DAILY LOG
U.S. Army Transport ETOLIN
Seattle, Washington, to Yakutat, Alaska

BBT Aboard US Army Transport ETOLIN out of Seattle WA since October 18, 1940. Arrived at Tamgas Harbor shortly after 7 am, October 21, 1940. Dropped anchor and signaled shore to send boat. Captains Blinn and Krueger arrived about 9 am. (Ship anchored far out in bay. Could not be seen from camp nor could whistle be heard. Captain Blinn did not know of her arrival and was enroute to look for her when he came aboard 9 am.) Commenced loading cargo about 1 pm. Completed loading cargo about 4 pm. Departed for Ketchikan immediately thereafter. Arrived at Ketchikan approximately 8 pm. Tied up at Alaska Steamship Company dock and commenced loading cargo immediately thereafter. Cargo completely loaded 6 am, October 22, 1940.

Passengers came aboard at Tamgas and/or Ketchikan as shown on attached roster - destination Yakutat.

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BBT Embarked at Ketchikan 8 am, Oct 22, 1940, taking inside passage. Fire and lifeboat drill 4:15 pm. Weather calm.

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JRK Inspected medical stores destined for Yakutat and found them incomplete in certain respects. Requisitioned certain necessary drugs by radio to the Commanding General, Presidio, San Francisco CA.

The general health of the command was good with the exception of one soldier who developed a moderately severe upper respiratory infection. His condition improved and was satisfactory on Oct 23, 1940. A few members became seasick but recovered quickly. Health conditions aboard ship were satisfactory.

The meals aboard ship were very satisfactory.

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* Ship anchored far out in bay. Could not be seen from camp nor could whistle be heard. Captain Blinn did not know of her arrival and was en route to look for her when he came aboard 9 A.M.

DAILY LOG
U.S. Army Transport ETOLIN
Seattle, Washington, to Yakutat, Alaska

October 23, 1940:
BBT Enroute Ketchikan to Yakutat. Weather clear and calm. Some rain squalls during the day.

Arrived Yakutat 6 pm. Commenced unloading cargo 7:30 pm. Continued until 11 pm, at which time ship pulled away from the dock approximately 15 feet due to low water. Deck load consisted of one Bay City shovel, two D8 Caterpillar tractors, four LeTourneau carry-alls, one Ford-Sullivan compressor truck, one motor grader, and two cargo trucks were unloaded during this period.

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October 24, 1940:
BBT Weather clear and calm. Warm. Unloaded cargo between the hours of 3 A.M. and 10 pm.

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October 25, 1940:
BBT Weather variable. Light rain in late afternoon but heavy rain at night. Commenced unloading cargo 4 A.M. and completed unloading 2:30 pm. ETOLIN departed shortly thereafter.

Supplies and equipment likely to be damaged by rain were put under shelter. Heavy equipment and lumber stacked on the wharf. Personnel moved ashore and supper was served in Company B mess.

Issued orders for Hans Buhman, Alaskan Pilot, Joseph F. Foley, Winch Operator, and David F. Hansson, Winch Operator, from Yakutat to Seattle by way of Seward, and issued transportation requests for their commercial travel from Seward to Seattle.

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October 26, 1940:
BBT Weather - rain practically all day. Calm.

Troops devoted day to getting settled.

Made reconnaissance of the field site with Captain Loomis, Lieutenant Carpenter, Tech. Sgt. Divonis, and Mr. Trigve.

October 27, 1940
BBT Weather - Overcast morning. Rain afternoon. Cool.

Alaska Steamer "Denali" arrived 9:30 am. Departed 12 pm. Mr. W. C. Falkner, Special Agent of the FBI was aboard. Spent two hours in conference with him, which will be subject of a separate letter. Mr. V.C. Grow, Assistant Engineer, arrived.

Men employed in getting settled in camp. Ramp constructed for loading onto flat cars. In afternoon made reconnaissance for wharf site and site of field. Determined bearings of southeast runway to be 280 degree magnetic according to calibration chart CAA.

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October 28, 1940:
FJL Moved one D8 tractor out to the camp site on the Yakutat railway. Work was commenced on the access road of 1200 ft. to the camp area. A two shift. basis was started, first shift. regular daylight hours, second shift. from 6 P.M. to 2 am.

Afternoon, finished planking roundhouse to be able to use as a garage. Motor park area still muddy and needs more dozer work combined with graveling surface.
Great shortage of equipment operators.

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October 29, 1940:
BBT Weather - Rain in forenoon. Warm.

Checked report of Major Gaffney and Directive and determined that the alignment of the southeast runway given as S-45-E is determining factor in the direction of the southeast leg of the CAA range station. Informed District Engineer that I contemplated laying out the runway along the 315 degree azimuth to the center tower and inquired if there were any objections. This to coincide with Major Gaffney's report and to avoid encroaching on the railroad.

Stripping of the roadway from the railroad to the camp site continued. Dozer operates satisfactorily in stripping muskeg. Notified District Engineer of approval of dock site and recommended its dimensions. Camp site staked out and work continued in running the line of the main access road from the CAA towers to the field.

Heaped gravel to the center of the service road.

FJL Work continued on access road, and an area of 90'x1200' was stripped of top soil to date. At this rate it appears that a D8 tractor on short haul can strip 3600 sq yds in an 8-hour shift. Oil lanterns were used during night shift. to mark the work area. This method is satisfactory on level ground.

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October 30, 1940:

BBT Weather - Warm and clear forenoon. Rain late afternoon.

The motor grader which was moved to the field site this morning bogged down before it could get away from the railroad right-of-way. So far this machine has been unsatisfactory in working in soft. ground and will probably be limited to finishing and knocking down high spots in roadways or other areas where there is a solid foundation. The gravel pile placed in center of roadway on October 29 has dried out considerably, and it is hoped that within two or three days it will be sufficiently dry to carry the motor grader.

Commenced clearing of main service road to field. Survey party continued this line and two other reconnaissance parties commenced study of suitable connecting road from the dock site to the main service road.

Placed a light on the top of the center radio tower for use as an aiming point to check the alignment of the southeast runway. Captain Loomis climbed to the top of the tower and could not see the field over the top of the trees. It is probable that a tower will have to be erected on the field for use in the orientation of the runway since the magnetic orientation is not considered sufficiently accurate.

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FJL The gravel for the road surface was worked up by the D8 tractor and the borrow pit used for drainage. During the forenoon a power grader was moved out the the area, and attempt was made to grade the road. The gravel was still wet and would not support the grader.

The assembly of one large carryall was started.

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October 31, 1940-Thursday:
BBT Weather - Clear all day. Temperature 8:30 A.M., 30 degrees. Warmer during the day.

Work continued on as previous day. Troops paid 6:30 pm. Access road from railroad to campsite had settled sufficiently over about two-thirds of its length to support the motor grader. Depth of muskeg at campsite 15" to 18". Depth of muskeg along railroad 4" to 8". completed survey main access road.

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November 1, 1940-Friday:
BBT Temperature 8:30 A.M., 29 degrees.

Road bed from railroad to campsite settled sufficiently to support motor grader except in spots where some muskeg had become mixed with gravel, at which point considerable difficulty was experienced. The solution is the removal of that section of the road and its replacement with clean gravel. The muskeg, however, is being left. in the road as a test to determine the ultimate effect of having muskeg mixed with gravel. Clearing of main access road continued.

Moved 12-yard LeTourneau carryall to field but did not unload from flat car.

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November 2, 1940- Saturday:
BBT Temperature 8:30 am, 32 degrees.

Work continued as on previous day. Unloaded carryall and attempted to use same for removal of muskeg. Carryall weighs approximately 10 tons light, carried on four pneumatic tires 18"x24", approximately 5,000 lbs per wheel. Carryall bogged down to the gravel in many places, causing the bed of the carryall to drag even when set in the elevated position at the rear wheels. D8 tractor would sink from 2" to 6". Carryall would sink from 4"to 12" in the same tracks. Carryall was used to clean the muck from previously stripped areas and would load satisfactorily. There was insufficient traction, however, to permit satisfactory hauling of even a half load onto the muskeg for dumping. One part load of about 2 yards of gravel was carried onto the muskeg with difficulty and dumped. Carryall was then loaded about two-thirds full of muskeg. Carryall picked up the muskeg satisfactorily, although it did not cut all the way through the layer, which at that point was about 12" deep. With great difficulty the load was taken onto the muskeg for dumping. In dumping, the muskeg packed into a single compact mass in front of the tail gate and moved forward out of the carryall in a single mass. When it had been pushed forward clear of the cutting plate, it continued to drag in a single mass, and it was finally unloaded by backing the carryall until the load was between te body. The tractor was then turned at a very sharp angle, and one front wheel was backed over a corner of the mass in order to free the carryall from the load. The
November 2, 1940- Saturday (Continued):
tractor would not pull the carryall over the load as it piled up about four feet deep between the

body of the carryall and the front wheels. Likewise the tractor could not back the front wheels over the mass, and it was with great difficulty that the machine was finally backed at an angle and freed from the load. The muskeg packed in the carryall until it was about as tight as a cocoa doormat, the water being almost entirely squeezed out during the loading process.

