

THE
ALASKA
HIGHWAY

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THE ALASKA HIGHWAY

AN INTERIM REPORT

FROM THE

COMMITTEE ON ROADS
HOUSE OF REPRESENTATIVES

PURSUANT TO

H. Res. 255

AUTHORIZING THE COMMITTEE ON ROADS, AS A
WHOLE OR BY SUBCOMMITTEES, TO INVESTI-
GATE THE FEDERAL ROAD SYSTEM,
AND FOR OTHER PURPOSES



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SUMMARY

An on-the-ground inspection of the Alaska Highway and its feeder roads located in Alaska and Canada was made by a subcommittee of the Committee on Roads of the House of Representatives in August 1945. This inspection was supplemented by a 4-month investigation of Federal agency records and other pertinent material to ascertain—

- (1) Why the highway was constructed.
- (2) What it cost.
- (3) The manner in which funds of the United States Government were expended on the project and its collateral facilities.
- (4) The present and future value of the highway to the United States and Alaska.

The committee found the following facts to be relevant to its study:

(1) At the time the decision was made to construct the Alaska Highway, the military and naval situation in Alaska and in the North Pacific was much more precarious than was generally known in the United States. Military ground and aerial forces and naval strength in that area were believed to be too weak to withstand a direct Japanese assault on Alaska. An overland supply route to supplement and, if necessary, replace marine transportation to Alaska was held to be a military imperative.

(2) A chain of military airfields in northwest Canada and Alaska was in existence and of great military value. These airfields, however, were not connected by any road system. They were supplied and serviced only by air at great expense and inconvenience. A ground supply route for these fields would serve the dual purpose of providing better supply service and acting as a ground guide for fliers on the United States-Alaska run.

(3) Several routes for the highway were considered, but the route finally selected from Dawson Creek, British Columbia, to Big Delta, Alaska, via the military airfields at Fort St. John, Fort Nelson, Watson Lake, Whitehorse, and Tanacross was obviously the most desirable and practical choice on account of the airfield supply needs and because the terrain traversed was not as rugged as that to be found on other suggested routes.

(4) The Alaska Highway and certain feeder roads were built with United States funds under an agreement with Canada whereby the United States would maintain the highway for the duration of the war and 6 months thereafter, subsequent to which, control of that portion of the highway located in Canada was to pass to Canada.

(NOTE.—Under an agreement recently arrived at, Canada is to assume control and maintenance of the highway on April 1, 1946.)

(5) Because the route selected passed through territory never before cut by a road, it was necessary to construct a rough trail through the wilderness in 1942 in order to have a means of transporting road-building equipment and other necessary materials to the job site.

This rough trail, popularly described as the "pioneer road," was built between March and November, 1942 under very primitive conditions by a force of seven Army Engineer regiments, totaling 394 officers and 10,765 enlisted men. These troops were given material assistance in the latter half of 1942 by 47 road contractors working under the supervision of the Public Roads Administration. An additional labor force of approximately 7,500 men was employed by these contractors. Total cost of constructing the pioneer road was \$19,744,585. This included all expenses incurred by the Public Roads Administration and its contractors and all investment made by the War Department in materials and supplies. No costs for troop labor and subsistence or War Department investment in major equipment are included in this figure, however.

(6) A final type road with graveled surface was constructed along the approximate route of the pioneer trail in 1943 by 77 private contractors and four management contractors working under the general supervision of the Public Roads Administration. The latter agency was working under an assignment given it for this purpose in 1942 by the War Department. A force of 14,100 men was employed at peak by these contractors and this was supplemented by an additional group of 1,850 civilian employees of the Public Roads Administration. Actual cost of constructing this final-type road was \$94,079,635. This sum does not include moneys previously spent in the construction of the pioneer road.

(7) The Public Roads Administration, through its contractors, performed other construction work for the War Department in northwest Canada and Alaska which may not be properly classified as direct highway construction expense. This additional work, which cost \$11,615,913, covered such items as highway maintenance, construction of airports, flight strips, pipe line, telephone, radio, and relay stations.

(8) At the conclusion of work by Public Roads Administration contractors on the final road, the agency turned over to the War Department a final-type job inventory valued at \$12,872,033 which consisted of major construction equipment, stock-piled road-surfacing materials, repair parts, and other supplies.

(9) All contractors employed by both the Public Roads Administration and the War Department operated under cost-plus-fixed-fee contracts. This method of awarding contracts was selected because of the need for speed in completing the project and because the wilderness location prevented preliminary cost estimates and route surveys by either Government engineers or interested contractors. Public Roads Administration has disbursed or will shortly disburse a total of \$5,159,621 as fixed fees to its contractors under contracts totaling (including fees) \$109,483,297.25. The War Department has disbursed a total of \$447,474 in fixed fees on \$13,718,640 worth of contracts which were let directly by that agency instead of through the Public Roads Administration.

(10) At the peak of construction operations on the highway, 11,107 pieces of road-building equipment, valued at more than \$36,000,000, were in use. Of these, 3,983 units were owned by contractors and were rented on a basis specified in contracts with the Public Roads Administration. Contractor-owned equipment rented under PRA contracts was valued at \$13,973,747.92. Rentals paid by the Government for use of this equipment over a 17-month period totaled \$5,753,-

019.67. The War Department entered into direct equipment-rental contracts in connection with the construction of the Haines lateral road and the completion of the permanent bridge program on the Alaska Highway. To this end the War Department rented 300 pieces of contractor-owned equipment, valued at \$1,573,836.85, for which it paid rentals totaling \$740,273.88 for a period of approximately 1 year. Rental schedules used by both agencies were below ceilings permitted under Office of Price Administration regulations. War Department rates were slightly higher than those used in Public Roads Administration's schedules.

(11) A total of 30,586 pieces of Government-owned construction equipment was used on all United States Government construction projects in Alaska and Northwest Canada which came under the supervision of the Corps of Engineers, War Department. Much of this equipment which was used on the Alaska Highway and its feeder roads was also used on other projects such as the Canol project. Only 635 pieces of this equipment have not yet been accounted for by the War Department.

(12) Under agreement with Canada, disposition of surplus, immovable property located in Canada which was built in connection with the Alaska Highway project is being handled by the Canadian Government for the account of the United States Treasury. Some movable surpluses are being sold or otherwise disposed of by Canada for the account of the United States under special agreement. Most of the surplus movable United States Government-owned equipment has been transferred either to Alaska or to the United States where it is being disposed of under the regulations of the Surplus Property Administration in those cases where it has been classified as excess to the present needs of the War Department.

(13) Certain additional construction costs which are not normally incurred on highway work in the United States increased the cost of constructing the Alaska Highway approximately \$37,340,000 more than similar type work would have cost in the United States. In like manner, the cost of constructing the Haines lateral road, a feeder road to the Alaska Highway, was increased approximately \$3,290,000. These increased costs were for extra transportation charges, for housing of workers, for travel expense of workers, and for overtime. There were additional increased costs peculiar to the project due largely to weather conditions which cannot be accurately computed and were therefore not taken into consideration in appraising the final cost.

(14) The Alaska Highway, as completed, consists of a permanent, all-weather, graveled highway, 1,422 miles in length, 26 feet in width (except for the southerly 75 miles which is 36 feet wide). It connects Dawson Creek, British Columbia, with Big Delta, Alaska. The highway has been maintained under War Department supervision in very satisfactory condition at relatively small maintenance expense. Automobiles can average 40 miles per hour or more over the entire route. The highway has a maximum estimated carrying capacity of 720,000 net tons per annum under demands of military pressure and a normal annual carrying capacity of 400,000 tons.

(15) At Big Delta, the northern terminus, the highway connects with the Richardson Highway running between Valdez and Fairbanks, Alaska. At Gulkana on the Richardson Highway is the terminus of the Glenn Highway which connects Anchorage with the Richardson

Highway. Both the Glenn and the Richardson Highways are permanent, graveled roads, which could be kept open on a year-round basis under a proper highway-maintenance program. From Tok Junction, near Tanacross, Alaska, there is a poor, but usually passable road which was built by Public Roads Administration contractors to expedite bringing supplies to the Alaska Highway directly from Gulkana.

(16) A feeder road, known as the Haines lateral road, 153.7 miles in length, commences at Haines, Alaska, at the northern end of the Inland Passage, crosses the coastal range into Canada and connects with the Alaska Highway at Champagne, Yukon Territory, 98 miles west of Whitehorse. This road was built to the standard of the Alaska Highway, but has not been maintained in recent months. A relatively small investment in repairs and maintenance will place the facility in shape to handle traffic on a year-round basis. This feeder road was built to relieve the transportation strain on the narrow-gage White Pass and Yukon Railroad which connects Skagway, Alaska, with Whitehorse, Yukon Territory. At the time construction of this facility was commenced the railroad in question was being used to transport supplies and equipment to the Whitehorse section of the Alaska Highway and serious delays were being encountered in effecting deliveries on schedule at a time when they were vitally needed if construction schedules were to be met.

(17) The final-type Haines lateral road was constructed under a contract let directly by the War Department to the firm of Foley Bros., Inc., and Rohl-Connolly Co. The pioneer trail over which the Haines Road is constructed was built principally by Engineer troops at a cost of \$1,694,000. Before the War Department contractor was employed to build the final-type road, Public Roads Administration contractors performed grading and bridge construction work at a cost of \$1,610,000. The total cost of constructing the Haines Road, including the pioneer trail, was \$12,216,000. On a mileage basis, the cost of constructing the Haines Road was slightly higher than the per-mile cost of constructing the Alaska Highway despite the former road's proximity to tidewater where supplies were more readily available. The type of terrain crossed by the Haines Road, however, required earth and rock excavation on a mileage basis about 65 percent greater than that found on the Alaska Highway route. This factor is believed to be responsible largely for the higher cost per mile in the construction of the Haines Road.

(18) Road facilities in Canada which feed the Alaska Highway at its southern terminus at Dawson Creek are poor-quality highways, unusable at certain seasons of the year. This is in contrast to the condition of the Alaska Highway proper which is usable at all seasons of the year. Freight may be brought to Dawson Creek by rail from points in the United States and Canada, however, at all seasons of the year.

(19) The nearest highway route from the United States to Dawson Creek is via Great Falls, Mont., or via Bismarck or Minot, N. Dak. Usable highways now connect these United States cities with Edmonton, Alberta; however, the roads from Edmonton to Dawson Creek are of poor quality and not usable at all seasons in their present state of repair.

(20) At present, there is no direct highway connection between the Pacific Coast States of the United States and Dawson Creek although the Province of British Columbia is now building a 180-mile connecting highway between Prince George, British Columbia, and Dawson Creek. A provincial road which is now in relatively poor condition now runs from Prince George to Vancouver from which city there is a good highway leading to the Pacific Coast States in this country.

The committee's findings and recommendations which are the result of this investigation are summarized in the concluding chapters of the following report.

Union Calendar No. 508

79TH CONGRESS } HOUSE OF REPRESENTATIVES { REPORT
2d Session } No. 1705

THE ALASKA HIGHWAY

MARCH 13, 1946.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed with illustrations

Mr. ROBINSON of Utah, from the Committee on Roads, submitted the following

REPORT

[Pursuant to H. Res. 255]

The accompanying report represents the unanimous findings of a subcommittee of the Committee on Roads appointed to inspect the Alaska Highway and its feeder roads, to determine why the highway was constructed, what it cost, the manner in which funds of the United States Government were expended on the project and its collateral facilities, and to also determine the present and future value of the highway to the United States and Alaska.

I. SCOPE OF INVESTIGATION

This study and investigation of the Alaska Highway and its feeder roads was undertaken under the authority of House Resolution 255, Seventy-ninth Congress, adopted July 3, 1945, reading as follows:

RESOLUTION

Resolved, That the Committee on Roads, as a whole or by subcommittee, is authorized and directed to make a full and complete study and investigation of the construction and maintenance of highways, roads, streets, and bridges over which the Government or any agency thereof exercises or may exercise any jurisdiction or direction, directly or indirectly, as a part of the war effort or otherwise, including the allocation of materials, equipment, and manpower for the construction or maintenance thereof, and practices incidental thereto whether private or governmental which affect the use, construction, and maintenance of such highways, roads, streets, and bridges.

The committee shall report from time to time to the House the results of its investigations and studies and in its reports the committee may recommend such legislation as may be deemed pertinent.

SEC. 2. For the purposes of this resolution the committee, or any subcommittee thereof, is authorized and directed to hold such hearings, to sit and act during the present Congress at such times and places, whether the House is in session, has recessed, or has adjourned, to employ such experts and such clerical,

stenographic, and other assistance, to take such testimony, to have such printing and binding done, to make such expenditures as it deems necessary. Subpenas may be issued over the signature of the chairman of the committee, and may be served by any person designated by the chairman. Oaths or affirmations may be administered by the chairman or any member of the committee designated by him.

Pursuant to this resolution, a subcommittee of the Committee on Roads was appointed to make the study and investigation. The subcommittee consisted of Hon. J. W. Robinson (Utah), chairman; Hon. W. M. Whittington (Mississippi); Hon. Jennings Randolph (West Virginia); Hon. Hugh Peterson (Georgia); Hon. Jesse P. Wolcott (Michigan); Hon. Paul Cunningham (Iowa); and Hon. J. Glenn Beall (Maryland).

All members of the subcommittee, except Representatives Whittington and Wolcott, spent the greater part of August 1945 in Canada and Alaska making an on-the-ground inspection of the Alaska Highway, its feeder roads, and the collateral facilities constructed under military supervision to serve the highway and to be served by it.

Members of the subcommittee traveled by automobile over the entire Alaska Highway except the 98-mile section between Whitehorse (Yukon Territory) and the junction of the Alaska Highway with the Haines lateral highway. This section was observed by flying over it at low altitude. In addition to covering 1,479 miles of the Alaska Highway and the Haines lateral road by automobile, the members of the subcommittee also drove over 575 miles of the connecting road system in Alaska.

At each stop highway maintenance and service facilities were inspected. Several airports along the highway were also inspected. Data were collected on the problem of supply for the air route, the nature and condition of the telephone and telegraph system which parallels the highway, and the pipe-line distribution system which supplies airports between Watson Lake (British Columbia) and Fairbanks (Alaska) with aviation and motor gasoline and Diesel and fuel oil. Meetings were held in various cities in Alaska and Canada, where a full discussion of the highway problem was had.

Information was obtained regarding the agreement between the United States and the Canadian Government for the construction and maintenance of the highway. Similar information was obtained with respect to collateral facilities such as the telephone and telegraph system and the distribution pipe line.

Detailed cost data as to the actual cost of construction of the Alaska Highway, the Haines lateral road, and the collateral military projects were obtained. This information included description and cost of equipment rented by the War Department, the Public Roads Administration, and the private contracting firms employed by these Federal agencies in work on this project. A report was secured from the Corps of Engineers as to the status and disposition of all Government-owned equipment used on the construction, operation, and maintenance of all United States Army projects in northwest Canada and Alaska. Much of the information obtained came from files of the War Department until recently classified as "secret."

The location of the highway, its access connections with the United States and southern Alaska ports, and its relation to other transportation and communication routes are shown in appendix A.

II. LOCATION AND CONDITION OF THE ALASKA HIGHWAY AND THE HAINES LATERAL ROAD

The Alaska Highway, as it has been officially named by an exchange of notes between the United States and Canada on July 19, 1943, begins at the railhead in the town of Dawson Creek, British Columbia, and extends northwesterly 1,422 miles across British Columbia and the Yukon Territory in Canada to Big Delta, Alaska, where it joins the Richardson Highway, which provides the final 95-mile link to Fairbanks, Alaska. Although actual highway construction begins at Dawson Creek, the real southerly focal point of the Alaska Highway is the city of Edmonton, Alberta, which is one of the principal railroad and communication centers of western Canada. Edmonton is connected with Dawson Creek by a provincial highway and by the standard-gage Edmonton, Dunvegan, and British Columbian Railway (Northern Alberta Railroad).

Beginning at Dawson Creek, the highway follows a general northerly and northwesterly course through prairie country, passing in the vicinity of the military airfield at Fort St. John, British Columbia, at mile 48. From Fort St. John the highway extends northerly along the eastern slopes of the Rocky Mountains, crossing the Sikanni Chief River and following the valleys of the Prophet and Muskwa Rivers to the vicinity of the military airfield at Fort Nelson, British Columbia, at mile 300. From Fort Nelson the highway turns westerly and enters the Rocky Mountains, reaching its maximum elevation of 4,250 feet at Summit Lake, at mile 390. From Summit Lake the highway continues a general northwesterly course to Muncho Lake and then follows the valley of the Trout River northerly to its junction with the Liard River.

Following the valley of the Liard, the highway passes through the Rocky Mountains and reaches the settlement of Lower Post and vicinity of the military airfield at Watson Lake, Yukon Territory, at mile 635. From Watson Lake the highway turns in a more westerly direction and, following the headwaters of the Swift River, crosses the Divide between the Mackenzie and Yukon watersheds at a point 80 miles east of Lake Teslin, at a maximum elevation of 3,208 feet. From Lake Teslin, the highway follows a general northwesterly course to the town of Whitehorse, Yukon Territory, at mile 917, which is the site of a military air base. At Whitehorse the highway connects with the narrow-gage White Pass & Yukon Railroad, which extends 110 miles southerly from Whitehorse to the port of Skagway, Alaska. From Whitehorse the highway extends in a general northwesterly direction, following the route recommended by the Alaskan International Highway Commission. It passes along the southern shores of Kluane Lake and crosses the international boundary between Canada and Alaska at mile 1,221. From the international boundary it proceeds northwesterly, following the valley of the Tanana River, passing in the vicinity of the military airfields at Northway, Alaska, at mile 1,265, and at Tanacross, Alaska, at mile 1,329. At Tok Junction near Tanacross, the Alaska Highway meets a connecting road extending southwesterly to Gulkana, there joining the Richardson Highway and the Glenn Highway leading, respectively, to the ports of Valdez and Anchorage, Alaska. From Tanacross the Alaska Highway extends northwesterly, still following the Tanana Valley, to Big Delta, Alaska, the site of a military airfield, at mile 1,422, where it forms a junction

with the Richardson Highway. The Richardson Highway provides the final 95-mile link to Fairbanks, Alaska, which is the leading city of the interior of Alaska. Ladd Field, at Fairbanks, is the focal point for distribution of military air traffic flowing to and from Alaska. Fairbanks also is the northerly terminal of the standard-gage Alaska Railroad, which extends south to the ports of Seward and Whittier on the Gulf of Alaska.

The Alaska Highway for the first 75 miles of its length from Dawson Creek was constructed prior to the reduction of construction standards in April 1943 and is 36 feet in width. It is surfaced with 24 inches of graded gravel, consisting of 16 inches of base course and 8 inches of top course. The remaining length of the highway is constructed 26 feet in width, in accordance with the reduced standards, and is gravel-surfaced over its entire length except between miles 76 and 151, where crushed sandstone was used, and between miles 300 and 320, where a shale surfacing was used. In general, the remainder of the highway has been surfaced with a base course of bank-run gravel varying in thickness from 4 to 10 inches and topped with a 2-inch layer of crushed gravel as a finishing course.

The alinement and grades over the Alaska Highway are such as to permit safe driving at speeds up to 50 miles per hour, with a few exceptions, over the entire length of the road. A maximum grade of 10 percent was allowable under the specifications, and such grades prevail over a few short stretches of the highway. However, only 127 miles of the road were constructed to grades in excess of 6 percent. The highway has 937 miles of tangent construction and 487 miles of curvature. Approximately 240 miles were constructed to curvatures in excess of 6°.

The Alaska Highway construction required the erection of 133 bridges 20 feet or greater in length. The total length of all bridges is approximately 7 miles. The 2,130-foot suspension bridge erected over the Peace River near Fort St. John, British Columbia, is the most imposing structure on the entire highway. Major bridges were also erected over the Kiskatinaw, Sikanni Chief, Muskwa, Liard, Teslin, and White Rivers in Canada and Johnson, Gerstle, Tanana, and Robinson Rivers in Alaska. A 2,300-foot single-lane pile-trestle bridge, erected across the Nisutlin River at its entrance into Teslin Lake, is the longest structure on the highway. Approximately 50 percent of the total bridge footage consists of steel bridges, including the two suspension bridges across the Peace and Lower Liard Rivers. The remaining bridges are constructed of timber, ranging all the way from ordinary pile-trestle structures across small streams to the high-level deck-truss structure across the Sikanni Chief River.

Approximately 8,000 culverts, having a combined total length of approximately 50 miles, were installed along the Alaska Highway. Approximately 95 percent of these were corrugated-galvanized-pipe culverts and wood-pipe culverts ranging from 18 to 120 inches in diameter.

The remaining 5 percent were creosoted-timber-box culverts ranging from 4 by 4 feet to 10 by 10 feet in cross section.

The Haines lateral road begins at tidewater of Lynn Canal at the town of Haines, Alaska, and extends northwesterly 154 miles across the southwestern part of Alaska, British Columbia, and the Yukon Territory in Canada, where it joins the Alaska Highway 98 miles west of Whitehorse and 502 miles southeast of Fairbanks, Alaska.

Beginning at tidewater, Haines, Alaska, the highway follows the northeast bank of the Chilkat River for 24 miles, thence up the Klehini River to mile 50, reaching an elevation of 1,613 feet. At this point the highway enters Chilkat Pass, traversing steep mountain slopes subject to slides. The grade increases to mile 57, elevation 3,140, where the road descends for 2 miles into Clear Creek Valley. The highway reaches the summit at mile 63, elevation 3,416 feet, traversing heavy grades from mile 59. From the summit the road descends by easy grades, passing the southern edge of Mosquito Flats, crossing the Nadahini River at mile 67.1, and following its left bank to Mule Creek, crossing at mile 72. At mile 74 the road passes over a gravel moraine which forms the divide between the Chilkat and Tatshenshini Rivers and continues through relatively flat country to mile 78. From this location it traverses the slopes of Mount Mansfield and rises to an elevation of 3,183 feet at mile 94, thence to an elevation of 2,390 feet to cross the Takhanne River at mile 99, approximately 6 miles east of Dalton Post.

From Takhanne River the road rises on heavy grades to an elevation of 2,949 feet to mile 101, thence over rolling country along the east side of the Unihini River Valley to Unihini Crossing at milepost 113.5. The road continues northerly over level wooded country to reach a point opposite the southern tip of Dezadeash Lake at mile 120, thence along the west shore of Dezadeash Lake to milepost 131, where it turns northwesterly, passing through a region of low glacial moraines and crossing Kathleen River at mile 138.2 and Quill Creek at mile 145.7. The highway descends on low grades from this point into the Dezadeash River Valley, joining the Alaska Highway at a point approximately 98 miles west of Whitehorse, Yukon Territory. The Haines lateral road was built to the same standards as the Alaska Highway.

The Alaska Highway was found to be in excellent condition for its entire length, except for two minor slides whose total length was approximately 400 feet. Maintenance crews were working on these slides at the time the highway was covered by the subcommittee, and no difficulty was experienced in driving automobiles past them under their own power. The party traveled at an average speed of between 30 to 40 miles an hour and could have maintained speeds between 50 and 60 miles an hour over the greatest portion of the highway.

The Haines lateral road has not been maintained by the Army since February 1944 but was in passable condition. Several wash-outs and one large slide on this road have occurred during the past 18 months, but the subcommittee drove over the Haines Road without delay of any sort. It was obvious that the most satisfactory route for a permanent right-of-way for a portion of the Haines Road was not selected, but it was also obvious that the road could be repaired to all-weather maintenance standards within a short time at relatively little expense.

III. REASONS FOR DECISION TO BUILD HIGHWAY TO ALASKA

The construction of a highway from the United States to Alaska had been proposed for many years prior to the outbreak of World War II. A commission appointed by President Hoover in 1930 reported favorably upon the project as a peacetime venture. A subsequent Commission, known as the Alaskan International Highway Com-

mission, appointed by President Roosevelt in 1938, also submitted favorable reports on the feasibility and desirability of the project. The House Committee on Roads had twice studied the proposal and made favorable reports, one in 1935, the other in 1940. Further steps, such as field studies, to determine the best route and construction costs had not been authorized at the time the United States entered World War II, however.

The War Department, basing its stand on the yardstick of military necessity, never expressed its opinion on the economic feasibility or viewed it as being of importance from a military point of view, however, until October 6, 1941, at which time the Secretary of War advised the chairman of the House Committee on Roads that—

from an evaluation of the trend in international affairs, the construction of this highway now appears desirable as a long-range defense measure.

On April 18, 1934, in a report on H. R. 6538, a bill to authorize construction of a highway to Alaska, the Secretary of War advised the chairman of the House Committee on Roads that the proposed highway was feasible from an engineering viewpoint and could be constructed at a reasonable cost but expressed no opinion on the economic or military value of the project.

In July and August 1938 the proposed highway was again studied by the War Plans Division of the General Staff at the request of Assistant Secretary of War Johnson, who had recently visited Alaska. The conclusion reached, which was approved by the Chief of Staff, was that—

from a purely practical standpoint, the military value of the proposed Alaska Highway is so slight as to be negligible.

The same opinion was again expressed by the Secretary of War on August 2, 1940, in a report on H. R. 10064, a bill to authorize a highway to Alaska on such route as might be approved by the President. In this report the Secretary advised the chairman of the House Committee on Roads that—

the value of the proposed highway as a defense measure is negligible.

It is understandable that the stand taken by the War Department on these early proposals was based solely on military necessity. The relatively strong position of the United States in the Pacific at that time apparently gave little cause for concern regarding the security of the sea lanes from the United States to Alaska.

With the fall of France on June 22, 1940, there began a greater awareness of the possible dangers confronting the United States as a result of the trend of international affairs.

On August 18, 1940, the United States and Canada established a Permanent Joint Board on Defense for the consideration of mutual measures for the defense of the North American Continent. The Board was composed of six members from each country. The United States was represented by two officers of the War Department, two officers of the Navy Department, and two civilian members. The Canadian membership was similarly composed of representatives of that country's military services and civilian members. Forty days after the establishment of the Board, on September 27, 1940, Germany, Italy, and Japan signed the tripartite alliance, an omen which the Joint Board obviously heeded.

In its first deliberations the Joint Board gave attention to the increasing gravity of the international situation in the Pacific and the necessity for taking defensive countermeasures. At its first meeting the Board reported that the effective defense of Alaska was considered of paramount importance to the defense of the continent against attack in the Pacific, because Alaska is the area most exposed to any attack by an enemy wishing to establish a foothold in North America. The principal line of communications between the United States and Alaska at this time was by sea. Communication by air was still largely in the pioneering and development stage.

The War Department had for some years taken the view that because of the extent and character of the terrain of Alaska, air power should play a prominent role in its defense. In order to establish and maintain an effective air force in Alaska, a secure and well-developed airway for the movement of military aircraft, particularly of the light bomber and fighter class, from the United States across western Canada to Alaska, was felt necessary.

Consideration to this view was given by the Permanent Joint Board on Defense on November 14, 1940, after an investigation by the military service members of the Board. As its tenth recommendation, the Board adopted a plan for the construction of such an airway across Canada and Alaska via the route of Grande Prairie, Fort St. John, Fort Nelson, Watson Lake, and Whitehorse in Canada and Northway, Tanacross, Big Delta, and Fairbanks in Alaska. This recommendation was approved by both Governments.

The air route across western Canada via Grande Prairie, Fort St. John, Fort Nelson, Watson Lake, and Whitehorse had been surveyed previously by the Canadian Department of Transport in 1935 and had been chosen as the most practicable flying route to the Yukon. In 1939 the Canadian Government had begun a more detailed survey of this route, including the location of landing fields. Survey parties were still in the field when the Permanent Joint Board adopted its tenth recommendation approving this route. Canada began construction of the airway in the winter of 1940-41. The air route selected had also been previously studied and recommended by the Plans Division of the United States Army Air Corps and had been approved by Gen. H. H. Arnold, Chief of the Army Air Forces.

In the meantime there had been further proposals in the United States for the construction of an overland highway to Alaska. On April 25, 1940, the President had transmitted to Congress the first report of the Alaskan International Highway Commission, which urged favorable consideration of the project. Dr. Vilhjalmur Stefansson, well-known Arctic explorer, had written to Gen. George C. Marshall, Chief of Staff, recommending the construction of a highway to Alaska via the Mackenzie and Yukon River systems. On January 25, 1941, General Marshall had replied to Dr. Stefansson that—

while such a road would certainly be of value, the War Department does not consider it of sufficient importance to justify its construction at this time on the basis of military necessity.

On February 5, 1941, Delegate Dimond, of Alaska, had introduced in the House H. R. 3095, a bill to authorize construction of a highway to Alaska along such a route as might be approved by the President.

On June 22, 1941, Germany invaded Russia. On July 26, 1941, Japan announced the occupation of bases in southern Indochina, thus posing grave threats to the security of Singapore, the Philippines, and the East Indies. The possibility of Japanese occupation of eastern Siberia, adjacent to Alaska, was viewed with concern. At the same time, the situation in the Atlantic was taxing our naval forces in that ocean to the limit because of the necessity of protecting lend-lease convoys and maintaining the neutrality patrol. There was every indication at that time that more of the Pacific Fleet would have to be moved into the Atlantic. This, coupled with the possibility of Japanese occupation of eastern Siberia and the prospects of a long war, made the construction of an overland highway to Alaska more desirable to many authorities as a long-range defense measure.

On July 30, 1941, Mayor F. H. LaGuardia, Chairman of the American Section of the Permanent Joint Board on Defense, following a conference with the President, announced that the President favored a detailed survey "as soon as possible" to determine the proper route of a highway to Alaska. On October 6, 1941, Secretary of War Stimson, in a letter to the chairman of the House Committee on Roads, writing in reference to Delegate Dimond's bill, H. R. 3095, stated, as previously quoted, that—

from an evaluation of the trend in international affairs, the construction of this highway now appears desirable as a long-range defense measure.

On July 29, 1941, the Permanent Joint Board, in view of the increasing gravity of the far-eastern situation, recommended expedited completion of the airway from the United States across western Canada to Alaska. Great difficulties were being encountered by Canada in the construction of the airfields because of their isolation. Fort St. John was reached by a difficult winding road 50 miles in length from railhead at Dawson Creek, British Columbia. This road was impassable during certain periods of the year. Fort Nelson was reached by a winter road 300 miles in length from Dawson Creek. This route was a difficult one, unsuitable for much tonnage and unusable except when the ground was frozen. There was an alternative summer route to Fort Nelson by water from railhead at Waterways, Alberta, down the Athabaska and Slave Rivers, through Great Slave Lake, down the Mackenzie River to the mouth of the Liard River, then up the Liard River to the mouth of the Nelson River and up the Nelson River to Fort Nelson—a distance of approximately 1,000 miles—portions of which were subject to periods of low water which delayed transit.

The ordinary route to Watson Lake, the next airfield west and north of Fort Nelson, about 300 miles, was by sea to the port of Wrangell, Alaska; thence by river boat or barge up the Stikine River approximately 100 miles to Telegraph Creek, British Columbia; thence by portage 70 miles to Dease Lake; thence by boat across Dease Lake, down the Dease River approximately 150 miles to Lower Post on the Liard River; thence overland 26 miles to Watson Lake. This route also was subject to periods of low water and sometimes required more than one summer season to traverse.

A similar situation existed at the intermediate airfield under construction by the United States at Northway, Alaska (then known as Boundary). This field could only be reached by a difficult overland trail, ordinarily impassable except when the ground was frozen.

The Japanese attack on Pearl Harbor on December 7, 1941, and the declaration of war by Germany and Italy involved the United States simultaneously in wars in both the Atlantic and Pacific areas. Of the nine United States battleships then attached to the Pacific Fleet, one was totally destroyed, one capsized, three were sunk to the bottom of the harbor, and three were damaged and put out of action. The remaining battleship escaped damage because of its presence in drydock at Bremerton, Wash. The commanding general of the Western Defense Command, Lt. Gen. J. L. DeWitt, stated in a report under date of June 5, 1943, that—

the surprise attack at Pearl Harbor by the enemy crippled a major portion of the Pacific Fleet and exposed the west coast to an attack which could not have been substantially impeded by defensive fleet operations.

The disaster at Pearl Harbor was followed on December 10, 1941, by the Japanese naval victory over the British Far Eastern Fleet off Singapore, resulting in the loss of the *Prince of Wales* and the *Repulse*. These enemy successes eliminated both the United States and the British fleets as offensive weapons for many months to come. The enemy speedily exploited these successes by occupying Guam on December 9, 1941, Wake on December 23, and Manila on January 2, 1942.

This trend of events in the Pacific found Alaska, which lay on the Great Circle route, the shortest distance between the United States and Japan, in the most exposed position to attack. On December 23, 1941, Lieutenant General DeWitt advised the War Department by telephone of the insecurity of the sea lanes to Alaska, stating:

He [Admiral Freeman, commandant of the Thirteenth Naval District] has only five destroyers—three he is using in Alaskan waters principally to protect our shipping going up with material and food for the command up there, and two in Puget Sound. That is so puny that he is almost helpless to assist me in what I've got to do up there.

Under date of January 3, 1942, the commanding general, Alaska Defense Command, advised the War Department that—

there is not at the present time a single up-to-date fighter plane in the Alaska Defense Command.

He stated that his total available air force was 23 planes.

For 3 or 4 weeks following the Pearl Harbor attack, General DeWitt has reported that substantially every United States merchant ship leaving west coast ports was attacked by enemy submarines. Intelligence reports show that enemy submarines or surface craft were detected off the west coast of the United States and in Alaskan waters on 41 separate occasions during December 1941.

On January 12, 1942, Delegate Dimond, of Alaska, spoke for 1 hour in the House of Representatives citing the defenseless state of Alaska and the necessity for immediate construction of an overland highway to that Territory.

On January 16, 1942, the President appointed a Cabinet committee consisting of the Secretaries of the Navy, War, and Interior to consider the necessity for a highway and the proper route therefor.

On February 2, 1942, this Cabinet committee met with the War Plans Division of the General Staff of the War Department and concluded that a highway connecting the United States with Alaska was necessary and, further, that it should satisfy two vital requirements, as follows: (1) Furnish a supply route to link up the established

airfields and thus permit their expansion and continued maintenance, and (2) provide an auxiliary overland supply route to Alaska, remote from possible attack by the enemy, to supplement sea and air routes and thus provide a certain measure of safety for the armed forces in Alaska as well as for personnel engaged in ferrying aircraft from the United States to Alaska. The Cabinet committee recommended that the highway should follow the route of the then existing chain of airports from Edmonton, Alberta, to Fairbanks, Alaska, which included the airfields at Grande Prairie, Fort St. John, Fort Nelson, Watson Lake, and Whitehorse, in Canada, and the Alaska airfields at Northway, Tanacross, and Big Delta.

The project was approved by the Chief of Staff of the United States Army on February 6, 1942, and by the President on February 11, 1942, who authorized work to begin at once on the construction of a pioneer road from Dawson Creek, Alberta, to Big Delta, Alaska, connecting at these points with existing road nets in Canada and Alaska. The authorization provided that this pioneer road would be constructed by United States Army engineer troops who would be followed by contractors furnished by the Public Roads Administration who would improve the pioneer road to the authorized standard of a highway. On February 14, 1942, the War Department directed the Chief of Engineers to proceed with the project as outlined above. On March 3, 1942, the President directed the Secretary of the Treasury to arrange for the transfer of an initial sum of \$10,000,000 from the emergency fund for the President to the War Department to defray housing, travel, and transportation expenses of military personnel used on this project.

Inasmuch as the decisions made by the Cabinet committee, the War Department General Staff, and the President coincided approximately with the date of the public hearings then being held by the Committee on Roads on H. R. 3095 (Dimond), the Committee on Roads adjourned its hearings without taking further action on said bill. The Committee on Roads was never advised as to the extremely critical nature of the military and naval situation as recorded above at the time that it was holding public hearings on H. R. 3095. It believes, however, that the decision of the Cabinet committee to recommend the immediate building of the overland highway at that time was a wise decision and justified by the serious nature of the military situation.

IV. AGREEMENT WITH CANADA FOR THE CONSTRUCTION AND MAINTENANCE OF THE HIGHWAY

On February 16, 1942, a declaration of military necessity concerning the highway was made by the Secretary of War to the Secretary of State with the view of securing rights-of-way through Canadian territory. Informal discussions were begun with Canadian officials, who agreed to the immediate beginning of reconnaissance surveys by the United States Army engineers, and suggested that the question of construction be referred to the Permanent Joint Board on Defense—United States and Canada. This Board recommended construction of the highway on February 26, 1942. On March 6 the Canadian Government announced approval of the recommendation of the Board and its acceptance of the offer of the United States to construct the

highway. Formal agreement between the two Governments was consummated by an exchange of notes, that from the American Minister to Canada on March 17, 1942, and that from the Canadian Government on March 18, 1942. Copies of the notes exchanged between the Honorable W. L. MacKenzie King, Canadian Secretary of State for External Affairs, and United States Minister Pierrepont Moffat were made public with announcement of the agreement in Ottawa and Washington.

The notes provided, in summary:

(1) The United States Army would make the necessary surveys and construct a pioneer road by use of Engineer troops.

(2) The highway would be completed under contracts made by the United States Public Roads Administration, with a view to finishing the project with all possible speed.

(3) The United States would maintain the highway for the duration of the war and for 6 months thereafter, unless the Government of Canada preferred to assume earlier responsibility for maintenance of the Canadian section.

(4) At the conclusion of the war, the Canadian part of the highway would pass to Canadian control, with the stipulation that citizens of the United States should not be discriminated against in its subsequent use.

(5) In consideration of these understandings, the Canadian Government agreed (a) to provide the right-of-way for the highway; (b) to waive all import duties, sales taxes, and license fees on equipment and supplies required for its construction; (c) to remit income tax on the income of the United States citizens employed in its construction or maintenance, and facilitate their admission to Canada; and (d) to permit the use of timber, gravel, and rock along the route of the highway as required in its construction.

V. THE ROUTE SELECTED

From the beginning there was no question as to the general routing of the Alaska Highway. The War Department desired that it follow the air route. The Corps of Engineers advised that a highway could be constructed along that route which would connect up the previously constructed military airfields. The Permanent Joint Board on Defense based its recommendation of February 26, 1942, upon three major arguments:

(1) The need for a traffic artery serviceable for the year-round movement of through freight to Alaska by truck.

(2) The need for a supply route for the airports.

(3) The need for the highway as a ground guide for flyers on the Alaska run.

It is true that there were strong arguments in favor of the selection of other routes and, if a decision had been made in times of peace to construct such an international highway, it is entirely probable that one of several other suggested routes might have been selected for that purpose.

Advocates of other and shorter routes who held forth arguments of economy in construction, a shorter and more direct overland route from the west coast of the United States to Alaska, equal safety factors, and greater scenic value were keenly disappointed when their

recommendations were rejected in favor of the route finally selected. Similar advocates of the longer water route down the Mackenzie River and across northern Yukon Territory to the Yukon River were likewise disappointed by the decision.

The investment already made in the existing airfields, the belief of the Army Air Forces that the safest air route for all-year flying had been selected and the recommendation of the Corps of Engineers that the construction was possible and feasible within the time limit set for its completion all combined to outweigh the arguments of advocates of alternate routes in the minds of the Cabinet committee, the War Department General Staff, the Permanent Joint Board on Defense, the President, and the officials of the Canadian Government.

Subsequent developments have proven that the air route is an extremely safe one. The commanding officer at the airfield at Big Delta, Alaska (generally considered to be the most unsafe of all fields on the chain) advised the subcommittee that less than 6 days a year are lost to pilots using that field for reasons of bad flying weather.

From an economic standpoint, the investment made by the United States Government in the airfields in Canada and the telegraph and telephone line constructed along the highway has already been almost totally recovered by an advantageous sale of these facilities to the Canadian Government on a cash-settlement basis. This subject will be discussed in detail further on in this report.

This committee does not propose to contest the recommendations made by advocates of alternative routes for an international highway from the United States to Alaska. It has concluded, however, that the construction of the chain of airfields from Edmonton to Fairbanks prior to the construction of the highway itself was sufficient justification for the selection of the route actually used and feels that failure of the two Governments and their authorized representatives to have selected the route now in use would have been a serious error in judgment and not in consonance with the military requirements of the situation as it then existed.

VI. CONSTRUCTION OF THE HIGHWAY AND ITS FEEDER ROADS

The construction of the Alaska Highway and its feeder facilities by the Corps of Engineers and the private construction firms operating under the direct supervision of the Public Roads Administration constitutes one of the construction epics of modern times. It was a gigantic task performed under great pressure where the elements of nature put man and machine to the ultimate test of performance. To say that it was a faultless performance where no errors of judgment or management took place would not be a supportable statement in view of the detailed findings of the committee on some points. However, the construction of the finished highway as it stands today—a splendid permanent all-weather road—when balanced off against the actual cost to the United States Government in terms of actual dollars-and-cents outlay, furnishes us with an example of what American ingenuity and managerial brains can do when confronted with an emergency problem that must be solved and for which there is no precedent in construction and transportation procedure.

If exceptions are made for the higher costs of transportation of men, materials, and equipment, for the cost of housing a peak force of 16,000 men, and for the factor of overtime pay made necessary by the time limit on the project, it will be found that the cost of constructing the highway itself was comparable with the average cost of constructing a highway of similar standards in the United States proper during peacetime.

The committee undertook the assignment of investigating this project fully prepared to probe to the utmost the facts and figures pertaining to this project and the conditions under which it was built. It believes that its investigation of these facts and conditions has been as exhaustive as possible under all circumstances. It can report that it was favorably impressed by its findings and such evidence as it found of an unsatisfactory nature was relatively minor and not unexpected in view of the magnitude and scope of the project.

The history of the construction of the project falls into two general classifications: (1) The work for which the Corps of Engineers assumed direct administrative and operational liability; (2) the work assigned by the Corps of Engineers to the Public Roads Administration for which the latter agency assumed full liability.

The original War Department directive issued to the Chief of Engineers on February 14, 1942, read in part as follows:

It is desired that you undertake the construction, with Engineer troops, of a pioneer-type road from Fort St. John, Canada, to Big Delta, Alaska, via Fort Nelson, Canada, Watson Lake, Canada, Whitehorse, Canada, and Boundary, Alaska. It is further desired that you arrange with the Public Roads Administration to follow the Engineer troops, to correct alinement and grade, construct permanent bridges and culverts, and provide for the completion of the project.

Nine months and six days after the issuance of said directive, the pioneer roadway of the Alaska Highway was completed and opened in a formal ceremony, November 20, 1942, at Soldier's Summit above the southern shore of Kluane Lake, Yukon Territory.

In addition to assuming responsibility for the construction of the pioneer road, the Corps of Engineers, under terms of a confidential letter, dated November 10, 1942, from the commanding general, Services of Supply, Gen. Brehon B. Somervell, to the commanding general, Northwest Service Command, was instructed to commence construction of a road from the vicinity of Haines Point, Alaska, south of Skagway, to the vicinity of Champagne, a point approximately 100 miles west of Whitehorse on the Alaska Highway. This road is now known as the Haines lateral road and construction was authorized to the same standards of construction as the Alaska Highway. Purpose of the Haines lateral road was to relieve the traffic load on the White Pass and Yukon Railway then carrying the bulk of the freight needed for highway construction and supply purposes on that portion of the Alaska Highway east and west of Whitehorse. On April 9, 1943, the Secretary of War authorized the Haines road, as a separate project from the Alaska Highway although over-all responsibility for its construction was vested also in the division engineer of the Northwest Service Command.

It will be seen that the Corps of Engineers concentrated its efforts during the months of February to November 1942, on pushing through the pioneer roadway in which task it was given material assistance by

contractors working under the supervision of the Public Roads Administration.

It will further be seen that the highway which now exists was constructed almost entirely in the calendar year 1943. In 1942 the objective was to force through the wilderness with some sort of a passable trail during the short road-building season. To meet this schedule, the pioneer road went where a bulldozer could go with reasonable ease and speed. At places where a road would normally be benched in a steep hillside or blasted out along a cliff, the bulldozers turned and went up and over the hill or cliff. Speed was the watchword during 1942 and the pioneer road built did not depart greatly from the natural road surface. Trucks did get over this pioneer road, but until July 1943 few of the trucks made the trip from Dawson Creek to Whitehorse in less than 15 days. This section of the highway was traversed by automobile by the subcommittee with ease in 3 days in August 1945.

Seven Engineer regiments were assigned to the construction of the pioneer road. These were the Eighteenth, Thirty-fifth, Ninety-third, Ninety-fifth, Ninety-seventh, Three Hundred and Fortieth, and Three Hundred and Forty-first Engineer Regiments, totaling a force of 394 officers and 10,765 enlisted men. During the latter half of 1942 these regiments were given material assistance in the construction of the pioneer road by 47 contractors working under the supervision of the Public Roads Administration who employed a force of 7,500 men.

There were only three practical points of access to the 1,500 mile route; namely, at the two extremities of the proposed highway and at Whitehorse, Yukon Territory. In order to utilize an existing winter trail from Fort St. John to Fort Nelson, which was impassable after the spring thaw, the Thirty-fifth Engineers were ordered to proceed to Fort Nelson in March 1942. This regiment completed the 325-mile overland march from Fort St. John to Fort Nelson successfully on April 5, 1942, thus cutting off 265 miles from the longest inaccessible part of the route. Because the Thirty-fifth Engineers would be inaccessible except by airplane, after the spring thaw, until a road could be opened to Fort Nelson, every effort was made to push a road through from Fort St. John. The Ninety-fifth and Three Hundred and Forty-first Engineers were assigned to this task and began work in May 1942. The Eighteenth, Ninety-third and Three Hundred Fortieth Engineers were sent by sea to Skagway, Alaska, thence over the narrow gage White Pass & Yukon Railroad to Whitehorse, all arriving in April 1942. From Whitehorse, the Eighteenth Engineers worked northerly toward Alaska; the Ninety-third Engineers worked southerly toward Lake Teslin; and the Three Hundred Fortieth Engineers were transported by boat from Whitehorse down the Lewes River to points on Lake Teslin and the Teslin River and began construction southerly toward Watson Lake. The Ninety-seventh Engineers were sent by sea to Valdez, Alaska, arriving in April 1942, and moved over the Richardson Highway to Slana where they began construction of a road through Mentasta Pass in the Alaska Range to the junction of the Tok and Tanana Rivers and thence southeasterly toward the international boundary to meet the Eighteenth Engineers working northerly from Whitehorse.

The rate of progress of the troops in construction is shown in the following tabulation:

Mileage under construction

To date indicated	Mileage	Remarks
Apr. 30.....	8	By Thirty-fifth Engineers.
May 31.....	95	By 4 regiments.
June 30.....	360	By 7 regiments.
July 31.....	794	Do.
Aug. 31.....	1,186	Fort Nelson reached Aug. 26.
Sept. 30.....	1,479	Road passable to Whitehorse, Sept. 24.
Oct. 25.....	1,645	Road passable to Fairbanks.

¹ Includes Public Roads Administration construction.

The accomplishments of Public Roads Administration contractors during 1942 included construction of 106 miles of pioneer roadway from Big Delta, Alaska, southeasterly to Tanacross, the widening and grading of over 900 miles of the pioneer roadway, and the completion of construction on the first 77 miles of the Alaska Highway north from Dawson Creek.

Pursuant to the terms of the original War Department directive of February 14, 1942, an agreement was reached between the Public Roads Administration and the Army regarding the part that the Public Roads Administration would play in the construction of the Alaska Highway. An exchange of letters under dates of March 4 and 16, 1942, provided for the improvement and construction of the highway by the Public Roads Administration following as near as practicable the route of the pioneer roadway constructed by Engineer troops.

The type of road to be constructed was to be a two-lane highway along the general lines of Specifications for Construction of Roads and Bridges in National Forests and National Parks, 1941, issued by the Public Roads Administration. The Public Roads Administration agreed to negotiate contracts for the performance of the work and to accept sole responsibility for the form, method of payment, inspection, and administration of contracts. The Corps of Engineers agreed to conduct all negotiations with the Government of Canada for the provision of necessary rights-of-way, to construct the pioneer roadway, and to transfer to the Public Roads Administration sufficient funds for the completion of the construction of the highway to authorized standards.

This agreement was embodied in the initial specifications for the highway issued by the office, Chief of Engineers, under date of April 29, 1942. These specifications provided for 36-foot final-type road with surfacing 28 feet in width. Surfacing was to be provided by materials from local sources. Initially, the bridges would be of the timber trestle type designed for H-15 loading (30 tons gross). Future steel bridges would be designed for H-20 loading (40 tons gross) with a 24-foot clear width of roadway. Culverts would be constructed so far as practicable of portland cement or corrugated metal or, if such materials were not available, of log boxes from local timber. The ruling grades were not to exceed 7 percent, and the curvatures were not to exceed 19° for open-sight distance and 16° for obscured-sight distance.

These specifications were the basis of the original plan for the completion of the Alaska Highway by the Public Roads Administration. The activities of the Public Roads Administration during 1942 were largely confined to assisting the Engineer troops in the completion of the pioneer roadway. Since primary emphasis during the first year was on this phase of the construction, it was not until the beginning of the construction season of 1943 that the Public Roads Administration could begin to give substantial attention to the construction of the permanent improvements on this highway. Aside from work on the pioneer roadway, the principal efforts of the Public Roads Administration during the balance of 1942 and the early months of 1943 were devoted to construction of camps for the housing of workers and the mobilization of contractors and equipment, and performing other essential work required by the Army. The Public Roads Administration obtained services of 4 management contractors and through them other Canadian and American contractors, totaling in all 77, who were employed on a cost-plus-a-fixed-fee basis.

Construction progressed at a rapid rate during 1943. At most camps, machinery was kept in operation 22 hours a day by two shifts of 11 hours each. The pioneer roadway was of great assistance to the forces of the Public Roads Administration, and it is fair to state that the Alaska Highway could not have been completed in 1943 but for the work done on the pioneer road.

As construction proceeded, it became apparent that because of favorable changes in the strategic situation in the Pacific, it would be unnecessary to develop the highway to the high standard of improvement originally planned. Accordingly, progressive steps were taken by the War Department to restrict improvements and reduce construction standards wherever feasible.

A conference was held between representatives of the Chief of Engineers and the Public Roads Administration on March 25, 1943, at which revised standards of design were adopted. These changes in final specifications were issued by the Chief of Engineers. The estimated maximum pay load tonnage to which any one section of the highway would be subjected would not exceed 3,000 short tons per day. The specifications provided that the highway should be constructed to handle such tonnages at maximum speeds for military vehicles of 40 miles per hour. The maximum roadbed width was to be 26 feet between the outside shoulder lines, and surfacing material was to be placed within the roadbed to a width of 20 to 22 feet. Surfacing was to consist of selected local materials including gravel or crushed stone placed to whatever depth was necessary to support the estimated military traffic loads. Maximum grades were not to exceed 10 percent. Curvature and sight distance were to be generally controlled by the alinement and grade of the existing pioneer road with deviations therefrom only where necessary to permit free movement of the estimated volume of traffic. New bridges were to provide two lanes for traffic and have a clear width not in excess of 24 feet. Existing bridges of adequate capacity and durability were not to be replaced even though they were of less than two-lane width. The capacity of new timber bridges was to be H-15 and of new steel bridges, H-20. Construction was to be completed not later than December 31, 1943.

Unusually good progress was made by the Public Roads Administration contractors during the remainder of the 1943 season. At the peak of construction in September, the total labor force approximately 15,900 of which approximately 10,400 were United States contractor employees, 1,850 were Public Roads Administration employees, and 3,700 were employees of Canadian contractors. Minimum wages payable to United States labor were set by United States Department of Labor, to Canadian labor by the Western Labor Board of Canada, and were approximately equal to rates prevailing in Seattle for United States workers and Vancouver and Edmonton for Canadian workers.

At the peak of construction, 11,107 pieces of equipment were in use of which approximately 6,000 were units of heavy equipment. Of the total equipment in use, 3,983 pieces were contractor-owned and rented to Public Roads Administration and 7,124 pieces were Government-owned.

Principal accomplishments during the 1943 season included the following:

Grading.....	cubic yards..	20,000,000
Ballasting.....	do.....	5,400,000
Surfacing.....	do.....	600,000
Minor drainage.....	linear feet..	250,000
Permanent bridges.....	do.....	21,000

By the end of August 1943, construction was over 70 percent complete; by the end of September, construction was over 80 percent complete. On October 31, 1943, the construction was 96 percent completed and Public Roads Administration's contractor forces ceased road construction activity as of that date. The construction work then remaining to be done consisted principally of the completion work on about 20 bridges to replace inadequate temporary structures. Bridge work continued under the supervision of the Public Roads engineers. Some of the contracts for uncompleted bridges were continued in force while others were assumed by the War Department. The War Department subsequently took over all construction and maintenance work. Such minor construction work as took place in 1944 and 1945 was by direct contracts. Maintenance work was by a civilian force under War Department supervision. Public Roads Administration Highway Engineer Francis C. Turner was loaned to the Army as consultant on maintenance.

Public Roads Administration contractors were assigned to the construction of the Haines lateral road during the winter of 1942-43 after a preliminary survey of the best possible route for the highway had been made by Public Roads Administration engineers.

A study was made during the winter of 1942-43 by Col. Theodore Wyman, Jr., division engineer, Northwest Service Command, who had over-all jurisdiction for the War Department at that time for the construction of both the Alaska Highway, the Haines Road, and collateral engineering projects in northwest Canada. As a result of this study Colonel Wyman concluded that Public Roads Administration contractors would be unable to complete both the Alaska Highway and the Haines Road during the 1943 construction season. Public Roads Administration contractors were directed to continue work throughout the winter on the Haines Road and then return to the Alaska Highway project in the spring of 1943. Colonel Wyman then

awarded the contract for the completion of the Haines Road to Foley Bros., Inc., and Rohl-Connolly Co., a new contractor operating under direct supervision of the War Department and not under supervision of the Public Roads Administration.

Construction was started by the Army contractor on the Haines Road during the latter part of March 1943. Two thousand employees were used at the peak of construction. The quantities of major items of work performed by the contractor on this project were as follows:

Clearing.....	acres..	1, 340
Grading.....	cubic yards..	4, 074, 551
Surfacing.....	do.....	723, 223
Culverts.....	linear feet..	35, 396
Bridges.....	do.....	3, 100

Work on this project was completed during November 1943.

During construction of the Haines Road, the War Department contractor found it necessary to deviate considerably from the route surveyed and recommended by Public Roads Administration engineers in the winter of 1942-43. This was done with the approval of the Army supervising engineers. The reason for this deviation, as explained to your committee by War Department engineers, was that the south 50-mile road alinement selected by Public Roads required approximately 2,250,000 cubic yards of excavation, 50 percent of which was rock work.

The Public Roads location is obviously more satisfactory for a permanent alinement, but use of that route, on account of the heavy rock cuts, would have delayed the completion of this feeder road at least one construction season, according to War Department engineers, and would have done so at a time when the facility was most needed to transport supplies and equipment onto the Alaska Highway project. All supplies and equipment for work in the Whitehorse area were then being carried in over the narrow-gage White Pass & Yukon Railroad, running from Skagway, Alaska, to Whitehorse. This road and its rolling stock was never built with the heavy traffic in view that this program imposed on it and some means had to be devised to prevent the further delay of moving the supplies bottlenecked at Skagway. The Haines Road was the only answer to this and speed was imperative in its construction at that time.

In several places on the Haines route selected by the Army the ground was subject to slides or was along and across rivers where fills and bridges could not be expected to remain permanently.

When transportation, housing, and quantities of materials involved were taken into consideration, an examination of the relative costs of the Haines Road compared with similar costs on the Alaska Highway show that the Army-supervised Haines job was approximately the same on a mileage basis as the Alaska Highway project.

VII. THE BRIDGE PROGRAM

The bridge construction program for the Alaska Highway was one of the largest ever undertaken at any one time. As previously stated, it involved construction of 133 bridges (20 feet or greater in length) having a combined total length of 7 miles, approximately 50 percent of the length of which consists of steel bridges.

During the season of 1942, only temporary timber trestle bridges were constructed in order to expedite completion of the pioneer roadway. However, during the winter of 1942-43, considerable study was given to the permanent bridge program. In planning for the type of bridge structure to be erected, it was considered that the maximum period of military usage of the Alaska Highway would probably not exceed 5 years. Experience indicated that timber trestle bridges of the type initially constructed would not withstand spring freshets and heavy rains of the nature encountered along the route of the highway. Nearly all of the temporary timber trestle bridges constructed during the 1942 season were washed out in the spring of 1943, and a large number of them were washed out several times during the remainder of that year. For example, the heavy floods of July 10 and 11, 1943, on the Muskwa and Sikanni Chief Rivers washed out all bridges within 200 miles on either side of Fort Nelson. Still more bridges on the southern sector were washed out in the heavy rains of August 1, 2, and 3, 1943.

Three pile trestle bridges over the Peace River were destroyed before the final structure was completed. Temporary bridges had to be repaired or reconstructed one or more times over 50 of the major stream crossings. At such stream crossings as the Peace, the Muskwa, the Liard, the Johnson, and the Robertson, crews worked continuously for months repairing damage to temporary bridges so as to expedite traffic movement until the permanent bridges were completed.

Study indicated that it would be more economical to construct permanent bridges as prescribed in the original directive of the War Department of February 14, 1942, than to replace temporary bridges periodically over a period of 4 or 5 years, the anticipated maximum period of military use of the highway. However, it was decided not to replace any temporary bridges with permanent bridges where the temporary bridges in question had adequate capacity and durability.

Since the construction of permanent bridges was determined to be more economical, consideration was given to the procurement of necessary materials for the permanent bridge program. Two types of materials were considered for the major structures; structural timber and steel. A survey made by the Corps of Engineers in December 1942 indicated that structural timber was in critically short supply due to the requirements of other essential war programs and the unprecedented rains which had occurred in the Pacific Northwest, bogging down lumbering operations, and that there was little prospect of the supply thereof improving in the foreseeable future. On the other hand, the structural steel situation was less acute at this stage. Upon contacting five leading steel bridge fabricators, it was found that all of them had substantial inventories of steel on hand and sufficient shop space available to begin fabrication immediately.

Further study of the bridge program indicated that there was little difference in the cost of steel bridges versus timber bridges for the major structures. The tonnage factor, however, was definitely in favor of the use of steel bridges, as it was known that very little large timber could be obtained locally. Studies showed that if preference should be given to steel for the major structures, 28,900 tons of materials would be required as against 44,500 tons if preference was given to structural timber. In view of the shortage of transportation facili-

ties to the Pacific Northwest and Alaskan area, and the time factor involved, it was determined to use steel for most of the major bridge structures. As previously stated, approximately one-half of the combined total footage of all bridges on the Alaska Highway consists of steel bridges. The 133 bridges in the program are classified according to type of main span or spans as follows:

Type:	Number
Native timber trestles.....	75
Treated timber trestles.....	2
Steel trusses.....	23
Steel I-beams.....	13
Plate girders.....	4
Suspension bridges.....	2
Reinforced concrete.....	3
Treated timber trusses.....	7
Original structures (not replaced).....	4
Total.....	133

The greatest of all structures on the Alaska Highway is the suspension span across the Peace River between Dawson Creek and Fort St. John, with a center span of 930 feet and a total length of 2,130 feet. Another similar but smaller suspension bridge was built across the Liard River at the lower crossing. It consists of three spans, one 543 feet long and the other two, 223 feet, carried on steel towers 93 feet high. The longest steel truss bridge to be completed in 1943 was that across the Muskwa River. It has an over-all length of 970 feet consisting of 10 spans up to 177 feet long and was designed to utilize second-hand steel salvaged from abandoned railroad bridges in southern California. Another impressive steel structure is the Upper Liard crossing, a continuous truss of two 320-foot spans. Other notable steel bridges, all of which are in Alaska, include the three-span cantilever truss across the Tanana with a center span of 430 feet and two side spans 258 feet long; the Robertson River and Big Gerstle River bridges made up of nine 200-foot truss spans each; and the Johnson River bridge with four 200-foot and one 160-foot spans.

The largest of the timber truss bridges is that across the Sikanni Chief River, totaling 585 feet in length, including three 140-foot and several smaller spans. Another large timber truss structure crossing the Kiskatinaw River, consists of a center span of 195 feet and two side spans of 114 feet each.

The Alaska Highway, along its 1,422 miles, crosses streams draining a tremendous area. Several of the major streams approach the Missouri and Upper Mississippi Rivers in size and amount of stream flow. The problems to be met in providing adequate bridging for the Alaska Highway are well described by Harold W. Richardson, editor of *Engineering News-Record*, in his recent book, *Bulldozers Come First* (McGraw-Hill, 1944), as follows:

Streams in the Alcan country do not behave like ordinary rivers. They are wild, tricky, and highly uncertain. The usual placid appearance of the broad, gently flowing Peace, Tanana, and Liard Rivers belies their ability to rise with startling rapidity in full flood or to carry irresistible ice floes that crush everything in their path. Engineers who happened to see for the first time glacial streams like the Duke, Donjek, Robertson, White, and Johnson as only trickling currents meandering through mile-wide debris-strewn valleys could scarcely believe that these rivers can boom into bank-full torrents within a few hours, can rise and fall with the sun as glaciers melt and then congeal in varying temperatures of the high ranges, or can pile up valley-wide layers of ice, 10, 20, or even 30 feet thick, with

the water still flowing on top. Other streams of mountain origin, like the Muskwa, Sikanni Chief, Toad, McDonald, Racing, Trout, Hyland, Coal, Takhini, Yerrick, Tok, and scores more, are innocent enough at times but can lash out with flood-swollen tongues with devastating suddenness. All these rivers are as untamed as the country they drain; they treat man-made structures with contempt. It takes mighty substantially built bridges to stand against their fury.

The bridge program for the Haines Road was much smaller in scope. Most of the streams, encountered in the construction, drain small areas in comparison with the major streams crossed by the Alaska Highway. A total of 36 bridges was constructed over streams crossed by the Haines Road of which only 4 are steel structures. The balance are chiefly pile trestle bridges.

VIII. COST

The analysis of the actual cost of constructing the Alaska Highway and the Haines lateral road has been probably the most difficult portion of your committee's assignment in making this investigation. The necessity for reconciling figures supplied the committee by both the War Department and the Public Roads Administration has consumed several months and is largely responsible for the delay in the issuance of this interim report, which takes place approximately 4 months after the committee completed its on-the-ground inspection of the highway and its collateral facilities.

A report issued by the Army Service Forces on April 6, 1945, known as Alaska Highway Completion Report did not accurately reflect the true cost of the highway because the cost of construction performed by Engineer troops on the Alaska Highway and other military construction projects had not been separated as to class of work done.

Likewise, \$11,615,913 had been charged by the War Department as part of the costs incurred by the Public Roads Administration in construction of the highway when, as a matter of fact, this sum was expended by Public Roads for other services which could not properly be classified as cost of highway construction. An analysis of that sum of \$11,615,913 shows that it was expended by Public Roads for the following purposes:

Maintenance during winter of 1942-43	\$6, 772, 139
Maintenance of completed highway	696, 770
Work on airports and flight strips	862, 841
Construction work at Dawson Creek railhead	933, 940
Pipe line, telephone, radio, and relay stations	182, 814
Camp construction and shop services	1, 787, 910
Winterizing buildings	160, 071
Work on Richardson Highway and Valdez dock, Alaska	219, 428
Total	11, 615, 913

In the completion report of the War Department, referred to above, a deficit claimed by Public Roads Administration in the amount of \$4,595,000 was noted, but was not recognized as a firm obligation by the War Department at that time. The report of the War Department gave the total cost to the Government as to the cost of construction of the Alaska Highway alone as \$139,794,567, including the sum of \$4,595,000 in dispute between the War Department and Public Roads. This figure has since been substantially revised through conferences held between War Department and Public Roads officials at which members of this committee were also present.

The figures as to the actual cost of the Alaska Highway alone upon which there now exists complete agreement between the War Department and the Public Roads Administration are as follows:

Pioneer Road (1,611 miles)

	Public Roads	Army	Total
Materials and supplies furnished troops.....		\$9, 547, 826	\$9, 547, 826
Gulkana-Slana Cut-off, Alaska.....	\$489, 213		489, 213
Temporary bridges.....	1, 254, 211		1, 254, 211
Construction of pioneer road.....	8, 453, 335		8, 453, 335
Total.....	10, 196, 759	9, 547, 826	19, 744, 585

On the above basis, the cost of the pioneer road was approximately \$12,300 per mile. However, your committee feels that it should call attention to the fact that the above figures furnished by the War Department only represent materials; supplies, such as gasoline, fuel oil, lubricants, repair parts and miscellaneous supplies furnished the troops from sources outside Regular Army supply channels. The cost of construction performed by Engineer troops on the Alaska Highway has not been kept as a separate item and accordingly no costs for troop labor and subsistence or major equipment are included in the above figure of \$9,547,826 submitted by the War Department as its cost of pioneer-road construction. Assuming that the Congress is interested in knowing the total number of Federal dollars expended in connection with the construction of this project, your committee, therefore, has decided that a conservative estimate of an additional \$8,000,000 should be added to the War Department's cost of constructing these portions of the Alaska Highway upon which Engineer troops worked. This figure is arrived at by allotting the sum of \$100 per month per man for 10,000 troops at work on the project for a period of approximately 8 months. This figure is intended to cover wages, subsistence, and cost of major equipment not otherwise reflected in submitted cost schedules.

Assuming that this additional figure of \$8,000,000 is substantially correct, the actual cost of the pioneer road to the Government is therefore increased to \$27,744,585, of which \$10,196,759 was expended by the Public Roads Administration and \$17,547,826 by the War Department. On this basis the pioneer road cost the Government \$17,221 per mile instead of the figure of \$12,300 agreed upon between the agencies concerned.

Continuing with the figures as to the actual cost of the Alaska Highway alone upon which there now exists agreement between the War Department and the Public Roads Administration we find:

Final-type road (1,422 miles)

	Public Roads	Army	Total
Roadway.....	\$64, 038, 603		\$64, 038, 603
Bridges.....	23, 166, 725	\$3, 433, 607	26, 600, 332
Supplies and materials furnished by Army.....		1, 600, 000	1, 600, 000
Equipment evacuation by Army.....		280, 700	280, 700
Personnel evacuation by Army.....		1, 560, 000	1, 560, 000
Total.....	87, 205, 328	6, 874, 307	94, 079, 635

On the above basis, the cost of the final-type road was \$66,160 per mile.

If the cost of the bridges is excluded from this figure, the final type road cost approximately \$47,500 per mile.

In this connection, it should be noted that certain increased costs of construction were incurred in building the Alaska Highway which are not normally incurred in the building of similar type highways in the United States. The construction of a pioneer road in a remote wilderness does not usually precede highway construction in this country. Accessibility to railhead or other highways, availability of some form of housing for workers and utility services usually exist on United States projects. In building the Alaska Highway none of these services were available at site and had to be supplied in order to make construction possible.

In addition, other increased cost factors entered in which were peculiar to this project and were unavoidable because of the wilderness location of the project and because of the need for speed in completing construction. These added costs, not normally incurred in similar projects in the United States, were—

(a) Transportation, 254,000 tons, at \$40.....	\$10,160,000
(b) Housing of workers, 16,000, at \$600.....	9,600,000
(c) Travel of workers, 32,000, at \$300.....	9,600,000
(d) Overtime.....	7,980,000

Total additional costs due to location of and speed re- quired in completing project.....	37,340,000
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In this connection, it should be noted that this type of added cost was slightly lower on the Haines lateral road project which is located nearer to tidewater than is the Alaska Highway. On the Haines project, added transportation cost is estimated at \$20 per ton, instead of \$40 per ton on the Alaska Highway. Worker housing on the Haines project was only \$400 per man as against \$600 on the Alaska Highway. Labor turn-over was more than 100 percent for the entire construction period. The average cost of round-trip transportation and travel time for individual laborers is estimated at \$200 per man for the Haines project as against \$300 per man on the Alaska Highway.

Overtime is accounted for by the large percentage of extra hours required in order to expedite construction. In the United States, under normal conditions where speed is required, new shifts would be employed where feasible with less overtime being paid.

Other factors which increased cost, but to which it is difficult to give monetary value are (1) losses resulting from inefficiency of labor caused by cold weather (tractor blades snapped at temperatures below 30° below zero), (2) high overhead resulting from extreme distances and poor communications between key points and necessity of completing the project in 2 years, and (3) necessity of providing suitable clothing for labor forces to withstand cold climate.

Applying the same factors to the Haines project we find that the Haines lateral road cost \$3,290,000 more than similar type construction would have cost in the United States for the following reasons:

Transportation, 32,000 tons, at \$20.....	\$640,000
Housing of workers, 2,000, at \$400.....	800,000
Travel of workers, 4,000, at \$200.....	800,000
Overtime.....	1,050,000

Total additional costs on Haines projects due to location of and speed required in completing project.....	3,290,000
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If allowances are made for these unavoidable additional costs incurred on both projects, it will be seen that the average unit cost per mile on both of these roads compares very favorably with costs of similar type construction in the United States during normal times.

Eliminating these costs not normally incurred in the construction of roads in the United States, your committee finds that the final type road on the Alaska Highway project cost \$39,800 per mile, including bridges, and \$28,500 per mile, excluding bridges. Similarly, the Haines lateral road cost \$47,155 per mile, including bridges, and \$42,876 per mile, excluding bridges, if these abnormal costs are not taken into consideration.

The higher cost per mile of the Haines lateral road, despite its proximity to tidewater and lower transportation and housing costs, is due in no small measure to the rough terrain traversed by the road. Extensive hillside cuts and fills were required on both approaches to the Coast Range which the road crosses via Chilkat Pass going between Alaska and Canadian territory. Approximately 65 percent more earth and rock excavation per mile was required on the Haines Road construction than on the Alaska Highway; 26,500 cubic yards of earth per mile were moved on the Haines Road compared with 16,100 cubic yards per mile on the Alaska Highway.

This higher excavation cost on the Haines Road, however, is largely offset by the substantially lower unit cost per mile of bridge construction. Thirty-two bridges on the Haines Road, totaling 3,027 feet in length were constructed at a total cost of \$759,000 or \$4,279 per mile, when the total length of the road is taken into consideration. In contrast, 133 bridges totaling 7 miles were constructed on the Alaska Highway at a total cost of \$26,600,332, or \$18,706 per mile, when the total length of the Alaska Highway is also taken into consideration. The bridges on the Alaska Highway, however, are permanent structures whereas with only a few exceptions those on the Haines Road should be classified as temporary structures which will undoubtedly have to be replaced with permanent structures when the Haines Road is opened for regular all-weather traffic.

