SPECIAL PROVISIONS

SECTION 104
SCOPE OF WORK

11/30/12 (H5)
Add the following subsection:

104-1.07 FROZEN GROUND. Frozen areas, ice lenses, and saturated soils may be encountered on this project and related material sources. Specific locations and specific content of frozen areas, ice lenses, and saturated soils are not defined. Any such area that may be encountered by the Contractor in the performance of the contract work will not be considered unforeseeable within the terms of the contract such as to entitle the Contractor to any adjustment in contract price or contract time. Reference is made to Subsection 203-3.03 of these Specifications.

SECTION 106
CONTROL OF MATERIAL

04/30/17 (N2)
106-1.02 MATERIALS SOURCES.

1. General. *Add the following subparagraph:*

    j. If pre-existing, naturally occurring, hazardous material is encountered in any Material Source under Department ownership, management, or permit; the Department will pay in accordance with Subsection 109-1.05 for the proper handling and disposal of the hazardous material. Avoid excavation activity in the vicinity of the hazardous material. The Department will not be liable for any delays or impacts to the production of any materials items due to encountering the hazardous material. Contractor shall adhere to Subsection 107-1.11(6). Nothing in this subsection relieves the Contractor of any statutory liability.

SECTION 201
CLEARING AND GRUBBING

201-3.01 GENERAL. *Add the following*: Do not perform vegetation clearing between May 1 and July 15.

SECTION 203
EXCAVATION AND EMBANKMENT

01/20/15 (N8)
203-3.01 GENERAL. *Add the following to the eighth paragraph:* Disposal in wetlands is prohibited, except as described in Subsection 107-1.11.

Add the following after the eighth paragraph: The Contractor shall certify in writing to the Engineer that all permits and clearances relating to all waste disposal sites selected by the Contractor have been obtained prior to any clearing or ground disturbance in the disposal site.

01/20/15 (N11)
203-3.03 EMBANKMENT CONSTRUCTION. *Delete the fourteenth paragraph and substitute the following:* When embankments are to be constructed across wet or swampy ground, which will not support the weight of heavy hauling and spreading equipment, the Contractor shall choose such methods of embankment construction and use such hauling and spreading equipment as will least disturb the soft foundation. When soft foundations are encountered, and when approved by the Engineer, the lower part of the fill may be constructed by dumping and spreading successive vehicle loads in a uniformly distributed

layer of a thickness not greater than that necessary to support the vehicle while placing subsequent layers, after which the remainder of the embankment shall be constructed in layers and compacted as specified.

It is not the policy of the State to allow an increase in the planned depth of embankment material over soft, wet, or swampy ground for the sole purpose of providing support for heavy hauling and spreading equipment, unless the Contractor proves to the satisfaction of the Engineer that the planned depth is inadequate to support light hauling vehicles. If use of smaller hauling vehicles or different methods of embankment construction than originally contemplated are necessary to comply with the foregoing, such shall not be the basis for a claim for extra compensation. The contract unit price for the various pay items involved shall be full compensation for all labor, materials, and equipment necessary to perform the work outlined herein.

01/20/15 (N12)
203-4.01 METHOD OF MEASUREMENT. *Add the following:* Borrow will not be weighed or used while free moisture is observed draining from the haul vehicle at the scale location.

02/01/20 (N13)
203-5.01 BASIS OF PAYMENT. *Add the following:* Ten percent (10%) of the value earned in the progress period shall be withheld on progress payments for all Section 203 items of work. Five percent (5%) will be released by work area, as defined in the SWPPP, when final stabilization is initiated. The last five percent (5%) will be released by work area, as defined in the SWPPP, when final stabilization as defined by the *Construction General Permit* has been obtained and accepted by the Engineer. Withholding will be made under Item 641.0006.____ Withholding.

SECTION 204
STRUCTURE EXCAVATION FOR CONDUITS AND MINOR STRUCTURES

02/01/20 (N75)
204-2.01 MATERIALS. *Delete the first paragraph and substitute the following:*

Embedment Material: Embedment Material consists of bedding, and backfill to 12 inches above the pipe. Use Selected Material, Type A (Subsection 703-2.07) passing the 2-inch sieve for embedment material between vertical planes 18 inches outside the horizontal projection of the outer most diameter of the pipe, horizontal planes located 12 inches above and below the outermost diameter of the pipe or to the depth shown on the Plans.

204-4.01 METHOD OF MEASUREMENT. *Delete the first sentence and substitute the following:* Embedment Material will be measured according to Section 109 as follows:

1. 204.2002.0000 By neat line volume.
2. 204.2003.0000 Will not be measured directly for payment.
3. 204.2004.0000 By weighing.

Structure Excavation will be measured according to Section 109 using neat line method as follows:

204-5.01 BASIS OF PAYMENT. *Delete this subsection in its entirety and substitute the following:*

1. Structure Excavation. The contract price includes:

   a. The placing and compacting of backfill more than 12 inches above the pipe when the material used is obtained from excavation
   b. Clearing and grubbing required and not paid for under other items
   c. The formation of any embankments made with surplus material from structure excavation
   d. The disposal of all surplus or unsuitable excavation.

Additional excavation to provide for shoring, sheet piles, excavation shields or flattening the excavation slopes, is subsidiary.

When items 204.0001.____ through 204.0003____, Structure Excavation, do not appear in the bid schedule, structure excavation required to complete other items of work is subsidiary except that excavation and disposal of unsuitable material required from below a plane 12 inches below the invert elevation of conduits and 12 inches below the bottom of structures will be paid for as extra work.

2. Embedment Material. The contract price includes all work and materials necessary to provide, place, and compact Embedment Material.

When items 204.2002.____ through 204.2004____, Embedment Material, do not appear in the bid schedule, any backfill or bedding material required whose source other than project excavation will be paid under Item 203.0006.0000 Borrow.

Add the following pay items:

PAY ITEM		
Item Number	**Item Description**	**Unit**
204.2002.0000	Embedment Material	CY
204.2003.0000	Embedment Material	LS
204.2004.0000	Embedment Material	TON

SECTION 502
PRESTRESSING CONCRETE

502-3.03 CAMBER *Replace the second paragraph with the following:*

Form girders so the roadway surface conforms to the indicated grade line with an allowance for 1/2 inch of positive camber at midspan. Form girders to adjust for the predicted long-term camber from loss of prestress and from dead load deflection. When estimating this adjustment, assume that future paving will not be applied.

SECTION 505
PILING

505-1.02 DEFINITIONS. *Add the following:*

PILOT BORE HOLE. A vertical boring drilled along the pile alignment to a prescribed depth and size, prior to driving the pile, intended to loosen or weaken hard soil conditions, and reduce risk of pile damage during driving. A pilot bore hole does not necessarily have to be void of the cuttings.

505-3.01 PILE DRIVING EQUIPMENT. *Add the following:*

4. Pilot Bore Equipment. Pilot bore holes may be drilled using auger, rotary-wash with casing, downhole hammers, cable-tools, or other appropriate equipment. Include pilot bore equipment in the pile driving plan for approval. Use only equipment included in the approved pile driving plan. The Engineer may inspect the pilot bore equipment for conformance with the approved pile driving plan after it has been mobilized to the site and prior to beginning pile operations. Remove and replace pilot bore equipment

found out of conformance with the approved pile driving plan at no extra cost to the Department and with no adjustment to contract time.

505-3.03 DRIVING PILES. *Add the following:*

6. Pilot Bore. Drill a pilot bore, prior to driving, at each pile location to one foot above the Minimum Penetration shown on the Plans. The diameter of the pilot bore will be sufficient diameter to install piles to minimum penetration, but no larger than 75 percent of the pile diameter.

505-5.01 BASIS OF PAYMENT. Add the following:

Drive Piles.

4. All equipment, material, labor and work required for pilot bore holes for the piles.

SECTION 520
TEMPORARY CROSSINGS

08/01/17 (N73)
520-2.04 DESIGN REQUIREMENTS. *Delete subparagraph 3.i. and substitute the following:*

i. Construct roadway surface of concrete or HMA. Construct skid-resistant bridge deck surface of concrete, steel, or HMA. The bridge deck surface shall not be wooden. Provide a bridge deck surface with a friction value of not less than 0.35 as determined by ASTM E1911.

520-3.03 WINTER MAINTENANCE. *Delete this subsection in its entirety and substitute the following:* During seasonal suspension of work the Department may accept maintenance responsibility for snow and ice removal according to Subsections 105-1.13 and 643-3.07. The Contractor is responsible for repairs and maintenance for damage resulting from the Department's action to remove snow and ice, or as required for any other reason, during seasonal suspension of work. Payment will be made for repairs resulting from Department caused damage by unit pay item or in accordance with Subsection 109-1.05, Compensation for Extra Work.

520-3.06 CLEANUP. *Delete this subsection in its entirety and substitute the following:* Remove temporary crossings, cleanup site, and stabilize site from erosive forces before final completion. Grade the areas as shown in the plans and return the remaining site substantially to its original condition. Additional cleanup conditions may be listed in the permits. Remove piling to a minimum of one foot below ground level.

520-5.01 BASIS OF PAYMENT.

Temporary Crossings. *Delete the first paragraph in its entirety and substitute the following:* The lump sum payment is full compensation for all design, engineering, load rating, inspection, labor, equipment and materials necessary to furnish, install, repair, maintain, all traffic control and traffic maintenance within the limits of the temporary crossings, and remove temporary crossings in their entirety except for its earthwork embankment.

Removing the earthwork embankment and achieving the final grading as shown on the Plans will be paid under Item 203.0003.0000 Unclassified Excavation.

SECTION 603

CULVERTS AND STORMDRAINS

01/20/15 (N21)
603-3.03 JOINING PIPE. *Delete numbered subparagraphs 2.a.2) & 3) and substitute the following:*

(2) Bands shall have a minimum width of 22 inches.

Delete numbered subparagraphs 2.b.2), 3) and 4) and substitute the following:

(2) Bands shall have a minimum width of 22 inches and shall have two circumferential rows of projections for each pipe end being joined.

(3) Furnish and install these bands with a gasket that resists infiltration and leakage.

SECTION 606
GUARDRAIL

11/01/16 (N67)
606-5.01 BASIS OF PAYMENT. *Add the following:* All traffic control devices necessary for removal, installation, reconstruction, or maintenance of 606 Pay Items shall be subsidiary to the respective 606 Pay Items.

SECTION 611
RIPRAP

611-1.01 DESCRIPTION. *Add the following:*
Place salvaged riverbed material in the riprap voids along the river bank and toe of the riprap.

01/20/15 (N23)
611-2.01 MATERIALS. *Add the following after the first sentence:* WAQTC FOP for AASHTO T 85 will determine apparent specific gravity.

Add the following:
Riverbed material to be salvaged from excavation of river bank and bed.

01/20/15 (N24)
611-3.01 CONSTRUCTION REQUIREMENTS. *Add the following after the first sentence of the second paragraph:* The Contractor shall not deposit excavated materials in adjacent stream channels or other bodies of water or in areas subject to flooding during high flows.

Add the following:
After riprap is placed use salvaged riverbed materials to fill the voids between the riprap.

Delete Section 613 in its entirety and substitute the following:
02/01/20 (N25)

SECTION 613
MONUMENTS AND MARKERS

613-1.01 DESCRIPTION. This work consists of furnishing and installing culvert marker posts in conformance with the Plans and Specifications or as directed.

613-2.01 MATERIALS. Steel mounting supports shall conform to the requirements of ASTM A 36. Steel mounting supports and fasteners for culvert marker posts shall be galvanized in accordance with AASHTO M 232.

Culvert marker posts shall be Carsonite CIB-380 flexible markers, or approved equal.

613-3.01 CONSTRUCTION REQUIREMENTS. Culvert marker posts shall be installed as detailed on the Plans.

613-4.01 METHOD OF MEASUREMENT. The quantities paid for shall be the actual number of culvert marker posts furnished, installed, and accepted.

If Item 613.0002.____ does not appear on the bid schedule all costs associated with providing and installing culvert marker posts shall be considered subsidiary to culvert installation and will not be measured or paid for separately.

613-5.01 BASIS OF PAYMENT. Culvert marker posts shall be paid for at the contract price, per unit of measurement, for the pay item shown in the bid schedule.

Payment will be made under:

PAY ITEM		
Item Number	**Item Description**	**Unit**
613.0002.____	Culvert Marker Post	EACH

SECTION 615
STANDARD SIGNS

02/01/20 (N26)
615-2.01 MATERIALS.

4. Delineators. *Add the following:* Delineators shall be of flexible design. The following flexible delineators are approved for use:

Carsonite:	Road Marker
Carsonite:	Curve Flex
Safe-Hit Corp:	Flexible Guide Post

The Contractor may submit an alternate for consideration by the Engineer.

615-3.01 CONSTRUCTION REQUIREMENTS. *Add the following to numbered paragraph 4:* The delineators shall be located uniformly 4 feet to 8 feet from the outside shoulder edge unless noted otherwise on the Plans. The reflector shall be 3" x 12" yellow or white reflective sheeting (one or two sides) meeting the requirements of Subsection 730-2.03, the Plans, and Standard Plan T-05. The reflector shall be mounted so that the top of the reflector is 4 feet above the surface of the shoulder.

01/20/15 (N27)
Delete numbered subparagraph 8 in its entirety and substitute the following:

8. All materials and finished signs are subject to inspection and acceptance in place.

    a. Surfaces exposed to weathering must be free of defects in the coating.

b. Finished signs must be clean and have no chatter marks, burrs, sharp edges, loose rivets, delaminated reflective sheeting, oxidation, corrosion, other blemishes, aluminum marks, or unapproved coatings. Do not make repairs to the face sheet.

c. Replace any finished sign not meeting a. and b. with a replacement sign at no cost to the Department.

11/01/16 (N68)
615-5.01 BASIS OF PAYMENT. *Delete the first sentence and substitute the following:* Sign posts, bases, mounting hardware and all traffic control devices necessary for removal, installation, reconstruction, or maintenance of 615 Pay Items are subsidiary.

Delete Section 618 in its entirety and substitute the following:
02/01/20 (N30)

SECTION 618
SEEDING

618-1.01 DESCRIPTION. It is the intent of this work that a uniform living vegetative cover be established according to the Plans and Specifications. This work consists of soil preparation, seeding, fertilizing, mulching, and establishing, and maintaining vegetated areas.