Snow flurries in late afternoon. Snow on the mountain range between the field and Russell Fiord for the first time.

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FJL Carryall took three days to assemble with one experienced man and two helpers. The 10-ton tractor crane was used to load and assemble the carryall.

Three 1-1/2 ton trucks were moved out to camp site. One soft. spot in access road was planked. The trucks ran the length of the road without trouble.

November 3, 1940- Sunday:
BBT Temperature 33 degrees. Partially cloudy.

No duties.

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FJL Worked the daylight shift. with the bulldozer to be ready for the messhall construction on Monday.

November 4, 1940- Monday:
BBT Weather clear. Temperature 8 A.M., 27 degrees.

Commenced movement of buildings to camp site and began construction of the messhall. Survey party continued survey of the dock site extension to the main access road. Four men worked on clearing access road. One dozer continued stripping area of camp site. No rain for five days. Muskeg sufficiently dry to burn. Surface of gravel access road dry and slightly dusty except where muskeg is mixed with the gravel where it is still damp and soft.
Tanker "Alaska Standard" in port delivered fifteen thousand plus diesel oil and some lubricants. Arrived 9 am, departed about 2 pm.

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November 5, 1940-Tuesday:
Weather clear and unlimited. Temperature 8:30 A.M. 17 degrees.

Work as usual. Many of the water lines in the camp site frozen. One dozer worked part of afternoon in clearing main access road in vicinity of CAA towers.

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November 6, 1940-Wednesday:
Weather clear and unlimited. Temperature 8:30 A.M. 13 degrees.

Work as usual. Some damage to water lines due to freezing. Diesel generator in cannery idled last night to avoid freezing and sticking.

Ice about 1-1/2 inch thick on standing water on the field. Muskeg is very dry and crisp on top, but where frozen is spongy with lots of voids in the ice. Stripping by dozers is easier under this condition than before freezing. Depth of freeze about 2 to 3 inches in the muskeg. Water level has dropped plus or minus 8 inches in the running streams.

November 7-Thursday:
BBT Weather clear and unlimited. Temperature 8:30 A.M. 15 degrees.

Work continued as usual. Steamer MT. McKINLEY arrived at noon, departed 2:30 pm. Elevating grader was moved to field by rail and its assembly completed at that point. Water lines in cannery encampment generally frozen, requiring large plumbing details than ordinarily necessary. Survey of dock connection to access road completed. 600 feet of access road cleared in vicinity of CAA towers. One bulldozer has continued to strip and perform miscellaneous tasks on two-shift. basis since October 28.

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November 8-Friday:
BBT Weather clear forenoon. High overcast afternoon Temperature 8:30 am, 15 degrees.

Work continued on erection of camp, the present status being the messhall (20'x160') is three-quarters completed and two barracks buildings have the foundations in. Elevating grader assembled and tried out in late afternoon. Indications, while not conclusive, are satisfactory. Elevating grader has pneumatic tires with dual wheels on the front. The grader was operated in a partially stripped swath cut by an angle dozer. The left. wheel had fair footing, the two right wheels ran in soft. muck. The dual wheels pushed the muskeg loosened by the dozer ahead of them, sometimes as much as a yard or more of muskeg being pushed ahead of the dual wheels, which would cause them to skid rather than turn. Little difficulty was experienced in getting the belt to carry the muskeg. The initial test is not conclusive. However, it was sufficient to indicate that when the swath becomes sufficiently wide to support all the wheels on the gravel, it should operate without difficulty. The mechanical features of the grader functioned satisfactorily. Except in areas of loose muskeg, the D8 Cat had no difficulty in pulling the grader. The load should be even lighter when all wheels roll on clean gravel.

The other Cat was employed on clearing the access road in vicinity of CAA towers.

November 9-Saturday:
BBT Weather clear all day. Temperature 8:30 A.M, 17 degrees.

Work on construction of camp continued as usual. One Cat used to run hoist for assembly of carryall. Four men occupied clearing main access road. Azimuth of main access road checked and confirmed by Mr. Trigve.

Elevating grader operated all day in stripping muskeg from access road in vicinity of camp. for the first four turns, the right side of the grader was in the muck, which had been chewed up by the dozer in clearing the initial starting strip. Its depth and softness was such that it was not unusual for the tractor to settle to the pan and for the grader to bog down to the axles of the rear wheel to the slide at the lower end of the elevator and the corresponding depth on the front dual wheel. The grader was operated with the minimum tread Ñ that is, the right rear wheel, which is adjustable, was pushed in as far as possible to keep it on the most solid ground for the starting operation. The disc of the grader would cut through the entire depth of muskeg, and in crossing drains or holes left. where trees had been pulled out, the cut would sometimes be two feet deep for a short distance. In such a case, when the cut was also about one foot wide, the mass of muskeg thrown onto the belt would be such that the grader would sometimes pivot over the right two wheels and allow the outboard end of the belt to rest on the ground. In only one case was it necessary to free the belt from the road by shoveling. In this case, it was estimated that there was at least two cubic yards of material on the belt. In other cases, when too much material was placed on the belt, the tractor would be stopped and the belt freed by its own power.

Motion pictures were made of the operation of the grader. The film will be sent to San Francisco for processing and will be returned to the Seattle District, where it may be observed. This film is of the initial operation and does not include any operation when the grader was on solid gravel—that is, when the area of stripping by the grader had exceeded the width of tread of the grader. It is considered that the operation of the grader is satisfactory for the removal of muskeg and presents the best solution considered thus far for the removal of muskeg from the runways and parking apron. There must, however, be provided a means for receiving the muskeg from the grader, hauling it away, and dumping it into suitable spoil areas. The use of crawler trailers is considered the best solution and they are so recommended by radiogram under the date of November 11 and by the report dealing with the stripping of muskeg (Report No. 2) which will follow.

November 10-Sunday:

BBT Weather clear and unlimited. Temperature 8:30 am, 16 degrees.

Two electric washing machines provided for the washing of clothing.

One tractor employed two shifts on stripping the edges of a section of the access road between the construction camp and the roadway intersection and in the removal of spoil in the vicinity of the camp where the road passes. At about 4:30 in the afternoon the tractor became mired at almost exactly the point of intersection of the center lines of the two runways, where a small clump a trees are standing. The tractor was being used to push over the trees at the time, and as it commenced to push against a tree of about one foot in diameter, the front end of the tractor dropped down until the dozer blade in its highest position was resting on the ground, which probably prevented further sinking of the tractor. This point on the field is very wet, and it is possible that the tractor ran into a spring or into a bed of soft. sand. The muck around the tractor appeared to be very thin. The tractor was extricated by placing 6"x6" timbers crossways underneath the rear of the track and operating the tractor in reverse, which pulled the timbers underneath the tractor, thereby lifting itself out. No particular difficulty was experienced in getting the tractor out, although about two hours were consumed in doing so. The temperature was about 22 degrees and the ice was about four inches thick on the standing water nearby. This thickness of ice (or a corresponding freezing of the muskeg) has not so far hampered stripping operations.

This November is the coldest November on record in the seven or eight years temperature records have been kept at Yakutat, the average temperature being from 10 to 15 degrees lower than other Novembers. The lowest temperature on record at Yakutat is eight degrees, which occurred in December, 1939.

November 11-Monday:

BBT Weather overcast at about 3,000 feet. Temperature 8:30 am, 27 degrees.

Work on erection of buildings as usual. Elevating grader operated forenoon. The right rear wheel had been extended 17 inches over the weekend and the grader operated at full capacity without any tendency to tilt due to the weight on the loaded belt. Operation of elevating grader suspended at noon due to a flat tire on one dual wheel. One 8-yard carryall taken to the field and its operation on stripping muskeg was tested. It loaded a little easier than the 12-yard carryall, but the same difficulty was experienced in unloading. A cleat on the unloading mechanism broke when attempt was made to unload the second load, and the carryall could not be unloaded until repaired. This may be accomplished by welding. At the moment, the carryall sits on the field with about six yards of muskeg in the bin. It is considered that stripping with the 8-yard carryall is an unsatisfactory operation due to the inability to unload on top of the muskeg. The carryalls cannot pass over the muskeg as it is dumped.

The position of the intersection of the center lines of the runways was checked, and the soft. spots mentioned in the log of November 10 commences at the NW end of the NW-SE runway and apparently extends in an almost southeasterly direction which is diagonally across the point of intersection of the two runways. Consideration is being given to moving the runways approximately 500 feet to the southeast, maintaining same alignments. In addition to avoiding the soft. spots mentioned, it will likewise reduce the amount of clearing necessary for the NE-SW runway. However, before this is recommended, the entire runways will be thoroughly explored. The approximate positions of the runways are being staked out in order that drainage cuts may be made on their boundary to stop surface run-off across the runway areas which must be stripped. Existing drains crossing the runways will be cleaned in order that they will drain freely, as it is desired to keep the area as dry as possible.

