

FROM: U S ARMY ENGINEER DISTRICT, ALASKA, P O BOX 7002, Anchorage, Alaska
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*Released Friday noon,
26 June 1964
Anchorage time*

QUAKE LIKELIHOOD

"Anchorage has not seen its last earthquake" Edwin B. Eckel, Chairman of the Field Team of Task Force 9, said, "though it is impossible for geophysicists to predict when the next one will occur." He cited that the frequency of occurrence of earthquakes in the world during the fifty year period prior to 1955 in the magnitude of 8 or greater is one every 8 months; 7.0 to 7.9 is one every 20 days; and 6.0 to 6.9 is one every three days. The frequency of occurrence in the Alaska area during the past 50 years in the magnitude of 8 or greater is one in 50 years; 7.0 to 7.9 is one in five years; 6.0 to 6.9 is one in three years.

It was emphasized no one can tell whether the next quake of magnitude 8 will strike tomorrow or more than 50 years from now, nor can it be foretold whether the epicenters will be closer to Anchorage than the Good Friday quake, or far out on the Aleutians.

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	UTILITIES	<u>CWE</u>	<u>Fund Source</u>	<u>Design Compl.</u>
f.	4th Ave. & L St. Restoration	750(A)	PL 875	27 June 4
g.	Repair of Dock Area Water Line	50(A)		
10.	Sanitary Sewer	7925(A)	PL 875	
a.	Inspection of Lines	750(A)		Aug. 4
b.	Redesign & Repair of Individual Portions not Otherwise Listed	3000(A)		Aug. 4 Dec. 4
c.	Turnagain Temp. Outfall	100(A)		20 June 4
d.	Dock Area Outfall	100(A)		July 4
11.	Streets, Curb, Cutter & Sidewalk	10000(A)	PL 875	

<u>Contr.</u> <u>Award</u>	<u>Scheduled</u> <u>Proj. Compl.</u>	<u>Actual</u> <u>Proj. Compl.</u>	<u>Remarks</u>
	Sept. 4		Result of soils study could modify minor portions of design. May be a "grant in lieu."
	Aug. 4		Critical area may be expanded subject to findings. Done by phases according to priority. Final phase to be completed by Aug. 64.
	Dec. 4 Nov. 5		Will be further broken down after proj. devel. Scope of work depends on findings of 10a. Priority work will be done in 64. Will be operable before end of 64 constr. season.
	Aug. 4		
	Aug. 4		
	Nov. 5		Scope of work dependent on results of soils study.

UTILITIES	<u>CWE</u>	<u>Fund Source</u>	<u>Design Compl.</u>	<u>Contr. Award</u>	<u>Scheduled Proj. Compl.</u>	<u>Actual Proj. Compl.</u>	<u>Remarks</u>
12. Storm Sewers	2600(A)	PL 875					
a. Inspection of Lines			Sept. 4		Sept. 4		Same as 10a.
b. Redesign & Repair of Individual Portion			Aug. 4 Dec. 4		Dec. 4 Nov. 5		Will be further broken down after proj. devl. Scope of work depends on findings of 12a. Priority work will make system operable 64 construction season.

STATE OF ALASKA BUILDINGS -- Detailed breakdown to be furnished by State Division of Buildings,
Department of Public Works.

ANCHORAGE INDEPENDENT SCHOOL DISTRICT

SCHOOL	<u>C&E</u>	Fund <u>Source</u>	Design <u>Compl.</u>	Contr. <u>Award</u>	Scheduled <u>Proj. Compl.</u>	Actual <u>Proj. Compl.</u>	<u>Remarks</u>
1. West High School	10000(A)	TOTAL PL 875	Feb. 5		Sept. 5 Jan. 6		Decision on whether new site is required dependent on soils studies. Target of Sept. 65 - Very tight.
a. Repair at Existing Site							
b. New Site	5000						
2. Wendler Junior High School	1000	(Items 2 - 6)	July 4		Aug. 4		Items 2 - 6. No major reconstruction involved.
3. Denali Elementary School			July 4		Aug. 4		
4. East High School			July 4		Aug. 4		
5. Ora D. Clark Jr. High School			July 4		Aug. 4		
6. Central Jr. High School			July 4		Aug. 4		
7. Government Hill Elementary School							
a. Demolition					Aug. 4		Criteria pkg for demo project compl.
b. New Building	900		July 4		July 5		Compl. schedule depends on real estate being available in June 64.

SPENARD P.U.D.

