ALASKA
Department of Transportation
And Public Facilities

GEOLOGY REPORT

Seward Highway MP 18-25
Falls Creek
Bridge No. 609

Project No. STP-031-1(27)/53919
September 2003

Prepared By:

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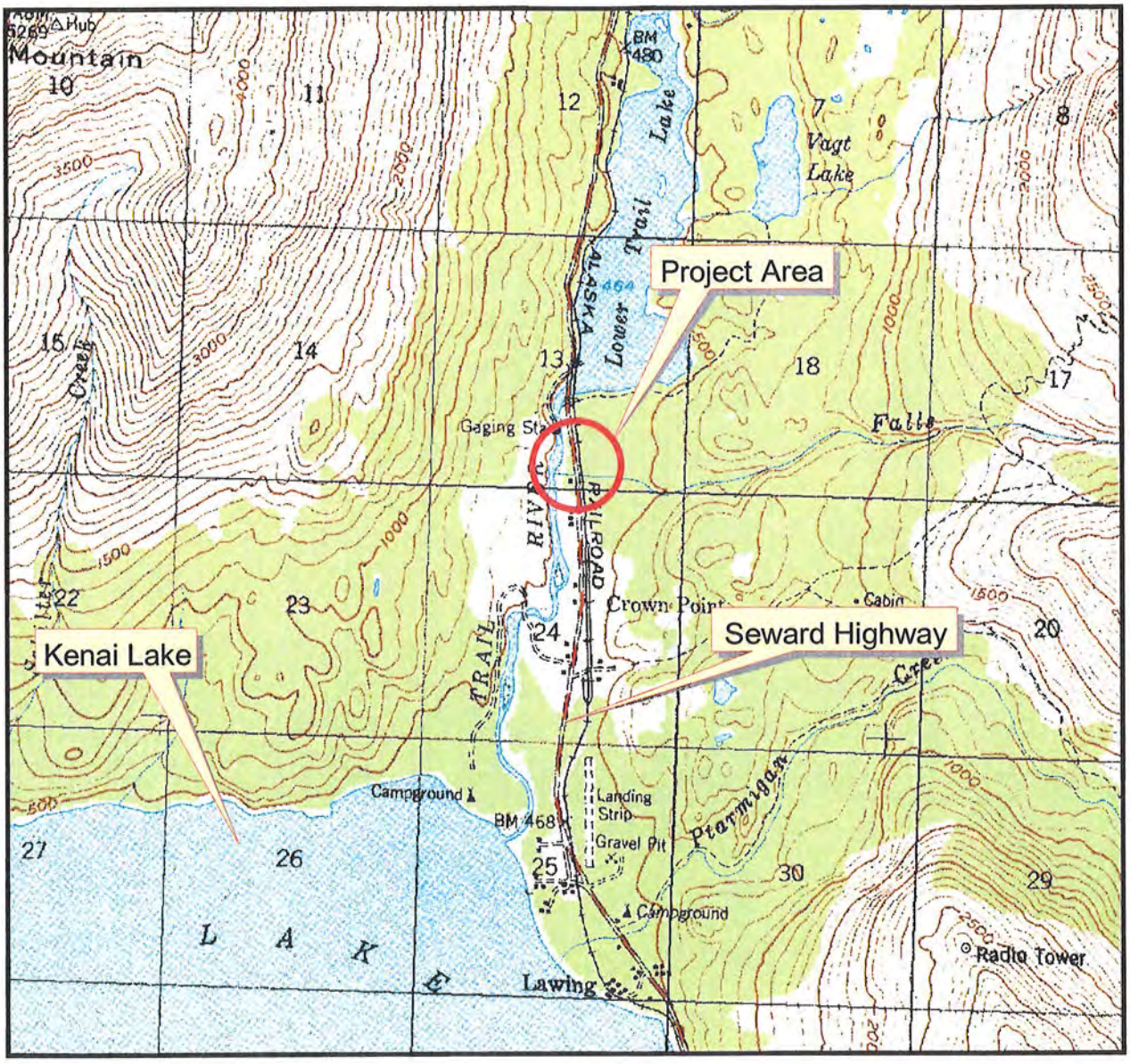


State of Alaska
Department of Transportation and Public Facilities

Seward Highway
Project STP-031-1(27)/53919
Falls Creek Bridge No. 609

Source: USGS, Seward, B-7, 1:63,360

Subject	Foundation Geology Report
Project	Seward Highway Mile Point 18-25.5
Bridge	Falls Creek Bridge No. 609
Federal Project No.	STP-031-1(27)
State Project No.	53919

INTRODUCTION

Purpose and Scope of Work

The purpose of this report is to describe the existing soil conditions for the proposed Falls Creek Bridge No. 609 which will replace the Seward Highway bridge over Falls Creek at about Mile Post 24.7. The new bridge location is east approximately 20 m upstream of the existing Falls Creek Bridge. The new bridge alignment will fall along the right side of the existing Alaska Railroad and railroad bridge over Falls Creek at the time of the investigation. The railroad and railroad bridge will be relocated farther to the east.

At the request of the Design Project Manager, the DOT&PF Statewide Materials Section conducted a foundation investigation at the site, under the field supervision of Engineering Geologist Peter J. Ondra using DOT&PF personnel and equipment. The purpose of the foundation investigation is to assess the suitability of the site and develop a soil profile for the design of the proposed structure.

This report describes the method of exploration, soil sampling, geotechnical test results, and the general site conditions at the time of the exploration.

GEOLOGY AND TOPOGRAPHY

The project area is on the Kenai Peninsula in the Kenai Mountains that rise to altitudes of 914 m to 1524 m above the adjacent glacier scoured valleys. The bedrock in the area is the Cretaceous aged Valdez Group. The Valdez Group is marine sedimentary rock found in thick sequences of thinly layered interbedded deposits of greywacke, phyllite and shale. The rock is intensely folded and faulted and has been subjected to low and moderate grades of metamorphism. The Valdez Group is at least several thousand meters thick and extends along the Alaskan coast from the Canadian Border to Kodiak Island. The northern limit of the Valdez Group is considered to be the Border Ranges fault system while the southern limit is defined by the Contact fault system.

In the valley floors, as at Falls Creek, a thick mantle of unconsolidated sedimentary deposits of alluvial and glacial origin covers the bedrock. The depth to bedrock at Falls Creek is unknown. The alluvial deposits consist of sand and gravel deposited by non-glacial streams and outwash deposited by glacial meltwater. The glacial deposits are composed of unsorted deposits of boulders, cobbles, gravel, sand and silt from terminal, lateral and ground moraines left by the retreat of alpine, valley and regional glaciers.

SEISMICITY

Falls Creek is located at approximate Latitude 60.259 and Longitude minus 149.224 in an area of high seismic activity. The surface trace of the Aleutian Megathrust subduction-zone is approximately 252 km to the southeast. The vast majority of earthquakes have occurred along the subduction zone that dips northward under the southwest Alaska Peninsula and Southcentral Alaska. The subduction of the Pacific plate beneath the continental North American plate has generated numerous large to great magnitude (magnitude M7.5+) thrust earthquakes along its interface contact zone with the overriding continental crust. The depth to the subduction zone at the site is 35.2 km (Youngs et al. SRL, 1997). The moment magnitude Mw 9.2 1964 Alaska earthquake, to the northeast of the site region, was an interface thrust mechanism event.