The total quantities of construction which figure in the cost of the final-type road on the Alaska Highway for which the Public Roads Administration and its contractors were wholly responsible are as follows:

Clearing and grubbing.....	acres.....	6, 413
Unclassified excavation.....	cubic yards.....	22, 953, 000
Minor structures.....	linear feet.....	277, 000
Selected ballast.....	cubic yards.....	6, 362, 000
Surfacing.....	do.....	791, 000
Bridges (totaling 7 miles).....		133

The costs of work performed on the final-type road on the Alaska Highway under jurisdiction of the Public Roads Administration exclusive of engineering and overhead costs are as follows:

Clearing and grubbing.....	\$2, 956, 884
Excavation.....	30, 191, 048
Minor structures.....	4, 120, 148
Ballast.....	20, 933, 981
Surfacing.....	5, 836, 542
Bridges.....	23, 166, 725

The total quantities of construction and their costs which figure in the construction of both the pioneer-type road and the final-type road

on the Haines lateral road project, including engineering and overhead costs, are as follows:

	Army	Public Roads	Total
Pioneer road: Construction.....	\$1,694,000	-----	\$1,694,000
Final-type road:			
Clearing and grubbing (1,340 acres).....	430,000	-----	430,000
Grading (4,074,551 cubic yards).....	5,650,000	\$1,346,000	6,996,000
Surfacing (723,223 cubic yards).....	1,750,000	-----	1,750,000
Culverts (35,396 linear feet).....	587,000	-----	587,000
Bridges (3,027 linear feet).....	495,000	264,000	759,000
Total.....	8,912,000	1,610,000	10,522,000
Grand total.....	10,606,000	1,610,000	12,216,000

Total length of Haines lateral road, 153.7 miles.

Upon completion of highway construction by the Public Roads Administration, an inventory of \$12,872,033 of materials, repair parts, construction equipment and other supplies were turned over to the War Department by the agency. That final job inventory is as follows:

Stock-piled road surfacing materials.....	\$843,000
Materials, repair parts, and other supplies.....	8,246,869
Major construction equipment.....	3,782,164
Total.....	12,872,033

(Further discussion on equipment and equipment rentals will be found in the following chapter.)

At the conferences between War Department and Public Roads Administration officials, at which representatives of your committee were also present, final agreement was reached between the agencies as to allocation of the expenditures made by both agencies which were properly chargeable to actual cost of constructing the Alaska Highway and the Pioneer Road. A total of \$138,312,166 which was carried on the books of both agencies as part of the cost of building these projects was broken down into individual accounts so that expenditures for Army work other than highway construction would be shown in their proper perspective. This final tabulation, as agreed upon between the agencies, is presented herewith as table 1. Explanatory comment also furnished by the agencies is also included. These figures summarize the statistics heretofore recorded in this chapter.

TABLE 1.—Distribution of Public Roads Administration and Army costs of the Alaska Highway

	Cost of work performed		
	By Public Roads	By Army	Total
1. Cost of pioneer road (1,611 miles):			
(a) Materials and supplies furnished troops.....	-----	\$9,547,826	\$9,547,826
(b) Gulikana to Slana.....	\$489,213	-----	489,213
(c) Temporary bridges.....	1,254,211	-----	1,254,211
(d) Construction of pioneer road.....	8,453,335	-----	8,453,335
Total.....	10,196,759	9,547,826	19,744,585

TABLE 1.—Distribution of Public Roads Administration and Army costs of the Alaska Highway—Continued

	Cost of work performed		
	By Public Roads	By Army	Total
2. Cost of final-type road (1,422 miles):			
(a) Roadway.....	\$64, 038, 603		\$64, 038, 603
(b) Bridges.....	23, 166, 725	\$3, 433, 607	26, 600, 332
(c) Supplies and materials furnished by Army.....		1, 600, 000	1, 600, 000
(d) Equipment evacuation by Army.....		280, 700	280, 700
(e) Personnel evacuation by Army.....		1, 560, 000	1, 560, 000
Total.....	87, 205, 328	6, 874, 307	94, 079, 635
3. Public Roads expenditures for Army on work other than highway construction:			
(a) Maintenance during winter of 1942-43.....	6, 772, 139		6, 772, 139
(b) Maintenance of completed highway.....	696, 770		696, 770
(c) Airports and flight strips.....	862, 841		862, 841
(d) Dawson Creek railhead.....	933, 940		933, 940
(e) Pipe line, telephone, radio, and relay stations.....	182, 814		182, 814
(f) Camp construction and shop services.....	1, 787, 910		1, 787, 910
(g) Winterizing buildings.....	160, 071		160, 071
(h) Richardson Highway and Valdez dock.....	219, 428		219, 428
Total.....	11, 615, 913		11, 615, 913
4. Final job inventory:			
(a) Stock-piled road-surfacing materials, etc.....	843, 000		843, 000
(b) Materials, repair parts, and other supplies.....	8, 246, 869		8, 246, 869
(c) Major construction equipment.....	3, 782, 164		3, 782, 164
Total.....	12, 872, 033		12, 872, 033
Grand total.....	121, 890, 033	16, 422, 133	138, 312, 166

DISTRIBUTION OF PUBLIC ROADS ADMINISTRATION AND ARMY COSTS OF THE ALASKA HIGHWAY

Table 1 represents the costs of work performed in connection with the construction of the Alaska Highway and other work performed in Canada and Alaska during 1942 and 1943 under the jurisdiction of the Public Roads Administration, and during 1942, 1943, and 1944 under the jurisdiction of the Army. The major items and groupings thereunder have been established as a result of agreement reached between the Public Roads Administration and the Army. Following is a summary of table 1:

Item	Cost of work performed		
	By Public Roads	By Army	Total
1. Cost of pioneer road.....	\$10, 196, 759	\$9, 547, 826	\$19, 744, 585
2. Cost of final type road.....	87, 205, 328	6, 874, 307	94, 079, 635
3. Other work.....	11, 615, 913		11, 615, 913
4. Final job inventory.....	12, 872, 033		12, 872, 033
Total.....	121, 890, 033	16, 422, 133	138, 312, 166

Following are discussed the various subitems as indicated in table 1:

1 (a) *Materials and supplies furnished troops.*—These costs were incurred only by the Army and represent materials and supplies such as gasoline, fuel oil and lubricants, repair parts, bridge timbers, miscellaneous supplies, and transportation furnished the troops for the construction of roadway and bridges on the pioneer road. No costs for troop labor and subsistence or major equipment are included.

1 (b) *Gulkana to Slana.*—When the Public Roads Administration contractors moved into Alaska in June 1942, the main field headquarters for Alaska operations was established at Gulkana. The improvement of the existing trail road between Gulkana and Slana, Alaska, was a part of the original plan of operation

and a substantial amount of construction work was performed on this section of road which was used for the delivery of materials and supplies to the section of highway between Big Delta and the Boundary. This work was performed by contractors under jurisdiction of the Public Roads Administration.

1 (c) *Temporary bridges.*—This work was likewise performed by the Public Roads Administration contractors in connection with the construction of the pioneer road on all sections of the highway.

1 (d) *Construction of the pioneer road.*—Work by the Public Roads Administration contractors on the construction of the pioneer road extended over all sections of the highway, the heaviest work being accomplished on the Fort St. John to Fort Nelson section, and the section from Whitehorse to Big Delta. The lightest work was accomplished on the Fort Nelson to Watson Lake section. All pioneer road construction from Big Delta to Tok Junction, and from Whitehorse to Jakes' Corner was done by the Public Roads Administration contractors; no work was done on these sections by troops.

2 (a) *Roadway (final road).*—The only costs charged against the construction of the final roadway are those of the Public Roads Administration. Where work performed by the Public Roads Administration in 1942 in connection with the construction of the pioneer road was utilized in the final road, the costs are considered as final road costs and have not been included under item 1 (d). In most cases, however, realignment and improvements in grades did not permit a very high salvage, and as a general rule, salvage was considered only when the alignment and grade of the pioneer road remained unchanged. No salvage was considered as being realized from the work performed by the Army on the pioneer road.

2 (b) *Bridges (final).*—These represent permanent bridges constructed on the highway. The \$23,166,725 entry under the Public Roads Administration is for costs incurred up to October 31, 1943. At that time the Public Roads Administration operations were terminated, and the remainder of the bridge program was completed in 1944 under Army direction.

2 (c) *Supplies and materials furnished by Army.*—These are supplies and materials furnished to Public Roads Administration by the Army.

2 (d), (e) *Equipment and personnel evacuation by Army.*—These represent the expenditures by the Army in the evacuation of equipment and personnel at the completion of construction work on the highway.

3 (a) *Maintenance during winter of 1942-43.*—Keeping the road open during the first winter season involved operations for which there was no previous experience. Heavy movements of freight over the southern section of the highway during the winter resulted in large costs in keeping the road open. The heaviest maintenance costs for the entire highway were incurred on the Fort Nelson to Watson Lake section. This section was in the Rocky Mountain area and because of the lateness of the season in which they moved to this section, the Public Roads Administration contractors were able to accomplish very little work in improving the pioneer road prior to the winter shut-down.

3 (b) *Maintenance of completed highway.*—Expenditures for maintenance of completed highway were incurred from the time the various road sections were completed in 1943 until October 31, 1943, when the Public Roads Administration discontinued operations on the highway.

3 (c) *Airports and flight strips.*—Work in this classification involved grading, surfacing, and other construction work in connection with the airports and flight strips along the highway. This work was usually authorized by means of work orders issued by the Army to the Public Roads Administration.

3 (d) *Dawson Creek railhead.*—This work included the construction of spur tracks, erection and servicing of Army warehouses, and the production and delivery of lumber for the construction of the warehouses at Dawson Creek.

3 (e) *Pipe line, telephone, radio, and relay stations.*—For the most part this work involved the clearing and grading for building sites for the pipe line, telephone, radio, and relay stations. Also, some minor work was involved in constructing the buildings. This work was authorized by means of work orders issued by the Army to the Public Roads Administration.

3 (f) *Camp construction and shop services.*—The Public Roads Administration contractors performed considerable amounts of camp construction work for the Army and for other prime contractors on work being performed in Canada. Also the repair shops established by the Public Roads Administration contractors were used by the Army and other prime contractors for the repair, overhaul, and winterizing of equipment. Much of this work was of an emergency nature and some was covered by work orders, but frequently the only record of a repair job was the charges made by the shop foreman.

3 (g) *Winterizing buildings.*—This represents work accomplished primarily during the winter of 1942–43 by the Public Roads Administration contractors in insulating floors, walls, and ceilings, and in the protection of water lines, etc., in buildings built by and for the Army during the 1942 construction season.

3 (h) *Richardson Highway and Valdez Dock.*—This represents maintenance work along the Richardson Highway and dock construction at Valdez in order to handle larger ships and facilitate the transportation of materials and supplies into the Alaska area.

4 (a) *Stock-piled road-surfacing materials, etc.*—Considerable crushed gravel for road surfacing was stock-piled by the Public Roads Administration for future use along the highway. Also included in this account are lumber and aggregates suitable for bridge construction and repair work which were produced and stock-piled at various places along the highway by October 31, 1943.

4 (b) *Materials, repair parts, and other supplies.*—This represents the final job inventory of materials, supplies, food, repair parts, etc., which were on hand at the time the Public Roads Administration activities were terminated on October 31, 1943. Practically all of this inventory was in warehouses, including those of the individual contractors spread out along the job as well as those of the management contractors at the field headquarters.

4 (c) *Major construction equipment.*—The Public Roads Administration purchased slightly over \$8,000,000 worth of major equipment in connection with the construction of the Alaska Highway. In addition, there was about \$14,000,000 worth of Government-owned equipment (approximately \$7,000,000 was Army-owned) made available with no charge against the Alaska Highway appropriation. Thus a total of \$22,000,000 worth of Government-owned equipment was involved on which a depreciation charge of \$4,200,000 was made to various items of work performed. This \$4,200,000 was deducted from the \$8,000,000 with the result that about \$3,800,000 (\$3,782,164) is carried as the value of the equipment account. (In effect, the \$4,200,000 is a charge against \$22,000,000 worth of equipment which is carried at a cost-new value of \$8,000,000 on the books.)

To meet the cost of construction, the following funds were made available to the War Department:

(1) President's emergency fund (Independent Offices Appropriation Act, 1943)-----	\$10,000,000
(2) Military Appropriation Act, 1943 (Engineer service, Army, project 430, international highway to Alaska)-----	90,000,000
(3) Military Appropriation Act, 1944 (Engineer service, Army, project 430g, Northwest Service Command)-----	40,847,000
(4) Military Appropriation Act, 1945 (Engineer service, Army, project 430e, replacement of temporary bridges on Alaska Highway)-----	4,000,000
Total-----	144,847,000

A portion of the estimate of \$40,847,000 for project 430g, Northwest Service Command, as appropriated in the Military Appropriations Act, 1944, was used for facilities other than the Alaska Highway, these being auxiliary facilities such as telephone system, emergency flight strips, and other items not properly chargeable to a highway construction account. This fact accounts for the difference between the total amounts appropriated and the total expended for actual construction of the Alaska Highway.

(NOTE.—A review of some of the exhibits appended to this report may show a discrepancy in figures contained in these exhibits when taken in comparison with figures contained in this chapter. The figures contained in this chapter are the corrected figures agreed upon between the War Department and the Public Roads Administration in the final settlement of their interagency accounts. The exhibits in question whose figures may not seem in balance with those found in this chapter are inserted because of other material contained in them which seems relevant to a full understanding of the conclusions reached in this report.)

IX. EQUIPMENT AND EQUIPMENT RENTALS

The greatest array of road-building machinery ever assembled on a single project in the history of American road building was utilized in the construction of the Alaska Highway.

At the peak of operations in September 1943, there were 11,107 units on the project strung out along the entire 1,422 miles of the highway. These represented a total value when new of over \$36,000,000. Of this grand total, 3,983 units were owned by the contractors and were on a rental basis specified in contracts with the Public Roads Administration. The remaining 7,124 units were Government-owned. The major portion of this Government-owned equipment was transferred to the Public Roads Administration by the Works Progress Administration and the Civilian Conservation Corps at the time of those agencies' liquidation. Some was also acquired by purchase. In addition, the War Department assigned a number of pieces of major equipment to the Public Roads Administration. Practically all of the Government-owned equipment was in need of complete repair before it could be used on the project. Contractor-owned equipment was in better condition than Government-owned equipment when the job commenced.

Transporting the equipment to the job site was one of the first major problems. The average contractor's outfit was moved a distance of approximately 2,700 miles. Movement by rail and boat to headquarters camps was delayed by weather, inadequacy of transport facilities, and preference given to Army contractors' equipment being used on other War Department projects in northwest Canada and Alaska. Movement of the equipment in the 1942 season was accomplished over the Army pioneer road. In many instances, it was necessary to "walk" tractors and shovels over narrow, unsurfaced roads through dust, mud, and muskeg for several hundred miles because equipment to transport this type of earth-moving equipment was either not available or pioneer road conditions were so bad at that time that machinery hauling equipment could not get through.

Although field offices of the Public Roads Administration in the United States were instructed to have repairs made on WPA and CCC equipment before shipment north, this was an almost impossible assignment because spare parts and skilled mechanics were practically unobtainable at that time on account of earlier military drain on both types of supplies and manpower. Because complete and thorough overhauling at scattered points in the United States proved to be impossible in early 1943 much of this equipment was shipped north in a border-line condition in order to relieve the great shortage of equipment. Many such machines were cannibalized as a source of useful parts for other and more serviceable machines.

The equipment received by Public Roads Administration from the Army engineers in the early months of 1943 had been used by engineer troops in construction of the pioneer road. Practically all of this equipment was in need of complete overhaul or was beyond repair. Later in 1943, the Army assigned an additional number of trucks, tractors, and shovels to the Public Roads Administration which were in good working condition.

The 11,107 pieces of equipment on the project consisted of the following:

Tractors.....	904	Blade graders.....	374
Trucks (dump).....	2, 790	Scrapers.....	370
Trucks (other).....	2, 374	Shovels.....	174
Crushers.....	89	All others ¹	4, 032

¹ "All others" includes automobiles, and station wagons, bulldozers, snowplows, booms, boilers, compressors, cranes, derricks, draglines, engines, light plants and generators, lubricators, motors, mixers, power control units, pumps, rippers and rooters, rollers, shop equipment, and welding units.

Establishment of adequate facilities and supplies for maintenance of equipment was an enormous task, possibly the most serious problem throughout the course of the job. The management contractors (see ch. X for more details on these firms) were given the job of locating, constructing, and operating shop facilities. The Okes Construction Co. set up complete equipment repair and machine shops at Fort St. John and at a point near the Sikanni Chief River. In addition, each construction contractor under the Okes management operated smaller shops for routine maintenance.

The R. Melville Smith Co. established its repair base at Dawson Creek. Each construction contractor under that management contractor operated a relatively complete field shop capable of undertaking even the most complex repair work. They were less dependent on the services of the management contractor than those under other management contractors.

The Dowell Construction Co. operated a repair base at McCrae, near Whitehorse, and had smaller shops at each of its five field camps.

The E. W. Elliott Co. operated a complete shop at Kluane Lake and had several field shops along their road section.

In Alaska, Lytle & Green Construction Co. operated a headquarters shop located at Tok Junction, which was possibly the most modern, if not the most complete, on the entire Alaska Highway. In addition that firm's construction contractors performed minor maintenance work at field camps.

The problem of maintaining equipment on the Alaska Highway and also on the Haines Road, was far more acute than on normal highway construction in the United States. It is not surprising that the original equipment turned over to Public Roads by the Army engineers in early 1943 was in such poor state in view of the pioneer conditions under which the troops lived and worked in 1942 in breaking through the pioneer trail.

Among the abnormal difficulties encountered were the following:

(a) *Soil and weather conditions.*—Along the great portion of the highway, the topsoil contains extremely fine, powdery material. In dry weather clouds of dust are raised by every vehicle. Even after the application of gravel surfacing, this dust is present, although noticeably reduced. Dust came in contact with all moving parts, accelerated wear, and was a principal cause of the high frequency of break-down.

Heavy traffic, rain, and poor drainage on the pioneer road combined to cause axle-deep mud that had an equally damaging effect on equipment.

Throughout the long winter, subzero temperature added to the mechanics' dilemma. Grease in bearings and gear boxes hardened and caused breakage when inexperienced operators started their vehicles without taking proper precautions. Low temperatures made steel brittle and more readily broken by the strain added by the stiff grease. Ordinary petroleum fuels proved to be unsatisfactory during extremely cold temperatures. Mechanics spent many hours in the shops and on the road trying to start engines. After considerable investigation, special mixtures of gasoline, diesel fuel, and lubricating oil remedied this situation.

In the coldest weather there was trouble with liquids for cooling engines. Cans of undiluted antifreeze were found to have frozen in a stock pile at Kluane Lake.

(b) *Procurement of parts and supplies.*—In 1943, the military was taking all the spare parts for rolling stock that our factories could produce and only a small portion of these parts and supplies were being channeled to even the more essential war industries. These military procurements, however, were intended for the active fighting fronts rather than for other use.

At the inception of the Alaska Highway job, Public Roads contractors were instructed to bring repair parts and supplies with them sufficient to meet anticipated needs for automotive and heavy equipment. Only the contractors under the Okes and Smith management brought along any considerable supply of repair parts. Earnest efforts by the procurement officers of the management contractors to obtain "rush" supplies of urgently needed supplies were made to little avail. The number of vehicles in "deadlines" grew accordingly. Contractor's shops were operated on two 11-hour shifts and emergency repair parts were made in contractor-operated shops that were normally made only in factories. Repair facilities could not keep pace with break-downs, however, according to the committee's best information.

Procurement of these parts for all agencies engaged on work in the Canada-Alaska area was then undertaken by the War Department in the late spring of 1943. Parts depots were established at Edmonton, Dawson Creek, Whitehorse, and Fairbanks. Subdepots were located at points approximately every 300 miles along the highway. Some coordination is reported to have been achieved, but the War Department also was unable to overcome many of the procurement difficulties already encountered by the Public Roads Administration and its contractors. The basic shortage was in production of the parts back at the factory. Delays in delivery in urgently needed parts of from 2 to 3 months were reported as not being uncommon during the 1943 season. Many pieces of equipment were entirely inoperative when hauled from the job in 1943 for this reason.

(c) *Personnel.*—A shortage of experienced mechanics and machinists, although not considered critical, did, at times, delay progress. This shortage was reported as being more noticeable in the Dowell and Lyle & Green shops than in those on the southern sector of the highway.

(d) *Army work orders.*—Although the shop facilities were installed by Public Roads management contractors to repair vehicles working under their supervision on the final-type road, it became necessary to assign them the repair of military vehicles and the equipment of contractors working directly under War Department supervision on other military projects not directly allied to the Alaska Highway project. Vehicles and equipment being used by Bechtel, Price, and Callahan on the Canol oil project, by Metcalf, Hamilton, and the Kansas City Bridge Co. on the airbases and other projects, and by Foley Bros., Inc. and Rohl-Connolly Co. on the Haines lateral road contract under direct Army supervision were also assigned to Public Roads contractors repair shops under Army work orders for repair and rehabilitation. By the close of the 1943 season, this added work load constituted a major portion of these shops' activity, according to information supplied the committee by Public Roads Administration officials.

(e) *Distribution of equipment.*—The difficulty in delivering equipment to the job sites at the times and places originally scheduled accounted for an apparent inequitable distribution of equipment to the various construction sections through July 1943. It was originally intended that trucks should be convoyed over the highway from Edmonton to the Whitehorse section, but road conditions, especially wash-out of temporary bridges, prevented their delivery in any quantity until the latter part of July 1943.

On August 15, 1943, the distribution of equipment to the various sections of the Alaska Highway was as shown in table 2.

TABLE 2.—Distribution of equipment on Aug. 15, 1943

Section	Total construction assignment in miles	Percent complete Aug. 15, 1943	Approximate mileage remaining to be built	Number of pieces of equipment assigned ¹	Pieces of equipment per mile of road to still be built
In Alaska.....	203	65	71	1,289	12.2
International Border to Watson Lake.....	668	40	401	3,706	9.2
Watson Lake to Fort Nelson.....	234	60	94	2,693	28.6
Fort Nelson to Fort St. John.....	249	75	62	2,462	39.7

¹ The remaining 967 pieces of equipment were operated by Public Roads Administration forces.

As shown in appendix F-10, the spring thaw, mud, and floods prevented any large accomplishment in grading and surfacing the highway until about mid-July 1943. From that time until October 30, when the highway was substantially completed, there was large and steady progress. Equipment was kept operating 20 to 22 hours a day. There were many break-downs, but repair parts were improvised and crews of mechanics worked day and night to get machines back into operation. It is not held to be an exaggeration to say that the 1,422 miles of final-type road was built largely in a 4-month period. Modern road-building equipment has a high rate of production when operated efficiently.

Equipment rental rates paid by the Government in the construction of both the Alaska Highway and the Haines lateral road have been the subject of a certain amount of public discussion. Because your committee believes that this public discussion by persons who did not possess all of the facts may have created an erroneous impression in the minds of both Congress and the general public, a detailed analysis of these rental schedules is included in this chapter.

Equipment rental rates paid by both the Public Roads Administration and the War Department were based on standard rates established by Associated General Contractors, hereinafter described as A. G. C., and were well within the legal rental limits permitted under regulations of the Office of Price Administration. These rates were adjusted for the conditions of the rental agreement.

Public Roads Administration rental contracts provided for a minimum monthly rental during the period the equipment was away from the original point of hire, straight rental for overtime periods, and, in some cases, a guaranty of 1 year's rental. Under these conditions, Public Roads was able to rent equipment considerably below the recognized standard rates for equipment on this type of work despite the added burden of having to pay the minimum monthly rental during the period the equipment was being transported from original point of hire to work site and back again.

Total rentals paid by Public Roads Administration to contractors for the entire construction period amounted to \$5,753,019.67. The equipment thus rented was valued at \$13,973,747.92.

A recapitulation of rentals paid by Public Roads is as follows:

TABLE 3.—*Equipment values and rentals paid*
RECAPITULATION OF ALL CONTRACTS UNDER PUBLIC ROADS
ADMINISTRATION

Project	Account No.	Contractor	Equipment value	Rentals paid, basic and overtime
		E. W. Elliott.....	\$343,544.90	\$112,815.83
		Lytle & Green.....	1,314,068.04	539,402.39
		Dovell Construction Co.....	3,840,153.62	1,415,717.70
		R. Melville Smith.....	5,148,085.83	2,188,338.80
		Okes Construction Co.....	2,808,295.21	1,338,737.64
		J. A. Roebling.....	242,731.05	104,251.70
		United States Steel.....	50,223.40	29,449.93
		Bay Cities Engineers.....	32,091.00	9,711.54
		Utah Construction Co.....	2,482.94	848.60
		Haddock Construction Co.....	94,554.87	13,746.34
		Total.....	13,876,230.86	5,753,019.47

TABLE 3.—*Equipment values and rentals paid*—Continued
PAID UNDER LYTLE & GREEN CO. MANAGEMENT CONTRACT

Project	Account No.	Contractor	Equipment value	Rentals paid, basic and overtime
3.....	0002	Lytle & Green, manager.....		1 \$235. 84
3-B.....	0012	Eblen & Eblen.....	\$63, 589. 72	26, 521. 94
3-C.....	0013	Eblen & Ekdahl.....	69, 074. 78	37, 673. 85
3-D.....	0014	William Horrabin.....	70, 576. 57	38, 949. 87
3-E.....	0015	V. L. Lundeen.....	32, 806. 50	15, 878. 54
3-F.....	0016	Gus Ostermann.....	85, 712. 95	40, 663. 56
3-G.....	0017	J. W. Scothorn.....	76, 022. 88	39, 161. 71
3-H.....	0018	Sears Construction Co.....	67, 044. 96	34, 248. 87
3-I.....	0019	Ira Van Buskirk.....	82, 172. 59	42, 071. 53
3-J.....	0020	J. Leo Hoak.....	16, 354. 09	13, 867. 33
3-K.....	0021	L. Peterson.....	12, 268. 41	6, 938. 60
3-M.....	0022	Western Engineering Co.....	26, 509. 25	8, 900. 78
3-N.....	0023	Duvall & McKinney.....	71, 153. 25	35, 224. 79
3-A.....	0024	E. M. Duesenberg.....	162, 934. 80	87, 057. 67
3-L.....	0025	Weldon Bros.....	36, 610. 00	16, 125. 57
3-O.....	0091	Ferguson & Diehl.....	61, 784. 00	13, 368. 73
3-P.....	0092	Kaser Construction Co.....	279, 345. 77	56, 466. 44
3-Q.....	0093	Linnan Construction Co.....	77, 951. 92	16, 473. 69
3-R.....	0100	United States Steel (Tanana Bridge).....	22, 156. 00	9, 583. 08

PAID UNDER DOWELL CONSTRUCTION CO. MANAGEMENT CONTRACT

4.....	0003	Dowell Construction Co., manager.....	\$59, 178. 18	\$20, 326. 14
4-C.....	0034	J. S. Ramstad.....	68, 692. 50	34, 852. 11
4-H.....	0059	Angeles Gravel & Supply.....	23, 850. 00	7, 912. 26
4-B.....	0060	L. Byers & R. Byers.....	84, 356. 46	30, 466. 08
4-I.....	0061	J. C. Dawson Co.....	120, 330. 29	47, 429. 35
4-A.....	0063	H. Govan & Adler.....	280, 482. 56	122, 515. 92
4-F.....	0064	E. T. Haas et al.....	323, 220. 48	147, 252. 19
4-D.....	0066	J. A. Jussell.....	122, 291. 99	61, 390. 97
4-G.....	0067	Crockett E. O'Neal.....	78, 296. 41	26, 883. 49
4-J.....	0068	McVaugh-Haynes Co.....	384, 155. 38	123, 189. 94
4-E.....	0069	W. C. Thompson.....	171, 650. 04	80, 778. 80
4-K.....	0084	E. L. Gates & Son.....	111, 751. 70	31, 807. 86
4-L.....	0085	Bates & Rogers.....	167, 054. 97	35, 764. 87
4-M.....	0086	David Nassif.....	895, 421. 13	337, 804. 20
4-O.....	0088	Gustafson & Jarvis.....	295, 476. 93	84, 847. 48
4-P.....	0089	Morse Bros.....	341, 116. 23	142, 655. 40
4-Q.....	0094	Ulland Bros.....	228, 291. 00	66, 929. 62
4-R.....	0098	Concrete Materials.....	84, 547. 38	22, 910. 96

PAID UNDER R. MELVILLE SMITH CO. MANAGEMENT CONTRACT

5.....	0004	R. Melville Smith, manager.....	\$74, 512. 82	\$29, 471. 31
5-A.....	0026	Curran & Briggs.....	328, 617. 82	142, 778. 19
5-H.....	0029	Emil Anderson.....	385, 052. 55	182, 983. 81
5-O.....	0030	A. F. Jupp Construction Co.....	400, 196. 04	186, 902. 55
5-C.....	0031	Storms Construction Co.....	351, 587. 22	143, 557. 35
5-F.....	0032	Bond Construction Co.....	292, 644. 42	133, 464. 04
5-B.....	0033	W. H. Harvey & Son.....	249, 007. 45	108, 426. 24
5-O.....	0045	Highway Paving Co.....	537, 685. 65	143, 863. 10
5-K.....	0048	Campbell Construction Co.....	320, 159. 06	107, 451. 47
5-D.....	0049	Don Construction Co.....	238, 945. 13	105, 342. 28
5-I.....	0050	Dufferin Paving Co.....	365, 030. 45	155, 104. 65
5-J.....	0051	Dufferin Paving Co. (Peace River Bridge).....	400, 124. 09	220, 855. 62
5-E.....	0053	W. A. Mackey.....	327, 459. 15	140, 417. 43
5-M and N.....	0054-8	McNamara Construction Co. (roads and bridges).....	486, 633. 23	223, 943. 01
5-Q.....	0057	H. Harvey (building construction).....		4 121. 36
5-L.....	0080	Caswell Construction Co.....	271, 558. 20	116, 489. 53
	0096	Rayner Construction Co.....	118, 842. 55	38, 156. 86

¹ Rental of Chevrolet \$18.30 and rental of sawmill \$217.54.

² Includes \$4,719.89 value of small tools and equipment.

³ Includes \$234.70 rental of small tools and equipment.

⁴ Rental of shop equipment: 5-horsepower engine, table saw, band saw, tool grinder, etc.

TABLE 3.—*Equipment values and rentals paid*—Continued
PAID UNDER OKES CONSTRUCTION CO. MANAGEMENT CONTRACT

Project	Account No.	Contractor	Equipment value	Rentals paid, basic and overtime
2.....	0005	Okes Construction Co., manager.....	\$4,334.59	\$33,387.26
2-A.....	0026	Standard Salt & Cement.....	158,344.61	65,886.72
2-F.....	0035	Adolphson, Huseeth, Laysner & Welch.....	344,568.35	157,752.82
2-C.....	0036	M. G. Astleford Co.....	232,040.34	132,586.24
2-D.....	0037	Art Bolier.....	255,862.50	142,675.31
2-K.....	0038	Brown & Leguil.....	224,825.36	104,672.26
2-I.....	0039	Coghlan Construction Co.....	110,539.94	66,479.84
2-O.....	0040	Mike Welch.....	179,379.09	46,084.59
2-T.....	0041	Dunnigan Construction Co.....	47,031.70	9,674.14
2-B.....	0042	Pederson Bros., Inc.....	82,640.22	32,409.50
2-J.....	0043	Reese & Olsen.....	157,405.72	95,070.15
2-L.....	0044	Southern Minnesota Co.....	248,054.19	130,585.96
2-G.....	0046	Thomas Bros.....	171,273.31	93,939.39
2-H.....	0047	Volk Construction Co.....	196,026.10	93,429.61
2-E.....	0062	Sorensen & Volden.....	149,825.84	77,026.70
2-M.....	0065	Roverud Bros.....	186,643.35	57,077.15

PAID TO CONTRACTORS UNDER DIRECT CONTRACT WITH PUBLIC ROADS ADMINISTRATION

9.....	0052	J. A. Roebling (erected Peace River Bridge).....	\$242,731.05	\$104,251.70
	0055	United States Steel Exporters (erected Liard Bridge).....	50,223.40	29,449.93
11.....	0056	Bay Cities Engineers (erected Muskwa River Bridge).....	32,091.00	9,711.54
12.....	0090	Utah Construction Co.....	2,482.94	848.60
13.....	0097	Haddock Construction Co.....	94,554.87	13,745.34
1.....	0001	E. W. Elliott.....	343,544.90	112,815.83

* This \$242,731.05 does not include the value of special bridge equipment for which a rental was paid in the amount of \$40,410 but this \$40,410 is included in rental paid.

† Rental on semitrailer \$79.31, sedans \$496.56, and electric pump \$272.73.

Approximately 1,200 pieces were used by the contractor, Foley Bros., Inc. and Rohl-Connolly Co., during the construction of the Haines lateral road. Of this number, more than 900 pieces, valued at approximately \$3,000,000 were Army-owned and the balance of 231 pieces, valued at \$946,000 was rented by the prime contractor from an equipment contractor, Bowen & McLaughlin, while 11 pieces, valued at \$458,807, were rented from the prime contractor. The equipment rented from the prime contractor, Foley Bros., Inc., and Rohl-Connolly Co., consisted of marine equipment used for transporting construction materials up the Inland Passage from Prince Rupert, British Columbia, to Haines, Alaska. For an average total rental period of 12.4 months, the prime contractor received a rental of \$127,116.81 on equipment valued at \$458,807. This rental schedule compares very favorably with other rental schedules allowed by both the War Department and the Public Roads Administration. Mention is made of this point at this time because one of the firms associated in this prime contract in question happens to be a firm whose relations with Col. Theodore Wyman, Jr., northwest district engineer who authorized the letting of said prime contract, have been under scrutiny by other congressional committees. Your committee does not believe that Colonel Wyman is subject to criticism for authorizing the letting of this particular marine equipment rental contract.

As to the rental contract with Bowen & McLaughlin, wherein that firm leased certain construction equipment to Foley Bros., Inc., and Rohl-Connolly Co. with the approval of the War Department,

although the rental schedules allowed are materially higher than those contained in Public Roads Administration schedules, they are still well below the authorized limit permitted under regulations of the Office of Price Administration.

The details of both the marine equipment rental contract with Foley Bros., Inc., and Rohl-Connolly Co. and the contract between Bowen & McLaughlin and the prime contractor are supplied in appendixes I-3 and I-4.

The standard equipment rental schedule used by the Public Roads Administration as being applicable to all equipment furnished its contractors on the Alaska Highway whether such equipment was the property of the contractor or was secured by him from a third party is also shown as appendix I-5.

War Department Engineers Form No. 57, equipment rental agreement, for use under cost-plus-a-fixed-fee contract, as used in the lease of equipment by Bowen & McLaughlin to Foley Bros., Inc., and Rohl-Connolly Co. is shown as appendix I-4. Said exhibit is a copy of the actual contract in question.

It will be noted that the War Department rental contracts in question differed from Public Roads rental agreements in that the Army contracts were based on a short term contract with no guaranteed rental period, and with one-half normal rental for overtime up to 8 hours and one-fourth for overtime over 8 hours. No allowance was made for lay-up time due to winter conditions.

Shown as appendixes I-1 and I-2 are charts showing comparison between rental schedules used by Public Roads Administration and War Department as against those provided in Associated General Contractors schedules and those permissible under Office of Price Administration regulations. It will be noted that schedules used by Public Roads Administration are much more economical from the Government's point of view than are the other schedules in question. This is accounted for, in part, by the fact that Public Roads was able to offer its contractors an assurance that the equipment would be in use for a substantial period of time. The War Department contracts were for a shorter duration with no minimum time period guaranteed.

An analysis of Public Roads rental schedules on typical items in comparison with A. G. C. and OPA schedules is shown in table 4.

A similar analysis of War Department rental schedules on typical items in comparison with A. G. C. and OPA schedules is shown in table 5.

TABLE 4.—Comparison of rental schedules on typical machines based on a rental period of 17 months and expressed as a percentage of cost when new¹

Equipment	Public Roads Administration rates	A. G. C. schedules	OPA ceilings
	Percent	Percent	Percent
1½-yard Diesel power shovel.....	46	83	131
1½-ton dump truck.....	92	131	195
D-8 type heavy tractor.....	67	89	218
17-cubic-yard carry-all scraper.....	63	89	258

¹ Rates listed include overtime allowance.

TABLE 5.—Comparison of rental schedules on typical machines based on a rental period of 12 months and expressed as a percentage of cost when new

Equipment	War Department rates	A. G. C. schedules	OPA ceilings
	Percent	Percent	Percent
2-cubic-yard Diesel power shovel.....	39	46	55
5-ton dump truck.....	51	46	65
Motor grader.....	54	46	92
Tractor.....	60	46	80
12-cubic-yard scraper.....	54	46	72
16-cubic-yard side-dump wagon.....	43	46	59

The War Department also employed one contractor through direct contract for the completion of the bridge program during 1944 after Public Roads Administration forces were withdrawn from the area. This contractor, Bates & Rogers, received rental for 57 pieces of equipment valued at \$183,486.30 in the amount of \$79,146.61 for a period of time averaging slightly under 1 year. (See appendix I-3 for full details on this rental contract.) Rental rates on this contract conform to those given contractor on the Haines Road project.

It was the intent of both the Public Roads Administration and the War Department that damaged, contractor-owned equipment be placed in a working condition before return to place of origin. This was provided for under terms of the rental contracts. Fulfillment of this agreement, however, would have placed the War Department in a difficult situation. Conditioning all such equipment would have seriously depleted stocks of repair parts still then in short supply which were certain to be needed for future maintenance operations and in other construction operations by the War Department in northwest Canada and Alaska. As a necessary war measure, therefore, the Public Roads Administration and the War Department were directed by the War Production Board not to undertake general repairs of the contractor-owned equipment at the conclusion of the Public Roads work on the project. Instead, Public Roads was directed to negotiate cash settlements with the owners of the equipment, based on inspections and appraisals. The War Department followed the same procedure with respect to contractors with which it had made direct contracts.

These field settlements were accomplished rapidly. Each settlement made by Public Roads was reviewed and approved by the War Department after inspection of the equipment by its representatives. The firm of Lytle & Green sold most of its equipment to the War Department for approximately the cost to the Government for repairs and transportation of the equipment to the point of origin.

The schedule of cash settlements made by both Public Roads and War Department with their respective contractors in lieu of repairing the equipment in question is shown in table 6.

TABLE 6.—Statement of cash settlements in lieu of repairing equipment
TO AMERICAN CONTRACTORS BY PUBLIC ROADS ADMINISTRATION

Contractor	Amount	Contractor	Amount
Okes Construction Co.....	\$5,344.15	United States Steel Co. (American Bridge).....	\$3,427.00
Adolphsen-Husch-Layser & Welch.....	29,372.50	Mike Welch.....	16,052.55
M. G. Asleford.....	10,872.50	E. W. Elliott.....	10,517.15
Bay Cities Engineering Co.....	61.08	V. L. Lundeen.....	6,073.70
Art Bolier.....	5,935.20	J. Leo Hcak.....	1,391.50
Brown & Leguil.....	8,850.00	Dowell Construction Co.....	3,457.02
Coghlan Construction Co.....	438.81	J. S. Ramstad.....	1,619.43
John W. Cannon.....	625.00	L. L. Byers & R. W. Byers.....	7,579.15
Dunnigan Construction Co.....	6,230.40	J. C. Dawson.....	5,013.48
R. W. Fellows.....	33.03	Hugh Govan & Adler Construction Co.....	12,924.59
A. Galli.....	50.00	Joe A. Jussel.....	7,637.69
E. O. Gerber.....	343.80	Crockett E. O'Neal.....	5,662.77
G. Hall Lumber Mills.....	249.42	McVaugh-Haynes Co.....	41,566.60
J. E. Haddock.....	11,107.75	Gustafson & Jarvis.....	21,668.89
Eino Johnson.....	203.45	Ulland Bros.....	15,585.70
Harry W. Jones.....	546.00	Concrete Materials & Construction Co.....	7,036.33
R. L. Kincaid.....	750.00	E. T. Haas—Ken Royce—R. Johnson.....	8,307.80
Pederson Bros.....	14,212.50	W. C. Thompson.....	13,747.06
Reese & Olsen.....	21,887.50	E. L. Gates & Son.....	8,795.28
Roverud Bros.....	11,439.90	David Nassif Co.....	137,069.41
John A. Roebings Sons Co.....	1,955.17	Morse Bros., and Associates, Inc.....	69,414.68
Sorensen & Volden.....	19,700.34	Angeles Gravel Supply Co.....	1,386.00
Southern Minnesota Co.....	14,968.90		
Thomas Bros.....	11,678.00	Total.....	593,258.09
Volck Construction Co.....	10,470.93		

TO CANADIAN CONTRACTORS BY PUBLIC ROADS ADMINISTRATION

R. Melville Smith Co., Ltd.....	\$3,191.44	W. H. Harvey & Son.....	\$27,825.30
Enil Anderson Construction Co.....	52,212.79	A. E. Jupp.....	26,189.06
Bond Construction Co.....	44,296.94	Wallace A. Mackey, Ltd.....	47,304.97
Campbell Construction Co.....	44,256.29	McNamara Construction Co.....	67,022.00
Caswell Construction Co.....	51,280.08	Rayner Construction Co.....	19,159.10
Curran & Briges.....	37,380.24	Storms Construction Co.....	47,760.95
Don Construction Co.....	35,198.00		
Dufferin Paving Co. (bridge).....	90,888.30	Total in Canadian money.....	717,671.32
Dufferin Paving Co.....	22,089.80	Equivalent in United States money.....	652,428.47
Highway Paving Co.....	96,616.06		

TO CONTRACTORS ON HAINES LATERAL ROAD BY WAR DEPARTMENT

Contractor	Amount
Foley Bros. Inc., Rohl-Connelly Co.....	\$9,574.51
Bowen & McLaughlin.....	154,768.21
Odin Jensen.....	100.00
Bates & Rogers Co.....	0
Total.....	163,432.72

Evacuation of all equipment from the project not needed for maintenance purposes began early in October 1943, and was substantially completed by the end of November.

A complete statistical investigation was made by your committee of the disposal of all Government-owned equipment brought into the area, not only for the construction of the highway but for all projects under the supervision of the Chief of Engineers, War Department, in northwest Canada and Alaska. All PRA-owned equipment was

transferred to the War Department for further use or disposition. All contractor-owned equipment was returned to the contractor or otherwise disposed of as in the case of Lytle & Green, which sold some of its equipment to the War Department.

Because of rumors coming to the attention of your committee that much Government-owned equipment had either been lost or stolen or could not be accounted for properly, and because much of the Government-owned equipment in northwest Canada and Alaska was being used on other projects than the Alaska Highway, a special attempt was made to trace down the sources of these rumors and make a determination as to their reliability.

An on-the-ground inspection of both the Alaska Highway and the Haines lateral road did not disclose any serviceable equipment not in use or not in equipment pools at appropriate storage points. An occasional wrecked truck or one that had been obviously cannibalized and then discarded as useless for further purposes was noted and inspected as your committee traversed the highway by automobile.

At each camp along the highway a thorough inspection was made of facilities and equipment located there. No unaccounted-for equipment items were discovered.

Several rumors as to large numbers of idle, but serviceable vehicles and other equipment were carefully traced down and found to be groundless. One such rumor related to a large guarded compound containing several hundred usable vehicles located just north of Fairbanks, Alaska. An on-the-spot investigation showed this lay-out to consist of surplus Government-owned equipment then being classified for disposal as surplus by officials of the War Department who were in charge of the compound. An official of the Reconstruction Finance Corporation's disposal division was found to be quartered at the compound working with the War Department officials in making this classification and taking the necessary steps leading up to the disposal by the RFC, an authorized disposal agency.

Another rumor held that many thousand pieces of usable construction and service equipment would be found north of a washed-out bridge on the Pelly River along the Canol Tote Road between Whitehorse and Norman Wells. An on-the-spot investigation of this rumor was not engaged in by your committee because of transportation conditions and because the equipment in question was originally used in the Canol project, not the Alaska Highway project. However, conferences were held with appropriate War Department officials in the field who had knowledge of this situation, including a major who had charge of moving out all equipment that could leave the Canol project under its own power or by truck. These officials advised your committee that approximately 2,000 pieces of construction equipment had either been left behind on the Canol project or had been transferred to the Imperial oil explorations project in that area. They reported, however, that the bulk of the rolling stock thus left behind was in an unusually poor state of repair and could not be brought out under its own power. They further reported that such items as power plants and other items having a respectable salvage value, including some rolling stock, had been adequately winterized and stored in such a way that it could ultimately be brought out to civilization when transportation conditions permitted.

A plan was being studied at the time the committee was in Canada whereby the bulk of this equipment could be recovered and disposed of in an orderly fashion. All other rumors proved untraceable and generally consisted of some isolated case where a tractor or truck was reported stolen and taken back farther into the interior. War Department officials did not dispute that there might have been isolated cases of stealing, but felt confident that this had not been engaged in on a large scale. In view of the sparsity of population and extremely isolated nature of the country where this stealing is alleged to have taken place, your committee does not lend much credence to these rumors because the names of all of the inhabitants are well known to the Royal Canadian Northwest Mounted Police and no thefts on a large scale could long be concealed from this force or be of any known value to the alleged thieves without their purchases of fuel oil and other essential automotive supplies soon being traced.

War Department records show that a maximum quantity of 30,586 pieces of Government-owned equipment essential to construction work were utilized in northwest Canada and Alaska. As of September 25, 1945, the War Department is able to account for all but 635 pieces of this equipment. A summary of the accounting, which covers 243 different types of equipment, is as follows:

	<i>Pieces</i>
Transferred to War Department pool in the United States.....	19, 339
Worn out and classified as useless for further service.....	2, 749
Sold to the Canadian Government.....	719
Transferred to Alaska Department, War Department (much of this is in the disposal pool at Fairbanks, earlier referred to).....	1, 690
Transferred to Imperial oil explorations project.....	1, 136
Transferred for use at War Department base at Prince Rupert, British Columbia.....	211
Canol Road inventory.....	1, 099
Retained for maintenance and operation of Alaska Highway and other War Department projects.....	3, 008
Shortage being accounted for.....	635
Total.....	30, 586

In explanation of the 635 pieces still to be accounted for, both Public Roads and War Department officials pointed out that, in the haste of construction during the hectic years of 1942-43, a number of trucks and other equipment were wrecked and abandoned, in several instances rolling off steep hillsides into mountain streams or lakes. Although an effort was made to keep an accurate record of such casualties, such was not always done. The construction of the pioneer road was conducted along the lines of a military campaign by Engineer troops and less attention was paid to bookkeeping during those grueling months than was paid to mileage gained daily in penetrating a wilderness never before traversed by automobile or mechanical equipment. Your committee does not feel that inability to account for only 2 percent of all the thousands of pieces of equipment used on all of the great military construction projects in this wilderness country is a subject for severe censure at this time, in view of the magnitude of the project and the great speed with which it was completed.

A special tabulation of all Government-owned equipment utilized for construction, maintenance, and operation of military construction

projects in northwest Canada and Alaska is appended as appendix 0-3 to this report.

X. CONTRACTORS EMPLOYED BY THE PUBLIC ROADS ADMINISTRATION

Throughout the history of Federal-aid highway construction, the Public Roads Administration has always favored the performance of highway construction under contracts awarded to the lowest bidder. This was not possible in the construction of the Alaska Highway, although the method would have been preferred had conditions permitted its use.

When the Public Roads Administration received its assignment from the War Department in the early spring of 1942 it was necessary to move men and equipment to the job immediately and begin work. The detailed location of the highway was not yet fixed. It would be months before plans, estimates of quantities of work, and specifications could be prepared to form the basis of the usual form of contract. There was neither time nor means of transportation to permit contractors to inspect the work they were to do as a basis for bidding.

Even if these obstacles had not existed, there was another reason why reasonable bids could not have been obtained. The work was to be done in a wilderness region far from all sources of supply. It would be necessary to establish complete facilities for housing, feeding, and medical care of the men and for repair and servicing of equipment. Contractors were in no position to know what these things would cost in the Canadian and Alaskan wilderness under war conditions. Normally, highway work is done by small contractors whose men live where they please and report to the job each day. For repair work the contractor calls on the nearest machine shop and his equipment dealer. At times he hires extra trucks from local people. He goes to the employment agency for men. An oil company delivers fuel regularly as needed. None of these services would be found in the northwest woods. Everything must come from outside, and largely from the United States. Utter confusion would have reigned had 40 or 50 contractors each undertaken to establish his own purchasing and transportation services under wartime conditions. The cost would have been prohibitive. The equipment, personnel, and experience of highway contractors' organizations were necessary, however, if the job was to be done within the time limit established.

Since few highway contractors are equipped to build over 15 or 20 miles of road in a construction season, it was felt necessary to secure the services of some 40 or 50 of them to do the work already assigned to the Public Roads Administration in the season of 1942.

A special form of contract was prepared, therefore, to meet these conditions and to devise machinery for dealing with and supplying all contractors. The form of contract entered into was one chosen by the War Department and approved by the Congress for use during the war where time did not permit preparation of detailed plans. This was a modified form of the standard cost-plus-a-fixed-fee contract tailored to meet the standard procedures and regulations of the Public Roads Administration as far as possible. (See appendix J for a sample copy of one of these contracts.)

All available Public Roads Administration employees were promptly shipped to the job sites to engage in establishing engineering headquarters, making surveys, investigating bridge sites and local surfacing materials. This left a shortage of experienced manpower to establish offices in various parts of the country to acquaint contractors with the terms of the contract offered, conditions of work, to enter into agreements with them and arrange for transport to the job. Subsequently, it would be necessary to send them a continuous stream of supplies, provide repair services, recruit and transport additional workers, and keep accurate records of men employed and work done. To build this form of supervising organization for Public Roads through normal civil-service procedures and under conditions prevailing in 1942 would take months, if it could be done at all. In addition, it should be remembered that this was at a time when the majority of experienced contracting firms were employed on important governmental construction projects here in the United States and were doing that with a shortage of experienced construction personnel. Furthermore, an expanded governmental organization to deal with contractors in this manner would have been subject to all the ills of a new machine with cogs not yet ground in to run smoothly. The obvious need was for a machine to begin operations at once and at high speed.

To meet this emergency, negotiations were begun at once by Public Roads with engineering firms experienced in the business management of large construction jobs. It was decided to divide the highway into four sections, each to be assigned to a management contractor with a fifth management contractor employed to provide transportation to the job.

Under the general direction of Public Roads, these management contractors were to recruit highway contractors wherever they could find qualified ones available, move them to a job, provide subsistence, repair, and other services on the job, and keep all records necessary for proper accounting with each individual contractor. All procedures and records were to be as prescribed by the Public Roads Administration and the agency's representatives were to be in daily contact with the management contractors. It was decided that this was the only procedure possible under which a large number of contractors could have been recruited and moved to the job within a matter of weeks. The results proved the wisdom of this policy, and your committee endorses the procedures used as the only ones which would have been likely to have met the emergency.

Services were therefore obtained of five experienced firms, staffed with men acquainted with construction work, needs in equipment operation, the supplying of construction forces, and transport of heavy machines. These management contractors then entered into negotiations with each individual contractor. The Public Roads Administration entered into a prime contract upon the recommendation of the management contractor. These negotiations allotted each such contractor a particular section of road. Probable quantities were estimated as accurately as available data permitted and a fixed fee agreed upon. The contracts provided that should the actual amount of work exceed greatly the original estimates the amount of the fee would be subject to renegotiation. The Government was to

pay the actual cost of supplies and all labor on the job. Rent was to be paid for contractor's equipment used, according to the fixed scale shown in appendix I-5 and discussed in some detail in the previous chapter. Under this plan it was not possible for a contractor to increase costs and be assured of any increases in his fee.

The management contractors selected and their assignments were as follows:

E. W. Elliott Co., Seattle, Wash.: Transportation and camp construction.

R. Melville Smith Co., Ltd., Toronto, Canada: Highway construction between Dawson Creek and Fort St. John; also between Fort Nelson and Watson Lake. Total, 250 miles.

Dowell Construction Co., Seattle, Wash.: Highway construction between Watson Lake and the Canadian-Alaskan boundary. Total, 627 miles.

Okes Construction Co., St. Paul, Minn.: Highway construction between Fort St. John and Fort Nelson. Total, 256 miles.

C. F. Lytle Co. and Green Construction Co., Sioux City, Iowa: Highway construction in Alaska. Total, 308 miles.

These were the initial assignments to management contractors made in 1942. Subsequent changes in the plan of operation resulted in changes in mileages given. (See appendix J-6 for contract assignments for the 1943 final type road-construction program.) It will be noted that changing conditions and difficulty of transporting heavy equipment from the southern sector of the highway to the Watson Lake-Alaska-Canada boundary section necessitated a substantial reduction in the mileage originally assigned to Dowell Construction Co. A difficult section of the highway at the lower end of Kluane Lake where the Slims River enters the lake was reassigned to E. W. Elliott, while adjoining sections to the north were assigned to Utah Construction Co., of San Francisco, Calif. C. F. Lytle Co. and Green Construction Co. made such good progress in finishing their Alaska portion of the contract that they were assigned a considerable mileage of the Dowell contract just south of the boundary and adjoining the work assigned to Utah Construction Co. The terrain covered by both Utah and Lytle-Green in Canada was some of the most difficult on the entire project due to conditions of permafrost and muskeg and run-away streams subject to glacial action. Elliott, Okes, and Smith also interchanged forces on three other sections of the project on small-mileage assignments.

During 1942, 47 construction contractors were placed on the job with the first equipment and men leaving the United States in May, only 2 months after Public Roads received its specific instructions from the War Department. Many employees of Lytle & Green were flown to Alaska by the Air Transport Command and commercial air lines. Others reached the project by railroad, air lines, motor transport, and by sea.

Although original publicity credited Engineer troops of the War Department with building the entire pioneer road, the record shows that Public Roads contractors made a substantial contribution to the trail-breaking job. As compared with the 10,000 soldiers employed on the project, contractors, by the end of the 1942 season, had brought approximately 7,500 civilians to the scene of operations.

During 1942 Public Roads contractors made the following contribution:

	<i>Miles</i>
1. Construction to high standards of a 36-foot permanent highway from Dawson Creek to a point 27 miles north of Fort St. John, British Columbia.....	77
2. Construction, without Army assistance, of 51 miles of highway east of Whitehorse (Yukon Territory) and 106 miles from Big Delta to Tanacross (Alaska) which with additional surfacing, was later incorporated in the present highway.....	157
3. Widening, regrading, and graveling of Army road between Fort St. John and Fort Nelson beyond the end of the permanent highway, 229 miles; from Whitehorse west to the White River (Yukon Territory) 254 miles; and from Tagish Cut-off to a point 20 miles east of the Nisutlin River, 100 miles.....	583
4. Regrading and improvement of Army road from Fort Nelson west, including mountain sections, 117 miles; from Slana to Tanacross (Alaska), 73 miles; and from Tanacross to the end of the graveled section east of the White River, 206 miles.....	396
5. Clearing or construction of connecting sections between Gakona, Gul-ana, and Slana (Alaska), 12 miles.....	12
Grand total.....	1, 225
Proportion of total mileage constructed in 1942 on which Public Roads contractors worked.....	percent... 76

In 1943, a total of 81 firms, 77 prime contractors, and 4 management contractors were employed on the project engaged in construction of the final type road, including work on the permanent bridges.

A list of the management and construction contractors employed on the Alaska Highway under Public Roads Administration, together with a statement of total amounts paid them on their respective contracts, fixed fees being given separately, is shown in table 7.

TABLE 7.—Statement of payments made by Public Roads for construction of Alaska Highway as of June 30, 1945

SUMMARY

	Contract No.	Total amount paid under contracts including fixed fee ¹	Total fixed fee paid contractor under contracts ¹
Dowell management.....		\$24, 162, 578. 84	\$1, 127, 995. 00
Okes management.....		21, 773, 323. 72	1, 259, 399. 00
Lytle & Green management.....		14, 223, 771. 64	1, 083, 630. 00
Smith management.....		28, 905, 526. 68	816, 743. 00
Independent contractors.....		20, 418, 096. 37	544, 471. 00
Total to contractors.....		109, 483, 297. 25.	4, 832, 238. 00 327, 383. 00

¹ Contracts for construction of the Alaska Highway were negotiated with management and construction contractors. Length of highway to be built, remoteness of the work, character of terrain, and other factors were considered in arriving at agreement as to the fixed fee to be paid each contractor. Contractors, with some exceptions, moved men, equipment, and supplies to the job, and carried on construction. Payments were made for work done under each contract, generally direct to worker or vendor. Re-adjustments of mileage of construction assigned contractors in order to complete the job on schedule, and nonhighway work done at Army request, necessitated negotiated adjustments of fixed fees. Because of wide variation in conditions affecting payments under the various contracts the total amount paid cannot be used as a basis for determination of the amount due the contractor. For example, the cost of moving men, equipment, and supplies to and from the job was generally paid under a construction or management contract. Transportation of men, equipment, and supplies to and from Alaska was generally by Government agencies and the cost has not been distributed to the Alaska contractors. This reduced payments under Alaska contracts but did not affect the construction assignments or fixed fees. Division of services between management and construction contractors varied according to election of the management contractors. Some management contractors furnished stocks of repair parts, repaired equipment, and housed and fed workers. Other management contractors passed these functions on to construction contractors in varying degrees. This procedure resulted in variation in payments under the two classes of contracts, but again did not effect construction assignments or fixed fees. The fairness of the fixed fees paid can be judged only by a detailed study of the units of work done and conditions surrounding the work. There were variations in the efficiency of the contractors but this is only one of the several causes of variations in the ratio of total payments to fixed fee.

² Represents the balance of fee due to contractors as of July 1, 1945.

TABLE 7.—Statement of payments made by Public Roads for construction of Alaska Highway as of June 30, 1945—Continued

SUMMARY—Continued

	Contract No.	Total amount paid under contracts including fixed fee ¹	Total fixed fee paid contractor under contracts ¹
Public Roads:			
Surveys.....		\$1,385,839.93	-----
Maintenance.....		126,888.05	-----
Administration.....		6,271,341.77	-----
Stores.....		5,826,076.18	-----
Total.....		123,093,443.18	\$5,159,621.00

PAYMENTS TO CONTRACTORS OF DOWELL GROUP²

Dowell Construction Co., 1437 Elliott Ave. West, Seattle 99, Wash.	WA4pr-14348....	\$10,127,511.41	\$149,150.00
Angeles Gravel Supply Co., Port Angeles, Wash.	WA4pr-14489.....	743,664.62	65,375.00
Bates & Rogers Construction Corp., 111 West Washington St., Conway Bldg., Chicago, Ill.	WA4pr-14773....	1,437,586.17	150,000.00
Byers, L. L. & R. W., Post Office Box 61, Los Gatos, Calif.	WA4pr-14477....	522,163.83	41,500.00
Concrete Materials Construction Co., Cedar Rapids, Iowa.	WA4pr-14822....	287,881.59	27,500.00
Dawson, J. C., Co., C and Chestnut Sts, Bellingham, Wash.	WA4pr-14499....	863,464.29	61,000.00
Gates, E. L., & Son, Box 896, Project City, Calif.	WA4pr-14729....	384,681.21	\$31,600.00
Govan, Hugh & Adler, Construction Co., Box 1917, Seattle 11, Wash.	WA4pr-14478....	1,210,529.02	\$69,075.00
Gustafson & Jarvis, Sioux Falls 9, S. Dak.	WA4pr-14774....	619,680.09	55,625.00
Haas, E. T., -Ken Royce-R. Johnson, 1104 Merchants Exchange Bldg., San Francisco, Calif.	WA4pr-14488....	997,736.03	68,625.00
Jussel, Joe A., 768 North 74th St., Seattle, Wash.	WA4pr-14476....	974,274.34	54,000.00
McVaugh-Haynes Co., Box 576, Dubuque, Iowa.	WA4pr-14711....	820,695.99	53,400.00
Morse Bros. & Associates, Inc., 8 Stoppel Bldg., Rochester, Minn.	WA4pr-14775....	1,024,561.67	57,250.00
Nassif, David, Co., 500 Statler Office Bldg., Boston, Mass.	WA4pr-14726....	1,429,075.49	\$21,120.00
O'Neal, Crockett E., Box 268, Ellensburg, Wash.	WA4pr-14490....	406,342.26	42,875.00
Ramstad, J. S., Box 1357, Oroville, Wash.	WA4pr-14475....	749,516.02	64,000.00
Thompson, W. C., 2801 3d St., San Francisco, Calif.	WA4pr-14494....	1,012,109.81	60,500.00
Ulland Bros., Austin, Minn.	WA4pr-14861....	537,105.00	41,500.00
Dowell Construction Co., 1437 Elliott Ave. W., Seattle 99, Wash.	WA7pr-887.....	14,000.00	14,000.00
Total.....		24,162,578.84	1,127,995.00

PAYMENTS TO CONTRACTORS OF OKES CONSTRUCTION CO. GROUP

Okes Construction Co., 1506 East 1st, National Bank Bldg., St. Paul, Minn.	WA4pr-14313....	\$3,922,188.23	\$217,700.00
Adolphson, Huseth, Laysner & Welch, 501 Plymouth Bldg., Minneapolis, Minn.	WA4pr-14530....	1,625,814.38	96,875.00
Astleford, M. G., Co., 5641 Colfax Ave. S., Minneapolis, Minn.	WA4pr-14527....	1,390,702.52	83,875.00
Boller, Art, 4139 Hubbard Ave., Robbinsdale, Minn.	WA4pr-14528....	1,683,985.67	\$79,681.25
Brown & Leguil, Mankato, Minn.	WA4pr-14534....	1,066,480.12	92,750.00
Coghlan Construction Co., 3921 Noble Ave., Robbinsdale, Minn.	WA4pr-14533....	829,778.33	69,830.00
Dunnigan Construction Co., 404 Oppenheim Bldg., St. Paul, Minn.	WA7pr-889.....	495,244.06	\$26,550.00
Pederson Bros., Inc., Montevideo, Minn.	WA4pr-14526....	1,426,447.45	61,563.00
Reese & Olson, Greenbush, Minn.	WA4pr-14535....	1,377,489.73	91,875.00
Roverud Bros., Spring Grove, Minn.	WA4pr-14550....	1,038,803.92	63,750.00
Sorensen & Volden, Albert Lea, Minn.	WA4pr-14529....	1,017,028.89	64,932.00
Southern Minnesota Construction Co., Spring Valley, Minn.	WA4pr-14525....	1,283,189.10	\$84,311.85
Standard Salt & Cement Co., 243 South Lake Ave., Duluth, Minn.	WA4pr-14536....	1,189,089.07	47,500.00
Thomas Bros., Foley, Minn.	WA4pr-14531....	1,064,265.77	75,000.00

¹ See footnote 1 on p. 43.² It should be noted that all contractor personnel under the Dowell management were paid directly by the Dowell Construction Co. The total amounts shown as paid to contractors under Dowell management do not reflect the pay-roll costs. The amount of pay-roll cost of all contractors under Dowell management is approximately \$7,000,000 and is included in the amount paid to the Dowell Construction Co.³ An additional amount due as shown in table 8.

TABLE 7.—Statement of payments made by Public Roads for construction of Alaska Highway as of June 30, 1946—Continued

PAYMENTS TO CONTRACTORS OF OKES CONSTRUCTION CO. GROUP—Continued

	Contract No.	Total amount paid under contracts including fixed fee ¹	Total fixed fee paid contractor under contracts ¹
Volk Construction Co., Rice Lake, Wis.....	WA4pr-14532.....	\$1,776,347.60	\$65,699.90
Welch, Mike, 501 Plymouth Bldg., Minneapolis, Minn.....	WA7pr-888.....	566,468.88	37,500.00
Total.....		21,773,323.72	1,259,399.00

PAYMENTS TO CONTRACTORS OF LYTLE & GREEN CONSTRUCTION CO. GROUP

Lytle & Green Construction Co., 312 Masonic Temple Bldg., Des Moines, Iowa.....	WA4pr-14299....	\$2,643,938.32	\$149,180.00
Duesenberg, E. N., Inc., Clear Lake, Iowa.....	WA4pr-14332....	924,715.81	120,000.00
Duvall & McKinney, Logan, Iowa.....	WA4pr-14345....	1,005,287.99	49,500.00
Eblen, Frank & Orville, Cumberland, Iowa.....	WA4pr-14333....	518,560.08	60,000.00
Eblen, Frank & Hilding, Ekdahl, Cumberland, Iowa.....	WA4pr-14334....	442,427.56	60,000.00
Ferguson & Diehl, Jefferson, Iowa.....	WA4pr-14803....	401,823.14	25,000.00
Hoak, J. Leo, Des Moines, Iowa.....	WA4pr-14341....	1,256,261.76	45,000.00
Kaser Construction Co., Adel, Iowa.....	WA4pr-14804....	866,095.14	37,500.00
Linnan, W. B., Construction Co., Pocahontas, Iowa.....	WA4pr-14805....	404,022.71	25,000.00
Lundeen, V. L., Inc., Montezuma, Iowa.....	WA4pr-14336....	516,933.28	45,000.00
Ostermann, Gus, Ochevedan, Iowa.....	WA4pr-14337....	536,474.15	60,000.00
Peterson, L., Cedar Rapids, Iowa.....	WA4pr-14342....	706,057.52	45,000.00
Horrabin, William, Construction Co., Iowa City, Iowa.....	WA4pr-14335....	532,255.13	60,000.00
Scothorn, I. W., Construction Co., Cherokee, Iowa.....	WA4pr-14338....	492,218.74	60,000.00
Sears Construction Co., Clear Lake, Iowa.....	WA4pr-14339....	479,989.99	60,000.00
Van Buskirk, Ira, Hawarden, Iowa.....	WA4pr-14340....	521,167.19	60,000.00
Welden Bros., Iowa Falls, Iowa.....	WA4pr-14343....	792,039.41	55,000.00
Western Engineering Co., Harlan, Iowa.....	WA4pr-14344....	864,068.29	55,000.00
United States Steel Export Co., 1602 Frick Bldg., Pittsburgh, Pa.....	WA4pr-14938....	329,426.43	12,450.00
Total.....		14,223,771.64	1,083,630.00

PAYMENTS TO CONTRACTORS OF R. MELVILLE SMITH CO. GROUP

Smith, R. Melville, Co., Ltd., 18 Grenville St., Toronto, Canada.....	WA4pr-14347....	\$5,048,083.87	\$104,000.00
Anderson, Emil, Construction Co., 1220 Brown St., Fort Williams, Ontario.....	WA4pr-14505....	2,189,803.20	64,000.00
Bond Construction Co., Ltd., Post Office Box 585, Kenora, Ontario.....	WA4pr-14506....	1,077,247.55	45,800.00
Campbell Construction, Ltd., 137 Wellington St., West Toronto.....	WA4pr-14545....	1,223,441.00	38,000.00
Caswell Construction, Kirkland Lake, Ontario.....	WA4pr-14738....	1,512,942.79	22,000.00
Curran & Briggs, Ltd., 61 Halverson Blvd., Toronto, Ontario.....	WA4pr-14466....	1,656,697.76	56,200.00
Don Construction Co., Ltd., 406 Metropolitan Bldg., Toronto.....	WA4pr-14496....	1,421,173.79	55,800.00
Dufferin Paving Co., Ltd., 2700 Dufferin St., Toronto, Ontario.....	WA4pr-14497....	1,965,387.55	53,600.00
Do.....	WA4pr-14583....	1,168,114.88	34,800.00
Harvey, W. H., & Son, 56 Kensington Ave., Kingston, Ontario.....	WA4pr-14522....	1,654,372.71	59,590.00
Harvey, Harold, 56 Kensington Ave., Kingston, Ontario.....	WA7pr-868.....	144,827.65	10,375.00
Highway Paving Co., Postal Station L, Toronto, Ontario.....	WA4pr-14741....	1,004,538.31	38,000.00
Jupp, A. E., Construction Co., Ltd., 170 Berkley St., Toronto, Ontario.....	WA4pr-14498....	1,745,069.05	47,100.00
Mackey, Wallace A., Ltd., 86 Church St., Weston, Ontario.....	WA4pr-14560....	1,450,467.22	45,800.00
McNamara Construction Co., 42 Industrial St., Leaside, Ontario.....	WA4pr-14740....	992,114.66	38,000.00
Do.....	WA4pr-14739....	1,637,259.50	28,400.00
Storms Construction Co., Ltd., 49 Givens St., Toronto, Canada.....	WA4pr-14495....	1,524,492.16	45,800.00
Rayner Construction Co., Ltd., 29 Commercial St., Leaside, Ontario.....	WA4pr-14882....	589,493.03	29,488.00
Total.....		28,905,526.68	816,743.00

¹ See footnote 1 on p. 43.⁴ An additional amount due as shown in table 8.