618-2.01 MATERIALS. Use materials that conform to the following:

Seed	Section 724
Fertilizer	Section 725
Mulch	Subsection 727-2.01
Water	Subsection 712-2.01

CONSTRUCTION REQUIREMENTS

618-3.01 SOIL PREPARATION. Clear all areas to be seeded of stones 4” and larger in diameter and of all weeds, plant growth, sticks, stumps and other debris or irregularities which may interfere with the seeding, establishment, and maintenance of the vegetated areas.

Prior to the application of seed, prepare slopes using one or more of the following methods, or as approved by the Engineer:

1. Manual Raking – Requires manual labor with landscaping rakes to produce a uniform pattern of grooves perpendicular to the fall of the slope.
2. Mechanical Raking - Requires the use of a scarifying slope board to produce grooves with an approximate width and depth of 1”, and no more than 6” apart. The resultant indentations shall leave a uniform pattern of grooves perpendicular to the fall of the slope.
3. Mechanical Track Walking - Requires operating tracked equipment in such a manner as to leave a uniform pattern of grooves perpendicular to the fall of the slope.

618-3.02 SEEDING SEASON. Perform seeding after the ground is free of snow and no sooner than May 31 and no later than August 15. Perform seeding when wind conditions, climatic conditions, and soil conditions will not hinder seeding and establishment.

618-3.03 APPLICATION METHOD. Use the Hydraulic Method. You must obtain the Engineer’s permission to use the Mechanical Method.

Hydraulic Method:

1. Seeding by the hydraulic method consists of furnishing and placing a slurry of dye, seed, fertilizer, trace mulch, water, and a second application of mulch.
2. Do not place seed in the slurry prior to 30 minutes before application.
3. Add the proportionate amount of seed to the water slurry in the hydraulic seeder after the proportionate amounts of trace mulch and fertilizer have been added.
4. Apply the slurry mixture in a manner that results in an even distribution of all materials. Apply seed, fertilizer, and trace mulch together in one application.
5. Hydraulic seeding equipment must maintain continuous slurry agitation so that a homogeneous, uniform mixture is applied through a spray nozzle, for the complete tank load. The pump must be capable of producing sufficient pressure to maintain a continuous, nonfluctuating spray capable of reaching the extremities of the seeding area with the pump & nozzle unit located on the roadbed. Provide sufficient hose to reach areas not practical to seed from the pump & nozzle unit situated on the road bed.
6. A second application of mulch shall be applied within 24-hours after seeding. Mulch shall be furnished and evenly applied at the rates required for temporary stabilization per the manufacturer's recommendations and according to Subsection 727-2.01. Mulch sprayed on signs or sign structures shall be removed the same day.

Mechanical Method:

1. Use mechanical spreaders, seed drills or other approved mechanical seeding equipment when seed and fertilizer are to be applied in dry form.
2. Water seeding area both prior to and after the application of fertilizer.
3. Spread fertilizer separately from seed.
4. An application of mulch shall be applied within 24-hours after seeding. Mulch shall be furnished and evenly applied at the rates required for temporary stabilization per the manufacturer's recommendations and according to Subsection 727-2.01. Mulch sprayed on signs or sign structures shall be removed the same day.

618-3.04 APPLICATION RATE. Apply seed, fertilizer, and trace mulch at the rates specified in the table below:

MATERIALS	TYPE	APPLICATION RATE PER 1,000 SQUARE FEET
Seed*	Notran Tufted Hairgrass	0.60 lb
	Gruening Alpine Bluegrass	0.15 lb
	Wainwright Slender Wheatgrass	0.20 lb
	Annual Ryegrass	0.05 lb
	Total	1.00 lb
Fertilizer	20-20-10	10 lb
Trace mulch**	See Subsection 727-2.01	20 lb

* Do not remove the required tags from the seed containers.

** Trace mulch application rate may be adjusted according to the manufacturer's recommendations when approved by the Engineer. Trace mulch is not required for mechanical seeding.

618-3.05 MAINTENANCE. Protect seeded areas against erosion and sedimentation. Protect seeded areas against traffic by approved warning signs or barricades. Water seeded areas, in a non-erosive manner, as required to establish a uniform living perennial vegetative cover. Be responsible for identifying, retracking, reseeding, refertilizing and remulching gullied or otherwise damaged areas. The second application of mulch shall be maintained so it properly performs its temporary stabilization function until final stabilization is achieved. Rescarify, reseed, refertilize and remulch unproductive areas as directed by the Engineer.

618-3.06 PERIOD OF ESTABLISHMENT. The establishment period extends until a uniform (e.g. evenly distributed, without large bare areas) perennial living vegetative cover with a density of 70 percent of the native background vegetative cover is established.

618-3.07 ACCEPTANCE. The Engineer will accept seeding when a uniform (e.g. evenly distributed, without large bare areas) perennial living vegetative cover with a density of 70 percent of the native background vegetative cover is established.

618-4.01 METHOD OF MEASUREMENT. Section 109 and as follows:

Watering seeded areas per Subsection 618-3.05 will not be measured directly for payment and is subsidiary, except when Pay Item 618.0003.____ is listed on the Bid Schedule.

Identifying, retracking, reseeding, refertilizing and remulching gullied or otherwise damaged areas will not be measured directly for payment and is subsidiary.

Seeding by the Acre. By the area of ground surface acceptably seeded and maintained. Soil preparation, seed, fertilizer, all mulch, dye, and water required for seed and fertilizer application will not be measured directly for payment and is subsidiary.

Seeding by the Pound. By the dry weight of seed acceptably seeded and maintained. Soil preparation, fertilizer, all mulch, dye, and water required for seed and fertilizer application will not be measured directly for payment and is subsidiary.

Water for Seeding. By the M Gal. (1,000 gallons) acceptably placed. Use a conversion factor of 8.34 pounds per gallon, if measured by weight.

618-5.01 BASIS OF PAYMENT. The accepted quantity will be paid for at the contract price, per unit of measurement, for the pay items listed below that appear on the bid schedule.

Payment will be made under:

PAY ITEM		
Item Number	**Item Description**	**Unit**
618.0001.____	Seeding	ACRE
618.0002.____	Seeding	LB
618.0003.____	Water for Seeding	MGAL

Delete Section 639 in its entirety and substitute the following:

SECTION 639
APPROACHES

639-1.01 DESCRIPTION. Construct approaches at the locations shown on the Plans.

639-2.01 MATERIALS. Use materials that conform to the standards for the main roadway.

639-4.01 METHOD OF MEASUREMENT. By the number of approaches and as shown on the Plans or as directed.

639-5.01 BASIS OF PAYMENT. Excavation required beyond the limits of the adjacent mainline is subsidiary.

Materials required to construct approaches is subsidiary to Item 639.2000.0000 Approach.

Payment will be made under:

PAY ITEM		
Item Number	**Item Description**	**Unit**
639.2000.0000	Approach	EACH

SECTION 642
CONSTRUCTION SURVEYING AND MONUMENTS

01/20/15 (N34)
642-3.01 GENERAL. *Delete the fifth paragraph and substitute the following:* Follow the Department's Construction Surveying Requirements, or if GPS survey is approved by the Engineer, use the Alaska Survey Manual GPS Surveys 2010 (rev. 8/15/10).

Add the following to the last sentence in the second to the last paragraph: or the Alaska Survey Manual GPS Surveys 2010 (rev. 8/15/10).

642-3.02 CROSS-SECTION SURVEYS. *Add the following to the first paragraph:* or the Alaska Survey Manual GPS Surveys 2010 (rev. 8/15/10).

Delete numbered paragraph 4 of the second paragraph in its entirety and substitute the following: Department's Construction Surveying Requirements or the Alaska Survey Manual GPS Surveys 2010 (rev. 8/15/10).

SECTION 643
TRAFFIC MAINTENANCE

03/07/19 (N40)
643-5.01 BASIS OF PAYMENT.

11. Traffic Control. *Add the following schedule:*

TRAFFIC CONTROL RATE SCHEDULE

TRAFFIC CONTROL DEVICE	PAY UNIT	UNIT RATE
Construction Signs	Each/Day	$ 6.50
Special Construction Signs	Square Foot	$ 28.00
Type II Barricade	Each/Day	$ 3.30
Type III Barricade	Each/Day	$ 11.00
Traffic Cone or Tubular Marker	Each/Day	$ 1.10
Drums	Each/Day	$ 3.30
Temporary Guardrail	Linear Foot	$ 25.00
Portable Concrete or Steel F Shape Barrier (12.5 foot standard length or$8/foot)	Each	$ 100.00
Temporary Crash Cushion/ non-redirective Water filled barrier (all required per end)	Each	$ 2,500.00
Temporary Crash Cushion / non-redirective Water filled Barrels (all required per end)	Each	$ 3,285.00

TRAFFIC CONTROL DEVICE	PAY UNIT	UNIT RATE
Temporary Crash Cushion / non-redirective Sand filled Barrels (all required per end)	Each	$ 4,325.00
Temporary Crash Cushion / Redirective	Each	$ 9,230.00
Plastic Safety Fence	Foot	$ 1.00
Temporary Sidewalk Surfacing	Square Foot	$ 2.00
Flexible Markers (Flat Whip, Reflective)	Each	$ 60.00
Flagging	Hour	$58.00
Electronic Boards, Panels and Signals		
Sequential Arrow Panel	Each/Day	$ 36.00
Portable Changeable Message Board Sign	Each/Day	$ 130.00
Portable Traffic Signals (Two)	Each/Day	$361.00
Cars and Trucks w/driver		
Pilot Car (4x2 ½ ton truck, or any car)	Hour	$72.00
Watering Truck – up to 4900 gallon capacity	M-Gallon	$ 28.00
Watering Truck – more than 4900 gallon	M-Gallon	$ 21.00
Street Sweeping (Regenerative Sweeper, Vacuum Sweeper, Mechanical or Power Broom with vacuum)	Hour	$ 214.00
40,000 GVW Truck with Crash Attenuator	Hour	$ 162.00
Interim Pavement Markings		
Painted Markings	Linear Foot	$ 0.30
Preformed Pavement Marking Tape (removable or non-removable)	Linear Foot	$ 1.75
Temporary Raised Pavement Markers	Each	$ 1.00
Word or Symbol Markings	Each	$ 40.00
Temporary Cover Markings	Linear Foot	$ 4.00
Removal of Pavement Markings	Linear Foot	$1.25

Delete Section 644 in its entirety and substitute the following:

SECTION 644
SERVICES TO BE FURNISHED BY THE CONTRACTOR

644-1.01 DESCRIPTION. Furnish and maintain facilities and services specified in the Contract for the Department's project administrative personnel to use during the project. Services include heat, electrical power (NEC compliant), water and any others required to operate the facilities. All furnished facilities remain the property of the contractor when the work is completed.

The Engineer may delete any 644 Items, by Directive within five working days after the Preconstruction Conference. If any 644 Items are deleted within the specified period, Subsection 109-1.09, Eliminated Items, shall not apply to the deleted 644 Items.

644-2.01 FIELD OFFICE. Furnish and maintain a suitable office for the Engineer to use during construction. Make the Field Office available for occupancy 2 weeks before commencing work on the

project through one week after Project Completion. The Field Office shall be within one half of one mile from the project.

1. Submit office proposal to the Engineer prior to procurement or transporting office to the project. The Engineer will approve the office general condition, location, access, features, and physical layout prior to beginning any office setup work. If this office is part of your building, completely partition it from the rest of the structure and provide a separate outside door equipped with a lock.

2. Provide at least the following minimum requirements, or as approved by the Engineer:

   a. Floor space of at least 1000 ft^2
   b. Window area of at least 60 ft^2
   c. Lockable outside door(s)
   d. Six each plastic folding tables, 8 ft. long
   e. Shelf space of at least 24 linear feet
   f. Adequate heating and cooling devices, and fuel or power to run the devices, to maintain an office temperature between 65° and 75°F.
   g. Adequate ventilation
   h. Continuous supply of drinking water from an approved source or commercial supplier
   i. Sanitary facilities including adequate hand soap, hand sanitizer, toilet paper, and paper towels
   j. Two 13-gallon trash cans with supply of trashbags
   k. Sanitary facilities including:
      (1) Adequate hand soap/hand sanitizer
      (2) Toilet paper
      (3) Paper towels
      (4) Disinfecting wipes
      (5) Continuous supply of disinfectant cleaning supplies meeting one of the following, for the duration of the project
         - Mixed disinfectant solution of 1/3 cup bleach to one gallon water *
         - Isopropyl alcohol 70% or greater *
         - Other disinfectants registered with the EPA

      *Container contents shall be clearly labeled if not commercially labeled
   l. Janitorial services at least weekly
   m. Provide electrical service as indicated in 644-2.09, #1 Field Office
   n. Internet Service:

      Furnish and install a high speed internet service, with all necessary ancillary equipment.

      The internet system shall have a send and receive capability supporting 1.0 Mbps download speed or higher and 0.5 Mbps upload speed at all times. The internet system shall have a minimum monthly data usage of 10 GB. Include a wireless router and an appropriately sized battery backup for the internet system. The system shall be for the exclusive use of the Engineer.

      Internet shall be supplied and operational no more than two weeks after the field office has been set up on site. Service plans shall be provided and remain in effect for the duration of the use of the field office.

   o. One multifunction Color Printer/Scanner/Copier meeting the following requirements:
      New or like-new condition
      Printing/copying at least 32 ppm
      Scan speed of 40 ppm at 400 DPI in color, at a minimum
      Print/Scan/Copy 8.5” x 11” and 11” x 17” in color, at a minimum
      Supports network scanning (FTP and SMB Support)
      Supports network printing (PCL and Postscript)

Network card included
Automatic Document Feeder

Furnish ink and toner and perform repairs and maintenance as necessary.

The Printer/Scanner/Copier remains property of the Contractor upon completion of the contract.

p. Make the field office accessible according to the requirements of *Americans with Disabilities Act Accessibility Guidelines* (ADAAG). Provide at least one designated handicap parking space.
q. One AED (Automated External Defibrillator), with carrying case and properly marked wall cabinet. Provide training on how to use the AED.
r. One combination Smoke and Carbon Monoxide Detector minimum. Provide combination Smoke and Carbon Monoxide Detectors in any location requested by the Engineer.
s. One 25 Person Trauma First Aid Kit. List of required contents available at http://dot.alaska.gov/nreg/files/25-Person-Trauma-Kit-Contents.pdf
t. Two mobile hotspots with month-to-month data plans. Include car charger and 5 gigabytes of data usage per month.
u. One satellite phone

3. Provide electrical power to the Department's portable concrete compressive strength lab if there are any bridge items in the bid schedule as identified in 644-2.09, #9.