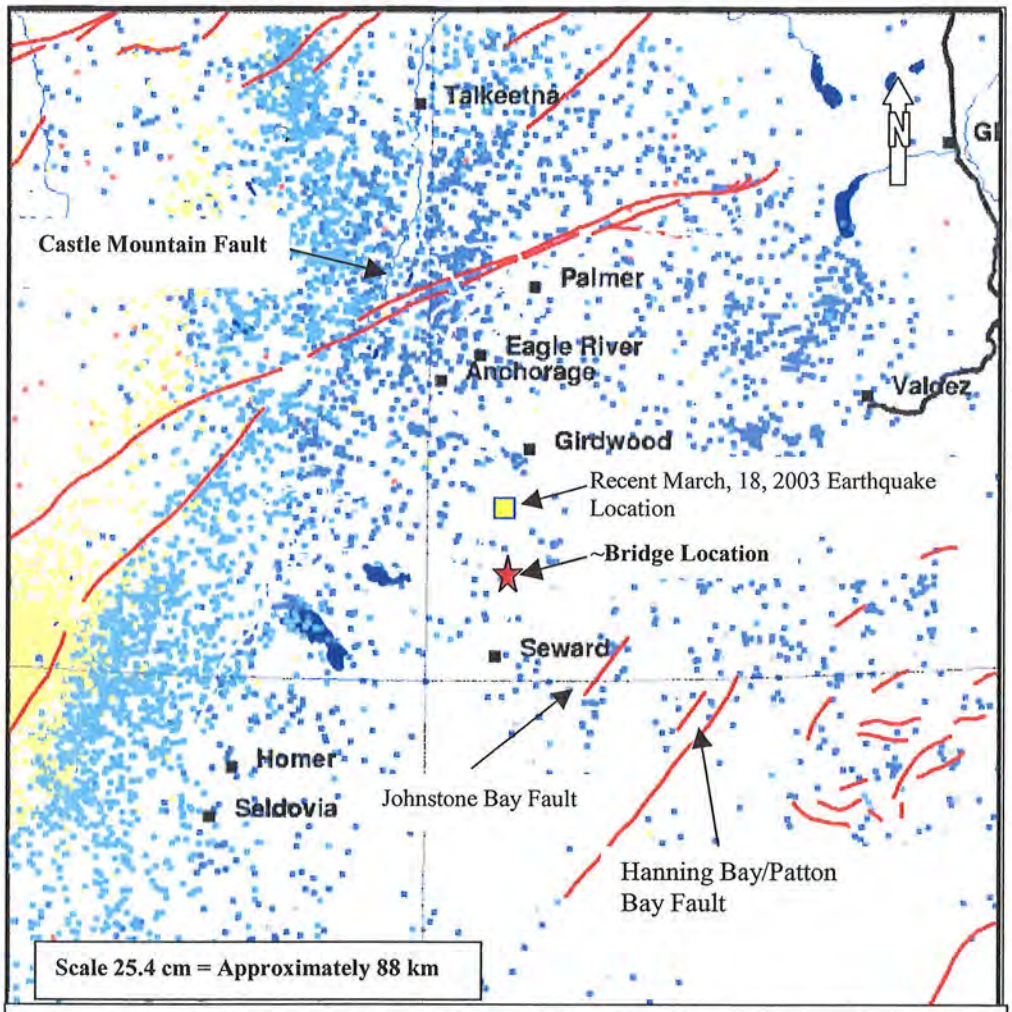
Locally, the smaller (about 16 km long) Johnstone Bay Fault is located about 66 km southeast and the Hanning Bay/Patton Bay Fault system (estimated from 16 to 48 km in length) is located about 122 km southeast of Falls Creek. The Johnstone Bay Fault is Holocene in age (within about 11,000 years old).

Design peak horizontal bedrock acceleration in rock with 90 percent probability of not being exceeded in 50 years and has an estimated return period of 475 years. The following table describes the general seismic parameters at this site.

General Seismic Parameters

Item	Value	Source
Peak Horizontal Acceleration	0.6g	AASHTO
Soil Profile	Type I	AASHTO
Site Coefficient	1.0	AASHTO

The design earthquake data is obtained from the 2002 AASHTO Standard Specifications for Highway Bridges 17th Edition, with the latest interims, Section (Division A-1-Seismic Design). A review of historic seismic activity and predictions of probable earthquake magnitudes on known deep and shallow active faults in the vicinity of the proposed bridge site resulted in seismic magnitudes greater than other recommended seismic values.



Plot of recorded seismic epicentral event (small yellow square). Source: Alaska Earthquake Information Center http://www.aeic.alaska.edu/Seis/recenteqs/index.html, Univ. of Alaska

METHOD OF EXPLORATION

Two penetrometers were driven and four test holes were drilled for the proposed bridge. The foundation investigation was done between April 12 and 13, 2001 and between August 21 and September 25, 2001. Test holes and penetrometers were located where the topography, creek and existing railroad bridge allowed access. The penetrometers and test holes were located by measuring from existing landmarks established by survey control points provided R&M Consultants Inc.'s survey crew.

As part of that investigation, Statewide Materials Personnel:

- Drilled test holes with a CME model 75 drill with NW (79 mm I.D. x 89 mm O.D.) casing.

- Drove casing using a 154 kg CME automatic hammer with a 762 mm free fall.
- Performed standard penetration tests (SPT) at about 1.5 m intervals using a standard split barrel sampler (36 mm I. D. x 50 mm O. D.) driven by a 64 kg CME automatic hammer system that meets requirements of AASHTO T-206 (ASTM 1586). The number of blows required to drive the sampler into undisturbed soil for each 152 mm increment was recorded. Refusal for the SPT occurs when the blow counts to drive the sampler reaches 50 blows per 152 mm interval, or when 100 blows per 304 mm interval, or when there is no observed advance of the sampler during application of 10 successive blows of the hammer. The driving may continue to a higher blow count, or be terminated before the driving limit is reached at the discretion of the field geologist.
- Drove friction penetrometer soundings with a 64 mm-diameter flush coupled, blunt-tipped steel rod with a 154 kg CME automatic hammer with a 762 mm free fall. Refusal occurs for the friction penetrometer when the blow counts reach 1000 blows per 304 mm.
- Performed penetrometer pullout tests to measure uplift resistance between the soil and the casing-rod. Pullout tests were done with the drill's hydraulic feed/retract cylinder mechanism up to one hour after driving.
- Photographed the site. Selected photographs are included with this report.
- Located test holes and penetrometers stations and elevations using a level, rod and cloth tape from reference points provided by R&M Consultants.

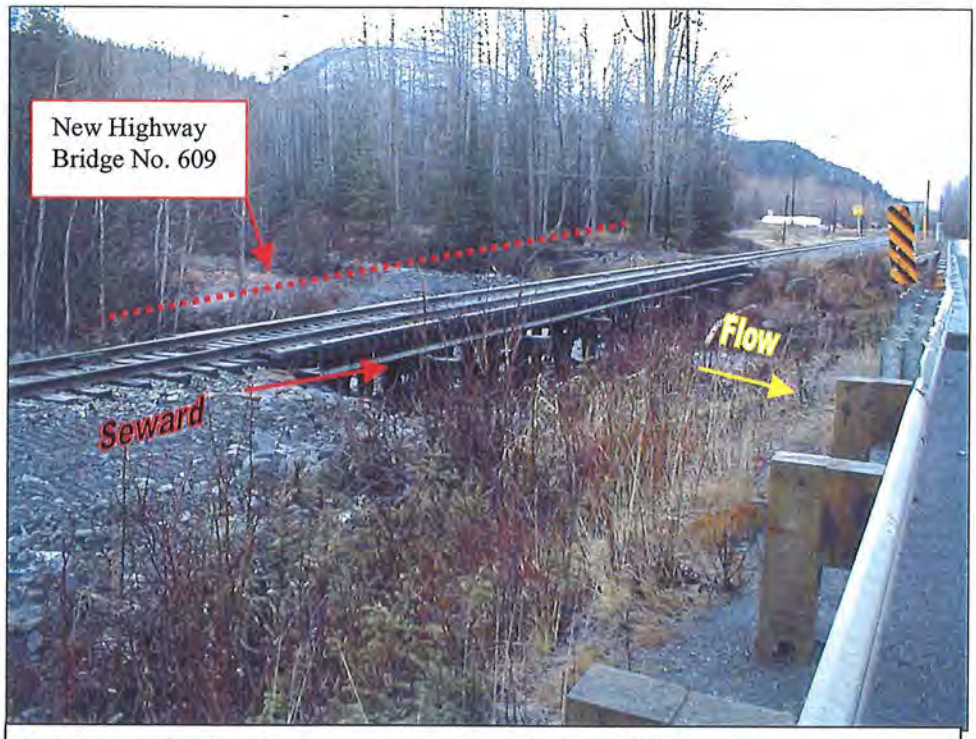
LABORATORY TESTING

The field geologist examined, visually classified, and logged the test holes. The samples were sealed, transported to the Statewide Materials Engineering Geology office in Anchorage, Alaska and examined by the Foundation Geologist and Geotechnical Engineer. Selected soil samples were tested in the Central Region Materials Laboratory in Anchorage in accordance with ASTM/USCS methods for a determination of any one or combination of the following properties:

- Particle size distribution
- Moisture content
- Atterberg limits
- Organic content
- Soil Classification
- Specific Gravity

The laboratory test results are listed in the Preconstruction Sample Testing Summary Reports.

GENERAL SITE AND SUBSURFACE DESCRIPTION



Looking south at the site from the east side of the Seward Highway.