TABLE 7.—Statement of payments made by Public Roads for construction of Alaska Highway as of June 30, 1945—Continued

PAYMENTS TO INDEPENDENT CONTRACTORS

	Contract No.	Total amount paid under contracts including fixed fee ¹	Total fixed fee paid contractor under contracts ¹
Elliott, E. W., Dexter Horton Bldg., Seattle, Wash.	WA4pr-14270	\$9,094,804.54	\$219,200.00
Roebling, John A., Son, Co., 640 Broad St., Trenton, N. J.	WA4pr-14705	1,392,056.96	35,500.00
United States Steel Export Co. (American branch), 1602 Frick Bldg., Pittsburgh, Pa.	WA4pr-14706	656,015.92	31,500.00
Bay Cities Engineering Co., 235 Bay Shore Blvd., San Francisco, Calif.	WA7pr-654	249,969.37	5,791.00
Do	WA7pr-277	124,517.85	4,216.00
Haddock, J. E., Ltd., 3538 East Foothill Blvd., Pasadena, Calif.	WA4pr-14700	1,022,580.60	49,200.00
Utah Construction Co., One Montgomery St., San Francisco, Calif.	WA4pr-14735	6,536,621.19	200,000.00
Kiss Crane Co., 2519 Alva Ave., El Cerrito, Calif.	WA7pr-278	38,497.97	864.00
Expenditures for U. S. Engineer Department after Oct. 31, 1943, paid by Public Roads.		629,378.08	
J. A. Roebling (Steel), 640 Broad St., Trenton, N. J.	WA4pr-18	460,224.42	
United States Steel Export Co. (Steel), 1602 Frick Bldg., Pittsburgh, Pa.	WA4pr-14680	199,735.36	
Judd Brown, Mankato, Minn.	No number	8,684.54	
Hector Construction Co., Hector, Minn.	do.	8,955.03	
C. L. Nelson & Co., Brainerd, Minn.	do.	5,500.00	
William Collins & Co., Fargo, N. Dak.	do.	145.38	
J. E. Haddock, 3538 East Foothill Blvd., Pasadena, Calif.	do.	18,500.00	
Ulland Bros., Austin, Minn.	WA4pr-14661	1,879.16	
Total		20,418,096.37	544,471.00

¹ See footnote 1 on p. 43.² An additional amount due as shown in table 8.

TABLE 8.—Statement of fixed-fee payments due to Public Roads contractors for work on the Alaska Highway as of June 30, 1945

Contractor	Contract No.	Balance due
Okes Construction Co.	WA4pr-14313	\$2,300.00
Southern Minnesota Construction Co.	WA4pr-14525	1,663.15
Volek Construction Co.	WA4pr-14532	7,300.10
Dowell Construction Co.	WA4pr-14348	7,850.00
Gates, E. L., & Son	WA4pr-14729	3,500.00
Govan, Hugh & Adler Construction Co.	WA4pr-14478	7,675.00
Nassif, David, Co.	WA4pr-14726	58,880.00
Lytle & Green Construction Co.	WA4pr-14299	1,000.00
Smith, R. Melville, Co., Ltd.	WA4pr-14347	26,000.00
Anderson, Emil, Construction Co.	WA4pr-14505	16,000.00
Bond Construction Co., Ltd.	WA4pr-14506	11,450.00
Campbell Construction, Ltd.	WA4pr-14545	9,500.00
Caswell Construction	WA4pr-14738	25,500.00
Curran and Briggs, Ltd.	WA4pr-14466	14,050.00
Don Construction Co., Ltd.	WA4pr-14496	6,200.00
Dufferin Paving Co., Ltd.	WA4pr-14497	13,400.00
Do	WA4pr-14583	8,700.00
Harvey, W. H., & Son	WA4pr-14522	14,895.00
Harvey, Harold	WA7pr-868	1,000.00
Highway Paving Co.	WA4pr-14741	9,500.00
Jupp, A. E., Construction Co., Ltd.	WA4pr-14498	11,775.00
Mackey, Wallace A., Ltd.	WA4pr-14560	11,450.00
McNamara Construction Co.	WA4pr-14740	9,500.00
Do	WA4pr-14739	7,100.00
Storms Construction Co., Ltd.	WA4pr-14495	11,450.00
Rayner Construction Co., Ltd.	WA4pr-14882	7,372.00
Elliott, E. W.	WA4pr-14270	8,800.00
Kiss Crane Co.	WA7pr-278	216.00
Folier, Art	WA4pr-14528	4,193.75
Dunnigan Construction Co.	WA7pr-889	2,950.00
Duvall & McKinney	WA4pr-14345	5,500.00
Bay Cities Engineering Co.	WA7pr-654	209.00
Do	WA7pr-277	604.00
Total		327,383.00

XI. CONTRACTORS EMPLOYED BY THE WAR DEPARTMENT

The War Department employed only two construction contractors on both the Alaska Highway and the Haines Road project.

These were Foley Bros., Inc., and Rohl-Connolly Co. for the construction of the Haines Road and Bates & Rogers Construction Co. for the completion of the permanent bridge program in 1944 after Public Roads Administration forces were withdrawn from the projects in October and November 1943.

NOTE.—Under the original plans of the War Department, responsibility was given to the Public Roads Administration for construction of the Haines Road. A directive issued to the district engineer of the Public Roads Administration at Whitehorse, Yukon Territory, by Brig. Gen. J. A. O'Connor, commanding officer, Northwest Service Command, on October 29, 1942, stated as follows:

"1. This request will serve as your directive to construct a two-way road. Sixty-foot clearing and 24-foot roadway, graveled, from Haines, Alaska, to Champagne, Yukon Territory, or some point west of Champagne where a satisfactory line intersects the Alcan Highway.

"2. You are directed to put contractors on each end at your line, namely, Haines and Champagne or vicinity, and an outfit at the foot of the summit on each side and prosecute the work. Commence as quickly as possible."

The work covered by this undertaking involved the completion of port facilities at Haines, Alaska, and the construction of a road from Haines, Alaska, approximately 150 miles northwesterly to connect with the Alaska-Canada Highway in Yukon Territory, Canada.

Public Roads immediately undertook the necessary preliminary arrangements such as assignment of survey crews and selection of a project manager to handle construction of the project.

On November 19, 1942, Mr. Louis J. Dowell, an individual trading as Dowell Construction Co. was notified to proceed with construction activities as project manager under a cost-plus-a-fixed-fee contract. The total estimated cost of the work was \$14,000,000 with the fixed fee set at \$99,000. Surveys by Public Roads' forces proceeded from both the north and south ends and the project manager meanwhile had recruited his contractors together with necessary personnel and equipment.

The following construction contractors were selected and began operations on the project:

Angeles Gravel Supply.
J. C. Dawson.
Govan & Adler.

Haas, Royce & Johnson.
C. E. O'Neal.
J. S. Ramstad.

Work progressed throughout the winter insofar as weather conditions permitted.

During December 1942, Colonel Wyman, division engineer, Northwest Division, informally advised Public Roads Administration that he intended to instruct Public Roads Administration to return Dowell to the Alcan in the spring of 1943 so that Dowell could devote his entire effort to the Alaska Highway construction during the 1943 season. On February 14, 1943, Colonel Wyman advised Public Roads that the USED had awarded a contract for the construction of the Haines Road to Foley Bros., Inc., and Rohl-Connolly Co. Colonel Wyman further requested that Public Roads Administration personnel and contractors be returned to work on the Alaska Highway by March 15, 1943. After some discussion of the plan of operations for undertaking further work on this project Mr. Dowell, project manager, was ordered by Public Roads to suspend all operations on March 23, 1943, and to transfer all contractors' forces and equipment on the north end of the project to the Alaska Highway. The contractor-owned equipment on the south end near Haines was to be shipped out by commercial vessels for transfer to other sections of the Alaska Highway.

The value of work accomplished by Public Roads Administration contractors at the time of their transfer from the project was \$1,610,000.

The following work was accomplished by the contractors:

Construction, north end

Truck trail cleared and graded, 30 miles southward from the junction.
Clearing full width, 8 miles southward from the junction.
Graded roadbed, 6 miles partially completed.

Approximately 35,000 cubic yards excavation moved.

Temporary timber and pile bridge over the Dezadeash River, 100 percent complete.

Construction camp established at Kathleen Creek, 15 miles south of junction.

Construction, south end

Nine miles of clearing, between Haines and 25 miles north, approximately 70 percent complete between 5 and 7 miles north, approximately 33,000 cubic yards moved.

Grading, 40 percent complete between 14 and 16 miles north, approximately 15,000 cubic yards excavation moved.

Construction of permanent line camps, of 100 men capacity each, at miles 6, 18, and 28 north.

Clearing, draining of site, and delivery of materials for base headquarters camp at Haines.

Construction of gridiron and dock ramp at Haines.

The following engineering had been performed by Public Roads at the time the project was turned over to the War Department:

Engineering, north end

Preliminary survey, 25 miles southward from the junction.

Located center line, 8 miles southward from the junction.

Design, 6 miles southward from the junction.

Engineering, south end

Preliminary survey, from Haines 44 miles northward.

Design, from Haines 44 miles northward.

Located center line, from Haines 25 miles northward, with a few short exceptions.

Clearing stakes and culvert stakes, from Haines 25 miles northward.

The contractors moved onto the project approximately 200 pieces of major equipment, including power shovels, tractors, trucks, compressors, etc. The major portion of this equipment was shipped into Haines for use on the south end, there being only 24 pieces assigned to the work on the north end. The total force employed on the project at one time was about 500 men.

The contract let by the War Department to Foley Bros., Inc., and Rohl-Connolly Co., to complete the work on the Haines Road commenced by Dowell Construction Co., was for \$11,000,000. Fixed fee for engineering and construction was set at \$352,000. This was a cost-plus-a-fixed-fee contract similar to that used between Public Roads Administration and its contractors. Equipment rentals paid this contractor and another equipment contractor, Bowen & McLaughlin, have been discussed in a previous chapter.

A supplemental contract covering the cost of construction of the base camp at Haines and relay stations for the operation of the Haines Road was also let to Foley Bros., Inc., and Rohl-Connolly Co. This contract was in the amount of \$865,000 and provided for a fixed fee of \$20,474 which was paid to the contractor. Copies of such contracts as were executed with this firm for construction work are appended as appendix K-1 to this report.

It should be noted that the road-building work done by Foley Bros., Inc., and Rohl-Connolly Co. on both the pioneer trail and final type road on the Haines project cost the Government \$10,606,000, a saving of \$394,000 from the \$11,000,000 provided in the firm's contract. It should be further noted that the original estimate of the Public Roads Administration for building both the pioneer trail and the final-type road on the Haines project was approximately \$14,000,000. As noted in chapter VI, the War Department's contractor did not follow the original Public Roads survey in all places because of the great amount of rock work involved in the Public Roads route. If the contractor had followed the Public Roads route, the

cost might well have been that estimated by Public Roads, but the opening of the road might have been unduly delayed. The importance of the Haines lateral road as a feeder road to carry supplies to the Alaska Highway project, thus taking the load off of the already overstrained facilities of the White Pass & Yukon Railroad (Skagway to Whitehorse), cannot be overstated.

The contract with Bates & Rogers Construction Co. for completion of the permanent bridge program on the Alaska Highway after departure of other Public Roads forces was a direct contract let to the firm by the War Department. It was also a standard cost-plus-a-fixed-fee contract in the amount of \$3,792,808 and calling for a fixed fee of \$114,825. A supplemental contract reduced the number of bridges to be constructed and the amount of the contract was reduced to \$2,247,640 and the fixed fee to \$75,000. A copy of said contract is appended to this report as appendix K-2.

Your committee finds nothing to criticize as to the manner in which these War Department contracts were let, supervised, or executed.

XII. MAINTENANCE SINCE COMPLETION OF CONSTRUCTION

After withdrawal of Public Roads Administration forces from the project at the end of October 1943, maintenance of the highway was carried out by the War Department.

Various methods of maintenance were tried out to determine the most efficient and economical method. During the winter of 1943-44 the southerly section of 620 miles was maintained by labor hired directly by the Army while the remainder of the highway was maintained by contract with three separate contractors, each responsible for designated sections of the highway.

After a trial period of several months, the War Department found that maintenance by directly employed labor was the more economical method because it permitted a more flexible organization and eliminated a large amount of overhead. Maintenance of the Haines lateral road was discontinued during February 1944. Since June 1, 1944, all maintenance on the Alaska Highway located within Canada has been performed by directly employed labor.

In June 1944, the War Department made arrangements with the Department of Interior's Alaska Road Commission for that agency to be responsible for maintenance of the 208-mile section of the Alaska Highway located in Alaska. Reference will be made further on in this report to your committee's impressions of the general lack of efficiency with which the Alaska Road Commission conducts its construction and maintenance assignments on the Alaska road system.

The total number of maintenance employees assigned to the 1,221-mile section of the highway in Canada has varied over the 6-month period ending in February 1945 from 385 employed in September 1944 to 514 employed in February 1945. Reductions in the size of the maintenance force, due to decrease in traffic, were made in July and August 1945. At the time your committee's inspection was made less than 200 employees were engaged in maintaining the highway.

The total number of pieces of equipment now being used for maintenance is 626, all of which is Government-owned. The total of

Alaska Highway maintenance equipment, as of July 25, 1945, was as follows:

Ambulances, ¼-ton, 4 by 4.....	10
5-passenger light sedans.....	6
½-ton pick-up trucks.....	42
Carry-all ¾-ton truck, 4 by 4.....	2
1½-ton stake and platform trucks, 4 by 4.....	22
3-ton dump trucks.....	65
2½-ton, 750-gallon fuel- or oil-service trucks.....	6
2½-ton refrigerator trucks.....	3
10-ton tractor trucks.....	7
15-ton tractor trucks.....	8
1-ton cargo trailers.....	4
1-ton, 250-gallon, water-tank trailers.....	3
2½-ton pole-type utility trailers.....	9
20-25-ton flat-bed semitrailers.....	4
50-60-ton flat-bed semitrailers.....	3
Pumps, 1 to 6 inches.....	45
Generator sets, 4 to 8 kilowatts.....	20
Generator sets, 10 to 20 kilowatts.....	16
Generator sets, 20 to 50 kilowatts.....	16
Arc welders, 200 ampere.....	9
Arc welders, 300 ampere.....	8
Air compressors, 210 to 315 cubic feet per minute.....	3
Steam generators.....	15
Hot-air heaters.....	45
3-drum hoist.....	1
Convoy lubricators.....	18
Truck mounted cranes, 8 to 12 tons.....	8
Crushing and screening plants.....	2
Motor graders.....	44
Leaning wheel graders.....	11
Concrete mixers.....	3
Rotary snow plows.....	8
Straight blade snow plows.....	36
V-blade snow plows.....	2
Pneumatic rollers.....	2
3-tooth rooters.....	4
Road scrapers, 12 cubic yards.....	10
Crawler-type shovels, 1 cubic yard.....	11
Sand spreaders.....	34
Diesel tractors, D-8's and HD-14's.....	20
St. Paul underbody truck blades.....	22
Saw-rigs.....	19
Total pieces of maintenance equipment.....	626

With the improved methods of maintenance and the smaller organization, coupled with a decline in the volume of traffic, costs of maintenance have steadily declined. For example, the cost of maintenance per mile during the first month of maintenance, November 1943, was \$663.06. The cost of maintenance in August 1945 was only \$99.72 per mile. These costs include all costs, both direct and indirect, and a charge for use of Government-owned equipment in order to show an actual cost statement. The monthly maintenance report for August 1945 is shown as appendix L-4.

In accordance with the conditions outlined in the exchange of notes of March 17-18, 1942, between Canada and the United States, Canada has informed the War Department that the Canadian Government will assume responsibility as of April 1, 1946, for the maintenance of the portion of the Haines lateral road which also lies within Canada. In a memo to the Assistant Chief of Staff, United States Army, Maj.

Gen. Guy V. Henry, senior United States Army member of the Permanent Joint Board of Defense, United States-Canada, states:

1. The Canadian Government has informed the undersigned that the Canadian Army will assume the responsibility for the maintenance and operation of the Alaska Highway on April 1, 1946, and it would be agreeable to the Canadian Government to release the United States from any of its responsibility in that highway on the date in question.

2. The Canadian Government has also informed the undersigned that the United States Government may withdraw from the operation and maintenance of the Alaska Highway land-line system (telephone system) within Canada on June 1, 1946, and pending any further action which might be taken by the Canadian Government for the installation in the area of a substitute radio communication system, the Department of National Defense for Air will undertake responsibility for the operation of the land-lines on June 1, 1946.

The Department of Interior has included in its fiscal year 1947 budget a request for an allotment for maintenance of the Alaska Highway in Alaska including that portion of the Haines lateral road which lies in Alaska.

Your committee feels that the Alaska Highway has been maintained in an excellent manner and that the cost of this maintenance has been reduced to a minimum consonant with efficiency. The committee is also of the opinion that excellent progress has been made by the War Department, through the Joint Board, in closing out its maintenance operations in northwest Canada by arranging with Canada to assume responsibility for the maintenance of all of the highway in Canada on April 1, 1946, and for operation of the telephone system on June 1, 1946.

XIII. CAPACITY OF THE HIGHWAY

The War Department estimates that, under the pressure of military necessity, the capacity of the Alaska Highway is 720,000 net tons per annum. If operated to this capacity, the Department states that supplies for a force of 100,000 troops stationed in Alaska could be transported over this facility in its present condition.

However, based on normal operating conditions where traffic was not pushed through under urgent military demand, the capacity of the highway is rated by the War Department at approximately 400,000 tons per year in tonnage delivered at Fairbanks, Alaska, which originates at the southern terminal of the highway at Dawson Creek, British Columbia, the end of rail communication.

Records show that the actual traffic and tonnage passing over the highway has been far less than the rated capacity of the highway. There has been little through movement of freight over the entire length of the highway. For the 12-month period, April 1944 to March 1945, the average haul per ton has been between 208 and 360 miles.

Freight has been and is being delivered for transportation over the highway at three points; by railroad to Dawson Creek at the southerly end of the highway; by sea and rail to Whitehorse at the approximate midpoint; and by sea, rail, and highway to Fairbanks at its northerly end. From these three points, the freight has been transported over the highway to intermediate points of demand, including the airfields. From Dawson Creek, freight is hauled as far north as Muncho Lake maintenance camp at mile 456. From Whitehorse, freight is hauled as far south as Coal River maintenance camp at mile 543 and as far

north as the Alaska-Canada boundary at mile 1,221. Stations along the highway in Alaska are supplied out of Fairbanks.

Records of freight movement over the highway to date are not entirely complete due to the variety of Canadian and American Government agencies using the highway and the number of different projects being carried on in the area. The movement and types of freight handled to date do not serve as a criterion for the highway's future use. It has been operating under military control and has been barred to civilian use except where permits of necessity were issued for civilian travel. Outside of Canadian Government survey parties and specially equipped prospecting parties looking for minerals needed in the war effort, the road has not been open to any civilian traffic for the past year except trucks serving the military establishments and trading posts already located in the area. There have been minor exceptions to this rule such as the case of the Fairbanks bus line operator who was permitted to bring his rolling stock overland from the United States by way of the highway. (See appendix M-8, which contains an interview describing these particular trips.)

During the year 1943, the total tonnage hauled over the highway for Army use was 82,445 tons. During the same year, a total of approximately 51,438 tons was hauled over the highway for construction operations in Army-operated vehicles. These figures do not include freight carried by various Canadian Government agencies such as the Royal Canadian Air Forces and the Department of Transport, those statistics not being made available to your committee.

During the year 1944, the total tonnage hauled over the highway for the Army was 76,185 tons, and for construction operations, 43,014 tons. This tonnage, expressed in terms of ton-miles, represents a total of 30,968,454 ton-miles. These figures do not include tonnage hauled by contractors for their own operation or freight carried by various Canadian Government agencies.

Traffic over the highway has been gradually decreasing during 1944 and 1945, due to the completion of the expansion program on the air fields on the Northwest Staging Route and other construction programs and discontinuance of the refinery operations at Whitehorse, a part of the Canol project. However, the increased movements of petroleum products over the distribution pipe line from Whitehorse down the Alaska Highway to Watson Lake and from Whitehorse up the Alaska Highway to Fairbanks have accounted for much of the recent decrease in the movement of freight over the highway. These petroleum products are brought to Skagway, Alaska, by tanker and then pumped over the coast range by pipe line to Whitehorse and then distributed in two directions from Whitehorse. During the 13-month period, February 1944 to February 1945, the total tonnage of petroleum products moving over these distribution pipe lines had averaged slightly under 5,000 tons per month.

XIV. CAMP FACILITIES, MEDICAL SERVICES, AND SANITATION

During 1942, housing facilities for troops and civilian workers on the project were primitive in the extreme. Soldiers, engineers, and construction workers were housed in tents, in many places, along the route during that year, enduring temperatures as low as 70° below zero several times during the winter of 1942-43. The need for adequate housing, medical, and sanitation facilities on the project was

apparent in the early stages of the work. The severe weather conditions and total lack of any but the most primitive living accommodations made it imperative that adequate facilities be provided at strategic locations on the route so that labor turn-over would not be too great. As previously stated, the labor turn-over was more than 100 percent, more than 16,000 persons. This was largely due to the inability of many workers to stand the rigorous climate.

It is important that the severity of weather and working conditions on the project be thoroughly realized because, without this background information, it would not be possible to otherwise account for the large investment in housing facilities and other buildings which the Public Roads Administration and the War Department were obliged to approve in their contractors' operations.

In 1943, housing and camp facilities were made available for the 14,100 civilian employees of contractors and the 1,850 employees of the Public Roads Administration working on the Alaska Highway. These facilities were comfortable and adequate when contrasted with those available during the previous year. Of the 14,100 contractors' employees, 10,400 were Americans working under the direction of 63 American contractors while 3,700 were Canadians working under the supervision of 18 Canadian contractors.

Systematic planning enabled the contractors to place camp constructing crews in advance locations so that housing was built during the winter of 1942 and was available by the time road-construction operations began in the spring of 1943. Existing camps were enlarged and new camps were constructed to meet the needs of the approaching construction season.

Prefabricated frame building material salvaged in the dismantling of several large Civilian Conservation Corps camps in the northwest part of the United States was used to advantage in this initial housing construction work. Later, a number of prefabricated metal huts were erected. After contractor-operated sawmills were placed in operation in 1943, over 15 million board feet of milled lumber was produced and used in camp construction.

There were two distinctly different classes of camps—the large headquarters camps of Public Roads Administration and its management contractors located at Fort St. John, Fort Nelson, Whitehorse, and Tok Junction—and the construction camps (also called "line" or "bush" camps) at 10- to 15-mile intervals along the route and at every large bridge job and sawmill. The headquarters camps accommodated over 1,000 people. The average line camp housed Public Roads engineer crews of 6 to 12 men and construction crews of 100 to 200 men.

The headquarters camps were small towns and different from line camps in having white-collar workers, women stenographers and clerical assistants, and a predominance of technical workers. These camps provided recreation halls and better medical, commissary, and communication service. Some criticism has been heard of the fact that these camps were equipped with moving picture projection facilities. When it is realized that these workers were stationed in outposts more remote than many military posts on the fighting fronts, and, once on the job could not leave except on account of illness or resignation, your committee does not believe that any criticism should accrue to those in charge for providing some form of recreation of this type for these workers in their spare time. It should be realized also that, at 100-

mile intervals along the route, the War Department has maintained telephone relay stations manned by small crews of Signal Corps enlisted men. In certain cases, motion picture projection facilities were installed for use by these isolated soldiers. These facilities, however, were usually available only at points where large construction camps and telephone relay stations were located at the same point on the route.

CCC and WPA camp equipment of all kinds was widely used in establishing camps. Most buildings were 20 feet wide and 120 feet in length. A typical line camp included five unpartitioned barracks, one office building, a combination kitchen and mess hall, a Public Roads Administration combination office and barracks building, a field shop, a storage warehouse, a bath house, and one elevated or underground meat storage shed. These semipermanent facilities contrasted strongly with the mobile camps of small buildings built on log skids and the tents which were used in the earlier construction on the Alaska section.

The barracks were generally unpartitioned, dormitory-type buildings. Each employee was assigned a cot with Army type mattress, sheets, and woolen blankets. A minimum of 50 square feet of floor space was provided for each occupant in accordance with Army health regulations. Washrooms were located either in a partitioned section of the dormitory or in a separate building between the dormitories. Hot and cold running water for washbowls and showers was available at all times. United States Public Health Service inspectors made periodic tests of the water and in addition carefully scrutinized the camps to make certain of their adherence to United States Public Health Service standards of sanitation.

This report would not be complete without a word of tribute to the contribution made by the United States Public Health Service to the maintenance of the health of workers on this project. Space does not permit a full recording of the splendid work done by that agency in this respect, but it should be noted that a large measure of the success met with by contractors and others in meeting their time schedules was due to the availability of the 11 public health supervised hospitals located at strategic points along the 1,422-mile route as follows:

Dawson Creek: Dispensary; beds available under contract with St. Joseph's Hospital.

Fort St. John: Dispensary; beds available under contract with Providence Hospital.

Fort Nelson: Kehr General Hospital, 50 beds.

Mile 107, North of Fort Nelson: Dispensary, 10 beds.

Liard River Crossing: Dispensary, 20 beds.

Mile 195, East of Whitehorse: Dispensary, 12 beds.

Whitehorse: Dispensary, 30 beds, access to United States Army Hospital.

Mile 152, West of Whitehorse: Dispensary, 12 beds.

Tanacross: Dispensary, 20 beds.

Gulkana: Dispensary, 20 beds.

Fairbanks: Beds available under contract with St. Joseph's Hospital.

During the fiscal year ending June 20, 1943, the following relief was furnished in this connection:

Outpatient treatments	46, 907
Physical examinations	1, 891
Hospital days	9, 591
Operations performed (major and minor)	693

Similar statistics were not compiled and are therefore not available for the final 4 months of operation.

The cost of building and equipping hospitals and dispensaries was paid from highway funds. Salaries of Public Health employees were paid by that organization. The investment made in this connection is held by your committee to have been absolutely necessary and a form of insurance that the project might be completed on time with workers whose health had not been undermined for lack of such facilities.

As to other types of camp buildings, the headquarter repair shops of the management contractors were large, well-equipped plants capable of performing all types of major repair work. The average shop included departments for repair or rebuilding of motors, radiators, batteries, and electrical equipment as well as a complete machine shop equipped with engine lathes, bench lathes, shapers, milling machines, piston grinders, bolt-threading machines, tin shop, forge, blacksmith shop, and welding equipment. Facilities were also available for the repair and retreading of tires. Over 75 smaller field shops, operated in most cases by the construction contractors and capable of performing routine equipment maintenance, were located along the length of the highway.

All camps were supplied with fire-fighting equipment. Each camp had a fire chief and crew trained in the prevention and extinguishing of fires. Safety engineers were placed in control of the general fire-prevention program and frequent inspections and recommendations were made to reduce fire hazards. Despite these precautionary measures, the record shows that several very damaging fires did occur.

A list of camps from Dawson Creek to the Canada-Alaska boundary on both the Alaska Highway and the Haines Road is shown as appendix N-1. It should be noted that the camps listed in said exhibit were used for other purposes than road construction in some instances.

The list also includes relay facilities. These facilities were constructed by the War Department at intermediate points to house Army truck drivers and station personnel required for the repair and servicing of vehicles and the maintenance of the station.

In general, these relay stations were constructed of prefabricated buildings, a large number of which were obtained from existing construction camps. However, the committee is of the opinion that the design and type of construction used by the War Department in erecting the relay station at mile 99 on the Haines Road was extravagant. This station was built entirely of new materials during the fall of 1943 with elaborate accommodations compared to the other relay stations visited. This relay station was constructed at a time when the necessity for such an extensive lay-out was doubtful. It should have been apparent at the time of construction that the facility would not be required for more than a 1-year period. When it is realized that this station built on Canadian soil, with the likelihood that a large percentage of its cost could not be recovered when it is disposed of as surplus, it is to be regretted that more economy was not used by the War Department in the design of this camp.

This station, situated approximately one-half mile off of the highway and not visible from the road, was found to have cost the War

Department approximately \$426,822, including \$136,583 for grading, drainage, and utilities.

This relay station at mile 99 on the Haines Road consists of the following units:

	<i>Number</i>
Housing and messing facilities for 209 men:	
Barracks, 20 by 96 feet.....	8
Mess halls, 20 by 96 feet.....	2
Addition to mess, 20 by 48 feet.....	1
Officers' quarters, 20 by 48 feet.....	2
Bath latrines, 20 by 48 feet.....	2
Motor repair facilities:	
Shop garages, 60 by 150 feet.....	2
Vehicle-inspection units, 20 by 150 feet.....	2
Miscellaneous construction:	
Supply and utility buildings, 20 by 96 feet.....	2
APO building, 20 by 48 feet.....	1
Administration building, 20 by 48 feet.....	1
Root cellars, 16 by 30 feet.....	2
Dispatcher stations, 20 by 30 feet.....	2
Ice houses, 20 by 20 feet.....	2
Hospital dispensary, 10 beds.....	1
Gasoline station, 6 pumps.....	1
Control station, 20 by 40 feet.....	1
Recreational and post exchange building, 4,032 square feet.....	1
Radio station, 12 by 20 feet.....	1
Powerhouse, 20 by 24 feet.....	1
Fire station, 20 by 24 feet, approximate.....	1

A break-down of the cost of this station shows 64,880 square feet of construction which cost \$6.57 per square foot including grading, drainage, and utilities and \$4.47 per square foot excluding those items. For the type of camp constructed, the committee does not believe the cost was excessive, but disapproves the policy of the War Department in authorizing such substantial construction for this temporary use at a time when its operational necessity was doubtful.

XV. DISPOSITION OF SURPLUS FACILITIES, EQUIPMENT, AND MATERIALS, INCLUDING COLLATERAL PERMANENT FACILITIES SUCH AS TELEPHONE SYSTEM AND PIPE LINE

As previously noted, Public Roads Administration transferred all of the surplus Government-owned facilities, equipment, and materials in its possession at the conclusion of the project to the War Department.

The responsibility for further disposition of these items then became that of the War Department as the agency having over-all responsibility for the Alaska Highway and Haines Road projects. This responsibility covered both movable and immovable items.

Under Public Law 457, Seventy-ninth Congress, the Surplus Property Act of 1944, the War Department is obliged to clear all transactions relative to the disposal of surplus items still located in Canada through the State Department, that agency having been designated by the Surplus Property Administration as the disposal agency for all surplus United States Government-owned property located in foreign countries. Surplus items located in Alaska are the sales responsibility of the Department of the Interior as soon as they have been declared surplus to the needs of the War Department. The Interior Department is responsible for disposal of both capital goods and consumer goods and for disposal of surplus real estate in Alaska under recent regulations of the Surplus Property Administration.

In the case of surplus property located in Canada, however, these dispositions are largely governed by the terms of the thirty-third recommendation of the Permanent Joint Board of Defense, Canada-United States, which was confirmed officially by an exchange of notes between the two nations. Said recommendation reads as follows:

THIRTY-THIRD RECOMMENDATION

(Adopted September 7, 1944; approved December 20, 1944)

The Permanent Joint Board on Defense recommends that the following formula be applied to the disposition of all defense facilities constructed or provided in Canada by the United States (and mutatis mutandis to any defense facilities constructed or provided in the United States by Canada) which have not already been dealt with.

IMMOVABLES

A. The Government of the United States shall, within 3 months from the date of the approval of this recommendation, supply the Government of Canada with a list of immovables (hereinafter referred to as facilities) which it desires to make subject to the provisions of this recommendation;

B. In the case of each of the facilities included in the list referred to in A, the Canadian Government and the United States Government will each appoint one qualified appraiser whose joint duty it will be to appraise such facility in order to determine the fair market value thereof at the time and place of appraisal. If the two appraisers cannot agree on the fair market value, they will select a third appraiser to determine this value. The amount set by the appraisers shall be paid to the United States Government by the Government of Canada;

Provided, That the foregoing paragraphs A and B shall not apply to any facilities heretofore specifically provided for: *And provided*, That, as there are certain facilities whose disposal would entail expenses such as custody and demolition, any expense of such a character would be taken into consideration in final accounting.

C. Any existing facility not included in the United States list shall, within 1 year after the cessation of hostilities, be relinquished, without cost, to the Crown either in the right of Canada or in the right of the province in which the same or any part thereof lies, as may be appropriate under Canadian law.

MOVABLES

A. The Government of the United States shall remove from Canada all those items which it desires.

B. The Government of Canada shall arrange through the appropriate governmental agencies for the purchase from the United States of such remaining items as it desires to obtain for its own use or disposition.

C. All other movables shall be transferred to a designated agency of the Canadian Government and shall be sold or disposed of by such agency, the proceeds to be paid to the Government of the United States.

Provided, That, in connection with the items referred to in paragraph C, the United States Government shall be represented by an officer designated by it for that purpose, who shall have an equal voice in the setting of prices, the allocation of priorities, the assessment of legitimate sales cost, and other details of the sale or other disposal of the items concerned: *And provided further*, That any such items remaining unsold at the end of 2 years from the time they are transferred to the Canadian agency concerned shall either be declared of no value and the account closed, or, at the option of the United States, shall be removed from Canada by the United States authorities.

In general, the War Department divided the surplus materials, supplies, and equipment accumulating in the area upon completion of the construction program into four categories:

(1) *Items of little or no value.*—In this category are included items so badly damaged or worn out that they could be considered as having no value, even for salvage, either to the Army or the public.

(2) *Items unfit for further military use but having some salvage or second-hand sale value.*—With reference to this category, the problem

was one of economical disposition. In many cases the cost of transporting these items back to the United States substantially exceeded the value of the items themselves. Therefore, it was held uneconomical and not in the best interests of the Government to return many of the items in this classification.

(3) *Items containing critical materials or items in critically short supply.*—In this category are included items having a value in excess of the cost of returning them to the United States and some items having a value of less than the cost of their return.

(4) *New or little used items in good condition.*—In most cases these items had a value in excess of the cost of their return to the United States. They were fit for further military usage or for other purposes.

There was apparently little difficulty in determining the proper disposition of items in categories (3) and (4). Items in these categories were generally returned to the United States. Similarly, there was no question as to the proper disposition of items in category (1) since they had no value. Most items in this category were either abandoned or destroyed, after surveys in accordance with War Department regulations.

It was the items in category (2) whose disposition created the most difficult problems. Initially, the international agreement with Canada, under which the highway was constructed, made no provision for the local sale of surpluses resulting from construction in those cases where it was uneconomical to provide for the return thereof to the United States. This was overcome by the terms of the thirty-third recommendation, previously noted.

In general, all nonferrous scrap and all equipment capable of repair has been returned to the United States without exactly balancing the cost of the return of each item against the individual value of the item. These were the items in short supply and it was considered good policy at that time while the war was still being fought to direct their return at the time of cleaning up the highway. In some instances, the policy of returning items may have been carried to excess, but with the large number of items processed, it was not always possible to make a refined calculation of present value versus cost of return. So far as was possible, empty ships returning from the Aleutian Islands were utilized in the return movement.

The total quantities of surpluses returned to the United States from the area since the completion of the entire construction and operation program in that area (Canol project, Alaska Highway, airfields, Haines Road, telephone system, distribution pipe line, etc.) are as follows:

Engineer construction equipment: Evacuated.....	pieces..	8, 299
Ordnance equipment: Automobiles.....	do.....	10, 861
Spare parts for equipment:		
Engineer construction equipment.....	tons..	4, 446
Ordnance equipment, automobiles.....	do.....	7, 605
Construction materials:		
Lumber.....	do.....	6, 448
All other.....	do.....	35, 651
Quartermaster supplies:		
Dry subsistence.....	do.....	3, 766
Post exchange resale goods.....	do.....	247
Clothing and equipage.....	do.....	3, 541
Petroleum.....	do.....	3, 613
All other.....	do.....	9, 649

Engineer troop supplies: Clothing and equipage.....	tons..	782
Medical supplies.....	do.....	285
Signal Corps supplies.....	do.....	1, 404
Engineer table of basic allowance equipment.....	do.....	6, 294
Ordnance arms and ammunition.....	do.....	477
Chemical warfare supplies.....	do.....	47
Transportation equipment:		
Boats.....	pieces..	48
Barges.....	do.....	33
Railroad engines.....	do.....	18
Railroad cars.....	do.....	80
Supplies:		
Marine equipment.....	tons..	11
Railroad equipment.....	do.....	170
Salvage materials: Miscellaneous clothing, tires, spare parts.....	do.....	1, 174
Total.....	do.....	85, 610
Total.....	pieces..	19, 339

The list of all Government-owned ordnance and engineer equipment utilized by the Chief of Engineers, United States Army, for construction, maintenance, and operation of military projects in northwest Canada and Alaska, reported as of September 25, 1945, is shown in appendix O-3, appended to this report. A summary of said report, including analysis of the disposition made of said equipment is shown in table 9:

TABLE 9.—Disposition of equipment used on all military projects in northwest Canada and Alaska

	Number of pieces		
	Engineer construction equipment	Ordnance automotive equipment	Total, all types
Maximum quantity utilized on all projects.....	14, 166	16, 420	30, 586
Transferred to War Department pool in United States.....	8, 478	10, 861	19, 339
Worn out, surveyed, and destroyed.....	1, 309	1, 440	2, 749
Sold to Canadian Government.....	371	348	719
Transferred to Alaska Department, War Department.....	1, 068	682	1, 690
Transferred to Imperial oil explorations project.....	814	322	1, 136
Transferred to Price Rupert Army base.....	52	159	211
Canol Road inventory.....	546	553	1, 099
Retained for maintenance and operation.....	1, 249	1, 759	3, 008
Shortage being accounted for.....	339	296	635

Upon the completion of the evacuation program, there will remain in Canada a small quantity of materials, supplies, and equipment which could not be returned economically to this country under any conditions. Arrangements are now being perfected with Canada for the disposition of these materials through the War Assets Corporation, the operating agency of the Crown Assets Allocation Committee, a policy agency of the Canadian Government. Under the procedure which it is hoped to establish, these quantities of materials will be reported to the Crown Assets Allocation Committee by the War Department. The Committee will then transfer these properties to the War Assets Corporation, a governmental corporation somewhat similar in status to the corporation of the same name which is the disposal subsidiary of the Reconstruction Finance Corporation in this country. The War Assets Corporation will attempt disposition of these properties in accordance with the formula laid down under the

thirty-third recommendation, previously quoted. The proceeds of sales, minus expenses, will be paid into the United States Treasury. No precise evaluation of what these properties may be expected to bring is possible at this time any more than it is possible to appraise possible returns from Government-owned surpluses in this country prior to actual consummation of sale to qualified bidders.

Some further word should be said about the disposition of certain immovable properties appurtenant to the Alaska Highway. As is already made public, the United States' improvements on the principal military airfields and the eight emergency landing strips along the highway within Canada and that part of the telephone communication system built by this Nation within Canada have already been purchased by Canada at the full construction cost of permanent facilities by an exchange of notes dated June 23, 1944. The United States armed forces retained the right to use these facilities for the duration of the war. The thirty-third recommendation provides, with reference to the remaining immovables, that they be reported by the Government of the United States to the Government of Canada for appraisal within a given time limit. Any facilities not reported for appraisal will be considered as having no value and revert to Canada at the end of the war without cost. The facilities reported for appraisal will be appraised by two qualified appraisers, one representing each Government, who will determine the fair market value thereof at the time and place of appraisal. The amount set by the appraisers will be paid by Canada to the United States.

In general, all temporary construction camps, which were built to house construction forces during the construction period, are considered to have little value and have not been reported to Canada for appraisal. However, all large construction bases along the highway, including the extensive facilities at Edmonton, Alberta, all weather and communication facilities along the highway, and the 12 Alaska Highway relay stations have been or are being reported to Canada for appraisal and disposition under the above agreement.

For better understanding of the nature of the telephone system, referred to above, a memorandum supplied your committee by the War Department in this connection is as follows:

The Alaska Highway communication system consists of the following facilities:

The main line consists of a 2-pair open wire route along the Alaska Military Highway, Edmonton to Fairbanks, a distance of 1,925 miles, with 19 repeater stations in Canada and 4 in Alaska.

The Whitehorse-Skagway line runs along the right-of-way of the White Pass & Yukon Railroad, and consists of four pairs of wires. Two of these pairs are used by the railroad, one pair for pipe-line operations and one pair for Army administrative circuit. In addition, two of these pairs are simplexed to provide one railroad telegraph circuit and one Army administrative teletype circuit. No repeaters are provided on this line.

RCAF circuit, Edmonton to Whitehorse: On request of Canadian Government a pair of wires was strung on the main line from Edmonton to Watson Lake and from Brooks Brook to Whitehorse. Local spurs were also constructed from Dawson Creek to Fort St. John to Beatton River, Coal River to Swift River, Teslin to Whitehorse, Canyon Creek to Aishihik, and Koidern to Snag. By the use of a C carrier system, three telephone and six telegraph channels were made available on the main line. These facilities are used primarily for air-traffic control purposes.

Construction of the telephone line in Canada to the Alaska boundary was specifically authorized in a letter to the United States Minister in Ottawa dated October 16, 1942. The United States Government was reimbursed for the portion of the Alaska Telephone System in Canada as covered in note 238 dated June 23,

1944. Negotiations are presently under way to transfer the operation of the telephone system to the Canadian Government as of June 1, 1946.

The Canol project, although not directly related to the Alaska Highway, is of interest to Members of Congress in connection with this report because certain equipment, manpower, and supplies were utilized on both projects. Consequently, a memorandum supplied to your committee by the War Department on this facility might also be of interest at this point. The memorandum is as follows:

The Canol project may be subdivided into five parts: namely, (a) the oil field development, (b) the crude oil pipe line, (c) the refinery, (d) the products distribution pipe line, and (e) the auxiliary features.

The oil field is located at Norman Wells on the Mackenzie River in the Northwest Territory, Canada, approximately 100 miles south of the Arctic Circle. The actual sustained production of the field averaged between 4,000 and 5,000 barrels per day during period of operation.

The crude oil produced at Norman Wells was delivered to field storage tanks located at Norman Wells. The crude oil was transported to the refinery by a pipe line from Norman Wells to Whitehorse, a distance of 577 miles. The pipe line is 4 inches in diameter for 458 miles from Norman Wells and 6 inches in diameter for the remaining 119 miles to Whitehorse. Crude oil was pumped by means of 10 pumping stations located at appropriate places along the line. The average daily capacity of the pipe line ranges between 3,500 and 4,500 barrels of crude.

A refinery is located at Whitehorse, the terminus of the crude oil pipe line. The refinery was designed for an average input capacity of 3,000 to 4,000 barrels of crude oil per day. The refinery, crude oil pipe line, and oil field development have been commonly designated Canol No. 1.

Products produced at the refinery were distributed by means of three products distribution pipe lines. The first, commonly known as Canol No. 2, extends from Whitehorse to Skagway, a distance of 110 miles following the route of the White Pass & Yukon Railroad. The pipe line is 4 inches in diameter, has two pumping stations, and an average daily capacity of 3,500 barrels of refined products. The second pipe line, commonly known as Canol No. 3, connects with Canol No. 2 line at Carcross, Yukon Territory, 45 miles southwesterly of Whitehorse and extends 266 miles to Watson Lake Yukon Territory following route of Alaska Highway. This pipe line is 2 inches in diameter and has an average daily capacity of approximately 400 barrels of refined products with two pump plants in operation and 800 barrels per day with five pumps in operation.

There is a third distribution pipe line, commonly known as Canol No. 4, which extends from Whitehorse to Fairbanks, Alaska, a distance of 596 miles. This pipe line is 3 inches in diameter and has an average daily capacity of approximately 1,300 barrels of refined products with 3 pumping stations in operation and a designed average daily capacity of approximately 3,000 barrels with 15 pumping stations in operation. At the termini of the various pipe lines and at strategic points on the pipe line system, there exist bulk storage tanks for refined products.

The principal auxiliary features of the project include a telephone line from Whitehorse to Norman Wells, additional telephone circuits from Whitehorse to the termini of the distribution pipe lines, and an access road following the route of the crude oil pipe line between Norman Wells and Whitehorse.

Agreement for the construction of the project was obtained from Canada in exchange of notes dated June 27 and 29, 1942.

Termination and disposal arrangements regarding Canol 1 are as follows:

- (a) Pipe line and refinery to remain the property of the United States during the war.
- (b) To be operated by its agents, itself, or representatives.
- (c) At termination of hostilities, it shall be valued by two appraisers, one United States and one Canadian with power, if they disagree, to appoint an umpire.
- (d) Valuation shall be based on the then commercial value of the pipe line, and refinery and Canada shall be given the first opportunity to purchase at valuation set.
- (e) If option is not exercised for 3 months, then may be offered for sale by public tender with amount of valuation as reserved price.
- (f) In the event neither Canada nor private company desire to purchase at agreed price, disposition shall be referred to the Joint Board for Defense for consideration and recommendation.

(g) Both Governments agreed that they themselves would not allow or order the dismantling of either, nor will they allow any purchaser to dismantle until dismantlement is recommended by the Permanent Joint Board.

(h) If operated for commercial purposes, it will be subject to regulations and conditions imposed by Canada.

(NOTE.—Canada has recently relinquished her option to purchase the crude oil pipe line and the refinery and these items will be sold as surplus under the supervision of the U. S. State Department. The products distribution line will be declared surplus by the United States War Department shortly, at which time Canada may execute its option to purchase.)

XVI. DISPOSITION AND FUTURE OF THE HIGHWAY

In accordance with the terms of the original exchange of notes between the United States and Canada, all that portion of the Alaska Highway and that portion of the Haines lateral road located within Canada will become an integral part of the Canadian highway system on April 1, 1946, at which time Canada has agreed to assume maintenance of these roads located within its boundaries.

That portion of the Alaska Highway in Alaska has already become an integral part of the Alaska road system.

The committee understands that these highways will be opened for civilian use during the summer of 1946. After the necessary steps are taken to place the Haines Road in more permanent usable condition both highways should be open to traffic on a year-round basis.

Inasmuch as Canada will assume responsibility after April 1, future maintenance of those portions of both highways which are located within its boundaries, your committee feels that this country's immediate future interest lies with the manner in which the portions of the highways located in Alaska are maintained. It would be incorrect to say that the committee was impressed favorably with the manner in which the Alaska Road Commission handles its assignment for maintenance and new construction. A careful survey of work being done by the Alaska Road Commission in maintaining, repairing, and engaging in new construction work on the Richardson Highway in Alaska between Valdez and Gulkana, especially in the vicinity of Keystone Canyon, left the committee with the impression that the Government is not receiving adequate value for funds appropriated by the Congress for work to be done under the supervision of the Alaska Road Commission in Alaska. Inadequate engineering knowledge was exhibited by officials of the Alaska Road Commission in constructing a new section of the Richardson Highway along the floor of Keystone Canyon.

The engineers of the Commission overlooked the simple engineering fact that rock cut out of the canyon wall and dumped into the adjoining river bed would block the channel and raise the water level in the canyon higher than its previous level. Consequently, at the first high water, the new road was found to be below the river level. Other evidences of inefficiency and employment on a political rather than a businesslike basis was found by your committee. For this reason, your committee will incorporate in this report a recommendation that the Territory of Alaska be included in the provisions of the present Federal-Aid Highway Act (Public Law 521) so that the Territory may benefit from the provisions of that legislation and the Government may receive more value from its highway investments in Alaska under the proven management of the Public Roads Administration.

However, satisfactory maintenance of those portions of the Alaska Highway and the Haines Road located within Alaska will not avail too much unless there is some assurance that the Canadian Government's standard of maintenance throughout the years to come will be on a basis comparable to that provided for the Alaska sections of the two roads. Also, present access to the Alaska Highway at its southern terminal at Dawson Creek by automobile is made only over a provincial dirt road from Edmonton, Alberta, which is passable only in the dry seasons of the year. Unless the Canadian or provincial governments improve the condition of this connecting road, the future value of the Alaska Highway as a through route from the United States to Alaska will be seriously impaired. Roads leading to Edmonton from the United States are permanent all-weather roads, but the intervening stretch between Edmonton and Dawson Creek is not up to the Alaska Highway standard.

For these reasons, your committee will include in this report a recommendation that a Joint Commission, Canada-United States, be established to deal with all problems related to the continued maintenance and operation of a through highway system from the United States to Alaska via Canada. Such a Commission should also have jurisdiction over the Haines lateral road which connects southeastern Alaska with interior Alaska via Canadian territory.

Northwest Canada and interior Alaska constitute areas rich in natural resources which have heretofore been inaccessible except to the hardiest prospector and trapper. Their fields of operation have been largely limited to the areas within easy travel distance of Whitehorse, Dawson Creek, Fort St. John, or Fairbanks by fairly primitive forms of transportation, including boat. Now, with a completed highway traversing this rich and hitherto unexplored area, one of the last of our pioneer areas on the North American Continent is made accessible to those with sturdy constitutions and vision.

To hold out to the returning veteran or the young man just out of school that this is a land of glittering opportunity would be a seriously misleading statement. Not only is capital required for a man or a woman to establish his or her own enterprise in this great area, but physical stamina of a high order is a requisite for those intending to settle there. The rewards in farming are doubtful this far north although Alaska still imports far more than it produces in farm produce. The timber is small and not found in commercial stands except at the southerly end in the vicinity of Fort Nelson. The best timber stands in this area are located in southeastern Alaska. The great wheat fields of Alberta extend as far north as Dawson Creek and Fort St. John, but the distances from market are great as may be understood from a close study of the map.

Gas has been found at Fort Nelson. The forces on the highway project dug for water and struck gas at this point. Oil has been discovered farther north at Norman Wells on the Mackenzie River. Large Canadian and American oil companies are now exploring for oil in commercial quantities in the Province of Alberta.

Minerals are found in abundance in this territory; the records and journals of the Canadian Bureau of Mines are indicative of many evidences of this as are the records of the United States Geological Survey for interior Alaska. Here again, however, this is a field in which considerable capital and equipment is required by one with mining ambitions. The most that should be said in this direction

is that the opening of the highway makes possible and stimulates serious mining effort in this area by those who have the know-how and the financial resources to undertake the effort.

From the standpoint of the tourist, it should be borne in mind that neither the Alaska Highway nor the Haines Road is a hard-surfaced road in the sense that we understand such a road in the United States. The road is heavily graveled, but is not a paved highway. Dust is a continuous annoyance to one who travels this highway by car and this will increase as an annoyance in direct proportion to the increase in traffic that the road carries. One of the first studies which could be made profitably by a joint commission would be a study of the cost and value of a project to hard surface this highway in such a manner that dust would not be a source of discomfort during the summer months when tourist traffic is likely to be heaviest in this area.

The Haines lateral road is the project which has the most immediate value and is of greatest current interest to the residents and businessmen of Alaska. Every place at which your committee conferred with local residents of Alaska (Cordova, Valdez, Anchorage, Homer, and Fairbanks) the importance of the Haines Road to the immediate business future of Alaska was stressed by these local businessmen. Your committee shares their view that the reopening and proper maintenance of the Haines Road is the primary project of importance in this connection.

The Haines Road is the only overland connecting link between southeastern Alaska and interior Alaska. The tourist who visits Alaska has missed a major scenic portion of his trip if he neglects to see southeastern Alaska and to take the boat trip up or down the Inland Passage from Haines to Skagway to Ketchikan via Sitka, Juneau, and Wrangell, thence down through Canadian waters to Seattle. This trip is held by many experienced travelers as one of the world's most scenic voyages.

Consequently, there is a warranted assumption that tourist traffic from the United States to Alaska will still continue to utilize the facilities of the Inland Passage and those who are so fortunate as to bring their cars with them on the voyage will want to leave the boat at Haines then traverse the Haines Road over the beautiful Coast Range via Canada on into interior Alaska where still further scenic wonders await them. Your committee visualizes a much greater use of the Haines Road and those portions of the Alaska Highway system than of the southerly sections of the Alaska Highway in Canada for some years to come, at least until such improvements are made by the Canadian and provincial governments to the connecting road system below Dawson Creek as have been previously discussed in this chapter.

The Province of British Columbia is now engaged in constructing a 180-mile stretch of road from Prince George, British Columbia, to Dawson Creek, the southern terminus of the Alaska Highway. This road will then open up traffic coming up the Fraser River Highway from Vancouver and from the States of Washington and Oregon. However, here again, the connecting highway links in Canada are not of the highest standard and much work would seem necessary on these before this alternate route from our Northwestern States could become very popular.

The recreational lure of the area adjacent to the entire length of the Alaska Highway and the Haines Road cannot be underestimated. It is a country of great scenic beauty. Muncho Lake in the Canadian Rockies, Teslin Lake further north on the road to Whitehorse, and the north side of the great St. Elias Range visible from the highway north of Whitehorse driving toward Alaska furnish views that are almost unsurpassed on this continent. However, the tourist planning a camping trip in this area must realize that there are no filling station accommodations, no stores in which to purchase essential supplies, except a few scattered Hudson Bay trading posts and such services as may be secured through the courtesy of Canadian military outposts located at the various airfields along the highway. There is a valid assumption here, however, that the Canadian Government with its usual foresight will encourage the early development of such service enterprises as are needed to encourage the tourist in taking this delightful trip. The hunting and fishing possibilities for the camper adequately equipped are equal to, if not better, than any to be found in the United States.

No one can prophesy the amount of traffic which will flow over this highway during the next few years. There will always be those hardy travelers whose enthusiasm for new places offsets any of the material discomforts which go with such a trip, but to visualize this highway as a route heavily traveled as the great through highways of this country in peacetime does not seem reasonable at this time due to the great distances which must be covered by tourists and others to reach either the southern or northern termini of the highway.

That the building of the highway will have a profound and far-reaching effect upon the economic and social life of the northwestern portions of this continent may be taken for granted. Such a gigantic and permanent project, a fundamental type of utility, can only result in progress and greatly enhanced development in all fields both in northwest Canada and in Alaska.

XVII. GENERAL COMMENTS

This study and investigation was initiated to determine the manner in which the funds of this Government were expended on this great project. It was also made to determine the present and future value of the project to the citizens of the United States and the Territory of Alaska.

On the first score, your committee can report that it is most favorably impressed with the manner in which this project was carried out both by the War Department and by the Public Roads Administration and their respective contractors. Where costs are shown to be considerably higher than for similar type work in the United States, the added transportation, housing, and labor turn-over costs inherent in a pioneer project of this type are understandable and not subject to criticism because of the admitted urgency of the project at the time it was undertaken.

The presence at the project for a period of several months as division engineer in charge of all construction projects in that area of a War Department officer who has been severely criticized in reports of another congressional committee led your committee to engage in more

than customary care in examining all of the detailed records of this project, particularly those which related to operations at the time this officer was in charge of work there. Numerous persons were interviewed by the individual members of your committee with respect to the activities and work of this officer, Col. Theodore Wyman, Jr.

The committee can report that no trace of negligence or failure to perform his assigned duty on the Alaska Highway and Haines Road projects can be attributed to Colonel Wyman as a result of its investigations in this direction. It was reported by those who had come in personal contact with the colonel or had had an opportunity to observe him in connection with his work on this project that he was a man inclined to make decisions by himself instead of in the customary conference with his staff and other assistants, but there was no evidence that such decisions as he made and was responsible for on these two projects were not sound or in consonance with generally accepted engineering and business practices on projects of this type. Your committee makes special mention of this man because it believes that fairness dictates that its findings should be clear and made public on this point, one which has been the subject of some surmise and unsupported public talk by those not fully aware of the details of this particular program.

Because of the great amount of research done by your committee into the detailed records of both the War Department and the Public Roads Administration, both in Washington and at the various agency offices in Canada and Alaska, a great deal of statistical data have been accumulated by the committee which has been used as a partial basis for the findings contained in this report. A large amount of this data has been appended to this report in order to provide a permanent record in congressional files of this information, and to support certain statements made as to specific points. Such data under normal procedure, would have been found in the record of committee hearings, but in the case of this particular investigation, the committee undertook its study by means of personal investigation and research to the end that such hearings were not felt necessary at this time when practically all of the members of the committee were otherwise engaged in other matters of equal congressional and national interest.

Your committee was uniquely impressed by what it saw and heard on its trip of inspection of these projects, especially in its stops at various points in Alaska. This Nation possesses in the Territory and residents of Alaska great natural and human resources which cannot be underestimated or left to cope with their future unaided by the Congress. In building this through route from the United States to Alaska, we have undertaken only the first step in what should be a carefully planned governmental program to develop other essential highway facilities in Alaska which will accelerate the orderly economic and social development of that great area. The spirit of free enterprise and independence which characterizes the majority of Alaska's leaders was refreshing in the extreme. Any program for the future development of a better road system in Alaska should take into account the ability and the willingness of the citizens and taxpayers of the Territory to make their own financial contribution to these future projects and their maintenance. It should be borne in mind, however, that the title to more than 99 percent of the land area of Alaska is

vested in the United States Government. For that reason, while expecting the citizens of Alaska to pay their proportionate share of the costs of any future road construction and maintenance program, we should also take into consideration the responsibility of the Federal Government for defraying its proper share of these expenditures in proportion to the national investment in the Territory.

It was with this in mind that the recommendations in the following chapter were made.

XVIII. CONCLUSIONS AND RECOMMENDATIONS

The construction of the Alaska Highway, the Haines lateral road, and the pioneer trail work which was a necessary prerequisite to building the final-type road represents an outstanding wartime accomplishment which reflects credit upon the Corps of Engineers of the War Department, the Public Roads Administration, and the 81 private construction firms and their employees who worked directly under the supervision of these governmental agencies.

Your committee feels that the construction of these roads was a justifiable project dictated by the precarious military and naval situations existing in the Alaska area in 1942 and 1943. It is recognized now that Japanese forces held the whip hand in that area for many months, but failed to exploit military possibilities that were open to them. If Japan had taken full advantage of the lack of United States forces, both military and naval, in Alaska during 1942, there is little doubt in the minds of high military personnel whose records have been examined by your committee that Alaska could have been fully occupied by the enemy. If such had taken place, the Alaska Highway would have provided the principal means of supplying such Allied forces as were available to defend the land mass of the northwest portion of this continent. On those grounds alone, the construction of the project was justified.

Additionally, there was great need for a highway to connect and help supply the military airfields placed at strategic locations from Edmonton, Alberta, to Fairbanks, Alaska. The route selected connected these airfields and performed the dual purpose of acting as a feeder route for them as well as becoming part of a through route from the United States to Alaska. Your committee has reviewed the reports on other proposed routes to Alaska and is convinced that the one chosen is the only practicable route which would have served maximum military requirements at that time.

The arrangements made between this Nation and Canada covering work to be done by United States forces and private firms on Canadian soil are found to have been fair and equitable to all parties. Negotiations were based on urgent need for a program of mutual defense, but consideration was given to the economic needs of the contractors and their employees who were transported to Canada from the United States for work on the project. Although the project represents an investment of this Nation's funds in a project of permanent value to another nation, it also constitutes an asset to the United States because it opens a travel corridor from this country to its Territory of Alaska previously not available. Canada's recent agreement to continue maintenance of the highways in question dissipates

any argument that the roads' postwar economic and military value is questionable.

The grade and alinement of the highways as built are in many places definitely below current standards for State highway construction in this country. The highways, as they exist today, however, are capable of serving a substantial amount of traffic for either war- or peace-time purposes. In general, speeds of 50 miles per hour are safe speeds provided caution is exercised by a driver on steep grades and on sharp curves which are adequately marked by warning signs.

In all of your committee's investigations and in all of the reports and records examined, there was no evidence of graft or corruption on the part of any official.

A confidential report of a United States Army colonel, Col. L. George Horowitz, to his superior, Col. F. S. Strong, Jr. (shown as appendix Q-1), was the only official record located which was strongly critical of construction work and related functions under the jurisdiction of the United States division engineer in the Northwest Service Command. This report covered work being done on other projects in addition to the Alaska Highway. The Northwest division engineer referred to in said report was Col. Theodore Wyman, Jr., previously referred to. Although the report is severely critical of this official and his superior, Brig. Gen. J. A. O'Connor, a detailed examination of its contents shows it to be full of ambiguous language, statements of criticism which are full of generalities for the most part, and where definite prophecy is made by the writers of the report as to events which would probably take place as a result of the inefficiency alleged, the record shows that the dire events forecast in the report never came to pass as far as work on the highway was involved. Consequently, although the report resulted in the transfer of Colonel Wyman to another post, its reliability is questioned because of its verbose construction and its utter failure to accurately forecast future developments as shown in the final record of the completed project. Where said report relates to operations under the direction of the division engineer connected with the Canol project and other facilities not connected with the Alaska Highway, your committee has not checked assertions as to those other projects because authority for investigation in that direction was not granted to your committee under its special resolution.

An exhaustive examination of the records of the work done by both Public Roads Administration and the War Department has convinced your committee that much larger quantities of materials were brought into the area than were needed for the construction project. This is indicated in the value of the inventory of approximately \$12,000,000 transferred by Public Roads Administration to the War Department upon completion of the project. It is certain that more careful planning would have reduced these expenditures. However, here, once again, we find that speed required in completing the program on schedule prevented more detailed planning in many instances.

Equipment rentals paid by Public Roads Administration were considerably lower than the average rental for equipment in the United States. Public Roads was able to secure equipment at these rates because of certain contractual agreements allowed the contractor, such as rental period guaranty, overtime payment, and idle-and-transit-time payment. Equipment rentals paid by the War Department were higher

than those paid by Public Roads, but were less than three-quarters of the maximum rates established by the Office of Price Administration. It is believed that with more careful bargaining the Army rates could have been reduced although the War Department's explanation that concessions were not made because Army rental agreements contemplated the use of the equipment for only 6 to 10 months carries weight with your committee. Neither Public Roads nor War Department rental agreements contained an equipment recapture clause. From a review of equipment records, it is not believed that much of the rented equipment would have been recaptured under the standard recapture clause. A few pieces, however, would have been taken over by the Government under such a provision which it would have been to the advantage of the Government to recapture under prevailing equipment market conditions. All rented equipment was returned to the contractor upon completion of construction in the fall and winter of 1943 except those few pieces which the Government purchased from certain contractors in the field.

There is no equipment of any value abandoned along the highway. A few pieces of what once constituted usable rolling stock were noted and inspected, but they were obviously items which had no further value even as salvage, having been thoroughly cannibalized for such usable parts as they might contain which could be used in repairing similar equipment.

The only usable equipment now along the Alaska Highway or the Haines Road is that which is in use for maintenance and operation of these roads and other Army facilities.

Your committee was satisfied with present conditions as it found them, but, since many reports had reached the United States that much equipment was left in the area and abandoned, the committee made a detailed investigation into the subject of Government-owned equipment brought into northwest Canada and Alaska for the construction of all such projects. This report, previously mentioned, shows that 30,586 pieces of Government-owned equipment, with a value of approximately \$81,000,000, when new, were used on all projects. Of this number 19,339 pieces were transferred to War Department equipment pools in the United States, 1,690 pieces were transferred to the Alaska Department, War Department, for maintenance of the Alaska Highway in Alaska and for disposal, 4,355 pieces were retained for maintenance and operation and for use on an oil exploration project, 1,099 pieces were stored in camps along the Canol crude-oil pipe line between Norman Wells and Whitehorse after discontinuance of that project and will be recovered when and where feasible, 2,749 pieces were worn out, and the balance of 635 pieces is being accounted for.

Most of the 1,690 pieces left in Alaska have recently been turned over to the surplus-disposal agency in Alaska assigned to dispose of surpluses in that area. The War Department's decision to hold construction equipment located in Alaska in that area rather than return it to the United States is considered sound. Much of the construction equipment used on the Alaska Highway and related projects in that vicinity was acquired from mining companies and contractors in the Territory and now that mining operations can be resumed legally this equipment will serve as a replacement in those fields. Most of the equipment in Alaska owned by commercial concerns was worn out

during the war when new equipment could not be obtained. By retaining this surplus equipment in the Territory, the Government is thus saved the added cost of transporting it back to the United States. This equipment is now being sold in Alaska.

From the operations observed during the investigation, it did not appear that the amount of equipment retained in the area for operation and maintenance of projects was excessive. However, 1,099 pieces of equipment have been left in camps along the crude-oil pipe line north of the unbridged Pelly River on the Canol Tote Road. Every effort should be made to return this equipment to the United States or dispose of it to the best advantage of the United States. The cost of removal of the equipment to locations where it can be sold should be weighed against the probable amounts to be received from the sale. This equipment should be disposed of and not allowed to deteriorate in the wilderness.

The report referred to shows that 2,749 pieces of equipment were worn out. This amount is not considered excessive in view of the large amount of equipment used on these projects. All of the salvaged equipment has been removed from the area where the value of the scrap was a critical item for the prosecution of the war or where the salvage equipment value in the United States exceeded the transportation and shipping cost.

The present shortage of 635 pieces still to be accounted for will probably be reduced somewhat by rechecking records both in the United States receiving points and the Army records in Canada, but it has been explained that a portion of the shortage is caused by the impossibility of identification of some equipment because of the stripping for spare parts to keep other equipment in operating condition. The records indicate that only a few pieces have been lost in the muskeg or through break-through the ice while shipping across rivers and lakes. The War Department should make every effort to account for the balance of the equipment and to make a thorough inspection of all areas of the project for abandoned equipment.

As pointed out in considerable details in the chapter on costs, when added costs of transportation, housing, and overtime and other factors peculiar to a wilderness project are taken into consideration, the cost of building both the Alaska Highway and the Haines Road compare favorably with cost of construction of similar type roads in the United States during normal times. This is a remarkable record in the opinion of your committee.

An investigation was also made into the contract for the construction of the Haines Road. This contract was made by the War Department with Foley Bros., Inc., and Rohl-Connolly Co. after a Public Roads Administration contractor had started its construction. The reason given by the War Department for bringing in a new contractor and returning the Public Roads contractor to the Alaska Highway in the spring of 1943 is held sound since additional contractors were obviously required to complete the projects on schedule. The charge made by some that favoritism was shown by Colonel Wyman in bringing in Foley Bros., Inc., and Rohl-Connolly Co. is not supported by the evidence. Several other large contractors were considered such as Prentice, White & Spencer, and Guy Atkinson Co., but those companies declined to negotiate for a contract. Colonel Wyman was relieved before these negotiations were completed. Foley Bros., Inc.,

is a reputable construction firm and the evidence shows that the firm's venture with Rohl-Connolly Co. was formed solely for the purpose of obtaining use of floating equipment for the transportation of materials to the job site.

The scarcity of such equipment was a condition that did exist on the west coast at that time. The rental rates paid to the contractor for the floating equipment are shown to be the smallest paid to any contractor in the area and are much below the established rates recommended by the Association of General Contractors. The fee for the construction of this road was well within the limits established by the Secretary of War for construction work in the United States. The contractor completed the work within the scheduled time and below the estimated costs. It is possible that better coordination might have been obtained if the contract had been with a Public Roads contractor, but, in view of the facts as they exist, no criticism seems possible for the War Department change in plan of construction during the winter of 1942.

Your committee submits the following specific recommendations as a result of its findings:

I. The United States and Canada should give early consideration to the formation of a joint commission to exercise responsible control over the maintenance and operations of the Alaska Highway, the Haines lateral road, and such feeder roads as now compose or shall compose later an integral part of the through highway system running from the United States to Alaska via Canada.

II. Such a joint commission, when formed, should institute an immediate survey to determine the probable cost of improving, realining, and hard surfacing this through route.

III. The Secretary of the Interior should make available immediately for settlement the corridor of public lands in Alaska through which the Alaska Highway and the Haines lateral road now run so that service station, hotel, and camping facilities may be established along these routes by private citizens.

IV. The provisions of the Federal-Aid Highway Act, Public Law 521, should be extended to cover road-building operations in the Territory of Alaska, but an exception should be made so that the Territory, the land area of which is largely owned by the Federal Government, should not be assessed more for its share of the cost of these improvements than it can equitably bear.

V. The Haines lateral road should be repaired and placed in usable condition for year-round service as soon as funds can be authorized for this work so that citizens residing in the interior of Alaska will thus be provided with a form of low-cost competitive transportation.

VI. Information concerning the condition of the Alaska Highway and its feeder roads should be made available to automobile associations both in the United States and in Canada so that tourists and others who expect to travel over these roads may know conditions as they presently exist. They should know particularly that at the present time the road has a gravel surface which, during the dry summer months, is extremely dusty; that repair and service-station facilities are extremely limited; and that first-class hotel accommodations are not available except at Edmonton, Whitehorse, and Fairbanks.

