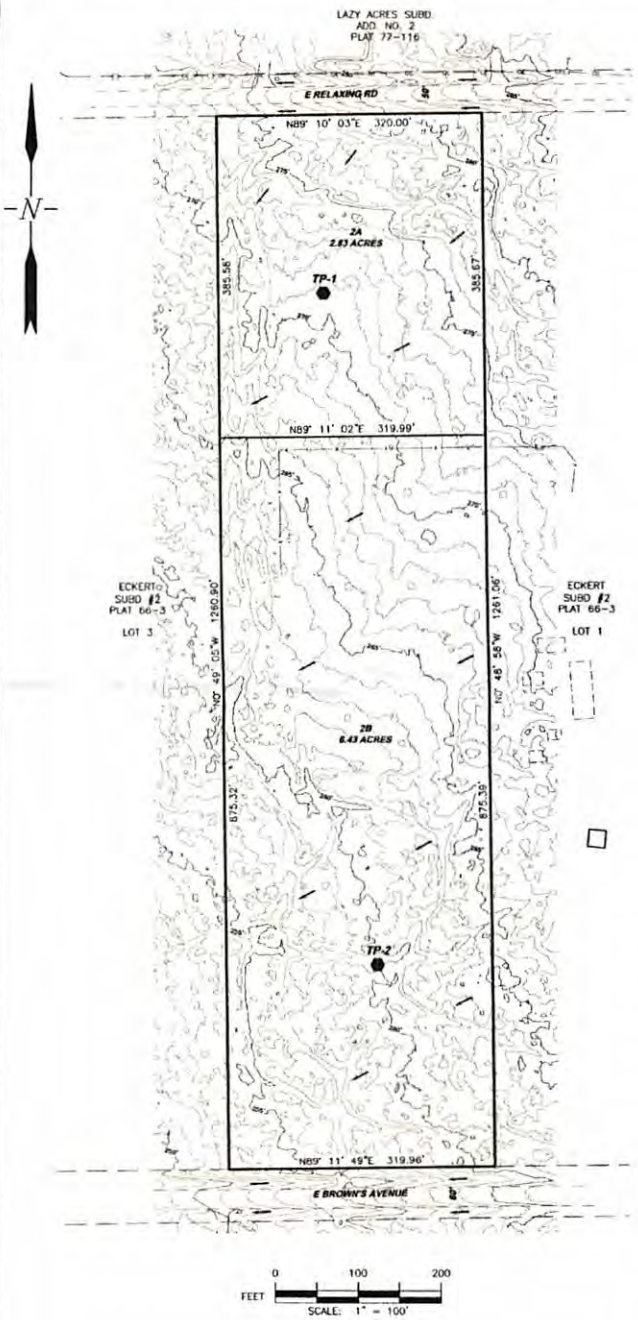
Eckert No. 2 RSB L2

Sincerely,

Jesse C. "Chris" Curlin

EXHIBIT E -1

ABBREVIATED PLAT



CERTIFICATE OF OWNERSHIP

WE HEREBY CERTIFY THAT WE ARE THE OWNERS OF THE PROPERTY SHOWN AND DESCRIBED IN THIS PLAN AND THAT WE ADOPT THIS PLAN OF SUBDIVISION BY OUR FREE CONSENT.

STEVEN R. AND DEBBIE D. ROWLAND — DATE
1100 N. TRANQUILITY LN., PALMER, AK 99645

NOTARY'S ACKNOWLEDGEMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS ___ DAY OF _____, 20___, FOR _____.

NOTARY FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES

NOTARY'S ACKNOWLEDGEMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS ___ DAY OF _____, 20___, FOR _____.

NOTARY FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES

CERTIFICATE OF PAYMENT OF TAXES

I HEREBY CERTIFY THAT ALL CURRENT TAXES AND SPECIAL ASSESSMENTS THROUGH _____, 20___, AGAINST THE PROPERTY, INCLUDED IN THIS SUBDIVISION, HAVE BEEN PAID.