Surface

The replacement bridge is approximately 20 m east and upstream of the existing Falls Creek Bridge at about Mile Post 24.7. The new bridge alignment will fall along the right side of the existing Alaska Railroad and railroad bridge over Falls Creek. Falls Creek is approximately 5 to 10 m wide and flows fast and clear toward the west over a streambed containing cobbles and boulders.

Penetrometer P 5 and test hole TH 10 were located near the centerline and right side of Abutment 1. The left side of Abutment 1 lies near the existing railroad alignment. TH 11 is an approach hole located approximately 34.5 m back (south) of Abutment 1.
P 1 and TH 15 were located near the right side of Abutment 2. The left side of Abutment 2 fell within the active channel of Falls Creek. TH 16 is an approach hole located approximately 26.4 m ahead (north) of Abutment 2.

Subsurface

Generally, the alluvial soil consist of interlayered silty sandy gravel, silty gravelly sand and sandy silt.

South Approach: TH 11 was located approximately 34.5 m back station (south) of Abutment 1. The soil consists of 0.6 m of surface organics and organic sandy silt over interlayered silty sandy gravel and silty sand with a seam of sandy silt between 1.4 m and 2.4 m in depth to the explored bottom at 12.8 m in depth (Elev.132.5 m).

Abutment 1: P 5 is near the proposed centerline 7 m back from Abutment 1. It reached refusal at 36.8 m in depth (Elev. 109.03 m).

TH 10 is near the right side of Abutment 1. The soil consists of 0.3 m of surface organics over interlayered silty sandy gravel with occasional cobbles and silty gravelly sand. A 0.5 m thick seam of silty sand was found at 8.9 m in depth. Silty sand with a 1.6 m thick seam of sandy silt was found at 21.5 m in depth. Clayey silt and sandy clayey silt was found starting at 31.0 m in depth and extending to the explored bottom at 43.3 m in depth (Elev. 102.69).

Abutment 2: Penetrometer P 1 is near the right side of Abutment 2. It reached refusal at 36.5 m in depth (elev. 107.3 m).

TH 15 is also located near the right side of Abutment 2 near the active creek channel. Cobbles and boulders were on the ground surface. The soil consists of silty sandy gravel interlayered with seams of gravelly silty sand and silty gravelly sand 0.7 to 0.9 m thick. A 1.5 m thick seam of silty sand was found at 27.5 m in depth. Sandy clayey silt with seams of fine sand was found at 29.0 m in depth and extends to the explored bottom at 42.7 m in depth (Elev. 101.16 m).

North Approach: TH 16 is approximately 26.4 m ahead station (north) of Abutment 2. The soil consists of 1.9 m of surface organics and organic gravelly sandy silt with a 0.2 m thick seam of wood at 1.2 m in depth. This material is probably waste material from the construction and maintenance of the nearby railroad embankment. Interlayered silty sandy gravel, gravelly silty sand, and silty gravelly sand were found at 1.9 m in depth to the explored bottom at 12.5 m in depth (132.05m).

Groundwater

Groundwater was observed at 3.5 m in depth in the south approach hole and at 2.3 m in depth in the north approach hole. The water table was observed in TH 10 at abutment 1 at 3.5 m in depth and at 1.5 m in depth in TH 15 at abutment 2. The water table is expected to fluctuate with changes in precipitation and melt runoff in Falls Creek.

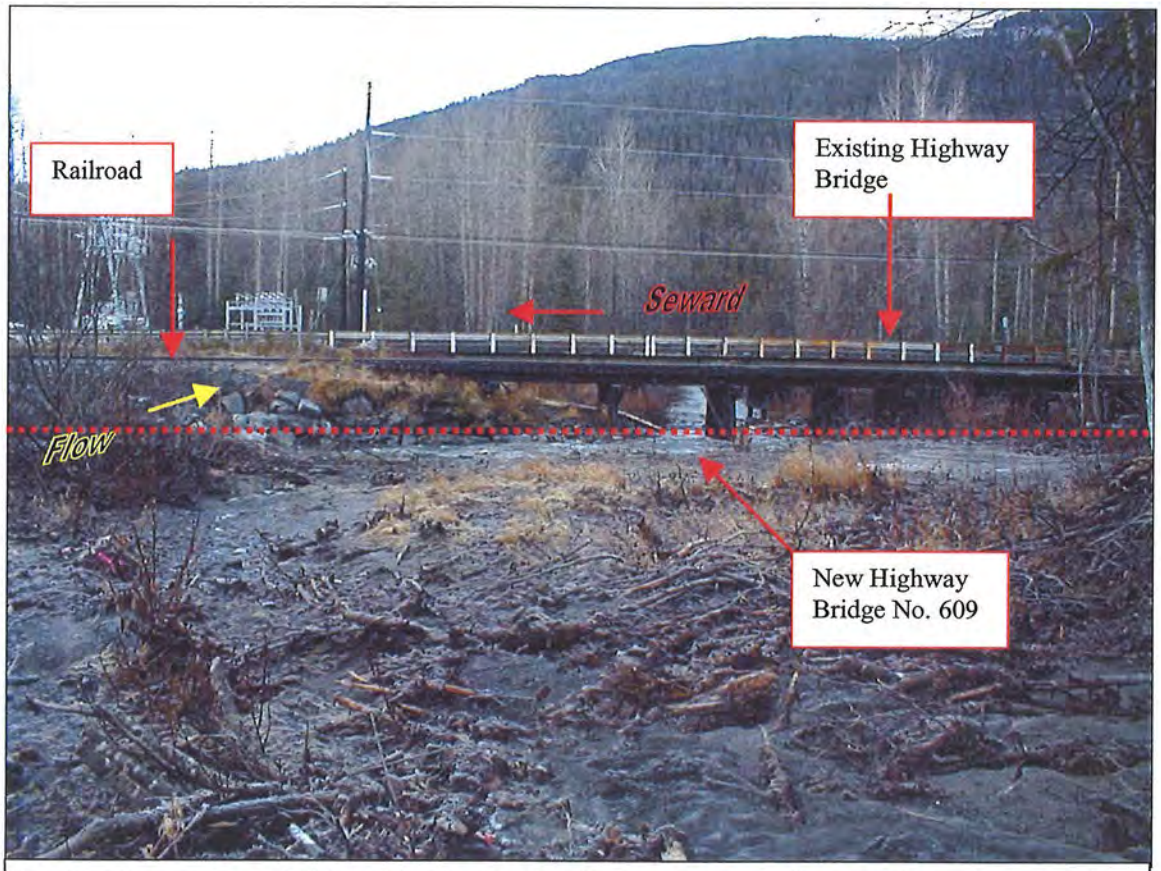
Vegetation

The part of the active channel of Falls Creek is covered with thick brush. The stream banks are lined with large cottonwood, birch and spruce trees.

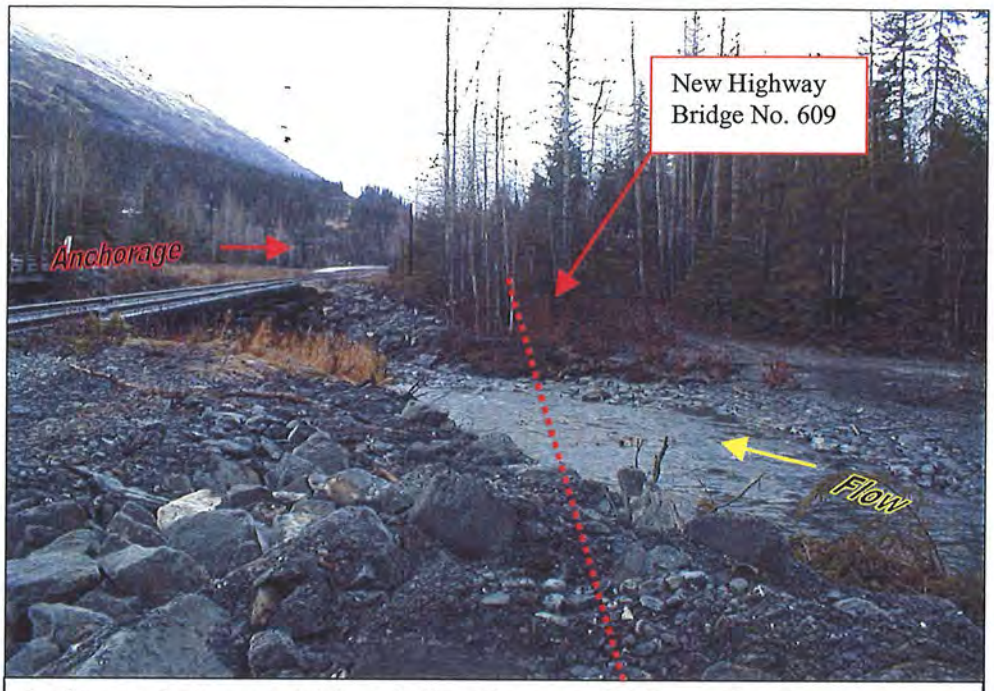
Utilities

A fiber-optic line is buried within the existing railroad embankment. Overhead lines are east (upstream side) of the existing railroad embankment and may have to be relocated for this project.