APPENDIXES

APPENDIX A

(Chapter I)

Exhibit

Map of northwest Canada and Alaska (map insert).....	1
Profile map of the Alaska Highway, showing elevations of highway above sea level at various points (map insert).....	2

APPENDIX B

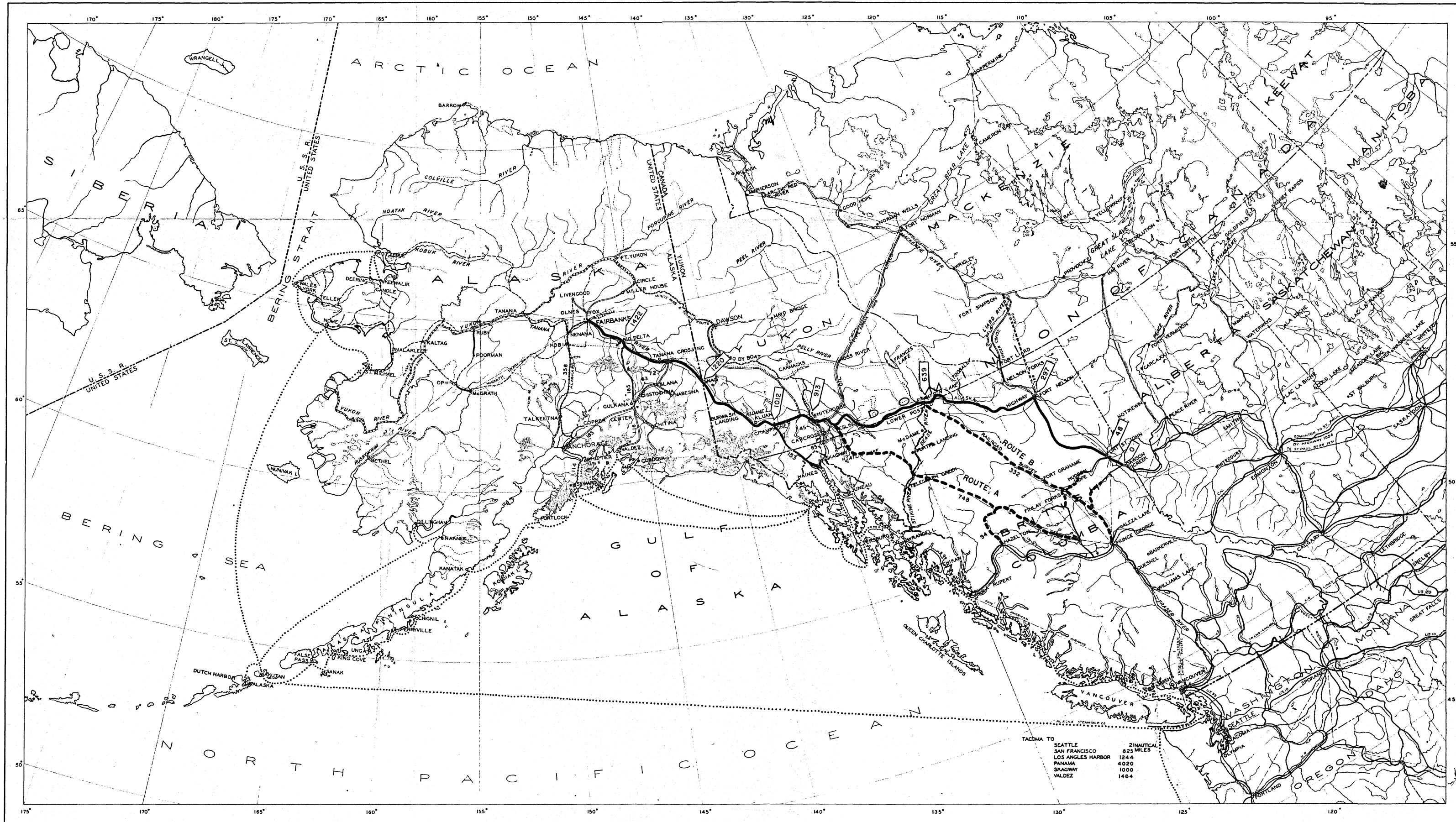
(Chapter II)

EXHIBIT 1.—*Table of mileages on Alaska Highway from Dawson Creek, British Columbia, the southern terminus of the highway*

[Based on odometer readings]

Location	Miles	Location	Miles
Dawson Creek (beginning of Alaska Highway).....	0.00	Hyland River Bridge.....	604.3
Kiskatinaw River Bridge.....	21.0	Road to lower post.....	618.1
Peace River Bridge.....	36.0	Watson Lake Rd.....	632.8
Fort St. John (Public Roads base camp).....	48.0	Liard River Bridge (upper crossing).....	640.8
Beatton River Bridge.....	146.4	Lower Rancheria Bridge.....	685.2
Beatton River flight strip, No. 1-A.....	146.9	Upper Rancheria River Bridge.....	719.5
Sikanni Chief River Bridge.....	161.3	Nisutlin Bay Bridge.....	801.2
Buckinghorse River Bridge.....	175.3	Junction Norman Wells Rd.....	834.8
Beaver Creek Bridge.....	206.4	Teslin River Bridge (Johnson crossing).....	834.5
Prophet River flight strip, No. 2.....	222.6	Carcross Rd. junction (Jakes Corner).....	862.8
Bear Creek Bridge.....	227.8	Lewes River Bridge.....	894.9
Muskwa River Bridge.....	294.7	White Pass R.R. crossing.....	906.6
Fort Nelson Airport road, right.....	297.1	Whitehorse.....	914.5
Fort Nelson: Relay station, radio station WXLV.....	297.6	Takhini River Bridge.....	943.3
Public Roads headquarters, Kehr Hospital.....	305.7	Champagne.....	971.7
Klledo River Bridge.....	332.4	Aishihik River Bridge.....	983.3
Tetsa River Bridge.....	380.8	Junction extension, Bear Mountain Cut-off and Haines Rd.....	1,008.9
Do.....	382.5	Entrance road to Klwane.....	1,050.5
Summit Lake, Quartermaster relay station (near highest point).....	388.8	Slims River Bridge.....	1,056.5
McDonald Creek Bridge.....	408.2	Duke River Bridge.....	1,095.0
Racing River Bridge.....	416.4	Donjek River (main bridge).....	1,128.3
Toad River Bridge.....	436.6	Koidern River Bridge No. 1.....	1,152.5
Muncho Lake Quartermaster relay station and radio station WXLZ.....	452.8	Koidern River Bridge No. 2.....	1,160.4
Muncho Lake.....	453.1	White River Bridge.....	1,165.4
Trout River Bridge.....	474.4	Canadian-Alaska boundary.....	1,217.5
Liard River Bridge (lower crossing).....	493.3	Tanana River Bridge.....	1,300.7
Smith River Bridge.....	511.7	Tok River Bridge.....	1,306.6
Coal River Bridge.....	531.7	Tok Junction Rd., to Slana.....	1,311.3
End Fort St. John division, beginning Whitehorse division.....	567.0	Robertson River Bridge.....	1,344.6
		Johnson River Bridge.....	1,377.9
		Little Gerstle River Bridge.....	1,386.7
		Big Gerstle River Bridge.....	1,391.1
		Junction with Richardson Highway.....	1,420.2
		Fairbanks, Alaska.....	1,519.0

ALASKA TRANSPORT MAP



1942

SCALE 1:5,000,000

FEDERAL WORKS AGENCY
PUBLIC ROADS ADMINISTRATION
ALASKA HIGHWAY DISTRICT

DAWSON CREEK TO EDMONTON	475 MILES
Via FUTURE RELOCATION via WHITECOURT	390 "
EDMONTON TO U.S.-CANADIAN BORDER	
Via McLEOD AND BABB TO CONNECTION	
WITH U.S. 89	364 "
Via LETHBRIDGE TO CONNECTION WITH	
U. S. 91	426 "

- ALASKA HIGHWAY
- OTHER HIGHWAYS
- RAILROAD SURVEY
- RAILROADS
- WATERWAYS
- PROPOSED OIL PIPE LINES
- PROPOSED HIGHWAY
- AIRWAYS
- WINTER ROAD
- HORSE OR CAT TRAIL

EXHIBIT 1

APPENDIX C

(Chapter III)

Exhibit	Exhibit
	Chronology of important events bearing on construction of Alaska Highway (source, records of Army Service Forces, War Department)..... 11
1	Paraphrase of telegram sent to American Legation, Ottawa, Canada, from the Secretary of State, February 12, 1942..... 12
2	Memorandum from the Secretary of State to the Secretary of War, February 13, 1942..... 13
3	Memorandum to the Chief of Staff, dated February 13, 1942, recommending sending attached letter to Secretary of State..... 14
4	Letter referred to in 14, sent by the Secretary of War to the Secretary of State, February 16, 1942..... 15
5	Minutes of Permanent Joint Board of Defense, Canada-United States, February 26, 1942, re Military Highway to Alaska..... 16
6	Memorandum for the President from F. H. LaGuardia, Chairman, American section, Permanent Joint Board on Defense, dated March 7, 1942..... 17
7	Memorandum for the President from the Secretary of War, with attachments, dated March 7, 1942..... 18
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9	Statement released by Department of State, July 22, 1943..... 20
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	Letter from Secretary of War to chairman of House Committee on Roads, dated October 6, 1941, approving H. R. 3095, a bill to construct a highway to Alaska.....
	Notes on Cabinet meeting of January 16, 1942.
	Notes of the Secretary of War after meeting held in his office on February 2, 1942.....
	Excerpt from notes of Brig. Gen. C. L. Sturdevant, Assistant Chief of Engineers, February 1942.....
	Summary of enemy activity in Pacific coastal area of North America for period December 7 to 31, 1941, inclusive (taken from War Department Intelligence Reports).....
	G-2 estimate of the situation in Alaska, dated June 9, 1943.....
	Comparison of estimated requirements and availabilities of oceangoing merchant vessel tonnage for specified war programs of the United States, by months, April 1942 to March 1943 (source, United States Maritime Commission, Division of Economics and Statistics).....
	Merchant marine losses and gains, United States, British Empire, and other United and neutral nations since September 3, 1939, by months, in gross tons (source, War Department records).....
	Chart to accompany exhibit 8.....
	Comparative sinkings; merchant vessels sunk by submarines versus enemy submarines sunk, January 1942 to November 1943, inclusive (source, Air Unit, Submarine Branch, Military Intelligence Service, War Department).....

EXHIBIT 1

OCTOBER 6, 1941.

HON. WILBURN CARTWRIGHT,

Chairman, Committee on Roads, House of Representatives.

DEAR MR. CARTWRIGHT: Careful consideration has been given to the bill (H. R. 3095), authorizing the construction of a highway to Alaska, which you transmitted to the War Department under date of May 24, 1941, with a request for the views of the Department relative thereto.

There are certain military limitations in connection with the proposed highway, which, from the viewpoint of national defense, may justify its construction only under a low priority.

From an evaluation of the trend in international affairs, however, the construction of this highway now appears desirable as a long-range defense measure.

As the highway will be financed by the United States Government, it is suggested that the bill as now drawn be amended to provide:

"That the construction of the proposed highway be under the general supervision and coordination of the Public Roads Administration of the Federal Works Agency."

With the inclusion of the foregoing feature in H. R. 3095, no further objection will be interposed to the enactment of the bill.

The Bureau of the Budget advises that while there is no objection to the submission of such report on the bill as the Department may deem appropriate, the Bureau has advised the Federal Works Agency that there would be no objection to its submitting a report to the committee unfavorable to the enactment of the bill.

Sincerely yours,

HENRY L. STIMSON, *Secretary of War.*

EXHIBIT 2. NOTES ON CABINET MEETING OF JANUARY 16, 1942

At Cabinet meeting of January 16, 1942, Secretary Ickes raised question of International Highway to Alaska. The President showed interest, and sentiment was generally favorable. Vice President Wallace spoke in favor of the eastern route, also called the Albee route, recommended by Mr. William Albee, of the

National Geographic Society, who had traversed this route from Edmonton to Dawson and stated it would be easier, quicker, and encounter less snow and fog than the Magnuson or western route.

The Secretaries of War, Navy, and Interior were requested to confer and agree on the necessity for a road and the proper route.

EXHIBIT 3. NOTES OF SECRETARY STIMSON AFTER MEETING HELD IN HIS OFFICE ON FEBRUARY 2, 1942

Present: The Secretary of War, the Secretary of the Navy, the Secretary of the Interior, Brig. Gen. R. W. Crawford, and Lt. Col. James K. Tully, of the Engineer Corps.

At this meeting, held under the direction of the President, it was decided that the first thing to do is to get (1) surveys of the route by the Engineer Corps and (2) surveys of the possible available equipment for road building, and to do this before a thaw which will make impassable the roadways in May. General Crawford was directed to make these inquiries and report in 1 week.

HENRY L. STIMSON, *Secretary of War.*

Copies to: The Secretary of the Navy, the Secretary of the Interior, Engineer Corps.

EXHIBIT 4. EXCERPT FROM NOTES OF BRIG. GEN. C. L. STURDEVANT, ASSISTANT CHIEF OF ENGINEERS

On Monday, February 2, 1942, the writer was called to the War Department and told that a decision had been reached to undertake the construction of a highway to Alaska on a route connecting a series of airfields from Fort St. John, British Columbia, to Big Delta, on the Richardson Highway in Alaska; that the Chief of Engineers would carry out the project; and that a plan for surveys and construction must be submitted within the next few days. Such a plan was submitted on February 4, and a formal directive to proceed with the project was received on February 14.

EXHIBIT 5

Summary of enemy activity in Pacific coastal area of North America for period Dec. 7, 1941, to June 30, 1942

Date ¹	Source	Enemy activity
Dec. 8.....	Associated Press.....	FBI agents arrested 736 Jap aliens during night in United States and Hawaii, Biddle announced. Country's border closed by Justice Department to all persons of Jap extraction.
Dec. 9.....	Compac N. Naval coastal frontier.	Evaluated as accurate: 1 sub near entrance Akutan Bay, Alaska.
Do.....	From commanding general, Ninth Army Corps, thru Fourth Army.	State of Washington Highway Patrol found several fires about 1 1/4 miles west of Admiralty Inlet (Port Angeles area) in the rough form of an arrow pointing in the direction of Seattle, and Brewerton to the southeast.
Do.....	From Eleventh Naval District, through Fourth Army.	Two hostile aircraft carriers reported 500 to 700 miles off Mazatlan, Mexico; sighted at 2 p. m. (Twelfth Naval District evaluation of report: Credibility doubtful.)
Dec. 10.....	Fourth Army.....	Hostile radio transmission about 200 miles southeast of Unalaska, indicates possible early Jap action against Aleutians. (Believed by Fourth Army to be Dec. 10.)
Do.....	Headquarters Fourth Army.	Canadian authorities report hostile carrier between coast of North America and Hawaiian Islands.
Do.....	Received by Major Vissering from ONI, on R/S file.	Radio reports indicate 2 Jap ships near Aleutian Islands, probably one carrier.
Do.....	Received orally by Major Vissering from ONI. In RS.	Jap sub sighted 1 mile southeast Morrowstone (lighthouse in Puget Sound).
Do.....	ONI through Major Vissering.	Good radio bearing report on enemy ship approximately 200 miles northwest of Unalaska.
Do.....	Thirteenth Naval District through A-2 (telephone) from commanding officer Pacific District, Canada, from Ottawa.	Jap activity believed 170°29'W. Fair to good radio transmission fix indicated enemy transmission at 170°15' W, 50°03' N.

See footnotes at end of table, p. 79.

Summary of enemy activity in Pacific coastal area of North America for period Dec. 7, 1941, to June 30, 1942—Continued

Date ¹	Source	Enemy activity
Dec. 11.....	Second Air Force through General Headquarters.	Sub sighted off Couquille Point near Marshfield, Oreg. (No data on whether friendly.)
Do.....	Associated Press, 11:30.....	Santa Cruz County blacked out. Large eucalyptus tree mysteriously bursting into flame while persons were evacuated from beach area.
Dec. 12.....	Second Air Force through G-2. Telephone message.	A reconnaissance plane sighted and bombed at sub 128° 15' W, 44°10' N. Sub decks awash at time. Sub in evidence after bombing.
Do.....	A FCC, Bolling Field, through A-2.	Sergeant in reconnaissance plane sent to investigate plane reported at 390°15' N, 132°10' W., sighted single engine plane similar to our Navy dive bomber, 466 miles northwest Hamilton Field. (Pilot considers sergeant reliable and experienced.)
Do.....	do.....	Presence of two submarines reported off Marshfield, Oreg.; verified by naval detachment at Port Angeles as well as by Coast Guard.
Do.....	Associated Press, 11:45.....	Flares were reported being dropped in financial district of San Francisco.
Do.....	Associated Press.....	Body of well-dressed oriental found in alley in Seattle. Police say he was slain on an execution block while kneeling with his hands tied behind his back.
Do.....	Headquarters, Western Defense Command through General Headquarters.	Navy reported suspected Jap naval vessels: one, 45° N, 146° W, at 1200 Greenwich civil time; one, 44°45' N, 132° 30' W, 1427 Greenwich civil time.
Do.....	Chief of Staff, Hawaiian Department (telegram from Colonel Smith).	ONI reported sub concentration proceeding north along Pacific coast 1 day out of San Francisco.
Dec. 13.....	Commanding officer, Thirteenth Naval District through ONI.	Coast Guard station, Port Angeles, reports plane sighted submarine 5 miles north Crescent Bay. Pilot, Lt. W. Verker, reports he has attacked sub. (Pilot reported steady and reliable.)
Do.....	do.....	Unidentified planes reported low over San Francisco shortly before 9 p. m. Pacific civil time. Blackout 2 hours, 25 minutes.
Do.....	The Naval Situation, Dec. 12-13, 1941 (summary for President from ONI, submitted by Brig. Gen. Sherman Miles.)	Army B-25 of Eighty-ninth Reconnaissance Squadron (Spokane) reports having dropped three 100-pound bombs near a submarine awash 120 miles off Astoria, Oreg. Results unknown.
Dec. 14.....	G-2, Fourth Army, General Headquarters.	Coast Guard plane reported it bombed, at 1736, submarine off Crescent Beach 5 miles northwest of that point. Final outcome not certain; when last seen was going east at 2 knots. Fort Flanzer listening station using hydroacoustical apparatus reported sub at 1925 and at 2010.
Dec. 18 ²	Captain of schooner <i>Samoa</i> in Associated Press.	Captain of lumber schooner <i>Samoa</i> reported that a great submarine fired 5 shells at vessel off central California coast before dawn.
Do.....	G-2, Western Defense Command, through General Headquarters, Major Raymond.	From an unknown source, the Twelfth Naval District has received a report of a Jap ship 900 miles west of Yaquina, Oreg.
Dec. 21 ³	Western Defense Command through General Headquarters.	Twelfth Bombardment Group pilot states definitely saw submarine 12:25 at 45°47' N, 124°48' W, off mouth Columbia River.
Dec. 20.....	United Press, Twelfth Naval District.	Enemy subs operating off coast of California.
Dec. 21.....	Major Dickson, G-2, Western Defense Command, via General Headquarters.	22 Jap fishing vessels seized and detained at Stevenson (near Vancouver) by Canadians. Move to inspect national cards of registration and to block aid to any submarine in Canadian waters.
Do. ⁴	Twelfth Naval District.....	Positively known submarine is operating off Blunts Reef and Santa Cruz, Calif. (Comment: Blunts Reef is north of San Francisco. Santa Cruz is south of San Francisco.)
Do.....	G-2, Western Defense Command via General Headquarters.	Enemy sub attacked by Navy about 15 miles west of Pigeon Point. Result unknown.
Do. ⁴	do.....	Unidentified sub spotted by Army plane off Point Reyes, 12:38 p. m. Sub made emergency dive. (Credibility unquestioned.)
Dec. 20 ¹	Western Defense Command through General Headquarters.	American tanker <i>S. S. Agwi World</i> en route San Francisco to Los Angeles was attacked by shell fire from large submarine, 2:20 p. m. Pacific standard time, 8 miles off Santa Cruz. No casualties.
Do. ¹	do.....	Tanker <i>Emilio</i> torpedoed 2:07 p. m. Pacific standard time. 20 miles off shore and 10 miles north of Cape Mendocino. 2 killed. 52 in lifeboats.

¹ See footnotes at end of table, p. 79.

Summary of enemy activity in Pacific coastal area of North America for period Dec. 7, 1941, to June 30, 1942—Continued

Date ¹	Source	Enemy activity
Dec. 22.....	Major Leibold, also No. 135, Headquarters, War Department, by telephone.	Navy reported 3 unidentified planes circled over San Clements Island for 15 minutes and dropped flares, after which they flew to San Diego and dropped a white flare 1 mile from Fort Rosecrans. By the time the flare had burned out, the sound detector lost the plane.
Do. ¹	do.....	S. S. <i>Panama Express</i> attacked by torpedoes at 9:52 p. m. and at 1:10 a. m., 30 miles from San Diego. Unhit, arrived San Diego.
Do.....	do.....	Unconfirmed reports of enemy submarine near Cape Mendocino.
Dec. 23 ¹	Associated Press, Western Defense Command, Fourth Army.	Navy reported tanker <i>Montebello</i> sunk off Estero Bay. No lives lost. Lifeboat shelled. Japs also reported sinking.
Do.....	Western Defense Command, Fourth Army.	Navy destroyer contacted sub off Point Burbon at 1:25 p. m.
Do.....	do.....	Unconfirmed reports of sub attack about 20 miles southwest of Santa Cruz. Discounted by Navy.
Do. ¹	From Second Air Force, General Headquarters.	1½ miles west of Hecata Head near Marshfield, Oreg., sub shelled S. S. <i>Larry Doheny</i> at 9:30 a. m. Undamaged. (reliable)
Do. ¹	Second Air Force, General Headquarters.	Sub reported at 9:20 a. m. to be 1½ miles south of Ledbetter Point (latter located near Willapa Bay, Wash.). (Considered reliable.)
Do. ¹	Second Air Force.....	Sub reported 3 miles northwest of Port Canby, off Columbia River, at 9:55 a. m. by Navy. (Considered reliable.)
Do.....	G-2, Western Defense Command (major McNair).	Lifeboat with 10 occupants off Morro Bay, Calif., sighted by planes. (Considered reliable).
Do.....	do.....	Submarines reported by Navy radio to be 20 miles south of Point Sur, Calif., 9 a. m.
Do. ¹	do.....	Two sub torpedo attacks on S. S. <i>Storey</i> off Farralones, Calif. Unsuccessful. (Reliable.)
Do.....	Associated Press, United Press, FCC (Rome in English).	Union oil tanker <i>Montebello</i> reported attacked. Japs on Dec. 24 reported <i>Montebello</i> sunk.
Dec. 24.....	Associated Press; Navy Harbor Defense Command, Fort MacArthur through G-2, Western Defense Command, via General Headquarters.	5,696-ton McCormick freighter <i>Absaroka</i> attacked by a submarine off southern California shore. The ship was kept afloat by a deck of lumber and was towed into breakwater at San Pedro. The captain states his ship was definitely hit by torpedoes. One man killed, 34 escaped.
Dec. 25.....	Coastal Intelligence of Navy, through Western Defense Command No. 115.	S. S. <i>Emilio</i> ashore on Steamboat Rock, near Crescent City, Oreg.
Do. ¹	Navy through Associated Press.	A 4-masted schooner, the <i>Dorothy Phillips</i> , entered a California port on the night of Dec. 24-25 listing at stern. Reported disabled by a sub near the scene of the <i>Absaroka</i> torpedoing.
Dec. 26.....	Ninth Coast Artillery District (cable) Western Defense Command to General Headquarters.	What appeared to be a disabled sub was observed at Santa Monica Bay, Calif., and some officers and enlisted men positively identified the object as a submarine. Others who saw it doubted its being a submarine.
Do. ¹	Western Defense Command.	Radio interception indicated an enemy sub or subs may still be in position off the coast near Cape Mendocino and San Luis Obispo. Later patrol plane dropped depth charge near enemy sub off Cape Mendocino. The sub dived on approach of plane. Navy considered sub undamaged.
Dec. 27.....	Navy Intelligence reports.....	Sub sighted off Santa Barbara. Sub sighted, Bird Rocks, near La Jolla.
Dec. 29 ¹	Fort Geo. Wright through AFCC through General Headquarters.	A B-25 reported that at 12:20 a sub 60 miles west of Juande Fuca Strait and headed south, dove when plane appeared. A white fishing vessel reported in the sub area for a while was later located and identified as the <i>Electra</i> . Radio reception developed static in this area when it was not present elsewhere.

See footnotes at end of table, p. 79.

Summary of enemy activity in Pacific coastal area of North America for period Dec. 7, 1941, to June 30, 1942—Continued

Date ¹	Source	Enemy activity
Dec. 31.....	Thirteenth Naval District through G-2, Western Defense Command.	As a result of close examination of radio direction finder bearings, the Thirteenth Naval District states a present indication of numerous, but undetermined number of enemy vessels in an area approximately 130° to 160° W. and 40° to 50° N. It is believed that this force has been moving east slowly since Dec. 21 and has been in communication with the submarines operating near the Pacific coast and Japan, using frequencies allotted Jap ships, but not necessarily their tenders and subs merely because sub frequencies are used. Estimates from the same source on intelligence received Dec. 27 indicate 3 enemy subs between southern California and San Francisco, one being off Lower California, and one about 125 miles off Point Arena.
Dec. 27-Jan. 3.....		Presence of hostile subs in the waters off California and possibly in Alaska, almost certain during period Dec. 27 to Jan. 3. One sub officially sunk off Pacific coast.
Dec. 31.....		Official report of commanding officer of Coast Guard ship, <i>Hermes</i> , off Cape Montana states ship attacked by sub. Sub probably sunk by <i>Hermes</i> .
Jan. 3-10.....		Submarines indicated in Lower California and in Alaska waters. Surface forces indicated southwest of Kodiak Island (radio fixes).
Jan. 10-17.....		1 or 2 Kaigun-type subs likely off California coast. Radio fixes indicate hostile surface vessels south and southwest Kodiak.
Jan. 17-24.....		No hostile operations during period. Hostile transmitter heard again about 800 miles southwest of Kodiak after cessation of 1 week, indicating possible presence of an enemy surface ship or ships. (Last hostile attack on shipping off California coast Dec. 24.)
Jan. 24-31.....		On Jan. 29, radio fixes indicate standing hostile navy patrol operating along 155° W., about 900 miles south of Kodiak.
Jan. 26.....		Unconfirmed report of sub off Scotch Cape, Unimak.
Feb. 3.....		Radio fix indicates possible hostile surface vessel 800 miles west of Eureka, Calif.
Feb. 5.....		Canadian patrol plane reported sub seen 200 miles due west of Gray's Harbor, Wash.
Feb. 7-14.....		Radio fixes indicate standing hostile patrol along Great Circle route.
Feb. 10.....		Possible distress signal from Russian vessel southwest of Kodiak Island.
Feb. 12.....		Sub reported southwest of Kiska.
Feb. 14-21.....		Minimum 5 radio fixes indicated enemy stations 400 to 600 miles west of Vancouver Island, possibly standing hostile patrol.
Feb. 18.....		Merchant vessel reported sub sighted off Cape Spencer Light, Alaska—identified as Jap. Many indications presence off California coast of subs, generally inconclusive.
Feb. 14-28.....		Minimum 8 radio fixes in area 200 to 600 miles off Vancouver Island, possible enemy standing patrol.
Feb. 21-28.....		Probable minimum 1, possibly 2 subs off Southern California coast; indications reported.
Feb. 20.....		Hostile sub reported 17 miles southeast of Chernoski, Unalaska.
Feb. 23 ¹		About 7 p. m. hostile sub stood offshore near Elwood, Calif. Fired 25 rounds at oil installations in area. Minor damage to oil derrick. No casualties. Sub tentatively identified as large enough to carry airplane.
Feb. 25.....		Planes reported over Los Angeles, apparently reliable eyewitnesses, indicated 1 to 5 planes. Estimated 9-18,000 feet.
Feb. 28.....		Tanker <i>W. H. Berg</i> reported being shelled about 50 miles southwest of San Francisco, probably by sub. No damage. 1 or 2 subs indicated off California coast.
Mar. 7-14.....		Radio fixes indicate presence of subs.
Mar. 8.....		1 or 2 subs indicated off California coast.
Mar. 11.....		Warning of unidentified plane (through air warning device); Plane over Santa Catalina Island.
Mar. 12.....		Hostile patrol previously reported seems to have reappeared about 300 miles south of Dutch Harbor.
Mar. 13.....		Canadian vessel attacks sub on sound contact. Sub near south end of Vancouver Island.
Do.....		Radio fix 35° N, 133° W.
Mar. 16.....		Radio fix south of Alaska (52° N, 156° W) indicates possibly 2 enemy vessels.

See footnotes at end of table, p. 79.

Summary of enemy activity in Pacific coastal area of North America for period Dec. 7, 1941, to June 30, 1942—Continued

Date ¹	Source	Enemy activity
Mar. 21-28		Indications of subs engaged on reconnaissance mission, particularly in Alaska. Fixes and contacts off west coast of United States and Alaska.
Mar. 23		Radio fix 45°20' N, 170° W.
Mar. 25		Shore battery report firing on sub near Seward.
Mar. 26		Sub reported sighted off Sanaka Island, Alaska.
Do		Sabotage of vessels in dry dock, San Diego.
Mar. 27		Indication sub Constantine Bay.
Mar. 28-Apr. 4		Indication hostile subs decreased. Some off west coast of United States.
Mar. 29		2 bridges burned by sabotage, San Diego.
Apr. 4-11		Indication hostile subs increased slightly.
Apr. 5		S. S. <i>MacDonough</i> fired on sub off coast near Los Angeles. (Fair credibility.)
Apr. 6		Coast Guard cutter sighted sub 58°11' N., 147°45' W. (Fair credibility.)
Apr. 12		Periscope sighted by naval patrol vessel 31°30' N, 121°30' W.
Apr. 15		Possible subs sighted Canadian Air Patrol: 54°36' N., 132° W; 50°20' N, 128° W.
Apr. 18		Sub conning tower sighted by Coast Artillery Battery off Morro Bay.
Apr. 19		Unimak Island ranger reported 2 land planes.
Do		Radar reported 52° N, 168° W.
Apr. 21		3 separate O P's reported sub observed off Copalis Beach, between Portland and Seattle.
May 3		Sub contact attacked by Canadian vessel north of Vancouver Island.
May 4		RCAF patrol sighted sub 54°15' N, 130°58' W. close in to Canadian coast.
May 7		Sub sighted by fishing boat off coast at Yakutat (58° N, 139° W) (credibility good)
May 16-23		6 reported objects thought to be submarines; 2 in waters off Puget Sound and 4 off coasts of Oregon and Washington (fair to poor credibility).
May 18		Cargo vessel reported sighting sub southwest Farallon Isle, off California coast (credibility fair).
May 22		Fisherman reported small surface sub in Cook Inlet near Anchorage (credibility questionable).
May 23-30		Possible submarine in Los Angeles-San Diego vicinity for reconnaissance.
May 26-29		Sub operating in Unimak Island-Bogoslof Island area, Aleutians, probably reconnaissance mission (appears established fact).
May 29-June 6		During period 14 reported sightings of subs, 8 credible.
May 30		PBY sighted sub 47°26' N, 136° W. (highly reliable observer).
Do		Army O P reported small sub 2 miles off Goleta. (Navy assigned low credibility.)
May 30-June 6		Enemy surface craft reported as 2 destroyers, 1 to 3 carriers, 3 cruisers operating vicinity Fox Islands, Alaska. Belmont Beach (Los Angeles) crowd reported sub 500 yards off shore (credibility low).
June 1		Pilot of B-17 reported enemy carrier north of Unalaska.
June 3		Army B-17 reported sub 50 miles southwest San Diego.
Do		Sub submerged.
June 3-4-5		Dutch Harbor attacked by 16 Jap bombers, 5 flights, 26 bombers and pursuit planes later in day succeeding 5 flights. Planes reported approached without attacking June 5.
June 4		Fort Glenn attacked by enemy fighters.
June 6-13		During period 11 reported sighting submarines, 7 credible; greatest number of sightings shifted to Alaskan area.
Do		In reference to radio fixes located previously in Gulf of Alaska-Aleutian Islands, most of these considered accurate as to general locality only, but it is believed they indicate presence of Japanese stations in area concerned. Majority of fixes believed to be on enemy subs.
June 6		Navy patrol reported enemy force of 2 heavy cruisers, 8 destroyers, and 2 aircraft carriers sighted 200 miles west Otter Point, Alaska.
June 7		Navy PBY attacked Jap plane Northwest Unimak Island at vicinity 54°30' N, 169°15' W.
Do		Navy PBY attacked enemy submarine on surface at 52°40' N, 172°06' W.
June 11		Navy PBY reported enemy ships vicinity Kiska Island. U. S. Air Force attacked ships.
June 11-12		Enemy on Kiska attacked from air. Considerable activity in Aleutian area.

See footnotes at end of table, p. 79.

Summary of enemy activity in Pacific coastal area of North America for period Dec. 7, 1941, to June 30, 1942—Continued

Date ¹	Source	Enemy activity
June 12		Incomplete report indicates presence another enemy force moving east-north of Kanaga Island.
Do		Navy Intelligence reports Jap force ashore at Attu.
June 12-13		Indications of enemy force moving south at 28°30' N., 173° W.
June 13-20		Of 17 possible sightings of submarines during week in Western Defense Command waters, 11 in Alaskan area. Fixes in general area 40°-50° N., 150° W. Reported sub sightings San Francisco-San Diego area.
June 15		Sub sighted off Cape Ommaney 56°11' N., 134°45' W.
June 16		Sub sighted by air patrol 60 miles Southwest Kiska 56°25' N., 136°45' W.
June 17		3 subs reported on surface off Cape Spencer, Alaska, 58°15' N., 138°30' W.
June 19		Attack on Army transport <i>General W. C. Gorgas</i> , at 56°15' N., 146°46' W. (in Gulf of Alaska) by sub which followed it.
Do		Unknown vessel attacked 5 miles southeast Divine Point, Korovin Island (unconfirmed).
June 20-27		16 sub sightings reported. Shift from Alaskan area to North Pacific coastal area.
June 20 ²		SS <i>Fort Camosun</i> , a 1,300-ton Canadian lumber schooner, torpedoed about 60 miles northwest Grays Harbor (vicinity 47°14' N., 125°20' W.) by 21-inch torpedo.
June 21 ²		Estevan Point radio station 49°22' N., 126°32' W., west coast Vancouver Island, shelled by submarine for 40 minutes.
June 22 ²		Area near Fort Steven (south of mouth of Columbia River), Oreg., shelled by submarine or surface craft.
June 23		S. S. <i>Camden</i> , tanker, attacked with torpedoes 50 miles southwest Cape Blanco, Oreg. No sub sighted.
June 20-27		Subs reported sighted in Alaska-Aleutian area, 3 reported off California coast.
June 26		Kiska bombed.
June 27-30		Kiska operations.
June 27-July 4		6 submarines sighted during period in Alaskan-Aleutian area. Reconnaissance indicated; reports of 10 subs off California coast; grouped in vicinity of seaports, probably observing for direction and quantity of shipping. 1 submarine sighted in the Canadian coastal area during the period.
Do		A large number of Jap fixes ranging from off the California coast to the Aleutians were reported during the period (credibility good to poor).
June 28		Army OP reported possible sub sighting near Jenner, off California coast.
Do		U. S. S. <i>Republic</i> (transport) reported possible sub contact 36°21' N., 126°03' W.
June 29		Canadian patrol plane reported sub at 52°03' N., 130°06' W.
Do		Coast Guard officer reported possible sub sighting off Point Huenne.
Do		Civilian observer reported possible sub sighting at San Pedro Channel, Catalinas.
June 30		Sub chaser reported sound contact 37°31' N., 123°19' W.
June 29		Navy reported sub sighted 15 miles north of Bogoslof Island, Alaska.
June 30		Plane reported sub sighted and attacked 52° N., 172° W.
Do		Sub sighted at Unimak Pass, at 54°17' N., 165°27' W.
Do		Navy reported possible sub at 45° N., 175° W.
Do		Navy reported possible sub at 52°28' N., 172°10' W.

¹ Date—refers to date of activity. In a few cases, date of message was used in lieu of specified date in body of message.

² Significant confirmation.

EXHIBIT 6. G-2 ESTIMATE OF THE SITUATION IN ALASKA

JUNE 9, 1943.

ENEMY CAPABILITIES

1. In order of probability:
 - (a) Reinforcement of Kiska.
 - (b) Cutting of American supply lines by submarine attacks in Aleutians or Alaskan coastal waters.
 - (c) Coordinated air- and/or sea-borne attacks against American Aleutian bases.
 - (d) Direct air- and/or sea-borne attack from Jap Aleutian bases or Kuriles against—
 - (1) Alaskan Peninsula bases.

- (2) Bering Sea islands and/or Nome as ice conditions permit.
- (3) Kodiak.
- (4) Seward and/or Valdez and inland along the Alaskan Railroad and Richardson Highway.
- (5) Southeastern Alaskan coastal installations.

2. Relative probability:

(a) The loss of Attu has seriously weakened the position of Kiska and has partially destroyed the strategic value of the Japanese occupation of the Aleutians. The loss of Kiska would further expose the Japanese homeland, the Kuriles, and the Japanese fishing fleet to American attack.

(b) The Japanese depend upon submarines for—

(1) Observation of American supply routes, task forces, and forward movements.

(2) Sinking of American supply vessels to Aleutians thereby cutting United States striking power against Kiska and Japan as well as softening up United States bases for possible Japanese counterblows.

(c) The Japanese airstrip at Kiska could be used for fighter plane action against our Aleutian bases, either alone or in support of a major naval attack.

(d) (1) Destruction of American installations at Cold Bay, Port Moller, Port Heiden, and Naknek would cripple American striking power in Alaska area. Temporary occupation and use of American air bases in the area might be indicated.

(2) Seizure of the Bering Sea islands would not be of immediate strategic importance. Seizure of Nome might interrupt the Air Transport Command traffic to the Union of Soviet Socialist Republics. Japanese activity in the Nome area would therefore largely depend upon Jap-Soviet relations. In the event of a Jap-Soviet break, Nome's strategic importance would be increased manifold.

(3) Major Japanese action against any Alaskan base would depend increasingly upon Japanese naval superiority as the distance from Japanese air bases greatened.

3. Conclusions:

(a) To maintain their present position in the Aleutians the Japanese must supply and defend Kiska at all costs.

(b) To further increase the security of the Kuriles, their fishing fleets and their homeland proper, offensive action of some sort in the Aleutian-Alaskan area is indicated.

H. H. MOLE,
Lieutenant Colonel, General Staff Corps,
Chief, North American Unit.

EXHIBIT 7

Comparison of estimated requirements and availabilities of oceangoing merchant-vessel tonnage for specified war programs of the United States by months, April 1942 to March 1943¹

[Millions of dead-weight tons]

Month	Tonnage required	Tonnage available	Difference, excess of tonnage required over tonnage available	Merchant tonnage estimated to be under United States military control (Army and Navy) ²	
				Cargo vessels	Troop carriers
1942—					
April	4.5	3.6	0.9	1.6	0.5
May	8.7	6.4	2.3	1.8	.5
June	11.3	7.8	3.5	2.1	.5
July	13.1	8.1	5.0	2.3	.5
August	14.4	8.6	5.8	2.5	.5
September	15.0	8.7	6.3	2.7	.5
October	15.4	8.8	6.6	3.0	.5
November	15.7	8.9	6.8	3.2	.5
December	15.9	9.2	6.7	3.4	.6
1943—					
January	16.0	9.5	6.5	3.6	.6
February	16.1	9.7	6.4	3.9	.6
March	16.1	9.9	6.2	4.1	.7

¹ Prepared by U. S. Maritime Commission, Division of Economics and Statistics, Apr. 6, 1942.

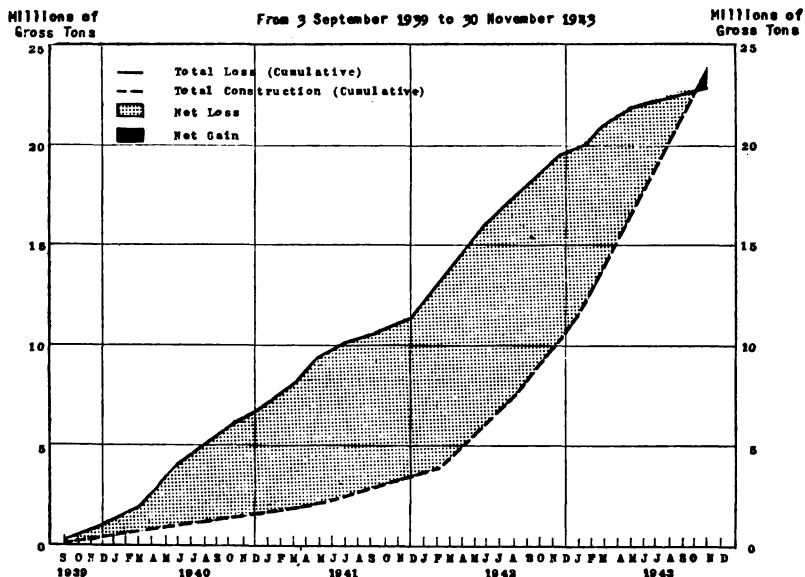
² Excludes naval auxiliaries but not tonnage scheduled to be delivered from new construction which may become naval auxiliaries; and excludes all tonnage owned by the Army and Navy.

EXHIBIT 8. LOSSES AND GAINS IN MERCHANT MARINE TONNAGE OF UNITED AND NEUTRAL NATIONS SINCE SEPTEMBER 3, 1939, BY MONTHS, IN GROSS TONS

The balance sheet below reflects the merchant-marine losses since September 3, 1939, of the United States, Great Britain, other United Nations, and neutrals. The figures include all types and sizes of oceangoing commercial vessels, including dry-cargo vessels, tankers, passenger vessels, combination vessels, trawlers, and fishing vessels. It does not include vessels specifically commissioned in British naval service, nor does it include United States Army-owned or Navy-owned transports.

In addition to vessels lost through belligerent action, there are included vessels lost through ordinary perils of the sea. Such losses amount to 1,720,712 gross tons. Losses are recorded on an "occurrence" basis, hence, previous monthly totals are amended as additional information is received and evaluated.

CUMULATIVE LOSSES AND GAINS



SOURCES: As to Losses - Division of Naval Intelligence, Table M-IX (A)
As to New Construction - Statistical Section, Division of Naval Intelligence

Shipping losses reported for the month of November 1943 amount to 34 ships aggregating 116,504 gross tons. During November construction was 165 ships aggregating 1,247,552 gross tons.

Total losses to Oct. 31, 1943:	<i>Gross tons</i>
United States.....	3, 011, 466
United Kingdom.....	11, 081, 451
Other united and neutral nations.....	8, 564, 216
	22, 657, 133
Deduct new ship construction:	
In United States.....	17, 501, 587
In United Kingdom.....	4, 302, 457
In Canada.....	1, 523, 790
	23, 327, 834
Net gain since Sept. 3, 1939.....	670, 701

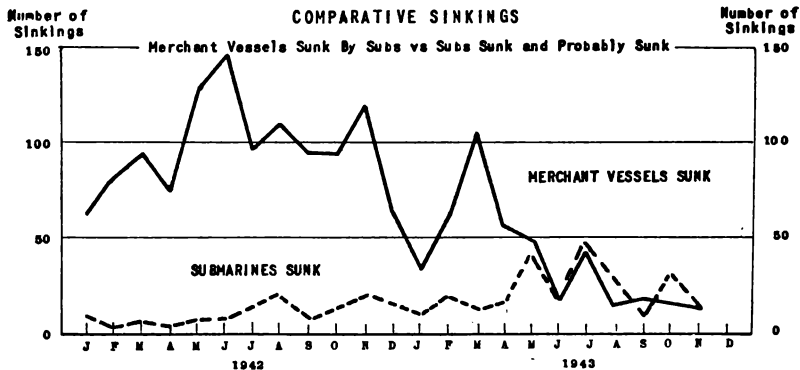
EXHIBIT 10. COMPARATIVE SINKINGS: MERCHANT VESSELS SUNK BY SUBMARINES VS. ENEMY SUBMARINES SUNK

The number of enemy submarines sunk during November again exceeded the number of merchant vessels sunk by submarines, although not by so large a margin as in October. Sixteen submarines were sunk during November while only 12 Allied and neutral merchant vessels were lost to enemy submarine action. For 1943 to date, 1.8 Allied and neutral merchant vessels have been lost to each enemy submarine sunk. The ratio for 1942 was 9.3 to 1.

ALLIED AND NEUTRAL VESSELS SUNK BY SUBMARINES

Enemy Submarines Sunk And Probably Sunk

Month	Merchant Vessels		Submarines	
	1942	1943	1942	1943
January	62	32	9	9
February	88	64	3	17
March	95	105	7	12
April	73	56	3	16
May	129	49	7	42
June	144	19	8	17
July	94	44	13	45
August	108	15	20	27
September	96	17	9	9
October	94	14	13	31
November	120	12	19	16
December	64		14	
ANNUAL TOTAL	1,161	427	125	241
GRAND TOTAL	1,588		366	



SOURCE: Air Unit, Submarine Branch, MIS.

Merchant vessel sinkings chargeable to submarines during the past 6 months have averaged 20.2 per month, a decrease of 77 percent from the previous 17-month average of 86.3 sinkings per month. Submarine sinkings for the past 6 months have averaged 24.2 per month as compared with a prior 17-month average of 13 per month.

"Submarines sunk" includes known and probable sinkings, officially defined by the Navy as follows: Known sunk: positive proof has been obtained. The collection of surface evidence, prisoners, wreckage, etc., are the only reliable proof of a sinking. Probably sunk: moral conviction that the submarine was sunk, but concrete evidence of a corpus delicti lacking. (Note: During 1943 submarines "probably sunk" have amounted to 22 percent of the totals shown.)

Standards for scoring kills are very high and are rigidly adhered to. British and American standards are identical.

EXHIBIT 11. CHRONOLOGY OF IMPORTANT EVENTS BEARING ON CONSTRUCTION OF ALASKA HIGHWAY

April 18, 1934.—In report on H. R. 6538, a bill to authorize construction of a highway to Alaska, the Secretary of War advised chairman of House Committee on Roads that proposed highway is feasible from an engineering viewpoint and can be constructed at a reasonable cost. Expressed no opinion on economic feasibility or military value of proposed highway.

July-August 1938.—Proposed Alaska Highway studied by War Plans Division of General Staff at request of Assistant Secretary of War Louis Johnson, who had just visited Alaska. Conclusion reached and concurred in by Chief of Staff that "from a purely practical standpoint the military value of the proposed Alaska Highway is so slight as to be negligible."

September 1, 1939.—Outbreak of World War II.

April 25, 1940.—Report of Alaskan International Highway Commission transmitted to the Congress by the President. This report recommends highway to Alaska, via route A, the coastal route.

June 22, 1940.—France falls to German armies. United States begins construction of two-ocean Navy.

August 2, 1940.—In a report on H. R. 10064, a bill to authorize a highway to Alaska on such route as might be approved by the President, the Secretary of War advised chairman of House Committee on Roads that "the value of proposed highway as a defense measure is negligible."

August 18, 1940.—In Ogdensburg agreement, Canada and United States establish Permanent Joint Board on Defense for consideration of mutual measures for defense of North American Continent.

September 27, 1940.—Germany, Italy, and Japan sign tripartite alliance.

November 14, 1940.—Permanent Joint Board on Defense, Canada-United States, recommends construction of air-staging facilities by Canada across its western territory to provide an airway for military aircraft flying from the United States to the defense or reinforcement of Alaska, following the route, Grande Prairie, Fort St. John, Fort Nelson, Watson Lake, Whitehorse, and Fairbanks. (This recommendation later approved by both Governments, and Canada began construction.) At same meeting the Board considered the report of the Alaskan International Highway Commission and other studies of the subject. It was unanimously concluded that the value of an overland highway to Alaska, via Routes A or B, would be negligible.

January 8, 1941.—Dr. Vilhjalmur Stefansson, in letter to Chief of Staff, recommends construction of a highway to Alaska via the Mackenzie and Yukon River systems with a connecting road across the Keele River-Stewart River divide, citing advantages of oil supply at Norman Wells on the Mackenzie.

January 25, 1941.—Chief of Staff advised Dr. Stefansson that "while such a road would certainly be of value, the War Department does not consider it of sufficient importance to justify its construction at this time, on the basis of military necessity."

February 1, 1941.—United States Fleet reorganized into three fleets—Atlantic, Pacific, and Asiatic. Increasing numbers of naval units begin to be transferred from Pacific to Atlantic.

February 5, 1941.—Delegate Dimond of Alaska introduces in Congress H. R. 3095, a bill to authorize construction of a highway to Alaska along such route as might be selected by the President.

March 1, 1941.—Congress passes Lend-Lease Act.

May 1, 1941.—Conference regarding highway to Alaska between officers of the General Staff and Governor Gruening and Delegate Dimond of Alaska and Representative Warren G. Magnuson, Chairman of Alaskan International Highway Commission.

May 8, 1941.—Second report of Alaskan International Highway Commission transmitted to Secretary of State. Recommends immediate construction of highway on route A. Copy sent to War Department under date of May 17, 1941.

June 22, 1941.—Germany invades Russia. Possibility of Japanese occupation of eastern Siberia viewed with concern.

June 24, 1941.—In view of changes in international situation, including probable necessity for moving more of Pacific Fleet to the Atlantic, possibility of Japanese occupation of eastern Siberia, prospects of a long war, the Chief of Staff concludes that construction of a highway to Alaska is desirable as a long-range defense measure. Desires that no objection be offered by the War Department to passage of H. R. 3095.

July 26, 1941.—Japan occupies bases in southern Indochina, posing threat to Singapore, Philippines, and East Indies.

July 29, 1941.—Permanent Joint Board on Defense, Canada-United States, in view of increasing gravity of far eastern situation, recommends expedited completion of the airway from the United States across western Canada to Alaska.

July 30, 1941.—The President conferred with Mayor F. H. LaGuardia, chairman of American section of Permanent Joint Board on Defense, and following this conference Mayor LaGuardia announced that the President favored a detailed survey "as soon as possible" to determine proper route of a highway to Alaska.

July-December 1941.—Further movements of United States Fleet units from Pacific to Atlantic to protect lend-lease convoys and maintain neutrality patrol. By December, approximately 50 percent of total naval units were in the Atlantic Fleet.

October 6, 1941.—In report on H. R. 3095, the Secretary of War advised chairman of House Committee on Roads that "from an evaluation of the trend in international affairs, the construction of this highway now appears desirable as a long-range defense measure."

October 15, 1941.—Report of British Columbia-Yukon-Alaska Highway Commission (of Canada) published. Recommends route B as preferable route for highway. The report is confined to discussion of routes west of the Rocky Mountains.

November 13, 1941.—Mayor LaGuardia advises President that Canadian construction of airway to Alaska is nearing completion. Heavy and medium bombardment craft can now be moved over route, and air facilities will be completed by summer of 1942 for movement of all types of aircraft.

December 7, 1941.—Japanese attack on Pearl Harbor involved United States simultaneously in war on Atlantic and Pacific fronts. Of nine battleships in Pacific Fleet, one totally destroyed, one capsized, three sunk to bottom of harbor, and three put out of action by battle damage. Commanding general, Western Defense Command, in subsequent report dated June 5, 1943, stated, "The surprise attack at Pearl Harbor by the enemy crippled a major portion of the Pacific Fleet and exposed the west coast to an attack which could not have been substantially impeded by defensive fleet operations." Japanese simultaneously attack Philippine Islands, Guam, and Wake Island.

December 9, 1941.—Japanese occupy Guam.

December 10, 1941.—Japanese naval victory over British Far Eastern Fleet off Singapore, resulting in loss of *Prince of Wales* and *Repulse*. This success eliminates both United States and British fleets as offensive weapons in the Pacific for many months.

December 22, 1941.—First United States forces land in Australia.

December 23, 1941.—Wake Island falls to Japanese. General DeWitt, commander of Fourth Army, on same day advises War Department by telephone of insecurity of Alaskan waters, stating, "He (Admiral Freeman, commandant Thirteenth Naval District) has only five destroyers, three he is using in Alaskan waters principally to protect our shipping going up with the matériel and food for the command up there and two in Puget Sound. That is so puny that he is almost helpless to assist me in what I've got to do up there."

December 1941.—Total United Nations' shipping sunk this month in all oceans by enemy action was 196 ships totaling 513,000 gross tons. Enemy submarines or surface craft detected off west coast of United States and in Alaskan waters on 41 separate occasions during this month. For 3 or 4 weeks following Pearl Harbor attack, substantially every United States merchant ship leaving west coast ports attacked by enemy submarine, according to summary of Intelligence reports.

January 2, 1942.—Manila falls to Japanese. United States forces under General MacArthur retreat to Bataan Peninsula for final defensive stand.

January 3, 1942.—Commanding general, Alaska Defense Command, advises War Department that "there is not at the present time a single up-to-date fighting plane in the Alaska Defense Command." Total available airforce is 23 planes.

January-June 1942.—Hostile submarines or surface craft detected lurking off west coast between Alaska and southern California on 134 separate occasions during this period, according to summary of Intelligence reports.

January 12, 1942.—Delegate Dimond of Alaska speaks for 1 hour in House of Representatives on H. R. 3095, citing defenseless state of Alaska and necessity for highway to Alaska. (Action on this bill subsequently postponed indefinitely upon initiation of construction by War Department as military measure.)

January 16, 1942.—Highway to Alaska discussed at Cabinet meeting. The question was raised by the Secretary of the Interior. Sentiment was generally favorable, and the President appointed a committee consisting of the Secretaries of War, Navy, and Interior to consider necessity for highway and proper route.

January 29, 1942.—First United States troops occupy Fiji Islands in furtherance of decision to hold line of communications to Australia at all costs. Remaining available naval strength in Pacific to be concentrated in South Pacific along this line.

January 1942.—Total United Nations' shipping losses in this month to enemy action were 143 ships totaling 552,000 gross tons.

February 2, 1942.—The Cabinet committee meets and approves construction of a highway to Alaska following route of Canadian military air bases, Grande Prairie, Fort St. John, Fort Nelson, Watson Lake, and Whitehorse, and United States air bases, Boundary (Northway) and Big Delta, Alaska. The simultaneous necessity of a supply road to link the air bases on the airway to Alaska and of an overland line of communication to Alaska are governing factors in decision to build highway and to follow the route of the airway.

February 6, 1942.—Plan for construction of highway using Engineer troops to construct pioneer roadway to be followed by contractors of the Public Roads Administration making permanent improvements, proposed by War Plans Division and approved by Chief of Staff.

February 11, 1942.—Construction of highway approved by the President. Initial fund of \$10,000,000 to begin work to be allocated from President's emergency fund and balance of necessary funds to be requested from Congress in future estimates in military appropriations.

February 13, 1942.—Canadian War Cabinet grants permission for surveys of highway to begin at once. Agrees to desire of President that terms regarding construction be handled through Permanent Joint Board on Defense.

February 14, 1942.—War Department directive to Chief of Engineers to begin construction of highway.

February 15, 1942.—Singapore falls to Japanese.

February 16, 1942.—German submarine fires on oil installations on Aruba in Dutch West Indies, marking increased tempo of German submarine campaign in American waters. Total United Nations' shipping losses to submarines during February rise to 148 ships, totaling 706,000 gross tons of which 252,000 gross tons represent ships of the tanker class. Monthly losses of tankers reach rate of three lost for each new one delivered.

February 23, 1942.—Japanese submarine fires on oil-field installations near Elwood, Calif. Concern is felt for safety of vulnerable California oil fields.

February 26, 1942.—Permanent Joint Board on Defense, Canada-United States, recommends construction of highway to Alaska following route of military air bases, on terms identical with those incorporated in subsequent exchange of notes. On same day the commanding general, Western Defense Command, advises War Department by letter that total naval forces assigned to protect sea lanes to Alaska are "painfully inadequate for the tasks assigned." United States naval forces in these waters consist of four destroyers, one gunboat, four cutters, and several miscellaneous smaller craft. Western Defense Command states that these forces are "definitely inadequate to provide necessary security to shipping in the inside passage and coastal sea lanes."

February 27, 1942.—Japanese win naval victory in Battle of Java Sea.

March 5, 1942.—Canadian War Cabinet approves recommendations of Permanent Joint Board on Defense for construction of highway to Alaska. Agrees to accept United States offer to construct highway at its own expense in consideration of expenditures already incurred by Canada in constructing the airway to Alaska (approximately \$25,000,000).

March 7, 1942.—President approves recommendations of Permanent Joint Board on Defense for construction of highway to Alaska. Construction of highway begins, with Engineer troops under command of Col. William M. Hoge.

March 9, 1942.—Java surrenders to Japanese.

March 12, 1942.—First United States Army division lands on New Caledonia. Intelligence reports indicate that Japanese forces are massing in Palau Islands and at Truk for movements into Bismarck Archipelago and Solomon Islands, headed by naval force of four battleships, three aircraft carriers, and numerous heavy and light cruisers. Total Allied naval forces available in South Pacific consist of seven heavy cruisers, one light cruiser, and two aircraft carriers. No chance to reinforce North Pacific at this stage.

March 17-18, 1942.—Formal exchange of notes between Canada and the United States for construction of highway to Alaska. The highway is to be maintained by the United States for the duration of the war plus 6 months unless Canada elects to assume maintenance of Canadian section at an earlier date. At end of war the highway within Canada becomes part of Canadian highway system but is to be usable by citizens of both countries without discrimination.

March 25, 1942.—War Department advises commanding general, Alaska Defense Command, that shortages of available units, matériel, and shipping will limit United States forces in Alaska to the "strategic defensive."

March 1942.—Total United Nations' shipping losses rise to 247 ships totaling 846,000 gross tons, including 285,000 gross tons of shipping of the tanker class. As of April 1, 1942, United States Maritime Commission estimates monthly shortages of dry-cargo shipping will progressively increase from 900,000 dead-weight tons for April 1942 to 6,200,000 dead-weight tons for March 1943. Army-Navy Petroleum Board estimates March shortage of tankers (below absolute minimum requirements) at 250 vessels totaling 1,875,000 gross tons.

April 9, 1942.—Bataan overrun by Japanese. United States forces retreat to Corregidor.

April 1942.—Shipping losses continue high. Total United Nations losses for this month are 149 ships, totaling 717,000 gross tons.

May 4, 1942.—Japanese conquest of Burma substantially completed.

May 6, 1942.—Corregidor surrenders.

May 8, 1942.—Battle of Coral Sea. Aircraft carrier *Lexington* is lost.

May 1942.—Shipping losses continue high. Total United Nations losses for this month are 159 ships totaling 735,000 gross tons.

June 3-4, 1942.—Japanese task force composed of two aircraft carriers, three or more cruisers (and possibly battleships), and several troop transports, attacks Dutch Harbor, Alaska. Defending United States naval forces in vicinity total three destroyers and four auxiliary vessels. Defending United States Air Forces in vicinity total 2 squadrons of PBY naval patrol planes, 12 B-26 medium bombers, and 1 B-17 heavy bomber, which were reinforced by 6 additional B-17's during attack. Much of this Air Force and its matériel had been hurriedly flown to Alaska in anticipation of this attack. Enemy forces withdraw after two attacks.

June 4-7, 1942.—Battle of Midway Island. Japanese fleet repulsed. Aircraft carrier *Yorktown* is lost.

June 9, 1942.—Japanese occupation of western Aleutian Islands is discovered. The available United States forces are insufficient to take counter measures. The airway to Alaska and its adjunct, the highway, assume increased importance as a means of reinforcing United States air power in Alaska. Plans projected for air offensive against Kiska and Attu to keep Japanese forces fully occupied.

June 21-22, 1942.—Japanese submarine shells Vancouver Island radio station and section of Oregon coast.

June 1942.—Shipping losses reach new high. Total United Nations shipping losses for this month are 188 ships totaling 886,000 gross tons. Total shipping losses in Pacific waters for first 6 months of 1942 are 773,780 gross tons.

July 21, 1942.—Japanese, continuing advance on New Guinea toward Australia, occupy Buna.

August 7, 1942.—Guadalcanal invaded by United States forces in South Pacific as part of defensive holding campaign to protect communications with Australia. United States forces in Pacific engaged to limit of capacity. Demands of this operation and prospective north African invasion leave little opportunity to reinforce North Pacific.

August 23, 1942.—German armies in Russia reach Stalingrad. Situation becomes grave. Airway from United States to Alaska and its supporting highway assume possible new strategic importance as line of supply to Russia and vital link with Siberia in event of Russian collapse in Europe.

August 31, 1942.—Adak Island in Aleutians occupied by United States forces as prospective air base from which to attack Japanese on Kiska and Attu.

September 13, 1942.—Aircraft carrier *Wasp* sunk in Southwest Pacific. United States naval forces suffer heavy damage in succession of naval engagements in Solomon Islands' area. From time to time, only one undamaged carrier and one undamaged battleship opposed Japanese forces.

September 1942.—First group of lend-lease aircraft ferried to Russia via airway to Alaska. Steady deliveries in increasing numbers to follow.

October 26, 1942.—Aircraft carrier *Hornet* lost in Battle of Santa Cruz Islands, leaving United States Navy only three carriers, of which one required in Atlantic and one undergoing repair of severe battle damage. Naval situation in Pacific

still precarious and little available strength to reinforce North Pacific. Japanese carrier strength estimated at 6 to 12 carriers at this stage.

November 20, 1942.—Pioneer roadway of Alaska Highway completed and opened. During winter of 1942-43 this roadway was usable as a winter road to transport considerable quantities of matériel and equipment to the air bases along its route to support aircraft operations including reinforcement of United States Air Forces in Alaska in their attacks on Japanese in the Aleutians and the ferrying of increasing numbers of lend-lease aircraft to Russia.

January 12, 1943.—United States forces occupy Amchitka in Aleutians as prospective air base for further attacks on Japanese on Attu and Kiska. The backbone of this air offensive was the medium-range bombers and fighter aircraft and replacement parts therefor which were flown to Alaska along the route of the Alaska Highway.

March 1943.—Height of submarine wolf-pack campaign in Atlantic. Shipping losses rise again to 105 ships totaling 730,000 gross tons for this month.

May 11, 1943.—United States task force invades Attu in Aleutian Islands.

June 21, 1943.—United States forces occupy Agattu in Aleutians.

June 30, 1943.—Reconquest of Attu completed. Estimated 10,000 Japanese remain on Kiska.

July 1943.—Shipping losses to submarines become stabilized at low point. New construction begins to come off shipways at rate of over 1,000,000 gross tons per month. First large group of new aircraft carriers joins Pacific Fleet at Pearl Harbor.

August 1-14, 1943.—Concentrated air raids on Kiska.

August 15, 1943.—Kiska invaded: Japanese gone.

September 1, 1943.—United States Navy assumes offensive in Pacific in carrier raid on Marcus Island. The tide definitely turns in our favor.

August-September 1943.—Improvements to permanent standard on Alaska Highway proceed at rapid pace. Plans are made for increased rate of deliveries of aircraft to Russia during 1943 and 1944 in aid of Russian campaigns against German armies in Russia. By August 31 permanent improvements on Alaska Highway are over 70-percent complete.

October 31, 1943.—Improvements of Alaska Highway substantially completed with exception of certain permanent bridges. Total tonnage moving over highway from January 1, 1943, through October 31, 1943, equals 497,560 tons, of which 429,830 tons are for construction of highway, air bases, etc., and 67,730 tons are for supply of Army including Air Corps.

November 1943.—Cumulative United Nations new ship construction finally catches up with and passes cumulative shipping losses since beginning of war. Total United Nations shipping losses to November 1943 have reached 22,657,133 gross tons (as compared with total losses of 12,543,392 gross tons in World War I).

EXHIBIT 12. PARAPHRASE OF TELEGRAM SENT

To: American Legation, Ottawa.

From: Secretary of State.

Date: February 12, 1942, 9 p. m.

No. 25

Confidential—For the Minister.

The War and Navy Departments, in view of the military situation in the Pacific have again considered the question of communications with Alaska. The military departments are now of the opinion that because of recent developments in the Pacific, it is imperative that a land route be provided from the United States to Alaska at as early a date as practicable. They feel that for military reasons such a road should follow the general line of Canadian airports, Fort St. John-Fort Nelson-Nelson-Watson Lake-Whitehorse, and thence connect with existing roads in Alaska.

The military departments of the United States Government feel that this road is an urgent military necessity, since it will permit the uninterrupted movement of supplies and reinforcements to Alaska from the United States. It is conceivable, moreover, that such a route might eventually serve for the movement of troops, equipment, and supplies via Alaska for an offensive against Japan.

The Secretaries of War, Navy, and Interior have reviewed and approved the recommendations of the military departments. They were likewise approved by the President yesterday, who has directed that all necessary steps to initiate this construction be undertaken as soon as possible.

The War Department desires to send two detachments of United States Army engineers to Canada to make surveys in connection with the proposed road and to construct a pioneer road if the surveys are satisfactory. The American Government will, of course, defray all of the expenses in connection with this work. Col. William M. Hoge, United States Army, will be in command of the engineer troops conducting this work. The War Department hopes that arrangements can be made as soon as possible for Colonel Hoge to visit Ottawa to confer with Canadian Government engineers who have knowledge of this proposed road. It is likewise hoped that the Canadian Government will be prepared to grant permission for the dispatch of the engineering troops to Whitehorse and Fort St. John to carry out this work. According to present plans, two regiments of United States engineering troops will be sent to Whitehorse and two such regiments to Fort St. John. Detailed arrangements for the movement of these troops can be made by the military commanders direct with the appropriate Canadian military officers under recommendation No. 22 of the Permanent Joint Board on Defense.

The United States Army engineers will be glad to have Canadian Army engineers participate in this work if the Canadian Government so desires.

The senior War Department member of the Permanent Joint Board on Defense will bring up the question of this road at the next meeting of the Board in New York on February 25. It is the President's hope that the necessary arrangements for the construction of the road can be made through the Permanent Joint Board on Defense.

Please take up this matter informally with the appropriate Canadian officials and telegraph or telephone your reply as soon as possible.

HULL.

EXHIBIT 13. MEMORANDUM FROM THE SECRETARY OF STATE TO THE SECRETARY OF WAR

FEBRUARY 13, 1942.

The Secretary of State presents his compliments to the honorable the Secretary of War and refers to his communication of February 13, 1942, enclosing a paraphrase of telegram No. 25 dated February 12, 9 p. m., to the American Minister to Canada in regard to the proposed construction of a military highway from the United States to Alaska.

Mr. Pierrepoint Moffat, the American Minister to Canada, called Mr. John Hickerson, of the Department of State, on the telephone at noon today and communicated the reply of the Canadian Government to this inquiry as follows:

(1) The Canadian Government readily grants permission for the proposed survey.

(2) The Canadian Government will be glad to have Colonel Hoge come to Ottawa and make available to him such information as Canadian engineers have in regard to the road; the Canadian Government is prepared to have Colonel Hoge arrive at any time convenient, the sooner the better.

(3) The Canadian Government, while appreciating the invitation to participate in this survey, desires to leave this aspect of the matter in abeyance for the present.

(4) The Canadian Government is entirely agreeable to the President's suggestion that this matter be handled through the Permanent Joint Board on Defense; the Canadian Government believes that it may well be desirable at a later date to put an exchange of notes incorporating the terms of any agreement reached by the two Governments through the medium of the Joint Board.

(5) The Canadian members of the Permanent Joint Board on Defense will be glad to consider this question at the forthcoming meeting in New York on February 25.

The foregoing information is communicated to General Habick by telephone immediately on its receipt. At General Habick's request, Mr. Hickerson telephoned Mr. Moffat on the afternoon of February 13 to inform him that Brig. Gen. C. L. Sturdevant, of the Army engineers, would visit Ottawa instead of Colonel Hoge, arriving there at noon, Monday, if agreeable to the Canadian Government, and that Col. William Hoge and two officers would proceed to Edmonton, Alberta, for preliminary reconnaissance work arriving probably on Wednesday of next week. Mr. Moffat stated that these visits would be agreeable to the Canadian Government and that he would be glad to meet General Sturdevant on his arrival in Ottawa on Monday, noon.

EXHIBIT 14

WAR DEPARTMENT,
WAR DEPARTMENT GENERAL STAFF,
Washington, February 13, 1942.

Memorandum to the Chief of Staff.
Subject: International Highway.

I. Discussion.—

1. Memorandum W. P. D. 4327-27 February 6, 1942, approved by the President February 11, 1942:

(a) Authorizes the expedited construction of an international highway under the direction of the Chief of Engineers along route Fort St. John-Fort Nelson-Watson Lake-Whitehorse-Boundary-Big Delta.

(b) Directs that necessary arrangements be made with the Canadian Government through the Permanent Joint Board on Defense, Canada-United States.

2. Although detailed arrangements are to be made through the Permanent Joint Board on Defense as above authorized, it is thought advisable to notify the Secretary of State in the premises.

Action recommended.—That the attached letter, describing the project and the military necessity therefor, be signed by the Secretary of War and dispatched to the Secretary of State.

L. T. GEROW,
Brigadier General,
Assistant Chief of Staff.
R. W. CRAWFORD,
Brigadier General, G. S. C.

EXHIBIT 15

FEBRUARY 16, 1942.

The honorable the SECRETARY OF STATE.

DEAR MR. SECRETARY: At the direction of the President, the Secretaries of War, Navy, and Interior conferred on the subject of an international highway between the United States and Alaska.

Based on decisions reached at this conference, the War Department prepared a memorandum which was approved by the President on February 11, 1942, authorizing the construction of an international highway along the route Fort St. John-Fort Nelson-Watson Lake-Whitehorse-Boundary-Big Delta, to connect with existing roads in Canada and Alaska. Necessary arrangements with the Canadian Government will be made through the Permanent Joint Board on Defense, Canada-United States.

This action was taken in view of the military and naval situation in the Pacific, which indicated that a land route to Alaska alternative to the existing sea routes was imperative from the viewpoint of national defense. Expedited construction is being arranged through the Chief of Engineers for the use of engineer troops to build a pioneer-type road, followed by civilian contractors of the Public Roads Administration, who will improve it to a standard 24-foot gravel highway.

Two regiments of Engineers, with attached units, will work north and south from Whitehorse and two regiments, with attached units, will work north from Fort St. John to Watson Lake.

Sincerely yours,

HENRY L. STIMSON, *Secretary of War.*

Copy to: The Chief of Engineers.

EXHIBIT 16. MINUTES OF PERMANENT JOINT BOARD ON DEFENSE, CANADA-UNITED STATES, FEBRUARY 26, 1942

MILITARY HIGHWAY TO ALASKA

The Board considered the increasing gravity of the military situation in the Pacific and possible developments therein affecting Alaska. The Board was informed that the United States Government believes that the construction of a land route to Alaska as an alternative to the sea route is imperative for the defense

of North America and that the United States Government, for military reasons, favors the route that follows the general line of the Canadian airports, Fort St. John-Fort Nelson-Watson Lake-Whitehorse-Boundary-Big Delta, the respective termini connecting with existing roads in Canada and Alaska. The Board shares this belief for the following reasons:

(1) That the effective defense of Alaska is of paramount importance to the defense of the continent against attack from the west, since Alaska is the area most exposed to an attempt by the enemy to establish a foothold in North America.

(2) That sea communications with Alaska in the future may be subject to serious interruption by enemy sea and air action.

(3) That construction of the highway will provide a secure inland route not exposed to attack from the sea, will alleviate the shipping situation, and will provide an alternate route for use in case sea communications are interrupted.

(4) That the air route to Alaska and the defense facilities in Alaska cannot be fully utilized without adequate means of supply for the air route. This can best be provided by a highway along this route.

(5) That the additional line of communications via the inland route will be of great value in the event of an offensive against Japan projected from Alaska.

(6) That there is already on this continent a sufficient supply of land transport vehicles to enable the road to be used to its full capacity for the rapid reinforcement and supply of the forces in Alaska, without adding to the burden of industry, and that the machinery for the construction of the road is already in existence.

(7) Air Transport Service does not offer a practicable substitute for the proposed road because of the shortage of aircraft and of aircraft constructional facilities.

(8) That the use of Skagway as a sea terminal with a road only from Whitehorse to Fairbanks would not be a satisfactory solution of the problem. (It is understood that the Whitehorse-Fairbanks section of the highway would probably be given first construction priority.)

The proposed highway would have its southern terminus on the Edmonton, Dunvegan, and British Columbian Railway, which has available carrying capacity substantially in excess of the possible carrying capacity of the road. Its northern terminus would be at a point about 60 miles south of Fairbanks on the Richardson Highway, which connects Fairbanks with Valdez. From Fairbanks there is also a railway connection with Seward. According to information furnished by General Sturdevant of the United States Army Engineers, the estimated approximate length of the road is 1,600 miles of which about 1,200 miles would be in Canada and 400 miles in Alaska; that the cost of a 24-foot gravel road capable of carrying heavy traffic during both summer and winter is likely to average in the neighborhood of \$50,000 to \$60,000 a mile; and that the total cost might conceivably exceed \$100,000,000 and probably would not be less than \$75,000,000. The information of the Canadian members in respect to costs was to the same effect.