The access road from the railroad to the construction camp is very hard and compact, partially due to drainage and partially to freezing. The ditches at the side of the road still carry three or four inches of water. A week ago, they carried approximately ten inches of water over a considerably greater cross section. No rain since October 30.

Ice is twelve inches thick over some of the ponds on the field. So far, the muskeg is no more difficult to handle than it was prior to the freeze. There is an advantage in that lightly laden trucks can drive over the muskeg at will. One compressor truck was taken to the field. Commissaries have been moved to the second floor of the cannery warehouse and Sibley stoves installed to insure against freezing. This operation commenced November 8. The Quartermaster reported that very little perishables have suffered due to cold. In order to properly preserve food, it was necessary to arrange the commissaries according to perishability rather than alphabetically, which seriously disturbed some of the commissary clerks.

November 12, 1940-Tuesday:
BBT Approximately four inches of heavy snow on the ground at 7 am. Rained throughout the day. Temperature at 7:30, 32 degrees.

Work on the building area as usual. Moved the Bay City gasoline shovel to the field site. Elevating grader operated until about 3:30 pm, at which time the king bolt on the plow as broken. Inasmuch as repair facilities are still in the village, repair could not be effected in the afternoon. Steps are being taken to move all facilities to the field site as rapidly as possible as t delays due to separation of these facilities from the site of the work.

Centerline of the south 45 degree east runway run out. Only a slight shift. is required in the position of the south 45 degree west runway to avoid the soft. spots previously mentioned. Runway will be moved a few feet to the southeast, maintaining a line to its original position.

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November 13, 1940-Wednesday:
BBT Wind of gale velocity—maximum 40 mph recorded on anemometer of CAA radio station (30 feet above ground, surrounded by woods 100 feet high) Ñ from approximately midnight throughout the morning and diminishing to about 30 mph at 4:30 pm. Constant rain throughout this period. Rainfall 3.1 inches. Temperature 7:30 am, 44 degrees.

The only damage to the construction on the field consisted in blowing off a roll of tar-paper along the southeast eave of the messhall. Said paper had not been fully secured. Snow was all gone by daylight. The field is drenched and the water runs through a drainage ditch crossing the building site to a depth of about one foot at a velocity of perhaps 3 mph. It was intended to move 40 men from the cannery to the construction camp, but said movement was postponed one day due to the weather. The shovel boom was removed from the Bay City shovel, and the long dragline or clamshell boom was installed in its place. It is intended to use the clamshell to dig a large exploration pit 300 feet northeast of the intersection of the center lines of the two runways. An attempt will be made to dig the hole approximately 10 feet deep. The area will be thoroughly cleared of muskeg prior to commencement of operations. Difficulty will probably be experienced in moving the shovel to the site, as everything is saturated with water and the small ditches are all overflowing. Tests were made in digging a small wall with a water jet furnished by the small gasoline engine-driven pumps through a fire hose. The top surface of the ground was frozen three or four inches beyond which the water jet would dig a hole about 8 feet deep in one minute, at which time the pipe would strike a different strata and would come to rest. Several holes were sunk in the immediate vicinity of the messhall, and they all stopped at the same depth. The purpose of these tests is for the sinking of a temporary wall for use in the camp while awaiting the installation of the permanent facilities. More on this same subject tomorrow. Seven Sibley stoves were installed in the messhall, which is 165 feet long. This building will be used as a combination barracks and messhall for the 40 men pending the completion of other facilities.

November 13, 1940-Wednesday (Continued):

Little accomplished in the soundings of Monti Bay due to the weather. One tractor employed in clearing the access road and five or six men employed in cutting timber.

There are 15 men on the sick list, principally with colds Ñ nothing serious except the loss of manpower. Steps are being taken to enforce proper uniform regulations to keep the men from getting wet while at work.

The Quartermaster was informed that upon the departure of Company "B" from the cannery area that he would take over operation of such area.

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November 14, 1940-Thursday:

BBT Weather changeable with rain throughout most of the day. Temperature at 7:30 am, 44 degrees.

Approximately 40 men moved from the cannery into the messhall on the field. There are no longer men sleeping in the cannery itself, the garrison being quartered in bunkhouses on the hill. The temporary floors and partitions made of building floors and sides in the cannery are now required for use in the construction of the barracks. In the event of an increased strength of personnel, a similar installation may be made in the cannery from buildings "on order."

A well to receive a 2-inch sand point was put down about 20 feet from the messhall opposite the sink connections. It being impossible to get sufficient water pressure from the small pump, air pressure from the Sullivan compressors in the compressor trucks was used to put down the hole Ñ that is, the hole was dug with an air jet rather than a water jet. The sand point was put down about 13 feet. A casing consisting of a length of 4-inch pipe was put down about eight feet into the ground and extending two-1/2 feet out of the ground to prevent surface water from running into the well. The well was pumped for about one half hour, at the end of which the water had changed from a milky white Ñ probably due to particles of rock being knocked off during the drilling process or otherwise disturbed due to the aeration Ñ to almost crystal clearness. This water was pumped to waste. The water tank later to be used in the hot water system was placed on a tower about ten feet high to afford a reservoir of water for use in the temporary kitchen and for the men quartered in the messhall. The well was later pumped for about an hour and a half without any sign of diminishing. The field is pretty generally flooded, with water standing six to eight inches deep on large sections of the runway areas. Small drains are overflowing, and the ditches previously cut are carrying away vast quantities of water.

Hydrographic survey of Monti Bay continued.

One bulldozer continued to clear on the main access road, which hereafter shall be referred to as "28th Engineers Road." The present status of the clearing is about 1500 feet completely cleared through the woods on the Yakutat and about the same amount on the airfield and, the muskeg being stripped from the area of the construction camp almost to the heavy timber. The section between the construction camp and the intersection of the runways is partially stripped. As men have been available, they have worked in the woods cutting trees too large for the dozer to handle. From four to six men are all that have been available for this work.

Following specific orders concerning wearing apparel, the health of the command is considerably improved, the number of men on the sick list having dropped from 15 to seven since this order went into effect.

The Bay City shovel rigged with a long boom and clamshell bucket commenced the excavatieet east of the intersection of the runways. Immediately after the muskeg was stripped from the test hole area, it became flooded to a depth of about one foot, and the test hole is being put down through this water. Were it not for the fact that in all probability the material obtained for the fill will come from a similarly flooded barrow pit or drainage ditch, it would be considered that such means of obtaining soil samples would be unsatisfactory. However, since it

November 14, 1940-Thursday (Continued):

is probable that the material for the runway fills will come from exactly this type of borrow, whether by hydraulic means or by dragline excavation, this means of sampling is at least representative. Soil samples will be taken tomorrow.

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November 15, 1940-Friday:

Weather unsettled. Intermittent showers throughout the day. Temperature at 7:30 am, 46 degrees.

Bay City shovel dug test hole to nine feet. The sides of the hole took on slope one to one. Little change in nature of gravel to this depth. Samples taken at 3-5 feet and 7-9 feet. Samples taken by dumping directly from shovel bucket into square five gallon cans which will be sealed by soldering a new top onto the can. Elevating grader used to strip 28th Engineers Road between construction camp and runways. Soundings in Monti Bay completed except for recheck of one or two questionable soundings.

One dozer continued clearing timber.

November 16, 1940-Saturday:
BBT Weather unsettled. Intermittent rain throughout the day. Temperature at 7:30 am, 32 degrees.

Test pit in vicinity of intersection of runway dug to 11 feet, which was the limit to which it could be dug with the Bay City shovel. The soil continued at a more or less same grade of gravel to that depth. There were occasional stones the size of a man's fist. The water in the test pit became somewhat milky when disturbed to that depth. The test pit was sunken through water that was almost to the top of the muskeg when digging commenced and remained at that height level throughout the operation. Samples were taken at 5, 9, and 11 feet depths with a fourth random sample gathered from the soil heap. Three samples will be placed in gasoline cans, sealed, and shipped to the soils laboratory, Mud Mountain Dam.

The D-8 tractor again became stuck in the vicinity of the intersection of the runways, when without warning the front end dropped down until the dozer blade came to rest on the ground. The tractor was gotten out by a combination of digging and the use of heavy timbers.

The CHIRIKOF arrived at 10:30 P.M. and the unloading of cargo commenced just before midnight.

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November 17, 1940-Sunday:
BBT Clear in early morning. Changed to rain with heavy blow in late afternoon. Snow fell intermittently throughout the day and melted as it struck the ground. Temperature at 7:30 am, 32 degrees.

CHIRIKOF departed 6:30 am, the cargo having been unloaded in about six hours. Mr. Kenning, Assoc. Engineer, Mrs. Thurman, wife of Captain Thurman, QMC, Mrs. Birch, wife of Lt. Birch, and Mrs. Nelson, wife of Mr. Nelson, arrived on the CHIRIKOF.