4. Provide electrical power to the Department's portable nuclear storage trailer as identified in 644-2.09, #8.

5. Provide the following to the Department's portable asphalt lab if there are any asphaltic materials in the bid schedule and item 644.0002.____ Field Laboratory does not appear in the bid schedule.

   a. electrical service as identified in 644-2.09, #4 Asphalt Laboratory.
   b. internet service as specified for the Field Laboratory.

All long distance calls made by State personnel will be paid by the State. Installation and maintenance fees, local calls, connection fees and internet service provider fees, and all other fees shall be paid by the Contractor. Paper used by the copier/scanner/printer will be paid by the State.

644-2.02 FIELD LABORATORY. Furnish and maintain a field laboratory for the Engineer to use exclusively throughout the contract. Provide a completely functional installation 2 weeks before commencing construction work through one week after Project Completion.

1. Grade and compact a site for the lab acceptable to the Engineer. Locate and level the structure on this site. If subsequent ground movement causes an unlevel or unstable condition, re-level or re-locate the facility as directed.

2. Provide a weatherproof structure suitable to field test construction materials, with the following minimum functional requirements:

   a. Floor space of 300 ft^2
   b. Two 10-ft^2 windows that open and lock
   c. Lockable door(s)
   d. Work bench(es), 2-1/2 x 16 feet total, 3 feet high
   e. Shelf space, 1 x 16 feet
   f. One 18-inch deep sink with attached industrial faucet with hand sprayer attachment and approved drain
   g. A gravity-fed 250-gallon tank or pressurized constant water supply of acceptable quality

h. electrical service as indicated in 644-2.09, #2 Field Laboratory
i. Heating equipment suitable to maintain a uniform room temperature of 65° to 75°F
j. Storage cabinet, 3 ft x 3 ft x 3 ft, lockable, securely fixed to an inside wall with a hinged door opening outward
k. Office desk and 2 chairs
l. One combination Smoke and Carbon Monoxide Detector minimum. Provide Combination Smoke and Carbon Monoxide Detectors at any location requested by the Engineer.
m. One 25 person Trauma First Aid Kit.
n. Internet Service and Phone:

Furnish and install a high speed internet service and a telephone, with all necessary ancillary equipment.

The internet system shall have a send and receive capability supporting 1.0 Mbps download speed or higher and 0.5 Mbps upload speed at all times. The internet system shall have a minimum monthly data usage of 10 GB. Include a wireless router and an appropriately sized battery backup for the internet system. The system shall be separate from the internet system of the Contractor for exclusive use of the Department.

The telephone system shall consist of commercially available telephones with the necessary equipment for each line. Provide one telephone that includes a built in digital answering machine.

Internet and telephone service shall be supplied and operational no more than two weeks after the field laboratory has been set up on site. Service plans shall be provided and remain in effect for the duration of the use of the field laboratory.

3. If the lab is a mobile unit mounted on axles and wheels, block the structure under the frame so that the wheels do not touch the ground and the blocking rests firmly on the prepared site.

4. Provide a separate weatherproof shed within 20 feet of the main lab structure (Shaking Shed). Grade and compact a site for the Shaking Shed acceptable to the Engineer. Locate and level the structure on this site. If subsequent ground movement causes an unlevel or unstable condition, re-level or re-locate the facility as directed.

a. The Shaking Shed shall have the following minimum functional requirements:

(1) Floor 8 ft x 12 ft, ceiling height 8 ft
(2) Door 4 ft wide and window 5 ft^2 that opens, both lockable
(3) electrical service as identified in 644-2.09, #3 Field Laboratory Out Building
(4) Work table 3 ft x 1-1/2 ft x 3 ft high, capable of supporting 250 pounds and affixed to an inside wall as directed
(5) Concrete-slab floor, 8 ft x 8 ft x 4 inches thick, cast-in-place or pre-cast. Install anchor bolts in the floor to accommodate the mounting pattern of the Gilson sieving machine at a location as directed.

Found the slab directly on the prepared site such that it is continuously supported.

5. Provide a weatherproof pole shed adjacent to the Shaking Shack. Grade and compact a site for the Splitting shed acceptable to the Engineer. Locate and level the structure on this site. If subsequent ground movement causes an unlevel or unstable condition, re-level or re-locate the facility as directed.

a. The Splitting shed shall meet the following minimum requirements
(1) 12’ x 24’ Pole shed structure with 8’ minimum ceiling height.
(2) Pole spacing 4’ to 6’
(3) Water proof roof

(4) 2x4 construction, or manufactured structure approved by the Engineer.
(5) 6 each 4' T8 LED lighting fixtures with bulbs spaced evenly across the roof structure
(6) Manufactured, industrial strength, welded-metal shelving with total 52 square feet of shelving
(7) 2 walls
(8) Smooth rigid floor as approved by the Engineer

6. For all types of installations, if the entryway is located higher than a single 7-inch rise, provide the following:

   a. Stairway, 3 feet wide x 11-inch tread x 7-inch rise
   b. Landing, 4 ft x 4 ft centered on the entryway
   c. Handrail(s) firmly affixed to the stairway

7. Provide the following lab equipment and services:

   a. Propane necessary for the lab operation, including two 100-lb tanks, regulators, hoses, fittings, and incidentals for a functional system
   b. Specialized sampling equipment such as belt templates or belt sampling devices as required
   c. Fuel and power necessary to continuously operate the facilities

8. Provide the following to the Department's portable asphalt lab if there are any asphaltic materials in the bid schedule.

    a. electrical service as identified in 644-2.09, #4 Asphalt Laboratory.
    b. internet service as specified for the Field Laboratory.

644-2.03 CURING SHED. Furnish and maintain a suitable weather tight shed for curing concrete test cylinders, with a suitable tank(s) for curing concrete test cylinders.

Provide a tank(s) large enough to contain at least 6 each 4" x 8" test cylinders from each pour that you propose to make during any 28-day period. Use a tank(s) at least 18 inches high, insulated, and constructed of heavy duty plastic or non-corrosive metal. Construct a lid to provide access to the tank(s).

Provide suitable heating to maintain the temperature in the tank between 70° and 77°F at all times when curing the test cylinders. In addition, provide suitable thermometers in the shed and tank(s) to check the temperature.

Provide a supply of calcium hydroxide (high-calcium hydrated lime) sufficient to maintain a fully saturated water bath in the tank(s). Provide a source of potable water.

Provide one combination smoke alarm and carbon monoxide detector.

Provide electrical service as identified in 644-2.09, #5 Curing Shed

644-2.05 VEHICLES. Furnish and maintain vehicles in good condition that are less than three years old and with less than 36,000 miles on the odometer for the exclusive use of the Department throughout the project. Provide full-size four-wheel drive pickups or sport utility vehicles. The Special Provisions will state the required number and type of vehicles. Provide vehicles from two weeks before commencing work to one week after Project Completion. Maintain the vehicles in satisfactory running condition throughout the duration of the contract. Provide insurance, fuel, fluids, lubricants, tire repair/replacement, and windshield repair/replacements as needed. If a vehicle is down for more than 24 hours, provide a replacement Vehicle of the same type at no additional cost.

The State of Alaska is responsible for damage to any vehicle caused by its own negligent operation.

The Engineer will approve the vehicles prior to transporting them to the project site. In addition to use on the project, all of the vehicles will be allowed to make round trips to the Department's regional headquarters. Remove all vehicles from the project at the end of the Contract.

Number of Vehicles	Type
2	1/2 Ton Crew Cab Trucks

Equip each vehicle as follows:

1. Four wheel drive
2. Automatic transmission
3. Power steering
4. Air conditioning
5. Fire extinguisher & basic first aid kit
6. Jack and lug wrench
7. 10 ply load range E tires in good condition
8. Two full size load range E spare tires in good condition mounted on rims
9. 360-degree Permanent Beacon
10. 2 sets of keys
11. CB Radio with 48" Antenna for all projects more than 50 miles from Fairbanks.

12. 3 each AKDOT&PF magnetic stickers. Plans available at http://dot.alaska.gov/documents/DOT-SOA-Construction-Magnets-Specs.pdf

Materials Truck

Number of Vehicles

1

Meet the above requirements for a vehicle and the following:

1. Flatbed with 2' tall railing
2. Minimum 1000 lb Lift attached to the bed of the truck

644-2.06 NUCLEAR TESTING EQUIPMENT STORAGE SHED. Design, furnish and maintain a weatherproof, heated, and ventilated nuclear densometer/testing equipment storage shed for the Engineer to use exclusively throughout the contract. Install the building at least 15-feet from an occupied area at a location approved by the Engineer. Install the shed at least one week before the commencement of construction activities and maintain it until one week after Project Completion. Provide sufficient floor area for the nuclear testing equipment and a portable electric heater to maintain a minimum room temperature of 50°F. Design the building with enough floor area to provide sufficient clearance between the equipment, heater, and combustibles. Provide a commercial grade metal-clad exterior entrance door of 3'-0" min width by 6'-8" height with dead-bolt lockset. Hang the door so that hinge pins are not accessible from the exterior. Provide the Engineer with 2 keys to control access. Provide a 5/16" x 10 foot long welded steel security chain securely attached inside the structure with tamperproof hardware for the Engineer to secure the testing equipment. Provide electrical service as identified in 644-2.09, #7 Nuclear Testing Equipment Storage Shed. Secure the structure to the ground with tamperproof anchors to resist wind loads and prevent unauthorized movement of the building. The Nuclear Testing Equipment Storage Shed remains the property of the Contractor. Remove the shed from the site following project completion. The Nuclear Testing Equipment Storage Shed must be windowless.

644-2.07 STORAGE CONTAINER. Furnish, transport and maintain a weathertight, lockable, steel enclosed 20 foot long x 8 foot wide x 8 foot high wooden floored container for the storage of the Department's materials, supplies and testing equipment (but not nuclear equipment). Provide twenty equally spaced fastening points on the interior walls that are capable of securing the Department's contents. Door opening dimensions of the storage container shall be greater than 60 square feet. Supply necessary equipment to lift and move container with minimal disturbance to the Department's contents. The container shall not be moved by skidding or hook lift. The Contractor shall be listed as the shipper on all documents listing and acknowledging receipt of the Department's goods for shipment.

Deliver an empty and clean container to the Regional Materials Laboratory, or location acceptable to the Engineer, three weeks prior to transporting to the project site. Allow 7 days for the Department to load the container. Transport the loaded container to the project site. Set up container at a location approved by the Engineer at least one week before the commencement of construction activities and maintain it until one week after Project Completion.

1. Provide electrical service and other facilities as follows:

   a. Provide a stairway with railing, built to meet the International Building Code, if there is more than 12-inch difference in floor entry and existing ground elevation.
   b. Provide electrical service as identified in 644-2.09, #6 Storage Container.

Return the container to the Regional Materials Laboratory, or location acceptable to the Engineer, upon project completion. Allow 7 days for the Department to unload the container. The storage container

remains your property after you complete the work.

644-2.08 FIELD COMMUNICATIONS. Provide internet and phone communication systems as directed by the Engineer.

644-2.09 ELECTRICAL POWER. Furnish and maintain a constant source of power to the facilities specified in the contract for the Department's use during the project. Provide a completely functional installation 2 weeks before commencing construction work through 2 weeks after Project Completion.

1. FIELD OFFICE. Provide electrical services as follows:

    a. Heating/Cooling adequate to maintain temperatures between 65° to 75°F
    b. Electrical current: 120/240 VAC, 60 cycle on 24 hour basis
    c. Wiring system to support a 40 amp user load demand with two 20-amp circuits
    d. Eight conveniently spaced outlets on the interior wall, consistent with local codes
    e. Eight 8ft LED minimum 5000 lumen lamps or sixteen 4ft LED minimum 2000 lumen lamps, between 2800K and 5000K color temperature

2. FIELD LABORATORY. Provide electrical services as follows:

    a. Heating/Cooling adequate to maintain temperatures between 65° to 75°F
    b. Electrical current: 120/240 VAC, 60 cycle on 24 hour basis
    c. Wiring system to support a 40 amp user load demand with two 20-amp circuits, GFI Protected
    d. Six conveniently spaced outlets on the interior wall, consistent with local codes
    e. Eight 8ft LED minimum 5000 lumen lamps or sixteen 4ft LED minimum 2000 lumen lamps, between 2800K and 5000K color temperature
    f. Exhaust fan: minimum 300 CFM

3. SHAKING SHED. Provide electrical services as follows:

    a. Heating/Cooling adequate to maintain temperatures between 65° to 75°F
    b. Electrical current: 120/240 VAC, 60 cycle on 24 hour basis
    c. Wiring system to support a 20-amp user load demand, GFI Protected
    d. Three conveniently spaced outlets on the interior wall, consistent with local codes
    e. Two 8ft LED minimum 5000 lumen lamps or four 4ft LED minimum 2000 lumen lamps, between 2800K and 5000K color temperature
    f. Exhaust fan: minimum 300 CFM

4. ASPHALT LABORATORY. Provide electrical services as follows:

    a. Electrical current: 120/240 VAC, 60 cycle on 24 hour basis
    b. 100-amp service

5. CURING SHED. Provide electrical services as follows:

    a. Heating/Cooling adequate to maintain temperatures between 70° to 77°F
    b. Two 100-watt incandescent or four 4ft LED minimum 2000 lumen lamps, between 2800K and 5000K color temperature

6. STORAGE CONTAINER. Provide electrical services as follows:

    a. Electrical current: 120/240 VAC, 60 cycle on 24 hour basis
    b. Wiring system to support a 20-amp user load demand, GFI Protected
    c. Two conveniently spaced outlets on the interior wall, consistent with local codes

d. Four 100-watt incandescent or eight 4ft LED minimum 2000 lumen lamps, between 2800K and 5000K color temperature

7. NUCLEAR TESTING EQUIPMENT STORAGE SHED. Provide electrical services as follows:

   a. Heating/Cooling adequate to maintain minimum temperatures of 50°F
   b. Electrical current: 120/240 VAC, 60 cycle on 24 hour basis
   c. Two 100-watt incandescent or four 4ft LED minimum 2000 lumen lamps, between 2800K and 5000K color temperature
   d. Wiring system to support a 20-amp user load demand

8. NUCLEAR TESTING EQUIPMENT STORAGE SHED (STATE PROVIDED). Provide electrical services as follows:

   a. Electrical current, 120/240 VAC, 60-cycle on 24-hour basis
   b. Wiring system to support a 20-amp user load demand

9. PORTABLE CONCRETE COMPRESSIVE LABORATORY. Provide electrical services as follows:

   a. Electrical current: 120/240 VAC, 60 cycle on 24 hour basis
   b. Wiring system to support a 20-amp user load demand

If 644.0015____, Nuclear Testing Equipment Storage Shed is deleted the electrical power requirement are still required per 644-2.09, #8.