UTILITIES	<u>CWE</u>	<u>Fund Source</u>	<u>Design Compl.</u>	<u>Contr. Award</u>	<u>Scheduled Proj. Compl.</u>	<u>Actual Proj. Compl.</u>	<u>Remarks</u>
1. Emergency Repair, 153(D) Spenard PUD Sewer System		PL 875		20 Apr.	Aug. 4		Cont. No. 64-38 Inlet Co.
2. Permanent Restoration							
	1700(A)	PL 875					
a. Inspection	750(A)		Aug. 4		Aug. 4		Critical area may be expanded subject to findings. Construction to be broken into phases.
b. Fish Creek Trunk					Sept. 4		
c. Redesign & Repair, Individual Portions							Scope of work dependent on 2a.

URBAN RENEWAL

Planning to be completed 10 days after soil study reports received. Then legislation passed and scope of work approved.

Distribution:

Executive Director, FR&DPC
City of Anchorage
Alaska State Housing Authority
Corps of Engineers
OEP - 2

Dollar Amounts in 000's

ITEM	<u>CWE</u>	<u>Fund Source</u>	<u>Design Compl.</u>
1. Repair Sewage Lift Station	7		
2. Demolition & Cleanup	129		
3. Restoration Public Util. & Facilities	23		
a. Damage Report	1		
b. Sewage Lift Station	.2		
c. Spruce Cape Water Line	.3		
d. Tagura Rd. Kraft Water High School	6		
e. Trailer Camp	9		
f. Restoration Streets, Side- walks, Sewers, Storm Drains, Water System (Other than above items)	30		
4. Loan of Pontoon 200 Dry Dock			
5. Kraft Water System	4		
6. Tagura Rd.	12		

June 24, 1964

KODIAK

<u>Contr.</u> <u>Award</u>	<u>Scheduled</u> <u>Proj. Compl.</u>	<u>Actual</u> <u>Proj. Compl.</u>	<u>Remarks</u>
	26 May 4	26 May 4	
	8 May 4	8 May 4	
	3 Apr.	3 Apr. 4	
	15 Apr.	15 Apr. 4	
	1 May	1 May 4	
	3 June	3 June 4	
	8 June	8 June 4	
	15 July	15 July 4	
	5 May	5 May 4	
	8 Aug. 4		
	8 Aug. 4		

	ITEM	<u>CWE</u>	<u>Fund Source</u>	<u>Design Compl.</u>
7.	Streets & Sidewalks	378		
8.	Sewer System	57		
9.	Water System	234		
10.	Storm Drains	8		
11.	City Dock	743		
12.	Small Boat Harbor	49		
13.	Harbor Master Building	8		
14.	60 Trailers	348		
a.	Restoration of Trailers	7.5		
15.	Restoration Kitoi Bay Research Station, Afognak	310		
16.	Inner Harbor Fac. Replacement	400	PL 875	
a.	Restore Parking Lot to Proper Grade			
b.	Restore Access Road on NW Side of Small Boat Harbor Basin			
c.	Creek Diversion	35		

ITEM	<u>CWE</u>	<u>Fund Source</u>	<u>Design Compl.</u>	<u>Contr. Award</u>	<u>Scheduled Proj. Compl.</u>	<u>Actual Proj. Compl.</u>	<u>Remarks</u>
17. Kodiak-Downtown	5100	URA					5100 is URA's portion of 75-25% split of net proj. cost between URA (75%) and local interests (25%).
a. Appraisal					18 May 4		
b. Acquisition							Start 6 July 64. Dependent on availability of funds.
c. Relocation							Start 6 July 64.
d. Site Clearance							Start 15 July 64.
e. Site Preparation							Start 5 July 64.
f. Site Improvements							Start 5 July 64.
g. Site Disposition							Start 10 July 64.
18. Kodiak-Dock & Warehouse	300						Bureau of Commercial Fisheries Facility.
a. Phase #1				15 Aug.	15 Oct. 4		This will provide basic facilities required.
b. Phase #2							
19. Kodiak Thru Highway	150	FAH (BPR)	1 Aug. 4		31 Dec. 4		

JOINT RELEASE: U S ARMY ENGINEER DISTRICT, ALASKA
TASK FORCE 9 - SENATOR ANDERSON COMMISSION

4TH AVENUE SLIDE

Task Force Nine reported today to the Senator Anderson Commission that a large area of downtown Anchorage can be used if major stabilization measures are taken in the Fourth Avenue slide area.

The Task Force has concluded the area, as it is today, is unstable under earthquake stresses, although under static conditions it is stable. Before the High Risk designation can be removed, regrading, buttressing of the slope and drainage must be accomplished. The necessary stabilization measures would cost several million dollars, according to preliminary engineering estimates.