MATANUSKA-SUSITNA BOROUGH TAX COLLECTION OFFICIAL

PLANNING AND LAND USE DIRECTOR'S CERTIFICATE

I CERTIFY THAT THE SUBDIVISION PLAN HAS BEEN FOUND TO COMPLY WITH THE LAND SUBDIVISION REGULATIONS OF THE MATANUSKA-SUSITNA BOROUGH, AND THAT THE PLAT HAS BEEN APPROVED BY THE PLATTING AUTHORITY BY PLAT RESOLUTION NO. _____, DATED _____, 20___, AND THAT THIS PLAT HAS BEEN APPROVED FOR RECORDING IN THE OFFICE OF THE RECORDER IN THE PALMER DISTRICT, THIRD JUDICIAL DISTRICT, STATE OF ALASKA IN WHICH THE PLAT IS LOCATED.
_____, 20___.

PLANNING AND LAND USE DIRECTOR — DATE

ATTEST: _____
PLATTING CLERK

NOTES

1. THERE MAY BE FEDERAL, STATE, AND LOCAL REQUIREMENTS GOVERNING LAND USE. THE INDIVIDUAL PARCEL OWNER SHALL OBTAIN A DETERMINATION WHETHER THESE REQUIREMENTS APPLY TO THE DEVELOPMENT OF PARCELS SHOWN ON THE PLAT TO BE RECORDED.
2. NO INDIVIDUAL WATER SUPPLY SYSTEM OR SEWAGE DISPOSAL SYSTEM SHALL BE PERMITTED ON ANY LOT UNLESS THE SYSTEM IS LOCATED, CONSTRUCTED, AND EQUIPPED IN ACCORDANCE WITH THE REQUIREMENTS, STANDARDS, AND RECOMMENDATIONS OF THE STATE OF ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION, WHICH GOVERNS THOSE SYSTEMS.
3. RESTRICTIVE COVENANTS WERE RECORDED IN THE PALMER RECORDING DISTRICT ON _____, 20___, AT SERIAL NUMBER _____.
4. SUBJECT TO RESERVATIONS AND EXCEPTIONS AS CONTAINED IN THE UNITED STATES PATENT AND/OR IN ACTS AUTHORIZING THE ISSUANCE THEREOF; SAID PATENT WAS RECORDED JUNE 8, 1949 IN BOOK 7, PAGE 119.

LEGEND

- FOUND 2 1/2" G.L.O BRASS CAP MONUMENT ON IRON PIPE
- FOUND 1 1/4" RED PLASTIC CAP ON 5/8" REBAR MARKED "C.L.S. LS 7074"
- PLAT BOUNDARY
- LOT LINE
- FENCE LINE
- EASEMENT
- ADJACENT PARCEL BOUNDARIES/ROW
- 5' ELEVATION CONTOUR LINE
- 1' ELEVATION CONTOUR LINE
- ELECTRIC METER
- POWER POLE W/ GUY ANCHOR
- ELECTRIC TRANSFORMER
- TELEPHONE PEDESTAL
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- EDGE OF ASPHALT
- EDGE OF GRAVEL
- HOUSE OR CABIN
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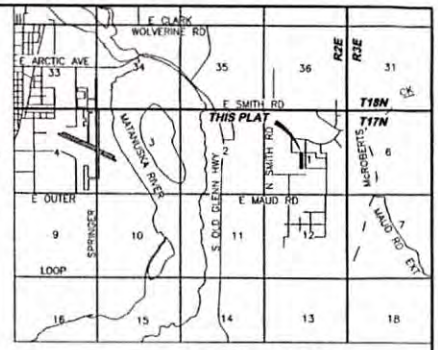
- EXISITNG & PROPOSED DRAINAGE DIRECTION



VICINITY MAP:

RECEIVED
JUL 19 2023
PLATTING

APPROVED AS: SHOWN [X]
CORRECTED [ ]
SIGN Mireya Armesto DATE 08/10/2023
GCI ENGINEERING & DESIGN

Agenda Copy

STATE OF ALASKA 49TH
MICHAEL R. EWING
LS -11794
RECORDED PROFESSIONAL LAND SURVEYOR

SURVEYOR'S CERTIFICATE:

I, MICHAEL R. EWING, LS11794, HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF ALASKA AND THAT THIS PLAT REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT THE MONUMENTS SHOWN ON THE PLAT ACTUALLY EXIST AS DESCRIBED, AND THAT ALL DIMENSIONAL AND OTHER DETAILS ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

MICHAEL R. EWING, PLS — DATE

A PLAT OF

THE ECKERT SUBDIVISION NO. 2

LOTS 2A AND 2B

A SUBDIVISION OF LOT 2, THE ECKERT SUBDIVISION NO. 2 (P66-3) WITHIN THE SW 1/4, SECTION 1, T17N, R2E, SEWARD MERIDIAN, ALASKA

PALMER RECORDING DISTRICT
THIRD JUDICIAL DISTRICT, STATE OF ALASKA

CONTAINING APPROXIMATELY 9.26 ACRES

PREPARED BY:
RECON
AECL #922
Rowland Engineering Consultants
263 West Piston Circle Palmer, Ak 99645
907 745 3630

SCALE: 1" = 100'

DRAWN BY:	DATE:
DVD	7/19/23
CHECKED BY:	SHEET:
MRE	1 OF 1

DRAFT

EXHIBIT E-2

Jesse Curlin

From: James Christopher <James.Christopher@enstarnaturalgas.com>
Sent: Tuesday, August 1, 2023 3:13 PM
To: Jesse Curlin
Cc: Andrew Fraiser; Sterling Lopez
Subject: RE: RFC Eckert No.2 RSB L2
Attachments: MSB No Comment 2023-090.pdf

[EXTERNAL EMAIL - CAUTION: Do not open unexpected attachments or links.]
Hello,

Please see ENSTARS attached letter with no comments.

Thank you,
Jimmy Christopher
Right of Way and Compliance Technician
ENSTAR Natural Gas Company, LLC
401 E. International Airport Rd.
P.O. Box 190288, Anchorage Ak 99519-0288
907-334-7944

From: Jesse Curlin <Jesse.Curlin@matsugov.us>
Sent: Tuesday, August 1, 2023 11:52 AM
To: sarah.myers@alaska.gov; colton.percy@alaska.gov; regpagemaster@usace.army.mil; pamela.j.melchert@usps.gov; butteakcc@gmail.com; snowshark1@hotmail.com; meshie@mtaonline.net; Andrew Fraiser <andrew.fraiser@enstarnaturalgas.com>; James Christopher <james.christopher@enstarnaturalgas.com>; ENSTAR ROW Shared Mailbox <row@enstarnaturalgas.com>; ospdesign@gci.com; mearow@mea.coop; timhaledistrict1@gmail.com; Alex Strawn <Alex.Strawn@matsugov.us>; Andy Dean <Andy.Dean@matsugov.us>; Brad Sworts <Brad.Sworts@matsugov.us>; Charlyn Spannagel <Charlyn.Spannagel@matsugov.us>; Collections <Collections@matsugov.us>; Daniel Dahms <Daniel.Dahms@matsugov.us>; Elaine Flagg <Elaine.Flagg@matsugov.us>; Eric Phillips <Eric.Phillips@matsugov.us>; Fire Code <Fire.Code@matsugov.us>; Fred Wagner <Frederic.Wagner@matsugov.us>; Jamie Taylor <Jamie.Taylor@matsugov.us>; John Aschenbrenner <John.Aschenbrenner@matsugov.us>; Katrina Kline <katrina.kline@matsugov.us>; Marcia vonEhr <Marcia.vonEhr@matsugov.us>; Margie Cobb <Margie.Cobb@matsugov.us>; Planning <MSB.Planning@matsugov.us>; Tammy Simmons <Tammy.Simmons@matsugov.us>; Theresa Taranto <Theresa.Taranto@matsugov.us>; Tom Adams <Tom.Adams@matsugov.us>
Subject: RFC Eckert No.2 RSB L2

CAUTION: This email originated outside of ENSTAR/TSU. Do not click links or open attachments unless you recognize the sender and know the content is safe. If you are not sure, use the "Report Phish" button or contact enstar.helpdesk@enstarnaturalgas.com

Hello,

The following link is a request for comments on the proposed Eckert No.2 RSB L2 subdivision.