Site Photographs



Looking downstream at Fall Creek Bridge No. 609. Photos were taken after a fall flood obliterated all drilling and survey locations.



Looking north along new highway bridge alignment. Cobbles and boulders in foreground are for existing railroad embankment.

Looking south along highway Bridge No. 609 alignment. Cobbles and boulders present along this alignment.

REFERENCES

1. Stanley, D.A., Geotechnical Report, Seward Highway M.P. 8-18, Project No. STP-031-1(25)/52419, State of Alaska, Department of Transportation and Public Facilities, October 1999.

2. Staff, State of Alaska DOT&PF, Engineering Geology & Exploration Manual, May 1993.

3. Wahraftig, Clyde, Physiographic Divisions of Alaska, U.S. Geologic Survey Professional Paper 482, 1965.

4. G. Plafker, L.M. Gilpin, J.C. Lahr, Neotectonic Map of Alaska, The geological Society of America, 1993.

5. USGS National Seismic Earthquake Hazards program, Interactive Deaggregations, 1996 at web site http://eqintl.cr.usgs.gov/eq/html/deaggint.shtml.

6. AASHTO Acceleration Coefficient Contour Map, Standard Specifications for Highway Bridges, 1992, Fifth Edition.

APPENDIX A

AKDOT&PF Textural Soil Descriptions

ALASKA DEPARTMENT OF TRANSPORTATION TEXTURAL SOIL DESCRIPTION

REVISED: APRIL 98

NOTES: 1) ALL SILTS WITH A PLASTIC INDEX > 4 SHALL BE TERMED "SLIGHTLY CLAYEY."
2) SANDS AND GRAVELS WITH 7% THRU 12% SILT AND/OR CLAY(0.075 mm) SHALL BE TERMED "SLIGHTLY SILTY" OR IF PLASTIC, (PI > 4) "SLIGHTLY CLAYEY" SAND OR GRAVEL.

(SILT/CLAY < 0.075 mm DIAMETER)
(SAND 0.075 mm TO 2.0 mm DIAMETER)
(GRAVEL 2.0 mm TO 75 mm DIAMETER)
(COBBLES 75 mm TO 305 mm DIAMETER)
(BOULDERS +305 mm DIAMETER)

COARSE-GRAINED SOILS
35% OR LESS SILT/CLAY

- GRAVEL > SAND
  - LESS THAN 20% SAND
    - MORE THAN 12% SILT/CLAY
      - PI > 10 → CLAYEY GRAVEL
      - PI ≤ 10 → SILTY GRAVEL
    - 12% OR LESS SILT/CLAY → GRAVEL
  - 20% OR MORE SAND
    - 12% OR LESS SILT/CLAY → SANDY GRAVEL
    - MORE THAN 12% SILT/CLAY
      - PI > 10 → CLAYEY SANDY GRAVEL
      - PI ≤ 10 → SILTY SANDY GRAVEL
    - MORE SILT/CLAY THAN SAND
      - PI > 10 → SANDY CLAYEY GRAVEL
      - PI ≤ 10 → SANDY SILTY GRAVEL
- SAND ≥ GRAVEL
  - 20% OR MORE GRAVEL
    - MORE SILT CLAY THAN SAND
      - PI ≤ 10 → GRAVELLY SILTY SAND
      - PI > 10 → GRAVELLY CLAYEY SAND
    - MORE THAN 12% SILT CLAY
      - PI ≤ 10 → SILTY GRAVELLY SAND
      - PI > 10 → CLAYEY GRAVELLY SAND
  - LESS THAN 20% GRAVEL
    - 12% OR LESS SILT CLAY → GRAVELLY SAND
    - 12% OR LESS SILT CLAY → SAND
    - MORE THAN 12% SILT CLAY
      - PI ≤ 10 → SILTY SAND
      - PI > 10 → CLAYEY SAND

FINE-GRAINED SOILS
MORE THAN 35% SILT/CLAY

- PI ≤ 10
  - 20% OR MORE GRAVEL
    - SAND ≥ GRAVEL
      - 20% OR MORE SAND → GRAVELLY SANDY SILT
      - GRAVEL > SAND → SANDY GRAVELLY SILT
    - LESS THAN 20% SAND → GRAVELLY SILT
  - LESS THAN 20% GRAVEL
    - 20% OR MORE SAND → SANDY SILT
    - LESS THAN 20% SAND → SILT
- PI > 10
  - LESS THAN 20% GRAVEL
    - LESS THAN 20% SAND
      - LL > 40 → CLAY
      - LL ≤ 40 → SILTY CLAY
    - 20% OR MORE SAND
      - LL > 40 → SANDY CLAY
      - LL ≤ 40 → SANDY SILTY CLAY
  - 20% OR MORE GRAVEL
    - LESS THAN 20% SAND
      - LL > 40 → GRAVELLY CLAY
      - LL ≤ 40 → GRAVELLY SILTY CLAY
    - 20% OR MORE SAND
      - SAND ≥ GRAVEL
        - LL > 40 → GRAVELLY SANDY CLAY
        - LL ≤ 40 → GRAVELLY SANDY SILTY CLAY
      - SAND < GRAVEL
        - LL > 40 → SANDY GRAVELLY CLAY
        - LL ≤ 40 → SANDY GRAVELLY SILTY CLAY

PRECONSTRUCTION SAMPLE SUMMARY

Project Name Seward Hwy MP 18-25

Project No. 53919 Sampled By Ondra Structure Bridge No. 609

Station							
Offset (feet)							
Depth (feet)		4.6-5.2 m	7.6-8.2 m	9.1-9.4 m	18.1-18.7 m	21.3-21.9 m	3.0-3.7 m
Test Hole No.		TH 609-01-10	TH 609-01-10, B	TH 609-01-10, B	TH 609-01-10, B	TH 609-01-10, B	TH 609-01-11, B
Field No.		FS 15-17	FS 25-27.5	FS 30-31	FS 60-61.5	FS 70.5-72	FS 10-11.5
Date Sampled		09/06/2001	09/06/2001	09/06/2001	09/06/2001	09/06/2001	09/12/2001
Lab No.		01A-3237	01A-3238	01A-3239	01A-3240	01A-3241	01A-3242
	75						
	50				100		
	25.0	100	100		94		
Percent	19.0	92	98		89	100	100
	12.5	85	93		89	98	99
Passing	9.5	79	87		85	97	99
	4.75	63	72	100	77	97	98
Sieve	2.00	46	53	99	62	96	93
	.425	22	25	92	27	87	74
Size	.180						
	.075	9.9	11.3	48.6	11.1	36.3	34.0
	.020						
	.002						
DOTTSD		Sl Si Sa Grl		Sa Si		Sa Si	Si Sa
AASHTO Class		A-1-a(0)		A-4(0)		A-4(0)	A-2-4(0)
FSV Class							
Unified Class							
Liquid Limit		NV		NV		NV	NV
Plastic Index		NP		NP		NP	NP
Moisture Content %							
Organic Content %							
% Gravel		54	47	1	38	4	7
% Sand		36	42	50	51	60	59
% Silt & Clay		10	11	49	11	36	34
Max. Dry Density							
Opt. Moisture %							
Degradation Value							
L.A. Abrasion Loss							
Sulfate Soundness		/	/	/	/	/	/

Note: Gradation test based on minus 75 mm material. AASHTO class may be inappropriate if organic content > 5%. The sampler used to take the above samples has and inside diameter of 35 mm or 50 mm, therefore soil particles with a diameter larger than 35mm or 51 mm was not recovered. See test hole logs for a field description of tested materials.