* See page 4

Federal, State and local officials are considering whether the stabilization measures would be economically justified, and if so, from what sources necessary funds might be obtained. Even with stabilization of the slide area, certain restrictions on land use must be applied. Since some subsidence and settlement can be expected in the area south of Fourth Avenue, special consideration should be given to foundation design. Because greater ground displacements can be expected in a zone 300 feet south from the crest of the slide, special design precautions must be taken to account for the differential, horizontal, and vertical ground displacements. The lower, or First Avenue limit of the area can

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be defined only after final design of stabilization measures. The regraded area must remain a high risk area for purposes of building repair or new construction. Restoration of utilities passing through the slide area can be done.

By stabilizing the slide area, the adjacent area between Fourth and Fifth Avenue, previously classified as High Risk can be preserved and made safe for restoration of damaged facilities and new construction.

Besides the Fourth Avenue area, the Task Force lifted restrictions on residential development areas of the Turnagain Arm bluffs in the vicinity of Campbell Point and Rabbit Creek. The rating on the steep face of the Turnagain Arm bluff at Point Campbell and Rabbit Creek has been rated "High Risk Final Classification."

The soils study on which the findings are based was made under a \$700,000 contract by Shannon and Wilson, Soils Consultants of Seattle, Washington. The study was organized by the U. S. Army Corps of Engineers, Alaska District and funded by the Office of Emergency Planning. It is continuing, and will cover all hazardous areas in the city of Anchorage and significant areas of Seward and Valdez.

The soils study recommendations have been presented to the city for the information and guidance of city officials in regulating reconstruction and zoning of the slide area.

The study recommendations were based on findings made by drilling, sampling and testing the slide zone. In the Fourth Avenue slide zone

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alone, 36 drill holes were bored to depths up to 150 feet. A total of 850 samples were tested. Twenty samples were subjected to intricate dynamic tests simulating an actual earthquake. The remainder were tested for static load-bearing qualities and other more routine soil tests.

The District Engineer said that Shannon and Wilson is continuing its drilling and testing of other Anchorage slide areas. The second interim report will be on L Street slide area scheduled July 6. A third report on the Turnagain slide area is scheduled July 11; a report on other slide areas including First Avenue, Romig Hill, Chester Creek and Government Hill is due July 25.

Generally speaking, what occurred in the March 27 earthquake in the slide zone was a slow continuous outward movement. It began near the end of the 8.5 magnitude earthquake, which lasted about three minutes, and stopped horizontal movement about the end of the quake. Cracking is evident on the surface in a zone surrounding the slide on the east, west and south in a border as much as two blocks wide in places. There are signs that an incipient trough (graben) developed north of Fifth Avenue near D Street intersection.

The slide moved horizontally. There was no measurable lowering involved for a mass of land four blocks long and a block and a half wide. It moved northwesterly about 18 feet while remaining intact.

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As this was occurring another area involving half of Fourth Avenue, about three blocks long, sank gradually and fairly evenly 10 feet down in a graben.

While this was happening at the top of the slide, the bottom, in the vicinity of First and Second Avenue, formed a pressure ridge with attendant property damage.

The study showed that the area is underlain by a 40-foot layer containing soils subject to loss of strength when disturbed. This layer contains sands and clays which tend to liquify under repeated shock loading. During the earthquake, a stratum of this layer became weakened permitting the landslide.

The slide took place in the vicinity of a previous slide which occurred some 100 years ago. The March 27 slide extends farther east than the previous slide, according to evidence.

The Task Force will issue a map which shows the ratings for all areas in the Anchorage area, excluding military reservations. The latest map supersedes a map issued on May 19 which showed original tentative classifications.

* The area of the Fourth Avenue slide is bounded on the north by the railroad tracks in front of the Alaska Railroad depot, on the east by Barrow Street, on the south by an alley between Fifth and Sixth Avenues and on the west by E street.

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The Task Force 9 Field Team rates areas of Anchorage for the Reconstruction Commission as a guide in developing insurance and loan policies of the Federal Housing Authority (FHA) and the Small Business Administration (SBA).

The rating definitions are: High Risk Pending Final Classification - Requires further study before final determinations can be made as to stability; High Risk Final Classification - Land considered unstable, particularly in event of future earthquakes; no reasonable means of stabilization known. No repair, rehabilitation, or new construction involving use of Federal funds is recommended. Private investment should be considered imprudent; Nominal Risk Area - Little likelihood of landslides except for small slumps, largely in artificial fill. In all other respects risks are no greater than is normally expected in the construction industry. Current Uniform Building Code for Seismic Zone 3 applies both to new buildings and to plans for rehabilitation of earthquake-damaged structures; Provisional Nominal Risk (4th Avenue slide area) - Change of this classification to a normal risk category is contingent upon construction of properly designed stabilization measures.