EXHIBIT E - 3

ENSTAR Natural Gas Company, LLC
Engineering Department, Right of Way Section
401 E. International Airport Road
P. O. Box 190288
Anchorage, Alaska 99519-0288
(907) 277-5551
FAX (907) 334-7798

August 1, 2023

Matanuska-Susitna Borough, Platting Division
350 East Dahlia Avenue
Palmer, AK 99645-6488

To whom it may concern:

ENSTAR Natural Gas Company has reviewed the following preliminary plat and has no comments or recommendations.

- **THE ECKERT SUBDIVISION NO.2 LOTS 2A AND 2B (MSB Case # 2023-090)**

If you have any questions, please feel free to contact me at 334-7944 or by email at james.christopher@enstarnaturalgas.com.

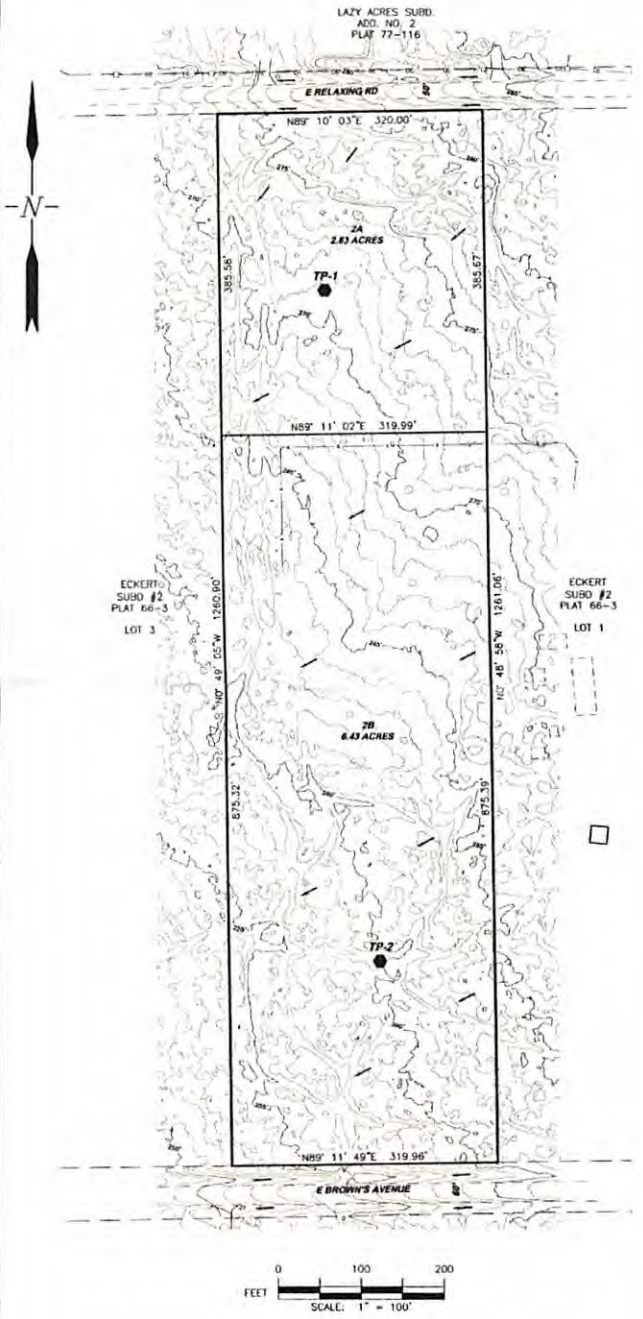
Sincerely,

James Christopher

James Christopher
Right of Way & Compliance Technician
ENSTAR Natural Gas Company, LLC

EXHIBIT E-4

ABBREVIATED PLAT



CERTIFICATE OF OWNERSHIP

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STEVEN R. AND DEBBIE D. ROWLAND — DATE
1100 N. TRANQUILITY LN., PALMER, AK 99645

NOTARY'S ACKNOWLEDGEMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS ___ DAY OF _____, 20___, FOR _____.