If the contract contains bridge items that require concrete or grout provide electrical power to the Department's Portable Concrete Compressive Laboratory per 644-2.09, #9.

644-3.01 METHOD OF MEASUREMENT. Section 109 and as follows:

Storage Container. By the number of storage containers specified, to include all components, installed and accepted as completed units and ready for materials and equipment storage.

644-4.01 BASIS OF PAYMENT.

Vehicles. Includes all resources, including fuel, oil, maintenance, and insurance to furnish the specified number of fully operational vehicles for the duration specified in the contract.

Lump Sum Items. Payment for lump sum items will be made as follows:

1. A percentage of the lump sum amount, to be determined by the Engineer, will be paid as full compensation for furnishing the facility at the site.

2. The balance of the lump sum amount will be prorated over the anticipated active construction period with a portion included as part of each interim payment, for maintenance, repairs, providing all utilities, and for removing it from the site. If anticipated construction period changes, the final increment will be held until final payment.

Storage Container. At the contract unit price to include all labor, materials, tools, equipment and supplies required to deliver the storage shed to the regional office for loading, to deliver it to the project office, to install it before commencement of construction, to maintain it for the duration of the project, to remove the shed and electrical service after project completion, to deliver it to the regional office for unloading, and to remove the storage shed. Electrical service and utility costs are subsidiary to this item.

Field Communications. Installation and maintenance of equipment and monthly invoice costs will be paid for by Contingent sum under Item 644.2002.0000, Field Communications. Provide invoices from vendor for installation, maintenance, and monthly subscription costs. When this bid item appears in the Bid Schedule, internet and phone service are not subsidiary to 644.0001.____ Field Office.

Payment will be made under:

PAY ITEM		
Item Number	**Item Description**	**Unit**
644.0001.____	Field Office	LS
644.0002.____	Field Laboratory	LS
644.0003.____	Curing Shed	LS
644.0006.____	Vehicle	LS
644.0015.____	Nuclear Testing Equipment Storage Shed	EACH
644.0016.____	Storage Container	EACH
644.2002.0000	Field Communications	CS
644.2010.0000	Nuclear Testing Equipment Storage Shed	LS

Delete Section 646 in its entirety and substitute the following:
02/01/20 (N42)

SECTION 646
CPM SCHEDULING

646-1.01 DESCRIPTION. Provide and maintain a Critical Path Method (CPM) progress schedule for the project. Use the schedule in coordinating and monitoring of all work under the Contract including activity of subcontractors, manufacturers, suppliers, and utility companies, and submittal review by the Department. Update the CPM as described in this specification.

Provide to the Engineer a legal copy of the software program to be utilized for the CPM Schedule item on the project. The software program shall have the full capacity to analyze and modify the CPM Schedule.

646-2.01 SUBMITTALS.

1. Submit a detailed initial CPM schedule at least 5 working days prior to the preconstruction conference, for the Engineer's approval. The construction schedule, for the entire project, may not exceed the specified contract time.

   Following the Engineer's review, if revisions to the proposed CPM schedule are required, do so promptly. The CPM schedule must be finalized within 15 days of the Notice to Proceed.

   No contract work may be pursued at the project site without an approved CPM schedule.

2. Weekly Work Plans. Submit a Weekly Work Plan in conjunction with Weekly Progress Meeting agenda. Detail your proposed operations for the upcoming week. This work plan shall reflect a true and accurate assessment by the Contractor concerning the actual progress on the project. Include:

   a. Tasks / work activities
   b. Work hours
   c. Subcontractors
   d. Location of the work to be performed

The approval by the Department of the initial CPM Schedule, subsequent CPM updated schedules, and the weekly Work Plans shall not relieve the Contractor as the responsible party for development and execution of the means, method, and timing of performance reflected in the schedule, nor completing the project within the specified contract time.

646-3.01 REQUIREMENTS AND USE OF SCHEDULE.

1. Schedule Requirements. Prepare the CPM schedule as a Precedence Diagram Network developed in the activity-on-node format which includes:

   a. Activity description
   b. Activity duration
   c. Critical Sequence of activities and Critical Path.

   Show on the activity-on-node diagram the sequence and interdependence of all activities required for complete performance of all items of work under this Contract, including shop drawing submittals and reviews and fabrication and delivery activities. The maximum review period allowed by the contract shall be shown where review functions by the Department are noted on the schedule

   The contract completion time will be adjusted only for causes specified in this Contract.

2. Weekly Progress Meetings. Hold Weekly job site progress meetings with the Engineer for the purpose of reviewing and updating the CPM schedule. Review progress and verify finish dates of completed activities, remaining duration of uncompleted activities, and any proposed time estimate revisions. At a minimum, the Contractor's Project Manager, Project Superintendent, Traffic Control Supervisor shall attend the weekly job site meetings.

   Provide an updated CPM schedule when the critical path on the CPM schedule has changed by 7 or more days.

646-4.01 METHOD OF MEASUREMENT. Section 109.

646-5.01 BASIS OF PAYMENT. If the requirements of Item 646 CPM Scheduling are not in full compliance, five percent (5%) of the total progress payment value earned during the progress period will be withheld until the requirements of Item 646 CPM Scheduling are in full compliance.

Payment will be made under:

PAY ITEM		
Item Number	**Item Description**	**Unit**
646.0001.____	CPM Scheduling	LS

SECTION 703
AGGREGATES

12/08/15 (N63)
703-2.09 SUBBASE. *Add the following:*

Subbase, Grading F. 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. Table 703-8 and

the first paragraph of Subsection 703-2.09 do not apply to Grading F. Meet the following gradation as tested by ATM 304:

Sieve	Percent Passing by Weight
2 in	100%
No. 4	15-65%
No. 200	0-6%

SECTION 707
METAL PIPE

04/30/17 (N48)

707-2.01 CORRUGATED STEEL PIPE, PIPE ARCHES, AND UNDERDRAINS. *Add the following:* All seams on pipes manufactured with helical corrugations shall have a continuous weld extending from end to end of each length of pipe in conformance with AASHTO M 36. Seams shall be welded in such a manner that they develop 90% of the average ultimate strength of the base metal. A test shall be performed by an independent lab in accordance with AASHTO T 241 Section 4 during the year in which the pipe is fabricated. The Supplier shall maintain quality control test results and provide them upon request. A copy of the test results containing the information specified in Section 4.6 of AASHTO T 241 shall be furnished to the Engineer.

A Supplier of welded helically corrugated pipe which qualifies for inclusion in the current publication of the Department's QUALIFIED PRODUCTS LIST is not required to perform the test.

01/20/15 (N49)

707-2.03 CORRUGATED ALUMINUM ALLOY CULVERT PIPE AND UNDERDRAINS. *Delete the first sentence and substitute the following:* This pipe shall conform to the requirements of AASHTO M 196 except that helical corrugations shall not be allowed.

SECTION 722
BRIDGE RAILING

722-2.01 BRIDGE RAILING. *Replace "Steel tube rail elements", "Steel Thrie Beam elements", "Posts", "Anchor bolts", "Shims, plates, angles and sleeves", and "Plate Washers and Tapered Plate Washers" with the following:*

Steel tube rail elements	AASHTO A500, Grade B or C
Steel thrie beam elements	AASHTO M 180, Class B, Type II
Posts	ASTM A709, Grade 50
Anchor bolts and rods	ASTM F3125, Grade A325 or ASTM A449, Type 1
Shims, plates, plate washers, angles, sleeves, and scuppers	ASTM A709, Grade 50
Beveled washers and tapered plate washers	ASTM F436

Delete Section 724 in its entirety and substitute the following:

SECTION 724
SEED

724-2.01 DESCRIPTION. This specification provides the requirements for grass seed, used to provide a living vegetative cover.

724-2.02 MATERIALS. Grasses of the type specified shall meet the applicable requirements as outlined by the State of Alaska Department of Natural Resources, Division of Agriculture, "Seed Regulations," latest edition. Seed shall meet or exceed the percentages of purity and germination as specified in Table 724-1. Grass seed shall be furnished in standard containers on which shall be shown the following information:

(1) the common accepted name of the specie (kind) and cultivar (variety) of the seed;
(2) the country or state where the seed was grown;
(3) the total percentage by weight of pure seed;
(4) the total percentage by weight of all weed seed;
(5) the total percentage by weight of inert matter;
(6) the total percentage by weight of other crop seed;
(7) the name and approximate number per pound of each kind of restricted noxious weed seed;
(8) the percentage of germination of the seed, together with the month and year the seed was tested;
(9) the percentage of hard seed, if any is present;
(10) the name and address of the person labeling the seed or selling, offering, or exposing the seed for sale within the state; and
(11) the lot number or other lot identification.

If furnished as a premixed seed, the containers shall state that the seed is a mixture; the name of the species and cultivars of seed; and total percentage by weight of each species of seed present in order of predominance; and the information listed above: (4), (5), (7), (8), (10) and (11).

Seed which contains any prohibited noxious weeds as listed in the Alaska Department of Natural Resources Division of Agriculture's Prohibited and Restricted Noxious Weeds list shall be rejected. The Prohibited and Restricted Noxious Weeds list is located at the following URL:
http://plants.alaska.gov/invasives/noxious-weeds.htm.

Seed containing more than the maximum allowable tolerance of restricted noxious weeds shall be rejected. Restricted noxious weeds, with their maximum allowable tolerances are listed in the Alaska Department of Natural Resources Division of Agriculture's Prohibited and Restricted Noxious Weeds list. The Prohibited and Restricted Noxious Weeds list is located at the following URL:
http://plants.alaska.gov/invasives/noxious-weeds.htm.

The Contractor shall furnish to the Engineer duplicate copies of a statement signed by the vendor certifying that each lot of seed has been tested by a recognized seed testing laboratory. Seed that has not been tested within nine (9) months shall be rejected. The Contractor shall not remove tags from the seed containers. Seed containers that do not have tags shall be rejected. Discrepancies in the lot numbers listed on the statement to the lot numbers indicated on the tags of the seed containers shall be grounds for rejection. Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be accepted. The Contractor shall immediately remove rejected seed from the project premises.

TABLE 724-1
SEEDING REQUIREMENTS

SPECIES (KIND)	CULTIVAR (VARIETY)	PERCENT PURITY	PERCENT GERMINATION	PURE LIVE SEED (PERCENT PURITY X PERCENT GERMINATION)
American Sloughgrass	Egan	90	80	72
Annual Ryegrass	---	85	80	68
Alpine Bluegrass	Gruening	90	90	81
Beach Wildrye	Benson, Reeve	95	40	38
Bering Hairgrass	Norcoast	95	75	71
Bluejoint	Sourdough	95	75	71
Brome	Manchar, Polar	90	80	72
Glaucous Bluegrass	Tundra	95	80	76
Kentucky Bluegrass	Merion, Nugget, Park	95	80	76
Perennial Ryegrass	---	85	80	68
Polargrass	Alyeska, Kenai	95	75	71
Red Fescue	Arctared, Boreal, Pennlawn	98	80	78
Timothy	Climax, Engmo	95	90	85
Tufted Hairgrass	Nortran	95	75	71
Wheatgrass	Wainwright	95	85	81

SECTION 725
FERTILIZER

01/20/15 (N52)
725-2.02 MATERIALS. *Add the following:* Fertilizer which has become wet, moldy or otherwise damaged in transit or storage will not be accepted. The Contractor shall immediately remove rejected fertilizer from the project premises.

SECTION 727
SOIL STABILIZATION MATERIAL

8/02/2018 (N54)
727-2.01 MULCH. *Delete this subsection in its entirety and substitute the following:* All mulch, excluding trace mulch, shall provide 100% ground coverage. Apply mulch at the manufacturer's recommended application rate and increase as needed to achieve 100% ground coverage. All mulch, including trace mulch, shall meet one of the following:

1. Wood Cellulose Fiber or Natural Wood Fiber. Fiber shall be produced from natural or recycled (pulp) fiber, such as wood chips or similar wood materials, or from newsprint, corrugated cardboard, or a combination of these processed materials. Fiber shall not contain any rock, metal, or plastic. Fiber shall be treated with a green dye nontoxic to plant and animal life to facilitate inspection of the placement of the material. Fiber shall be manufactured in such a manner that after addition and

agitation in slurry tanks with water, the fibers in the material will become uniformly suspended to form a homogenous slurry. When hydraulically sprayed on the ground, the material shall allow the absorption and percolation of moisture. The organic matter content shall be at least 90 percent on an oven-dry basis. The moisture content shall be no more than 15 percent as determined by oven dried weight. Each package of the cellulose fiber shall be marked by the manufacturer to show the dried weight. Product must be nontoxic to plant and animal life.

Wood Cellulose Fiber or Natural Wood Fiber may be used to stabilize slopes flatter than 4H:1V. On slopes 4H:1V or steeper Wood Cellulose Fiber or Natural Wood Fiber may be used if an approved tackifier is used, in addition to Wood Cellulose Fiber or Natural Wood Fiber, according to the Manufacturer's recommendations. Wood Cellulose Fiber or Natural Wood Fiber may not be used after August 1.

2. Wood Strand. Wood Strand shall be a blend of loose, long, thin wood pieces derived from native conifer or deciduous trees with high length to width ratio. A minimum of 95-percent of the wood strands shall have lengths between 2 and 10 inches, with a width and thickness between 1/16 and 3/8 inches. Wood Strand shall not contain resin, tannin, or other compounds in quantities that are detrimental to plant life. Sawdust or wood shavings shall not be used as Wood Strand. Wood Strand may be used on slopes flatter than 4H:1V. Wood Strand may not be used after August 1.

3. Straw. All straw material shall be in an air dried condition, free of noxious weeds, seeds, and other materials detrimental to plant life. Hay is not acceptable. Straw shall be suitable for spreading with mulch blower equipment. Straw may be used on slopes flatter than 4H:1V. Straw may not be used after August 1.