No work on the field until 4 P.M. except that necessary to dig out the tractor and get it back into operation. The night shift. worked with the bulldozer as usual. This bog down of the tractor was the most serious so far.

November 18, 1940-Monday:

BBT Intermittent rain squalls throughout the day, Temperature 7:30 am, 42 degrees.

There was more water on the field than at any time since October 23, and extreme caution is necessary to avoid bogging down the equipment. Its efficiency of operation is lowered because of this.

The second tractor was moved to the field site in order to have two units working close together to simplify their supervision and to enable one tractor to be used in pulling out the other in the event of a bog down.

The 30 KW generator unit and the wash boring equipment was moved to the field in preparation for the installation of the generator and commencement of wash boring operations. A temporary installation will be made of the generator pending receipt of cement for the foundations.

The steamer "MT. McKinley arrived 7 A.M., departed about 9:30 A.M.

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November 19, 1940- Tuesday:

Rain throughout the day. Temperature 7:30 am, 29 degrees.

Work as usual.

November 20, 1940-Wednesday:
BBT Intermittent rain all day. Temperature 7:30 am, 38 degrees.

5 KW AC generator temporarily installed in camp to permit operation of the range in the kitchen. Water connections from the temporary well to the hot water tanks of the stove installed. Work commenced on installations of water connections to the heating system in the completed barracks building. 40 men moved from the mess hall to the barracks building.

In the afternoon the Resident Engineer and Captain Loomis made a reconnaissance of the entire landing field area, including walking about 7000 feet down the center line of the S-45-E runway, cutting diagonally across the field area in the approximate location of the proposed diagonal runway, thence southwest to the heavy timber along the shore line around the small lake in the vicinity of the end of the S-45-W runway, thence back to the construction camp.

There are large drains between the 4000 and 5000 foot lengths of the S-45-E runway. The drains cross the runway from northwest to southeast, while up near the points of intersection of the runways the drains cross almost directly north to south. The drains at the lower end of the runway carry water about three feet deep, which is a little more than twice the depth of the water in the upper end. A considerable area of the lower end of this runway is under water. However, it is believed that adequate side drainage will draw the water down and permit the construction of the runway at a uniform slope at the upper end without an excessive fill.

The far end of the S-45-W runway is low and at this season is largely under water at the 10,000 foot distance. The water in the creek at that point is about waist deep. It is believed that this area also can be drained by the side ditches, which, however, will have to be drained into an enlarged section of the creek. That is, the creek will have to be enlarged and straightened to carry away the water.

Some of the natives say that "years ago" at extreme tides it was possible to row a boat from Lost River to Ankau Creek across what is now the extreme end of the S-4 is seriously doubted as there is no indication of its being flooded by tidal action in recent years. The possibility, however, of installing a tide gate in the enlarged section of the creek when drainage has been completed is being considered. This, however, is not an immediate problem.

November 21, 1940-Thursday:
BBT Snow intermittently throughout the day, approximately 1inch total fall. Temperature 29 degrees at 7:30 am.

The Division and District Engineers inspected the field site in the forenoon, witnessing the operation of stripping the muskeg by the elevated grader and by the bulldozer, and the grading of the access road from the railroad to the construction camp by the motor patrol grader.

They likewise inspected a demonstration of wash boring in the vicinity of the runways and directed that the wash boring called for along the borrow areas parallel to the runways be "wash probings" to a depth of 25 feet in lieu of the 50 feet originally called for in a letter dated October 19, 1940, file 1245 (Yakutat Air Base) 29, with occasional holes to 50 feet. The collection of the soil sample from around the hole as washed up by the water jet was approved. In the absence of regular soil sample containers which have been requested from the district, it was indicated that samples collected in glass fruit jars would be accepted. It was therefore proposed to conduct the wash borings with a 1 1/2 inch jet to a depth of 25 feet with every fifth hole to 50 feet. casing will be used only when needed to reach these depths. One soil sample will be collected per hole where there is little change of gravel in the hole. However, in cases where there is changes in the grade of gravel, samples will be collected for each grade of material. It is to be recorded that the taking of these samples is for the determination of the nature of the gravel afor the fill of the runway, and it is not to be confused with the taking of samples for the determination of the suitability of the material for concrete. This latter sampling will be the subject of additional entries in the log and of correspondence at the time the areas are sampled. There is a possibility that suitable aggregate may be obtained in the immediate vicinity of the field, and this fact will be determined at the earliest practicable date.

A recommendation was made to the District Engineer that the cross section of the runway consist of a fill above the surface of clean gravel to a depth of crown of 30 inches in the center of the runway, the concrete strip to be six inches thick in the center and eight inches thick at the edges as in the case of the runway at Ladd Field, Fairbanks, and possibly at Anchorage, although the details of the latter design are not available, and it is only from memory that this statement is made. Under this condition there will be a depth of fill of 24 inches in the center of the runway, tapering to a zero fill 250 feet on either side of the center line, beyond which for a distance of 20 feet will be a flat shoulder, beyond which will be the borrow, beyond which in turn will be the spoil heaps of muskeg from the runway and borrow areas. Cross sections of the runway will be sent to the Seattle Office on the KVICHAK on or about December 1, 1940. The District Engineer and Division Engineer tentatively approved this cross section, such approval being predicated upon satisfactorily lowering the water table by means of the side ditches obtained by borrow. Such ditches will be approximately 10 feet deep. If the water table is not satisfactorily lowered by these ditches, then a larger fill will be required.

It was recommended that the sub-surface drainage consist of a herringbone system of perforated corrugated drain pipe, probably with a bitumastic coating. Both of the foregoing recommendations are the subject of separate correspondence.
The question of wet or dry fay was discussed at length, and the views of the District Engineer on this matter were in general that in view of the small cross section of fill, the necessity of having

parallel drains, the necessity of spreading the fill by any means, the necessity of awaiting the stripping of the entire runway and the completion of the installation of the sub-surface drainage system before filling can commence, and the likelihood of forming a large mass of frozen affluent over the field if dredging takes place in the winter, it is probable that preference should be given to fill by dry methods. This, however, is tentative, and is in nowise an expression as to whether this fill is to be by concrete or otherwise. The present mission, insofar as the filling is concerned, is one of obtaining technical data, who and who the fill will be made to be determined after such data are collected.

With reference to the depth of fill, the Resident Engineer expressed the belief that by taking the side borrow at a distance of about 300 feet from the centerline to a depth of approximately 10 feet on each side of the runways, the installation of a herringbone sub-surface drainage system one foot beneath the present gravel level (on the proper slopes), that the water table would be lowered beyond the three foot limit considered necessary for proper surface drainage and for protection against frost. A close study will be made of the action of the water table at the time drainage is commenced, and if at that time indications are that a greater depth of fill is necessary to obtain a proper foundation and to obtain a minimum lowering of the water table of three feet beneath the bottom of the runways, then an additional depth of fill will be recommended. However, indications are that there will be no difficulty in lowering the water table by the means above outlined.

The District Engineer approved the design and construction of the 28th Engineers Road from the Government Dock Site to the field by this office. The question of routing to the north of the CAA towers rather than a straight line from the dock site was discussed. It was explained that the route selected had two advantages: a route to the south of the CAA towers presented construction difficulties due to the nature of the ground; it was desired to bring the roadway into line with the runway in order that a direct bearing may be made through the clearing on the CAA towers, and such roadway in case of war would be a route for taking small planes from the field area into the woods for camouflage. The District Engineer approved the route selected. A formal letter requested the approval of the District Engineer was given to him prior to his departure.

Colonel Park and Colonel Dunn departed for Ketchikan aboard the NEHAMA about 5 pm. With the exception of the demonstrations conducted in the forenoon, all other work was suspended for the day. Thanksgiving dinner was held in the construction camp on the field, except the necessary guard and fatigue details at the cannery area.

-oOo-

November 22, 1940-Friday:
BBT Temperature 7:30 A.M. 20 degrees.

Commenced digging sewer trench with Bay City shovel rigged as a dragline. Commenced work about 1000 feet south of the construction camp at the approximate point of intersection of the sewer with the main drainage canal yet to be designed, trench being dug approximately seven feet deep. Gravel encountered in this area is more coarse than any heretofore found in the field area. A sample is being taken with a view to its being tested for use as aggregate. Bay City shovel dug about 100 feet of trench. Work continued on the drainage of the runways and in wash boring.

In hole No. 1, 350 feet northeast of the intersection of the center lines of the runways at a depth of about 20 feet, it appears that a different strata of gravel is encountered. In sinking the jet pipe, it moved steadily to that depth, upon which the water ceased coming to the top of the ground but went in the other direction. The jet immediately "froze" in the hole. This would seem to indorous strata had been reached. It is necessary to case the hole beyond this point. Samples were taken to this depth. Work was continued on the hole.

Work commenced on the survey of the area of the apron as called for in letter, District Engineer, dated November 13, 1940, file 6282(Yakutat)23. Preparations are being made for other surveys as called for in same letter.