Task Force 9's Field Team includes Edwin B. Eckel, chairman, U. S. Geological Survey; Ernest Dobrovolsky, U.S.G.S., both of Denver, Colorado; Harold Stuart, Division geologist and Ove Carstensen, structural engineer, both U. S. Corps of Engineers of Portland, Oregon; William Cloud, seismologist, U. S. Coast and Geodetic Survey, San Francisco. Colonel Harry

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Tufts and Colonel William Penley of the Anderson Commission's Washington staff assisted the Field Team in its Anchorage work, as did Dr. Karl Steinbrugge, Consultant to U.S.C. and G.S. and a number of geologists assigned by the U. S. Geological Survey.

Consultants to the Alaska District are: Dr. Ralph B. Peck, Professor of Foundations Engineering, University of Illinois; Mr. Thomas F. Thompson, Consulting Geologist, San Mateo; Dr. Laurits Bjerrum, head Norwegian Geotechnical Institute.

Consultants assisting the Shannon-Wilson organization are: Dr. Harry B. Seed, University of California; Dr. Neil Twelker, Consultant, Seattle; Dr. Richard Meese, University of Washington; Mr. Robert Spence, Consultant, Vancouver.

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ANCHORAGE

Rec Plan

This plan has been coordinated with the City of Anchorage by the Corps of Engineers.

UTILITIES	CWE	Fund Source	Design Compl.	Contr. Award	Scheduled Proj. Compl.	Actual Proj. Compl.	Remarks
1. City Dock Repair	5(D)*	PL 875		29 Mar.	1 Apr. 4	30 Mar. 4	Cont. No. 64-14 M.B. Contr. Co. (Denali RE)
2. Water & Sewer Restoration— Turnagain & W. Turnagain	190(D)	PL 875	7 Apr. 4	8 Apr.	Oct. 4	15 May 4	Cont. No. 64-25 N.E. Sommers (Denali RE) 25% materials ordered Const. to commence prior to soils study.
3. Dry Cargo Dock Storage (Tel. Dept. Emergency Work Added by Modification)	150(D)	PL 875	7 Apr.	8 Apr.	Oct. 4	4 May 4	Cont. No. 64-27 M.B. Contr. Co. (Denali RE)
4. Emergency Sewer Restoration— Bootleggers Cove	36(D)	PL 875		8 Apr.	Oct. 4	22 Apr. 4	Cont. No. 64-31 Alaska Plumbing & Heating (Denali RE)
5. Demolition Proj. #1, No. Side 4th Ave., A to E Sts.	283(D)	PL 875		21 Apr.	Oct. 4	20 May 4	Cont. No. 64-39 Chris Berg, Inc. (Denali RE)
6. Municipal Power & Light Repair	54(D)	PL 875	27 Apr.	28 Apr.	Oct. 4		Cont. No. 64-42 W.R. Grasle Co. (Denali RE)
7. Emergency Sewer Restoration, K-L Sts.	73(D)	PL 875	10 Apr.	9 Apr.	23 Apr. 4	25 Apr. 4	Cont. No. 64-50 B-E-C-K (Denali RE)

*/(A) indicates first preliminary cost estimate;

(D) indicates amount for which the construction contract was actually awarded.

UTILITIES	<u>CWE</u>	<u>Fund Source</u>	<u>Design Compl.</u>
8. Municipal Light & Power	750(A)	PL 875	
a. Underground System			30 July
b. Overhead System			30 July
9. Water System	6747(A)	PL 875	
a. Restoration of Turnagain Service	500(A)		8 June 4
b. Replace 24" Water Line between Gamble & Pine, Pine St. to Plant	2200(A)		28 July Nov. 4
c. Treatment Plant	150(A)		28 Sept.
d. Repair of other City water lines not separately listed	100(A)		3 Aug.
e. Pipe Procurement	700(A)		
(1) Except 24"			
(2) 24" Main			

<u>Contr.</u> <u>Award</u>	<u>Scheduled</u> <u>Proj. Compl.</u>	<u>Actual</u> <u>Proj. Compl.</u>	<u>Remarks</u>
	Aug. 5		
	Aug. 5		Priority work during 1964, remainder in 1965.
		Oct. 4	25% materials ordered Const. to start in advance of soils study.
	Nov. 4		Line is now operable but has many leaks--Contracts will require line to be operable by Oct.
	Sept. 5		
	Sept. 5		System currently operable. Structural damage requires repair.
	Aug. 5		Will be further broken down after proj. develop- ment. Priority work 1964; compl. subject to soils study. All work required to provide service to existing homes and busi- nesses to be completed in 64.
30 June 4			100% of 24" and 25% of other has been procured in advance of soils study completion to permit construction soon as authorized.
1 Aug.			