PRECONSTRUCTION SAMPLE SUMMARY

Project Name Seward Hwy MP 18-25

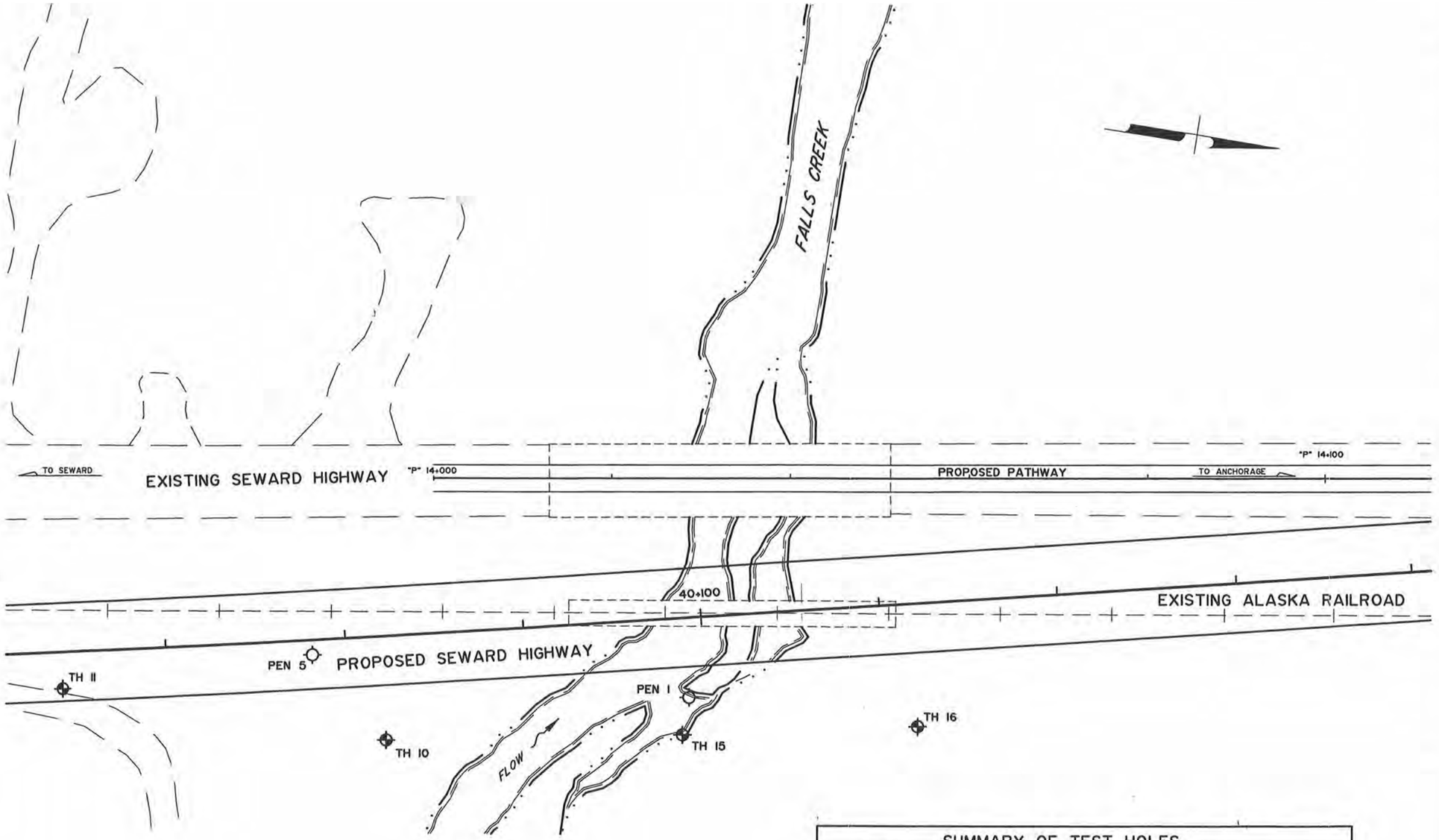
Project No. 53919 Sampled By Ondra Structure Bridge No. 609

Station							
Offset (feet)							
Depth (feet)		7.6-8.2 m	9.1 m - 9.7 m	11.9 m - 12.2 m			
Test Hole No.		TH 609-01-11	TH 609-01-11	TH 609-01-16			
Field No.		FS 25-27	FS 30-32	FS 39-41			
Date Sampled		09/12/2001	09/12/2001	09/24/2001			
Lab No.		01A-3243	01A-3244	01A-3246			
	75						
	50						
	25.0		100				
Percent	19.0		97	100			
	12.5	100	86	95			
Passing	9.5	100	79	92			
	4.75	98	62	78			
Sieve	2.00	88	42	60			
	.425	63	21	28			
Size	.180						
	.075	38.0	9.9	10.4			
	.020						
	.002						
DOTTSD							
AASHTO Class							
FSV Class							
Unified Class							
Liquid Limit							
Plastic Index							
Moisture Content %							
Organic Content %							
% Gravel		12	58	40			
% Sand		50	32	50			
% Silt & Clay		38	10	10			
Max. Dry Density							
Opt. Moisture %							
Degradation Value							
L.A. Abrasion Loss							
Sulfate Soundness		/	/	/	/	/	/

Note: Gradation test based on minus 75 mm material. AASHTO class may be inappropriate if organic content > 5%. The sampler used to take the above samples has and inside diameter of 35 mm or 50 mm, therefore soil particles with a diameter larger than 35mm or 51 mm was not recovered. See test hole logs for a field description of tested materials.

APPENDIX C

TEST HOLE LOCATIONS AND LOGS



SUMMARY OF TEST HOLES				
TEST HOLE DESIGNATION	STATION	OFFSET	NORTHING	EASTING
TH 11	40+028.0	4.8 m RT.	45580.7±	16476.6±
PEN 5	40+056.3	1.6 m RT.	45607.9±	16468.4±
TH 10	40+064.0	11.6 m RT.	45617.6±	16476.5±
PEN 1	40+098.2	8.9 m RT.	45650.4±	16466.3±
TH 15	40+097.2	13.1 m RT.	45650.3±	16470.6±
TH 16	40+123.4	13.8 m RT.	45676.1±	16465.4±

THESE STATION AND OFFSETS ARE BASED ON DESIGN CENTERLINE 8/1/03.

SHEET NO.	TOTAL SHEETS
STATE	YEAR
ALASKA	2003
PROJECT DESIGNATION	
STP-031-1(27)/53919	

GENERAL NOTES:

1. REFERENCE POINT STATION WERE LOCATED USING A CLOTH TAPE FROM EXISTING LANDMARKS.
2. TESTHOLE AND CONTINUOUS PENETROMETER ELEVATIONS WERE LOCATED FROM R & M REFERENCE POINTS USING A LEVEL AND ROD.
3. HORIZONTAL AND VERTICAL GEOMETRY FURNISHED BY CENTRAL REGION HIGHWAY DESIGN SECTION. TOPOGRAPHIC DATA PROVIDED BY R & M CONSULTANTS IN OCTOBER 2000.

LEGEND

- TESTHOLE
- PENETROMETER
- TESTPIT

Reviewed by
Terry L. Barber, C.P.G.

TEST HOLE LOGS
AND LOCATIONS

SEWARD HIGHWAY
MP 18 TO MP 25

FALLS CREEK
GENERAL LAYOUT

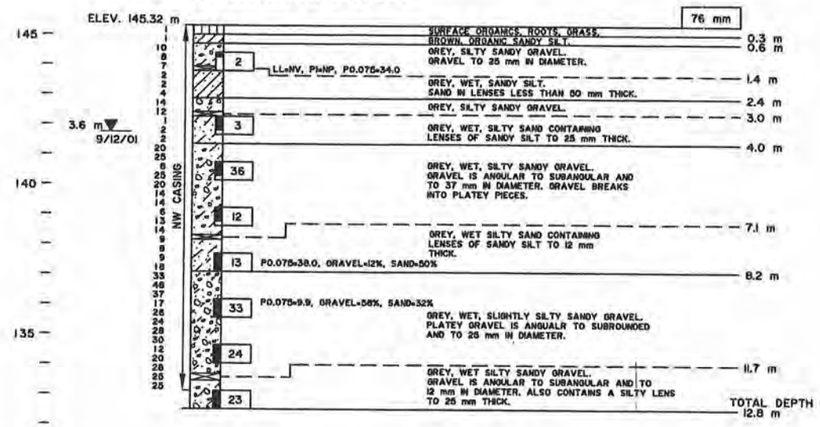
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