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November 23, 1940-Saturday:
Temperature 7:30 am, 32 degrees. Moderately calm forenoon, changing to snow and strong blow in afternoon, with temperature dropping rapidly toward nightfall.

Soil samples tan at 20 feet with the wash boring equipment in test hole No. 1.

Electric lights installed in mess hall and in barracks 1 and 2. The oil range was put in permanent use and oil heating system connected in the mess hall.

Drainage of runways continued.

Two near mishaps occurred this date. At about 8 am, two flat cars broke loose at the top of the hill and ran down past the cannery and struck another flat car on the dock, driving it off the end of the track to the edge of the dock, knocking the guard rail and piling out of line. The car came to rest with one truck hanging over the water. A similar accident occurred about two years ago with Libby, at which time two men were drowned. The car was put back on the track, repairs of dock commenced, and a heavy timber was lashed across the track with steel cable to prevent a repetition. A frog will be installed above the cannery to derail any other cars breaking loose. At noon time a fire broke out in the cannery above the vertical tube boiler used for heating hot water, said fire being due to poor judgment on the part of the fireman. Proper action was
November 23, 1940-Saturday (Continued):
taken; little damage was done.

Approximately 40 men moved to the field. There are between 80 and 90 men living in the field camp. Company Headquarters of Company "B" moved to the field this date.

November 24, 1940-Sunday:

BBT Overcast and calm. Temperature 7:30 am, 39 degrees, dropped to freezing later in the day, and remained about that level.

Two dozers continued work on the drainage of the runways. Status at close of work Sunday night: the N-45-E runway has had drainage ditches cut on both sides for the first 3500 feet with cross drains as required to carry accumulated run-off beyond the capacity of the parallel drains. These cross drains are extended to the south from 100 to 200 yards as may be required to drop water in the parallel drains to a point of steady flow without any backing up in the vicinity of the runway. It has been found that this is of material assistance in handling the muskeg and in operating equipment in the "land" between the drains. The drain on the south side of the N-45-W runway is extended 5500 feet, which is the limit of the present runway. Little work has been done on the north drain, which, however, will be completed within two or three nights, as work will be done on these drains at night where the dozers can be employed to a good advantage. They will be used in the woods during the day time.

November 25, 1940-Monday:

BBT Clear in the forenoon. Overcast later in the day. Temperature 7:30 am, 32 degrees.

Two dozers employed in stripping 28th Engineer Road in the vicinity of the woods. One crew resumed cutting timber in the roadway too large for the dozers t handle. Night shift. resumed work on cutting the drains to the S-45-W runway but got stuck so many times that work on these drains was discontinued at night and will be continued in the daylight hours when there is greater visibility and less likelihood of getting stuck. Bay City shovel continued work on the sewer line. Work commenced on the plumbing for the bath house and latrine. Some of the fittings do not agree with those called for on the list of materials. However, they will be adapted for use although considerable additional work will be required.

Soil sample taken at depth of 25 ft. from hole No. 1. The nature of the soil changed from course gravel to sand at 23 ft.

Lt. Carpenter from duty to sick in hospital. Admission diagnosis appendicitis.

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November 26, 1940-Tuesday:

BBT Cloudy with trace of rain. Temperature 7:30 am, 39 degrees.

Timber crew continued in the woods along 28th Engineer Road. One dozer employed on runway drainage, the other dozer in stripping the area for the additional buildings. Soil sample taken from the spoil obtained from the sewer ditch. An attempt was made to get a representative sample. A gasoline drum was filled about three-fourths full by dumping directly from the shovel bucket into the drum. The drum was then sealed by welding the top and prepared for shipment to Mud Mountain Soils Laboratory. Both dozers worked at night in the woods along 28th Engineer Road. One survey party commenced chaining the center line and location of cross sections in the S-45-E runway. The other survey party completed leveling in the hanger and apron area.

November 27, 1940-Wednesday:
BBT Weather cloudy. Temperature 7:30 am, 25 degrees.
Pulled casing in test hole No. 1. Moved wash boring equipment to hole No. 2. Handling of wash boring equipment on the field is slow and cumbersome, requiring several hours to tear down from one setup, move the equipment, and get ready to drill again. This procedure is being modified to permit more rapid operation. Instructions given to construct a single sled of sufficient strength and capacity to carry all wash boring equipment together with tripod, pipe, hose, fuel, etc. in order that everything may be moved in one trip with the tractor. Inasmuch as tractors are often operating a mile or more from the wash boring equipment, request is being submitted for a small D2 or D4 tractor for utility use. Such a tractor has been definitely needed from the outset. Both tractors were used in stripping around camp site and on N-45-W runway in forenoon. One tractor returned to Yakutat in afternoon, and resumed work on 28th Engineer Road. This change made possible by the near completion of the drainage of the runways, which makes safe the operation of a single tractor on the field, and made necessary by need of access road from Yakutat to the dock site. Tractor on the field employed stripping 28th Engineer Road on night shifts.

Commenced taking of profile and cross sections of S-45-E runway.

Hot water system in cannery resumed operations Tuesdays, Thursdays, Saturdays and Sundays.

November 28, 1940-Thursday:
BBT Weather high overcast. Temperature 7:30 am, 30 degrees.

Wash borings taken holes No. 2 to a depth of 20 feet, No. 3 to 27 feet; gravel to the bottom of both holes.

Tractor at Yakutat continued clearing right-of-way of road to dock site during daytime and working on 28th Engineers Road at night. Other work as usual.

November 29, 1940-Friday:
BBT Weather overcast. Ground covered with coating of ice about 1/8 inch thick—very slippery. Temperature 7:30 am, 30 degrees.

Tractor on the field became stuck in the woods 5:30 am. It was out of operation about two-thirds of the day. There was no work done in wash boring due to the inability to move the equipment because of the tractor being stuck. Other work as usual.

November 30, 1940-Saturday:
BBT Intermittent rain. Temperature 7:30 am, 30 degrees.

Work as usual 28th Engineers Road vicinity of village. Finished stripping center section 28th Engineers Road from construction camp to about station 20 in direction of runways. Sank three wash boring test holes. Commenced work on large sled to carry complete wash boring equipment as one unit. Bay City shovel worked on drainage southwest construction camp and on sewer line that vicinity.

Messrs. Hibler, Electrician, and Loceen, Plumber, completed work at noon, preparatory to returning on KVICHAK

KVICHAK arrived 5 pm. Unloading started immediately hatches were opened and continued until 2 am.

December 1, 1940-Sunday:
BBT Overcast, rain at night. Temperature 7:30 am, 38 degrees.
11-ton, all wheel drive, Mack truck and 6,000 gallon water tank (weight 5 tons) unloaded from KVICHAK. KVICHAK has 9 feet freeboard when loading and is 6 feet below top of dock at high tide, necessitating use of steep ramp for unloading heavy lifts. Due to limited air pressure on the winches and the very long booms, the ship's gear of the KVICHAK will not effectively handle a lift. heavier than about 1,500 lbs. The size of her hatch is so small that it is with difficulty that 4 cargo boards can be placed for lifting. All of this causes cargo to be handled very slowly. The average time for the cycle of a complete lift. from the bottom deck is approximately 2 minutes. Cargo was worked from midnight to 2 am, resumed at 5:30 A.M. and continued constantly thereafter. It was necessary to work the ship at night to take advantage of the high tide and to get ship away from the dock before the scheduled arrival of the next Alaska steamer.

Tractor on the field continued working in the woods on 28th Engineers Road, and tractor in Yakutat laid up undergoing repairs to dozer hoist clutch. This is the first instance of a tractor being out of operation due to a minor repair. One tractor has more than 500 hours operation and the other almost as much.

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December 2, 1940-Monday:
BBT Heavy rains all day. Temperature 7:30 am, 36 degrees.

Continued unloading KVICHAK. Only other work was by the tractors on the 28th Engineers Road.

The following passengers arrived on KVICHAK and came ashore this date, except Maynard E. Olson, Operator of Mechanical Equipment (General), who came ashore Saturday night; Virgil M. Swanson, Oiler; Roy M. Hansen, Operator of Mechanical Equipment (Piledriver). Messrs Hibler and Loosen moved aboard ship.

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December 3, 1940-Tuesday:
BBT Heavy rain and high wind. Temperature 7:30 am, 38 degrees.

60 mile gale Cape St. Elias; 42 mile gale Cape Spencer.

KVICHAK unloaded 7 am but remained in port due to storm.
Commenced construction of fill of 28th Engineers Road vicinity of construction camp by use of elevating grader on night shift. Except for tractor operation and wash boring, all other work suspended to compensate for previous Sunday's work. One wash boring hole drilled. Drill was not moved due to high water in vicinity of drill.

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December 4, 1940-Wednesday:
BBT Continued heavy rain. Temperature 7:30 am, 36 degrees.

Resumed normal operations.