At its twenty-fourth recommendation, the Board accordingly as a matter pertaining to the joint defense of Canada and the United States, recommends the construction of a highway along the route that follows the general line of airports, Fort St. John-Fort Nelson-Watson Lake-Whitehorse-Boundary-Big Delta, the respective termini connecting with existing roads in Canada and Alaska.

The Board was informed by the United States members that the United States Government, appreciating the burden of the war expenditure already incurred by Canada since her entry into the war in September 1939, and in particular on the construction of the air route to Alaska, and being convinced of the necessity of the road and the urgency of its construction, would be prepared to meet the whole of the cost of its construction, and of its maintenance during the war, without asking Canada to do more than provide certain facilities as indicated below. If this offer on the part of the United States Government were accepted, that Government would—

(A) Carry out the necessary surveys for which preliminary arrangements have already been made and construct a pioneer road by the use of United States engineer troops for surveys and initial construction. (It would expect to complete this work during the current year and is advised that the pioneer road should be sufficiently advanced to be capable next winter of carrying a small amount of emergency traffic.)

(B) Arrange for the highway's completion under contracts made by the United States Public Roads Administration and awarded with a view to insuring the execution of all contracts in the shortest possible time without

regard to whether the contractors were Canadian or American. (It expects that the road should be able to carry traffic to its full capacity not later than the end of 1943.)

(C) Maintain the highway until the termination of the present war unless the Government of Canada prefers to assume responsibility at an earlier date for the maintenance of so much of it as lies in Canada.

(D) Agrees that at the conclusion of the war that that part of the highway in Canada shall become in all respects an integral part of the Canadian highway system subject to the understanding that there shall at no time be imposed any discriminatory conditions in relation to the use of the road by Canadian or United States civilian traffic.

In the event of this proposal being accepted, the United States Government would ask the Canadian Government to agree—

(A) To acquire rights-of-way for the road in Canada, the title to remain in the Crown; in the right of Canada or of the Province of British Columbia as appears most convenient.

(B) To waive import duties, transit, or similar charges on shipments originating in the United States and transported over the highway to Alaska, or originating in Alaska and transported over the highway to the United States.

(C) To waive import duties, sales taxes, license fees, or other similar charges on all equipment and supplies to be used in the construction or maintenance of the road and on personal effects of the construction personnel.

(D) To take the necessary steps to facilitate the admission into Canada of such United States citizens as may be employed in the construction or maintenance of the highway, it being understood that the United States will assume the expense of repatriating any such persons if the contractors fail to do so.

EXHIBIT 17

PERMANENT JOINT BOARD ON DEFENSE, CANADA-UNITED STATES,
Washington, March 7, 1942.

Memorandum for the President.

Subject: Military Highway to Alaska (twenty-fourth recommendation of Permanent Joint Board on Defense.)

1. On February 11, 1942, you approved a joint proposal of the Secretaries of War, Navy, and Interior for construction of the above.

2. The accompanying recommendation of the Defense Board is in accord with and furtherance of that proposal. In order to formalize the record, a notation of your approval is requested.

3. The United States Army and Navy concur.

F. H. LA GUARDIA,
Chairman, American Section.

(Enclosure: Copy of Twenty-fourth Recommendation of Joint Defense Board.)

NOTE.—On March 7, 1942, these papers signed "OK FDR" at bottom of copy of twenty-fourth recommendation, and returned to PJB.D.

EXHIBIT 18

MARCH 7, 1942.

Memorandum for the President.

Subject: International Highway.

1. In reply to your memorandum of March 2, relative the latest War Department plans, I beg to advise that these plans are the same as those approved by you on February 11, viz:

(1) That, for military reasons, it is essential that the road follow the general line of Canadian Airways, Fort St. John-Fort Nelson-Watson Lake-Whitehorse, and thence to the United States bases at Boundary, Big Delta, and Fairbanks.

(2) That the surveys and the construction of a pioneer road will be carried out by the United States Engineers, who will be followed by the United States Public Roads Administration, which will enlarge and improve the pioneer road to a highway of the gravel type with a 24-foot width, the cost to be borne by the United States.

(3) At its sessions of February 25 and February 26, the Permanent Joint Board on Defense, Canada-United States, recommended the construction of the road as above. On March 5, the Canadian Government approved this recommendation.

(4) There is enclosed herewith the draft of an announcement that will be made this afternoon by Mr. Mackenzie King to the Canadian Parliament.

(5) The draft of a letter to Mayor LaGuardia is submitted herewith.

HENRY L. STIMSON,
Secretary of War.

(Two enclosures: Draft of announcement, and draft of letter to LaGuardia.)

PERMANENT JOINT BOARD ON DEFENSE,
Washington, March 6, 1942.

STATEMENT TO BE MADE BY MR. MACKENZIE KING TO THE CANADIAN PARLIAMENT
ABOUT 3:30 P. M. THIS AFTERNOON

The advisability from a military standpoint of constructing a highway to Alaska has been under review by the Defense Services of Canada and United States. After final consideration by the Permanent Joint Board on Defense, on February 25 and 26, a unanimous recommendation advising the construction of such a road was addressed to the two Governments. This recommendation has now been examined and approved by both Canada and United States.

This recommendation of the Defense Board, which has been endorsed by the military authorities in each country and approved by the respective Governments, is based on purely military considerations. The dimensions of the road, the type of construction, and route chosen have all been selected on this basis and this basis only.

The road as approved will start at Fort St. John in northern British Columbia and will follow the general line of the airports which Canada has constructed through Fort Nelson, Watson Lake, and Whitehorse, thence to Boundary, Big Delta, and Fairbanks. The highway will thus connect with the existing road system of Canada and Alaska.

The United States Government, appreciating the burden of war expenditure already incurred by Canada since her entry into the war, and particularly on the construction of the air route to Alaska, has offered to undertake the building and wartime maintenance of the highway. At the conclusion of the war, that part of the highway which is in Canada will become, in all respects, an integral part of the Canadian highway system.

This offer has been accepted and its terms will be set forth in an exchange of notes which will be signed and made public in the near future. Canada will, of course, provide all necessary facilities, including the right-of-way for the road. Meanwhile, American engineers who have been selected to make the survey and to lay out the pioneer road, have been authorized to commence work without further delay.

Hon. F. H. LA GUARDIA,
*Chairman, Permanent Joint Board on Defense,
City Hall, New York City.*

DEAR FIORELLO: In reply to your letter of February 27, relative to the Alaska Highway, I take pleasure in informing you that the proposals of the United States Government, which were endorsed unanimously by your Joint Board on Defense, were approved by the Canadian Government on March 5, 1942.

I am sure that our people will appreciate the fact that the selection of the route was based on purely military considerations.

Sincerely,

EXHIBIT 19

DEPARTMENT OF STATE,
Washington, March 31, 1942.

In reply refer to
Eu 843.154 Seattle-Fairbanks Highway/367.

The Secretary of State presents his compliments to the Honorable the Secretary of War and encloses for the files of the War Department, two copies of despatch

No. 2712 of March 19, 1942, from the American Minister at Ottawa transmitting certified copies of notes exchanged between the Minister and the Canadian Secretary of State for External Affairs with respect to the construction of a highway through Canada to Alaska.

(Enclosure: From American Legation, Ottawa, March 19, 1942, with enclosures in duplicate.)

OTTAWA, *March 19, 1942.*

Subject: Exchange of notes on the Alaska Highway Agreement.

The honorable the SECRETARY OF STATE,
Washington, D. C.

SIR: I have the honor to enclose certified copies of my note No. 626, March 17 1942, proposing an agreement on the construction of a highway through Canada to Alaska and of the reply of the Secretary of State for External Affairs, No. 29, dated March 18, 1942, agreeing to the proposals.

Respectfully yours,

PIERREPONT MOFFAT.

EXHIBIT 20

For the press.

DEPARTMENT OF STATE,
July 22, 1943.

CONFIDENTIAL RELEASE FOR PUBLICATION AT 3 P. M., E. W. T., THURSDAY, JULY 22, 1943, NOT TO BE PREVIOUSLY PUBLISHED, QUOTED FROM OR USED IN ANY WAY

The following is an exchange of notes between the Government of the United States and the Government of Canada:

JULY 19, 1943.

The Honorable LEIGHTON MCCARTHY, K. C.,
Minister of Canada.

SIR: I have the honor to inform you that the Honorable Anthony J. Dimond, Delegate of Alaska, United States House of Representatives, has proposed that the highway from Dawson Creek, British Columbia, to Fairbanks, Alaska, be given the official name Alaska Highway.

The Government of the United States believes that the name suggested by Mr. Dimond is suitable and in harmony with popular usage. It is of the further opinion the highway should be jointly named by the Governments of the United States and Canada in view of the location of the greater part of the highway within Canada and in view of the friendly cooperation which has made possible its construction.

In accordance with the foregoing, I have the honor to propose that the highway from Dawson Creek, British Columbia, to Fairbanks, Alaska, be designated the "Alaska Highway." If the Canadian Government is agreeable to this proposal, it is suggested that this note and your reply in that sense shall be considered as placing on record the agreement of the two Governments in this matter.

Accept, sir, the renewed assurances of my highest consideration.

CORDELL HULL.

The Honorable CORDELL HULL,
Secretary of State of the United States,
Washington, D. C.

JULY 19, 1943.

SIR: I have the honor to inform you that the Government of Canada concurs in the proposal, contained in your note of July 19, 1943, that the highway from Dawson Creek, British Columbia to Fairbanks, Alaska be given the official name Alaska Highway.

Accept, sir, the renewed assurance of my highest consideration.

LEIGHTON MCCARTHY.

APPENDIX D

(Chapter IV)

EXHIBIT 1. AGREEMENT BETWEEN THE UNITED STATES AND CANADA—MILITARY HIGHWAY TO ALASKA, EFFECTED BY EXCHANGE OF NOTES SIGNED MARCH 17 AND 18, 1942 (EXECUTIVE AGREEMENT SERIES 246)

*The American Minister to the Canadian Secretary of State for External Affairs*LEGATION OF THE UNITED STATES OF AMERICA,
Ottawa, Canada, March 17, 1942.

No. 626.

The Right Honorable, the SECRETARY OF STATE FOR EXTERNAL AFFAIRS,
Ottawa.

SIR: 1. As you are aware, on February 26, 1942, the Permanent Joint Board on Defence approved a recommendation as a result of which the two sections proposed to their respective Governments: "the construction of a highway along the route that follows the general line of airports, Fort St. John-Fort Nelson-Watson Lake-Whitehorse-Boundary-Big Delta, the respective termini connecting with existing roads in Canada and Alaska." This recommendation, based as it was on military considerations and military considerations only, and having the endorsement of the service departments of the two countries, has been approved by both Governments.

2. My Government, being convinced of the urgent necessity for the construction of this highway and appreciating the burden of war expenditure already incurred by Canada, in particular on the construction of the air route to Alaska, is prepared to undertake the building and wartime maintenance of the highway. Subject to the provision by Canada of the facilities set forth in paragraph 3 of this note, the Government of the United States is prepared to—

(a) Carry out the necessary surveys for which preliminary arrangements have already been made and construct a pioneer road by the use of United States Engineer troops for surveys and initial construction;

(b) Arrange for the highway's completion under contracts made by the United States Public Roads Administration and awarded with a view to insuring the execution of all contracts in the shortest possible time without regard to whether the contractors are Canadian or American;

(c) Maintain the highway until the termination of the present war and for 6 months thereafter unless the Government of Canada prefers to assume responsibility at an earlier date for the maintenance of so much of it as lies in Canada;

(d) Agree that at the conclusion of the war that part of the highway which lies in Canada shall become in all respects an integral part of the Canadian highway system, subject to the understanding that there shall at no time be imposed any discriminatory conditions in relation to the use of the road as between Canadian and United States civilian traffic.

3. For its part, my Government will ask the Canadian Government to agree—

(a) To acquire rights-of-way for the road in Canada (including the settlement of all local claims in this connection), the title to remain in the Crown in the right of Canada or of the Province of British Columbia as appears more convenient;

(b) To waive import duties, transit, or similar charges on shipments originating in the United States and to be transported over the highway to Alaska, or originating in Alaska and to be transported over the highway to the United States;

(c) To waive import duties, sales taxes, license fees, or other similar charges on all equipment and supplies to be used in the construction or maintenance of the road by the United States and on personal effects of the construction personnel;

(d) To remit income tax on the income of persons (including corporations) resident in the United States who are employed on the construction or maintenance of the highway;

(e) To take the necessary steps to facilitate the admission into Canada of such United States citizens as may be employed on the construction or maintenance of the highway, it being understood that the United States will undertake to repatriate at its expense any such persons if the contractors fail to do so;

(f) To permit those in charge of the construction of the road to obtain timber, gravel, and rock where such occurs on Crown lands in the neighborhood of the right-of-way, providing that the timber required shall be cut in accordance with the directions of the appropriate Department of the Government of the province in which it is located, or, in the case of Dominion lands in accordance with the directions of the appropriate Department of the Canadian Government.

4. If the Government of Canada agrees to this proposal, it is suggested that the practical details involved in its execution be arranged directly between the appropriate governmental agencies subject, when desirable, to confirmation by subsequent exchange of notes.

Accept, sir, the renewed assurances of my highest consideration.

PIERREPONT MOFFATT, *American Minister.*

The Canadian Secretary of State for External Affairs to the American Minister

DEPARTMENT OF EXTERNAL AFFAIRS,
Ottawa, Canada, March 18, 1942.

No. 29.

The UNITED STATES MINISTER TO CANADA,
Ottawa.

SIR: I have the honor to acknowledge receipt of your note of March 17, 1942, No. 626, in which you referred to the recommendation approved by the Permanent Joint Board on Defense, as a result of which the two sections of the Board proposed to their respective Governments: "the construction of a highway along the route that follows the general line of airports, Fort St. John-Fort Nelson-Watson Lake-Whitehorse-Boundary-Big Delta, the respective termini connecting with existing roads in Canada and Alaska."

2. As announced on March 6, 1942, the Canadian Government has approved this recommendation and has accepted the offer of the United States Government to undertake the building and wartime maintenance of the highway which will connect the airports already constructed by Canada.

3. It is understood that the United States Government will—

(a) Carry out the necessary surveys for which preliminary arrangements have already been made, and construct a pioneer road by the use of United States engineer troops for surveys and initial construction.

(b) Arrange for the highway's completion under contracts made by the United States Public Roads Administration and awarded with a view to insuring the execution of all contracts in the shortest possible time without regard to whether the contractors are Canadian or America.

(c) Maintain the highway until the termination of the present war and for 6 months thereafter unless the Government of Canada prefers to assume responsibility at an earlier date for the maintenance of so much of it as lies in Canada.

(d) Agree that at the conclusion of the war that part of the highway which lies in Canada shall become in all respects an integral part of the Canadian highway system, subject to the understanding that there shall at no time be imposed any discriminatory conditions in relation to the use of the road as between Canadian and United States civilian traffic.

4. The Canadian Government agrees—

(a) To acquire rights-of-way for the road in Canada (including the settlement of all local claims in this connection), the title to remain in the Crown in the right of Canada or of the Province of British Columbia as appears more convenient;

(b) To waive import duties, transit, or similar charges on shipments originating in the United States and to be transported over the highway to Alaska, or originating in Alaska and to be transported over the highway to the United States;

(c) To waive import duties, sales taxes, license fees, or other similar charges on all equipment and supplies to be used in the construction or maintenance of the road by the United States and on personal effects of the construction personnel;

(d) To remit income tax on the income of persons (including corporations) resident in the United States who are employed on the construction or maintenance of the highway;

(e) To take the necessary steps to facilitate the admission into Canada of such United States citizens as may be employed on the construction or maintenance of the highway, it being understood that the United States will undertake to repatriate at its expense any such persons if the contractors fail to do so;

(f) To permit those in charge of the construction of the road to obtain timber, gravel, and rock where such occurs on crown lands in the neighborhood of the right-of-way, providing that the timber required shall be cut in accordance with the directions of the appropriate department of the government of the Province in which it is located, or, in the case of Dominion lands, in accordance with the directions of the appropriate Department of the Canadian Government.

5. The Canadian Government agrees to the suggestion that the practical details of the arrangement be worked out by direct contact between the appropriate governmental agencies subject, when desirable, to confirmation by subsequent exchange of notes.

Accept, sir, the renewed assurances of my highest consideration.

W. L. MACKENZIE KING,
Secretary of State for External Affairs.

APPENDIX E

(Chapter V)

	Exhibit	Exhibit
Description of various routes suggested for a highway to Alaska (source: War Department files).....	1	Report from commanding general, Army Air Forces, dated December 12, 1944, evaluating Northwest Staging Route, United States-Canada-Alaska.....
Comparative distances of various routes to Alaska (source: War Department files).....	2	Number and location of intermediate flight strips on or adjacent to Alaska Highway (source: War Department files).....
Excerpt from article in Washington Herald, March 23, 1933, by late Brig. Gen. William Mitchell.....	3	Airfields and landing strips served by Alaska Highway (source: War Department files).....
Memorandum to commanding general, Services of Supply from deputy chief of the air staff, dated July 29, 1942, recommending construction of flight strips along route of Alaska Highway.....	4	
Memorandum from Chief of Staff, Army Service Forces, to commanding general, Army Air Forces, dated December 7, 1944, requesting an evaluation of the flying route adjacent to the Alaska Highway known as Northwest Staging Route, United States-Canada-Alaska.....	5	

EXHIBIT 1. DESCRIPTION OF VARIOUS ROUTES

Route A or Coastal Route.—Begins at Prince George, British Columbia, and extends northerly via Fort St. James and Stuart Lake in nearly a direct line to Atlin, British Columbia, on Atlin Lake; thence northerly to Whitehorse, Yukon Territory; thence northwesterly via Lake Kluane and the Tanana River to Big Delta, Alaska, where it joins the existing Richardson Highway to Fairbanks, Alaska. This route is favored by the Alaskan International Highway Commission.

Route B or Rocky Mountain Trench Route.—Begins at Prince George, British Columbia, and extends northerly through the Rocky Mountain trench via Finlay Forks, Sifton Pass, Lower Post, Francis Lake and Selkirk to Dawson, Yukon Territory, and thence westerly to Big Delta, Alaska. This route is favored by the Canadian commission known as the British Columbia-Yukon-Alaska Highway Commission. It is the route surveyed by the Corps of Engineers in 1942 for a railroad.

Route C or Prairie Route.—Begins at railhead at Dawson Creek, British Columbia, and extends northwesterly via Fort St. John and Fort Nelson to Watson Lake, thence northerly and northwesterly via Francis Lake and Selkirk to Dawson, Yukon Territory, and thence westerly to Big Delta, Alaska. This route is favored by interests in the North Central States of the United States and in the Canadian Province of Alberta. It is also advocated by the so-called United

States-Canada-Alaska Prairie Highway Association, a voluntary association of citizens from the Midwestern States and the prairie Provinces of Canada, organized in 1940 on the initiative of the Governor of North Dakota. Portions of this route had been explored for the National Geographic Society by Mr. William H. Albee. This route substantially follows the old Indian trails used by miners in the Klondike gold rush of 1897-99.

Route D or Inside Prairie Route.—Begins at railhead at Peace River, Alberta, and extends northerly through the Peace and Hay River Valleys to Providence at the westerly end of Great Slave Lake; thence northerly following the Mackenzie Valley to the vicinity of Norman Wells oil field; thence westerly across the Mackenzie Mountains through the Gravel River-Stewart River divide to Mayo Landing and Dawson, Yukon Territory; thence westerly to Big Delta. This route was advocated by Dr. Vilhjalmur Stefansson, well-known Arctic explorer and writer. (See his article, *Routes to Alaska*, in *Foreign Affairs*, July 1941).

Route of Alaska Highway.—Begins at railhead at Dawson Creek, British Columbia, and follows route C as far as Watson Lake. Then leaves route C and extends northwesterly to Whitehorse where it joins route A. Follows route A from Whitehorse to Big Delta, Alaska. Thus the first 635 miles of the Alaska Highway follow route C; the next 282 miles are used to cross over from route C to route A at Whitehorse; and the final 511 miles from Whitehorse to Big Delta follow route A.

Air route (Northwest Staging Route).—The air route has its southerly focal point at Edmonton, Alberta. Air traffic from the Middle West and East of the United States flows through Edmonton. From Edmonton the route follows the line of established air bases (which are linked by the Alaska Highway and connecting roads) at Grande Prairie, Fort St. John, Fort Nelson, Watson Lake, Whitehorse, Northway, Tanacross, Big Delta, and Fairbanks. Pacific coast air traffic joins this route at Fort St. John coming in via Prince George, British Columbia. This air route was approved by both Canada and the United States as the military air route from the United States to Alaska pursuant to the tenth recommendation of the Permanent Joint Board on Defense, Canada-United States, adopted on November 14, 1940. Eight flight strips have been constructed adjacent to the Alaska Highway at appropriate points between the established air bases, thus permitting emergency landings and adding to the safety of the air route.

EXHIBIT 2. COMPARATIVE DISTANCES OF VARIOUS ROUTES TO ALASKA

Route A.—Fort St. James, British Columbia, to Big Delta, Alaska—1,344 miles (as estimated by Alaskan International Highway Commission).

Route B.—Prince George, British Columbia, to Big Delta, Alaska—1,306 miles (from Army Railroad Survey).

Route C.—Dawson Creek, British Columbia, to Big Delta, Alaska—1,404 miles (using Alaska Highway and Railroad Survey mileages).

Route D.—Peace River, Alberta, to Big Delta, Alaska—1,700 miles (using known mileage of 1,000 miles on winter road to Norman Wells and scaling remainder of distance on map).

Alaska Highway.—Dawson Creek, British Columbia, to Big Delta, Alaska—1,428 miles (measured).

EXHIBIT 3. EXCERPT FROM ARTICLE IN WASHINGTON HERALD OF MARCH 23, 1933, BY THE LATE BRIG. GEN. WILLIAM MITCHELL

An excellent airway from the United States to Alaska could be established running up the east side of the Rocky Mountains, then down the Yukon Valley to Nome.

Part of this route would be over Canadian territory, but in case of trouble with Japan, Canada's destiny would be the same as ours and her assistance would be freely given.

We can fly up the Pacific coast where the shortest distance from the United States to Alaska is only 500 miles, or about 4 hours' flight; the other route is preferable, as the area behind the Rockies is free from the fog, heavy rains, and snows that occur on the coast.

EXHIBIT 4

WAR DEPARTMENT,
HEADQUARTERS, ARMY AIR FORCES,
Washington, July 29, 1942.

Memorandum for Commanding General, Services of Supply.
Subject: Flight Strips on Alaskan Highway.

1. The various sections of the Army Air Forces Air Transport Command having to do with the movement of bombardment, pursuit and transport airplanes and equipment and supplies into the vital Alaskan theater have urgently requested additional landing facilities along the route of the Alaskan Highway.

2. In view of the increasing importance of Alaska and this supply route through Canada and the lack of landing facilities, it is requested the Chief of Engineers be directed to prepare a program and construct a series of flight strips along the route of the Alaskan Highway.

3. The urgency of our needs leads to the suggestion that inasmuch as the Public Roads Administration is now building flight strips throughout this country and as this agency has already large engineering forces engaged in the construction of the Alaskan Highway, that the Office of the Chief of Engineers prepare this program in cooperation with the Army Air Forces and the Public Roads Administration.

4. There should be constructed immediately not to exceed eight flight strips between Edmonton, Alberta, Canada, and Fairbanks, Alaska. A rough estimate of the cost of these flight strips is an average of \$500,000 each. This would require only \$4,000,000 and would permit the movement of Air Transport Command equipment on a much more dependable basis than is now possible with the present system of airports.

5. The construction season in the areas along this highway is very short and, in view of this, it is urged that a directive be issued immediately on this matter.

L. S. KUTER,
*Brigadier General, United States Army,
Deputy Chief of the Air Staff.*

EXHIBIT 5

ARMY SERVICE FORCES,
OFFICE OF THE COMMANDING GENERAL,
Washington 25, D. C., December 7, 1944.

Memorandum for the Commanding General, Army Air Forces.
Subject: Northwest Staging Route, United States-Canada-Alaska.

1. In connection with evaluation of and future planning for the Alaska Highway, this headquarters desires to obtain an evaluation of the air route to Alaska via Edmonton, Fort St. John, Fort Nelson, Watson Lake, Whitehorse, Northway, Big Delta, and Fairbanks, which route the highway follows.

2. The Air Transport Command has now had over 2 years' experience in flying this route with varied types of planes and has also had some experience in flying other routes in northwestern Canada.

3. It is requested that this headquarters be furnished with a brief report evaluating this route from the standpoint of weather conditions, all-around suitability for the types of planes which have had to be flown over it, and other relevant factors, including its desirability for all-around air operations as compared with such other routes as the Pacific coastal route, the Rocky Mountain "trench route," and the route up the MacKenzie River Valley.

For the commanding general:

W. D. STYER,
*Lieutenant General, United States Army,
Chief of Staff.*

EXHIBIT 6

HEADQUARTERS, ARMY AIR FORCES,
Washington, December 12, 1944.

Memorandum for the Commanding General, Army Service Forces.
Subject: Northwest Staging Route, United States-Canada-Alaska.

1. Reference is made to memorandum, December 7, 1944, from General Styer to this headquarters, subject, Northwest Staging Route, United States-Canada-

Alaska, in which an evaluation is requested of the various air routes to Alaska. The requested information outlined below is based on the experience of pilots who have flown over the various routes and a top secret report by Lt. Gen. Delos C. Emmons, Commanding General, Alaskan Department, October 18, 1944, addressed to the Chief of Staff, subject, North Pacific Development Plan. A copy of this report is on file in the office of the Assistant Chief of Air Staff, Plans, Postwar Division (extension 73498).

2. Briefly stated are pertinent advantages and disadvantages of each of the four routes as requested in referenced memorandum.

ALCAN HIGHWAY AIR ROUTE

Advantages—

- (a) Comparatively good weather permitting frequent contact flights.
- (b) Good communication and weather facilities which assure more reliable weather forecasting.
- (c) Well suited for ferrying present-type aircraft, including small twin-engine and single-engine types, because of the adequacy of airports and facilities, navigational aids, and emergency landing strips.
- (d) Permits use of fuel from the Whitehorse oil refinery.
- (e) Airfields and facilities can be supplied by the Alcan Highway.
- (f) From a pilot's standpoint, it is more advantageous in that crash landings and bail-outs can be made along the route with better chances of personnel survival.

Disadvantages—

- (a) Longer route to the southern coast of Alaska and the Aleutians.
- (b) Extreme low temperatures during the winter months. (Future training and technical developments must insure that low temperatures will not be a handicap to aircraft operation.)

PACIFIC COASTAL AIR ROUTE

Advantages—

- (a) Easy to supply by water.
- (b) Comparatively free from extremely low temperatures.
- (c) Shorter route to the southern coast of Alaska and the Aleutians.

Disadvantages—

- (a) Comparatively poor weather.
- (b) Fewer weather stations and no permanent weather reporting station in the area to the west, from which the air masses flow, with resulting inaccurate weather forecasts.
- (c) Almost impractical for ferrying small twin-engine and single-engine aircraft because of the fact that practically all the route is over water, the greater distance between bases, bad weather, and the small number of alternate landing strips and navigational aids.
- (d) Less chance of personnel survival in case of bail-out or of crash landing.

MACKENZIE RIVER VALLEY AIR ROUTE

Disadvantages—

- (a) Impractical from a supply standpoint.
- (b) Development of this route has been negligible, and consequently it cannot be classified as an established air route.

ROCKY MOUNTAIN "TRENCH ROUTE"

This headquarters and the Air Transport Command do not know of a route by this name; however, it is assumed that this route is via Prince George. Airfields along this route are farther apart, and the weather, navigation, and communication facilities are not as good as along the Alcan Highway air route.

3. In general, the fact that the Alcan Highway air route was chosen in preference to all other routes when the necessity arose for ferrying large numbers of aircraft and transporting large quantities of matériel is an indication of the merits of this route; and its practicability has been proven by the vast volume of air traffic it has accommodated. Its existence has been beneficial to the United States Army Air Forces in training personnel in aircraft operation in extremely low temperatures, which is a factor that must be considered in future planning.

4. In conclusion, it is readily seen from the information above that the Alcan Highway route is the most desirable air route to Alaska; consequently, it is felt

that its installations and facilities including the Alcan Highway should be maintained for future use.

For the Commanding General, Army Air Forces:

L. S. KUTER,
Major General, United States Army,
Assistant Chief of Air Staff, Plans.
JOE L. LOUTZENHEISER,
Brigadier General, United States Army,
Chief, Operational Plans Division

EXHIBIT 7

Number and location of intermediate flight strips on or adjacent to Alaska Highway

UNITED STATES CONSTRUCTION

Flight strip:	Location (in miles north of Dawson Creek)
No. 1 (Dawson Creek).....	Mile 0 (at Dawson Creek).
No. 2 (Sikanni Chief River).....	Mile 137 (between Fort St. John and Fort Nelson).
No. 3 (Prophet River).....	Mile 245 (between Fort St. John and Fort Nelson).
No. 4 (Liard River).....	Mile 508 (between Fort Nelson and Watson Lake).
No. 5 (Pine Lake).....	Mile 723 (between Watson Lake and Whitehorse).
No. 6 (Squanga Lake).....	Mile 843 (between Watson Lake and Whitehorse).
No. 7 (Pon Lake).....	Mile 1013 (between Whitehorse and Northway).
No. 8 (Burwash).....	Mile 1095 (near Burwash Landing on Lake Kluane).

CANADIAN CONSTRUCTION

Combined radio range and flight strip:	Location (in miles north of Dawson Creek)
Beaton River.....	Mile 130 (approximately 40 miles east of this point).
Smith River (Toobally).....	Mile 518 (junction, connecting road).
Teslin.....	Mile 804 (junction, connecting road).
Aishihik.....	Mile 995 (junction, connecting road).
Snag.....	Mile 1189 (junction, connecting road).

EXHIBIT 8. AIRFIELDS AND LANDING STRIPS SERVED BY ALASKA HIGHWAY

U. S. Army program of expansion, 1943-44

Name and type	Location	Beginning date	Completion date
Dawson Creek (landing strip).....	Dawson Creek, British Columbia.	September 1942..	September 1943.
Fort St. John (air base).....	Fort St. John, British Columbia.	July 1943.....	September 1944. ¹
Beaton River (radio range and landing strip; construction by Canada)	Beaton River, British Columbia.	April 1943.....	January 1944.
Sikanni Chief (landing strip).....	Sikanni Chief River, British Columbia.	September 1943..	December 1943.
Prophet River (landing strip).....	Prophet River, British Columbia.	August 1943.....	November 1943.
Fort Nelson (air base).....	Fort Nelson, British Columbia.	July 1943.....	July 1944.
Liard River (landing strip).....	Liard River British Columbia.	October 1943....	January 1944.
Smith River (radio range and landing strip; construction by Canada).	Smith River, British Columbia.	May 1943.....	July 1944.

¹ Additional work authorized; to be done by Canada in spring of 1945.

U. S. Army program of expansion. 1943-44—Continued

Name and type	Location	Beginning date	Completion date
Watson Lake (air base).....	Watson Lake, Yukon Territory.	July 1943.....	July 1946.
Pine Lake (landing strip).....	Pine Lake, Yukon Territory...	August 1943.....	December 1943.
Teslin (radio range and landing strip; construction by Canada).	Teslin, Yukon Territory.....	May 1943.....	July 1944.
Squanga Lake (landing strip).....	Squanga Lake, Yukon Territory.	August 1943.....	December 1943.
Whitehorse (air base).....	Whitehorse, Yukon Territory.	July 1943.....	August 1944.
Pon Lake (landing strip).....	Pon Lake, Yukon Territory...	September 1943.....	January 1944.
Aishihik (radio range and landing strip; construction by Canada).	Aishihik, Yukon Territory.....	May 1943.....	July 1944.
Burwash (landing strip).....	Burwash Landing, Yukon Territory.	August 1943.....	January 1944.
Snag (radio range and landing strip; construction by Canada).	Snag, Yukon Territory.....	May 1943.....	July 1944.
Northway (air base).....	Northway, Alaska.....	July 1943.....	September 1944.
Tanacross (air base).....	Tanacross, Alaska.....	do.....	August 1944.
Big Delta (air base).....	Big Delta, Alaska.....	do.....	September 1944.
Mile 26 Field (satellite field).....	Near Fairbanks, Alaska.....	August 1943.....	June 1945. ¹
Ladd Field (air base).....	Fairbanks, Alaska.....	August 1939.....	(2)
Weeks Field (municipal airport).....	do.....	(4)	(5)

¹ Estimated date of completion.

² Important program of expansion under way; will not be completed until sometime this summer.

⁴ A municipal airfield; construction accomplished by the city of Fairbanks; dates when construction undertaken and completed not available from local sources.

APPENDIX F

(Chapter VI)

	Exhibit	Exhibit
Memorandum for the Chief of Staff from the War Plans Division, dated February 6, 1942.....	1	Directive from Assistant Chief of Engineers to Col. W. M. Hoge, dated March 3, 1942, assigning responsibility to Colonel Hoge for preliminary construction work on the Alaska Highway.....
Immediate action directive from the Adjutant General for the Secretary of War to the Chief of Engineers, dated February 14, 1942.....	2	Letter from Assistant Chief of Engineers to Colonel Hoge, dated April 24, 1942, notifying latter officer of division of responsibility for construction of the Alaska Highway.....
Letter from the President to the Secretary of the Treasury, dated March 3, 1942, authorizing transfer of funds from the emergency fund for the President to the War Department for expense connected with, or incident to, the construction of the Alaska Highway.....	3	Total tonnage required for construction of Alaska Highway (source, memorandum from Office of Chief of Engineers to Under Secretary of War, December 9, 1943).....
List of troop units engaged on Alaska Highway Construction (source, War Department files).....	4	Chart showing obstacles to travel on Alaska Highway in summer of 1943, prepared by engineering staff of Public Roads Administration.....
General specifications and requirements for the construction of the Alaska Highway (source, War Department files).....	5	Alaska Highway Construction Progress Chart, prepared by War Department.....
Correspondence of War Department and Public Roads Administration, Federal Works Agency, relative to work on construction assigned by War Department to Public Roads Administration (source, files of War Department and Public Roads Administration).....	6	Three maps showing relation between pioneer road and proposed relocation of final-type road suggested by Public Roads Administration (source, Public Roads Administration files).....

EXHIBIT 1

WAR DEPARTMENT,
WAR DEPARTMENT GENERAL STAFF,
WAR PLANS DIVISION,
Washington, February 6, 1942.

Memorandum for the Chief of Staff.
Subject: International Highway.

I. Discussion

1. At a meeting of the Secretary of War, Secretary of the Navy, and Secretary of the Interior February 2, 1942, the question of the International Highway was discussed and decisions made as follows (tab A):

(a) To obtain surveys of the route by the Corps of Engineers.

- (b) To obtain surveys of available road-building equipment.
 - (c) To accomplish 1 (a) and 1 (b) before the spring thaw.
 - (d) General Crawford (War Plans Division) was directed to report by February 9, 1942, in regard to 1 (a) and 1 (b) above.
2. The Chief of Engineers in memorandum February 4, 1942, advises that after conference with and concurrence of the Commissioner, Public Roads Administration, the following outline of a plan for construction of a supply road to Alaska is submitted (tab B):
- (a) *Survey*.—
 - (1) Sufficient maps are now available north of Whitehorse to permit Public Roads Administration to locate road.
 - (2) Planimetric maps of route south of Whitehorse will be available in 6 weeks or less.
 - (3) Company D, Twenty-ninth Engineer Battalion (topographic), will locate road south from Whitehorse; and Company A, Six Hundred and Forty-eighth Engineer Battalion (topographic), north from Fort St. John.
 - (b) *Construction*.—Four Engineer regiments (combat or general service) and two light ponton companies will construct a pioneer-type road as follows:
 - (1) Eighteenth Engineers (combat), with Seventy-third Engineer Company (light ponton), from Whitehorse north, April 1.
 - (2) Three hundred and Fortieth Engineers (new general service) from Whitehorse south, May 1.
 - (3) Thirty-fifth Engineers (combat), with Seventy-fourth Engineer Company (light ponton) to make winter march with equipment and supplies to Fort Nelson before the spring thaw and work north from Fort Nelson after the thaw.
 - (4) Three Hundred and Forty-first Engineers (new general service), north from Fort St. John, May 1.
 - (c) Contractors furnished by Public Roads Administration will follow Engineer troops, improving road to authorized standard.
 - (d) Public Roads Administration advises sufficient road-building equipment is available for their use; the Chief of Engineers has enough for troops.

II. Action recommended

The Secretary of War directs that:

1. Construction of pioneer-type road from Fort St. John to Big Delta, Alaska, be performed by Engineer troops.
2. The following Engineer units be placed at disposal of Chief of Engineers, upon his request:
 - Eighteenth Engineer Regiment (combat).
 - Thirty-fifth Engineer Regiment (combat).
 - Seventy-third Engineer Company (light ponton).
 - Seventy-fourth Engineer Company (light ponton).
 - Company D, Twenty-ninth Engineer Battalion (top) (General Headquarters).
 - Company A, Six Hundred and Forty-eighth Engineer Battalion (top) (Army).
3. The Eighteenth and Thirty-fifth Engineer Regiments (except survey and ponton companies) will form cadres for new general service units and submit requisitions for replacements.
4. Following units be activated March 1942:
 - Three Hundred and Fortieth Engineer Regiment (general service), Vancouver Barracks, Wash.
 - Three Hundred and Forty-first Engineer Regiment (general service), Fort Ord, Calif.
5. Necessary arrangements be made with Canadian Government through the Permanent Joint Board, Canada-United States defense.
6. Budget, Legislative, and Planning Branch take necessary steps to secure an initial allotment of \$10,000,000 from the President's emergency fund. These funds are to be allotted to the Chief of Engineers, with authority to make sub-allotments to the Public Roads Administration.
7. Funds to complete construction be included in future estimates.
8. The Chief of Engineers be advised of action above.

III. Concurrences

Assistant Chief of Staff (G-3).
Assistant Chief of Staff (G-4).

L. T. GEROW,
*Brigadier General,
Assistant Chief of Staff.*
R. W. CRAWFORD,
Brigadier General, General Staff Corps.

Approved February 6, 1942.
By order of the Secretary of War:

G. C. MARSHALL,
Chief of Staff.
By R. N. YOUNG,
*Lieutenant Colonel, General Staff Corps,
Assistant Secretary, War Department General Staff.*

Noted: Chief of Staff.

February 11, 1942, Mr. Schott, office, Secretary of War, telephoned, at 2:45 p. m., the following message: "I have discussed this matter with the President, and he approves. You are authorized to immediately proceed with the project. The President has some suggestions, which he will transmit to you later. These, however, will not interfere with immediate commencement of the project."

R. W. CRAWFORD,
Brigadier General, General Staff Corps.

EXHIBIT 2

WAR DEPARTMENT,
The ADJUTANT GENERAL'S OFFICE,
Washington, February 14, 1942.

Subject: International Highway.
To: Chief of Engineers.

1. It is desired that you undertake the construction, with Engineer troops, of a pioneer type road from Fort St. John, Canada, to Big Delta, Alaska, via Fort Nelson, Canada, Watson Lake, Canada, Whitehorse, Canada, and Boundary, Alaska. It is further desired that you arrange with the Public Roads Administration to follow the Engineer troops, to correct alinement and grade, construct permanent bridges and culverts, and provide for the completion of the project.

2. Necessary action to obtain diplomatic approval of this project by the Canadian Government has been initiated by the Permanent Joint Board on Defense, Canada-United States. The actual movement of troops into Canada, except for survey parties and advance detachments, for this purpose may not be initiated until you have received formal notification of this approval.

3. Separate action is being taken to make troops available to you for this purpose.

4. The Quartermaster General is being directed to—

Supply arctic clothing to the Thirty-fifth Engineers, the Seventy-fourth Engineer Company (light pontoon), Company A, Six Hundred and Forty-eighth Engineers (topographic), and the detachments accompanying the Fort Nelson force.

Supply special rations which will withstand freezing to the above listed troops.

Replace all motorcycles of all Engineer units engaged on this project with $\frac{1}{4}$ -ton trucks (4 by 4).

Direct arrangements between your office and the Office of the Quartermaster General are authorized.

5. The budget officer for the War Department has initiated necessary action to obtain an allotment of \$10,000,000 from the President's emergency fund for the initiation of this work. These funds will be allotted to you with authority to make suballotments to the Public Roads Administration. You are authorized to include funds in future estimates to provide for completion of this project.

By order of the Secretary of War:

JOSEPH L. CLARK, *Adjutant General.*

EXHIBIT 3

THE WHITE HOUSE,
Washington, March 3, 1942.

The Honorable, The SECRETARY OF THE TREASURY.

MY DEAR MR. SECRETARY: By virtue of the authority vested in me by the provisions of the appropriation entitled "Emergency Fund for the President," contained in the Independent Offices Appropriation Act, 1942, approved April 5, 1941, I hereby allocate from the sum of \$100,000,000 provided by said appropriation as follows: War Department, \$10,000,000.

To be expended by the Secretary of War for each and every purpose connected with or incident to the construction of an international highway between the United States and the Territory of Alaska, by way of the Dominion of Canada, and such roads collateral thereto as the Secretary of War may deem desirable; such funds to be expended without regard to the provisions of sections 355 and 3709 of the Revised Statutes, the civil service and classification laws, or the limitations or requirements of existing law with respect to the employment of aliens, rentals, alterations, improvements, and repairs of buildings, purchases from the General Schedule of Supplies, the purchase, maintenance, operation, upkeep, and repair of passenger-carrying vehicles, printing, binding, blankbook work and envelopes, and the products of prison and blind labor: *Provided*, That the funds hereby allocated may be used for housing, travel, and transportation of military personnel but not for their pay, subsistence, or other maintenance charges.

Please arrange for the necessary transfer of funds and advise the Secretary of War when this has been done.

Sincerely yours,

FRANKLIN D. ROOSEVELT.

EXHIBIT 4

Troop units engaged on Alaska Highway construction

Unit	Date of arrival	Date of departure or completion of Alcan Highway construction	Strength	
			Officers	Enlisted men
1. Eighteenth Engineer Regiment (C).....	April 1942 ...	January 1943 ..	55	1,459
2. Company D, Twenty-ninth Engineer Battalion (top).....	.....do.....	February 1943 ..	5	186
3. Thirty-fifth Engineer Regiment (GS).....	March 1942 ..	.....do.....	46	1,230
4. Clearing Platoon, Company D, Fifty-eighth Medical Battalion.....	.....do.....	.....do.....	5	54
5. Seventy-third Engineer Company (LP).....	April 1942 ..	.....do.....	6	215
6. Seventy-fourth Engineer Company (LP).....	March 1942 ..	June 1943 ..	10	328
7. Ninety-third Engineer Regiment (GS).....	April 1942 ..	January 1943 ..	46	1,250
8. Ninety-fifth Engineer Regiment (GS).....	June 1942 ..	February 1943 ..	45	1,228
9. Ninety-seventh Engineer Regiment (GS, colored).....	April 1942 ..	.....do.....	51	1,227
10. Three Hundred and Fortieth Engineer Regiment (GS).....	.....do.....	May 1943 ..	46	1,260
11. Three Hundred and Forty-first Engineer Regiment (GS).....	May 1942 ..	July 1943.....	43	1,146
12. Four Hundred and Twenty-eighth Engineer Company (DT).....	July 1942 ..	January 1943 ..	4	118
13. Company A, Six Hundred and Forty-eighth Engineer Battalion (top).....	March 1942 ..	November 1942 ..	8	270
DETACHMENTS SERVICING ABOVE ORGANIZATIONS CONSTRUCTING HIGHWAY				
Signal Detachment B, Fort St. John, British Columbia.....	May 1942 ..	February 1943 ..	.....	16
Signal Detachment H, Dawson Creek.....	April 1942 ..	.....do.....	.....	4
Signal Detachment D, Charlie Lake.....	May 1942 ..	.....do.....	.....	15
Signal Detachment I, Dawson Creek.....	June 1942 ..	.....do.....	.....	16
Signal Detachment I, Whitehorse.....	April 1942 ..	.....do.....	.....	16
Finance Detachment, Dawson Creek.....	March 1942 ..	.....do.....	1	10
Finance Detachment, Whitehorse.....	April 1942 ..	.....do.....	1	10
Quartermaster Detachment, Dawson Creek.....	March 1942 ..	.....do.....	.....	.....
Quartermaster Detachment, Fort St. John.....	.....do.....	.....do.....	.....	.....
Quartermaster Detachment, Fort Nelson, British Columbia.....	.....do.....	.....do.....	5	127
Quartermaster Detachment, Whitehorse.....	April 1942 ..	.....do.....	2	84
Quartermaster Detachment, Carcross.....	.....do.....	.....do.....	1	5

Troop units engaged on Alaska Highway construction—Continued

Unit	Date of arrival	Date of departure or completion of Alcan Highway construction	Strength	
			Officers	Enlisted men
14. One Hundred and Thirty-third Quartermaster Truck Company.	August 1942.	May 1943.....	4	120
15. One Hundred and Thirty-fourth Quartermaster Truck Company.	July 1942.....	.....do.....	4	120
16. One Hundred and Fortieth Quartermaster Truck Company.	April 1942.....	.....do.....	3	123
17. One Hundred and Forty-first Quartermaster Truck Company.	July 1942.....	.....do.....	3	114
Total.....	.....	.....	394	10,756

PART II. MISSIONS

1942

1. Eighteenth Engineer Regiment (GS). Construction of highway from Whitehorse to Canada-Alaska border.
2. Company D, Twenty-ninth Engineer Battalion (top.). Road location; final survey of completed road (northern section).
3. Thirty-fifth Engineer Regiment (GS). To construct highway from Fort Nelson to Watson Lake.
4. Clearing Platoon, Company D, Fifty-eighth Medical Battalion. To provide medical treatment to all organizations engaged in highway construction. Deployed over entire length of highway.
5. Seventy-third Engineer Company (LP). To assist regiments in all water crossings and in ferrying operations until permanent bridges were installed.
6. Seventy-fourth Engineer Company (LP). Do.
7. Ninety-third Engineer Regiment (GS). To construct highway from Tagish north to McClintock River and east and southeast toward Teslin.
8. Ninety-fifth Engineer Regiment (GS). To follow Three Hundred and Forty-first Engineer Regiment and improve the road built by that regiment from Fort St. John to Fort Nelson.
9. Ninety-seventh Engineer Regiment (GS). To construct highway from Slana northward to Tanana River.
10. Three Hundred and Fortieth Engineer Regiment (GS). To construct highway from Teslin eastward to Watson Lake.

1943

- Do..... To construct pilot road from junction of Alcan Highway and proposed Haines cut-off road to Haines Point, Alaska; maintenance and operation of all stream crossings between Whitehorse, Yukon Territory, and Big Delta, Alaska.

1942

11. Three Hundred and Forty-first Engineer Regiment (GS). Road construction from Fort St. John to Watson Lake.

1943

- Do..... Maintenance and operation of all stream crossings located between Dawson Creek and Whitehorse, including all necessary repairs and construction of all bridges.

1942

12. Four Hundred and Twenty-eighth Engineer Company (DT). Attached to regiments to provide gravel-hauling equipment.
13. Company A, Six Hundred and Forty-eighth Engineer Battalion (top.). Reconnaissance and survey.
- Signal, finance, and quartermaster detachments. To service those units actively engaged in construction.
14. One Hundred and Thirty-third Quartermaster Truck Company. Supply engineer regiments from Dawson Creek railhead.
15. One Hundred and Thirty-fourth Quartermaster Truck Company. Operate supply train from the railhead at Carcross to the regimental supply offices of the Ninety-third Engineers at Squanga Lake and at Morley Bay, and of the Three Hundred and Fortieth Engineers also at Morley Bay.
16. One Hundred and Fortieth Quartermaster Truck Company. Supply engineer regiments from Dawson Creek railhead.
17. One Hundred and Forty-first Quartermaster Truck Company. Supply the Eighteenth Engineer Regiment from the railhead at Whitehorse, Yukon Territory.

PART III. SPECIAL EQUIPMENT

In addition to normal T/BA, certain special engineer equipment was assigned the Eighteenth, Ninety-third, Ninety-fifth, and Three Hundred and Fortieth Engineer Regiments as follows:

D-8 caterpillar bulldozers.....	20
Extra D-4 caterpillar bulldozers.....	10
Half-cubic-yard shovels.....	3
LaTourneau 12-yard carry-alls.....	6
Adams leaning-wheel graders.....	6
Rooters.....	6
Galion road graders.....	3
Additional caterpillar leaning-wheel graders.....	6

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, November 2, 1945.

Mr. DAN W. EASTWOOD,
Chief Investigator, Roads Committee,
House of Representatives, Washington 25, D. C.

DEAR MR. EASTWOOD: In accordance with your telephonic request of October 31, 1945, the following information is submitted:

The construction of the Alaska Highway was under the supervision of the Office, Chief of Engineers, with Brig. Gen. Clarence L. Sturdevant in immediate charge. By orders dated March 3, 1942, Brig. Gen. William M. Hodge was placed in command of the Provisional Engineer Brigade which was assigned the job of constructing the pioneer road. General Hodge reported directly to the Office, Chief of Engineers. In the latter part of May 1942, due to the extent of operations and the difficulty of communications, the field command was divided into two sectors—the Whitehorse sector, extending from Big Delta to Watson Lake; and the Fort St. John sector, extending from Dawson Creek to Watson Lake, General Hodge was placed in command of the Whitehorse sector and Gen. J. A. O'Connor was placed in command of the Fort St. John sector. In September 1942, the Northwest Service Command was created with headquarters at Whitehorse, and placed under the command of General O'Connor. A division engineer was placed in charge of all construction within the command. During the latter part of 1942, and until March 1943, the division engineer was Col. Theodore Wyman, Jr. On April 3, 1943, General Worsham replaced Colonel Wyman as division engineer. No other important changes were made in the organization until after the highway was completed.

The mission of the Northwest Service Command was as follows:

(a) The commanding general, Northwest Service Command, was responsible for and had the same powers and authorities as conferred upon commanding generals of service commands in the United States so far as they apply to activities of the Army of the United States in the Provinces of British Columbia and Alberta, and the Territories of Yukon and Mackenzie, Canada.

(b) The commanding general, Northwest Service Command, was additionally charged with the operation and supply activities connected with the White Pass and Yukon Railway, the highway from Whitehorse to Fairbanks in Alaska, and base installations in Skagway and Fairbanks, Alaska.

(c) Construction in the Northwest Service Command was executed by the Chief of Engineers through the commanding general, Northwest Service Command, who controlled the activities of the division engineer, Northwest Division.

(d) The primary mission of the commanding general of the Northwest Service Command was the direction and coordination of supply activities over highways, railways (exclusive of the Alaska Railway), inland waterways, airfields, and pipe lines for the supply of United States forces and personnel under the jurisdiction of the commanding general, Northwest Service Command, in western Canada and Alaska, and for such other forces and personnel as was designated by proper authority, together with the coordination of all construction necessary to such supply activities and authorized by the commanding general, Army Service Forces.

For the Chief of Engineers:

R. J. HAFNER,
Lieutenant Colonel, Corps of Engineers,
Acting Executive Officer, Office, Director of Military Construction.

EXHIBIT 5. GENERAL SPECIFICATIONS AND REQUIREMENTS

1. *Description.*—The road to be built will consist of a gravel or crushed stone surface 24 feet in width, with dust preventative treatment where and when practicable. The gravel surface will be flanked by shoulders and drainage ditches as shown on the approved plans and provided with cross drains and culverts as required for passing surface drainage under the road.

2. *Location.*—(a) *General:* In general, the location shall be such as to balance cuts and fills within economical limits of haul wherever practicable, except that embankments may exceed cuts where suitable embankment material is available within reasonable haul.

(b) *Height of embankment:* In low ground the embankment shall be such that the subgrade of the highway will be not less than 2 feet above the adjacent terrain.

(c) *Horizontal curves:* Horizontal curves shall in general not be sharper than 6°, (955 feet radius) and in no case sharper than 8° (717 feet radius) without consideration and approval by the division engineer. The roadway on curves sharper than 6° shall be increased in width by 2 feet on the inside of the curve. All curves shall be laid out with transition curves at each end, and superelevation shall be given to the outside edge of the road surface, with a maximum value of 0.10 feet per foot of width for curves of 6 to 8°.

(d) *Gradients:* Sustained gradients shall be limited to 3 percent wherever practicable, and no gradients exceed 1,000 feet in length shall be greater than 7 percent. All changes in gradient shall be made with vertical curves.

(e) *Sight distance:* At all curves both horizontal and vertical, a minimum sight distance of 1,000 feet shall be maintained if practicable. In no case shall the sight distance be less than 600 feet, without prior approval of the division engineer.

(f) *Warning signs:* Warning signs shall be erected at curves sharper than 6°, and "no passing" signs shall be erected wherever the sight distance is less than 1,000 feet.

3. *Section in cut.*—Road sections in cut shall be as shown on the approved plans, with gravel surface 24 feet wide, shoulders 3 feet to 6 feet wide, and adequate ditches. Slope from edge of shoulder to bottom of ditch shall be not less than three horizontal to one vertical.

4. *Section in fill.*—(a) *Section:* Road section in fill shall be as shown on the approved plans, with gravel surface 24 feet wide, shoulders 6 feet wide, and embankment slopes not less than 1½ horizontal to 1 vertical.

5. *Shoulders.*—Stabilize shoulders as indicated by the approved plans.

6. *Subgrade and base course.*—The combined supporting power of the subgrade and base course or base courses shall be sufficient to support a load of 10,000 pounds per wheel under all weather conditions. The base course shall be at least 12 inches in compacted depth and shall consist of durable, well graded crushed or screened gravel or stone unless a lesser depth is approved by the division engineer or his authorized representatives. The lower 6 inches to 8 inches of the base course shall meet the requirements, and shall be constructed in accordance with items 52, 52A, 55, or 56 of Specifications for Construction of Roads and Bridges in National Forests and National Parks, Revised July 15, 1941, Federal Works Agency, Public Roads Administration, as called for on the approved plans.

The upper 4 to 6 inches shall meet the requirements and shall be constructed in accordance with items 100, 101, or 102 of the same specifications.

When and where practicable a bituminous treatment shall be applied, meeting the requirements of items 112, 113, or 114, as shown on the approved plans.

Selected ballast or subgrade material shall be placed to depths shown on the approved plans and shall be obtained from sources shown on the approved plans, or approved by the division engineer or his authorized representative.

Deviations from the above specifications will require the approval of the division engineer or his authorized representative.

7. *Drainage.*—Provisions for drainage shall be in accordance with the approved plans, or as required and directed by the division engineer or his authorized representative. Such provisions shall include culverts for existing streams, pipe, culverts, or ditches to drain low points in side ditches, channel changes in existing streams, ditches at top of or on sides of cuts, dumped stone or riprap protection of ditches and at inlets and outlets of culverts, and other related work.

The gradients of all side drains shall be sufficient to provide natural drainage. Outfall ditches shall be constructed where necessary to prevent roadside accumulation of water.

8. *Materials.*—Local materials will be utilized in the construction wherever practicable.

JULY 3, 1943.

GENERAL SPECIFICATIONS AND REQUIREMENTS FOR THE CONSTRUCTION OF THE ALASKA MILITARY HIGHWAY

1. *General*

(a) (1) The following text sets forth the general specifications and requirements for the construction of the Alaska Military Highway between Dawson Creek, British Columbia, and Big Delta, Alaska, during the year 1943. This text supercedes the provisions of all previous specifications issued concerning construction or improvements of the Alaska Military Highway for work to be performed after this date.

(2) The construction work will be performed by civilian contractors under the direct supervision of the Public Roads Administration, and under the general supervision of the division engineer, USED, northwest division, Edmonton, Alberta, Canada.

(3) The work to be accomplished is the construction and improvement of a military road as set forth in OCE Directive Consecutive No. F-2, Subject: Alcan Highway, dated May 20, 1943. Any provisions of these specifications that do not agree with the above directive are automatically null and void.

(4) The location and standard of design for the Alaska Military Highway will be determined in every instance by the division engineer, northwest division, or his authorized representative and transmitted to the operating contractor through the Public Roads Administration.

(5) The typical cross sections attached to and made a part of these specifications are to be considered a guide section rather than a mandatory one.

2. *Description*

(a) (1) The road to be constructed shall be suitable for year-round operation of military traffic with a maximum speed of 40 miles per hour.

(2) Roadbed width: The maximum roadbed width will be 26 feet extending from outside shoulder line to shoulder line. The road surface will provide for two lanes of traffic, and the surfacing material shall be placed to a width of 20 to 22 feet.

(3) Gradients: The road will be constructed with maximum gradients not to exceed 10 percent. All changes in gradients shall be made with vertical curves.

(4) Curvature and sight distance: Maximum horizontal curves shall be determined by economical construction. Sight distance provided shall normally be a minimum of 300 feet except in mountainous country where the minimum sight distance requirements cannot be economically obtained.

(5) Superelevation and extra shoulder width will be required on all horizontal curves, 6° and sharper unless otherwise directed. The roadway and surfacing on curves 6° and sharper shall be increased in width by a minimum of 2 feet on the inside of the curve. The following table has been established for widening on curves:

Radius of curvature—feet:	Widening—feet
Up to 249.....	4.0
250 to 299.....	3.5
300 to 349.....	3.0
350 to 399.....	2.5
400 and over.....	2.0

Superelevation shall be given to the roadway as required for a 40 m. p. h. vehicle speed, with a maximum value of 0.10 feet per foot of width for curves of 6° and sharper.

(6) Warning signals shall be placed at all locations that present hazards to the normal flow of traffic as directed.

3. *Earthwork*

(a) (1) Clearing and grubbing shall be as directed. Vegetable matter, moss covered areas, brush and corduroy logs shall be left in place, or applied at such points where stabilization or insulation is required. When directed, timber cut from the right-of-way will be saved for construction of timber bridges, culverts, or any other construction designated.

(b) (1) Roadway and drainage excavation shall conform to the typical sections where practicable. Modifications may be made to suit field conditions.

(2) Drainage: Adequate roadside and cross drainage will be provided to suit the various and particular sections of the road. The amount and type of drainage necessary will be determined in the field based upon climatic, topographic, and soils conditions.

(c) (1) Unclassified excavation for structures shall consist of the necessary excavation for bridge foundation, pipe and box culverts, according to the requirements of structures shown on the plans or as directed. All excavation shall be done in such a manner that the surface to receive masonry or concrete shall not be disturbed. Loose and disintegrated rock or thin strata must be removed. Excavated material shall be utilized, so far as suitable for backfill or embankment.

(d) (1) Borrow shall consist of approved material excavated from borrow pits when sufficient quantities of suitable material are not available from roadway excavation. The borrow pits shall conform with lines, grades, and dimensions shown on the plan or as directed. Borrow pit material shall be varied according to the various locations or the manner in which it shall be utilized.

(e) (1) Overhaul of materials shall only be undertaken when and as directed. Overhaul shall be kept within approved economical limits.

(f) (1) Embankments shall be constructed in accordance with the approved plans or as directed. The embankments shall be formed of material excavated from the roadway and/or borrow as directed.

(g) (1) Shoulders shall be stabilized with gravel or crushed rock as shown on the approved plans or as directed.

(h) (1) Backfill for structures other than pipe culverts: Material shall be selected from excavation or borrow; frozen material, muskeg, or material containing excessive vegetable matter shall not be used. No backfilling is to be placed against any abutment, wingwall, or culvert until permission is given. All filling adjacent to structures shall be made in 6-inch layers, with due regard to the safety of the structure. Compaction shall be achieved by the best approved method available, and no drop hammers or similar equipment may be used. Jetting of fills and/or hydraulic methods involving liquid pressure are not to be employed within two and one-half times the height of the abutment or wall, unless prior approval is secured.

(i) (1) Backfill and placement of pipe culverts shall include the preparing of bedding for pipes, backfilling to level 8 inches above the pipe and backfilling to ground surface. All material to be selected from excavation or borrow, of quality specified in paragraph 3 (h) (1).

(2) Trenches shall be of proper size to provide adequate side support. The trench bottom should provide a firm but slightly yielding foundation uniformly along the pipe and a slight camber should be provided for settlement in the longitudinal direction.

(3) Bedding shall be shaped and fitted to receive the pipe surface and any rocks or ledges shall be removed below grade. When rock or other materials must be removed, a compacted earth cushion shall replace it to a thickness of one-half inch per foot height of fill over the top of the pipe, with a minimum depth of 8 inches.

(4) Backfilling shall consist of placing selected material beside the pipe in 6-inch layers to a minimum height of 8 inches above the pipe. The material shall be compacted in a satisfactory manner. The remainder of the fill shall then be placed.

(j) (1) Disposal of surplus materials shall include waste materials and rock brought to the surface by scarifying. Disposal shall be accomplished by widening embankments and by flattening slopes or depositing in places as directed.

(k) (1) Preparation of new subgrade shall be performed in a satisfactory manner. The top layer of material required to bring the embankment to subgrade elevation shall be a variable depth of select material as designated. Until the subgrade has been approved, no base course, surface course, or pavement shall be laid.

4. Surface course

(a) (1) A surface course of local materials, gravel, or crushed stone for a depth of 3 inches shall be placed upon the base course in accordance with the typical sections, as directed. The material shall be spread from moving vehicles, equipped to distribute the material in a uniform layer. The material shall be thoroughly mixed but shall not be watered during mixing unless directed. Rolling will not be required, but distribution shall be carried on in a direction away from the source, and trucks shall compact the material by using the entire width of the surface when hauling.

5. Base course

(a) (1) The base course shall consist of a variable-depth layer of local material, gravel, or crushed stone necessary to support military traffic loads, placed on the subgrade in accordance with the typical sections or as directed. The material used for the construction of the base course shall be uniformly graded to include sufficient binder and shall be a free draining, stable, base course. Normally the base course shall only be compacted by traffic and equipment moving over it.

6. Structures

(a) (1) Bridges: New bridges will in general provide two lanes for traffic and have a clear width not to exceed 24 feet. Existing bridges of adequate capacity and durability should not be replaced, even though they are of less than two-lane width. New timber bridges will have a capacity of H-15; new steel bridges, a capacity of H-20. All bridges, both timber and steel, shall be constructed according to the approved plans and specifications, or as directed. Sound timber cut from the right-of-way may be used if it meets the requirements as to size, length, and strength as directed.

(b) (1) Log culverts shall be constructed in accordance with the approved plans and specifications, or as directed. All materials shall be sound timber and may be cut from the right-of-way if it meets requirements as to size, length, and strength. All fastenings shall be of sufficient quality to hold the structure rigid.

(c) (1) Dry rubble masonry shall consist of stone masonry laid without mortar and constructed on the approved foundation bed as shown in approved plans or as directed. All stone shall be clean, hard, and durable, and completed structure shall be of ample size and properly proportioned to fulfill the drainage requirements. Stone secured from roadway excavation may be used if satisfactory.

(d) (1) Cement rubble masonry shall consist of stone masonry laid with cement mortar joints. All rubble masonry shall conform to the approved plans and be placed as directed. Stone shall be clean, hard, and durable. Sand and portland cement mortar shall conform to Standard Federal Specifications and be proportioned as follows: One part portland cement to two or three parts sand. Stone secured from roadway excavation may be used if satisfactory.

(e) (1) Culvert pipe shall be installed where shown on the approved plans and/or as directed. Installation shall conform with part 3 (i) (1) of these specifications.

7. Incidental construction

(a) (1) Piling shall conform to the approved plans and specifications. All piles shall be driven true to line and to the penetration required to develop bearing. Depth of penetration shall be as directed. Unless required by special condition, all piling shall be untreated native timber, cut from sound trees of the required size, strength, shape, and length. Usual specifications as to quality, preparation, and driving shall be used.

(b) (1) Riprap or loose riprap shall be constructed of heavy, hard, angular stone at locations indicated.

(c) (1) Timber and log cribbing shall be constructed from timber or log members as shown on the approved plans. All cribbing shall conform to line grade and dimensions shown on the plans and unless otherwise directed shall be cut from local materials or timber. Timber shall conform with the required size, shape, length, and strength. All fastenings shall be good quality and adequate to hold the structure rigid. When sawed timbers are used, the fastening shall be made with drift bolts of three-fourths-inch diameter and length sufficient to extend through two tiers plus 4 inches in the third tier, or other suitable means.

(2) Ties shall have sufficient length to develop the required anchorage against overturning and in no case shall the length extending into the fill be less than two-thirds of the height of fill above the tie in question. Ties shall be framed to the face walls by dovetailing or similar jointing, and ties at fill ends shall be anchored to crosspieces with drift bolts or other suitable means. Ties shall be spaced a maximum of 8 feet center to center in any horizontal tier and shall be staggered with the next tier of ties. Tiers of ties shall be not more than 3 feet apart vertically.

(3) Filling of the interior of the crib shall progress simultaneously with the erection of the crib or be placed in even, horizontal layers, later tamped and consolidated.

(d) (1) Timber guide posts shall be furnished and installed at the locations selected and shall be fitted with warning reflectors where necessary. Material and depth of embedment shall be as directed.

(e) (1) Wood guardrail shall be native timber.

(2) Sawed posts and rails shall be of the grade specified on the plans. Railing shall be of sufficient length to span two panels, and shall have a minimum diameter of 9 inches, and shall be bolted to the posts.

(3) Posts shall be set vertically to the depth shown on the plans and be maintained in alignment while being backfilled. Backfilling shall be tamped in around posts in layers. Posts shall be cut off, after backfilling to grade and sloped or leveled as called for in plans. Posts shall be shaped or notched as called for on the plans to provide a suitable surface for railing.

EXHIBIT 6

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 6, 1942.

Brig. Gen. P. B. FLEMING,
*Administrator, Federal Works Agency,
Washington, D. C.*

MY DEAR GENERAL FLEMING: The War Department has directed the Chief of Engineers to construct a road to be known as the Canadian-Alaskan Military Highway from Dawson Creek, Alberta, to Alaska. The proposed route will follow generally the line of established airfields, to include Fort St. John, British Columbia; Fort Nelson, British Columbia; Watson Lake, Yukon; Whitehorse, Yukon; Boundary, Alaska; and Big Delta, Alaska.

The War Department requests the services of the Public Roads Administration to cooperate with the War Department in the location and construction of this highway. In carrying out this plan it is proposed to turn over in advance to the Public Roads Administration for expenditure such funds as it may need from time to time.

It is desired at this time that the officials of the Public Roads Administration be given your authority to undertake the engineering, the letting of contracts and supervising of the work to be performed, either by contract or day labor, and to confer with the Chief of Engineers and his representatives so that the necessary details may be arranged.

Your approval is requested at your earliest convenience.

Sincerely yours,

E. REYBOLD,
*Major General,
Chief of Engineers.*

FEDERAL WORKS AGENCY,
Washington, March 6, 1942.

Maj. Gen. E. REYBOLD,
*Chief of Engineers, War Department,
Washington, D. C.*

MY DEAR GENERAL REYBOLD: Immediately upon receipt of your request for the services of the Public Roads Administration for the construction of the Canadian-Alaskan Military Highway, the attached authority was dispatched to the Public Roads Administration authorizing them to take any measures which the construction of that highway requires.

Sincerely yours,

BAIRD SNYDER, *Acting Administrator.*

FEDERAL WORKS AGENCY,
Washington, March 6, 1942.

Interoffice memorandum.

To: Mr. T. H. MacDonald.

From: Baird Snyder, Acting Administrator.

Subject: Authority for Construction of Canadian-Alaskan Military Highway.

Pursuant to our request from Major General Reybold, Chief of Engineers of the United States Army, you are hereby authorized on behalf of the Federal Works Administrator to undertake any measures which the construction of the Canadian-Alaskan Military Highway shall require.

Without further authorization, you are hereby authorized to undertake the engineering, acquisition of land, with the assistance of the general counsel, letting

of contracts, supervision of work to be performed either by contract or day labor, and to confer with the Chief of Engineers and his representatives for the further development of the details of the project.

The above specific authorities are given without limitations against undertaking any other responsibility not specifically mentioned.

FEDERAL WORKS AGENCY,
PUBLIC ROADS ADMINISTRATION,
Washington, March 4, 1942.

Brig. Gen. CLARENCE L. STURDEVANT,
Office of the Chief of Engineers, Washington, D. C.

DEAR GENERAL STURDEVANT: With reference to our recent discussions concerning the survey, construction, and improvement of a land route from the United States through Canada to connect with the highway system of Alaska, the Federal Works Administrator has authorized the Public Roads Administration to cooperate with the Office of the Chief of Engineers in this undertaking. The purpose of this letter is to outline for your consideration, and confirmation if you approve it, the general terms and conditions under which the joint enterprise should go forward.