BRIDGE NO: 609
DRAWING NO: 1 OF 5

DWG NAME: C:\MATLS\BASE-SEW4\PLN-BASE-SEW4 | DATE: 9/15/03 | VIEW=FALLS

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	STP-031-1(27) 53919	2003		

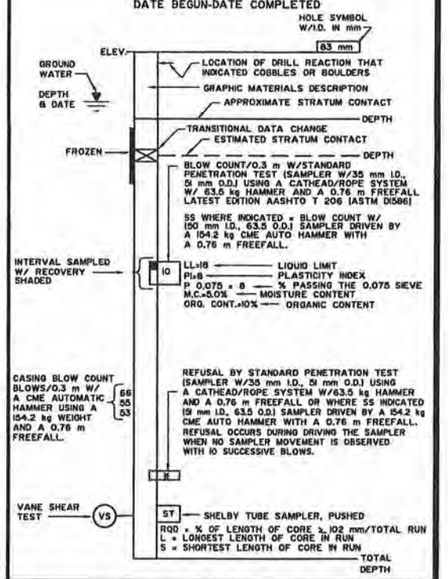
TEST HOLE II
STA. 40+028.0, 4.8 m RT.
9/12/01
N 45580.7±, E 16476.6±



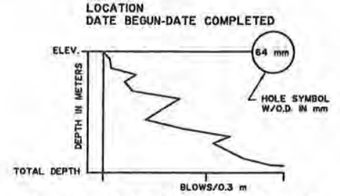
NOTE:

1. NW CASING PULLOUT BREAK FORCE AT 12.8 m IN DEPTH WAS 0 kN.

TYPICAL TEST HOLE LOG



TYPICAL PENETROMETER TEST LOG



PENETROMETER W/64 mm O.D., WITH A CME AUTOMATIC HAMMER USING A 155 kg WEIGHT AND A 0.76 m FREEFALL.

Reviewed by
Terry L. Barber, C.P.G.

TEST HOLE LOGS AND LOCATIONS

SEWARD HIGHWAY
MP 18 TO MP 25

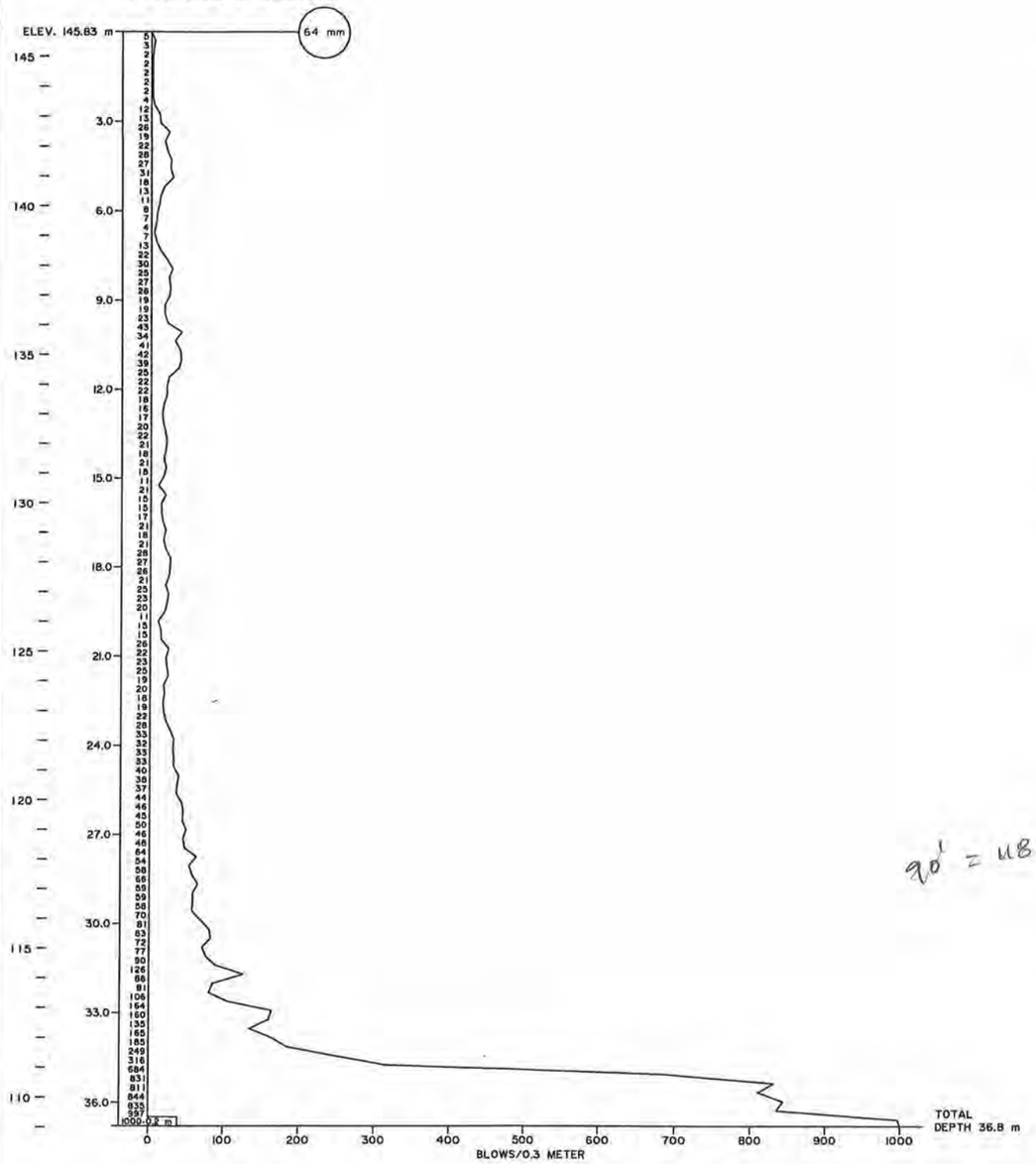
FALLS CREEK
BRIDGE APPROACH

STATE OF ALASKA
DEPARTMENT of TRANSPORTATION
AND
PUBLIC FACILITIES

BRIDGE NO: 609
DRAWING NO: 2 OF 5

DWG NAME: C:\CADD\MATLSV\SEWARD06-25\FALLS\LOGS-FALLS VIEW 1 | DATE: 9/15/03 | SCALE: 1 = 100

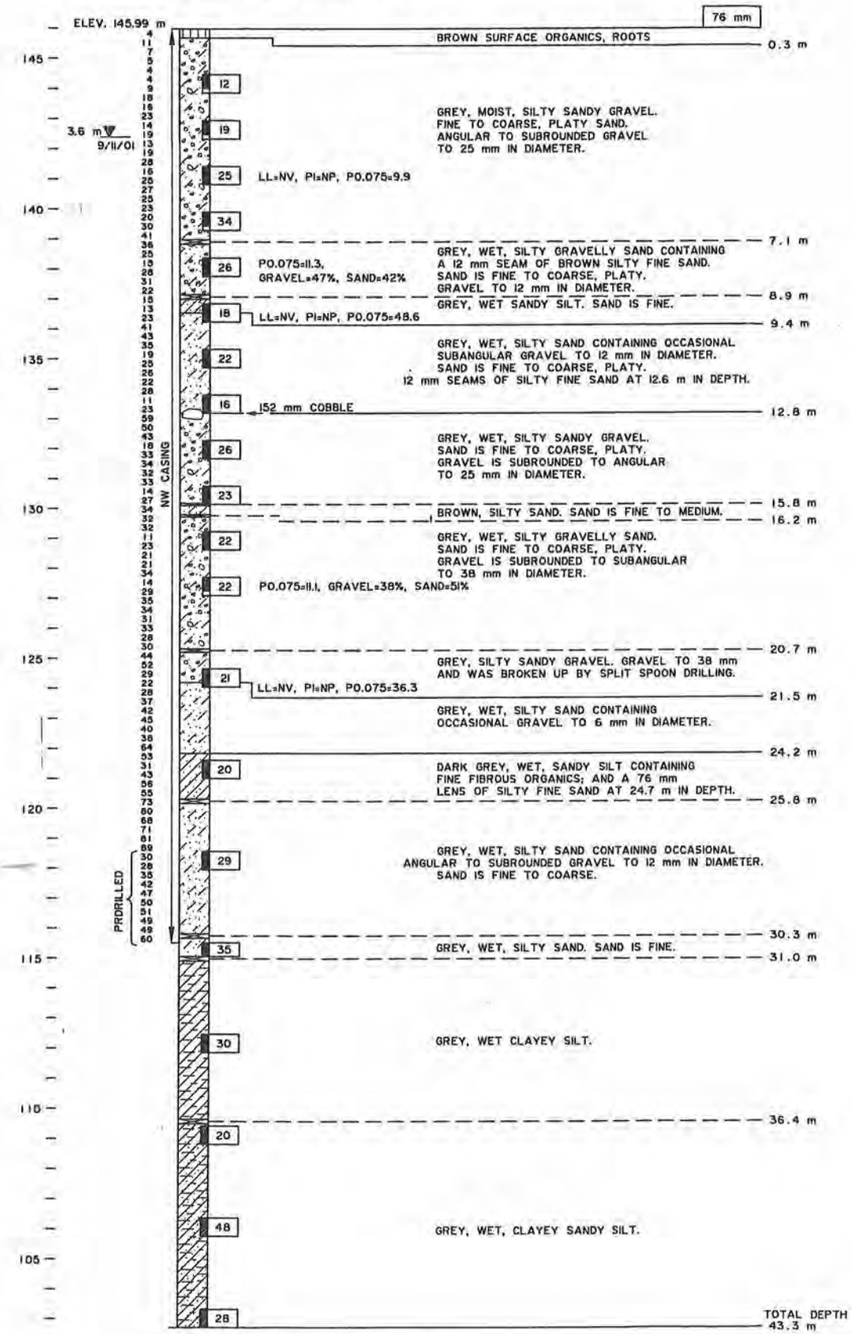
PENETROMETER 5
STA. 40+056.3, 1.6 m RT.
8/21/01
N 45607.9±, E 16468.4±