KVICHAK departed 7:30 am. Alaska steamer Mt. McKINLEY arrived 11:30 pm.

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December 5, 1940-Thursday:
BBT Rain. Temperature 7:30 am, 35 degrees.

Installed new belt on elevating grader. Placed grader in operation casting the fill on 28th Engineers Road vicinity of construction camp in late afternoon. Other work as usual.

December 6, 1940, Friday:
BBT Rain. Temperature 7:30 am, 40 degrees.

Work as usual.

December 7, 1940-Saturday:
BBT Rain. Temperature 7:30 am, 38 degrees.

Bay City shovel rigged as a pile driver used to drive 4 inch pipe to obtain soil samples along the center lines of the S-45-E runway. A bucket was constructed on the end of a 4 inch pipe to raise the soil sample out of the hole when the pipe is pulled. The bucket consists of a thin plate placed diametrically across the pipe to which was attached two hinged flappers, each of which is slightly larger than one half the cross sectional area of the pipe. In driving, the plate welded across the pipe serves as a cutting edge and as a hinge pin for the flappers. The flappers turn on the hinge and take a position on edge crosswise the pipe. When the pipe is full, the sand and gravel, together with the suction in the bottom of the hole pull the flappers outwards, effectively closing the end of the pipe, thereby forming a bucket used to raise the soil samples. Two soil samples were taken by driving the pipe to a depth of between 6 and 7 feet into the gravel below the muskeg, the muskeg being removed by shovel before driving commenced. There was no difficulty in pulling the pipe. Construction was commenced on another bucket for attachment to a piece of pipe 10 feet long to permit driving to a depth of 8 to 9 feet to obtain the sample from that depth.

The gravel along 28th Engineers Road is so compact that it is difficult to turn up with the plow on the elevating grader and places an undue stress on the machine. The sharp rocks showed promise of seriously cutting the belt if the operation continued. To avoid the risk of damaging the elevating grader and cutting the belt, the operation of this machine in road construction is definitely discontinued.

Resumed construction of barracks No. 4 on which construction had been suspended awaiting additional materials which came in on the KVICHAK.

Nightfall found one tractor out of service on the field due to the front hoisting clutch going out. The Bay City shovel was stuck in the middle of the runway, and the other tractor working on the road to the dock was bogged down on its nose, having slid down the hill Ñ the ground having given way underneath it.

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December 8, 1940, Sunday:
BBT Rain. Snow in afternoon.

Temperature 7:30 am, 33 degrees. Snow melted as it fell. Tractor on field was repaired, and the tractor on the dock road was gotten out under its own power.

The commanding officer gave a talk to the troops on military discipline and customs of the service.

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December 9, 1940-Monday:
BBT Intermittent rain. Temperature 7:30 am, 37 degrees.

The 28th Engineers Road was blocked with a small earth dam southeast of the intersection of the access road to prevent water flowing down the roadway in the direction of the runways. Drains were extended to the southwest alongside the construction camp area, which, together with a similar set of drains approximately one half mile northwest of the construction camp, dropped the water level in these areas by about 6 inches, whereas on December 7 the water in the 28th Engineers Road near the intersection of the runways was more than knee deep. The effective drainage lowered the water to about 8 inches deep.

The tractor on the field employed during the day in shifting the wash boring sled and assisting the movement of the Bay City pile driver being used to take soil samples along the center line. Four soil samples were taken with the Bay City pile driver and two wash boring samples were obtained with the other rig.

The wash boring equipment was transferred from the small sled to a very large sled, about 10 ft. x 20 ft., with 12 in x 16 in runners. This sled carries an A-frame about 20 ft. high for use in handling the jet.

The drill bucket, using a capped pipe and vent plug, was substituted for the open drill pipe used previously to effect greater recovery from the hole.

On the night shift. the tractor on the field employed in removing about 4 inches of silt and chopped up muskeg which remained on the roadway between the construction camp and the intersection of the runways. This muskeg was pushed to the sides with the motor patrol grader and after dark with the dozer, there being no lights on the patrol grader. The dozer was likewise employed on the night shift. in heaping the material in the center of the 28th Engineers Road between the construction camp and Yakutat.

The tractor at Yakutat was laid up for the installation of the hoisting unit.

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December 10, 1940-Tuesday:
BBT Intermittent light rain. Temperature 7:30 am, 39 degrees. Light fog early morning. Visibility reduced to about 2 miles. This is the first fog seen at Yakutat.

Wash boring and Bay City units obtained samples from 4 holes along the S-45-E runway. As lower end of runway approached, ground is very soft. The soil changed from gravel to very fine sand near hole No. 40 and 40C. Sand extends from just under the muskeg to at least 27 ft.

Road patrol grader used on section of 28th Engineers Road between camp and runways. At 4:30 P.M. all the equipment on the field was bogged down. The tractor, however, was gotten out at about 7 o'clock. It, of course, can pull out the other pieces of equipment. Tractor used on 28th Engineers Road on night shift. Tractor at Yakutat undergoing installation of Hyster unit.

Dug foundation trenches and placed forms for the concrete foundation for latrine and bath houses.

Other work as usual.

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December 11, 1940-Wednesday:
BBT Weather generally fair. Temperature 7:30 am, 33 degrees.

Poured concrete foundation for latrine and bath house. Wash boring rig sank 6 holes. Bay City rig stuck until 3:30 in the afternoon and obtained one sample. Tractor on field employed in connection with wash boring equipment during day and worked on 28th Engineer Road night shift. Tractor at Yakutat undergoing installation of Hyster unit.

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December 12, 1940-Thursday:
Fog in morning. Generally fair. Temperature 7:30 am, 28 degrees.

Poured foundation blocks for electric generator. Wash boring unit took 5 samples and Bay City unit 4 or 5. Patrol grader worked on 28th Engineer Road during day and the tractor at night. Tractor used for shifting wash boring equipment during the day. Stripping of area for garage and carpenter shop completed. Carpenter shop is being placed southeast of the construction camp just across the extension of the access road. 6,000 gallon water tank taken to the field. Installation of Hyster unit completed on tractor at Yakutat.

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December 13, 1940-Friday:
BBT Rain. Temperature 7:30 am, 38 degrees.

The Bay City unit completed taking samples on center line of S-45-W runway, taking samples from either 1 or 2 holes and then moved back undersection of runways where it became stuck and awaited the movement of the tractor. Wash boring unit took 2 samples. Road patrol grader continued on 28th Engineers Road day shift; tractor at night.

The section of the 28th Engineers Road between the construction camp and the runways, which a week ago was under about one foot of water, has been drained and the fill has been placed in the center of the road to about 18 inches over a width of about 12 feet. This fill has been placed by moving gravel to the center from side borrow by means of the motor grader and the angle dozer. The fill has drained nicely and is sufficiently solid to permit a truck to pass over it. The section of the road between the construction camp and Yakutat was originally worked with the elevating grader and later with the angle dozer, which instead of pushing a narrow strip all the way to the center of the fill, pushed up a heavy layer and attempted to carry it across the fill (while the other section of the road was filled by taking light cuts, each of which was carried all the way across the shoulder to the center, and by the time it reached the center fill, had been thoroughly mixed and was quite dry.) The section filled by means of the dozer rolled up large rolls, carried the water to the center of the road, and is still soft.

The section of the road between the construction camp and the runways might be considered as a miniature runway in that it was stripped clean, had side ditches cut, and the spoil from the ditches moved to the center. The entire roadway drained nicely, the shoulders are solid, and the fill is reasonably dry and well compacted.

The ditches along the roadway have been considerably enlarged and drainage is greatly improved.

Tractor at Yakutat resumed clearing on the access road to the dock. About 600 feet remain to be cleared. Clearing is by means of dragging out the down timber and pulling over the standing trees by 1 inch cable attached to the Hyster unit.

December 14, 1940-Saturday:
BBT Intermittent rain. Temperature 7:30 A.M., 39 degrees.

Bay City unit moved to test hole 3,000 ft. from intersection of runways on S-45-E runway and took one sample, following which there was trouble with the boom which had been bent in shifting the equipment. Machine was out of order the remainder of the day. Wash boring unit made one hole and was stuck until about 4 pm, at which time the tractor succeeded in getting it out. There remain 4 wash boring holes on the NW side of the S-45-W runway.

Tractor worked on 28th Engineer Road on night shift. Road is about four-fifths completed from the woods to the intersection of the runways (1-1/2 miles). Tractor at Yakutat used to snake logs out of right-of-way to dock.

December 15, 1940-Sunday:
BBT Intermittent rain. Temperature 7:30 am, 38 degrees.

Mechanics worked on repair of boom for Bay City shovel. Tractor and motor grader employed on 28th Engineers Road. Ramp completed for unloading heavy equipment from KVICHAK scheduled to arrive in a day or two.

December 16, 1940, Monday:
BBT High overcast. Temperature 7:30 am, 32 degrees.

Completed wash borings S-45-W runway.

