

APPENDIX D

Material Recommendations



Statewide Materials
Department of Transportation and Public Facilities

Memorandum State of Alaska

TO: Kevin Jackson, P.E.
Project Manager

DATE: February 21, 2020

THRU: Mike Yerkes, P.E.
Materials Group Chief

FROM: Mitch Miller, P.E.
Geotechnical Engineer

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SUBJECT: Dowling Road & Seward Hwy
Interchange Recommendations
Project No. CFHWY00359
Draft Geotechnical Recommendations

Central Region Materials (CRM) conducted a field exploration program that required multiple mobilizations in support of design elements. The goal of the geotechnical investigation was to evaluate the subsurface soils ability to support the proposed improvements and evaluate the condition of the existing highway and frontage road embankments. A major component of this effort was establishing the accuracy of existing construction records. Verifying the accuracy of the asbuilt drawings allowed us to comfortably interpolate between test hole locations and utilize those records as well as historical test hole information in the development of these recommendations.

Project History

Prior to development in the late 1960s and early 1970s the area around the Seward Highway and Dowling Road interchange was characterized by undulating topography with intermittent peat deposits in the low lying areas. The interchange area was developed in phases. Its current configuration is the result of the following series of projects listed in chronological order:

Seward Highway 1969-1971

Dowling to Northern Lights Blvd. Grading, Drainage, Surfacing, Illumination, Signalization & Bridges_F-031-2(25)

- Constructed an unsurfaced 4-lane separated highway embankment from 68th Ave to Dowling Rd. The next phase finished the embankment with subbase, base and pavement.
- Constructed and paved 4-lane separated highway from Dowling Rd. to the tie in with the Old Seward Hwy alignment north of 36th Ave.
- Removed all peat from under the embankment footprint with the exception of short section north of Tudor Road where exceptionally deep peat was found. A combination of partial depth removal followed by rolling surcharge/displacement was used across the area.
- Constructed bridges over Campbell Creek.

Seward Highway 1970-1971

Potter to Dowling Road Grading, Drainage, Surfacing_F-031-2(13)

- Constructed and paved 2-lane highway from south end of Potter Marsh to Dimond Blvd. (became the southbound lanes of the divided highway ultimate configuration)
- Constructed and paved 4-lane separated highway from Dimond Blvd. to Dowling Rd
- Removed all peat from under the embankment footprint

Seward Highway 1975-1976

Seward Highway Interchanges Dimond and Dowling Grading, Drainage, Paving, Bridges and Illumination_RF-031-2(34)

- Constructed grade-separated interchanges at Dimond Blvd. and Dowling Rd.
- Extended the peat dig out limits to include the embankment widening resulting from the mainline grade raises at the interchanges
- Extended 4-lane divided highway to approx. 1,800 feet south of Dimond
- Paved previously placed Brayton Dr. embankment from DeArmoun to Dowling
- Surcharged and paved portions of the frontage roads that were realigned at the new interchanges
- Surcharged and paved on and off ramps at the new interchanges

Dowling Road 2002-2003

Dowling Road Old Seward Hwy to Lake Otis Pkwy_NH-0532(4)/59599

- Reconstructed Dowling Road from a 2-lane roadway with signalized intersections at the Seward Hwy ramps to its current 4-lane width with a center two-way left turn only lane.
- Replaced the signalized intersections at the highway ramps with the existing roundabouts.
- Project removed all organic peat from beneath Dowling Road and for a limited distance along each Seward Hwy ramp.

Seward Highway 2012-2013

Seward Highway Reconstruction Dowling Road to Tudor Road_NH-0A3-1(43)/50816

- Increased the highway to eight lanes wide between Dowling Rd. and Tudor Rd.
- Extended the peat digout the full width of the new roadway, including the Dowling Rd. northbound on ramp and southbound off ramp that were previously surcharged during the interchange construction project.