A. The Public Roads Administration will make available its facilities and personnel, and agrees:

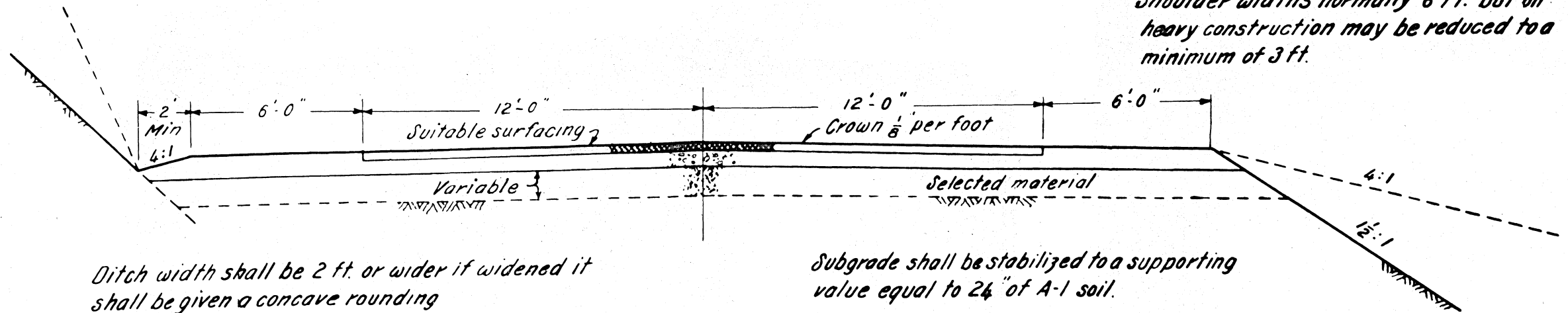
1. To make the necessary reconnaissance surveys for the purpose of determining the general routing of the highway between the control points from United States through Canada and to Alaska.
2. To prepare plans, specifications, and estimates for the construction of the road on the location finally decided upon. The specifications shall be prepared as far as practicable, along the lines of the "Specifications for Construction of Roads and Bridges in National Forests and National Parks, 1941," issued by the Public Roads Administration, designated FP-41.
3. To advertise for proposals and award contracts for the work; or to negotiate with responsible contractors for the performance of the work either on a unit price or a cost-plus-a-fixed-fee basis, as may be deemed most advantageous to the Government after review by both agencies.
4. To locate the highway on the route selected, following as near as practicable the truck trail roads to be constructed by the Office of the Chief of Engineers of the Army provided for in paragraph 3 of section B hereof.
5. To lay out and stake the highway, supervise the construction operations, provide for all necessary testing of materials, prepare estimates of the work as it progresses, and make payments thereof periodically from funds transferred by the Office of the Chief of Engineers.
6. To accept the project upon its completion, make repairs thereto, provide and operate such essential facilities as may be necessary for the reasonable use thereof during the continuance of the existing emergency, all from funds to be made available by the Office of the Chief of Engineers.
7. To keep accurate records of all the work performed and expenditures made by the Public Roads Administration, and make such reports thereon as may be required by the Office of the Chief of Engineers.

B. The Office of the Chief of Engineers agrees:

1. To conduct all negotiations with the Government of Canada or with any of its political or other subdivisions if required, for the purpose of obtaining:
 - (a) The free entry of materials, supplies, equipment, and all articles necessary for the construction of the project;
 - (b) All necessary rights-of-way on public and private property;
 - (c) Police protection during the construction and maintenance of the highway;
 - (d) The free use of publicly owned materials necessary for the project in and along the right-of-way, including surfacing materials, timber, stone, water, etc.;
 - (e) The unhampered entry into Canada and return to the States of all individuals engaged on the work.
2. To transfer to the Public Roads Administration sufficient funds for engineering, construction, maintenance, and such other items as may be necessary in connection with the project.
3. To construct truck trail roads, following as near as may be practicable the reconnaissance surveys made by the Public Roads Administration.

EXHIBIT 6

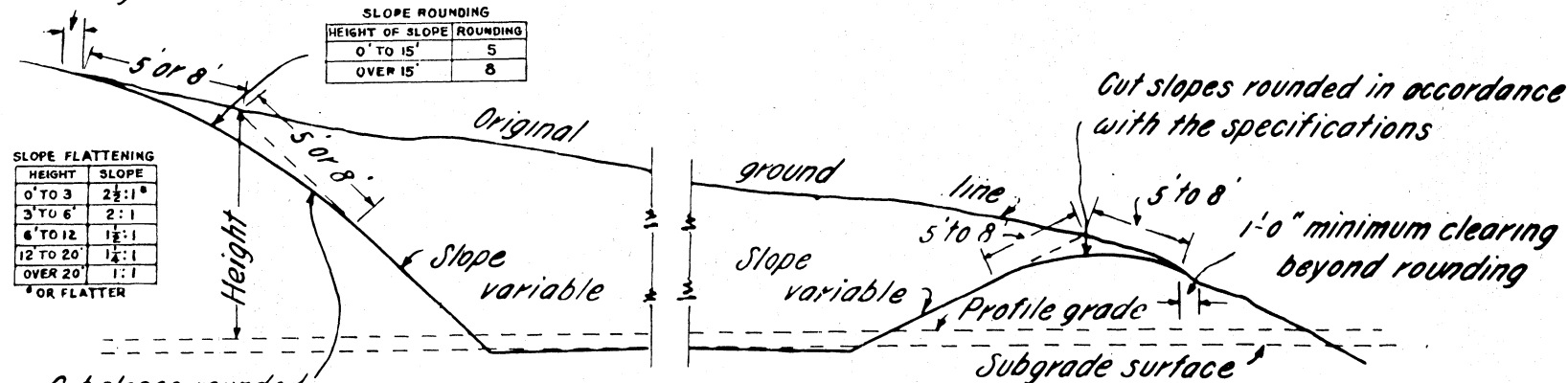
Shoulder widths normally 6 ft. but on heavy construction may be reduced to a minimum of 3 ft.



Ditch width shall be 2 ft. or wider if widened it shall be given a concave rounding

Subgrade shall be stabilized to a supporting value equal to 24" of A-1 soil.

1'-0" minimum clearing beyond rounding



Cut slopes rounded in accordance with the specifications

Cut slopes rounded in accordance with the specifications

PROPOSED
EDMONTON - ALASKA HIGHWAY
TYPICAL SECTIONS

FEB 21, 1942

APPROVED

R. G. Jones
CHIEF DIVISION OF DESIGN

Thos. Howard Touse
COMMISSIONER, PUBLIC ROADS ADMINISTRATION

4. To provide transports or other vessels for the transportation of men, materials, equipment, and supplies in those cases where overseas transportation is required.

5. To obtain such priority ratings covering materials, supplies, equipment, machinery, spare parts, etc., as may be necessary for the expeditious completion of the project.

6. To provide for such clearances through the State Department, the Bureau of Customs, the Immigration Service, and other Federal authorities as may be necessary for the proper conduct of the project.

C. The general scope and design of the highway shall be as follows:

Two-lane road.—The ultimate design standard shall provide for a two-lane roadbed with suitable surfacing. A typical section is attached hereto.

Surfacing.—Materials from local sources shall be used for surfacing wherever found satisfactory. Surfacing shall be applied in stages, but the final wearing surface shall be laid only after the subgrades, slopes, and drainage faults have had time to develop and be corrected.

Bridges.—Initially, bridges shall be of the timber trestle type so far as practicable, fabricated with timber from local sources. The final permanent structures shall be left for future financing and the determination of the governmental authority to be charged with the operation of the highway.

Small culverts.—These structures shall be constructed, so far as practicable, of portland cement or corrugated metal. If portland cement or corrugated metal is not available for small culverts, log boxes shall be constructed from local timber.

Grades and curves.—The ruling grades shall not exceed 5 percent, the maximum grades 7 percent. Curvature on prairie terrain shall not exceed 3°; in mountainous section, 19° on open sight distance, and 16° where the sight distance is obscured or blind. All curves shall have standard spirals and curvature about 3°, roadbed widenings. On all embankments the roadbed shall be widened sufficiently for the erection of guardrails.

Widths of rights-of-way.—The standards for rights-of-way shall embrace a dedicated width of 100 feet on each side of the center line of the highway in prairie terrain and sufficient widening in mountainous sections to accommodate the extended slopes. Across public lands or Government reservations a zone of 1,000 feet on each side of the center line of the highway shall be reserved to prevent private encroachments and to provide for the protection and satisfactory operation of the highway.

This outline of a memorandum of understanding is suggested as a basis for discussion. I will hold myself in readiness for a conference with you at your convenience. It is unnecessary to add that it is our purpose to cooperate fully in every way with the Corps of Engineers to the end that this work may be rushed to completion at the earliest possible date.

Very truly yours,

THOS. H. MACDONALD, *Commissioner.*

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 16, 1942.

MR. THOMAS H. MACDONALD,
Commissioner, Public Roads Administration,
Washington, D. C.

DEAR MR. MACDONALD: 1. In reply to your comprehensive letter of March 4 in which you set forth the general terms and conditions under which the joint enterprise for construction of the Canadian-Alaskan Military Highway should go forward, the Chief of Engineers is pleased to inform you that he approves and confirms the conditions and assignment of responsibilities as stated by you subject to the comments, amendments, and additions, stated below, all references being to corresponding parts and paragraphs of your letter.

2. *Part A, paragraph 2.*—Since the Chief of Engineers is responsible to the War Department for accomplishing the construction of the road, it is necessary that this office approve the main features of the technical specifications. It is therefore requested that copies of FP-41 be furnished this office. It is also requested that this office be informed regarding the location, cost, and other main features of all contracts approved. This may be done by forwarding a synopsis or copy of each construction contract.

3. *Part A, paragraph 3.*—It is preferred that the Public Roads Administration accept sole responsibility for the form, method of payment, inspection, and administration of contracts.

4. *Part B, paragraph 3.*—Should the truck trail road on a major section between control points be completed before the end of a working season, it is desired that the troops be free to undertake completion of designated sections where this can be done without physically interfering with a contractor's operations. Contracts should therefore be drawn in such a manner that contractors will not have a vested right to complete or start any section which might be completed sooner by troops. For example, if one regiment working west from Kluane Lake should meet the other regiment working east from Nabesna about August 1st it is intended that both regiments shall face about and construct the specified road until the end of the working season or until they meet contractors working toward them. If the contracts can be made flexible enough, the best interests of the Government might indicate the desirability of having the troops, after meeting, devote remaining time to clearing only for the wider road or to clearing and grading only or to bridge construction.

5. *Part B, paragraph 4.*—Transportation will be arranged but it appears now that no Government controlled shipping will be available for contractors before the middle of May or perhaps the first of June. In order to make necessary arrangements it will be necessary to furnish the War Department with statements 30 days in advance of the weight and ship tonnage of equipment and supplies and the number of men for which transportation is desired.

6. *Part C, two-lane road.*—Where heavy construction is involved it is thought the width might be reduced at least temporarily to 20 or 22 feet to expedite progress.

7. *Part C, small culverts.*—The use of local material will be necessary for some time in Alaska and western Yukon because of shipping limitations. Substantial construction may be undertaken where material can be obtained by rail or trucks.

8. *Part C, grades and curves.*—If experience indicates such desirability, this office will entertain recommendations for a somewhat lower standard in mountain sections.

9. *Part C, widths of right-of-way.*—This matter will require arrangements with the Canadians.

For the Chief of Engineers:

C. L. STURDEVANT,
Brigadier General,
Assistant Chief of Engineers.

FEDERAL WORKS AGENCY,
PUBLIC ROADS ADMINISTRATION,
Washington, D. C., March 17, 1942.

Brig. Gen. C. L. STURDEVANT,
Assistant Chief of Engineers, Office of the Chief of Engineers,
Washington, D. C.

MY DEAR GENERAL STURDEVANT: In reply to your letter of March 16, 1942, approving and confirming the conditions and assignment of responsibilities for the construction of the Canada-Alaska Military Highway, as set forth in our letter of March 4, 1942, the Public Roads Administration concurs in such amendments and additions.

In compliance with paragraph No. 2 of your letter, we are forwarding to you today, under separate cover, six copies of "Specifications for Construction of Roads and Bridges in National Forests and National Parks, 1941."

Under paragraph No. 4, provision will be made in the contracts covering work between Whitehorse and Nabesna to utilize troops to expedite the work.

Under paragraph No. 5 dealing with transportation, contracts will provide for the submission of schedules of contractors' personnel, equipment, and supply movements.

Copy of the Priority Committee's memorandum to Mr. James S. Knowlson, Director, Division of Industry Operations of the War Production Board, is included. You will note under paragraph No. 3 of this letter the Corps of Engineers must certify as to military importance of projects in Alaska to raise priority of any project above an A-1-c rating. Please provide necessary certification to raise the Canada-Alaska military highway to an A-1-a rating.

Very truly yours,

THOMAS H. MACDONALD,
Commissioner.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 20, 1942.

MR. THOMAS H. MACDONALD,
Commissioner, Public Roads Administration,
Washington, D. C.

MY DEAR MR. MACDONALD: 1. In reviewing our exchange of letters which constitutes our agreement as to the division of responsibilities in connection with construction of the Canadian-Alaskan Military Highway, I find two points apparently requiring further clarification. These points involve questions of route location and the use of Engineer troops.

2. The Chief of Engineers desires to retain final decision regarding the route to be followed after receiving your recommendations and those of our field organization. It is requested therefore that your conclusions and recommendations be submitted to this office as rapidly as possible. A separate letter discusses the possibility of fixing certain portions of the route at this time.

3. As to the use of Engineer troops for work in addition to that of trail construction please refer to paragraph 4 of my letter of March 16 and the third paragraph of your reply dated March 17. You will note that my statement was general and intended to cover all sections of the road. Your reply refers only to the example that I used to illustrate a situation that may arise. It is now requested that all contracts make suitable provision for the use of troops in completing various sections of the road under the conditions stated in my letter of March 16.

4. Your concurrence in the foregoing is requested.
For the Chief of Engineers:

C. L. STURDEVANT,
Brigadier General,
Assistant Chief of Engineers.

APRIL 13, 1942.

Brig. Gen. C. L. STURDEVANT,
Assistant Chief of Engineers,
Office of the Chief of Engineers, Washington, D. C.

MY DEAR GENERAL STURDEVANT: Reference is made to my letter of March 4 in which was outlined for your consideration suggestions regarding general terms and conditions, including standards of design for the construction of the Alaska Highway.

As suggested at our conference of April 10 the following bridge design standards are recommended for consideration as a matter of economy:

Timber structures.—H-15 loading: Long timber trestles and wood truss bridges over 60 feet in length to have a 14-foot clear width of roadway; trestles less than 100 feet in length and wood trusses less than 60 feet in length to have a 24-foot clear width of roadway.

Design for future steel bridges.—H-20 loading: 24-foot clear width of roadway.

I would appreciate an expression of your attitude in regard to the designs suggested above.

Very truly yours,

THOMAS H. MACDONALD, Commissioner.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, April 28, 1942.

MR. THOMAS H. MACDONALD,
Commissioner, Public Roads Administration,
Washington, D. C.

DEAR MR. MACDONALD: Reference is made to your letter of April 13, 1942, in which you propose certain bridge design standards. Your proposals have been carefully considered and are approved with the exceptions indicated below.

It is requested that the following standards be adopted:

Timber structures.—H-15 loading: Long timber trestles and wood truss bridges over 60 feet in length to have a 12-foot clear width of roadway; trestles less than 100 feet in length and wood trusses less than 60 feet in length to have a 24-foot clear width of roadway.

Design for future steel bridges.—H-20 loading: 24-foot clear width of roadway.

The limiting length of two-way bridges are to be considered as a general guide and may be increased in special cases where local conditions appear to justify such action.

For the Chief of Engineers:

C. L. STURDEVANT,
Brigadier General,
Assistant Chief of Engineers.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, April 29, 1942.

Subject: Specifications for Alcan Highway construction.

To: _____.

1. Reference is made to letter of March 3, 1942, to Brig. Gen. William M. Hoge. Subject: Construction of the Canadian-Alaskan Military Highway (copy attached), particularly to paragraph 10.

2. The specifications for the final-type highway submitted by the Commissioner, Public Roads Administration, as approved by this office and summarized below, have been prepared generally in accordance with the Specifications for Construction of Roads and Bridges in National Forests and National Parks, 1941, issued by the Public Roads Administration and designated FP-41, a copy of which was mailed your headquarters by air mail on April 27, 1942.

(a) *Two-lane road.*—The ultimate design standard shall provide for a two-lane roadbed with suitable surfacing. A typical section is attached hereto. Comment by office, Chief of Engineers: "Where heavy construction is involved, the width may be reduced at least temporarily to 20 or 22 feet to expedite progress."

(b) *Surfacing.*—Materials from local sources shall be used for surfacing wherever found satisfactory. Surfacing shall be applied in stages, but the final wearing surface shall be laid only after the subgrades, slopes, and drainage faults have had time to develop and be corrected.

(c) *Bridges.*—Initially, bridges shall be of the timber trestle type so far as practicable, fabricated with timber from local sources. The final permanent structures shall be left for future financing and the determination of the governmental authority to be charged with the operation of the highway.

NOTE.—Site location of timber bridge may vary considerably from that of permanent structure.

As added by the Chief of Engineers:

"*Timber structures.*—H-15 loading: Long timber trestles and wood truss bridges over 60 feet in length to have a 12-foot clear width of roadway; trestles less than 100 feet in length and wood trusses less than 60 feet in length to have a 24-foot clear width of roadway.

"*Design for future steel bridges.*—H-20 loading: 24-foot clear width of roadway.

"The limiting lengths of two-way bridges are to be considered as a general guide and may be increased in special cases where local conditions appear to justify such action."

(d) *Small culverts.*—These structures shall be constructed, so far as practicable, of portland cement or corrugated metal. If portland cement or corrugated metal is not available for small culverts, log boxes shall be constructed from local timber.

Modifications by the Chief of Engineers:

"The use of local material will be necessary for some time in Alaska and western Yukon because of shipping limitations. Substantial construction may be undertaken where material can be obtained by rail or truck."

(e) *Grades and curves.*—The ruling grades shall not exceed 5 percent, the maximum grades 7 percent. Curvature on prairie terrain shall not exceed 3°; in mountainous sections, 19° on open sight distance, and 16° where the sight distance is obscured or blind. All curves shall have standard spirals and curvature above 3°, roadbed widenings. On all embankments the roadbed shall be widened sufficiently for the erection of guard rails.

Modifications by the Chief of Engineers:

"As experience indicates such desirability, this office will entertain recommendations for a somewhat lower standard in mountainous sections."

NOTE.—Maximum grade of 10 percent and curvatures of 24° for open sight distance and 20° for obscured sight distance are the modifications which this office has in mind.

(f) *Widths of rights-of-way.*—As arranged with the Canadian Government and its representatives.

3. While the above specifications apply to the final-type highway, sector commanders will use them as a guide in the location of the pioneer road, with a view to permitting the final road to follow the location of the pioneer road as far as practicable. However, both the final decision as to location of the pioneer road and the specifications therefor will rest with each sector commander since the mission requires Engineer troops to push through a pioneer road during the present working season, regardless of desirable specifications.

4. As pointed out in previous correspondence with the Public Roads Administration, copies of which have been furnished sector commanders, troops may be used to undertake the completion of designated sections of the final-type highway where this can be done without physically interfering with the contractor's operations. Contracts entered into by the Public Roads Administration are therefore being drawn in such a manner that contractors will not have a vested right to complete or start any section which might be completed sooner by troops. However, where troops build a section of the completed road, such sections will be based on the road location selected by the Public Roads Administration's field representatives as ascertained by sector commanders after conference with those representatives. It is desired that in such cases the final-type road be staked out in advance by the road locators of the Public Roads Administration.

5. The Public Roads Administration has been advised by the Chief of Engineers that, where the final-type highway coincides with the pioneer road, the contractors will be required to perform their work so that troop vehicles can safely traverse sections of road under construction.

6. The Public Roads Administration has been requested to transact all business with respect to rights-of-way through sector commanders who will make all contacts with local Canadian officials and keep this office informed regarding any difficulties or delays that cannot be handled locally.

7. Although sector commanders are not responsible for the operations of the Public Roads Administration except in matters of right-of-way, it is expected that they will keep in close touch with the work of that agency in order to facilitate coordination and cooperation with their field forces and to keep this office informed of any unusual matters of interest to or requiring action by this office.

By order of the Chief of Engineers:

C. L. STURDEVANT,
Brigadier General,
Assistant Chief of Engineers.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 25, 1943.

Maj. Gen. PHILIP B. FLEMING,
Administrator, Federal Works Agency,
Washington, D. C.

DEAR GENERAL FLEMING: This letter is in confirmation of the agreements reached at the conference today between the representatives of the Federal Works Agency and the Chief of Engineers on the subject of the Alcan Highway and Haines cut-off military road. The following were present:

Representatives of Federal Works Agency:

Maj. Gen. Philip B. Fleming, Administrator, Federal Works Agency.
Mr. Thomas H. MacDonald, Commissioner of Public Roads Administration.
Mr. Ernest E. Hall, executive officer, Federal Works Agency.

Representatives of the Chief of Engineers:

Maj. Gen. E. Reybold.
Maj. Gen. T. M. Robins.
Col. L. D. Worsham.
Col. T. F. Farrell.
Col. A. H. Burton.

It was agreed:

1. The location and standards of design for the Alcan Highway to be determined in every instance by the division engineer, northwest division.

2. The Haines cut-off military road to be constructed as directed by the division engineer northwest division.

3. All procurement of equipment, supplies, and materials for construction activities in the northwest division, including PRA contractors, to be under the direction of the division engineer, northwest division. This shall not be inter-

puted to prevent the procurement by the PRA or its contractors of minor amounts of supplies and materials.

Very sincerely,

E. REYBOLD,
Major General,
Chief of Engineers.

FEDERAL WORKS AGENCY,
Washington, D. C.

Maj. Gen. E. REYBOLD,
Chief of Engineers, War Department,
Washington, D. C.

MY DEAR GENERAL REYBOLD: This will acknowledge your letter of March 25 outlining the understanding reached between representatives of the Office of the Chief of Engineers and the Federal Works Agency at the conference held on that date.

Sincerely yours,

PHILIP B. FLEMING,
Major General, United States Army,
Administrator.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, April 26, 1943.

Subject: Alcan Highway.
To: The Commanding General
Army Service Forces
Washington, D. C.

(Attention Requirements Division.)

1. Reference is made to confidential letter of this Office dated February 10, 1943, subject "Capacity Alcan Highway," which was returned by your first endorsement of February 25, 1943. The first endorsement referred to cites maximum highway capacities that may be assumed for purposes of design and construction, states that maximum speed of military vehicles may be assumed at 40 miles per hour, and directs that the type of road finally developed should be cleared with the Requirements Division.

2. There is enclosed herewith strip map showing the location of the pioneer road as constructed. It is recommended that the Alcan Highway project be limited to a road extending from Dawson Creek, British Columbia, to Big Delta, Alaska (on the Richardson Highway 90 miles south of Fairbanks), the highway to be routed through or have connections with airfields at Fort St. John, Fort Nelson, Watson Lake, Whitehorse, Boundary (Northway), and Big Delta. This is the scope of the project originally approved by the War Department and covered in international correspondence. The Haines cut-off military road and any other access roads (other than those constructed as incidental to the Alcan Highway) should be authorized as separate projects.

3. In constructing the final-type road some relocations from the pioneer road will need be made in order to avoid muskeg areas or provide adequate drainage. Relocation will be confined to such cases except where realignment will improve conditions without increase in cost of or time required for construction.

4. Maximum roadway width will be 26 feet with a 20- to 22-foot roadway surface of local materials (gravel or crushed stone) to the depth necessary, as determined by soil and drainage conditions, to support anticipated traffic loads. Shoulders will be stabilized with local materials.

5. Maximum grades have been set at 10 percent. No hard and fast rule has been set for curvature. Since economical determination of the maximum allowable in any particular instance will need be made on the ground after the spring break-up, decisions on maximum curvature will be made by the United States Army district engineer after consultation with field representatives of the Public Roads Administration.

6. In general, bridges will be two-way structures 24 feet wide. However, no existing bridges, even if one-way will be replaced except those that would be unsafe for traffic intended or those destroyed by the spring ice break-up. Timber structures will be designed for H-15 loading and steel structures for H-20 loading.

7. It is estimated that the Alcan Highway can be completed to the above standards by December 31, 1943 (unless unforeseen difficulties are encountered in obtaining or transporting necessary equipment and materials), at a cost of \$115,000,000, exclusive of engineer troop operating expenses, and that sufficient work will be under contract by June 30, 1943, to permit completion with \$10,500,000 included in estimates for fiscal year 1944.

8. Report with recommendations of the division engineer, northwest division, and the commanding general, Northwest Service Command, has been requested on advisability of improving to the same standards as now proposed for the Alcan Highway two cut-off roads which were constructed as pioneer access roads during the last construction season. The cut-off roads in question are as follows:

(a) A road extending from mile W240 on the Alcan Highway in a westerly direction to Carcross

(b) A road extending from mile WH 425 on the Alcan Highway to Slana at which point it would join the Slana-Gulkana road previously constructed by the Alaska Road Commission.

Upon receipt of field report on these cut-off roads this office will submit a report with recommendations thereon. If work on these cut-off roads over and above that necessary as an incidental to construction of the Alcan Highway is undertaken, it is considered that they should be treated as projects separate from the Alcan Highway, as indicated in paragraph 2 above.

9. Approval is requested on the scope and standards set forth above for the Alcan Highway and for use of the same standards on the Haines cut-off military road.

For the Chief of Engineers:

THOMAS M. ROBINS,
Major General,
Assistant Chief of Engineers.

LES/emf
Ext. 71810
May 8, 1943

Subject: Alcan Highway.

SPRMC 611 Alaska (April 26, 1943) (first endorsement).

Headquarters, Army Service Forces, Washington, D. C.

To: The Chief of Engineers, Pentagon Building, Washington, D. C.

1. The recommendations on the scope and standards for final development of the Alcan Highway, as set forth in the basic communication, are approved.

2. The Haines cut-off military road, authorized by the Secretary of War April 9, 1943, as a separate project, will be constructed to the same standards.

3. The above approval is given with the understanding that completion of this construction will be in accordance with the "Priority Listing of Projects in the Northwest Service Command" forwarded to your office by memorandum dated March 31, 1943, subject: "Projects in the Northwest Service Command," file SPRMC 600.12.

For the commanding general:

W. A. WOOD, Jr.,
Brigadier General, General Staff Corps,
Director, Requirements Division.
MASON C. PRICHARD,
Lieutenant Colonel, General Staff Corps,
Chief, Construction Planning Branch, Requirements Division.

WAR DEPARTMENT,
OFFICE OF THE DIVISION ENGINEER,
NORTHWEST DIVISION,
Edmonton, Alberta, Canada, July 3, 1943.

1. At a meeting held in the United States engineer office, northwest division, Edmonton, Alberta, Canada, at which there were present Maj. Gen. T. M. Robins, Deputy Chief of Engineers, Brig. Gen. L. D. Worsham, division engineer, and Mr. T. H. MacDonald, Public Roads Commissioner, the following agreements were reached:

(a) Agreement of March 25, 1943, as stated in letter from Maj. Gen. E. Reybold, Chief of Engineers, to Maj. Gen. P. B. Fleming, Public Roads Administrator, must be complied with by all echelons of the Public Roads Administration.

(b) All contracts entered into by the Public Roads Administration for work on the Alaska Military Highway must be terminated by the Public Roads Administration not later than December 31, 1943. Complete authority to administer existing contracts, to issue change orders, to move contractors from one job to another is to be delegated to the Public Roads Administration district engineer.

(c) Under general supervision of the Public Roads Administration district engineer, Mr. J. H. Humbard, Public Roads Administration liaison officer, will plan and direct Public Roads Administration construction operations. Mr. Humbard will maintain an office at the headquarters of the northwest division engineer and will receive instructions in regard to operations directly from the northwest division engineer, or his authorized representatives.

T. H. MACDONALD,
Public Roads Commissioner.

T. M. ROBINS,
*Major General, United States Army,
Deputy Chief of Engineers.*

L. D. WORSHAM,
*Brigadier General, United States Army,
Division Engineer.*

EXHIBIT 7

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 3, 1942.

Subject: Construction of the Canadian-Alaskan Military Highway.

To: Col. W. M. Hoge, Corps of Engineers, Engineer Replacement Training Center, Fort Belvoir, Va.

1. The Secretary of War has directed the Chief of Engineers to undertake the construction of the above-entitled highway subject to necessary agreements with the Canadian Government. The plan as now developed calls for survey, the construction of a pioneer road by engineer troops to facilitate surveys and final location of the road, and the construction of a permanent road through the agency of the Public Roads Administration. The Canadian Government has agreed to the survey activities and the construction of the pioneer road. Negotiations are in progress regarding the construction of the permanent road.

2. The general route has been prescribed by the War Department and is to follow the existing air route to permit supply of air fields at Fort St. John, Fort Nelson, Watson Lake, Whitehorse, all in Canada, Boundary, and Big Delta in Alaska. Should any important deviation from this route appear desirable as the result of surveys, further War Department approval must be obtained.

3. To carry out the foregoing directive and plan, a Provisional Engineer Brigade has been set up to consist eventually of Headquarters Provisional Engineer Brigade, the Eighteenth, Thirty-fifth, Three Hundred and Fortieth, and Three Hundred and Forty-first Engineer Regiments, the Seventy-third and Seventy-fourth Light Pontoon Companies, Company D, Twenty-ninth Engineer Battalion (top), and Company A, Six Hundred and Forty-eighth Engineer Battalion (top). Additional engineer units may be made available at a later date.

4. Col. William M. Hoge is assigned to the command of the Provisional Engineer Brigade and is hereby directed to proceed with the necessary surveys and construction of the pioneer road. Colonel Hoge will report directly to the Chief of Engineers. Troops will come under his command upon arrival at the railheads at Dawson Creek and Whitehorse in accordance with War Department orders. Location of command posts will be reported, when established, to the Chief of Engineers.

5. The Public Roads Administration has been invited informally to participate in the preliminary surveys and representatives of that Administration should be given all practicable assistance. The commanding officer should confer freely with such representatives to the end that work on the pioneer road may fit into the location of the permanent road desired by the Administration. However, the location of the pioneer road will be decided finally by the commanding officer.

6. The pioneer road will be pushed to completion with all speed within the physical capacity of the troops. The objective is to complete the entire route at the earliest practicable date to a standard sufficient only for the supply of

the troops engaged on the work. Further refinements will be undertaken only if additional time is available or if all available troops cannot be employed in pushing forward. To this end it is desired that the Thirty-fifth Engineers be employed entirely on the Fort Nelson-Watson Lake section unless recommendations for a different disposition are approved by this office.

7. Insofar as applicable the commanding officer is vested with all the authorities now given to district engineers by orders and regulations, Corps of Engineers, and other pertinent instructions heretofore and hereafter issued by the Chief of Engineers.

8. Monthly reports of operations to include troop dispositions, status of survey operations, and the extent of pioneer road completed for each period covered by such report will be submitted by the commanding officer to the Chief of Engineers.

9. Funds and instructions as to financial reports will be made available in a separate communication.

10. Further instructions will be issued regarding the functions of the commanding officer with respect to the construction of the permanent road.

By order of the Chief of Engineers:

C. L. STURDEVANT,
Brigadier General,
Assistant Chief of Engineers.

EXHIBIT 8

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, April 24, 1942.

Brig. Gen. WILLIAM M. HOGE,
Officer in Charge, Canadian-Alaskan Military Highway,
Fort St. John, British Columbia, Canada,
Whitehorse, Yukon, Canada.

DEAR HOGE: It has been decided to divide the highway job into two sectors to be known as the Whitehorse sector, Alcan Highway and the St. John sector, Alcan Highway. Copies of drafts of War Department directives on the subject have been mailed to you at Whitehorse and Fort St. John.

You will have the Whitehorse sector, with four regiments, and O'Connor will relieve you of the St. John sector at an early date after issue of the War Department directive. Both sectors will report to the Chief for operations.

It is believed that the two headquarters are too far apart for proper supervision by one officer. You will still have a sizable command and territory. The dividing point between the sectors will be Watson Lake, at least initially.

This change is no reflection on your management in any respect.

Regards,

C. L. STURDEVANT,
Brigadier General,
Assistant Chief of Engineers.

EXHIBIT 9. TOTAL TONNAGE REQUIRED FOR CONSTRUCTION OF ALASKA HIGHWAY ¹

The total tonnage of materials, consumables, and equipment transported from the United States to Canada and Alaska for construction of the highway was 254,120 tons.

Methods of transportation to construction site were as follows:

1. By railroad to Dawson Creek, British Columbia; and thence northerly over highway by truck.....	Tons 122, 490
2. By boat or barge from Seattle or Prince Rupert northerly to Skagway; thence by railroad to Whitehorse and over the highway by truck.....	91, 017
3. By boat or barge from Seattle to Whittier and Valdez; thence by rail and truck to Big Delta, Alaska, and southerly over highway by truck.....	40, 613
Total.....	254, 120

¹ Source: Memorandum from Office, Chief of Engineers, to Under Secretary of War, Dec. 9, 1943, file SPEKM. Final Official Continent Field Progress Report—Alaska Highway.

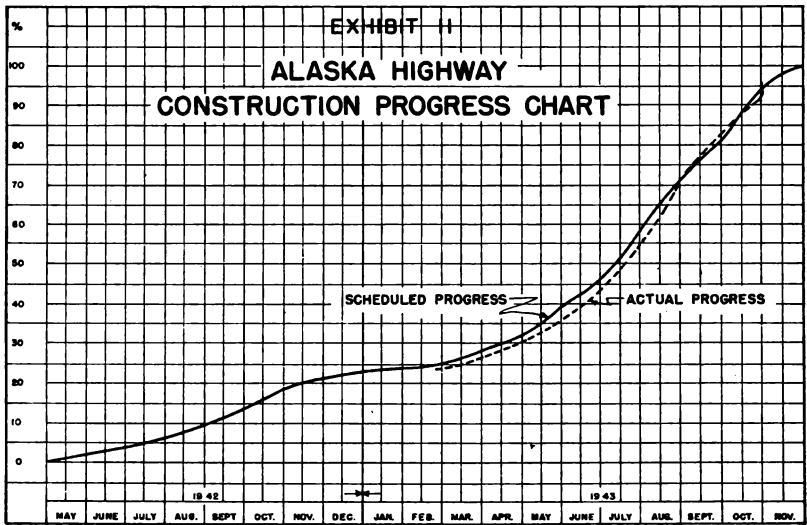


EXHIBIT 10 OBSTACLES TO TRAVEL ON ALASKA HIGHWAY IN SUMMER OF 1943

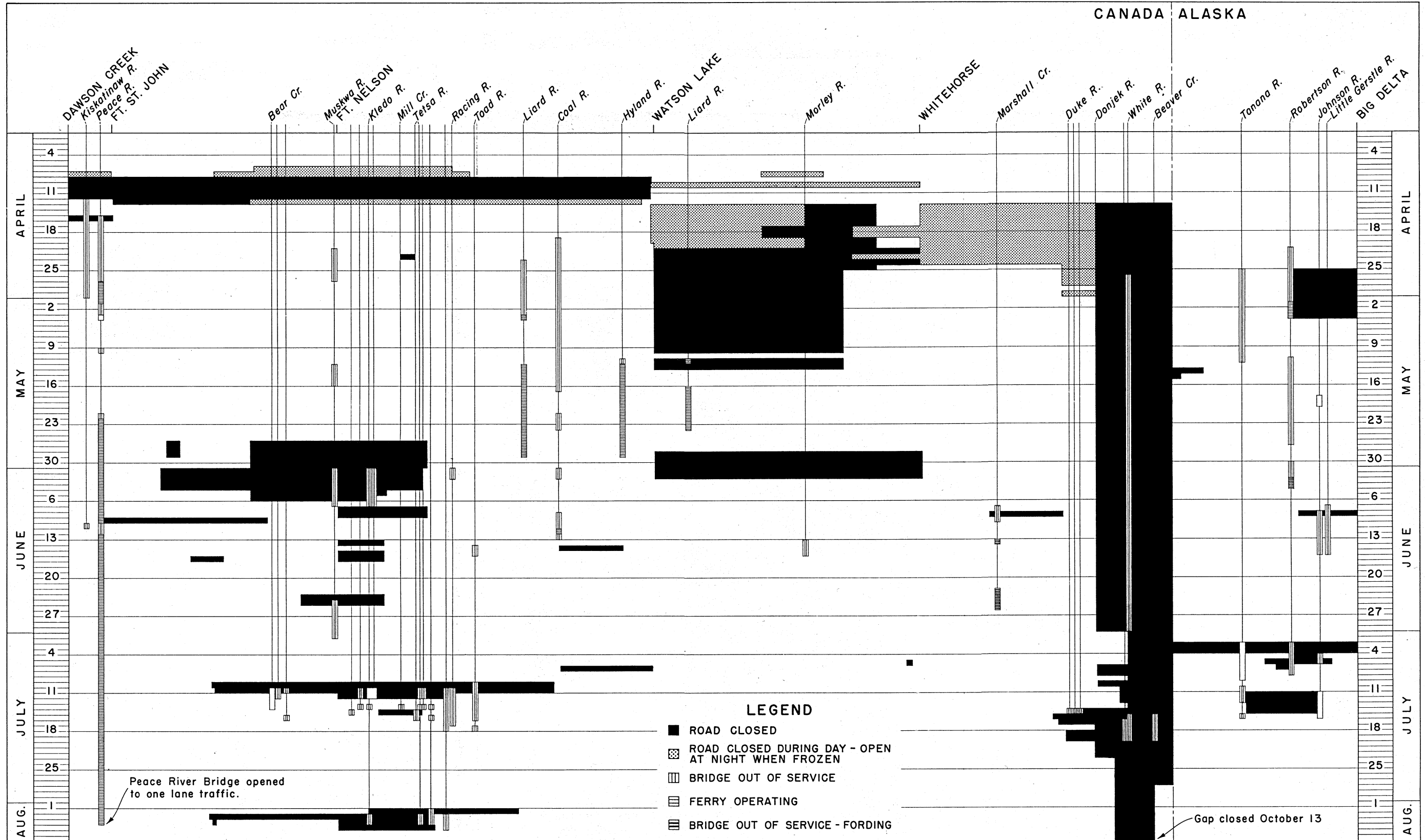
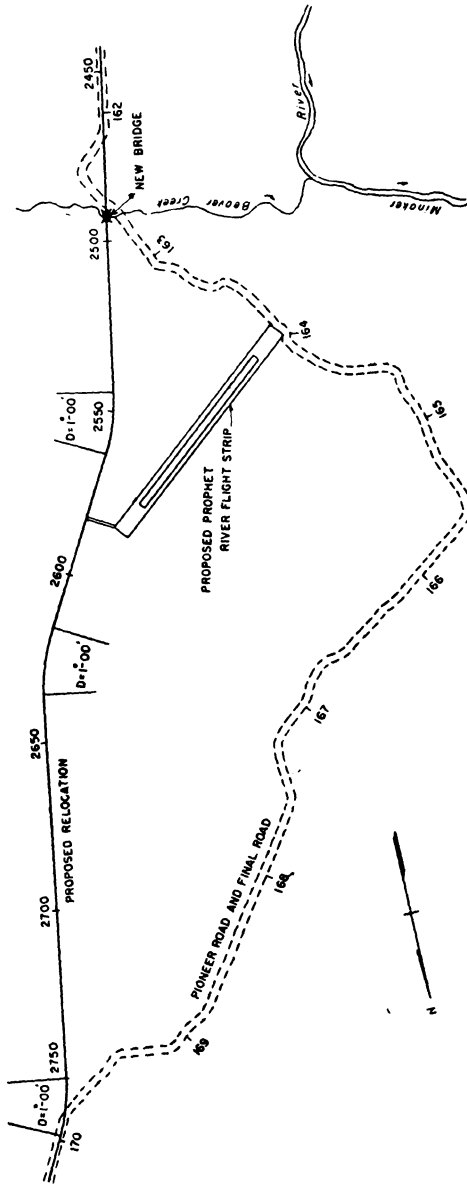
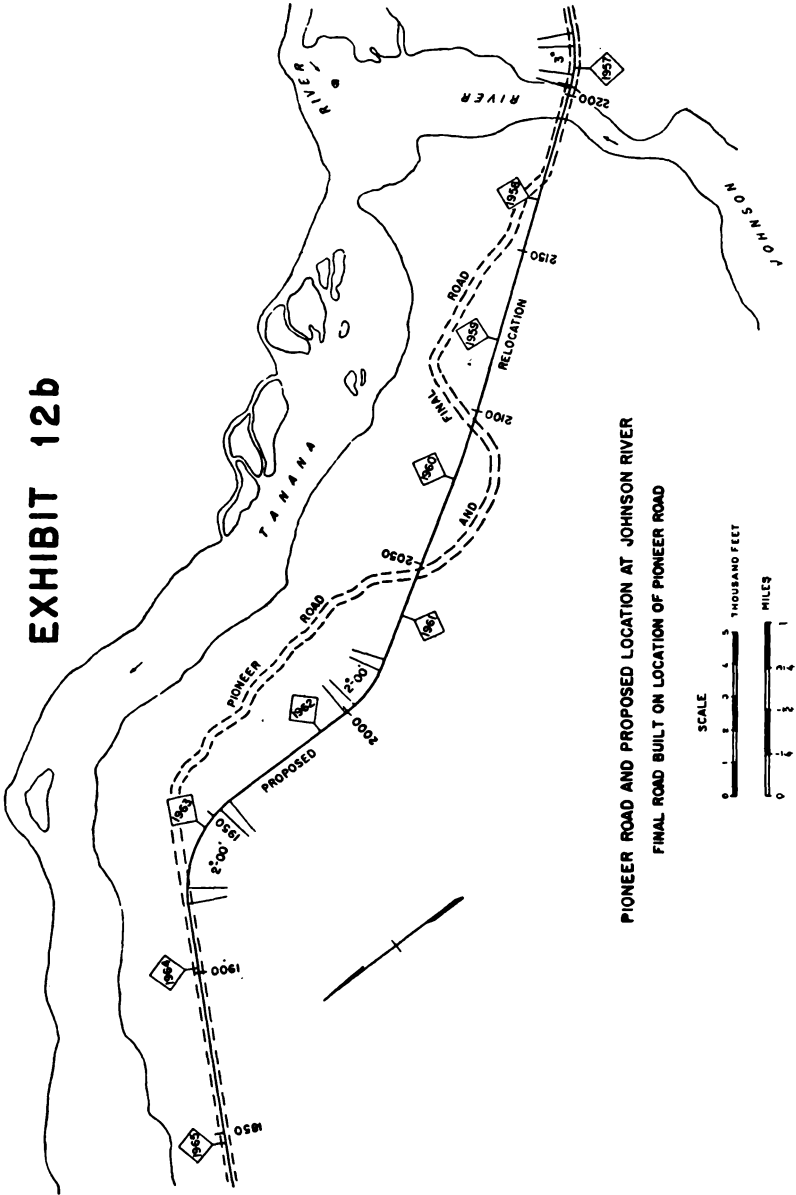


EXHIBIT 12a



PROPOSED RELOCATION AT BEAVER CREEK

EXHIBIT 12b



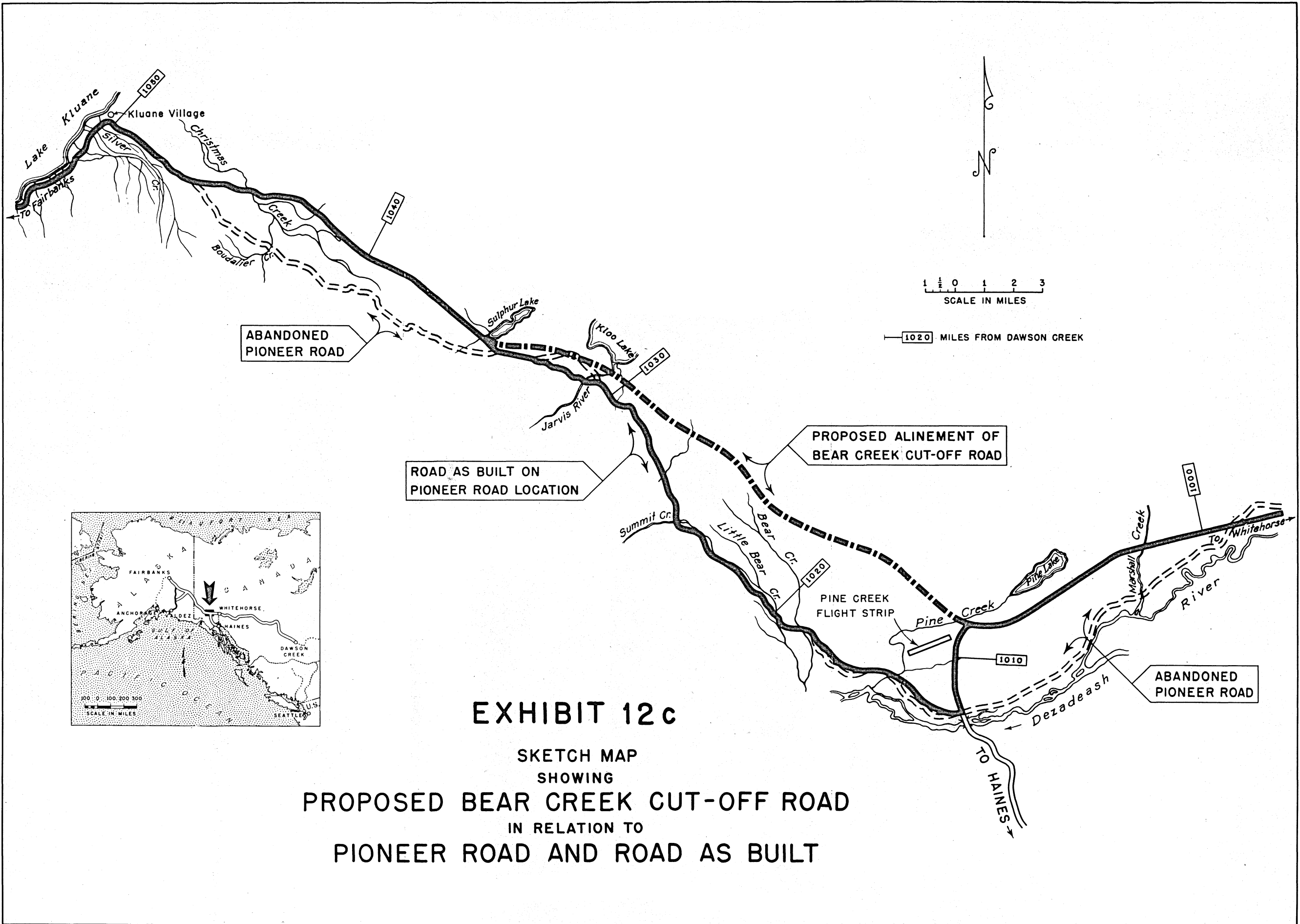


EXHIBIT 12c
 SKETCH MAP
 SHOWING
PROPOSED BEAR CREEK CUT-OFF ROAD
 IN RELATION TO
PIONEER ROAD AND ROAD AS BUILT

APPENDIX G

(Chapter VII)

Exhibit	Exhibit
Interoffice memorandum, Corps of Engineers, relative to sources of supply for bridge program, dated December 11, 1942.....	1
Letter to Commissioner, Public Roads Administration, from Col. Albert H. Burton, Corps of Engineers, dated December 12, 1942.....	2
Reply to above, dated December 15, 1942.....	3
Supplementary letter to 3, dated January 23, 1945.....	4
Interoffice memorandum, Corps of Engineers, with attachments, dated January 27, 1943.....	5
Map showing location and cost of bridges on the Alaska Highway, prepared by Public Roads Administration.....	6

EXHIBIT 1

DECEMBER 11, 1942.

Subject: Bridges for the Alcan Highway.

From: Construction Division, Operations Branch, Materials and Equipment Section, Contractors' Service and Priorities Unit.

To: Fortifications Section.

(Attention Colonel Burton.)

1. With reference to our conversation in your office this morning, regarding the 74 bridges for the Alcan Highway to consist of 60-, 100-, and 160-foot spans and the possibility of securing these bridges completely fabricated in the next 60 to 90 days, this office offers the following information:

It is suggested that the Public Roads Administration contact the following:

(a) Mississippi Valley Structural Steel Co., Melrose Park, Ill. (Mr. R. D. Wood).

(b) The St. Joseph Structural Steel Co., St. Joseph, Mo. (Mr. Tom Dodd).

(c) The International Steel Co., Evansville, Ind. (Mr. Walter Koch).

(d) The Clinton Bridge Co., Clinton, Iowa (Mr. George Wilson).

(e) The Joseph T. Ryerson & Son, Chicago, Ill. (Mr. Harvey Dieterich).

2. The above structural steel fabricators have all done work for the Corps of Engineers and have all engaged in bridge building. They were contacted today to determine as to whether they had a stock of steel which they could use for the bridges involved as well as to ascertain their shop loads at present. It was determined that all of the fabricators mentioned above have rather substantial and complete inventory of steel on hand also that they have available shop space and could get to work on the fabrication of these bridges immediately.

3. It is suggested that if the Public Roads Administration decides to purchase steel bridges that they contact the above fabricators previous to designing the structures required so that available stocks can be utilized rather than necessitating the ordering of steel requirements from steel mills and awaiting rollings and deliveries.

ROETH.

EXHIBIT 2

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, December 12, 1942.

Hon. THOMAS H. MACDONALD,
Commissioner, Public Roads Administration,
Washington, D. C.

MY DEAR MR. MACDONALD: Reference is made to recent telephone conversations between Colonel Burton, Captain Curtis, and Mr. Clark on the subject of the use of steel rather than structural timber for certain bridges on the Alcan Highway.

It is understood that for 74 spans, including lengths of 60, 100, and 160 feet, requirements are approximately as follows:

For timber trusses:

Structural timber.....	board feet..	6,000,000
Steel hardware.....	tons.....	900

For steel bridges: Structural steel.....	do.....	5,000
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Information available to this office indicates that, due to essential requirements for structural timber and unprecedented rains in the Pacific Northwest, the structural timber situation is now acute, and that there is no prospect of the situation improving in the foreseeable future. The structural-steel situation, on the other hand, does not appear to be quite so acute at this time. Accordingly, it would appear that there is a better chance of obtaining delivery of the spans in

question during the next 90 days if fabricated of steel rather than of structural timber.

There is enclosed herewith a memorandum dated December 11, from the materials and equipment section of this office to the undersigned, listing several steel companies which, it is believed, have considerable stock on hand and are in a position to undertake fabrication of the bridges without delay. Your attention is invited to paragraph 3 of the memorandum, in which it is suggested that these fabricators be contacted prior to designing the spans, since prompt delivery can probably be obtained if the design is such that structural steel in stock can be used. Delivery on this basis would undoubtedly be more rapid than would be the case if the companies receiving the orders must await rollings and deliveries.

This office will, of course, afford every possible assistance to you in securing materials for the bridges in question.

For the Chief of Engineers:

ALBERT H. BURTON,
Colonel, Corps of Engineers.
Assistant, Operations Branch, Construction Division.

EXHIBIT 3

FEDERAL WORKS AGENCY,
PUBLIC ROADS ADMINISTRATION,
Washington, December 15, 1942.

CHIEF OF ENGINEERS

War Department, Washington, D. C.

(Attention Col. A. H. Burton.)

DEAR SIR: Reference is made to your letter of December 12 regarding comparative amounts of critical materials required for timber trusses and steel bridges in 54 spans on the Whitehorse Division of the Alaska Highway and the difficulties anticipated in securing such materials. Your suggestion that we contact a number of designated bridge companies which are understood to have a considerable stock of steel on hand is appreciated and steps are being taken to ascertain to what extent these companies can fulfill our requirements.

We have just received from our field offices estimates of materials required on all bridges on the Alaska Highway, which represent the closest approximation to actual requirements that can be computed at this time. The following is an estimate of materials based upon general use of timber spans with steel trusses used for spans in excess of 160 feet:

Item	Total	Allotment first quarter	Period, 1943 second quarter
Bridge timber..... thousand feet board measure	20, 000	8, 000	12, 000
Culvert timber..... do.....	9, 500	3, 800	5, 700
Structural steel:			
Shapes..... tons.....	2, 400	960	1, 440
Plates..... do.....	1, 000	400	600
Reinforcing steel..... do.....	1, 000	400	600
Hardware..... do.....	3, 500	1, 400	2, 100
Nails..... do.....	200	80	120
Cable..... do.....	200	200	0
Wire..... do.....	15	15	0
Total timber..... thousand feet board measure	29, 500	11, 800	17, 700
Total steel..... tons.....	8, 315	3, 455	4, 860

Materials on order prior to December 12 not included in above summary.

The following estimate is based upon the general use of steel spans:

Item	Total	Allotment first quarter	Period—1943 second quarter
Bridge timber.....thousand feet board measure..	6,500	2,600	3,900
Culvert timber.....do.....	9,500	3,800	5,700
Total, timber.....thousand feet board measure..	16,000	6,400	9,600
Structural Steel:			
Shapes.....tons..	15,000	6,000	9,000
Plates.....do.....	10,000	4,000	6,000
Reinforcing Steel.....do.....	5,000	2,000	3,000
Hardware.....do.....	2,000	860	1,200
Nails.....do.....	150	60	90
Cable.....do.....	300	300	0
Wire.....do.....	25	25	0
Total, steel.....tons..	32,475	13,185	19,290

Materials on order prior to December 12 not included in above summary.

We shall be glad to confer with you further in the event assistance is desired in procuring the necessary materials.

Very truly yours,

THOS. H. MACDONALD, *Commissioner.*

EXHIBIT 4

FEDERAL WORKS AGENCY,
PUBLIC ROADS ADMINISTRATION,
Washington, January 23, 1943.

CHIEF OF ENGINEERS,

War Department, Washington, D. C.

(Attention Col. Albert Burton.)

DEAR SIR: Reference is made to our letter of December 15 regarding amounts of critical materials required for the Alaska Highway bridges.

A revised estimate has been submitted by our field engineers eliminating the requirements for the bridges across the Peace and Liard Rivers and those originally planned on the section between Gulkana and the Tok-Tanana Junction. Revisions have also been made in the proposed designs to permit the adoption of the most economical types.

The following is a revised estimate of the steel requirements if steel spans are adopted for all crossings except those for which other provisions have already been made, and on the basis of using wood floors on the Alaska and Whitehorse sections and concrete floors on the Fort St. John section, and with reinforced concrete trestles on concrete filled metal tube piles on the smaller crossings.

Structural steel shapes.....tons..	7,800
Structural steel plates.....do.....	4,200
Reinforcing steel.....do.....	3,000
Hardware and nails.....do.....	120
Wire.....do.....	25
Metal pile casings for tubular piers.....do.....	960
Darcelet bolts.....do.....	500
Bridge timber.....thousand feet board measure..	6,500
Culvert timber.....do.....	9,500

Of the total amount shown for bridge timber, it is estimated that 6,000,000 feet board measure can be produced on the job, the remainder to be structural grade Douglas fir. The culvert timber is to be Douglas fir, select merchantable grade.

The following is a revised estimate of material requirements if timber structures are adopted for all crossings for which provisions have not already been made:

Bridge timber.....	thousand feet board measure..	20, 000
Culvert timber.....	do.....	9, 500
Structural steel shapes.....	tons.....	2, 000
Structural steel plates.....	do.....	1, 400
Reinforcing steel.....	do.....	1, 350
Hardware.....	do.....	1, 500
Nails.....	do.....	200
Wire.....	do.....	25

Of the amount shown for bridge timber, it is estimated that 10,000,000 feet board measure can be produced locally, the remainder to be structural grade coast Douglas fir. The culvert timber should be Douglas fir, select merchantable grade. In this connection, it might be desirable to canvass the possibilities of procuring metal pipe for the smaller-sized culverts.

The above estimates are based upon the latest available data but may later be subject to some revisions due to changed conditions encountered in the field. It is believed, however, that they will give you the comparative quantities of critical materials required for the two types of structures, viz, steel and timber.

We are compiling material lists for all structures required on the project and these will be forwarded you tomorrow, in accordance with Colonel Wyman's request in order that you may arrange for the allocation of the required material.

Very truly yours,

THOS. H. MACDONALD,
Commissioner of Public Roads.

EXHIBIT 5

JANUARY 27, 1943.

Bridges for Alcan Highway
Colonel HARDIN,
General ROBINS,
Colonel BURTON,
Fortification Section.

1. There is attached hereto letter of January 27 to Mr. MacDonald for your signature and my letter of January 27 to the northwest division for note (copy of this letter being sent to Mr. MacDonald).

2. A rough check on the question of steel bridges versus timber bridges indicates that there is little difference in cost. The tonnage factor however is definitely in favor of steel bridges and based on information furnished by the Materials and Equipment Section on the present situation of structural steel and structural timber the time factor is also definitely in favor of steel bridges.

3. Both of the above factors, that is, tonnage to be transported and time are considered important. At present all or practically all of operations in the Northwest Service Command are being delayed because of transportation. Colonel Wyman indicated that capacity of the White Pass and Yukon Railroad has been greatly reduced this winter and that there is at present some 260,000 tons of freight earmarked to go in over this railroad. He was of the opinion that equipment and supplies including bridge materials for Alcan must of necessity go in by rail to Dawson Creek and thence by highway. Mr. MacDonald in his letter of January 23 makes the assumption that a substantial amount of bridge timber can be obtained locally. If his assumption is correct the tonnage involved in the bridges which would have to be transported (imported) is as follows:

	<i>Tons</i>
Steel bridges.....	18, 000
Timber bridges.....	25, 500

It seems doubtful whether any substantial quantity of structural timber needed for bridge construction can be obtained locally. If no such timbers could be obtained locally the tonnage to be transported (imported) would be as follows:

	<i>Tons</i>
Steel bridges.....	28, 900
Timber bridges.....	44, 500

A. N. B.

(Attachments: Letters to Mr. MacDonald and to Northwest Division Engineer.)

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, January 27, 1943.

Mr. THOMAS H. MACDONALD,
Commissioner, Public Roads Administration, Washington, D. C.

DEAR MR. MACDONALD: Reference is made to your letters of January 23 and 24, 1943, and to conference held in this Office on January 25 with Messrs. Clark and Archibald, all on the subject of bridges for the Alcan Highway.

There is enclosed herewith for your information and file copy of letter of this Office dated January 27, 1943, to the division engineer, northwest division, on the above subject and which, it is believed, is self-explanatory. Confirming agreement reached in the above-mentioned conference, it is desired that the steel spans in question be placed under order at the earliest possible date. Other items listed in your letter of January 23, including reinforced steel, metal-pile casings for tubular piers, and culvert timber, should not be ordered pending further study of this matter in Edmonton by the division engineer, northwest division, and your district engineer.

As indicated in letter to the division engineer, it is expected that his office will extend the necessary preference ratings to cover the steel spans in question. This Office (Capt. A. C. Roeth, extension 79572) will make every effort to secure allocation of necessary steel plate upon receipt of information as to names of fabricators needing same. The names of such fabricators should be furnished at the earliest possible date.

For the Chief of Engineers:
Very respectfully yours,

THOMAS M. ROBINS,
Major General,
Assistant Chief of Engineers.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, January 27, 1943.

Subject: Bridges for Alcan Highway.
To: Northwest Division Engineer.

1. There is enclosed herewith for your information and file, copies of letters from the Public Roads Administration dated December 15, 1942, and January 23 and 24, 1943, on the above subject.

2. Conference was held in this Office on January 25 on the subject in question, same being attended by Messrs. Clark and Archibald, of the Public Roads Administration. These gentlemen advised that the Administration had contacted some 25 fabricators, including those suggested by the Materials and Equipment Section of this Office, that many fabricators are not working to anything like full capacity, and that many of them have substantial stocks of steel on hand although in practically every instance available stock would need be supplemented by certain beams, shapes, etc., from the mills in order to permit complete fabrication of one or more bridges. They further stated that plans of the various spans were submitted to the fabricators in connection with obtaining the above-mentioned information and that, accordingly, both the Administration and the fabricators are in position to complete negotiation of contracts in a very short time.

3. Based on the above facts and the further fact that structural timber is now critical and it is expected that such situation will continue for a substantial period, the Public Roads Administration was requested to place orders for the steel spans in question at the earliest possible date. They were informed that preference rating for such orders would be extended by the northwest division and that the Materials and Equipment Section of this Office would take action to have such plate as is not available in fabricators stock included in March rollings, such action to be initiated upon receipt of information from the Public Roads Administration as to names of fabricators for which rollings of plate will be required.

4. In connection with materials listed in third paragraph of Public Roads Administration letter of January 23, Captain Roeth stated that serious difficulty would be experienced in obtaining metal pile casings for tubular piers if in fact it would be possible to obtain such casings at all. Mr. Archibald thought that the use of metal casings would possibly be avoided by the use of H beams. It would appear that present War Department construction policy necessitates careful consideration of this item, with a view to the possible use of timber piling in lieu of concrete piling. Likewise, it would appear that careful consideration should be given to the use of local timber rather than douglas fir of select mer-

chantable grade for use in culverts, both from the standpoint of conserving Douglas fir and reduction of tonnage to be transported to the site of the work.

5. It is believed that the division engineer in collaboration with the service commander, should give careful and continuing consideration to the matter of transportation of construction supplies and equipment to job sites and that the Public Roads Administration district engineer should be kept fully informed as to routings and methods of shipment of the fabricated bridges in question as well as other items being, or to be, procured by the Public Roads Administration.

6. Copy of letter this Office dated January 27 to the Commissioner of Public Roads Administration is enclosed herewith for your information.

By order of the Chief of Engineers:

A. H. BURTON,
Colonel, Corps of Engineers,
Assistant, Operations Branch,
Construction Division.

APPENDIX H

(CHAPTER VIII)

	Exhibit
Expenditures and cost analysis of all work done under supervision of the Public Roads Administration on the Alaska Highway, the Haines lateral road, and nonrelated military projects, as of June 30, 1945 (prepared by Public Roads Administration).....	1
Map showing roadway cost per mile, excluding bridges, on the Alaska Highway (prepared by Public Roads Administration).....	2

APPENDIX I

(CHAPTER IX)

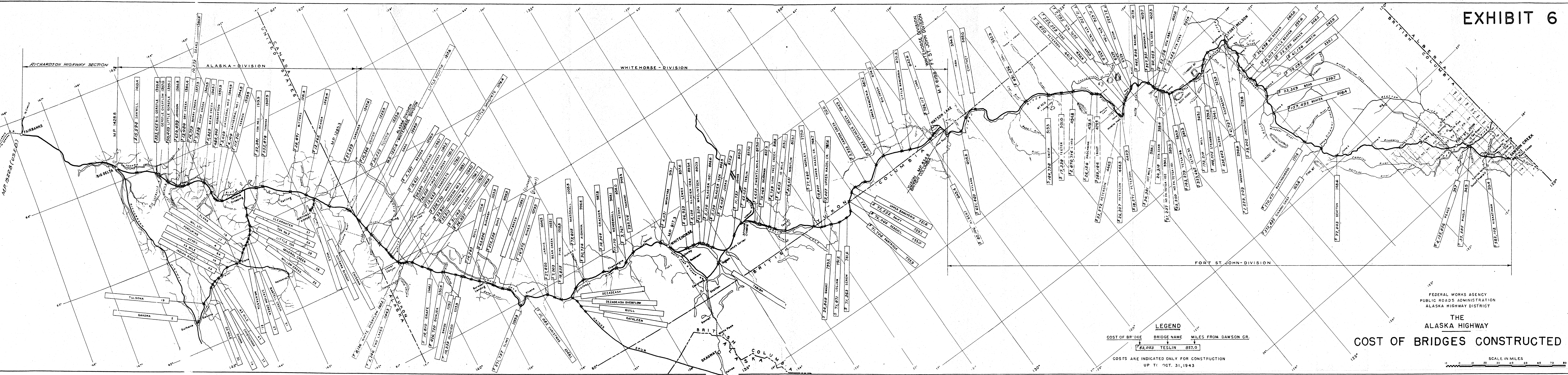
Exhibit		Exhibit
Analysis by chart of charges for rental of construction equipment paid by War Department to War Department contractors on the Haines lateral road (source: Prepared from War Department files) (six charts and analysis).....	1	Copy of War Department equipment rental agreement used on all War Department contracts in Northwest Canada and Alaska when contract let directly by War Department (exact copy of contract with Bowen & McLaughlin used as example).....
Analysis by chart of equipment rental charges paid by Public Roads Administration to PRA contractors on the Alaska Highway and related projects (source: Prepared from Public Roads Administration files) (four charts).....	2	Sample copy of equipment rental schedule applicable to all Public Roads Administration contracts in Northwest Canada and Alaska... 4
Summary of equipment rentals paid by War Department.....	3	5

EXHIBIT 1. BASIS OF CHARGES FOR RENTAL OF CONSTRUCTION EQUIPMENT ON HAINES MILITARY HIGHWAY

1. The attached graphic analysis of equipment charges shows a comparison of the items included in equipment rental listed in schedule published by the Associated General Contractors of America, Inc., and the Army schedule for Haines Road. The OPA ceiling rentals also are compared graphically. The break-down of OPA rentals is not available in this office.

2. The items included in equipment rental charges allowed by the A. G. C. and Army schedule are as follows:

(a) *Depreciation.*—A. G. C. computes depreciation rates by the straight-line method by which a uniform percentage is charged off each year during the life of the equipment. These rates are based on operation under the wear and tear of average job conditions, where personnel of operating crews frequently changes, contemplating one shift per day use. The average depreciation rate shown in A. G. C. schedule is 20 percent per year or based on a 5-year life. The average equipment year is based on 8 months. The average life of the equipment is 40 working months. The equipment rented by the Army was operated in two shifts, 10 hours each per day, and the operating conditions in the Northwest are not considered normal. Based on the longer operating period and unfavorable operating conditions, depreciation rates allowed by the Army are 25 to 50 percent higher than A. G. C. rates.



LEGEND

COST OF BRIDGE BRIDGE NAME MILES FROM DAWSON CR.