Alaska Steamship Company vessel MOUNT McKINLEY arrived 4:30 am, departed 10 am. KVICHAK arrived 10 am. Unloading commenced 11 am. Three tractors, back filler and ditcher unloaded by 2 pm. The arrival of this heavy equipment was anticipated, and portable ramps had been constructed to accommodate it. It required only a few minutes to put the portable ramps in place, and the equipment was brought off the ship without difficulty. It is considered that these ramps are suitable for unloading any mobile equipment up to 20 or 30 tons in weight. Unloading continued throughout the night.

Carryall used to haul gravel for a fill at the site of the garage and carpenter shop. Mr. Sparks instructed the soldier operator in handling the carryall, who thereafter worked independently. Borrow was taken from alongside the 28th Engineer Road southeast of its intersection of the access road. It is considered that this material is representative of td. It is gravel of the type of the soil samples sent to the Mud Mountain Laboratory Ñ a little on the course side. As was expected, the carryall handled this material in an excellent manner. The 28th Engineer Road bore the weight of the empty carryall without undue bogging, and the stripped area outside the ditch of the 28th Engineer Road, which is the virgin sub-soil, supported the loaded carryall without difficulty. The D-8 tractor was not unduly loaded either in filling or drawing the loaded carryall. Although the material is saturated gravel, the bin loaded readily to about three-quarters of its capacity. It is not known if an attempt was made to load it any heavier, but its operation was smooth and even. There is no difficulty in training soldiers to operate this equipment. They are enthusiastic about it and get a great deal of enjoyment from it.

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December 17, 1940-Tuesday:
BBT Rain. Temperature 7:30 am, 38 degrees.

Wash borings resumed on S-45-E runway. Work continued on road to the dock site. Motor grader used on 28th Engineer Road on the field. About 1-1/2 miles of this road is up to grade, but will require work with motor grader until it settles. Indications are that the road will be in good shape within a few weeks.

Took one Allis-Chalmers tractor to mile post 5, which is opposite the 5500 ft. mark on the S-45-E runway, where it was tested to determine its action in muskeg. In this test, the blade would slide across the muskeg, but upon taking a second cut in the same place the blade dug in and immediately stalled the tractor. The tractor was without sufficient power to lift. the blade without backing it off. This type of tractor is too light to use in muskeg, and it was so reported to the District Engineer, which fact is doubtless already known. The request was renewed for 3 heavy tractors, preferably D-8's, in order that only one class of spare parts will be required.

Small amount of work done with the carryall, completing the fill for the base of the garage.

Unloading of KVICHAK c

December 18, 1940-Wednesday

Clear until mid-afternoon, then overcast, followed by a gale from the southwest with very heavy tide. Temperature 7:30 am, 31 degrees.

Wash borings; surveys S-45-E runway, work on road to dock, and motor patrol work on Engineer Road continued.

In blasting a stump from the road, a piece struck the house of Mr. Edwards near the dock site. Very little damage was done, which will be repaired; and it is expected that nothing further will be heard from the incident.

A second test was made with the Allis-Chalmers tractor near mile post 5 in an area approximately 50 yards southeast of the test of the previous day. The purpose of this test, aside from observing the action of the tractor in muskeg, was to obtain photographs and motion pictures of it, this being the first suitable day for photographs in about 3 weeks, although some pictures had been made under unfavorable conditions during that period.

Immediately upon lowering the blade it dug in and the tractor went right in after it. Before it had moved half a tractor length, it had gone so deep that the fan on the motor was cutting water, which immediately rose to the surface of the muskeg. The tractor was then thrown in reverse and attempt was made to get it out of the hole. The track slipped and it dug itself in. 3x8's and 2x12's were brought, split and an attempt was made to place them underneath the tractor in order to give it more solid footing and the necessary traction to pull itself out. The tracks are 12 inches wide, and the cleats are so closely spaced that they will not grasp a timber sufficiently large to offer much support. Small pieces would be drawn under and buried under

the muskeg. Pieces large enough to do any good would not be drawn underneath the tractor. The cable from the winch was attached to the locomotive about 200 ft. away, and attempt was made to pull the tractor out with the cable. The was unsuccessful. However, it was probably due to the maladjustment of the cable clutch, since it had not been used or e factory. Although the tractor could have been dug out with shovels, logs were cut and placed under it, as is done when the D-8's get stuck, a D-8, working a quarter mile away, was brought over and used to pull out the small tractor.

These tractors (Allis-Chalmers Model M) are doubtless excellent tractors for the purpose for which they are intended. The manufacturer recommends them for use on farms and in orchards, and in his advertising literature is an illustration with the title, "Built to take big loads over rough ground," which shows the tractor pulling a double disc harrow, probably 6 ft. wide, up about a 15 degree slope. It is clear that these tractors are unsuitable for use in muskeg, although considerable use may be expected of them in moving small loads and in doing dozing in gravel from time to time. In order to release the D-8 back into the woods, it is proposed to use two of these small tractors to assist the Bay City shovel in moving down the center of the runway. Additional mention will be made of this, probably in the log for December 20.

Photographs were also taken of the movement of traffic on the 28th Engineer Road to furnish a progress picture of the condition of the road as of this date.

Wash borings continued.

Unloading of the KVICHAK continued.

December 19, 1940-Thursday:

BBT Heavy rains very early morning. Cleared about daylight, and remained clear until late evening when the rains resumed. Temperature 7:30 am, 40 degrees.

KVICHAK was unloaded at about 4 A.M. and deported just before 5:30 am. 1st Lt. Lawrence E. Carpenter departed for Station Hospital, Fort Lewis, for observation and treatment (appendicitis). Mr. Crichton, Draftsman, returned to the Seattle District Office for duty, having been on temporary duty at Yakutat.

The Navy patrol boat PT-72 came into the harbor just before the KVICHAK departed. Her master is Commander Anderson, Naval Reserve, with Mr. Adams, First Officer. She took on water and requested medical assistance, as she has an ill man aboard (flu). She remained in port.

Surveys and work on the road to the dock continued. Wash borings completed to 5,000 ft. on the S-45-E runway, and the equipment returned to the camp area. The D-8 tractor employed to clean out and enlarge drainage ditches.

The Parsons ditcher was taken to the field but not unloaded. She was being held up for the installation of lighting equipment. A spare generator for the Dodge truck is being installed on the ditcher, for which purpose it was necessary to fabricate special pulleys and to weld carrying plates for the generator to the motor supports.

December 19, 1940-Thursday (Continued):

Work resumed on a small scale on the construction of the latrine and bath houses as some of the men had become rested from unloading cargo. Approximately 950 tons had been unloaded from the KVICHAK. Preparations continued for the construction of the dock. It is expected that the driving of piling will commence early next week.

Engineering data forwarded to the District Office as covered by correspondence dated December 16-18.

The first issue of the "Yakutattler," a combination safety and welfare publication, was hurriedly reproduced in order that copies of it might go out on the KVICHAK. In addition to the "Yakutattler," it is expected that this office will be a contributor to the Seattle District Safety Bulletin. There is considerable interest in this publication, and the personnel are becoming safety minded.

December 20, 1940-Friday:

BBT Heavy rain, strong wind from the southeast. Temperature 7:30 am, 41 degrees. Warmest day since we have been at Yakutat.

Navy patrol boat PT-72 still in port.

Ditcher unloaded but not put in operation due to the necessity of repairing the main excavation chain, which had a broken link. It will probably be placed in operation tomorrow. Two small tractors sent to assist movement of Bay City shovel. They were ineffective. One tractor remained stuck in the field. It will probably be pulled out by the D-8.

Resumed operations clearing 28th Engineer road about one mile from the construction camp in the direction of the village in very heavy timber, averaging approximately 3 ft. in diameter. About 300 ft. of roadway were cleared, the timber having been previously felled. This timber would make excellent lumber and is being saved for possible future use, although little extra effort is being expended in this regard.

Work continued on the access road to the dock. Mr. Kenning placed in charge of dock construction and construction of the road from the dock towards the field until it meets the road from the field.

-oOo-

December 21, 1940-Saturday:
BBT Rain. Temperature 7:30 am, 34 degrees.

Moved ditcher to site for commencement of drainage ditch 600 ft. northeast of the 5,000 ft. station on the S-45-E runway. Ditcher was started just before quitting time. To support the ditcher on the muskeg, it was necessary to lay a solid mat of timbers. Timbers about 12 feet long are used for this purpose. They are often pressed into the muskeg so deep that it is necessary to problem for them in order to recover them as they go completely out of sight.

In moving heavy timbers to form a bridge for the ditcher over a small stream, the D-8 tractor became stuck in mid-morning and was gotten out at 5 pm. The tractor sank on an even keel to a point where she got water in the crankcase. Following her excavation, she was, of course, drained clean and completely re-serviced, which required until Sunday noon (December 22).

Survey crew staked the ditch line for the ditcher. Work continued on the road to the dock site.