Seward Highway 2017-2018

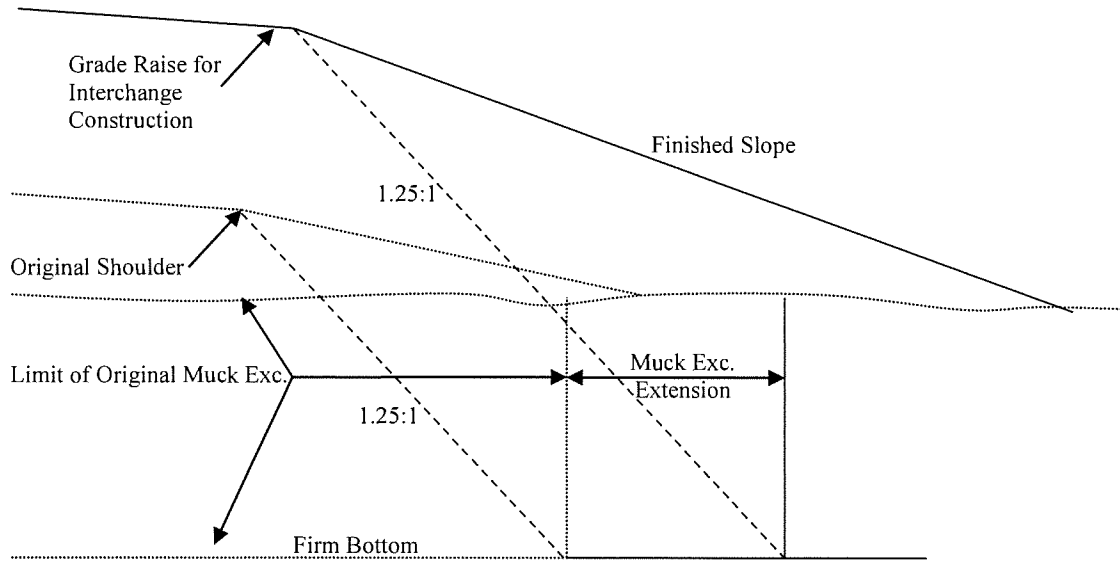
Seward Highway Reconstruction Dimond Blvd. to Dowling Road_CFWY000162

- Increased the highway to eight lanes between Dimond Blvd. and Dowling Rd.
- Extended the peat digout full width of the new roadway, including the Dowling Rd. northbound off ramp and southbound on ramp that were previously surcharged during the interchange construction project

Previous Muck (Peat) Excavation Limits

Seward Highway

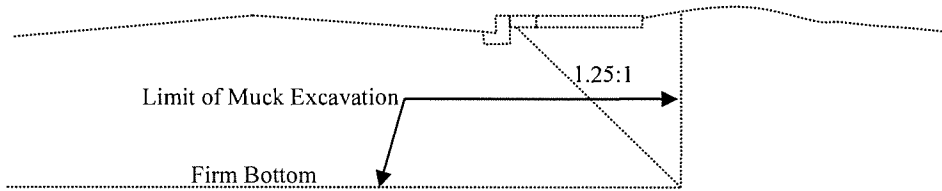
The projects that constructed the Seward Highway excavated the peat from under the mainline embankment. The project that constructed the Dowling Interchange extended the muck removal as shown below.



Seward Highway Muck Excavation Limits

Dowling Road

The 2002 project that reconstructed Dowling Road excavated the peat from under the mainline embankment. Removal limits were defined as shown below.



Dowling Road Muck Excavation Limits

Recommended Muck Excavation Limits

Roundabout and Approach Ramps

It is recommended that all the peat be removed from under the shifted roundabout and approach ramp locations. The removal limits should be defined by a 1.25H:1V line projected from the top back of curb or finished shoulder down to the bottom of the peat layer. The anticipated bottom of excavation elevations are given on the following table.

Muck Excavation

Alignment	STATION FROM	STATION TO	EL Firm Bottom	NOTES
RAMP DO1	3102+00	3104+00	123	Peat has been removed beneath existing ramp. Expand removal where new alignment diverges off existing ramp.
RAMP DO2	3208+00	3217+00	118	Existing ramp has been dug out. Extend dig out on project right where new alignment diverges off existing ramp.
RAMP DO3	3310+00	3313+00	117	Existing ramp has been dug out. Extend dig out on project left where new alignment diverges off existing ramp.
RAMP DO4	3401+00	3413+00	117	Existing ramp has been dug out. This excavation should tie into the existing ramp dig out on project right at Sta. 3407+50.
BRAYTON BD1	---	---	---	Proposed horizontal alignment matches existing Brayton Drive. No dig out is required.
BRAYTON BD2	---	---	---	Proposed horizontal alignment matches existing Brayton Drive. No dig out is required.
HOMER HD3	---	---	---	Proposed horizontal alignment matches existing Homer Drive. No dig out is required.
HOMER HD4	6601+06	6604+56	117	Terminate dig out on Homer Dr. along a 10H:1V transition from bottom of muck exc. (firm bottom) to the bottom of the new structural section.
DOWLING	3010+00	3019+00	114	Existing Dowling Road has been removed. Extend removal for proposed widening. Excavation ties into Ramp DO4 dig out.
	3021+00	3022+50	116	Existing Dowling Road has been removed. Extend removal for proposed widening. Excavation ties into Ramp DO4 dig out.