NOTES:

1. RODS WOULD NOT ROTATE AT 23.8 m IN DEPTH WITH A 609 mm PIPE WRENCH..
2. PENETROMETER PULLOUT BREAK FORCE PRESSURE FROM 36.8 m IN DEPTH WAS 200 kN.

TEST HOLE 10
STA. 40+064.0, 11.6 m RT.
9/6/01-9/11/01
N 45617.6±, E 16476.5±

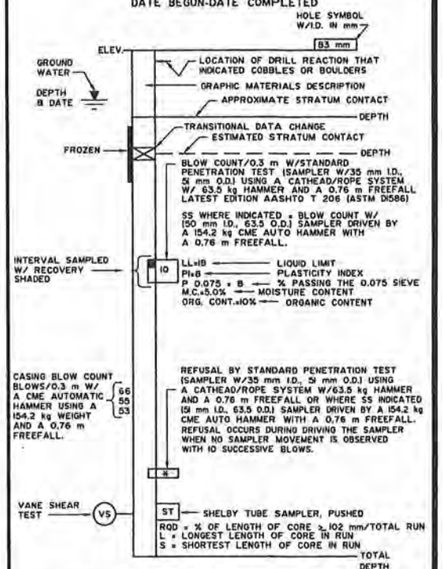


NOTES:

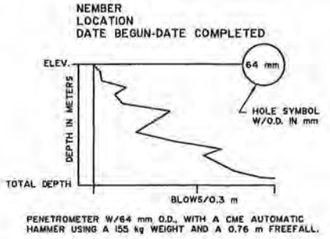
1. NW CASING PULLOUT BREAK FORCE IMMEDIATELY AFTER DRIVING TO 30.3 m WAS 100 kN.
2. OPEN HOLE ROTARY WASH BORED FROM 30.3 m TO 43.3 m IN DEPTH.

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	STP-031-1(27) 53919	2003		

TYPICAL TEST HOLE LOG



TYPICAL PENETROMETER TEST LOG



PENETROMETER W/64 mm O.D., WITH A CME AUTOMATIC HAMMER USING A 155 kg WEIGHT AND A 0.76 m FREEFALL.

Reviewed by
Terry L. Barber, C.P.G.