4. Bonded Fiber Matrix (BFM). The BFM shall be a hydraulically-applied blanket/mulch/covering composed of long strand, thermally processed wood fibers and crosslinked, hydro-colloid tackifier. The BFM may require a 24-48 hour curing period to achieve maximum performance. Once cured, the BFM shall form an intimate bond with the soil surface to create a continuous, absorbent, flexible erosion resistant blanket that allows for rapid germination and accelerated plant growth. BFM may be used to stabilize slopes between 2H:1V and 4H:1V. BFM may be used after August 1.

5. Fiber Reinforced Matrix (FRM). The FRM shall be a hydraulically-applied, flexible erosion control blanket/mulch/covering composed of long strand, thermally processed wood fibers, crimped, interlocking fibers and performance enhancing additives. The FRM shall require no curing period and upon application shall form an intimate bond with the soil surface to create a continuous, porous, absorbent and erosion resistant blanket that allows for rapid germination and accelerated plant growth. FRM may be used to stabilize slopes 2H:1V and steeper. FRM may be used after August 1.

A list of pre-approved products can be found in Table 1.

Table 1. Pre-Approved Mulch Products List

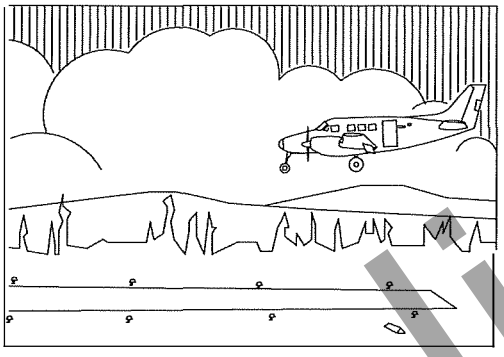
Product Name	Product Type	Manufacturer
Astro-Mulch	Wood Cellulose Fiber	Thermo-Kool Inc. Wasilla, AK
Fibermulch	Wood Cellulose Fiber	Thermo-Guard Insulation, Spokane, WA
NaturesOwn High Density Paper Hydroseeding Mulch	Wood Cellulose Fiber	Hamilton Manufacturing, Inc., Twin Falls, ID
Hydro-Spray	Wood Cellulose Fiber	National Fiber, Belchertown, MA
EcoFibre	Natural Wood Fiber	Profile Products LLC, Buffalo Grove, IL

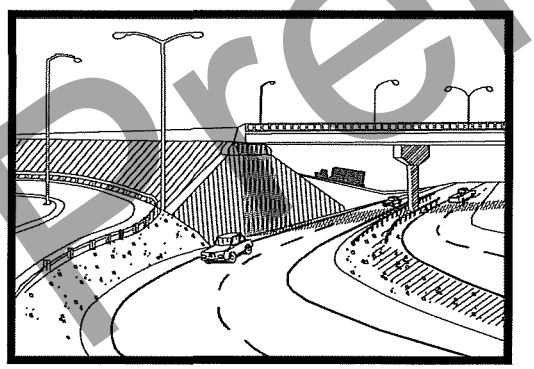
Product Name	Product Type	Manufacturer
EcoFibre plus Tack	Natural Wood Fiber	Profile Products LLC, Buffalo Grove, IL
Terra Novo Wood Fiber Plus Tackifier	Natural Wood Fiber	Terra-Novo Inc. Bakersfield, CA
Conwed Fiber 1000	Natural Wood Fiber	Profile Products LLC, Buffalo Grove, IL
Rainier Fiber plus Tack	Natural Wood Fiber	Fiber Marketing International, Spokane, WA
Terra Wood with Tack	Natural Wood Fiber	Profile Products LLC, Buffalo Grove, IL
Excel Fibermulch II	Natural Wood Fiber	American Excelsior Co., Rice Lake, WI
Mat-Fiber Plus	Natural Wood Fiber	Mat, Inc., Floodwood, MN
Mat-Fiber	Natural Wood Fiber	Mat, Inc., Floodwood, MN
EcoAegis	Bonded Fiber Matrix (BFM)	Profile Products LLC, Buffalo Grove, IL
ProMatrix Engineered Fiber Matrix	Bonded Fiber Matrix (BFM)	Profile Products LLC, Buffalo Grove, IL
Verdyol Virgin BFM	Bonded Fiber Matrix (BFM)	Erosion Control Blankets, Manitoba, Canada
Rainier Fiber Bonded Fiber Matrix	Bonded Fiber Matrix (BFM)	Fiber Marketing International, Spokane, WA
Profile Hydro-Blanket BFM	Bonded Fiber Matrix (BFM)	Profile Products LLC, Buffalo Grove, IL
Soil Guard	Bonded Fiber Matrix (BFM)	Mat, Inc., Floodwood, MN
Flexterra FGM	Fiber Reinforced Matrix (FRM)	Profile Products LLC, Buffalo Grove, IL
Flex Guard	Fiber Reinforced Matrix (FRM)	Mat, Inc., Floodwood, MN
Hydra CX	Fiber Reinforced Matrix (FRM)	Tensar North American Green Poseyville, IN

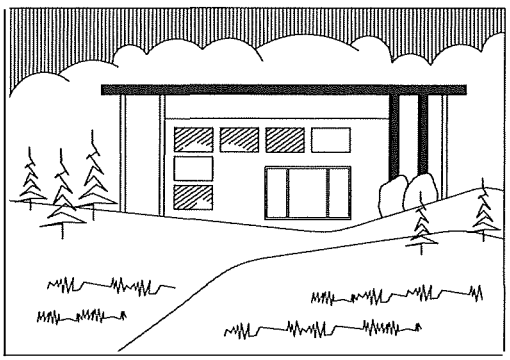
MATERIAL SITE REPORT

DENALI HIGHWAY MP 25 ROCK CREEK BRIDGE

Project No. NFHWY00128
Federal No. 0750015

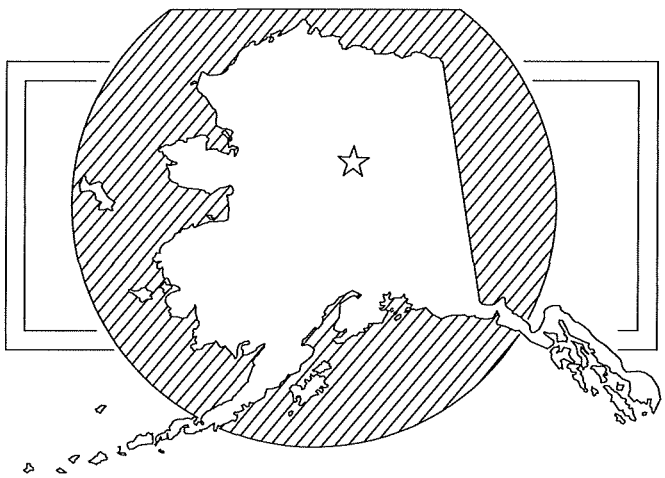






STATE OF ALASKA

Department of Transportation and Public Facilities



NORTHERN REGION

JULY 2020

MATERIAL SITE REPORT
DENALI HIGHWAY MP 25 ROCK CREEK BRIDGE
PROJECT NO. NFHWY00128
FEDERAL NO. 0750015
JULY 2020

PREPARED BY:

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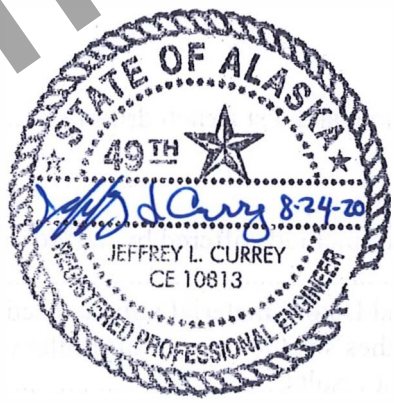
Regional Geologist

APPROVED BY:



JEFF CURREY, P.E.
Materials Engineer

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Material Site Investigation for Denali Highway MP 25 Rock Creek

Bridge Replacement

MS 52-1-004-5

Summary

At the request of Guangyan Griffin, P.E., Engineering Manager, Northern Region Materials Section (NRMS) personnel conducted drill exploration to evaluate the potential material resource at Material Site (MS) 52-1-004-5 to use on the Denali Highway Mile Post (MP) 25 Rock Creek Bridge replacement. MS 52-1-004-5 is located on the west side of MP 6 of the Denali Highway (Figure 1)

The drilling footprint covers an estimated area of approximately 16 acres with an average of 29-foot-thick resource layer based on drilling exploration. Site geometry and resource thickness suggest deposit geometry is permissive to host an estimate 350,000 yd^3 of material within the preferred mining area outlined in Figure 1.

NRMS personnel collected 19 samples for gradation. Of these 19 samples:

- 8 met Standard Highway Material Specifications for Select Materials Type A.
- 4 met Standard Highway Material Specifications for Select Materials Type B.
- 7 met Standard Highway Material Specifications for Select Materials Type C.

NRMS personnel collected 9 samples for L.A. Abrasion and 7 samples for Degradation Value determination. All L.A. Abrasion results met Standard Highway Material Specification for Subbase, Base Course, and Surface Course. Of the 7 Degradation Value results 4 samples met Standard Highway Quality Standards for Subbase, Base Course, and Surface Course.

Introduction

Rock Creek Bridge located at Mile Post (MP) 25 of the Denali Highway needs replaced. A temporary detour will be constructed during replacement of Rock Creek Bridge. In support of this project NRMS personnel conducted a geotechnical field exploration of M.S. 52-1-004-5 to evaluate the material resource within the undeveloped material site.

Field Investigation

Field investigation took place on August 19th through August 21st by NRMS Engineering Geologist II K. Maxwell, College Intern K. Harnar, and Drill Sub-journeys T. Hartford and M. Sousa. Drilling was conducted utilizing a track-mounted CME-850 with 6-inch solid stem augers. Trenches were excavated by Northern Region Division (NRD) Tazlina District Equipment Operator G. Alcott with a Volvo EC 150B LC excavator.

A total of four test trenches and six test holes were completed within the approximate material site boundary; one additional test hole was drilled outside the material site boundary (Figure 1). Locations of the test holes and test trenches were recorded using a handheld Garmin GPS 61st, using the North American Datum (NAD) 83 with an accuracy of ± 50 feet. Samples were collected from auger cuttings and grab samples.

Soil samples and test hole conditions were logged in the field using the Unified Soil Classification System (USCS). Selected samples were submitted to the Northern Regions Materials Laboratory (NRML) for testing. The testing program includes particle size gradations for classifications, quality testing, moisture content, organic content ignition, and proctor testing.

Laboratory Testing

Selected samples were submitted to the Northern Regions Materials Laboratory for testing. The testing program includes index and quality tests (Table 1).

Table 1. List of tests and standard methods offered by the Northern Region Materials Laboratory.

Test Method	AASHTO	ASTM
Index Tests		
Gradation	T27	C136
Minus #200 Gradation	T11	C117
Hydrometer	T88	D422
Liquid Limit	T89	D4318
Plastic Limit	T90	D4318
Moisture Content-Aggregate Soil	T255 T265	C455 D2216
Organic Content (Burn)	T267	
Proctor	T180	D1557
USCS Classification	D2487	
Fine Specific Gravity	T100	D854
Coarse Specific Gravity	T85	D127
Quality Tests		
Degradation	T13	
Los Angeles Abrasion	T96	C131
Sodium Soundness	T104	C88
Nordic Abrasion	ATM 312	

M.S. 52-1-004-5

Location

This site lies on the west side of the Denali Highway at MP 6. It is located in Section 22, T21S, R11E, Fairbanks Meridian at 63.08677N 145.61206W.

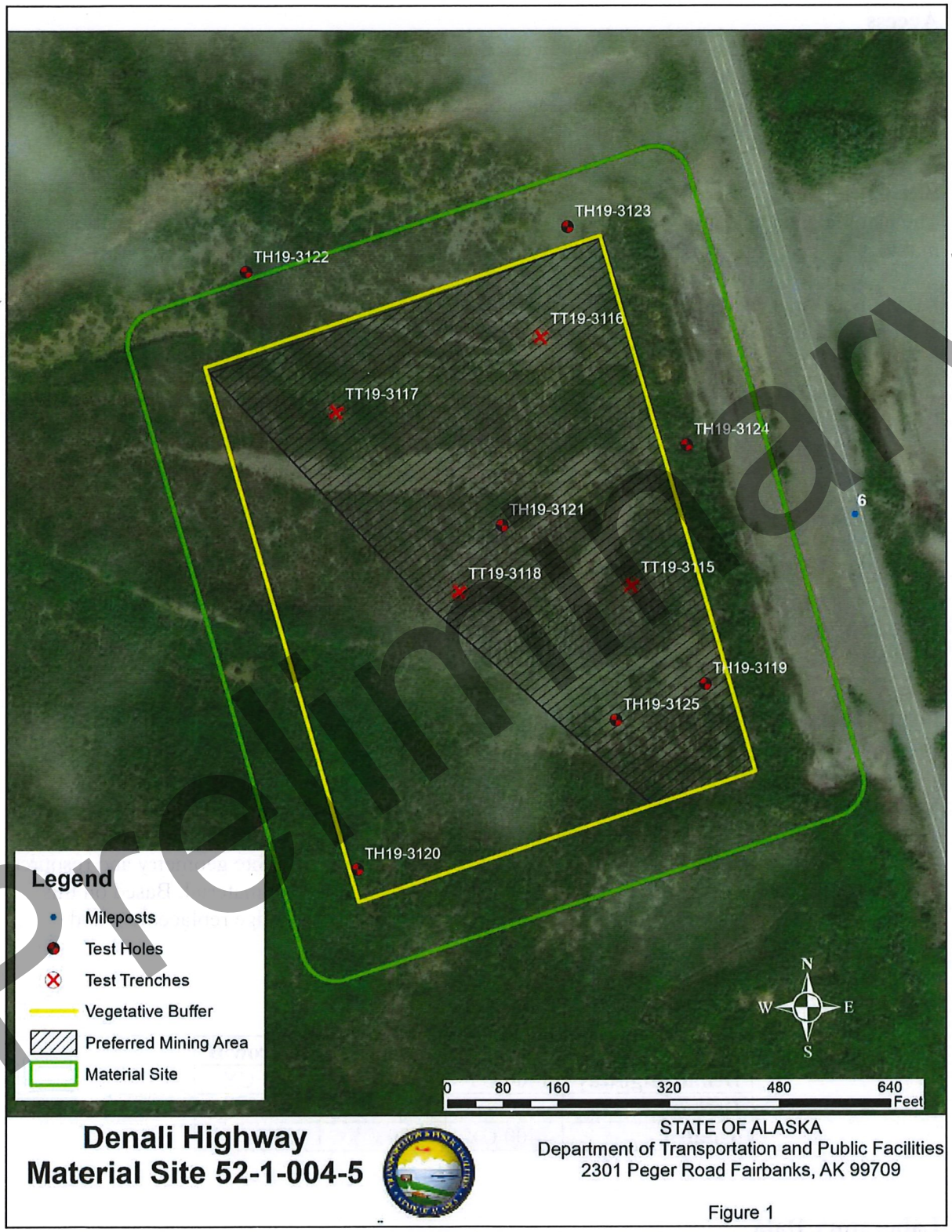


Figure 1. M.S. 52-1-004-5 test hole and test trench excavation

Access
M.S. 52-1-004-5 has no access road. Between the material site and Denali Highway is a 3- to 5-foot deep ditch and 100 foot vegetative buffer. The material site has not been mined. This site is closed with an application to mine the area submitted to the State of Alaska Department of Natural Resource (DNR) in September 2019.