\$63,053 TESLIN 837.0

COSTS ARE INDICATED ONLY FOR CONSTRUCTION UP TO OCT. 31, 1943

FEDERAL WORKS AGENCY
PUBLIC ROADS ADMINISTRATION
ALASKA HIGHWAY DISTRICT

THE
ALASKA HIGHWAY

COST OF BRIDGES CONSTRUCTED

SCALE IN MILES

0 10 20 30 40 50 60 70 80

EXHIBIT 1

Expenditures and cost analysis, Alaska Highway, as reported by Public Roads Administration¹

Project	Recapitulation			Cost analysis													
	Direct construction	USED reimbursement	Total ¹	Pay rolls	Materials and supplies	Equipment ²			Transportation		Travel expenses	Insurance, communication, etc.	Fixed fee	Public roads engineering	Medical	Mess halls and barracks	Office rent
						Purchases	Rentals	Repairs	Freight	Passenger							
FORT ST. JOHN																	
Okes Construction Co.	\$15,696,037.43	\$6,102,450.40	\$21,798,487.83	\$11,854,603.98	\$3,505,952.05	\$204,516.23	\$1,387,920.40	\$899,264.86	\$1,109,011.73	\$588,014.04	\$122,770.51	\$519,652.67	\$1,259,399.00	\$347,382.36			
R. Melville Smith Co.	23,625,434.55	4,111,625.58	27,737,060.13	11,599,847.76	7,640,020.16	919,954.48	1,982,086.22	1,570,352.91	2,085,123.76	528,360.70	163,249.88	144,016.68	781,943.00	321,851.56		\$253.02	
E. W. Elliott, Transportation and Building	1,198,116.31	530,388.00	1,728,504.31	749,703.03	356,771.78	57,110.05	106,193.85	49,166.48	160,522.28	40,378.51	25,485.00	133,668.25	41,659.84	7,845.24			
Surveys	671,209.61		671,209.61	363,958.56	55,303.69	103,670.62	306.34		40,928.87	63,044.42	23,823.48	927.06			\$19,246.02	4.55	
Maintenance		110,184.21	110,184.21	57,670.83	25,902.27	9,280.28			3,368.79	1,530.32	10,069.68	2,092.79			203.11	33.63	
Administration	2,300,791.43	14,000.00	2,314,791.43	1,118,540.70	405,266.18	213,390.82	19,285.54		218,167.99	102,607.95	57,920.98	17,180.39			133,093.50	481.55	
Stores expenditures	669,906.55		669,906.55		52,066.09	9,800.02		144,589.84				171.20					
Peace River Bridge:																	
Dufferin, substructure	1,168,114.88		1,168,114.88	424,562.43	246,644.92	2,500.00	234,116.67	34,118.22	169,974.98	5,185.61	1,500.25	1,595.14	34,800.00	13,116.66			
Roebling:																	
Structural steel	460,234.42		460,234.42	168,863.81	201,271.01									99.60			
Superstructure	1,408,224.69		1,408,224.69	704,577.38	125,779.42	5,884.11	157,589.26	3,043.11	240,533.79	49,058.42	28,565.36	46,283.74	35,500.00	11,410.10			
Total, Peace River Bridge	3,036,573.99		3,036,573.99	1,129,139.81	541,288.15	299,655.12	391,705.93	37,161.33	410,508.77	54,244.03	30,065.61	47,878.88	70,300.00	24,626.36			
Liard River bridge:																	
United States Steel:																	
Superstructure	656,015.92		656,015.92	247,556.53	149,974.60	488.03	38,711.80	16,061.67	121,029.01	15,841.60	5,843.09	11,679.52	31,500.00	17,330.07			
Structural steel	169,735.36		169,735.36	143,858.86					24,704.36					1,172.14			
Total Liard River bridge	825,751.28		825,751.28	247,556.53	293,833.46	488.03	38,711.80	16,061.67	145,733.37	15,841.60	5,843.09	11,679.52	31,500.00	18,502.21			
Bay cities:																	
Muskwa River bridge	249,989.37		249,989.37	151,108.52	44,715.38	726.00	12,300.00	1,350.16	13,106.93	7,930.24	2,447.01	6,914.41	5,791.00	3,599.72			
Dismantling railroad	124,517.85		124,517.85	39,959.69	26,266.70		8,707.69	2,546.92	33,965.22	1,023.15	260.99	8,902.91	2,416.00	483.58			
Kiss Crane, bridges for steel	38,497.97		38,497.97	18,230.80	9,765.24		4,026.63	422.99	8,663.45	2.98	31.09	2,245.28	864.00	245.51			
Haddock Construction Co.	1,041,080.60		1,041,080.60	487,166.71	254,162.77	2,424.79	15,435.99	10,422.85	138,648.84	27,399.75	15,303.16	26,515.82	49,200.00	14,399.92			
Total Fort St. John	49,477,906.94	10,868,648.19	60,346,555.13	27,817,484.92	13,205,313.92	1,821,086.44	3,966,680.39	2,731,340.01	4,830,967.40	1,430,377.69	457,270.48	921,845.86	2,243,072.84	738,921.46	23,878.34	157,542.63	772.75
565 miles construction, average cost per mile	87,571.52	19,236.54	106,808.06														
WHITEHORSE, YUKON TERRITORY																	
Dowell Construction Co.	15,328,714.68	8,834,215.83	24,162,930.51	12,804,800.08	4,393,109.60	801,116.82	1,390,537.89	589,774.39	1,198,024.73	568,122.17	506,949.95	488,077.46	1,127,995.00	293,447.42		975.00	
E. W. Elliott, transportation and building	4,220,047.73	1,842,400.42	6,062,448.15	2,629,819.80	1,251,157.57	200,327.46	372,510.18	172,467.74	563,085.20	141,641.03	89,397.10	468,834.36	146,136.91	27,970.80			
Utah Construction Co.	6,536,621.19		6,536,621.19	3,044,537.68	1,029,732.33	1,393,822.89	848.60	136,462.22	285,265.83	162,897.18	62,904.13	157,960.53	200,000.00	62,189.80			
Surveys	478,903.17		478,903.17	272,397.01	42,289.80	46,762.18	1,004.11		8,139.67	61,749.96	25,293.43	2,159.50			13.60	18,820.64	
Maintenance		16,703.84	16,703.84	13,311.72	2,625.39					196.05	210.65	360.03					
Administration	1,079,210.85	11,933.08	1,091,143.93	654,938.36	104,251.04	7,343.38	17,732.95		78,948.21	83,904.14	62,378.04	6,854.43			13,725.00	60,421.78	
Total Whitehorse, Yukon Territory	27,644,397.62	10,705,253.17	38,349,650.79	19,419,804.65	6,820,540.34	2,451,998.12	1,782,633.73	898,704.35	2,133,463.64	1,018,600.53	747,133.30	1,124,246.40	1,474,131.91	383,608.02	13,738.60	79,242.42	1,804.78
622.5 miles construction, average cost per mile	44,408.67	17,197.19	61,605.86														
ALASKA TERRITORY																	
Lytle & Green Construction Co.	10,889,512.32	3,334,259.32	14,223,771.64	7,291,614.25	2,863,060.93	367,624.63	539,402.39	519,900.66	583,659.65	384,688.34	224,029.94	236,987.38	1,083,630.00	129,173.42			
E. W. Elliott, transportation and building	884,224.71	418,727.37	1,302,952.08	565,122.05	268,879.08	43,054.72	80,049.23	37,061.83	121,002.15	30,437.43	19,210.51	100,742.69	31,403.25	5,989.14			
Surveys	235,727.15		235,727.15	129,270.83	7,573.29	39,280.38			33,858.63	12,384.30	8,451.72	483.56			22.05	4,393.39	
Administration	337,918.93		337,918.93	185,452.47	30,051.59	8,884.61	9,733.53		48,855.18	14,941.19	21,088.60	4,951.83			4,177.95	3,792.91	
Total Alaska Territory	12,347,383.11	3,752,986.69	16,100,369.80	8,171,468.60	3,169,564.89	458,844.39	629,185.15	556,962.49	787,375.61	442,451.26	272,760.77	343,165.46	1,115,033.25	135,162.56	4,200.00	8,186.30	6,009.07
200 miles construction, average cost per mile	42,577.19	12,941.33	55,518.52														
DISTRICT OFFICE EXPENSES																	
Seattle, administration	444,185.68		444,185.68	239,593.74	65,175.14	22,581.21	2,447.50		28,425.04	23,662.17	26,145.65	22,750.74			1,569.72	11,834.77	
Edmonton, administration	1,059,072.20		1,059,072.20	511,137.71	87,407.10	40,824.53	36.78		290,041.02	25,058.74	59,068.21	32,332.39			362.64	11,684.89	
Chicago, administration	192,411.75		192,411.75	87,771.62	14,377.42	9,033.67	16.00		12,677.13	8,951.56	38,879.53	13,748.09				6,951.73	
Washington, administration	27,651.07		27,651.07	2,156.73	904.14				882.82	2,461.85	21,230.16	15.37					
Missoula, administration	72,387.57		72,387.57	46,462.78	747.83		3,577.00		4,246.55	5,665.03	10,472.97	1,215.41					
Portland, administration	7,637.17		7,637.17	6,810.97	386.12				25.09	230.62	166.48	17.89					
San Francisco, administration	10,040.68		10,040.68	7,152.55	186.32				209.85	94.28	1,744.25	107.03					
Off highway, U. S. Engineer Department	82,900.99		82,900.99	69,724.15	569.09				1,231.26	2,468.62	8,757.17	150.70				546.40	
Washington office, expenditures	226,660.66		226,660.66		226,660.66					139.20							
District 1, expenditures	155,838.03		155,838.03	87.87	155,686.26					13.20	50.70						
District 2, expenditures	148,115.02		148,115.02	810.96	147,289.14					4.15		10.77					
District 3, expenditures	43,305.50		43,305.50		43,305.50												
District 12, expenditures	57,949.80		57,949.80	1,048.94	56,881.18					319.68							
U. S. Engineer Department, expenditures	629,378.08		629,378.08	61.49	490,471.39	2,958.48	83.44	123,030.02	6,319.98			474.21		5,979.07			
Stores, expenditures	1,177,209.03		1,177,209.03	271.59	1,031,580.99	10,205.86		39,605.26	86,650.57	3,791.40	404.31	4,671.78				27.27	
Stored-steel account	368,390.55		368,390.55		368,390.55												
Equipment expenditures	2,900,152.36	673,111.95	3,573,264.31	72,031.36	682,504.19	907,279.26	3,483.80	836,471.06	1,008,293.67	19,267.94	13,519.63	30,413.40					
Equipment, Edmonton	20,469.37		20,469.37		7,282.17	169.75		1,321.86	1,276.67	314.83	10,067.21	36.88					
Total, district office expenses	7,623,755.51	673,111.95	8,296,867.46	1,045,122.46	3,379,365.99	993,057.76	9,644.52	1,000,428.20	1,440,279.65	92,443.27	190,506.27	105,944.66	0	5,979.07	1,932.36	1,118.19	31,045.05
SUMMARY																	
Fort St. John division	49,477,906.94	10,868,648.19	60,346,555.13	27,817,484.92	13,205,313.92	1,821,086.44	3,966,680.39	2,731,340.01	4,830,967.40	1,430,377.69	457,270.48	921,845.86	2,243,072.84	738,921.46	23,878.34	157,542.63	772.75
Whitehorse, Yukon Territory, division	27,644,397.62	10,705,253.17	38,349,650.79	19,419,804.65	6,820,540.34	2,451,											

Insert in appendix H

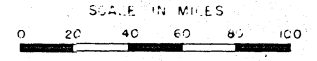
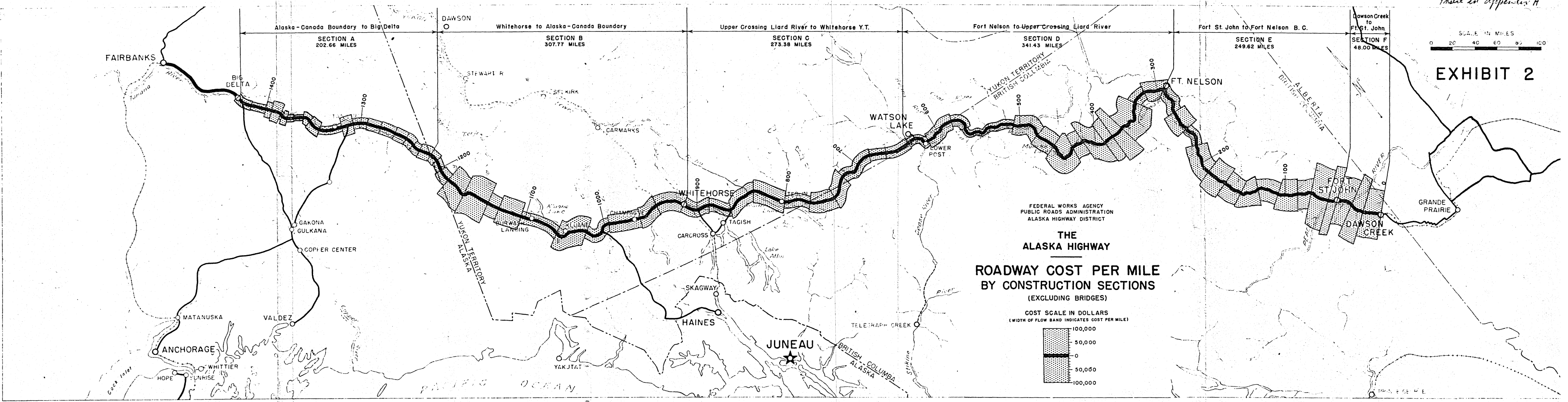


EXHIBIT 2



(b) *Major repairs and overhauling.*—A. G. C. schedule allows 15 percent per equipment year for major repairs. These repairs include those items of heavy shop repair in contrast with minor or field repairs. The Army schedule allows only one-third of the A. G. C. repair charges since the Army equipment rental agreement provided that equipment be returned in operable condition except under normal wear and tear.

(c) *Interest on investment.*—A. G. C. computes interest at 5 percent, the average contractor's cost of obtaining money for the purchase of equipment. The same percentage is allowed in Army rental rates.

(d) *Storage and incidental.*—A. G. C. storage rate is based on average storage and incidental expense of storing equipment between successive jobs or operations. This expense is made up of such items as rental and maintenance of storage warehouses or yards, wages of watchmen, and such direct overhead expense as may be involved in providing the storage facilities and handling the equipment in and out of storage. The average expense of storage is 3.5 percent per annum. The same percentage is allowed in Army rental rates.

(e) *Insurance.*—A. G. C. schedule allows an average of 1 percent per annum throughout the useful life of the equipment. It covers the average cost of premiums on general policies covering the usual insurable risks, including fire and theft. Army rates do not allow an item for insurance since the contractor was not required to carry insurance on equipment rented to the Army.

(f) *Taxes.*—A. G. C. expense of 1.5 percent per annum for taxes includes the average personal taxes on assessed valuation of equipment and corporation taxes on capital value of equipment, but does not include State or United States income taxes which are more properly items of general expense. The Army rental rates include the same amount as A. G. C. for taxes.

(g) *Profit and overhead.*—The A. G. C. schedule includes no element of profit or return sufficient to justify continuous reinvestment in construction equipment for rental to others. A. G. C. manual of equipment rental schedules states, "A contracting firm desiring to rent its equipment would need to add a ready-to-serve charge to cover overhead in addition to profit." The Army rental rates show from 4 to 10 percent per annum for overhead and profit on equipment rented from an equipment contractor.

(h) *Discussion.*—Based on the break-down shown it is estimated that the equipment contractor for the Haines Road made an annual profit of 5.5 percent of the value of the equipment.

(i) *Comparison of Army and PRA rental rates.*—In comparing PRA and Army rental rates consideration must be given to the following:

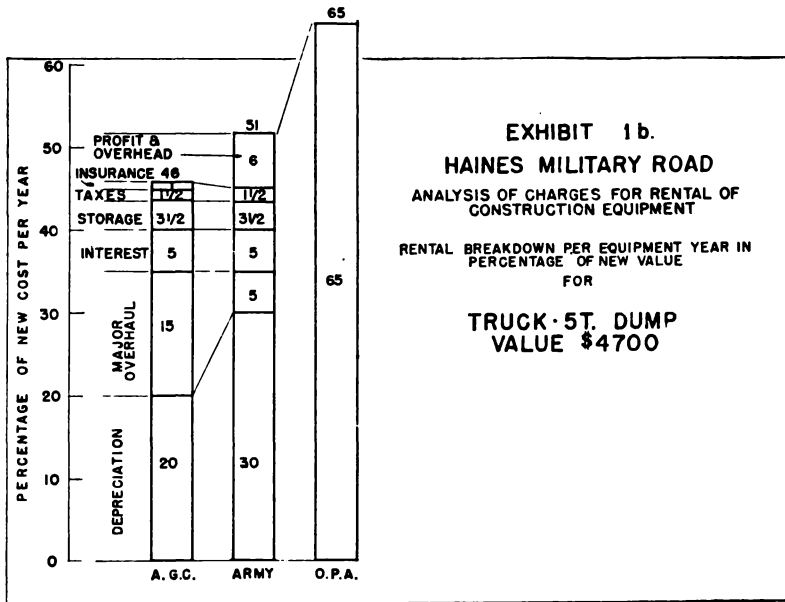
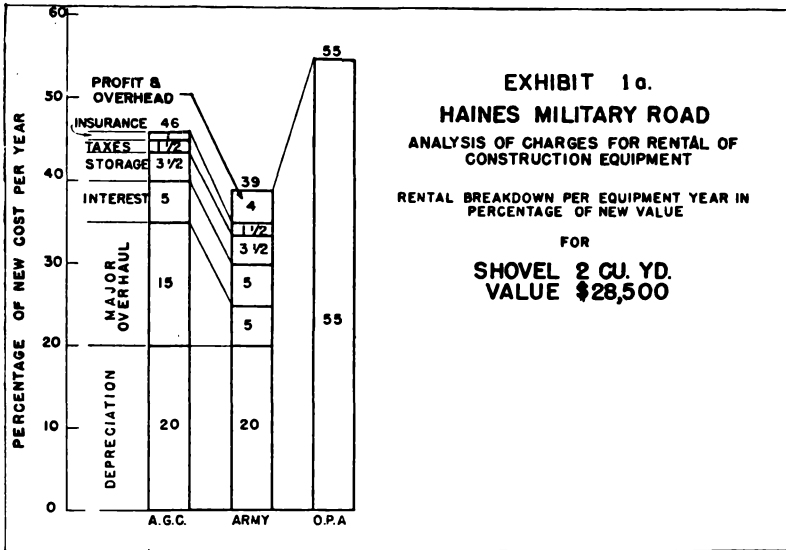
(1) Guaranty: PRA guaranteed a 12-month rental period.

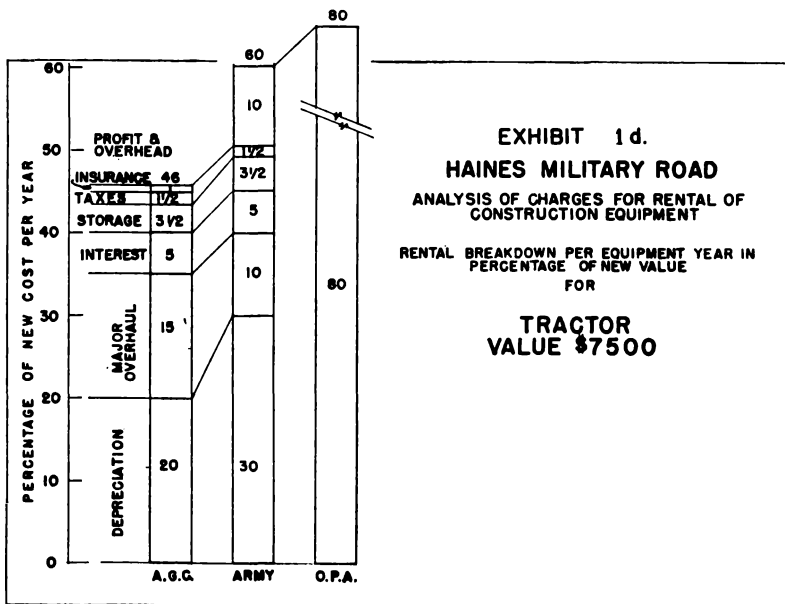
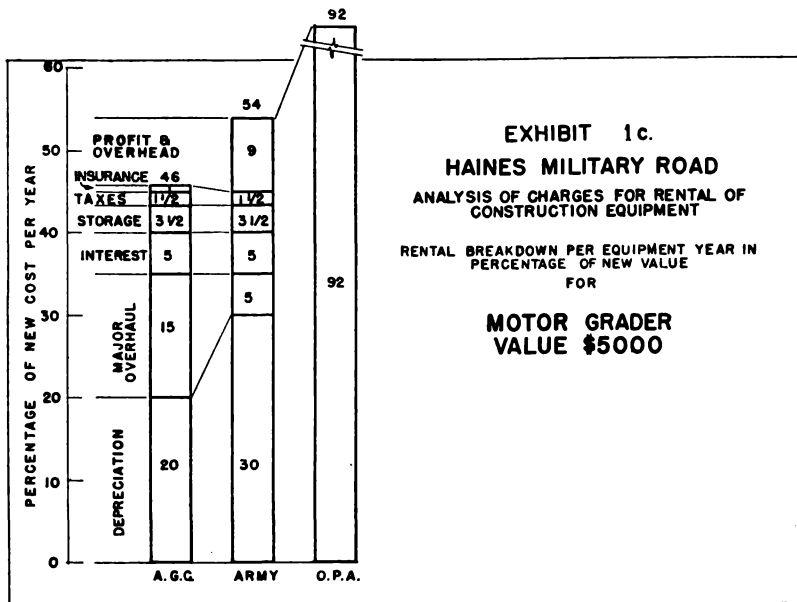
(2) Cessation of work: PRA allowed contractor rental during months when equipment was idle for winter shut-down.

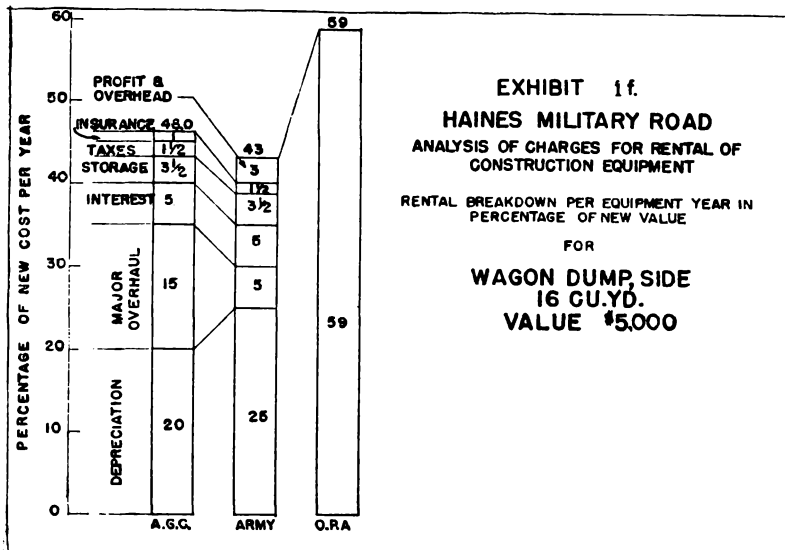
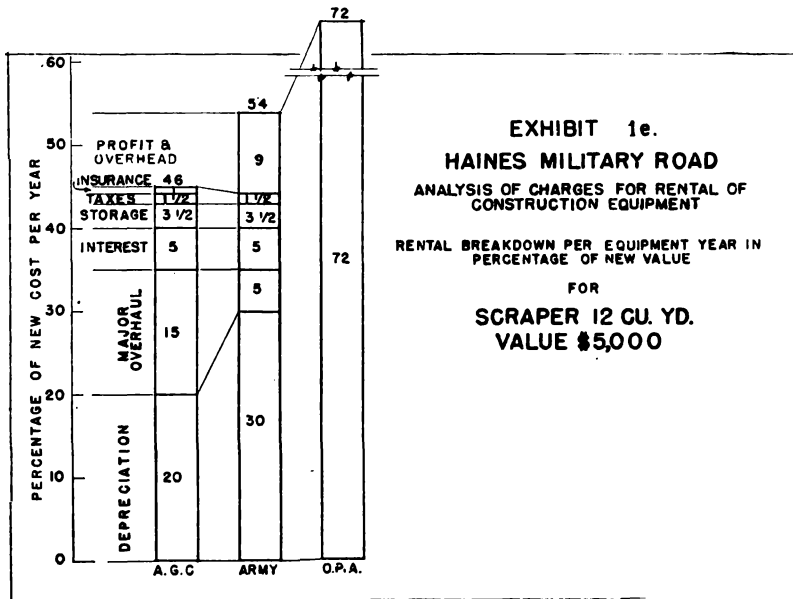
(3) Profit: PRA charges do not include an item for profit. The profit on equipment rental is included in the total profit and does not show in equipment rental cost.

(4) Overtime: PRA allowed straight time for overtime whereas Army allowed one-half straight time for overtime.

(5) Army did not allow rental for laytime because of winter shut-down. However, only a few items of rented equipment remained on the job during winter months in idle status.







**COMPARISON OF EQUIPMENT CHARGES
FOR THE
1942 - 1943 RETENTION PERIOD**

UNDER CONDITIONS PREVAILING ON THE ALASKA HIGHWAY INVOLVING RETENTION OF EQUIPMENT FROM JUNE 1942 TO NOVEMBER 1943 AND THROUGH TWO CONSTRUCTION SEASONS COMPRISED OF TWO 11 HOUR SHIFTS DAILY, 7 DAYS A WEEK DURING THE WORKING PERIOD.

POWER SHOVEL
1 1/2 CU. YD. DIESEL

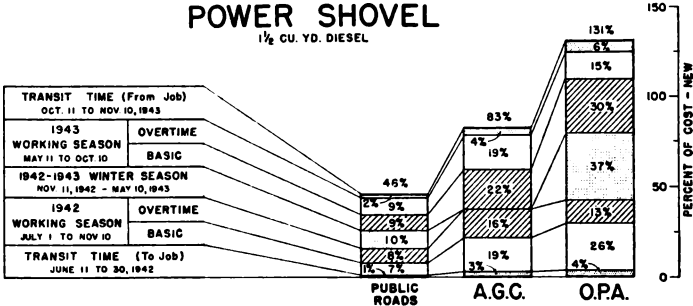


EXHIBIT 2a

**COMPARISON OF EQUIPMENT CHARGES
FOR THE
1942 - 1943 RETENTION PERIOD**

UNDER CONDITIONS PREVAILING ON THE ALASKA HIGHWAY INVOLVING RETENTION OF EQUIPMENT FROM JUNE 1942 TO NOVEMBER 1943 AND THROUGH TWO CONSTRUCTION SEASONS COMPRISED OF TWO 11 HOUR SHIFTS DAILY, 7 DAYS A WEEK DURING THE WORKING PERIOD.

MEDIUM TRUCK
1 1/2 TON, DUMP, 2-3 CU. YD. CAP.

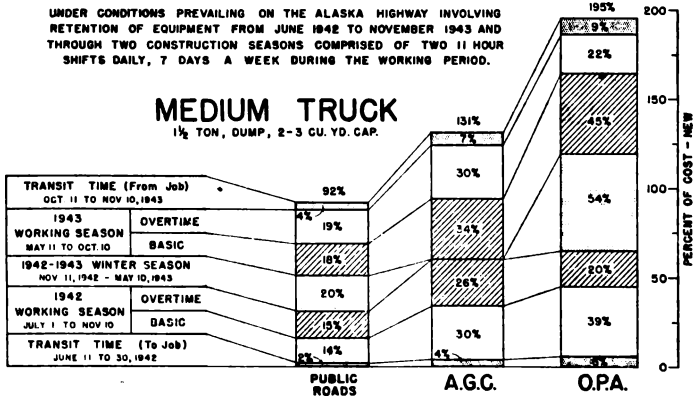


EXHIBIT 2b

COMPARISON OF EQUIPMENT CHARGES FOR THE 1942 - 1943 RETENTION PERIOD

UNDER CONDITIONS PREVAILING ON THE ALASKA HIGHWAY INVOLVING RETENTION OF EQUIPMENT FROM JUNE 1942 TO NOVEMBER 1943 AND THROUGH TWO CONSTRUCTION SEASONS COMPRISED OF TWO 11 HOUR SHIFTS DAILY, 7 DAYS A WEEK DURING THE WORKING PERIOD.

HEAVY TRACTOR

95 TO 115 H.P. DIESEL
(D-8 TYPE)

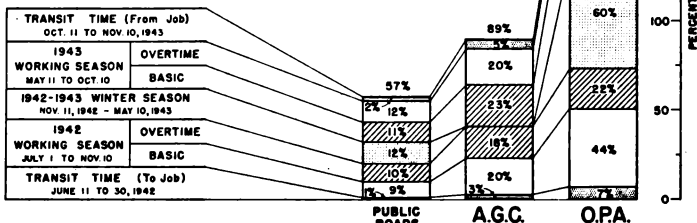


EXHIBIT 2c

COMPARISON OF EQUIPMENT CHARGES FOR THE 1942 - 1943 RETENTION PERIOD

UNDER CONDITIONS PREVAILING ON THE ALASKA HIGHWAY INVOLVING RETENTION OF EQUIPMENT FROM JUNE 1942 TO NOVEMBER 1943 AND THROUGH TWO CONSTRUCTION SEASONS COMPRISED OF TWO 11 HOUR SHIFTS DAILY, 7 DAYS A WEEK DURING THE WORKING PERIOD.

LARGE CARRYALL

17 CU. YD. SCRAPER

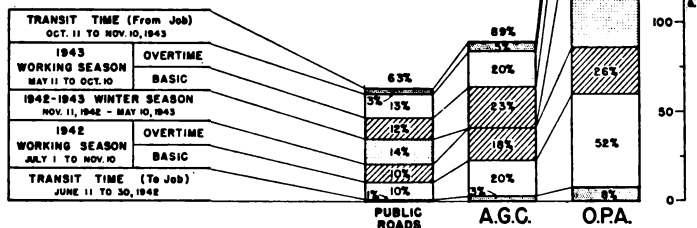


EXHIBIT 2d

EXHIBIT 3

Summary of second party and third party equipment rentals under cost-plus-fixed-fee
Contract No. W-3416-Eng-51 (592)

Number	Contractor	Total approved valuation	Total rental rate per month	Date rental begins	Date rental ceases	Total accrued rental paid
Second party rentals: W-3416-Eng-51 (592).	Foley Bros., Inc., and Rohl-Con- nolly Co., 900 New York Bldg., St. Paul, Minn.	\$458,807.00	\$10,234	Mar. 6, 1943	June 24, 1944	\$127,116.91
Third party rentals: Rental Agree- ment No. 1.	Bowen & Mc- Laughlin, Haines, Alaska.	928,343.05	67,099	Feb. 23, 1943	Dec. 3, 1943	530,860.36
Rental Agree- ment No. 2.	Odin Jensen, Haines, Alaska.	3,200.50	1 ¹ 15	May 1, 1943	Nov. 30, 1943	3,150.00
Total.....	-----	1,390,350.55	1 ¹ 77,333	-----	-----	661,127.27

¹ Per day.

¹ Per day rental rate not included in total.

THE ALASKA HIGHWAY

Summary of second and third party marine equipment rental paid under Foley Bros., Inc., and Rohl-Connelly Co., contract No. 3416-Eng-51

Equipment code No.	Description	Model	Serial	Year	Appraised valuation	Rental rate per month	Date rental begins	Date rental ceases	Total accrued rental paid
171670	Side-dump barge No. 1: Length, 119.9 feet; breadth, 38 feet; depth, 10.3 feet (wood constructed 1934).				\$40,000.00	\$578	Mar. 12, 1943	Apr. 20, 1944	\$7,706.65
171779	Flat-deck barge No. 3: 120 feet long, 38-foot beam, 12-foot depth, capacity, 1,000 tons.				34,500.00	551	Mar. 16, 1943	June 24, 1944	8,446.65
171679	Hopper barge No. 8: 125 feet long, 38-foot beam, 12-foot depth, 1,000-ton capacity.				46,800.00	1,107	Mar. 10, 1943	Jan. 7, 1944	11,033.10
171689	Hopper barge No. 7: 125 feet long, 38-foot beam, 12-foot depth, 1,000-ton capacity.				46,800.00	1,107	Mar. 12, 1943	Jan. 10, 1944	11,070.00
171670	Derrick barge No. 4: 120 feet long, 38-foot beam; capacity, 1,000 tons.				65,000.00	2,000	Mar. 11, 1943	May 18, 1944	30,600.00
209236	Tug (Superior)				39,333.00	889	Mar. 24, 1943	Jan. 30, 1944	9,087.43
8662A	Tug (Georgia): 500-horse power steam engine, triple expansion.				40,000.00	967	Mar. 6, 1943	Feb. 28, 1944	11,475.07
171750	Miscellaneous anchors, chains, and floats.				8,824.00	275	Mar. 21, 1943	June 16, 1944	3,904.16
171917	Hopper barge No. 8: 125 feet long, 38-foot beam, 12-foot depth, 1,000-ton capacity.				46,800.00	1,107	Mar. 25, 1943	Mar. 28, 1944	13,431.60
171917	Flat-deck barge No. 9: 120 feet long, 38-foot beam, 12-foot depth, 1,000-ton capacity.				30,750.00	551	Mar. 7, 1943	Apr. 20, 1944	7,438.49
171918	Flat-deck barge No. 10: 120 feet long, 38-foot beam, 12-foot depth, 1,000-ton capacity.				30,000.00	551	Mar. 16, 1943	Jan. 13, 1944	5,491.64
171919	Flat-deck barge No. 11: 120 feet long, 38-foot beam, 12-foot depth, 1,000-ton capacity.				30,000.00	551	Mar. 6, 1943	Apr. 18, 1944	7,420.12
	Total				498,807.00	10,234			127,116.91
	RENTAL AGREEMENT NO. 2—ODIN JENSEN								
	Pile driver with hoist and 3,500-pound hammer, 8-cylinder Studebaker engine.				3,200.50	115	May 1, 1943	Nov. 30, 1943	3,150.00
	Total marine payments made								130,266.91

1 Per day.

NOTE.—All amounts stated are United States funds.

THE ALASKA HIGHWAY

Third party equipment rental paid under Foley Bros., Inc., and Rohl-Connolly Co. contract No. 3416-Eng-51

(Rental agreement No. 1—Bowen & McLaughlin, Haines, Alaska)

Equipment code No.	Description	Model	Serial	Year	Appraised valuation	Rental rate per month	Date rental begins	Date rental ceases	Total accrued rental paid
SK-985	2-door sedan	Ford	18-6505145	1941	\$775.00	\$45.00	Mar. 2, 1943	Dec. 3, 1943	\$409.50
SK-984	do	do	18-6829098	1942	775.00	45.00	Mar. 1, 1943	Nov. 23, 1943	394.50
SK-983	do	Chevrolet	9BG11-7013	1942	775.00	45.00	do	Nov. 27, 1943	400.50
SK-982	do	do	21A 004-38775	1941	775.00	45.00	Mar. 2, 1943	do	400.50
SK-981	Coupe	do	21BG10-6027	1942	775.00	45.00	do	do	342.50
SK-989	Pick-up truck	do	21KC08-0188	1940	675.00	37.50	Feb. 22, 1943	do	342.50
SK-988	do	do	21AK12-4425	1941	675.00	37.50	do	do	342.50
SK-987	½-ton pick-up truck	Ford	35163970	1942	600.00	37.50	do	do	342.50
SK-986	do	Chevrolet	35163970	1940	600.00	37.50	do	do	342.50
SK-980	do	GMC	35163970	1942	600.00	37.50	do	do	342.50
SK-509	do	GMC	7250	1932	600.00	37.50	Mar. 1, 1943	do	333.75
SK-508	do	do	F01D3752	1942	1,400.00	75.00	do	do	667.50
SK-509	½-ton truck panel with 200-ampere welder	Mack	F01D3752	1942	4,600.00	300.00	Feb. 23, 1943	Nov. 15, 1943	2,792.50
SK-508	Truck, dump	do	248652	1942	4,600.00	300.00	do	do	2,620.00
SK-507	do	Mack	FQ1D3763	1942	4,600.00	300.00	do	do	2,738.44
SK-506	do	White Motor Co	248568	1942	4,600.00	300.00	Feb. 23, 1943	do	2,720.00
SK-505	do	do	3436	1935	4,500.00	300.00	Feb. 22, 1943	do	2,620.00
SK-504	do	White Motor Co	248653	1942	4,600.00	300.00	do	do	2,942.20
SK-503	do	do	248761	1942	4,600.00	300.00	do	do	2,917.51
SK-502	do	do	248376	1942	4,600.00	300.00	do	do	2,641.25
SK-501	do	Mack	EQ1D3751	1942	4,600.00	300.00	Feb. 23, 1943	Nov. 15, 1943	2,920.00
SK-500	Truck with 61½-gallon fuel tank	Chevrolet	21M501-6078	1942	1,200.00	63.75	Nov. 15, 1943	Dec. 3, 1943	585.01
SK-509	Truck dump	White Motor Co	248702	1942	4,600.00	300.00	do	Nov. 1, 1943	2,509.37
SK-508	do	do	248701	1942	4,600.00	300.00	do	do	2,628.44
SK-507	do	do	248612	1942	4,600.00	300.00	do	Nov. 15, 1943	2,689.06
SK-506	Truck platform	General Motors Corporation	CC303-16188	1942	1,075.00	56.25	Feb. 28, 1943	do	480.01
SK-505	do	do	CC303-16023	1942	1,075.00	56.25	do	do	480.01
SK-504	Truck platform 6-service unit	Ford	248457	1941	4,600.00	300.00	do	do	2,722.10
SK-503	Truck dump	White Motor Co	248429	1942	4,600.00	300.00	Feb. 25, 1943	do	2,450.00
SK-502	do	do	248613	1942	4,600.00	300.00	do	Nov. 1, 1943	2,719.06
SK-501	do	do	248760	1942	4,600.00	300.00	Feb. 23, 1943	Nov. 15, 1943	2,694.69
SK-500	do	do	248466	1942	4,600.00	300.00	Feb. 25, 1943	Nov. 17, 1943	2,984.39
SK-509	do	do	248098	1942	4,600.00	300.00	Feb. 23, 1943	Dec. 3, 1943	2,984.39
SK-508	do	Hug	3431	1935	4,500.00	300.00	Feb. 23, 1943	Oct. 8, 1943	2,250.00
SK-507	do	do	3431	1935	4,500.00	300.00	do	do	2,480.01
SK-506	Truck platform and service unit	General Motors Corporation	CC303-15772	1942	1,075.00	56.25	Feb. 28, 1943	Nov. 15, 1943	480.01
SK-505	Semitruck	Diamond T	360-94605	1937	3,800.00	225.00	Feb. 22, 1943	Nov. 17, 1943	1,980.00
SK-504	With La Crosse trailer	Hug	3428	1935	4,500.00	300.00	do	Oct. 8, 1943	2,250.00
SK-503	Truck dump	do	3428	1935	4,500.00	300.00	do	do	2,250.00

¹ Truck only.

Third party equipment rental paid under Foley Bros., Inc., and Kohl-Connolly Co. contract No. 3416-Eng. 51—Continued

Equipment code No.	Description	Model	Serial	Year	Appraised valuation	Rental rate per month	Date rental begins	Date rental ceases	Total accrued rental paid
8K-5472	Truck dump	White Motor Co.	248567	1942	\$4,600.00	\$300.00	Feb. 28, 1943	Dec. 3, 1943	\$2,770.63
8K-5471	do	Mack	EQ1D-3754	1942	4,600.00	300.00	Feb. 22, 1943	do	3,187.51
8K-5470	do	White Motor Co	248508	1942	4,600.00	300.00	do	Nov. 17, 1943	2,558.38
8K-5469	Truck, with 1,000-gallon fuel tank	International Harvester.	35571	1942	2,100.00	75.00	do	Oct. 8, 1943	862.50
8K-5468	Truck dump	Hug.	3429	1935	4,500.00	300.00	do	do	2,250.00
8K-5393	Truck with winch	Federal	78559	1936	1,000.00	56.25	Feb. 28, 1943	Dec. 3, 1943	513.76
8K-5391	Truck, with 315-foot Schramm compressor	Chevrolet.	218005-6975	1937	1,850.00	56.25	Feb. 23, 1943	Nov. 15, 1943	489.38
8K-5235	Truck dump	do	21Y R04-4954	1941	1,250.00	75.00	do	do	652.50
8K-2999	Compressor, air	Ingersoll-Rand	40-T-4206	1941	5,000.00	270.00	do	Oct. 8, 1943	2,016.00
8K-2972	do	Schramm.	450025	1939	4,250.00	270.00	do	Nov. 15, 1943	2,348.00
8K-3249	Compressor	do	151096	1942	2,000.00	97.50	Feb. 28, 1943	do	938.50
8K-3248	Welder	do	2110516	1938	860.00	55.50	Feb. 27, 1943	do	268.55
8K-3240	do	Wilson.	22	1942	1,500.00	75.00	Feb. 27, 1943	do	688.50
8K-3229	do	Wilmington.	32-66N-236	1942	1,500.00	75.00	Feb. 23, 1943	do	327.83
8K-4188	Bulldozer	LeTourneau.	E5-409-K8B	1942	1,000.00	108.75	do	Dec. 3, 1943	957.00
8K-4187	do	do	E6459-K8B	1941	1,000.00	108.75	do	Nov. 15, 1943	946.13
8K-4186	do	do	E3789-K8A	1941	1,000.00	108.75	do	Nov. 18, 1943	957.00
8K-4184	do	do	E6899-K8B	1942	1,000.00	108.75	do	Nov. 17, 1943	953.38
8K-4183	do	do	E6897-K8B	1942	1,000.00	108.75	do	Nov. 15, 1943	946.13
8K-4182	do	do	E6894-K8B	1942	1,000.00	108.75	do	do	946.13
8K-4180	do	do	E3902-K8B	1942	1,000.00	108.75	do	do	946.13
8K-4189	do	do	E6895-K8B	1942	1,000.00	108.75	do	Nov. 18, 1943	957.00
8K-4188	do	do	E6896-K8B	1942	1,000.00	108.75	do	Nov. 15, 1943	946.13
8K-4176	Dozer, hydraulic	Bucyrus-Erie.	17809	1942	892.50	105.00	Apr. 15, 1943	Oct. 29, 1943	682.50
8K-1499	Tractor.	Allis-Chalmers	1491	1942	7,000.00	581.25	Feb. 23, 1943	Nov. 18, 1943	5,203.33
8K-1498	do	do	1493	1942	7,000.00	581.25	do	Nov. 15, 1943	5,056.88
8K-1497	do	Caterpillar	SR7398P	1942	7,000.00	581.25	do	Nov. 18, 1943	5,773.35
8K-1496	do	do	8R740SP	1942	7,000.00	581.25	do	Nov. 15, 1943	5,076.91
8K-1495	do	do	8R5737SP	1942	7,000.00	581.25	do	do	5,115.00
8K-1494	do	do	8R7388P	1942	7,000.00	581.25	do	do	5,078.46
8K-1493	do	do	1H526P-SP	1941	7,000.00	581.25	do	Nov. 15, 1943	5,072.61
8K-1492	do	do	1H528P-SP	1941	7,000.00	581.25	do	do	5,212.43
8K-1491	do	do	1H469P-SP	1941	7,000.00	581.25	do	Nov. 18, 1943	5,167.01
8K-1490	do	do	1H468P-SP	1941	7,000.00	581.25	do	do	5,705.41
8K-1489	do	do	1H470P-SP	1941	7,000.00	581.25	do	Nov. 15, 1943	5,038.73
8K-1487	do	Allis-Chalmers	1492	1942	7,000.00	581.25	do	Nov. 18, 1943	5,115.00
8K-1486	do	Caterpillar	1H9070	1941	7,000.00	581.25	do	do	5,492.84
8K-1471	do	do	8R740-SP	1942	7,000.00	581.25	do	Nov. 15, 1943	5,410.81
8K-1470	do	Allis-Chalmers	1012	1942	7,000.00	581.25	do	do	5,056.88
8K-1469	do	do	1284	1942	7,000.00	581.25	do	do	5,077.45

8K-1436	do	International	TDF 1206	3 910.00	581 25	Apr. 15, 1943	Oct. 20, 1943	3 778.13
8K-1431	Caterpillar	do	1H8916	6 664.25	581 25	Apr. 23, 1943	Nov. 18, 1943	4 628.59
8K-1430	do	do	1H3550	6 664.25	581 25	do	Nov. 15, 1943	3 933.13
8K-1429	do	do	1H4691-SP	6 664.25	581 25	do	do	3 207.29
8K-1419	do	do	1H7563	6 664.25	581 25	Apr. 15, 1943	Nov. 18, 1943	3 977.16
8K-1418	do	do	1H4630-SP	6 664.25	581 25	May 6, 1943	do	4 304.19
8K-1417	do	do	1H6448	6 664.25	581 25	Apr. 23, 1943	Nov. 15, 1943	3 933.13
8K-1416	do	do	1H8911	6 664.25	581 25	do	Nov. 18, 1943	4 330.25
8K-1415	do	do	1H5541	6 664.25	581 25	do	do	4 303.55
8K-5749	Trailer (see SK-5475, p. 1)	P & H	11001	700.00	78 75	Feb. 27, 1943	Nov. 27, 1943	4 074.74
8K-6000	Bucket, dragline, 1½-yard	Owens	Z 1083	600.00	67 50	Feb. 26, 1943	do	706.13
8K-5999	Bucket, clamshell, ¾-yard	Page	14-58 3-3254	500.00	56 25	Feb. 27, 1943	do	594.38
8K-5998	Bucket, dragline, ¾-yard	Williams	do	700.00	78 75	do	do	706.13
8K-5997	Bucket, dragline, 1½-yard	Graeco	297	2 150.00	112 50	Feb. 28, 1943	Nov. 15, 1943	960.00
8K-6242	Service unit	do	245	1 500.00	87 50	do	do	1 576.00
8K-6241	Pin press and tools	Pro. Semitrailer	440	3 500.00	206 25	Feb. 23, 1943	Nov. 16, 1943	1 576.00
8K-6238	Shovel, 2-yard	Kama	1005	27 000.00	1 483 00	Feb. 26, 1943	Nov. 27, 1943	6 311.79
8K-1893	Shovel and dragline, 1½-yard	Koehring	5218	22 000.00	963 75	Mar. 1, 1943	do	2 349.72
8K-1892	Shovel, ¾ dragline, ¾-yard	Northwest	5290	6 500.00	478 50	Feb. 28, 1943	do	4 408.60
8K-1891	Shovel, ¾ dragline, ¾-yard	do	5268	11 000.00	536 25	Feb. 23, 1943	do	4 968.40
8K-2240	Scraper, 15-yard	LeTourneau	S11232RUC	8 000.00	592 50	do	Nov. 16, 1943	3 469.43
8K-2246	Scraper, 15-yard	do	S9633LUC	8 000.00	431 25	do	Oct. 8, 1943	3 220.00
8K-2245	Scraper, 13-yard	do	S6383YR13C	5 500.00	431 25	Feb. 27, 1943	Nov. 16, 1943	3 817.85
8K-2244	Scraper, 12-yard	do	S11861LPC	5 000.00	337 50	Feb. 27, 1943	Dec. 3, 1943	3 146.48
8K-2243	do	do	S11860LPC	5 000.00	337 50	do	Nov. 16, 1943	3 263.85
8K-2242	do	do	S9328 FUC	10 000.00	592 50	do	Dec. 3, 1943	5 468.27
8K-2242	Scraper, 18-yard	do	7044	8 000.00	592 50	Feb. 23, 1943	Nov. 16, 1943	5 174.50
8K-2241	do	Garwood	S9155 FP	7 000.00	431 25	do	Oct. 8, 1943	3 305.76
8K-2236	Scraper, 14-yard	LeTourneau	7075	7 000.00	431 25	Mar. 2, 1943	Nov. 16, 1943	3 734.78
8K-2235	Scraper, 15-yard	Garwood	7043	8 000.00	592 50	do	do	5 080.68
8K-2234	Scraper, 18-yard	do	6294	8 000.00	592 50	do	Dec. 3, 1943	5 286.29
8K-2219	do	do	7074	7 000.00	431 25	do	Nov. 16, 1943	3 708.75
8K-2217	Scraper, 15-yard	do	do	9 140.50	1 181 25	Apr. 23, 1943	do	8 032.50
8K-2186	Scraper, 28-cubic yard	Woodridge	S-613	2 200.00	131 25	Feb. 23, 1943	Oct. 8, 1943	8 347.50
8K-2186	do	do	do	2 200.00	131 25	do	do	960.00
8K-2248	Ripper	LeTourneau	R3480-K30B	2 200.00	131 25	do	do	960.00
8K-2247	do	do	R2980-K30B	6 000.00	412 50	do	Nov. 15, 1943	3 622.25
8K-2240	Motor grader	Caterpillar	9K-1571	6 000.00	412 50	do	Nov. 17, 1943	3 617.16
8K-2239	do	do	9K1668-SP	6 000.00	412 50	do	do	3 617.16
8K-2238	do	do	9K1668-SP	6 000.00	412 50	do	do	3 617.16
8K-2237	do	do	VF 323	5 000.00	337 50	Mar. 3, 1943	Nov. 17, 1943	2 998.01
8K-2218	do	Allis-Chalmers	6K946SP	600.00	56 25	Feb. 23, 1943	Nov. 18, 1943	489.38
8K-1499A	Power-control unit	Garwood	6905	600.00	56 25	do	do	489.38
8K-1497A	do	Caterpillar	9R873	600.00	56 25	do	Nov. 16, 1943	489.38
8K-1496A	do	do	9R835	600.00	56 25	do	Nov. 15, 1943	489.38
8K-1495A	do	do	9R833	600.00	56 25	do	Nov. 18, 1943	489.38
8K-1494A	do	LeTourneau	P29039RRC	600.00	56 25	do	do	489.38
8K-1493A	do	do	P15283TE	600.00	56 25	do	Nov. 15, 1943	489.38
8K-1492A	do	do	P11334TE	600.00	56 25	do	Nov. 18, 1943	489.38
8K-1491A	do	do	P17485TE	600.00	56 25	do	do	489.38
8K-1490A	do	do	do	600.00	56 25	do	Nov. 14, 1943	489.38

Third party equipment rental paid under Foley Bros., Inc., and Rohl-Connolly Co. contract No. 9416-Eng-51—Continued

Equipment code No.	Description	Model	Serial	Year	Appraised valuation	Rental rate per month	Date rental begins	Date rental ceases	Total accrued rental paid
SK-1488A	Power-control unit.	LeTourneau	F11847TD	1942	\$600.00	\$6.25	July 24, 1943	Dec. 3, 1943	\$523.13
SK-1470A	do	do	F14073TE	1942	600.00	56.25	do	Nov. 16, 1943	491.25
SK-1466A	do	do	F29066RRE	1942	690.00	56.25	do	Nov. 15, 1943	489.38
SK-1471A	do	do	F19853R8C	1942	600.00	56.25	do	do	489.38
SK-1482A	do	do	F18721R8C	1942	600.00	56.25	do	do	489.38
SK-1483A	do	do	F28075R8D	1942	600.00	56.25	do	do	489.38
SK-1485A	do	do	F18696R8C	1942	600.00	56.25	do	Nov. 18, 1943	485.00
SK-1491A	do	do	(Plate gone)	1941	600.00	56.25	do	do	493.00
SK-3551	do	do	F14560C7R8	1942	600.00	56.25	do	Nov. 15, 1943	359.18
SK-1419A	do	do	F16927TE	1942	667.25	56.25	May 6, 1943	Nov. 15, 1943	401.25
SK-1431A	do	do	F16393TE	1942	667.25	56.25	Apr. 15, 1943	Nov. 15, 1943	401.25
SK-1416A	do	do	do	1942	667.25	56.25	do	Nov. 18, 1943	386.25
SK-1417A	do	do	F13673R8P	1942	667.25	56.25	May 6, 1943	Nov. 30, 1943	386.25
SK-1418A	do	do	do	1942	667.25	56.25	Apr. 23, 1943	Nov. 15, 1943	380.63
SK-1419A	do	do	do	1942	667.25	56.25	do	Dec. 3, 1943	414.38
SK-1430A	do	do	W 159	1942	667.25	56.25	do	Nov. 18, 1943	401.25
SK-1432A	do	do	W 152	1942	667.25	56.25	do	Nov. 18, 1943	401.25
SK-492	do	do	151	1942	667.25	56.25	Apr. 15, 1943	Nov. 18, 1943	401.25
SK-1401	Comp.	Ford Mercury	99A-536948	1942	850.00	45.00	Mar. 1, 1943	Nov. 23, 1943	394.50
SK-1401	Tractor, RD8	Caterpillar	1H951	1942	6,664.25	581.25	May 6, 1943	Nov. 15, 1943	3,828.89
SK-2157	Scraper, 17-cubic yard	Woodbridge	S-524	1942	7,969.50	592.50	do	Nov. 16, 1943	3,792.00
SK-2157	Scraper, 18-cubic yard	do	S-529	1942	7,969.50	592.50	do	Nov. 16, 1943	3,792.00
SK-2157	Scraper, 23-cubic yard	do	S-563	1942	9,140.50	1,181.25	do	Nov. 16, 1943	7,246.25
SK-2183	do	do	S-634	1942	9,140.50	1,181.25	Apr. 15, 1943	Nov. 16, 1943	8,347.50
SK-2183	do	do	C104-20	1942	10,465.00	1,181.25	Apr. 23, 1943	do	8,032.50
SK-2153	do	do	C104-22	1942	10,465.00	1,181.25	Apr. 15, 1943	do	8,351.25
SK-4970	Light plant, 5,000-watt	LaPlanto-Chosto	C104-22	1942	2,250.00	112.50	do	Oct. 8, 1943	8,347.50
SK-4951	do	Caterpillar	4B9404SP	1942	1,500.00	67.50	Feb. 23, 1943	Nov. 16, 1943	8,351.25
SK-4925	do	do	154630	1942	1,500.00	67.50	Dec. 3, 1943	Nov. 16, 1943	8,347.50
SK-4973	Light plant, 3,000-watt	Blackhawk	Red Devil	1942	400.00	30.00	Mar. 1, 1943	Dec. 3, 1943	1,600.75
SK-4971	Light plant, 250-watt	Fairbanks-Morse	FL-1903	1942	250.00	30.00	Feb. 23, 1943	Nov. 17, 1943	483.13
SK-4971	Light plant, 750-watt	do	NC-3122	1942	250.00	30.00	do	Nov. 1, 1943	247.00
SK-4967	Light plant, 500-watt	Master	L-7600	1942	250.00	30.00	do	Nov. 5, 1943	247.00
SK-4978	do	do	NG 4184	1942	250.00	30.00	do	Nov. 27, 1943	273.00
SK-4918	do	do	NE 17215	1942	250.00	30.00	do	do	263.00
SK-4972	do	do	NE 14429	1942	250.00	30.00	do	do	270.00
SK-4953	do	do	NI 3123	1942	250.00	30.00	Feb. 26, 1943	Nov. 15, 1943	261.00
SK-4953	do	do	NI 4102	1942	250.00	30.00	Feb. 23, 1943	Nov. 15, 1943	261.00
SK-4953	do	do	SN 4102	1942	250.00	30.00	do	Nov. 27, 1943	273.00
SK-4952	do	do	4132	1942	250.00	30.00	do	do	273.00
SK-4919	Light plant.	Kohler	4H9476	1942	250.00	30.00	Nov. 17, 1943	Nov. 17, 1943	263.00
SK-4922	Light plant, 44-20, 20-Kilowatt.	Master	4H9476	1942	250.00	30.00	Nov. 27, 1943	Nov. 27, 1943	270.00
SK-4922	Light plant, 800-watt	Caterpillar	48250	1942	1,912.50	150.00	Apr. 15, 1943	Dec. 3, 1943	2,600.00
SK-4895	Light plant, 1,500-watt	Kohler	47293	1942	1,375.00	150.00	Feb. 26, 1943	Nov. 17, 1943	2,600.00
SK-4895	do	do	do	1942	500.00	30.00	May 12, 1943	Nov. 27, 1943	197.00

SK-4092	do	37695	500.00	30.00	July 24, 1943	Nov. 17, 1943	161.00
SK-4093	Light plant	D-25546	500.00	30.00	May 19, 1943	Nov. 27, 1943	1,200.51
SK-4150	Motor grader	1949	5,389.00	393.75	July 24, 1943	do	10,969.81
SK-1955	Shovel, 2 1/2-yard	Bucyrus 54-B (Erie)	33,379.50	1,406.25	May 23, 1943	do	9,837.79
SK-1960	Shovel, 2-yard	5782	29,180.50	1,485.00	July 23, 1943	do	8,164.91
SK-1979	Shovel	3895	27,500.00	1,238.00	May 19, 1943	do	8,124.53
SK-1973	do	6773	25,615.00	1,1	May 12, 1943	do	3,752.99
SK-1408	Tractor	1-H-2940	6,359.28	581.25	May 11, 1943	Nov. 15, 1943	3,631.57
SK-1402	do	1-H-2943	6,359.28	581.25	May 11, 1943	do	3,990.45
SK-1396	do	1-H-4038 SP	6,359.28	581.25	May 11, 1943	do	3,724.44
SK-1400	do	1-H-4239 SP	6,359.28	581.25	May 12, 1943	do	3,719.45
SK-1409	do	1-H-6834 SP	6,359.28	581.25	May 11, 1943	do	3,751.69
SK-1395	do	1-H-4679 SP	6,359.28	581.25	May 11, 1943	do	3,827.31
SK-1394	do	1-H-4961 SP	6,359.28	581.25	May 11, 1943	do	3,976.48
SK-1407	do	1-H-5765 SP	6,359.28	581.25	May 11, 1943	do	2,540.13
SK-1406	do	1-H-4634 SP	6,359.28	581.25	do	do	735.89
SK-1404	do	7-M-2150	5,005.63	483.75	July 24, 1943	Nov. 15, 1943	1,313.50
SK-1392	do	WEX-7-BH779	5,005.63	483.75	do	do	1,698.51
SK-4472	Bulldozer and power unit	LeTourneau D-7	1,000.00	108.75	May 12, 1943	Dec 3, 1943	1,322.38
SK-4473	do	LeTourneau D-8	1,000.00	108.75	May 12, 1943	do	1,659.63
SK-5726	Wagon, 16-yard side dump	Athey	5,036.25	266.25	do	do	1,322.38
SK-5725	do	16034	5,036.25	266.25	May 11, 1943	Nov. 17, 1943	1,659.63
SK-5724	do	16035	5,036.25	266.25	do	do	1,322.38
SK-5723	do	16036	5,036.25	266.25	do	do	1,659.63
SK-5731	do	19037	5,036.25	266.25	do	do	1,322.38
SK-5727	do	16038	5,036.25	266.25	do	do	1,322.38
SK-5720	do	FC-31-16043	5,036.25	266.25	do	do	1,322.38
SK-5733	do	FC-31-16044	5,036.25	266.25	do	do	1,659.63
SK-5730	do	16027	5,036.25	266.25	May 12, 1943	Nov. 17, 1943	1,322.38
SK-5737	Wagon, 18-yard bottom dump	16028	5,036.25	266.25	May 11, 1943	Oct. 8, 1943	1,659.63
SK-5725	do	18019	3,952.50	266.25	May 12, 1943	Nov. 17, 1943	1,659.63
SK-5599	Wagon, side dump	18020	3,000.00	266.25	do	do	1,659.63
SK-5726	do	14073	3,000.00	266.25	May 10, 1943	do	1,677.38
SK-5720	do	8C2	2,103.75	145.00	do	do	903.84
SK-5720	Wagon, rubber tires, bottom dump	8C2 R106-7	2,103.75	145.00	May 12, 1943	do	903.84
SK-5720	do	8CS R102-7	2,103.75	145.00	do	do	908.67
SK-5720	do	8CS R101-7	2,103.75	145.00	May 11, 1943	do	908.67
SK-5720	do	8CS R835-7	2,103.75	145.00	May 12, 1943	do	903.84
SK-5721	do	6W743	2,103.75	145.00	do	do	903.84
SK-5722	do	6W1104	2,103.75	145.00	do	do	903.84
SK-5724	do	A43W2281	2,103.75	145.00	May 11, 1943	Nov. 16, 1943	903.84
SK-5725	do	A43W2282	2,103.75	145.00	May 12, 1943	Nov. 17, 1943	903.84
SK-2176	Tamping roller, 2-drum	41CR963-1	841.50	67.50	do	do	450.00
SK-3892	Wagon drill	For Mach. No. 436	1,168.75	123.75	May 11, 1943	Oct. 8, 1943	614.63
SK-1868A	Crane and derrick attachments	1H442	5,000.00	200.00	May 19, 1943	Nov. 27, 1943	1,266.67
SK-1389	Tractor with compressor, mounted		8,041.85	550.00	May 12, 1943	Nov. 18, 1943	3,446.67
	Total		928,343.05	67,099.00			530,860.36

* No payments made.

NOTE.—All amounts stated are United States funds.

Summary of second party and third party equipment rentals under cost-plus-fixed-fee contract No. W-3416-Eng-736

Number	Contractor	Total approved valuation	Total rental rates	Date rental begins	Date rental ceases	Total accrued rental paid
Second party rental: W-3416-Eng-736.....	Bates & Rogers Construction Corp.....	\$183,486.30	\$8,827.21	Nov. 1, 1943	Sept. 25, 1944	\$79,146.61
Third party rental.....		None	None			None
Total.....		183,486.30	8,827.21			79,146.61

Note.—All amounts stated are United States funds.

Second party equipment rental, Bates & Rogers Construction Corp.—W-3416-Eng-736

Equipment code No.	Description	Model	Serial	Year	Appraised valuation	Rental rate per month	Date rental begins	Date rental ceases	Total accrued rental paid
.....	Marion crane	361	6862	1937	\$20,000.00	\$731.25	Nov. 1, 1943	Sept. 25, 1944	\$8,728.31
.....	do.	362	7139	1939	21,300.00	1,125.00	do.	June 21, 1944	8,607.19
.....	do.	362	7471	1941	21,800.00	1,125.00	do.	May 24, 1944	7,630.00
.....	Northwest crane	6	4681	.....	18,110.00	731.25	do.	Sept. 25, 1944	8,540.39
.....	Osgood crane	.....	2856	1939	19,515.00	731.25	do.	Aug. 15, 1944	7,266.80
.....	Air compressor, pneumatic	P. C.	29643	1942	4,445.00	270.00	do.	May 17, 1944	1,775.00
.....	do.	33780	33780	1942	5,565.00	310.50	do.	do.	2,061.00
.....	do.	30534	30534	1942	5,365.00	310.50	do.	do.	2,370.15
.....	American Hoist & Derrick derrick, 5-ton	315	33779	1942	1,631.33	84.75	do.	do.	1,018.63
.....	do.	.....	1409	1940	1,350.00	69.75	do.	do.	25.99
.....	Swinging pile lead	.....	71948	1943	350.00	5.25	do.	do.	56.89
.....	do.	.....	20447	1943	350.00	5.25	do.	do.	56.89
.....	American Hoist & Derrick engine hoist, 3 drums	.....	1847C	1912	4,530.00	131.25	do.	do.	1,583.20
.....	do.	.....	1860F	1911	4,530.00	131.25	do.	do.	1,603.90
.....	American Hoist & Derrick engine, slewing, 4 by 5	.....	460D	1923	900.00	26.25	do.	do.	320.81
.....	do.	.....	450D	1922	900.00	26.25	do.	do.	316.65
.....	American Hoist & Derrick drum, counterweight	.....	102	1913	170.00	18.75	do.	June 19, 1944	143.13
.....	do.	.....	103	1919	170.00	18.75	do.	do.	143.13
.....	McKiernan-Terry pile hammer No. 7	.....	8441	1935	1,550.00	105.00	do.	July 19, 1944	906.50
.....	do.	.....	5625	1925	1,550.00	105.00	do.	do.	906.50
.....	McKiernan-Terry steam hammer	.....	6-B-2	1929	2,300.00	155.25	do.	Sept. 25, 1944	1,704.52
.....	McKiernan-Terry pile hammer	.....	7537	1937	2,300.00	155.25	do.	do.	1,710.99
.....	Pile hammer, Casgrain cap	.....	8646	1922	132.00	5.25	do.	do.	40.85
.....	Ingelsoll-Rand air sheeting hammer	R30	731000	1930	390.00	40.50	do.	Nov. 11, 1943	14.85

McKiernan-Terry steam hammer	5781	1925	825.00	65.25	do.	June 19, 1944	498.08
do.	9146	1942	825.00	65.25	do.	do.	498.08
Vulcan drop hammer	1478	1922	246.00	18.75	do.	Aug. 15, 1944	178.13
Vulcan pile extractor	2650	1930	1,450.00	97.50	do.	Sept. 25, 1944	1,096.26
Jaeger centrifugal pump	13021	1937	1,139.00	93.75	do.	do.	1,015.63
do.	P-8734	1937	1,139.00	93.75	do.	do.	1,015.63
do.	P-7307	1937	1,139.00	93.75	do.	do.	1,015.63
do.	P-7317	1937	1,139.00	93.75	do.	do.	1,015.63
Barber-Greene conveyor	20962-1	1939	2,245.00	127.50	do.	do.	1,384.75
do.	157845	1939	2,245.00	127.50	do.	Nov. 11, 1943	46.75
do.	46571	1938	2,245.00	127.50	do.	do.	46.75
do.	46711	1938	2,100.00	116.25	do.	Sept. 25, 1944	1,706.25
do.	3821	1928	2,100.00	116.25	do.	Nov. 18, 1944	763.38
do.	3821	1928	2,100.00	116.25	do.	May 18, 1945	763.38
Johnson portable bin	6643	1926	1,828.00	123.00	do.	Sept. 25, 1944	1,569.27
Blaw-Knox clamshell bucket	B-6690	1935	702.00	67.50	do.	do.	736.87
do.	7472	1935	702.00	67.50	do.	June 19, 1944	429.38
Owen clamshell bucket	1308	1911	684.00	50.25	do.	do.	383.58
Williams clamshell bucket	266-2711	1933	1,086.00	78.75	do.	do.	555.50
Page dragline bucket	101	1924	680.00	63.75	do.	May 24, 1944	433.50
Insley side-tip bucket	113	1924	234.00	15.00	do.	Sept. 25, 1944	162.50
do.	121	1924	234.00	15.00	do.	do.	162.50
do.	117	1924	234.00	15.00	do.	do.	162.50
do.	120	1924	234.00	15.00	do.	do.	162.50
do.	123	1924	234.00	15.00	do.	do.	162.50
do.	19431	1943	1,635.00	25.20	do.	do.	162.50
Skid pile driver	19432	1943	1,635.00	25.20	do.	June 22, 1944	194.88
do.	19433	1943	1,635.00	25.20	do.	do.	194.88
do.	19434	1943	1,635.00	25.20	do.	Sept. 25, 1944	273.00
Mercury sedan coupe	1942	1942	1,413.82	84.83	do.	do.	273.00
Mercury Fordor sedan	1942	1942	1,413.82	84.83	do.	do.	918.99
Total			183,486.30	8,827.21			79,146.61

EXHIBIT 4

War Department Engineers
Form No. 57

Agreement No. 1
Principal Contract No. W-3416-Eng-51 (592)
Date: February 9, 1943

EQUIPMENT RENTAL AGREEMENT

(For use under cost-plus-a-fixed-fee contract)

Lessee: Foley Brothers, Inc. & Rohl-Connolly Co.
Lessor: Bowen & McLaughlin.
Place: Haines, Alaska.

This agreement, entered into this 20th day of February 1943, by Bowen & McLaughlin, a partnership consisting of Truman Bowen and J. L. McLaughlin, of the City of Great Falls, in the State of Montana, hereinafter called the Lessor, and Foley Brothers, Inc., a corporation organized and existing under the laws of the State of Delaware, with its principal office in St. Paul, Minnesota, and Rohl-Connolly Co., a corporation organized and existing under the laws of the State of Nevada, with its principal office in Los Angeles, California, jointly and severally, hereinafter called the Lessee;

Whereas, the Lessee has heretofore, to wit, on the 9th day of February 1943, entered into a contract hereinafter called the principal contract, with the United States of America, hereinafter called the Government, to construct Haines Road at or near Haines, Alaska;

Whereas the Lessor has agreed to rent to the Lessee for use in connection with the afore-mentioned construction the equipment listed on Schedule A attached hereto and made a part hereof; and

Whereas the Lessor has read and is familiar with each and every part of said principal contract and the respective rights, powers, benefits, and liabilities of the Lessee and the Government thereunder;

Now, therefore, this agreement witnesseth: That the parties hereto do mutually agree as follows:

ARTICLE I

The Equipment.—The Lessor shall furnish the equipment listed on Schedule A attached hereto and made a part hereof. Equipment shall be in condition to render efficient, economical, and continuous service and shall be equipped with all mechanical devices and equipment required by Federal, State, and local authorities, provided that nothing in this article shall be construed to limit the authority of the Contracting Officer to prohibit the use of any piece of equipment which, in the opinion of the Contracting Officer, is mechanically unsafe for use. Each piece of equipment shall be registered by the Lessor with all Federal, State, and local authorities requiring registration, and registration plates or other evidence of registration shall be displayed in accordance with the requirements of the registering authority. Each piece of equipment shall be clearly marked with the identification number assigned to it on Schedule A.

ARTICLE II

Repairs, Inspections, Loss or Damage, Fuel.—A. All repairs not compensated to the Lessor by insurance, found to be necessary after acceptance of the equipment and not caused by latent defects in the equipment, shall be made by the Lessee.

B. The equipment covered by this Agreement shall be inspected by the Contracting Officer at the point of shipment and will be, there, by him accepted or rejected as to condition and suitability for use on the work.

C. The equipment will be returned to the Lessor in the same condition as when accepted, less normal wear and tear, provided that in case of loss, damage, or destruction, the Lessee shall not be liable unless and except when such loss, damage, and destruction results from the negligence of the Lessee's corporate officers or its Project Manager having supervision or direction of the entire work. The measure of damage and loss under this provision shall be based upon the approved value set forth in Schedule A attached hereto, less rentals paid and/or accrued and less any insurance adjustment.

D. All fuel and lubricants will be furnished by the Lessee.

E. In the case of loss, damage, or destruction, due to no fault of the Lessor, and occurring after the Contracting Officer has accepted the equipment as required

by Paragraph B of this Article, and the equipment has been delivered to a common carrier for shipment to the project site, the Lessor shall be compensated only in such amounts as the Contracting Officer shall certify as reasonable.

ARTICLE III

Operators.—Equipment is rented without operators. Any operator deemed incompetent by the Lessor and the Lessee shall be removed from any piece of equipment. Should the Lessor and the Lessee fail to agree as to the competency of any operator the matter shall be submitted to the Contracting Officer, and his decision shall be final as to the parties hereto.

ARTICLE IV

Working Period.—The Lessor shall initiate shipment of the equipment to the site of the work immediately. It is estimated that the equipment will be used for approximately one year, but the Lessee reserves the right to increase or decrease the rental period.

ARTICLE V

Payments.—A. The Lessor shall be paid at the rate prescribed in Schedule A attached hereto and made a part hereof. Rental Payments will be made monthly on or about the 10th of the month for the previous calendar month if practicable. However, failure to make payments by the 10th of each succeeding month will not constitute breach of this agreement entitling the Lessor to terminate same. The rental period shall begin on the delivery of such equipment to a common carrier for shipment to the site of the work, as evidenced by bill of lading covering such shipment or other evidence satisfactory to the Contracting Officer, and shall terminate, unless title to the equipment passes to the Government at an earlier date, on the date of notice from the Lessee or the Contracting Officer to the Lessor that such equipment is no longer required. If such equipment does not meet the requirements of Article I when it arrives at the work site the rental period therefor shall not begin until such equipment shall have been placed, at the expense of the Lessor, in condition to satisfy all the requirements of Article I. During interruptions in service caused by latent defects in the equipment, no rental shall accrue.

B. Transportation will be paid by the Lessee, f. o. b. cars, at original point of shipment, provided transportation from that point is not otherwise compensated to the Lessor by the Government. Return transportation, f. o. b. cars, to original point of shipment or equivalent mileage will be paid by the Lessee. If, after release of the equipment, the Lessee designates a shipping point other than the point of origin, return transportation to that point will be paid by the Lessee subject to limitations hereinafter mentioned.

Charges for transportation of any piece of equipment over a distance in excess of 500 miles must have the written approval of the Contracting Officer. If transportation is accomplished by any method other than rail, there shall be paid the actual cost of such transportation upon approval by the Contracting Officer. In no event shall the payment made for return transportation exceed the payment made for transportation to the job site unless such excess cost results solely from an increase in freight rates or is required by Government transfer of equipment to another site more distant from the point of origin than is the site referred to in the Preamble of this agreement. No transportation charges shall be paid by the Lessee for any piece of equipment which arrives at the work site in other than sound and workable condition, if such piece of equipment cannot be placed in sound and workable condition within a reasonable length of time. The determination as to whether such equipment is in sound and workable condition and what is considered a reasonable length of time shall in every instance be made by the Contracting Officer. Only such loading, unloading, assembling, and dismantling costs as are incurred at the work site will be paid by the Lessee.

ARTICLE VI

Substitutions.—Failure of any piece of equipment to perform to the satisfaction of the Lessee or the Contracting Officer shall be sufficient cause for the termination of the contract by the Lessee, or the requirement by the Lessee that the equipment be replaced with equipment satisfactory to the Contracting Officer. In the event of such replacement, all rental paid for the piece of equipment replaced shall be considered, for the purpose of Article VII, to have been paid for the new piece of equipment, and the replacing unit or units shall continue in service

under this agreement subject to all the provisions thereof, provided that the valuation and/or rental rate shall be subject to revision upward or downward as required by the Contracting Officer.

ARTICLE VII

[Stricken out of contract.]

ARTICLE VIII

Assignments.—Neither this contract nor any interest therein shall be assigned nor transferred except under the provisions of Article X of this contract and with the further exception that the whole or any part of this contract is assignable to the Government.

ARTICLE IX

Termination.—Subject to the prior written approval of the Contracting Officer, the Lessee shall have the same right and under the same conditions and terms to terminate this contract as has the Government to terminate principal contract.

ARTICLE X

Transfer of Equipment.—A. At any time prior to the release of any piece of equipment by the Lessee, the Contracting Officer may require transfer, to any location other than the one in which the Lessee is working, of any or all pieces of equipment rented under this agreement.

B. In the event of such a transfer of equipment, the transportation of such equipment to the new location and return transportation to the point of origin shown in this agreement will be paid by the Lessee.

C. It is agreed that in the event of transfer of equipment as set forth above, this agreement shall be assigned to a Lessee designated by the Government at such other location and the equipment covered by this agreement which is transferred to the new location shall continue in service subject to all the terms of this agreement.

D. In cases where more than one unit of equipment is rented hereunder the Lessor agrees that at the option of the Government the Lessor will enter into a new Equipment Rental Agreement covering any individual unit or units of equipment covered by this agreement. Said new agreement will be executed by a Lessee designated by the Government and will contain the following provision:

ARTICLE XI

Valuation and Liens.—A. When the equipment rented hereunder shall arrive at the site of the work, the Lessor shall file with the Lessee information called for on Parts II and III of Schedule A attached hereto. All items of equipment shall be valued and accepted or rejected by the Contracting Officer or his authorized representative at the original point of shipment, as specified in Article II-B, herein. The acceptance of such valuation shall be final and not subject to modification by the Contracting Officer at a later date. Each and every piece of equipment rented under this agreement shall be subject to all of the provisions, rules, and regulations of the National Emergency Price Control Act of January 30, 1942, and amendments thereof, and the Office of Price Administration, with respect to valuations and rental rates, anything to the contrary in this Agreement notwithstanding.