Diesel locomotive out of order undergoing repairs. The clutch is completely gone. Locomotive cannot be operated until a new clutch is obtained from Seattle and installed.

Felling crew worked in the woods on 28th Engineer Road.

Navy patrol boat PT-72 departed 2:30 pm.

-oOo-

December 22, 1940-Sunday:
Clear all day. Temperature 7:30 am, 26 degrees.

Ditcher was operated intermittently throughout the day, the intervening time being spent on adjusting, tuning and servicing the machine.

Small amount of work was done on the road to the dock.

D-8 on the field was in the shop in the forenoon, and in the early evening, it took a large timber mat to the Bay City shovel, which had been mired down at the 3,000 ft. mark on the S-45-E runway.

At 2:30 pm, tractor commenced work in the woods on 28th Engineer Road and continued until 4 pm, whereupon the night shift. took over, and tractor was operated on building the road between section already completed and the limit of the clearing in the woods. This, of course, is on the landing field end of the road.

Navy patrol boat PT-73 entered the harbor at 7 A.M. and departed without making contact with shore. Apparently, she was trying to find PT-72. PT-74 called at 9 A.M. and left. a

radio
December 22, 1940-Sunday (Continued):
message for delivery to the Commanding Officer, 13th Naval District, and departed.

Made reconnaissance throughout length of the S-45-W runway to 10, 184 ft, which is the bank of a branch of the Lost River. At this point, the stream is from 4 to 6 ft. deep, depending upon the rainfall and the tide, and is about 60 ft. wide. It is a clear, fast flowing stream. The left. bank, that is the northeast shore, is covered with underbrush and small scattered trees. The right bank (the southwest shore) is heavily timbered with a dense growth of spruce about 60 ft. high. The trees are so closely spaced that one can see only 80 or 100 ft. into the forest. The trees are about 1 ft. in diameter.

Should this runway be constructed to its full 10,000 ft. length as proposed either one of two things would be necessary: first, these woods would have to be cleared to the width of the runway for a distance of about 800 ft. or the runway would have to extend the same distance beyond the point of its intersection with the S-45-E runway. Of these, the more practicable solution from a construction point of view would be to extend the runway 800 ft. to the northeast, as the last 2,500 ft. of the runway, that is, from 7,500 ft. to 10,000 ft, is very marshy and offers increasingly expensive work as the 10,000 ft. end is approached. There is a definite change in the nature of the soil at about 5,000 ft. on this runway. From the intersection of the two runways to 5,000 ft, the runway is on fairly solid ground except for the crossing of a small stream at about 4,000 ft. At about 5,000 ft. and 6,000 ft, about 25% of the area appears to be under water all the time, and at 7,400 ft, there is a small patch of woods through which a small stream runs. The bottom of this stream instead of being gravel is black mud, probably waist deep; and from this point on to 10,000 ft, the ground is soft. and marshy and between 9,500 and 10,000 ft, the northwest half of the runway is covered by a lake extending to the northwest and covering about 20 acres, although its depth is only 2 ft. Before any construction can be undertaken on the lower end of this runway, considerable drainage will have to be accomplished. The branch of Lost River previously referred to, which crosses the runway at 10,184 ft, is of sufficient size to carry the normal runoff except for short periods immediately following heavy rains, at which time it appears that the entire lower end of the runway will be covered with water probably to a depth of a foot to 18 inches. There was evidence of tidal action on the stream, although it did not appear that the high tide caused it to overflow its banks.

December 23, 1940, Monday:
BBT Generally fair. Temperature 7:30 am, 29 degrees.

Work continued on the road to the dock, clearing 28th Engineer Road, construction of latrine and bath houses, and work with ditcher. Ditcher dug about 350 ft. in two shifts.

The operation of the ditcher with the present buckets is unsatisfactory as the ditcher is always full of water and the fine sand and gravel flow off the bucket without being carried to the apron. Plans are being made to modify the buckets.

-oOo-

December 24, 1940, Tuesday:
BBT Weather clear. Temperature 7:30 am, 20 degrees.

Holiday by executive order.

Only work was with tractor on approach to dock.

-oOo-

December 25, 1940, Wednesday:
BBT Overcast. Temperature 7:30 am, 20 degrees.

Holiday-no duties.

-oOo-

December 26, 1940, Thursday:
BBT Weather clear. Temperature 7:30 A.M., 20 degrees.

Ditcher out of operation all of first shift. and one half of second shift. while the buckets were being modified. Modification consisted of welding a length of 4 inch strap iron across the back end of the bucket to increase its capacity. The strap is of such length as to fit inside the chain which forms the two sides to the bucket. The capacity of the buckets was more than doubled. The conveyor belt was likewise repaired.

Work continued on the road to the dock site and on clearing 28th Engineer Road. Clearing is at a rate of about 300 ft. per day of one shift. to a width of 80 ft. Timber averages about 2-1/2 ft. in diameter and 100 ft. high. Growth is dense. On the night shift. the tractor cuts ditches and commences the fill for the road.

The Bay City shovel attempted to continue the taking of soil samples along the center line of the S-45-E runway. Mats approximately 4 ft. x 10 ft. were used to support the shovel on the soft. ground, but due to the wet and cold they immediately became coated with ice about one half inch thick, and they were of such little use that the use of the shovel to obtain the remainder of these samples will be discontinued and they will be taken by wash boring instead.

Construction commenced on the pump house.

-oOo-

December 27, 1940-Friday:

BBT Temperature 7:30 am, 31 degrees. Snow about 2 inches deep by nightfall.

The approach to the dock has progressed to a stage where it is possible to move the piledriver to the site. Movement of piledriver from vicinity of Libby store commenced in late afternoon.

Work continued on the clearing of 28th Engineer Road.

A small gas engine driven centrifugal pump was rigged, using hose and jet, for wash borings. The remainder of the wash boring samples (5) were taken on the S-45-E runway with this unit. Probing was to a depth of about 9 ft, a 10 ft. length of pipe being used.

Work continued with the ditcher on two shifts. Inasmuch as it is necessary to lay a plank road ahead of the ditcher, a crew of seven men are required for its operation. About 200 ft. of the ditch was dug during two shifts—depth of ditch approximately 6 ft. The ditch parallels the S-45-E runway a distance of approximately 600 ft. from the center line thereof in the direction of the railroad, commencing approximately abreast of station 79, which is about 6,000 ft. from the intersection of the two runways.

Work continued on the construction of bath house, latrine and pump house, and work commenced on construction of garage. It will be necessary to place garage on higher foundation than indicated on drawings as present design will not permit the tractor to pass through the door; raising the foundation to a greater height is the most simple way of obtaining the necessary clearance.

Authority was received for the employment of local labor.

-oOo-

December 28, 1940-Saturday:

Temperature 7:30 am, 30 degrees. Snow about 4 inches deep. Considerably more snow fall but melted down to this depth. It overlays ice about one half inch deep.

Work continued on the ditcher on two shifts. At the close of the first shift, about 750 ft. of ditch had been dug.

Commenced on the installation of the plumbing to go beneath the floor of the latrine and continued construction of pump house and garage.

Four soil samples were taken to a depth of about 5 ft. in the area of the apron at the points indicated on the map showing the location of the soil samples. These samples were taken by digging with a shovel, an attempt being made to obtain samples representative of the soil to the full depth of the hole.

Work continued on the 28th Engineer Road and on the road to the dock. The movement

December 28, 1940-Saturday (Continued):
of the piledriver from the cannery to the dock site continued. The approach to the dock was brought down to the proper elevation for driving the piling. This required a cut of approximately 15 ft. in the bank.

Approximately 22 natives were given physical examinations with view to employment. All but 5 passed.

During the night shift, the cat on the field was used to clear the right of way through the woods along the route of the ditcher. This area, while through light timber, consists of very fine sand for a distance of about 100 ft., over which the tractor could move only with great difficulty.

December 29, 1940-Sunday:
BBT Weather clear. Temperature 7:30 am, 24 degrees.

Movement of the piledriver continued. She was moved about 300 ft.

Tractor employed on the field ditching and filling on 28th Engineer Road. The ditches are kept up with the clearing, and the filling follows shortly behind.

-oOo-

December 30, 1940-Monday:
BBT Weather clear. Temperature 7:30 am, 18 degrees.

Work continued as on December 28th.

17 natives commenced work clearing heavy timber on 28th Engineer Road. They made excellent progress and gave every indication of being good woodsmen.

Piledriver was moved into position for driving first bent.

-oOo-

December 31, 1940-Tuesday:
Weather clear. Temperature 7:30 am, 9 degrees. Note: the temperatures heretofore given are the temperatures obtained from a surveyor's thermometer hanging on the north side of the building about 3 feet therefrom and these temperatures are not to be accepted as official weather bureau temperatures. On this date, the official temperature was 4 degrees, as obtained from the CAA weather station.

Piledriver moved into position in late afternoon. Other work as usual. Approximately 1,000 ft. of ditch has been dug by the ditcher parallel to the S-45-E runway near the 5,000 foot end.