Site Condition
The material available at this site consist of glaciofluvial deposits beneath the silt and organic mat.

NRMS personnel drilled 7 solid stem auger holes and excavated 4 test trenches. These test holes and test trenches intercepted the following generalized soil profile:

- 0 to 0.5 feet of organic mat;
- 0.5 to 2.0 feet of silt;
- 2 feet-Bottom of hole (10 to 31 feet) of well- and poorly-graded gravel, silty gravel, or silty sand.

Stripping and Overburden
The site is undeveloped with an overburden layer consisting of a 3- to 4-inch vegetative mat overlying a 0- to 1-foot thick organic silt layer.

Frozen Soil
No frozen soil was encountered.

Groundwater
No groundwater was encountered.

Volume and project needs
The explored drilling footprint covers an estimated area of approximately 16 acres with an average of 22-foot-thick resource layer based on drilling exploration. Site geometry and resource thickness suggest deposit geometry to host an estimate 350,000 yd^3 of material. Based on this approximate volume there is an excess in potential material for the bridge replacement and detour material volume needs (Table 2).

Table 2. Bridge Replacement and Detour material volume needs

	E1	Borrow A	Borrow B
Denali Highway	1400 CY	4500 CY	3100 CY
Detour	-	1500 CY	2400 CY
Total	1400 CY	6000 CY	5500 CY

Laboratory Data
Generally speaking, laboratory classification of soils matched visual classification made in the field. NRMS personnel collected 19 samples for gradation. Of these 19 samples:

- 8 met Standard Highway Material Specifications for Select Materials Type A.
- 4 met Standard Highway Material Specifications for Select Materials Type B.
- 7 met Standard Highway Material Specifications for Select Materials Type C.

NRMS personnel collected 9 samples for L.A. Abrasion and 7 samples for Degradation Value determination. All L.A. Abrasion results met Standard Highway Material Specification for Subbase, Base Course, and Surface Course. Of the 7 Degradation Value results 4 samples met Standard Highway Quality Standards for Subbase, Base Course, and Surface Course.

Table 3. Laboratory data (parenthesis is the number of results with each classifications).

Sample	% Gravel (+#4)	% Sand (-#4, +#200)	% Fines (-#200)	USCS Classification	LA Abrasion	Degradation	Liquid Limit/Plastic Limit	Select Type
19-3750	65.0	32.4	2.6	GW	-	-	NV/NP	A
19-3751	66.0	32.2	1.8	GP	19	32	NV/NP	A
19-3752	71.0	25.1	3.9	GW	15	39	NV/NP	A
19-3753	96.0	3.4	0.6	GW	15	39	NV/NP	B
19-3754	79.0	19.2	1.8	GW	16	27	NV/NP	A
19-3756	74.0	23.8	2.2	GW	19	48	NV/NP	A
19-3757	80.0	18.4	1.6	GW	-	-	NV/NP	A
19-3758	80.0	10.0	10.0	GP-GM	11	61	NV/NP	B
19-3759	70.0	14.7	15.3	GM	-	-	NV/NP	C
19-3760	47.0	32.5	20.5	GM	12	-	NV/NP	C
19-3761	68.0	13.7	18.3	GM	-	-	NV/NP	C
19-3762	81.0	9.0	10.0	GP-GM	-	-	NV/NP	B
19-3763	53.0	28.4	18.6	GM	-	-	NV/NP	C
19-3764	50.0	35.2	14.8	SM	-	-	NV/NP	C
19-3766	57.0	30.1	12.9	SM	-	-	NV/NP	C
19-3767	90.0	5.2	4.8	GW	-	-	26/4	B
19-3768	82.0	9.1	8.9	GP-GM	12	-	NV/NP	A
19-3769	16.0	59.6	24.4	SM	-	-	NV/NP	C
19-3770	87.0	8.1	4.9	GW	11	59	NV/NP	A
Ranges	**50-87**	**5.2-59.6**	**0.6-24.4**	**GW (8), SM (3), GP-GM (3), GP (1), GM (4)**	**11-19**	**27-61**	**26/4-NV/NP**	**A (8), B (4), C (7)**

NRMS collected 7 cobble counts by weight from the 4 test trenches (TT19-3115 to TT19-3118) ultizing the excavator bucket for the samples. The cobble count results ranged from 16 to 59 percent by weight. Table 4 summarizes the cobble count results.

Table 4. Cobble Count by weight results.

Test Trench Number	Depth Interval (ft)	Cobble Count by Weight (percentage)
TT19-3115	4-6	59
TT19-3115	10-12	34
TT19-3116	5-7	49
TT19-3116	11-13	16
TT19-3117	7-10	36
TT19-3118	4-6	49
TT19-3118	9-11	42
Ranges	**4-13**	**16-59**

Preferred Mining Area

The preferred mining area is the North to Southeast region of the material site inside the vegative buffer; this area can produce Select Type A, B, and C (Figure 1). Select Type A will be the most common material produced. Material within the vegative buffer can be crush to produce E-1 as well. The estimated depth intervals of Select Type A, B, and C are summarized in Table 5.

Table 5. Estimated expected depth interval for Select Type A, B, and C.

Material Type	Depth Interval (ft)	Estimated Volumes (yd^3)
Select Type A	4-11	180,000
Select Type B	10-15	10,000
Select Type C	13-22	160,000
Total	**4-22**	**350,000**

Comments and Recommendations

- Use material site to produce Select Type A, B, and C.
- Crush material at site to met Highway Material Specifications for E-1.
- Cobble counts determined in the test trenches range from 16 to 59 percent.
- Stream channels transverse the material site, consisting of higher silt contents.

References

Alaska Department of Transportation and Public Facilities. 2003, Alaska Field Rock Classification and Structural Mapping Guide: State of Alaska, ADOT&PF Geotechnical Procedures Manual, 31 p.

Appendix A: Test Hole Logs

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TH19-3119
Project Number	NFHWY00128	Total Depth	23.5 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/20/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	CME 850
Station, Offset		Weather	~37F, cloudy, no wind
Latitude, Longitude	N63.08514°, W145.61029°	TH Finalized By	K. Harnar
Elevation	3337.0	Vegetation	Tundra with crowberries

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Sample Data: Method | Number | Blow Count | Sample Interval | Uncorrected N-Value | Casing Blows / ft | Frozen | Graphic Log

Depth (ft)	SUBSURFACE MATERIAL
0	ORG MAT
1	Bn SILT *hi Org*
2	Tn-Or SILT moist
3	Gy-Bn SILT
4	Gy-Bn SILT w/ Gravel
5	Gy-Bn Silty GRAVEL w/ Cobbles moist, Gravel 1.5" to 3"
6	Gy-Bn Poorly-graded GRAVEL w/ Silt moist, Gravel 2" minus
8	SAMPLE 19-3758 (10.0-15.0): GP-GM, 10% -200, LA 11, DEG 61, NV, NP
17	Gy Silty GRAVEL moist to wet, Gravel 1" minus
19	SAMPLE 19-3759 (19.0-22.0): GM, 15.3% -200, LA 12, NV, NP, Max. Density 150.8 pcf, Opt. Moisture 4.9%
23	BOH

Drilling Method: S-S Auger

Method: AUGER (19-3758); AUGER (19-3759)

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TH19-3120
Project Number	NFHWY00128	Total Depth	31 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/20/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	CME 850
		Station, Offset	
		Weather	~39F, cloudy, no wind
		Latitude, Longitude	N63.08442°, W145.61334°
TH Finalized By	K. Harnar	Vegetation	Tundra with crowberries
		Elevation	3343.0

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Drilling Method	Depth in (Feet)	Casing Blows / ft	Sample Data: Method	Sample Data: Number	Sample Data: Blow Count	Sample Data: Sample Interval	Sample Data: Uncorrected N-Value	Frozen	Graphic Log	SUBSURFACE MATERIAL
S-S Auger	0									ORG MAT
	1–5		AUGER	19-3760						Gy-Bn Silty GRAVEL w/ Sand dry to moist, Gravel 1" minus SAMPLE 19-3760 (1.0-5.0): GM, 20.5% -200, NM 8.9%, ORG 1.5%, NV, NP
	5–13		AUGER	19-3761						Gy Silty GRAVEL moist, Gravel 2" minus SAMPLE 19-3761 (5.0-12.0): GM, 18.3% -200, NV, NP
	13–18		AUGER	19-3762						Gy Poorly-graded GRAVEL w/ Silt & Sand moist, Gravel 2" minus SAMPLE 19-3762 (14.0-18.0): GP-GM, 10% -200, NV, NP
	19–31		AUGER	19-3763						Gy Silty GRAVEL w/ Sand moist to wet, Gravel 2" minus, silt interbedded with sand and gravel layers SAMPLE 19-3763 (25.0-31.0): GM, 18.6% -200, NV, NP
	31									BOH

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

NR AKDOT TEST HOLE LOG - USCS ROCK CREEK BRIDGE MATERIAL SITE INVESTIGATION.GPJ NR_AKDOT_PRECON_USCS_06_28_07.GDT 5/20/20

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TH19-3121
Project Number	NFHWY00128	Total Depth	31.5 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/20/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	CME 850
Station, Offset			
Weather	~42F, cloudy, no wind	Latitude, Longitude	N63.08577°, W145.61206°
TH Finalized By	K. Harnar	Vegetation	Tundra with crowberries
Elevation	3336.0		

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Drilling Method	Depth in (Feet)	Casing Blows / ft	Sample Data: Method	Number	Blow Count	Sample Interval	Uncorrected N-Value	Frozen	Graphic Log	SUBSURFACE MATERIAL
S-S Auger	0									ORG MAT
	1									Tn-Or SILT *hi Org*
	2									Tn-Or SILT w/ Gravel w/ Cobbles
	3									
	4									Gy-Bn Poorly-graded GRAVEL w/ Sand w/ Cobbles moist, Gravel 3" minus
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12		AUGER	19-3764						Bn-Gy Silty SAND w/ Gravel moist, Gravel 1" minus SAMPLE 19-3764 (13.0-19.0): SM, 14.8% -200, NV, NP
	13									
	14									
	15									
	16									
	17									
	18									
	19									Bn-Gy Silty GRAVEL w/ Sand moist, Gravel 2" minus
	20									
	21									
	22									
	23									
	24									
	25									
	26									
	27									
	28									
	29									
	30									
	31									BOH

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

NR AKDOT TEST HOLE LOG - USCS ROCK CREEK BRIDGE MATERIAL SITE INVESTIGATION.GPJ NR_AKDOT_PRECON_USCS_06_28_07.GDT 5/20/20

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TH19-3122
Project Number	NFHWY00128	Total Depth	27 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/20/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	CME 850
		Station, Offset	
Weather	~45F, cloudy, no wind	Latitude, Longitude	N63.08677°, W145.61429°
TH Finalized By	K. Harnar	Vegetation	Tundra with crowberries
		Elevation	3342.0

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Drilling Method	Depth in (Feet)	Casing Blows / ft	Sample Data: Method	Sample Data: Number	Sample Data: Blow Count	Sample Data: Sample Interval	Sample Data: Uncorrected N-Value	Frozen	Graphic Log	SUBSURFACE MATERIAL
S-S Auger	0									ORG MAT
	1									Bn-Or SILT *hi Org*
	2									Gy-Bn Poorly-graded GRAVEL w/ Sand
	3									w/ Cobbles
	4									moist to wet, Gravel 3" minus
	5									Gy-Bn Poorly-graded GRAVEL w/ Boulders
	6									23" boulder
	7									Gy-Gn Poorly-graded GRAVEL w/ Sand
	8									Gravel 3" minus
	9									
	10									
	11									
	12		AUGER	19-3766						Bn-Gy Silty SAND w/ Gravel
	13									moist, Sub-rounded to round Gravel 1" minus
	14									SAMPLE 19-3766 (13.0-16.0): SM, 12.9% -200, LA 11, DEG 61, NV, NP
	15									
	16									
	17									Bn-Gy Silty GRAVEL w/ Sand
	18									moist, dense, Gravel 2" minus
	19									
	20									
	21									
	22									
	23									Bn-Gy Sandy SILT very loose
	24									Bn-Gy Sandy SILT w/ Gravel
	25									moist
	26									
	27									BOH

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TH19-3123
Project Number	NFHWY00128	Total Depth	30 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/21/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	CME 850
Station, Offset			
Weather	~38F, partly cloudy, no wind	Latitude, Longitude	N63.08694°, W145.61147°
TH Finalized By	K. Harnar	Vegetation	Tundra with crowberries
Elevation	3334.0		

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Sample Data: Casing Blows / ft | Method | Number | Blow Count | Sample Interval | Uncorrected N-Value | Frozen | Graphic Log