TEST HOLE LOGS AND LOCATIONS

SEWARD HIGHWAY
MP 18 TO MP 25

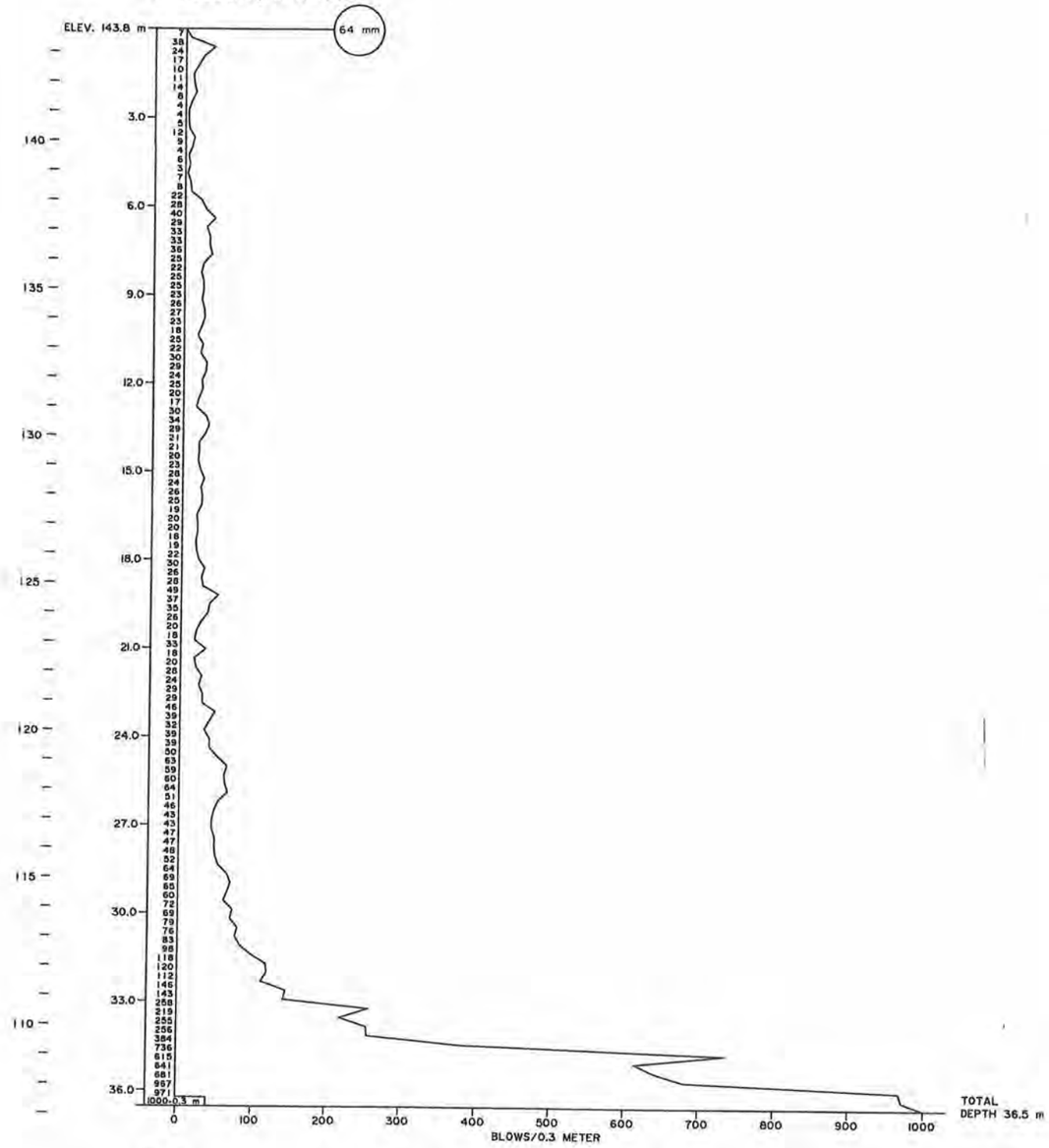
FALLS CREEK
ABUTMENT 1

STATE OF ALASKA
DEPARTMENT of TRANSPORTATION
AND
PUBLIC FACILITIES

BRIDGE NO: 609
DRAWING NO: 3 OF 5

DWG NAME: C:\CADD\MATLS\SEWARD\18-25\FALLS\LOGS\FALLS VIEW 2 | DATE: 9/17/03 | SCALE: 1 = 10.0

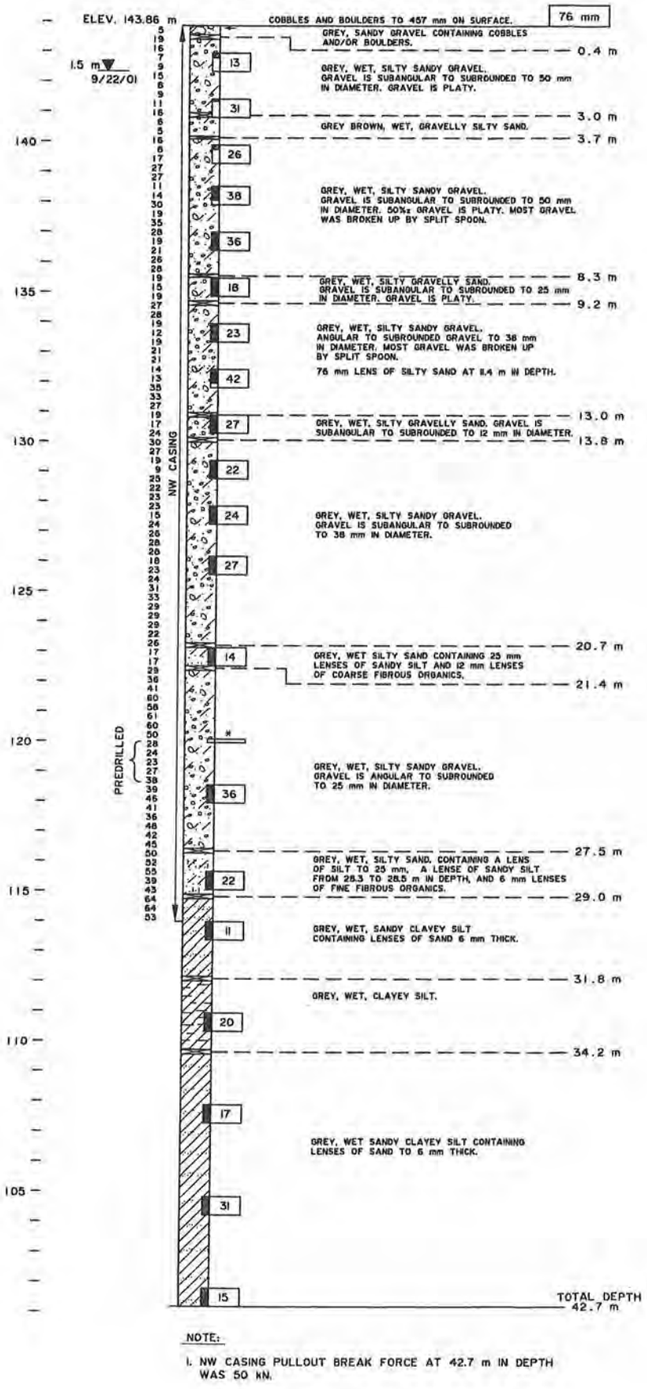
PENETROMETER 1
STA. 40+098.2, 8.9 m RT.
4/12/01-4/13/01
N 45650.4±, E 16466.3±



NOTES:

1. ROD COULD NOT BE TURNED WITH A 609 mm LONG PIPE WRENCH AT 25.59 m IN DEPTH.
2. PENETROMETER ROD PULLOUT BREAK FORCE FROM 36.5 m IN DEPTH WAS 200 kN.

TEST HOLE 15
STA. 40+097.2, 13.1 m RT.
9/20/01-9/22/01
N 45650.3±, E 16470.6±

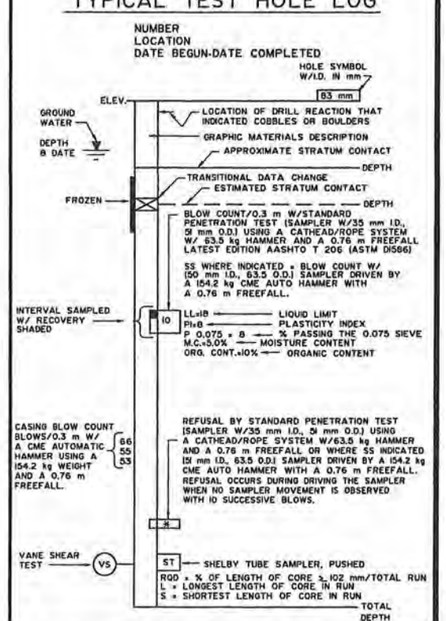


NOTE:

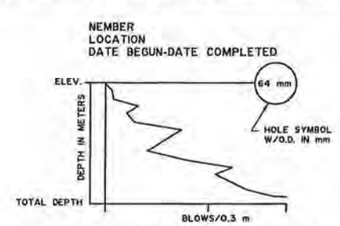
1. NW CASING PULLOUT BREAK FORCE AT 42.7 m IN DEPTH WAS 50 kN.

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	STP-031-1(27) 53919	2003		

TYPICAL TEST HOLE LOG



TYPICAL PENETROMETER TEST LOG



PENETROMETER W/64 mm O.D. WITH A CME AUTOMATIC HAMMER USING A 155 kg WEIGHT AND A 0.76 m FREEFALL.

Reviewed by
Terry L. Barber, C.P.G.

TEST HOLE LOGS AND LOCATIONS

SEWARD HIGHWAY
MP 18 TO MP 25

FALLS CREEK
ABUTMENT 2

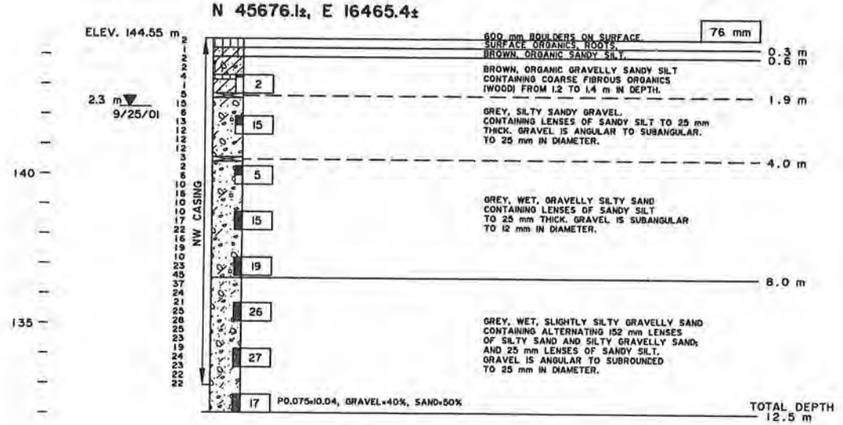
STATE OF ALASKA
DEPARTMENT of TRANSPORTATION
AND
PUBLIC FACILITIES

BRIDGE NO: 609
DRAWING NO: 4 OF 5

DWG NAME: C:\CADD\MATLS\SEWARD18-25\FALLSFALLOGS-FALLS VIEW 4 | DATE: 9/17/03 | SCALE: 1 = 10.0

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	STP-031-1(27) 53919	2003		

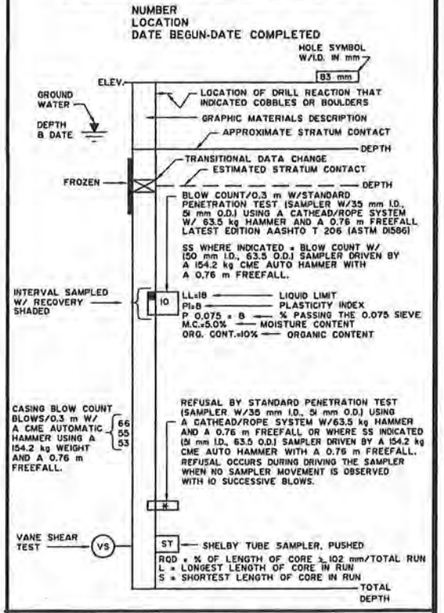
TEST HOLE 16
STA. 40+123.4, 13.8 m RT.
9/24/01-9/25/01
N 45676.1±, E 16465.4±



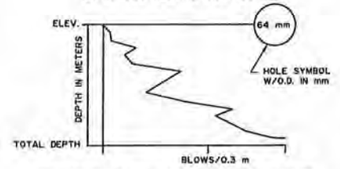
NOTE:

1. NW CASING PULLOUT BREAK FORCE AT 12.5 m IN DEPTH WAS 0 kN.

TYPICAL TEST HOLE LOG



TYPICAL PENETROMETER TEST LOG



PENETROMETER W/64 mm O.D. WITH A CME AUTOMATIC HAMMER USING A 155 kg WEIGHT AND A 0.76 m FREEFALL.

Reviewed by
Terry L. Barber, C.P.G.

TEST HOLE LOGS AND LOCATIONS

SEWARD HIGHWAY
MP 18 TO MP 25

FALLS CREEK
BRIDGE APPROACH

STATE OF ALASKA
DEPARTMENT of TRANSPORTATION
AND
PUBLIC FACILITIES

BRIDGE NO: 609
DRAWING NO: 5 OF 5

DWG NAME: C:\CADD\MATLSYS\SEWARD\18-25\FALLS\FLOGS-FALLS VIEW 6 | DATE: 9/16/03 | SCALE: 1 = 10.0