NOTARY FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES

NOTARY'S ACKNOWLEDGEMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS ___ DAY OF _____, 20___, FOR _____.

NOTARY FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES

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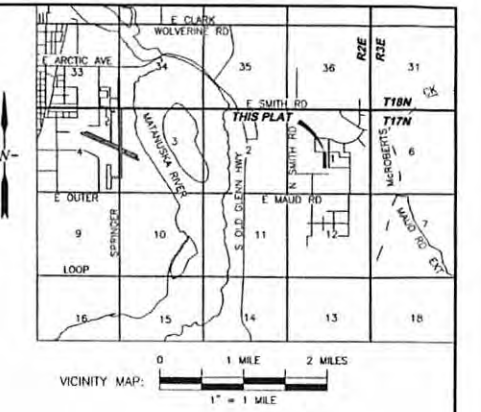
MATANUSKA-SUSITNA BOROUGH TAX COLLECTION OFFICIAL

PLANNING AND LAND USE DIRECTOR'S CERTIFICATE

I CERTIFY THAT THE SUBDIVISION PLAN HAS BEEN FOUND TO COMPLY WITH THE LAND SUBDIVISION REGULATIONS OF THE MATANUSKA-SUSITNA BOROUGH, AND THAT THE PLAT HAS BEEN APPROVED BY THE PLATTING AUTHORITY BY PLAT RESOLUTION NO. _____, DATED _____, 20___, AND THAT THIS PLAT HAS BEEN APPROVED FOR RECORDING IN THE OFFICE OF THE RECORDER IN THE PALMER DISTRICT, THIRD JUDICIAL DISTRICT, STATE OF ALASKA IN WHICH THE PLAT IS LOCATED.
_____, 20___.

PLANNING AND LAND USE DIRECTOR — DATE

ATTEST: _____
PLATTING CLERK



RECEIVED
JUL 19 2023
PLATTING

Agenda Copy

STATE OF ALASKA
49TH
MICHAEL R. EWING
LS - 11794
RECORDED PROFESSIONAL LAND SURVEYOR

SURVEYOR'S CERTIFICATE:

I, MICHAEL R. EWING, LS11794, HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF ALASKA AND THAT THIS PLAT REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT THE MONUMENTS SHOWN ON THE PLAT ACTUALLY EXIST AS DESCRIBED, AND THAT ALL DIMENSIONAL AND OTHER DETAILS ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

MICHAEL R. EWING, PLS — DATE

NOTES

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- FOUND 1 1/4" RED PLASTIC CAP ON 5/8" REBAR MARKED "C.L.S. LS 7074"
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- HOUSE OR CABIN
- SHED OR DECK
- EXISITNG & PROPOSED DRAINAGE DIRECTION

A PLAT OF

THE ECKERT SUBDIVISION NO. 2

LOTS 2A AND 2B

A SUBDIVISION OF LOT 2, THE ECKERT SUBDIVISION NO. 2 (P66-3) WITHIN THE SW 1/4, SECTION 1, T17N, R2E, SEWARD MERIDIAN, ALASKA

PALMER RECORDING DISTRICT
THIRD JUDICIAL DISTRICT, STATE OF ALASKA

CONTAINING APPROXIMATELY 9.26 ACRES

DRAFT

PREPARED BY:	SCALE: 1" = 100'	
RECON, AECL #922 Rowland Engineering Consultants 560 West Parvin Circle, Palmer, AK 99645 907 746 3630	DRAWN BY: DVD	DATE: 7/19/23
	CHECKED BY: MRE	SHEET: 1 OF 1

EXHIBIT E-5