Depth (ft)	SUBSURFACE MATERIAL
0	ORG MAT
1	Bn SILT *hi Org*
2	Tn-Bn SILT w/ Gravel w/ Cobbles
3	
4	Gy-Bn Silty GRAVEL w/ Cobbles dry to moist, Sub-angular to round 2" minus gravel
5	
6	Gy-Bn Well-graded GRAVEL w/ Cobbles moist, Gravel 3" minus
7	
8	SAMPLE 19-3767 (7.0-13.0): GW, 4.8% -200, LL 26, PI 4, Max. Density 150.8 pcf, Opt. Moisture 4.9%
9	
10	
11	
12	
13	
14	Bn-Gy Poorly-graded GRAVEL w/ Silt & Sand moist, Gravel 2" minus
15	
16	SAMPLE 19-3768 (15.0-20.0): GP-GM, 8.9% -200, LA 12, NV, NP
17	
18	
19	
20	
21	
22	Gy-Bn Well-graded GRAVEL w/ Silt & Sand Gravel 2" minus
23	
24	
25	Bn-Gy Silty GRAVEL w/ Sand Gravel 2" minus
26	
27	
28	
29	
30	BOH

Drilling Method: S-S Auger

Sample 19-3767: AUGER, 7.0-13.0
Sample 19-3768: AUGER, 15.0-20.0

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

NR AKDOT TEST HOLE LOG - USCS ROCK CREEK BRIDGE MATERIAL SITE INVESTIGATION.GPJ NR_AKDOT_PRECON_USCS_06_28_07.GDT 5/20/20

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TH19-3124
Project Number	NFHWY00128	Total Depth	31 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/21/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	CME 850
		Station, Offset	
		Weather	~45F, partly cloudy, no wind
		Latitude, Longitude	N63.08608°, W145.61044°
TH Finalized By	K. Harnar	Vegetation	Tundra with crowberries
		Elevation	3330.0

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Drilling Method	Depth in (Feet)	Casing Blows / ft	Sample Data: Method	Sample Data: Number	Sample Data: Blow Count	Sample Data: Sample Interval	Sample Data: Uncorrected N-Value	Frozen	Graphic Log	SUBSURFACE MATERIAL
S-S Auger	0									ORG MAT
	1		AUGER	19-3769						Bn-Or Silty SAND dry to moist, *hi Org* SAMPLE 19-3769 (1.0-3.0): 24.4% -200, ORG 13.8%, LA 11, DEG 61
	2									
	3									
	4									Bn-Or Gravelly SILT moist, *hi Org*, Round 2" minus gravel
	5									
	6									
	7									Bn-Gy Poorly-graded GRAVEL w/ Cobbles Gravel 3" minus
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									Bn-Gy Silty GRAVEL w/ Sand loose, Gravel 3" minus
	19									
	20									
	21									
	22									
	23									
	24									
	25									
	26									
	27									
	28									
	29									
	30									
	31									BOH

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TH19-3125
Project Number	NFHWY00128	Total Depth	31.5 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/21/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	CME 850
Station, Offset			
Weather	~45F, partly cloudy, no wind	Latitude, Longitude	N63.085°, W145.61107°
TH Finalized By	K. Harnar	Vegetation	Tundra with crowberries
Elevation	3339.0		

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Drilling Method: S-S Auger

Depth in (Feet)	Casing Blows / ft	Sample Data: Method	Number	Blow Count	Sample Interval	Uncorrected N-Value	Frozen	Graphic Log	SUBSURFACE MATERIAL
0									SUBSURFACE MATERIAL
1									ORG MAT
2									Bn-Or SILT *hi Org*
3		AUGER	19-3770						Bn-Gy Well-graded GRAVEL w/ Sand w/ Cobbles Gravel 1.5" minus
4									SAMPLE 19-3770 (2.0-8.0): GW, 4.9% -200, SSc 1.0, LA 11, DEG 59, NV, NP
5									
6									
7									
8									
9									
10									
11									
12									Bn-Gy Silty GRAVEL w/ Sand moist, Gravel 2" minus
13									
14									
15									
16									
17									
18									Bn-Gy Silty SAND w/ Gravel Gravel 0.75" minus
19									
20									
21									
22									Gy-Bn Sandy SILT moist to wet, loose
23									
24									
25									
26									Gy-Bn Sandy SILT w/ Gravel moist to wet, Gravel 2" minus
27									
28									
29									
30									
31									BOH

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TT19-3115
Project Number	NFHWY00128	Total Depth	12 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/19/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	Cat/Excavator
		Station, Offset	
Weather	~45F, partly cloudy, no wind	Latitude, Longitude	N63.08553°, W145.61093°
TH Finalized By	K. Harnar	Vegetation	Tundra with crowberries
		Elevation	3337.0

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Drilling Method: Backhoe Excavator

Depth in (Feet)	Casing Blows / ft	Sample Data: Method	Sample Data: Number	Sample Data: Blow Count	Sample Data: Sample Interval	Sample Data: Uncorrected N-Value	Frozen	Graphic Log	SUBSURFACE MATERIAL
0									ORG MAT
1									Bn SILT *hi Org*
2									Bn Poorly-graded GRAVEL w/ Silt
3									Bn Poorly-graded SAND w/ Gravel moist, Gravel 3" minus
4									Bn-Gy Well-graded GRAVEL w/ Sand w/ Cobbles
5		GS	19-3750						SAMPLE 19-3750 (4.0-6.0): GW, 2.6% -200, NV, NP, Max. Density 135.5 pcf, Opt. Moisture 4.9% Cobble Count 4'-6' 59%
6									
7									
8									
9									
10									Poorly-graded GRAVEL w/ Sand Cobble Count 10'-12' 34%
11		GS	19-3751						SAMPLE 19-3751 (10.0-12.0): GP, 1.8% -200, SSc 14.4, LA 19, DEG 32, NV, NP, Max. Density 135.5 pcf, Opt. Moisture 4.9%
12									BOH

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TT19-3116
Project Number	NFHWY00128	Total Depth	13 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/19/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	Cat/Excavator
		Station, Offset	
Weather	~47F, party cloudy, no wind	Latitude, Longitude	N63.08651°, W145.61171°
TH Finalized By	K. Harnar	Vegetation	Tundra with crowberries
		Elevation	3335.0

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Drilling Method: Backhoe Excavator

Depth in (Feet)	Sample Data: Method	Number	Blow Count	Sample Interval	Uncorrected N-Value	Frozen	Graphic Log	SUBSURFACE MATERIAL
0								ORG MAT
1								Bn SILT dry to moist, *hi Org*
2								Bn-Tn SILT w/ Gravel w/ Cobbles moist, Gravel 3" minus
3								Bn-Gy SILT w/ Gravel w/ Cobbles moist, Gravel 3" minus
4								
5								Bn-Gy Well-graded GRAVEL w/ Sand Cobble Count 5'-7' 49%, Gravel 2" minus SAMPLE 19-3752 (5.0-7.0): GW, 3.9% -200, SSc 8.4, SSf 6.5, LA 15, DEG 39, NV, NP
6	GS	19-3752						
7								
8								
9								Bn-Gy Poorly-graded GRAVEL w/ Sand Gravel 3" minus
10								Bn-Gy Well-graded GRAVEL Cobble Count 11'-13' 16%, Gravel 2" minus
11								SAMPLE 19-3753 (11.0-13.0): GW, 0.6% -200, SSc 8.4, SSf 6.5, LA 15, DEG 39, NV, NP
12	GS	19-3753						
13								BOH

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

NR AKDOT TEST HOLE LOG - USCS ROCK CREEK BRIDGE MATERIAL SITE INVESTIGATION.GPJ NR_AKDOT_PRECON_USCS_06_28_07.GDT 5/20/20

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TT19-3117
Project Number	NFHWY00128	Total Depth	10 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/19/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	Cat/Excavator
Station, Offset			
Weather	~50F, partly cloudy, no wind	Latitude, Longitude	N63.08622°, W145.61351°
TH Finalized By	K. Harnar	Vegetation	Tundra with crowberries
Elevation	3339.0		

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Drilling Method: Backhoe Excavator

Sample Data: Casing Blows / ft | Method | Number | Blow Count | Sample Interval | Uncorrected N-Value | Frozen | Graphic Log

SUBSURFACE MATERIAL

0 – ORG MAT

Bn-Or SILT
hi Org

Bn-Gy Well-graded GRAVEL
w/ Sand
w/ Cobbles and Boulders
Sub-angular to round gravel

Cobble Count 7'-10' 36%
SAMPLE 19-3754 (7.0-10.0): GW, 1.8% -200, LA 16, DEG 27, NV, NP
SAMPLE 19-3755 (7.5-10.0): LA 16, DEG 48

GSGS 19-3754 19-3755

10 – BOH

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

NR AKDOT TEST HOLE LOG - USCS ROCK CREEK BRIDGE MATERIAL SITE INVESTIGATION.GPJ NR_AKDOT_PRECON_USCS_06_28_07.GDT 5/20/20

FINAL TEST HOLE LOG

STATE OF ALASKA DOT/PF
Northern Region Materials
Geology Section

Project	Denali Highway MP 25 Rock Creek Bridge	Test Hole Number	TT19-3118
Project Number	NFHWY00128	Total Depth	11 feet
Field Geologist	K. Maxwell, K. Harnar	Dates Drilled	8/19/2019
Field Crew	T. Hartford, M. Sousa	Equipment Type	Cat/Excavator
Station, Offset		Weather	~55F, partly cloudy, no wind
Latitude, Longitude	N63.08551°, W145.61244°	TH Finalized By	K. Harnar
Vegetation	Tundra with crowberries	Elevation	3338.0

Ground Water Data	While Drilling	After Drilling
Depth in (ft.)		
Time		
Date		
Symbol		

GENERAL COMMENTS:

Drilling Method: Backhoe Excavator

Sample Data: Method, Number, Blow Count, Sample Interval, Uncorrected N-Value

Casing Blows / ft | Frozen | Graphic Log

Depth in (Feet)	Sample Method	Sample Number	SUBSURFACE MATERIAL
0			ORG MAT
1			Tn-Or SILT dry to moist, *hi Org*
2			Tn-Or SILT w/ Cobbles moist
3			Bn-Gy Well-graded GRAVEL w/ Sand w/ Cobbles and Boulders moist, Sub-angular to round gravel
4			
5	GS	19-3756	Cobble Count 4'-6' 49% SAMPLE 19-3756 (4.0-6.0): GW, 2.2% -200, SSc 14.6, SSf 16.0, LA 19, DEG 48, NV, NP
6			
7			
8			
9			Cobble Count 9'-11' 42% SAMPLE 19-3757 (9.0-11.0): GW, 1.6% -200, NV, NP
10	GS	19-3757	
11			BOH

Note: Unless otherwise noted, all samples are taken with 1-3/8-in. ID Standard Penetration Sampler driven with 140 lb. hammer with 30-in. drop. ☐ CME Auto Hammer ☐ Cathead Rope Method

NR AKDOT TEST HOLE LOG - USCS ROCK CREEK BRIDGE MATERIAL SITE INVESTIGATION.GPJ NR_AKDOT_PRECON_USCS_06_28_07.GDT 5/20/20

Appendix B: Laboratory Data

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION
NORTHERN REGION
LABORATORY TESTING REPORT

PROJECT NAME:	Denali Highway MP 25 Rock Creek Bridge
PROJECT NUMBER:	NFHWY00128
AKSAS NUMBER:	
SAMPLED BY:	K. Maxwell, K. Harnar
MATERIAL SOURCE:	CENTERLINE

TEST HOLE NUMBER		TT19-3115	TT19-3115	TT19-3116	TT19-3116	TT19-3117	TT19-3117	TT19-3118
DEPTH (feet)		4.0-6.0	10.0-12.0	5.0-7.0	11.0-13.0	7.0-10.0	7.5-10.0	4.0-6.0
LATITUDE		N63.08553°	N63.08553°	N63.08651°	N63.08651°	N63.08622°	N63.08622°	N63.08551°
LONGITUDE		W145.61093°	W145.61093°	W145.61171°	W145.61171°	W145.61351°	W145.61351°	W145.61244°
LAB NUMBER		**19-3750**	**19-3751**	**19-3752**	**19-3753**	**19-3754**	**19-3755**	**19-3756**
DATE SAMPLED		19-Aug-19	19-Aug-19	19-Aug-19	19-Aug-19	19-Aug-19	19-Aug-19	19-Aug-19
% Passing	**3"**							
	2"	96	90	86	91	93		85
	1.5"	86	78	76	73	77		74
Gravel	**1.0"**	78	68	64	53	68		61
	0.75"	70	60	55	42	60		54
	0.5"	59	51	46	28	50		43
	0.375"	52	46	41	20	44		38
	#4	35	34	29	7	31		26
	#8	22	21	22	4	21		19
	#10	18	20	19	4	20		17
	#16	14	10	16	3	13		12
	#30	8	4	11	2	7		7
Sand	**#40**	6	3	9	1	5		6
	#50	5	3	7	1	4		4
	#60	4	2	6	1	3		4
	#80	4	2	5	1	3		3
	#100	3	2	5	1	2		3
Silt/Clay	**#200**	2.6	1.8	3.9	0.6	1.8		2.2
	0.02							
Hydro	**0.005**							
	0.002							
	0.001							
LIQUID LIMIT		NV	NV	NV	NV	NV		NV
PLASTIC INDEX		NP	NP	NP	NP	NP		NP
USCS CLASSIFICATION		GW	GP	GW	GW	GW		GW
USCS SOIL DESCRIPTION								
NATURAL MOISTURE								
ORGANICS								
SP. GR. (FINE)		2.87						
SP. GR. (COARSE)		2.93						
MAX. DRY DENSITY		135.5	135.5					
OPTIMUM MOISTURE		4.9	4.9					
L.A. ABRASION			19	15	15	16	16	19
DEGRAD. VALUE			32	39	39	27	48	48
SODIUM SULF. (CRSE)			14	8	8			15
SODIUM SULF. (FINE)				7	7			16
NORDIC ABRASION								
REMARKS								

GENERAL COMMENTS

Gradation is based on material passing the 3" sieve, according to Alaska Test Method T-7.

[1] Organic content determination is based on the results of the ATM T-6 test method.

(Soil descriptions shown in parentheses are based on field determinations.)

USCS Soil Description Abbreviations: WG = Well-graded; PG = Poorly-graded; E = Elastic; L = Lean; F = Fat

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION
NORTHERN REGION
LABORATORY TESTING REPORT

PROJECT NAME:	Denali Highway MP 25 Rock Creek Bridge
PROJECT NUMBER:	NFHWY00128
AKSAS NUMBER:	
SAMPLED BY:	K. Maxwell, K. Harnar
MATERIAL SOURCE:	CENTERLINE

TEST HOLE NUMBER		TT19-3118	TH19-3119	TH19-3119	TH19-3120	TH19-3120	TH19-3120	TH19-3120
DEPTH (feet)		9.0-11.0	10.0-15.0	19.0-22.0	1.0-5.0	5.0-12.0	14.0-18.0	25.0-31.0
LATITUDE		N63.08551°	N63.08514°	N63.08514°	N63.08442°	N63.08442°	N63.08442°	N63.08442°
LONGITUDE		W145.61244°	W145.61029°	W145.61029°	W145.61334°	W145.61334°	W145.61334°	W145.61334°
LAB NUMBER		**19-3757**	**19-3758**	**19-3759**	**19-3760**	**19-3761**	**19-3762**	**19-3763**
DATE SAMPLED		19-Aug-19	20-Aug-19	20-Aug-19	20-Aug-19	20-Aug-19	20-Aug-19	20-Aug-19
% Passing	**3"**	96						
	2"	78						93
	1.5"	67	99			93	96	90
Gravel	**1.0"**	59	94			73	89	83
	0.75"	53	85	91	96	65	78	77
	0.5"	45	70	75	90	54	62	69
	0.375"	40	56	64	77	47	51	64
	#4	29	29	40	58	34	28	52
	#8	20	20	30	53	32	19	47
	#10	16	18	28	53	32	18	47
	#16	12	17	27	50	30	16	43
	#30	6	16	25	46	28	15	38
Sand	**#40**	4	15	24	44	27	14	34
	#50	3	15	23	41	25	13	30
	#60	3	15	22	39	24	13	28
	#80	2	14	20	33	22	12	25
	#100	2	13	20	29	22	12	23
Silt/Clay	**#200**	1.6	10.0	15.3	20.5	18.3	10.0	18.6
	0.02							18.4
Hydro	**0.005**							10.3
	0.002							6.2
	0.001							4.4
LIQUID LIMIT		NV	NV	NV	NV	NV	NV	NV
PLASTIC INDEX		NP	NP	NP	NP	NP	NP	NP
USCS CLASSIFICATION		GW	GP-GM	GM	GM	GM	GP-GM	GM
USCS SOIL DESCRIPTION								
NATURAL MOISTURE					8.9			
ORGANICS					1.5			
SP. GR. (FINE)								2.86
SP. GR. (COARSE)								
MAX. DRY DENSITY				150.8				
OPTIMUM MOISTURE				4.9				
L.A. ABRASION			11	12				
DEGRAD. VALUE			61					
SODIUM SULF. (CRSE)								
SODIUM SULF. (FINE)								
NORDIC ABRASION								
REMARKS					insufficient material for proctor		insufficient material for proctor	

GENERAL COMMENTS

Gradation is based on material passing the 3" sieve, according to Alaska Test Method T-7.

[1] Organic content determination is based on the results of the ATM T-6 test method.

(Soil descriptions shown in parentheses are based on field determinations.)

USCS Soil Description Abbreviations: WG = Well-graded; PG = Poorly-graded; E = Elastic; L = Lean; F = Fat

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION
NORTHERN REGION
LABORATORY TESTING REPORT

PROJECT NAME:	Denali Highway MP 25 Rock Creek Bridge
PROJECT NUMBER:	NFHWY00128
AKSAS NUMBER:	
SAMPLED BY:	K. Maxwell, K. Harnar
MATERIAL SOURCE:	CENTERLINE

TEST HOLE NUMBER		TH19-3121	TH19-3122	TH19-3123	TH19-3123	TH19-3124	TH19-3125	
DEPTH (feet)		13.0-19.0	13.0-16.0	7.0-13.0	15.0-20.0	1.0-3.0	2.0-8.0	
LATITUDE		N63.08577°	N63.08677°	N63.08694°	N63.08694°	N63.08608°	N63.085°	
LONGITUDE		W145.61206°	W145.61429°	W145.61147°	W145.61147°	W145.61044°	W145.61107°	
LAB NUMBER		**19-3764**	**19-3766**	**19-3767**	**19-3768**	**19-3769**	**19-3770**	
DATE SAMPLED		20-Aug-19	20-Aug-19	21-Aug-19	21-Aug-19	21-Aug-19	21-Aug-19	
% Passing	**3"**							
	2"				98			
	1.5"			98	98		100	
Gravel	**1.0"**	99	96	86	95		93	
	0.75"	97	92	74	90		84	
	0.5"	91	86	49	76		65	
	0.375"	85	79	36	66	99	53	
	#4	66	58	15	35	93	25	
	#8	50	43	10	18	84	13	
	#10	49	42	10	18	83	12	
	#16	35	33	9	14	73	8	
	#30	26	26	8	12	61	7	
Sand	**#40**	24	23	7	12	53	7	
	#50	22	21	7	11	45	7	
	#60	21	20	7	33	41	6	
	#80	19	18	6	10	35	6	
	#100	18	17	6	10	32	6	
Silt/Clay	**#200**	14.8	12.9	4.8	8.9	24.4	4.9	
	0.02							
Hydro	**0.005**							
	0.002							
	0.001							
LIQUID LIMIT		NV	NV	26	NV		NV	
PLASTIC INDEX		NP	NP	4	NP		NP	
USCS CLASSIFICATION		SM	SM	GW	GP-GM		GW	
USCS SOIL DESCRIPTION								
NATURAL MOISTURE								
ORGANICS						13.8		
SP. GR. (FINE)				2.74				
SP. GR. (COARSE)				2.96				
MAX. DRY DENSITY				150.8				
OPTIMUM MOISTURE				4.9				
L.A. ABRASION			11		12	11	11	
DEGRAD. VALUE			61			61	59	
SODIUM SULF. (CRSE)							1	
SODIUM SULF. (FINE)								
NORDIC ABRASION								
REMARKS						Org[1]		

GENERAL COMMENTS

Gradation is based on material passing the 3" sieve, according to Alaska Test Method T-7.

[1] Organic content determination is based on the results of the ATM T-6 test method.

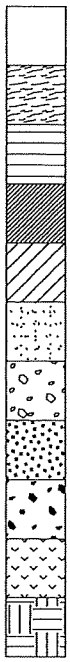
(Soil descriptions shown in parentheses are based on field determinations.)

USCS Soil Description Abbreviations: WG = Well-graded; PG = Poorly-graded; E = Elastic; L = Lean; F = Fat

Appendix C: Symbols and Definitions

SYMBOLS AND DEFINITIONS

BASIC MATERIAL SYMBOLS



ASPHALT

PEAT

CLAY (Cl)

ICE

SILT (Si)

POORLY GRADED SAND (Sa)

POORLY GRADED GRAVEL (Gr)

WELL GRADED SAND

WELL GRADED GRAVEL

BEDROCK (Bx), soft(Type)

BEDROCK (Bx), hard(Type)

SOFT OR HARD BEDROCK BASED ON DRILLING RATE

NOTE

MAIN COMPONENT (UPPER CASE ... SOLID LINES)
MINOR COMPONENT (Title Case ... DASHED LINES OR SPARSER PATTERN)

USCS SIZE DEFINITIONS

BOULDERS (Boulders)	12"+
COBBLES (Cobbles)	3" TO 12"
GRAVEL	#4 TO 3"
ANGULAR FRAGMENTS	#10 +
SAND	#200 TO #4
SILT	#200 TO 0.005 mm
CLAY	MINUS 0.005 mm

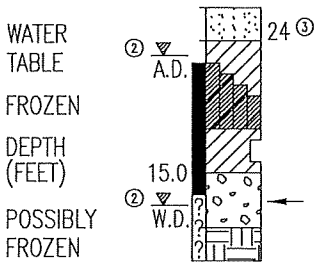
TEST RESULTS

_._%-200	= % PASSING #200 SIEVE
NM _._%	= NATURAL MOISTURE
ORG _._%	= ORGANIC CONTENT
SSc _	= SODIUM SULFATE LOSS(coarse)
SSf _	= SODIUM SULFATE LOSS(fine)
LA _	= LOS ANGELES ABRASION
DEG _	= DEGRADATION
LL _	= LIQUID LIMIT (NV = no value)
PI _	= PLASTIC INDEX (NP = non-plastic)

MISC.

Tr	= TRACE
sl	= SLIGHTLY
hi	= HIGHLY
w/_	= WITH UNSPECIFIED AMOUNT
X'tls	= CRYSTALS
TH	= TEST HOLE
TT	= TEST TRENCH
TP	= TEST PIT

TYPICAL LOG



① Station value may also be on centerline e.g. Sta 210+53, CL or lat-long format e.g. N64.56789°, W145.67890°

② W.D.= WHILE DRILLING, A.D.= AFTER DRILLING

③ "N VALUE" INDICATES STANDARD PENETRATION TEST (1.4" I.D., 2.0" O.D. SAMPLER DRIVEN WITH 140 LB. HAMMER, 30" FREE FALL) AND IS SUM OF 2nd AND 3rd 6" OF PENETRATION.

PLAN VIEW SYMBOLS

AUGER TEST HOLE (TH)

DOZER/BACKHOE TEST TRENCH (TT)

DRILLING METHODS

H-S	HOLLOW STEM AUGER
S-S	SOLID STEM AUGER

SAMPLING METHODS

AUGER	AUGER CUTTINGS
GS	GRAB SAMPLE
SS	SPLIT SPOON
CS	CONTINUOUS SAMPLER
SPT	STANDARD PENETRATION TEST
NR	NO RECOVERY

SOIL DENSITY/CONSISTENCY DESCRIPTORS

NON-COHESIVE		COHESIVE	
RELATIVE DENSITY	BLOWS/FOOT (N) VALUE	CONSISTENCY	BLOWS/FOOT (N) VALUE
VERY LOOSE	< 4	VERY SOFT	< 2
LOOSE	5-10	SOFT	2-4
MEDIUM DENSE	11-30	FIRM	5-8
DENSE	31-50	STIFF	9-15
VERY DENSE	> 50	VERY STIFF	16-30
		HARD	> 30

COLOR

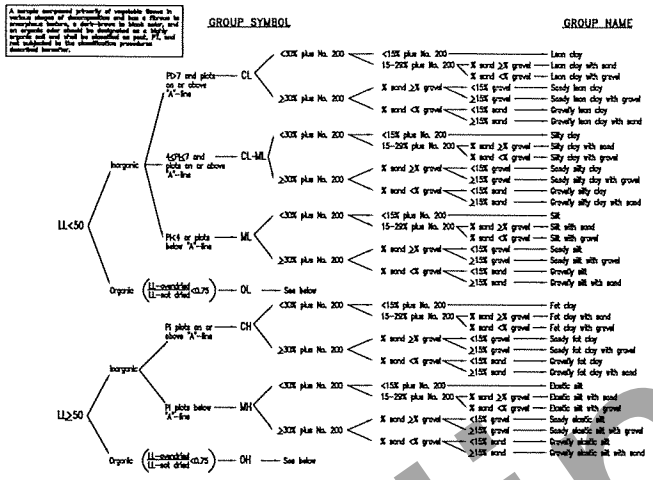
Bk = BLACK	Gy = GRAY	Tn = TAN
Bl = BLUE	Or = ORANGE	Wh = WHITE
Bn = BROWN	Rd = RED	Yw = YELLOW
Gn = GREEN		

MOISTURE

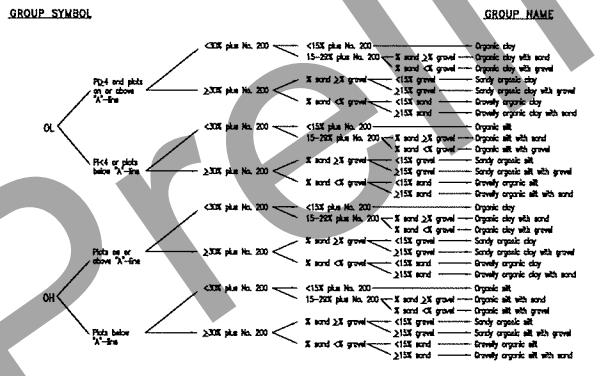
dry	= < OPTIMUM*	DUSTY, DRY TO THE TOUCH
moist	~ OPTIMUM*	DAMP, NO VISIBLE WATER
wet	= > OPTIMUM*	VISIBLE FREE WATER

* OPTIMUM MOISTURE FOR MAXIMUM DENSITY

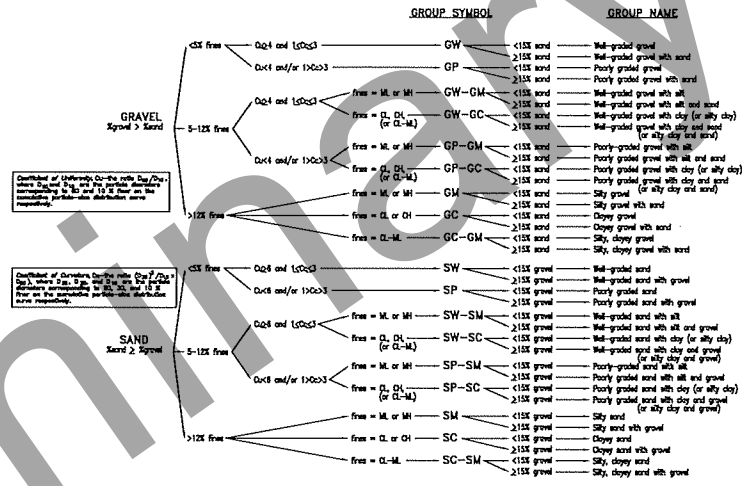
Classification of Soils for Engineering Purposes (Unified Soil Classification System)



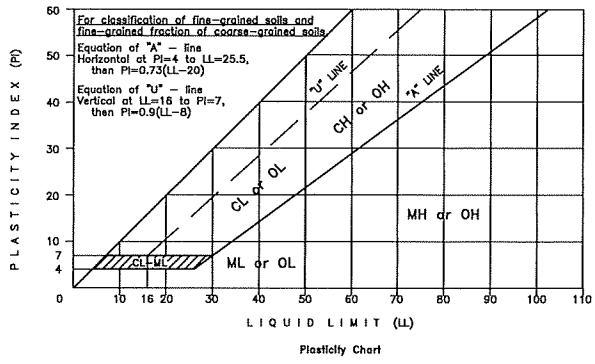
Flow Chart for Classifying Fine-Grained Soil (50% or More Passes No. 200 Sieve)



Flow Chart for Classifying Organic Fine-Grained Soil (50% or More Passes No. 200 Sieve)



Flow Chart for Classifying Coarse-Grained Soil (More Than 50% Retained on No. 200 Sieve)



Plasticity Chart