B. *Payment of Liens.*—The Lessor agrees to apply to the liquidation of all indebtedness secured by liens or other encumbrances against the equipment rented under this agreement, such portion of the rental paid as is necessary for the prompt discharge of such indebtedness. It is agreed that if, at any time, any person holding a lien or other encumbrance against any piece of equipment rented under this agreement shall submit to the Lessee evidence that the Lessor is not discharging his indebtedness to such holder of a lien or encumbrance in accordance with the written terms under which such indebtedness was incurred, or in a manner required in the performance of Article VII hereof, the Lessee shall have the right to impound all further rental due or to become due until such time as the rights of the Lessor and the lien holder are determined and all just and proper claims of the lien holder are satisfied. If such satisfaction is not made, the Lessee shall have the right to apply sums so impounded to the satisfaction of such just and proper claims. Nothing in this Article shall be construed as requiring the Lessor to pay to the lien holder any sum not required to be paid by the terms under which the indebtedness was incurred, or to pay any sum to the lien holder prior to the time such sum is due by the written terms under which

the indebtedness was incurred, except to the extent that advance payment may be required in performance of Article VII of this agreement. No rental impounded by the Lessee shall be paid to any lien holder unless written notice of the Lessee's intention so to apply the rental shall be given to the Lessor at least seventy-two (72) hours prior to the time rentals shall be so paid.

C. Where more than one piece of equipment is covered by this agreement and listed on Schedule A, each piece of equipment will be considered as being rented separately under this agreement. The rental of any piece of equipment may be terminated separately, or any piece of equipment may be recaptured or transferred separately in the same manner as though it were the only piece of equipment rented under this agreement. Separate affidavits as called for in Part II of Schedule A will be executed showing the amount of encumbrance on each piece of equipment.

D. If there be a blanket lien involving two or more pieces of equipment, the lien shall contain a provision permitting release of any piece of equipment rented hereunder and covered by the blanket lien by payment of the proportionate amount of the blanket lien against the piece of equipment which represents the amount shown in the affidavit of encumbrances for that piece of equipment. Failure of the Lessor to procure such modification of any blanket lien shall constitute grounds for the termination of this rental contract.

ARTICLE XII

Disputes.—Whenever the Lessor and the Lessee are unable to agree on any question arising under this contract, the dispute shall be submitted for the arbitration and determination of the Contracting Officer, whose decision shall be final and conclusive as to the parties hereto.

ARTICLE XIII

Definitions.—a. The term "Contracting Officer" as used herein shall mean the Contracting Officer who executed the principal contract and shall include his duly appointed successor and his authorized representative. In the event this agreement is assigned to another Lessee under the provisions of Article X hereof, the term "Contracting Officer" shall include the person authorized to perform the duties of contracting officer at the place to which this agreement is assigned.

b. The term "contract month" as used herein shall mean the period lying between the date on which the rental period begins and the corresponding day of the next succeeding month. If there be no corresponding day of any next succeeding month, the contract month shall terminate on the last day of the next succeeding month.

c. The term "original point of shipment" as used herein means the point served by common carrier that is nearest to the location of the equipment at the time it is rented.

ARTICLE XIV

This contract shall be subject to the written approval of the Contracting Officer and shall not be binding until so approved.

ARTICLE XV

The following changes were made in this agreement before it was signed by the parties hereto:

 Agreement as of the day and year first above written.

BOWEN & McLAUGHLIN, *Lessor.*
 By TRUMAN BOWEN.

Witness:

- (1) K. H. Morrissey.
- (2) Joseph J. McCarthy.

FOLEY BROTHERS, INC., & ROHL-
 CONNOLLY CO.,

Lessee.

By E. L. NEVILLE,

Works Manager.

Witness:

- (1) Joyce A. Anderson.
- (2) Olive M. Spinnær.

Agreement No. 1 Under Principal Contract No. W-3416-Eng-51 (592)

APPROVAL BY CONTRACTING OFFICER OF EQUIPMENT RENTAL AGREEMENT BETWEEN FOLEY BROTHERS, INC., AND ROHL-CONNOLLY COMPANY, LESSEE, AND BOWEN AND M'LAUGHLIN, LESSOR

The Equipment Rental Agreement dated 20 February 1943 by and between Bowen and McLaughlin, partnership consisting of Truman Bowen and J. L. McLaughlin, lessor, and Foley Brothers, Inc., and Rohl-Connolly Company, corporations, lessee, known as Agreement No. 1 under Principal Contract No. W-3416-Eng-51 (592), is hereby approved.

C. M. CLIFFORD,
Lieutenant Colonel, Corps of Engineers,
Contracting Officer.

I, H. M. Breimhurst, certify that I am the Assistant Secretary of Foley Brothers, Inc., one of the corporations named as the Lessee herein; that E. L. Neville, who signed this agreement on behalf of the combined Lessee, was then Works Manager of said combined corporations; that said agreement was duly signed for and in behalf of said corporation, Foley Bros., Inc., by authority of its governing body and is within the scope of its corporate powers.

H. M. BREIMHURST. [CORPORATE SEAL]

Place: _____
Date: 1943.

I, Irma Dickey, certify that I am the secretary of Rohl-Connolly Company, one of the corporations named as the Lessee herein; that E. L. Neville, who signed this agreement on behalf of the combined Lessee, was then Works Manager of said combined corporations; that said agreement was duly signed for and in behalf of said corporation, Rohl-Connolly Company, by authority of its governing body, and is within the scope of its corporate powers.

IRMA DICKEY. [CORPORATE SEAL]

Place: Los Angeles, California.
Date: 1943.
Approved:
By _____

Title

CHARLES F. WEDDINGTON,
Captain, Corps of Engineers,
Area Engineer.

SCHEDULE A

PART I. RATES OF RENTAL

Full month.—The basic rental rates shown on this schedule are monthly rates and shall constitute the maximum rental payable during any one calendar month, regardless of the number of days in any month, except as provided herein. If any piece of equipment is in actual use in excess of 240 hours during any one calendar month there shall be paid, in addition to the basic rate, one-half of the hourly rate for each hour in excess of 240 during which the equipment is in actual use during any one calendar month. The hourly rate shall be computed by dividing the basic rate by 240.

Portion of a month.—For any period less than a calendar month during which any piece of equipment shall have been rented there shall be paid as basic rental that proportion of the basic rate which the number of days the equipment was rented bears to thirty. If during any period of less than a calendar month for which any piece of equipment shall have been rented any such piece of equipment shall have been in actual use for a total number of hours in excess of eight times the number of calendar days in such portion of a month there shall be paid for each excess hour one-half the hourly rate.

PART II. LIST OF HOLDERS OF LIENS AND OTHER ENCUMBRANCES

1. Attention is invited to section 35 of the Criminal Code, as amended, which provides:

"Whoever shall make or cause to be made or present or cause to be presented, for payment or approval, to or by any person or officer in the civil, military, or

naval service of the United States, or any department thereof, or any corporation in which the United States of America is a stockholder, any claim upon or against the Government of the United States, or any department or officer thereof, or any corporation in which the United States of America is a stockholder, knowing such claim to be false, fictitious, or fraudulent; or whoever, for the purpose of obtaining or aiding to obtain the payment or approval of such claim, or for the purpose of obtaining or aiding to obtain the payment or approval of such claim, or for the purpose and with the intent of cheating and swindling or defrauding the Government of the United States, or any department thereof, or any corporation in which the United States of America is a stockholder, shall knowingly and willfully falsify or conceal or cover up by any trick, scheme, or device a material fact, or make or cause to be made any files or fraudulent statements or representations, or make or use or cause to be made or used any false bill, receipt, voucher, roll, account, claim, certificate, affidavit, or deposition, knowing the same to contain any fraudulent or fictitious statement or entry, shall be fined not more than \$10,000 or imprisoned not more than ten years, or both."

BOWEN & McLAUGHLIN,
Per TRUMAN BOWEN.

Date: February 20, 1943.

2. The following affidavit shall be executed and sworn to by the Lessors of equipment.

STATE OF MINNESOTA

County of Ramsey, ss:

I, Truman Bowen (name of party signing affidavit), Partner (title), being duly sworn, do depose and say: That I am the sole owner (except as set forth on Schedule B hereto) of the equipment covered by this agreement and that the following is a complete and correct statement of the amount or amounts of any and all indebtedness secured by liens or other encumbrances of any nature, legal or equitable, which are held by any person, firm or corporation, against the equipment rented in accordance with the terms of this rental agreement.

Equipment Number (Use number shown on Part I):

Name and Address of Encumbrance Holder: None.

Amount of Inebtedness Secured by Encumbrance:

TRUMAN BOWEN,
Copartner.

Subscribed and sworn to before me this 10th day of May 1943.

DOLGORES C. PHELPS, *Notary Public.*

My Commission Expires August 13, 1949.

SCHEDULE B

(To be executed where lessor is not the true owner)

I, Truman Bowen, am (coowner) of the equipment mentioned herein which equipment is unencumbered by any lien, legal or equitable, excepting those set out on schedule A hereto. I have read and am familiar with each and every part of the foregoing rental agreement between Bowen & McLaughlin (Lessor) and Foley Brothers, Inc. & Rohl-Connolly Co. (Lessee) which contract is executed with my knowledge and approval. For the purpose of this rental contract, I hereby nominate the above-mentioned Lessor my agent and direct and empower him to perform all acts required under this rental contract, and to receive all money earned by the rented equipment under this rental contract. Moreover, I expressly authorize the Lessor as my agent and to take such action as may be required by the Contracting Officer under Article X hereof.

(Signed) TRUMAN BOWEN,

(Signed) J. L. McLAUGHLIN,

(Title) *Co-Partners of Bowen & McLaughlin.*

[PLACE OF SEAL]

Subscribed and sworn to before me this 13th day of March 1943 at St. Paul, Minn.

J. EDWARD SHEPHERD,
Notary Public, Ramsey County, Minn.

My commission expires December 27, 1946.

The following units as shown on attached schedule A's are to be considered rented on a flat monthly basis at the rate shown on the respective schedule A. No overtime will accrue for the use of these units.

S. K. No.	Page	S. K. No.	Page	S. K. No.	Page
995	1	4492	15	1431-A	36
994	1	4490	15	1416-A	36
993	1	4489	15	1417-A	36
992	1	4488	15	— Item 4	36
991	2	4476	16	1415-A	37
989	2	5749	22	1430-A	37
998	2	6000	23	1429-A	37
997	2	5999	23	— Item 4	37
996	3	5998	23	4970	39
990	3	5997	23	4951	40
989	3	6242	24	4975	40
5490	6	6241	24	4973	40
5486	7	6238	24	4971	40
5485	7	1499-A	31	4974	41
5484	7	1487-A	31	— Item 2	41
5476	9	1489-A	31	— Item 3	41
5475	9	— Item 1	32	— Item 4	41
5469	10	1490-A	32	4972	42
5393	11	1497-A	32	4947	42
5391	11	1469-A	32	4953	42
2999	12	1494-A	33	4952	42
2972	12	1486-A	33	— Item 1	43
2971	12	1488-A	33	— Item 2	43
3249	12	1470-A	33	4949	43
3240	13	1496-A	34	4922	43
— Item 2	13	1471-A	34	— Item 1	44
4499	13	1492-A	34	— Item 2	44
4498	13	1493-A	34	— Item 3	44
4497	14	1495-A	35	— Item 4	48
4496	14	— Item 2	35	— Item 1	49
4494	14	1491-A	35	— Item 2	49
4493	14	1419-A	35	— Item 4	54
				— Item 1	55

NOTE—Fifty-five pages listing equipment on Haines Road omitted.

**EXHIBIT 5. EQUIPMENT RENTAL SCHEDULE OF PUBLIC ROADS ADMINISTRATION
USED ON ALL CONTRACTS. APPROVED MAY 1942**

! The terms, conditions, and rental rates as herein outlined will be applicable to all equipment furnished by contractors on the Alaska Highway whether such equipment is the property of the contractor or secured by him from a third party.

(1) The basic annual rental rate shown on the accompanying list of classes of equipment is predicated on returning to the contractor the full annual cost of ownership during each 12 months' retention of the equipment by the Public Roads Administration.

(2) The basic annual rental rate as shown for each class of equipment is to be computed on the certified delivery price new.

(3) The basic monthly rental rate is the basic annual rental rate divided by 12.

(4) Each piece of equipment furnished by the contractor on which rental rates will be paid must be certified and approved by the engineer in charge as necessary and as of suitable type and capacity for use on the project and must be given an identifying number as directed by the engineer. Such certification and approval by the engineer will be made prior to placing the equipment in operation, and neither the rental nor the shipping charges will be paid for equipment not certified and approved.

(5) If requested, preliminary inspection and certification of equipment prior to shipment will be made by the Public Roads Administration. This preliminary inspection and certification is for the purpose of expediting the loading and shipping of equipment determined to be necessary and does not constitute evidence of approval of condition of equipment at the job site.

(6) The responsibility for the condition of the equipment is placed solely on the contractor and approval of class, type, and capacity of equipment by the engineer is not to be construed as approval of the condition of the equipment. If at any time any unit of equipment furnished by the contractor cannot be operated efficiently due to its having been originally furnished in an unsatisfactory condition or with defective, missing, or badly worn parts, the engineer shall notify the contractor of the suspension of the rental until such time as the equipment has been placed in a satisfactory condition. The cost of placing such equipment in

satisfactory operating condition shall be borne by the contractor and shall not be reimbursable as a part of the project cost. The judgment of the engineer as to the condition of equipment shall be final.

(7) It is anticipated that contractor's equipment will be retained on the work for a period of at least 12 months and the annual rental rate is predicated on this assumption. Retention periods will start with the date of shipment by common carrier and will be computed to the nearest full month. In the event the equipment is retained for less than 6 months the accrued basic monthly rentals during the period of retention shall be increased in accordance with the following table:

<i>Months of retention (nearest full month)</i>	<i>Percent increase over accrued basic monthly rental</i>
Up to 1 month.....	50
Up to 2 months.....	40
Up to 3 months.....	30
Up to 4 months.....	20
Up to 5 months.....	10
6 months to 12 months.....	0

After the equipment has been retained 12 months, it shall be considered as entering a new period of retention, and the foregoing schedule shall apply similarly to this new period of retention.

(8) Within the period of retention there may be one or more working periods as designated by the engineer. Each working period will begin with the order by the engineer to proceed with the work and will end with the order by the engineer to stop the work. Overtime use of the equipment during the working period is permissible and such overtime will be paid for in accordance with the following when approved by the engineer:

(a) Normal working time in hours, for which the basic rental rate will apply, will be determined by multiplying the number of calendar days in the working period by 8.

(b) Overtime is defined as the number of hours of actual use during the working period which is in excess of the number of hours of normal working time as computed above. Compensation will be paid for such overtime at a rate equivalent to 50 percent of the basic annual rental rate converted to an hourly basis.

(9) Inasmuch as a normal working week is considered as comprising 8 hours per day for 6 days each week, an additional credit to hours of actual use of 15 percent, computed to the nearest half hour, will be given to equipment working on Sundays. This additional credit is applicable only to the time worked on each Sunday and Sunday work may be included on the contractor's scheduled work program.

(10) Reimbursement will be made to the contractor monthly for proper rentals at the basic monthly rental rates. Reimbursement for overtime will be made at the conclusion of each working period. Reimbursement for increase in rental rates because of retention for less than 6 months will be made at the time the equipment is released from the project.

(11) Whenever accumulated equipment rental payments for any piece of equipment shall amount to the percentage for the particular class of equipment as shown in the following table, then the basic annual rental rate shall be reduced to 7½ percent of the certified delivery price new:

<i>Class</i>	<i>Percent</i>	<i>Class</i>	<i>Percent</i>
Class A.....	125.0	Class D.....	140.0
Class B.....	130.0	Class E.....	160.0
Class C.....	135.0	Class F.....	175.0

(12) Equipment units which cannot be reasonably identified with any of the groups in this schedule shall be assigned a class identification and rates comparable with those in this schedule for similar equipment shall be recommended by the engineer for approval by the Commissioner. Pending action by the Commissioner the engineer shall use such recommended rates as the basis of reimbursement.

(13) Small tools and minor equipment costing less than \$300 per unit furnished by the contractor and certified by the engineer as necessary for the work may be inventoried and appraised upon delivery to the project and reimbursement therefor may be made to the contractor. The title to such property for which reimbursement is made will be in the Government of the United States and the con-

tractor will be held responsible under the property accountability regulations of the Public Roads Administration until such small tools and equipment have been properly surveyed or are properly accounted for upon completion of the project.

(14) Necessary repair and operating costs of the equipment will be paid directly by the contractor and be reimbursable as a part of the direct project cost.

(15) Equipment rental shall accrue from the date of shipment by a common carrier, or the date of shipment under its own power or by highway vehicle, and shall expire upon return to the point of origin or to such other place as is mutually agreed upon by the contractor and the engineer, but reimbursement for return transit time will not exceed that to the point of origin; provided, that shipment of equipment under its own power or by highway vehicle shall be made only upon prior approval of the engineer.

(16) For all equipment and tools certified and approved by the engineer for use, the costs of transportation to the site of the work and return to the point of origin will be subject to reimbursement. However, reimbursement for transportation costs shall be limited to not exceed the cost of transportation for a distance of 2,000 miles, each way, unless previously approved by the engineer. Where return of equipment is authorized to other than point of origin, return transportation costs will be reimbursed provided that such reimbursement will in no event exceed the cost of return transportation to the point of origin as above limited.

(17) Charges for necessary packing and loading for shipment to the project, necessary unpacking and unloading charges at destination, and necessary packing and loading charges for return shipment will be subject to reimbursement. Unpacking and unloading charges at destination upon return of equipment will not be subject to reimbursement.

(18) This schedule shall be subject to revision by the Commissioner whenever facts are presented which justify such revision.

Equipment rental schedule

Class identification	Equipment item	Basic annual rental rate expressed as a percentage of the certified list price new
	Accessories and attachments:	
D.....	Backfillers, blades, bulldozers, buckets, skimmer scoops.....	25.0
D.....	Booms.....	25.0
C.....	Power-control units.....	27.5
A.....	Automobiles, includes station wagons.....	40.0
C.....	Bar benders, bar cutters.....	27.5
	Batchers, includes bins, hoppers, weighing machines:	
C.....	Wood.....	27.5
E.....	Steel.....	20.0
	Bituminous equipment:	
C.....	Distributors, with or without truck.....	27.5
D.....	Heating equipment.....	25.0
C.....	Mixers and pavers.....	27.5
	Plants:	
D.....	Traveling.....	25.0
F.....	Stationary.....	17.5
C.....	Tanks, with or without truck.....	27.5
C.....	Brooms, powered and nonpowered.....	27.5
D.....	Finishing machines.....	25.0
	Boilers:	
F.....	Locomotive type.....	17.5
E.....	Other.....	20.0
	Cars, includes narrow and standard gage:	
E.....	Batch, dump, flat, and hopper type.....	20.0
F.....	Spreader type.....	17.5
B.....	Carts, includes concrete and cement buggies.....	32.5
B.....	Cement gun machines.....	32.5
B.....	Chutes and spouts, concrete.....	32.5
	Compressors, air, all types, on skids, wheels, or autotruck unit:	
C.....	Less than 100 cubic feet.....	27.5
C.....	100 cubic feet or over.....	25.0
D.....	Coring machines, with or without truck.....	25.0
C.....	Cranes, motortruck, crawler, or locomotive type:	
C.....	Less than 5 tons.....	27.5
D.....	5 tons to less than 12 tons.....	25.0
E.....	12 tons to less than 25 tons.....	20.0
F.....	25 tons or greater.....	17.5

Equipment rental schedule—Continued

Class identification	Equipment item	Basic annual rental rate expressed as a percentage of the certified list price new
	Crushers, jaw and roll type:	
D	Portable	25.0
E	Stationary	20.0
C	Crushing, screening, and loading: Portable unit	27.5
	Derricks:	
E	Metal	20.0
D	Wood	25.0
	Draglines:	
C	Autotruck type, including truck	27.5
	Other:	
D	Less than 1 cubic yard	25.0
D	1 cubic yard or over	20.0
D	Drill rigs (blast hole)	25.0
D	Drill sharpeners	25.0
E	Engines, generators, motors	20.0
D	Finishing machines, concrete	25.0
B	Floats, concrete road, steel	32.5
E	Forges	20.0
B	Forms, steel, all types, with fastenings	32.5
	Graders:	
C	Pull-type blade graders, subgrade planers, strike-off machines, fine graders	27.5
D	Self-powered blade graders, angle dozers, bulldozers, form graders	25.0
D	Elevating graders	25.0
B	Grinders, concrete surface	32.5
E	Hoists, winches, all types, powered and nonpowered	20.0
B	Harness	32.5
C	Horses, mules	27.5
F	Instruments, surveying	17.5
	Loaders, conveyors, belt and chain bucket, with or without power:	
C	Portable	27.5
D	Stationary	25.0
F	Locomotives	17.5
C	Mixers, includes agitators, traveling mixers, and pavers, also mortar and plaster mixers	27.5
D	Pile hammers, extractors, pullers, rigs	25.0
B	Pipe, metal, air, and water	32.5
C	Placers, spreaders, concrete, also box type for miscellaneous materials with or without power attachment	27.5
C	Post drivers, pullers, machines	27.5
C	Pumps, all types	27.5
	Rails, tracks, including switches, railroad:	
F	Standard-gage	17.5
E	Narrow-gage	20.0
B	Road disks, drags, harrows, plows, rippers, rooters, scarifiers	32.5
	Rollers, tamps:	
C	Pull-type	27.5
E	Self-powered	20.0
D	Sawrigs and woodworkers	25.0
	Scrapers, includes Fresno and bottomless drag and lift type:	
A	Less than 4 cubic yards	40.0
B	4 cubic yard to less than 12 cubic yards	32.5
C	12 cubic yards and over	27.5
C	Screening units, shaker and rotary	27.5
F	Shop equipment, lathes, milling machines, planers, drill presses, threading and cutting machines	17.5
	Shovels, power, includes skimmer type:	
C	Autotruck type, including truck	27.5
D	Other: Less than 1 cubic yard	25.0
E	1 cubic yard and over	20.0
F	Tanks, storage and sprinkler	17.5
D	Towers, metal	25.0
	Tractors, includes dumptors, dump tractors, combination truck-crawler units:	
B	Less than 25 horsepower	32.5
C	25 horsepower to less than 50 horsepower	27.5
D	50 horsepower and over	25.0
F	Trailers, dump and platform	25.0
F	Transformers	17.5
C	Trenching machines	27.5
	Trucks, dump, platform, stake, general purpose:	
A	1½-ton manufacturer's rated capacity or under	40.0
C	Over 1½-ton manufacturer's rated capacity	27.5
D	Turntables	25.0
	Wagons, pull type, crawler and wheel type:	
D	Steel	25.0
B	Wood	32.5
C	Welding outfits	27.5

APPENDIX J

(Chapter X)

Exhibit	Exhibit
Sample copy of fixed-fee engineering-management contract used by Public Roads Administration on the Alaska Highway and other military projects in northwest Canada and Alaska (contract with Dowell Construction Co. used as example).....	1
Sample copy of fixed-fee construction contract used by Public Roads Administration with contractors other than management contractors on above projects.....	2
Labor statistics relative to construction of the Alaska Highway (source: Public Roads Administration completion report, dated January 1944).....	3
Wage rate schedules used by American and Canadian contractors on construction in Alaska and Canada (source: War Department files).....	4
Alaska Highway manpower chart, exclusive of troops (source: War Department files).....	5
Contract assignments map for 1943 road construction program on the Alaska Highway (prepared by Public Roads Administration).....	6

EXHIBIT 1

Contract No. WA4pr-14348
Alaska-Canada Highway Project No. 4

**FIXED-FEE ENGINEERING-MANAGEMENT CONTRACT
PUBLIC ROADS ADMINISTRATION**

Project manager and address: Louis J. Dowell, an individual trading under the name of Dowell Construction Company, Smith Tower Building, Seattle, Washington.

**CONTRACT FOR ENGINEERING-MANAGEMENT SERVICES IN THE CONSTRUCTION OF
ALASKA-CANADA HIGHWAY PROJECT NO. 4**

Location: Those portions of Sections B and C of the Alaska Highway shown on the "Plan of Operation" prepared by and on file with the Public Roads Administration, as may be designated by the District Engineer, lying between the western terminus of Section B at or near the International boundary line between Alaska and Canada and the eastern terminus of Section C near Lower Post (Watson Lake) all in the Dominion of Canada, exclusive of that mileage along the southwest shore of Kluane Lake under contract to E. W. Elliott, and totaling approximately four hundred fifty (450) miles.

Fixed fee: \$105,000.

Estimated construction cost, exclusive of fixed fee: \$15,000,000.

Payment: To be made by a duly authorized officer of the United States Treasury.

Funds to meet the obligations of the United States under this contract are available under the following designation, the unobligated balances of which are sufficient to cover such obligations:

802/35902.602 Working Fund, Federal Works Agency,
Public Roads Administration
(Engineer Services, Army), 1942-43

FIXED-FEE ENGINEERING-MANAGEMENT CONTRACT

This contract, entered into this 25th day of May 1942, by the United States of America (hereinafter called the Government) represented by the Contracting Officer executing this contract, and Louis J. Dowell, an individual trading under the name of Dowell Construction Company, 315 Smith Tower Building, Seattle, Washington (hereinafter called the Project Manager).

Witnesseth:

Whereas the Government has agreed to engage the Project Manager to perform the services hereinafter set forth, under the general terms and conditions expressed in letter of May 23, 1942, from said Project Manager to the Commissioner of Public Roads and letter of May 25, 1942, from the Commissioner of Public Roads to said Project Manager, and as otherwise expressed herein, which said letters are by reference made a part hereof; and

Whereas the performance of said services under a fixed-fee contract entered into after negotiations approved by the Commissioner of Public Roads, and without advertising for bids, is authorized under Executive Order No. 9001 as extended by Executive Order No. 9023; and

Whereas the parties hereto desire that the general terms and conditions set forth in said letters of May 23d and 25th, 1942, be expressed in detail and the intention

of the parties more clearly defined by entering into a more formal fixed-fee contract for the performance of said services:

Now, THEREFORE, the parties hereto do mutually agree as follows:

ARTICLE I. STATEMENT OF WORK

1. The Project Manager shall, in the shortest possible time, furnish engineering-management and other services to assure the satisfactory completion of the construction of those portions of Sections B and C of the Alaska Highway shown on the "Plan of Operation" prepared by and on file with the Public Roads Administration, as may be designated by the District Engineer lying between the western terminus of Section B at or near the International boundary line between Alaska and Canada and the eastern terminus of Section C near Lower Post (Watson Lake) all in the Dominion of Canada, exclusive of that mileage along the southwest shore of Kluane Lake under contract to E. W. Elliott, and totaling approximately four hundred fifty (450) miles.

2. The Project Manager shall, in accordance with the provisions of this contract, provide the following engineering-management services, subject at all times to the direction and approval of the District Engineer of the Public Roads Administration:

(a) Select a representative satisfactory to the Public Roads Administration, such representative being hereinafter designated and referred to as "General Manager," who shall have general direction and supervision of the work.

(b) Recruit the services of an adequate number of competent and experienced contractors with sufficient equipment, machinery, skilled personnel, and ability to obtain necessary labor and perform the work required for the construction of said project. If the contractors thus recruited are satisfactory to the Commissioner of Public Roads, or his duly authorized representative, the Government will enter into a separate contract with each of them for the construction of such portion of the project, the furnishing of such labor, materials, supplies, equipment, and other appropriate services, as may be deemed necessary or desirable to insure completion of the project within the shortest possible time.

(c) Allocate portions of the work to be performed on the project to the individual contractors engaged under subsection (b) hereof, and shift the construction operations of the individual contractors from place to place as necessary to achieve the most efficient and expeditious prosecution and completion of the work.

(d) Supervise and control the individual contractors with respect to the management of their operations, the work performed by them, the furnishing and handling of their equipment, and the supervision of the employment and discharge of their personnel.

(e) Maintain and operate a central office in the vicinity of the project where all records required by the Government shall be kept, and keep all records required by the Government, including but not limited to fiscal and cost accounts, personnel records, time reports, requisitions, purchase orders, and such other records, both for the Project Manager and the individual contractors as may be deemed necessary by the Commissioner of Public Roads or his duly authorized representative.

(f) Provide, maintain, and operate a central equipment repair depot, a central storage and supply depot, any requisite subdepots and camps adequate to provide board and lodging for all personnel engaged to perform any work in connection with the project, and adequate sanitary, health, and hospital facilities not otherwise provided in connection therewith.

(g) Provide, as the work progresses, adequate facilities for communication between all parts of the work and with the office of the District Engineer, and for transportation of supplies and equipment to and between the various parts of the work.

(h) Furnish for the consideration and approval of the District Engineer a chart showing the executive, administrative, and other personnel, exclusive of labor, to be employed in furnishing management services for the project, indicating their duties and proposed salaries, and designating the individuals and salaries or portions thereof considered as part of the general overhead expenses. This chart shall be supplemented from time to time during the progress of the work so that it shall present, for the consideration and approval of the District Engineer, such revisions as are deemed necessary by the Project Manager.

(i) Furnish such other management services as may be required by the Commissioner of Public Roads or his duly authorized representatives.

3. It is estimated that the construction cost of the work covered by this contract will be Fifteen Million Dollars (\$15,000,000.00) exclusive of all fixed fees,

and that the work herein contracted for will be ready for utilization by the Government on or before December 31, 1943. It is expressly understood, however, that neither the Government nor the Project Manager guarantees the correctness of either of these estimates. The estimated cost set forth above is based upon the best data now available to both the Government and the Project Manager.

In consideration of his undertaking this contract, the Project Manager shall receive the following:

- (a) Reimbursement for expenditures as provided in Article II.
- (b) A fixed fee in the amount of one hundred five thousand dollars (\$105,000.00), which shall constitute complete compensation for the Project Manager's services, including profit and all general overhead expenses.
- (c) Rental of equipment as provided in Equipment Rental Schedule of the Public Roads Administration, approved May 1942, attached hereto and made a part hereof.

4. The Contracting Officer or his authorized representative may at any time, by written order and without notice to sureties, if any, make changes in or additions to the plans and specifications, issue additional instructions, require additional work on the project, or direct the omission of work covered by the contract. It is understood that the fixed fee is based on the estimated cost of the work specified in paragraph 1, Article I, of this contract. If in the judgment of the Contracting Officer there is a substantial increase in the work under this contract by reason of any changes, additions, or additional requirements, not contemplated under the "Plan of Operation" for Sections B and C of the Alaska-Canada Highway, an adjustment in the fixed fee may be made if it is determined by the Contracting Officer that an adjustment will be justified and will be within the authority of law. In no event shall such fixed fee exceed the limitation prescribed by law.

5. Title to all materials, tools, machinery, equipment, and supplies the cost or value of which is to be reimbursed the Project Manager by the Government shall vest in the Government at such point or points as the District Engineer may designate in writing or when payment or reimbursement therefor is made; Provided, That the right of final inspection and acceptance or rejection of such materials, tools, machinery, equipment, and supplies at such place or places as he may designate in writing is reserved to the District Engineer; Provided further, That upon such final inspection the Project Manager shall be given written notice of acceptance or rejection as the case may be. In the event of rejection, the Project Manager shall be responsible for the removal of the rejected property within a reasonable time.

6. During the performance of this contract, the work shall be under the full-time direction of a General Manager selected by the Project Manager and approved by the Contracting Officer. In no event shall the Project Manager be entitled to reimbursement for any salary, wages, or like compensation for the direction of the work, whether performed by an individual, a partner, a corporate officer or other representative, except as shown on the approved chart submitted in compliance with paragraph 2 (h) of Article I hereof.

ARTICLE II. COST OF THE WORK

1. *Reimbursement for Project Manager's Expenditures.*—The Project Manager shall be reimbursed in the manner hereinafter described for such of his actual expenditures in the performance of the work as may be approved or ratified by the Contracting Officer or the District Engineer and as are included in the following items:

- (a) All labor, material, tools, machinery, equipment, supplies, services, power, and fuel necessary for either temporary or permanent use in the performance of the services required hereunder.
- (b) All subcontracts made in accordance with the provisions of this contract. Provided, however, that regardless of the form of any subcontract the fees of any such subcontractor shall not be considered as a cost for which the Project Manager will be entitled to reimbursement.
- (c) Such equipment rentals and such repairs and repair parts as are not included in the rental of equipment from construction contractors and not made necessary by the fault or negligence of the Project Manager or his employees reimbursement to be in accordance with the terms of the Equipment Rental Schedule of Public Roads Administration approved May 1942.
- (d) Transportation charges on materials and supplies.
- (e) Transportation and traveling expenses to and from the work of the necessary field forces for the economical and successful prosecution of the work;

expenses of procuring labor and expediting the production and transportation of materials and equipment. Expenditures under these items must have the written authorization of the District Engineer.

(f) Salaries of superintendents, timekeepers, foremen, and other field employees of the Project Manager in connection with the work. In case the full time of any field employee of the Project Manager is not applied to the work, his salary shall be included in this item only in proportion to the actual time applied thereto. The qualifications, experience and salary of any person, other than a laborer or mechanic, assigned to service by the Project Manager shall be subject to approval by the District Engineer. No compensation of such employees shall be reimbursed by the Government except in accordance with the salary schedules approved by the District Engineer for this work.

(g) Buildings and equipment required for necessary field offices, camps and other facilities, and the cost of maintaining and operating said offices, and other facilities, including minor expenses such as telegrams, telephone service, expressage, and postage. The cost of maintaining and operating camps, buildings, and utility service will be reimbursed. All facilities shall be subject to such sanitary requirements as the District Engineer may prescribe or approve.

(h) Premiums on such bonds and insurance policies as the District Engineer may approve or require as reasonably necessary for the protection of the Government or the Project Manager.

(i) Losses and expenses, not compensated by insurance or otherwise (including settlements made with the written consent of the District Engineer), actually sustained by the Project Manager in connection with the work and found and certified by the District Engineer to be just and reasonable unless reimbursement therefor is expressly prohibited.

(j) Payments from his own funds made by the Project Manager under the Social Security Act, and any disbursements required by law, which the Project Manager may be required on account of this contract to pay on or for any plant, equipment, process, organization, materials, supplies, or personnel.

(k) If the Project Manager and/or his representative shall be required to travel, the Government will reimburse the Project Manager for the transportation, including Pullman where necessary, and will allow for such travel six dollars (\$6.00) per day in lieu of all other expenses. Transportation by privately owned automobile on such required travel shall be reimbursed at the rate of five cents (\$.05) per mile per vehicle as representing the actual cost of such transportation. All such travel shall either be authorized or approved in writing by the District Engineer.

(l) Disbursements incident to the payment of pay rolls either of the Project Manager or the individual contractors, including but not limited to, the cost of disbursing cash, necessary guards, cashiers, and paymasters. If payments to employees are made by check, facilities for cashing checks must be provided without expense to employees and the Project Manager shall be reimbursed therefor.

(m) Such other items not expressly excluded by other provisions of this contract as should, in the opinion of the District Engineer, be included in the cost of the work. When such an item is allowed by the District Engineer, it shall be specifically certified as being allowed under this paragraph.

2. Government's Right to Furnish Supplies and Materials.—The Government reserves the right to furnish any materials, equipment, machinery, tools, or services, including communication services, necessary for the completion of the work. The Project Manager shall cause the foregoing equipment and machinery to be suitably marked with an identifying mark or symbol, indicating that such items are the property of the United States. Upon the completion of this contract or upon demand, the Project Manager shall return such equipment and machinery to the place designated by the District Engineer.

3. Government's Rights to Make Direct Payments.—(a) The Government reserves the right to pay directly to common carriers any or all freight charges on materials, equipment, and supplies.

(b) The Government will pay direct for all telegrams, telephone communications (including teletype and facsimile when authorized by the District Engineer to be installed), cablegrams, radiograms, and similar messages that may be sent by the Project Manager pertaining directly to the contract for work to be done or materials to be furnished thereunder, and the Project Manager is hereby designated as an agent for the Government for the purpose of causing to be transmitted any such messages.

(c) The Government reserves the right to pay directly to the persons concerned all sums due from the Project Manager for labor, materials, or other charges.

4. *Non-Reimbursable Expenditures.*—No reimbursement or payments shall be made for the general administrative and overhead expenses of the Project Manager's home offices or regularly established branch offices in the United States or for the salaries or portions thereof of the officers and other personnel of the Project Manager designated on the approved organization chart as general overhead. No member of the partnership party to this contract shall be assigned on a reimbursement basis to duty in furnishing the management services herein required; nor shall any interest on capital employed or on borrowed money be included in the cost of the work.

5. *Discounts.*—The Project Manager shall, to the extent of his ability, take all cash and trade discounts, rebates, allowances, credits, salvage, commissions, and bonifications and shall assist the individual contractors in so doing and when he or they are unable to take advantage of such benefits he shall promptly notify the District Engineer stating the reason therefor. In determining the actual net cost of articles and materials of every kind required for the purpose of this contract, there shall be deducted from the gross cost thereof all cash and trade discounts, rebates, allowances, credits, commissions, and bonifications which have accrued to the benefit of the Project Manager or would have so accrued but for the fault or neglect of the Project Manager. There also shall be deducted similar items lost to individual contractors through fault or neglect of the Project Manager. Benefits lost through no fault or neglect on the part of the Project Manager or lost through fault of the Government shall not be deducted from gross costs.

6. All revenue from the operations of facilities necessary or required for the project, or from rebates, discounts, refunds, etc., shall be accounted for by the Project Manager and credited on the cost of the work chargeable to the Government.

ARTICLE III. PAYMENTS

1. *Reimbursement for Cost.*—The Government will currently, at the option of the Project Manager, reimburse the Project Manager for or pay directly to the persons concerned all direct costs incurred in accordance with Article II upon certification to and verification by the Contracting Officer of the receipted invoices and such other documents as the Contracting Officer may require. Generally, reimbursement will be made weekly, semi-monthly, or monthly as requested by the Project Manager.

2. *Payment of the Fixed Fee.*—The fixed fee prescribed in Article I shall be compensation in full for the services of the Project Manager, including profit and all general overhead expenses. Eighty percent (80%) of the said fixed fee shall be paid as it accrues in monthly installments, based on the percentage of the completion of the work as determined from estimates made and approved by the District Engineer. Upon completion of the work and its final acceptance, any unpaid balance of the fee shall be paid to the Project Manager.

3. *Payments by Project Manager.*—If bills for purchases or services of any kind incurred by the Project Manager hereunder and properly chargeable to the project are not paid promptly by the Project Manager, the Contracting Officer may, in his discretion, withhold from payments otherwise due the Project Manager an amount equivalent to the amount of any such bill. Should the Project Manager neglect or refuse to pay such bills within five (5) days after notice from the Contracting Officer so to do, the Government shall have the right to pay such bills directly, and in such event a deduction equal to five percent (5%) of the amount so paid directly shall be made from the Project Manager's fee.

4. *Final Payment.*—Upon completion of the work and its final acceptance in writing by the Contracting Officer, the Government shall pay to the Project Manager the unpaid balance of the cost of the work determined under Article II hereof, and of the fee, less any sum that may be necessary to settle any unsettled claims in connection with this contract, or any claim the Government may have against the Project Manager. The Contracting Officer shall accept the completed work with reasonable promptness. Prior to final payment and as a condition thereto, the Project Manager shall furnish the Government with a release of all claims against the Government arising under and by virtue of this contract other than such claims, if any, as are specifically excepted by the Project Manager from the operation of the release in stated amounts to be set forth therein.

ARTICLE IV. RECORDS AND ACCOUNTS—INSPECTION AND AUDIT

1. The Project Manager agrees to keep records and books of account, for himself and the individual contractors, showing the actual cost of all items of labor, materials, equipment, supplies, services, and other expenditures of whatever

nature for which reimbursement is authorized under the provisions of this contract or any separate construction contract. The system of accounting to be employed by the Project Manager shall be such as is satisfactory to the District Engineer.

2. The District Engineer shall at all times have access to the premises, work, and materials, to all books, records, correspondence, instructions, plans, drawings, receipts, vouchers, and memoranda of every description of the Project Manager pertaining to said work; and the Project Manager shall preserve such papers, without additional compensation therefor, for a period of three (3) years after completion or termination of this contract.

3. Any duly authorized representative of the Project Manager shall be accorded the privilege of examining the books, records, and papers of the District Engineer relating to the cost of the work for the purpose of checking and verifying such cost.

4. The Contracting Officer shall have the right to decide which functions of accounting, checking, and auditing are to be performed exclusively by the Government and to prescribe procedures to be followed by the Project Manager in such accounting, checking, and auditing functions as he may perform. The employment and number of personnel to be engaged by the Project Manager for checking, auditing, and accounting work shall be subject to the approval of the District Engineer and if, in the opinion of the District Engineer, the number of employees engaged in checking, auditing, and accounting work is excessive, such reductions in force as the District Engineer deems necessary shall be made.

ARTICLE V. SPECIAL REQUIREMENTS

1. The Project Manager hereby agrees that he will:

(a) Procure and thereafter maintain such bonds and insurance in such forms and in such amounts and for such periods of time as the Contracting Officer or his authorized representative may approve or require. In every instance where this contract requires the United States to reimburse the Project Manager the premium on a bond or insurance policy, the bond or insurance policy shall contain an indorsement or other recital excluding by appropriate language any claim on the part of the insurer or obligor to be subrogated, on payment of a loss or otherwise, to any claim against the United States.

(b) Reduce to writing, unless this provision is waived in writing by the Contracting Officer, every contract in excess of two thousand dollars (\$2,000) made by him for the purpose of the work of the Project Manager hereunder for services, materials, supplies, machinery, equipment, or for the use thereof; insert therein a provision that such contract is assignable to the Government; make all such contracts in his own name, and not bind or purport to bind the Government or the Contracting Officer thereunder.

(c) Enter into no subcontract for any portion of such work, except in the form prescribed by the Commissioner of Public Roads, nor without the written approval of the District Engineer. Subcontracts are defined as contracts entered into by the Project Manager with others which involve the performance, wholly or in part at the site of the work, of some part of the work described in Article I hereof.

(d) At all times during the progress of the work, keep at the site thereof a duly appointed and qualified representative who shall receive and execute on the part of the Project Manager such notices, directions, and instructions as the District Engineer may give.

(e) The District Engineer may require the Project Manager to dismiss from work such employee or employees as the District Engineer deems incompetent, careless, or insubordinate, or whose continued employment he deems inimical to the public interest. The Project Manager shall make every reasonable effort in the selection of his employees and in the prosecution of the work under this contract, to safeguard plot drawings and schematic drawings furnished him and drawings and specifications, and to prevent the theft or unauthorized use of the same.

(f) Furnish sufficient technical, supervisory and administrative personnel to insure the prosecution of the work in accordance with a progress schedule approved by the District Engineer. If, in the opinion of the District Engineer the work falls behind the progress schedule approved by him, the Project Manager shall take such steps as may be necessary to improve his progress and the District Engineer may direct him to order the individual contractors to increase working days, or hours of labor per day. Failure to promptly comply with such directions shall be deemed sufficient cause to terminate the contract for the fault of the Project Manager.

(g) Employ no person who is or has been employed by any other contractor engaged in the construction of the Alaska Highway without the consent of such other contractor, such employment in any event to be approved in writing by the District Engineer.

(h) The Project Manager further agrees that upon the termination of this contract, or upon the termination of the services of any of his employees recruited in and brought from the United States, he will return such employees in accordance with the terms of their contract of hire immediately to the place of their recruitment or, at the option of the employees, to some other place in the United States at equivalent or less cost. The expense of returning employees to the United States hereunder shall be a reimbursable charge under the contract.

ARTICLE VI. TERMINATION OF CONTRACT BY GOVERNMENT

1. The Government may terminate this contract at any time by a notice in writing from the Contracting Officer to the Project Manager. Such termination shall be effective in the manner and upon the date specified in said notice and shall be without prejudice to any claims which the Government may have against the Project Manager. Upon receipt of such notice, the Project Manager shall, unless the notice directs otherwise, immediately discontinue all work in connection with performance of this contract and shall proceed to cancel promptly all existing orders and terminate all subcontracts insofar as such orders and/or subcontracts are chargeable to this contract.

2. If this contract is terminated for the fault of the Project Manager the Contracting Officer may enter upon the premises and take possession, for the purpose of completing the work contemplated by this contract, of any or all materials, tools, machinery, equipment, and appliances which may be owned by or in the possession of the Project Manager, including all options, privileges, and rights of the Project Manager with respect to facilities for performing the work, and may complete or employ any other person or persons to complete said work.

3. Upon the termination of this contract, full and complete settlement of all claims of the Project Manager arising out of this contract shall be made as follows:

(a) The Government shall assume and become liable for all obligations, commitments, and claims that the Project Manager may have theretofore in good faith undertaken or incurred in connection with said work, the cost of which would be reimbursable in accordance with the provisions of this contract; and the Project Manager shall, as a condition of receiving the payments mentioned in this Article, execute and deliver all such papers and take all such steps as the Contracting Officer may require for the purpose of fully vesting in the Government the rights and benefits of the Project Manager under such obligations or commitments.

(b) The Government shall reimburse the Project Manager for all expenditures made in accordance with Article II and not previously reimbursed.

(c) The Government shall reimburse the Project Manager for such further expenditures after the date of termination for the protection of Government property and for accounting services in connection with the settlement of this contract as are required or approved by the Contracting Officer.

(d) If the contract is terminated for the convenience of the Government, the Project Manager will be paid that proportion of the prescribed fee which the work actually completed bears to the entire work under this contract, less fee payments previously made, plus not to exceed fifty percent, as may be agreed upon between the Contracting Officer and the Project Manager, of the remaining portion of the fee which would have been payable to the Project Manager had he continued the work to completion. If the contract is terminated due to the fault of the Project Manager, no additional payment on account of the fee will be made in excess of the fee already earned at the time of termination. In no event shall the fee agreed upon or paid exceed the limitation imposed by law.

(e) The obligations of the Government to make any of the payments required by this Article, or by paragraph 2, Article III of this contract, shall be subject to any unsettled claims in connection with this contract which the Government may have against the Project Manager.

4. Prior to final settlement the Project Manager shall furnish a release as required in paragraph 4 of Article III hereof.

ARTICLE VII. CONTRACTING OFFICER'S DECISIONS AND DISPUTES

The extent and character of the work to be done by the Project Manager shall be subject to the general supervision, direction, control, and approval of the

District Engineer to whom the Project Manager shall report and be responsible. All disputes arising under this contract shall be decided by the District Engineer, whose decision shall be in writing, subject to written appeal by the Project Manager within thirty (30) days to the Commissioner of Public Roads or his duly authorized representative, whose decision shall be final and conclusive upon the parties hereto. In the meantime, the Project Manager shall diligently proceed with the work as directed.

ARTICLE VIII. CONVICT LABOR

The Project Manager shall not employ any person undergoing sentence of imprisonment at hard labor.

ARTICLE IX. LABOR

1. (a) The rates of wages to be paid all mechanics and laborers shall be not less than the minimum rates nor more than the maximum rates specified in the wage schedule submitted by the Project Manager and approved by the District Engineer. Under special circumstances higher rates may be approved in writing by the District Engineer. The Project Manager shall furnish for the approval of the District Engineer the schedule of wage rates he or any subcontractor proposes to pay; and, similarly, from time to time any proposed changes to be made in said rates shall be submitted to the District Engineer for his consideration and approval. The wage rates so fixed and approved shall govern regardless of any contractual relationship which may be alleged to exist between the Project Manager or subcontractor and such mechanics and laborers. The District Engineer shall have the right to withhold from the Project Manager so much of his claims for reimbursement as may be considered necessary by the District Engineer to pay to laborers and mechanics employed by the Project Manager or any subcontractor on the work the difference between the rates of wages approved for each individual and the rates of wages received by such individual.

(b) In the event it is found by the District Engineer that any laborer or mechanic employed by the Project Manager or any subcontractor directly on the site of the work covered by the contract has been, or is being, paid a rate of wages less than the minimum rate approved as aforesaid, the Government may, by a written notice to the Project Manager, terminate his right to proceed with the work or such part of the work as to which there has been a failure to pay said required wages, and prosecute the work to completion by contract or otherwise, and the Project Manager shall be liable to the Government for any excess cost occasioned the Government thereby.

(c) Should the Project Manager or any subcontractor pay to any laborer or mechanic a wage based upon a rate in excess of the wage rate for the classification in which said laborer or mechanic is included, as approved for the work by the Contracting Officer or his authorized representative, such increased wage shall be at the expense of the Project Manager and shall not be reimbursed by the United States. When, in connection with the audit and check by the District Engineer, or his authorized representative, of the Project Manager's pay rolls, it is found that one or more laborers or mechanics have been paid wages at rates in excess of the approved wage rates established for such laborers or mechanics, the reimbursement made to the Project Manager on account of such pay rolls will not include such excess payments.

2. The Project Manager shall compensate laborers and mechanics for all hours worked by them in excess of eight (8) hours in any one calendar day at a rate of one and one-half times the basic rate of pay of such laborers and mechanics and shall include a stipulation in each subcontract that laborers and mechanics will be paid at a rate of one and one-half times their basic rate of pay for all hours worked by them in excess of eight (8) hours in any one calendar day.

3. (a) The Project Manager shall furnish the District Engineer, or his authorized representative, within seven (7) days after the regular payment date of each and every pay roll, an affidavit in the form and pay roll in the form furnished by the District Engineer. The affidavit shall be sworn to by the Project Manager or the subcontractor concerned, or by the authorized officer or employee of the Project Manager or subcontractor supervising such payment, to the effect that each and every person employed on the work has been paid in full the wages shown on the pay roll covered by the affidavit; that no rebates have been or will be made, either directly or indirectly, to, or on behalf of, the Project Manager or such subcontractor, from the full wages earned as set out on such pay roll; and

that no deductions other than permissible deductions have been or will be made, either directly or indirectly, from the full wages earned as set out on such pay roll.

(b) The Project Manager shall cause appropriate provisions to be inserted in all subcontracts relating to this work to insure fulfillment of the requirements of this Article.

ARTICLE X. WORKMEN'S COMPENSATION INSURANCE

During the life of this contract the Project Manager will provide and maintain, for all employees of the Project Manager engaged in work under this contract, Workmen's Compensation Insurance or such other protection for employees as may be required by Federal, State, Canadian, or Provincial statutes in the jurisdiction in which such work is performed, or such protection for employees as may be required by the Contracting Officer in those places where there are no such statutory requirements, under direction of the Contracting Officer. If the whole or any part of the work under this contract is sublet, the same protection provided for employees of the Project Manager will be provided for the protection of the employees of the subcontractors. The Project Manager shall supply the District Engineer with proof of compliance with this Article.

ARTICLE XI. ACCIDENT PREVENTION

In order to protect the life and health of his employees in the performance of this contract, the Project Manager will take or cause to be taken such measures as the Contracting Officer may determine to be reasonably necessary for this purpose.

ARTICLE XII. NOTICE TO GOVERNMENT OF LABOR DISPUTES

Whenever an actual or potential labor dispute is delaying or threatens to delay the timely performance of the work, the Project Manager will immediately give notice thereof to the District Engineer. Such notice shall include all relevant information with respect to such dispute.

ARTICLE XIII. OFFICIALS NOT TO BENEFIT

No Member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE XIV. COVENANT AGAINST CONTINGENT FEES

The Project Manager warrants that he has not employed any person to solicit or secure this contract upon any agreement for a commission, percentage, brokerage, or contingent fee. Breach of this warranty shall give the Government the right to terminate the contract or, in its discretion, to deduct from payments due the Project Manager the amount of such commission, percentage, brokerage, or contingent fee. This warranty shall not apply to commissions payable by the Project Manager upon contracts or sales secured or made through bona fide established commercial or selling agencies maintained by the Project Manager for the purpose of securing business.

ARTICLE XV. ASSIGNMENT OF CLAIMS

1. Neither this contract nor any interest therein shall be assigned or transferred by the Project Manager to any other party or parties except as provided in the Assignment of Claims Act of 1940 (54 Stat. 1029).

ARTICLE XVI. DEFINITIONS

1. The term "Commissioner of Public Roads" shall mean the Commissioner of Public Roads, Public Roads Administration, Federal Works Agency.

2. The term "his duly authorized representative" shall mean any person authorized by the Commissioner of Public Roads to act for him.

3. The term "Contracting Officer" shall mean the Commissioner of Public Roads, or any officer signing the contract in behalf of the United States, or authorized to act for the Commissioner of Public Roads.

4. The term "District Engineer" shall mean the District Engineer of the Public Roads Administration in whose district the project is located or his duly

authorized representative. The District Engineer is hereby designated an authorized representative of the Contracting Officer.

5. The term "General Manager" shall mean the representative of the Project Manager having general direction and supervision of the work.

ARTICLE XVII. ALTERATIONS

The following changes were made in this contract before it was signed by the parties hereto:

The work to be performed under this contract is estimated to cost fifteen million dollars (\$15,000,000.00), but it is understood and contemplated by the parties hereto that when and if additional funds are made available the work required may be increased and an appropriate adjustment in the fixed fee made by written order from the Government to the Project Manager: *Provided*, That no such increase in the work required shall be ordered or adjustment in the fixed fee made which will cause an increase in the amount of said fee to more than one hundred thirty-five thousand Dollars (\$135,000.00), except as provided in paragraph 4, Article I, hereof.

In witness whereof, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA,
FEDERAL WORKS AGENCY,
PUBLIC ROADS ADMINISTRATION,
By [s] THOS. H. MACDONALD,
Commissioner of Public Roads.
(Contracting Officer)

Project Manager:
DOWELL CONSTRUCTION COMPANY,
By [s] L. J. DOWELL
(Sole Owner)

Witnesses as to signature of Project Manager:

[s] MARGARET A. MCKAY.
(Witness)

[s] L. F. MORTLAND.
(Witness)

SPECIAL PROVISIONS FOR CANADIAN SECTIONS

(American Contractors)

Wage Rates.—A schedule of minimum and maximum wage rates to be paid all laborers and mechanics shall be submitted by the Contractor to the Engineer for his consideration and approval. The wage rates shall be based on the prevailing rates paid for work of a similar character in the locality of the project. The schedule of wage rates submitted by the Contractor may be changed or modified by the Engineer before its approval. Any employee who is paid on an hourly rate basis shall be paid for not less than forty (40) hours per week at the rate provided for his classification for each calendar week that he is in the employ of the Contractor regardless of whether or not he actually works as many as forty (40) hours: *Provided*, That the employee is available and willing to work the full forty (40) hours and that his employment for less than forty (40) hours during any week is due to no fault or negligence on his part.

Payments to Labor.—The wages of all labor shall be paid in legal tender of the United States of America, except that this condition will be considered satisfied if payment is made by a negotiable check, on a solvent bank, if provision is made whereby such check may be cashed readily by the employee for the full amount, without discount or collection charges of any kind. Where checks are used for payment, the Contractor shall make all necessary arrangements for them to be cashed and shall give information regarding such arrangements. No fee of any kind shall be asked or accepted by the Contractor or any of his agents from any person who obtains work on the project, nor shall any person be required to pay any fee to any other person or agency obtaining employment for him on the project.

Board and Lodging.—Every employee shall be permitted to lodge, board, and trade where and with whom he elects, and neither the Contractor nor his agents nor his employees shall directly or indirectly require as a condition of employment that an employee shall lodge, board, or trade at a particular place or with a particular person.

In the event the Contractor provides a camp and furnishes board and lodging to his employees, the camp shall be operated to the satisfaction of the Engineer, and the Contractor shall not charge for such board and lodging in excess of a rate approved by the Contracting Officer. No intoxicating beverages shall be sold or allowed to be sold to his employees by the Contractor or his agents.

Board and Lodging for Government Employees.—The Contractor shall furnish, if he operates a camp, board and lodging for employees of the Government engaged on the work, such board and lodging to be at rates not in excess of the rates charged by the Contractor for similar services to the employees of his own organization.

Transportation of Employees.—No charge shall be made for any transportation furnished by the Contractor or his agents to any employee unless authorized by the Engineer.

Employment on Wage Basis Only.—No individual shall be employed as a laborer or mechanic on this contract except on a wage basis, but this shall not be construed to prohibit the rental of teams, trucks, or other equipment from individuals. No such rental agreement, or any charges for feed, gasoline, supplies, or repairs on account of such agreement, shall cause any deduction from the wages accruing to any employee, except as authorized by the Government.

Wages shall be exclusive of equipment rental on any equipment which the worker may furnish in connection with his work.

No deductions of any kind shall be made from the wages earned, except those authorized by the Engineer. Deductions for board and lodging shall be made from wages in all cases where the Government pays the wages directly or where the Contractor makes payments of the wages and is to be reimbursed therefor by the Government.

Affidavit and Pay Rolls.—Each Contractor or subcontractor engaged in the prosecution of the work shall furnish for each pay period an affidavit with respect to the wages paid during each pay period.

Said affidavit shall be executed and sworn to by the Contractor or subcontractor or by the authorized officer or employee of the Contractor or subcontractor who supervises the payment of wages and shall be on a form furnished or approved by the Government.

Changes.—Only residents of the United States shall be employed on the project, except that in case of emergency and with approval of the contracting officer, or his authorized representative, Canadian labor may be employed temporarily through Canadian employment agencies. Residents of the United States employed on the project shall not be subject to Canadian regulations or laws with respect to wages and working conditions.

The paragraph "Payments to Labor" is hereby modified so as to effectuate an understanding with Canadian officials to pay laborers such sums as they may wish for use in Canada in Canadian funds, including the benefit of exchange, and such sums as they may wish to transmit home in United States funds.

The last sentence in the paragraph entitled "Wage Rates," on page 1 of these Special Provisions, is revised to read as follows:

"Any employee who is paid on an hourly rate basis at the rate provided for his classification shall be paid for not less than an average of forty (40) hours per week for each pay period that he is in the employ of the Contractor regardless of whether or not he actually works forty (40) hours each week during such period: *Provided*, That the employee is available and willing to work the full forty (40) hours and that his employment for less than forty (40) hours during any week is due to no fault or negligence on his part."

The Equipment Rental Schedule approved May 1942 as prepared by the Public Roads Administration was included and made a part of this contract.

DOWELL CONSTRUCTION Co.,
Seattle, Wash., May 23, 1942.

HON. THOS. H. MACDONALD,
Commissioner, Public Roads Administration,
Washington, D. C.

DEAR SIR: This proposal is submitted outlining the terms under which we offer to accept the management of the construction of a portion of the Alaska Highway between Watson Lake, or Lower Post, Canada, and the Alaska-Yukon boundary line. This portion of the highway is understood to be approximately 450 miles in length.

We propose to secure the services of the necessary contractors with sufficient equipment and personnel who will enter into individual contracts with the Public

Roads Administration for the construction of proportionate parts of the sections of the highway as enumerated above.

We would be designated as "project manager" and furnish the necessary management services to assure the satisfactory completion of the project as indicated above, subject at all times to the approval of the district engineer of the Public Roads Administration. Such services to include—

(a) The direct management and control of the separate contractors, their personnel and equipment, and the operations carried on by them.

(b) The maintenance and operation of a central office on the project where all records required by the Government shall be kept, including but not limited to fiscal and cost accounts, personnel records, time reports, requisitions, purchase orders, and such other records as may be deemed necessary by the district engineer for proper accountability.

(c) The supervision of employment and discharge of all personnel of the separate contractors engaged on the project.

(d) The allocation and allotment of the work to the separate contractors engaged on the project.

(e) The authority and responsibility for shifting the construction operations of the separate contractors from place to place on the project when necessary to insure the most efficient and expeditious prosecution and completion of the work.

(f) The supervision and/or maintenance and operation of a central equipment repair depot, a central storage and supply depot, necessary camps to provide board and lodging for all personnel on the project, all of which shall include necessary sanitary and health facilities.

(g) Such other management services as may be required by the Public Roads Administration.

We will furnish for the approval of the engineer in charge a chart showing the executive, administrative, and other personnel to be regularly assigned to the project, indicating their duties and proposed salaries and designating the individuals and salaries or portions thereof considered as a part of the general overhead expenses of the project manager. We will also submit and supplement as necessary work programs and revisions in organization charts.

It is understood that—

1. The Public Roads Administration, at the option of the project manager, will either reimburse the project manager for, or pay directly to the persons concerned, all direct costs of furnishing management services for the project, including all traveling expenses as authorized. It is understood that we are to set up administrative offices at Whitehorse and also an office sufficiently staffed in Seattle to take care of purchases, personnel, etc., for all of which we are to be reimbursed under this management agreement.

2. The Public Roads Administration shall maintain on the project at all times necessary personnel for the purpose of engineering, supervision, and inspection and for auditing and checking all requisitions, purchases, accounts, pay rolls, and all other records, for satisfactory performance in compliance with all contract provisions and with Federal laws and regulations.

3. The Public Roads Administration will pay to the project manager a fixed fee of \$135,000, which fee shall constitute full and complete compensation for all engineering-management services, said fee being based on an estimated total cost of \$20,000,000 for the construction of the project, exclusive of all fixed fees. Eighty percent of said fixed fee shall be paid as it accrues in monthly installments, based on the percentage of completion of the construction work as determined from estimates made and approved by the district engineer. Upon completion of the project and its final acceptance, the unpaid balance of the fee shall be paid to the project manager.

In carrying out the management services herein offered we agree to be guided by and subject to the provisions of the contract entered into by the Public Roads Administration and the individual contractors for the construction of this project.

Very truly yours,

DOWELL CONSTRUCTION Co.
By L. J. DOWELL.

MAY 25, 1942.

The DOWELL CONSTRUCTION Co.,
Seattle, Wash.

GENTLEMEN: Pursuant to our preliminary discussions and your letter of May 23, 1942, outlining the proposed terms and conditions under which the Dowell

Construction Co., a firm organized and existing under the laws of the State of Washington, and filed in the auditor's office of King County, in the city of Seattle, State of Washington, will undertake to perform engineering-management and other services in connection with the construction of a portion of the Alaska Highway, you are hereby authorized to proceed immediately with furnishing such services under the following general terms and conditions:

1. The highway project, for which your services are engaged, extends from a point near Watson Lake or Lower Post, Canada, to a point on the international line between Canada and Alaska, a distance of approximately 450 miles, designated as portions of sections B and C as shown on the "Plan of operation" prepared by and on file with the Public Roads Administration, except such portions as may be allocated to E. W. Elliott.

2. Your firm, the Dowell Construction Co., will be designated and referred to as "Project manager."

3. The project manager will recruit the services of an adequate number of competent and experienced contractors with sufficient equipment, machinery, and skilled personnel and labor to perform the construction work required on the above-mentioned project. If the contractors thus recruited are satisfactory to the Public Roads Administration, the Government will enter into separate construction contracts with each of them for such portion, or portions, of the project as may be deemed necessary to insure completion within the shortest possible time.

4. The project manager shall furnish and maintain the necessary management services to insure the satisfactory completion of the project within the shortest possible time, subject at all times to the direction and approval of the district engineer of the Public Roads Administration. Such services shall include—

(a) The direct management and control of the separate contractors, their personnel and equipment, and the operations carried on by them.

(b) The maintenance and operation of a central office on the project where all records required by the Government shall be kept, including but not limited to fiscal and cost accounts, personnel records, time reports, requisitions, purchase orders, and such other records as may be deemed necessary by the district engineer for proper accountability.

(c) The supervision of employment and discharge of all personnel of the separate contractors engaged on the project.

(d) The allocation and allotment of the work to the separate contractors engaged on the project.

(e) The authority and responsibility for shifting the construction operations of the separate contractors from place to place on the project when necessary to insure the most efficient and expeditious prosecution and completion of the work.

(f) The supervision and/or maintenance and operation of a central equipment repair depot, a central storage and supply depot, necessary camps to provide board and lodging for all personnel on the project, all of which shall include necessary sanitary and health facilities.

(g) Such other management services as may be required by the Public Roads Administration.

5. The project manager shall furnish for the consideration and approval of the district engineer of the Public Roads Administration a chart showing the executive, administrative, and other personnel, exclusive of labor, to be employed in furnishing management services for the project indicating their duties and proposed salaries, and designating the individuals and salaries or portions thereof considered as a part of the general overhead expenses of the project manager. This chart shall be supplemented from time to time during the progress of the work, showing necessary revisions in the organization for consideration and approval by the district engineer.

6. The Public Roads Administration, at the option of the project manager, will either reimburse the project manager for, or pay directly to the persons concerned, all direct costs of furnishing management services for the project. No reimbursement or payments shall be made by the Government for the general administrative and overhead expenses of the project manager's offices in the United States or for the salaries or portions thereof of the officers and other personnel of the project manager designated on the approved organization chart as general overhead expenses. No officer of the Dowell Construction Co. shall be assigned on a reimbursement basis to duty in furnishing the management services herein required.

7. The Public Roads Administration shall maintain on the project at all times necessary personnel for the purpose of engineering, supervision, and inspection, and for auditing and checking all requisitions, purchases, accounts, pay rolls, and all other records, for satisfactory performance in compliance with all contract provisions and with Federal laws and regulations.

8. The Public Roads Administration will pay to the project manager a fixed-fee of \$135,000 which fee shall constitute full and complete compensation for all engineering-management services, said fee being based on an estimated total cost of \$20,000,000 for the construction of the project, exclusive of all fixed fees. Eighty percent of said fixed fee shall be paid as it accrues in monthly installments, based on the percentage of completion of the construction work as determined from estimates made and approved by the district engineer. Upon completion of the project and its final acceptance, the unpaid balance of the fee shall be paid to the project manager.

9. In performing the services herein provided for the project manager agrees to be guided by and to comply in all respects with the applicable provisions of the contracts entered into by the Public Roads Administration with the separate contractors engaged to perform the construction operations on the project, including the payment of not less than the minimum wage rates fixed in such contracts and other labor requirements in connection with work performed directly by the project manager.

10. In order to avoid delay, this letter, together with your proposal as herein modified, shall constitute the general terms and conditions under which you are authorized to proceed with performance of the engineering-management services above outlined.

Very truly yours,

THOS. H. MACDONALD,
Commissioner of Public Roads.

Accepted: May 25, 1942.

DOWELL CONSTRUCTION Co.,
By L. J. DOWELL, *President.*

EXHIBIT 2

Contract No.
Alaska-Canada Highway Project No.

FIXED-FEE CONSTRUCTION CONTRACT

PUBLIC ROADS ADMINISTRATION—FEDERAL WORKS AGENCY

Contractor and address:

Contract for constructing Alaska-Canada Highway Project No.

Location:

Fixed fee: \$.....

Estimated cost, exclusive of fixed fee: \$.....

Payment: To be made by an authorized officer of the United States Treasury.

Funds to meet the obligations of the United States under this contract are available under the following designations, the unobligated balances of which are sufficient to cover such obligations:

802/35902.002 Working fund, Federal Works Agency,
Public Roads Administration
(Engineer Services, Army) 1942-43

This contract entered into this ____ day of _____ 194__, by the United States of America (hereinafter referred to as the "Government") represented by the contracting officer executing this contract and _____ (hereinafter referred to as the "Contractor");

Whereas the Government desires to engage the services of a contractor to perform the work and services hereinafter set forth; and

Whereas the accomplishment of the said work under a fixed-fee contract entered into after negotiations approved by the Commissioner of Public Roads and without advertising for proposals, is authorized under Executive Order No. 9001 as extended by Executive Order No. 9023,

Whereas as a result of such negotiations the Commissioner of Public Roads has directed that the Government enter into a fixed-fee contract with the Contractor for the accomplishment of the said work:

Now, THEREFORE, the parties hereto do mutually agree as follows:

ARTICLE I. STATEMENT OF WORK

1. The Contractor shall in the shortest possible time furnish the labor, materials, tools, machinery, equipment, facilities, supplies not furnished by the Government, and services, and do all things necessary for the completion of the following work:

Construct such portion or portions of the Alaska-Canada Highway between ----- and ----- designated and shown as Section ----- on the "Plan of Operation" for said highway prepared by the Public Roads Administration, as may be determined by the Project Manager and as approved by the Engineer. It is understood that the Project Manager, with the approval of the Engineer, may shift the Contractor's operations from one point to another at any place within the limits of said Section -- of said highway as may be considered necessary to insure completion of the work within the shortest possible time, all work and services hereunder to be performed in accordance with the specifications, special provisions, plans, and drawings which are made a part hereof and designated as follows:

(a) Public Roads Administration Specifications FP-41 (revised July 15, 1941) insofar as said specifications apply to and do not conflict with this contract as determined by the Engineer.

(b) Special Provisions for Canadian sections of Alaska-Canada Highway.

(c) Plans for sections of this project referred to above in Article I, or

(d) Working drawings to be furnished hereafter by the Engineer and subject in every detail to his supervision, direction, and instructions.

It is estimated that the total cost of the construction work covered by this contract will be approximately ----- dollars (\$-----) exclusive of the Contractor's fee and that the work herein contracted for will be ready for utilization by the Government within -- months from the date of this contract. It is expressly understood, however, that neither the Government nor the Contractor guarantees the correctness of either of these estimates. The estimated cost set forth above is based on the best data now available to both the Government and the Contractor.

In consideration for his undertaking this contract the Contractor shall receive the following:

(a) Reimbursement for expenditures as provided in Article II.

(b) Rental for Contractor's equipment as provided in Article II.

(c) A fixed fee in the amount of ----- (\$-----) which shall constitute complete compensation for the Contractor's services including profit and all general overhead expenses.

2. The Contracting Officer or his authorized representative may at any time, by written order and without notice to sureties, if any, make changes in or additions to the plans and specifications, issue additional instructions, require additional work on Sections ----- and order work on other sections of the highway in ----- not mentioned above or direct the omission of work covered by the contract. It is understood that the fixed fee is based on the estimated cost of the work specified in paragraph 1, Article I, of this contract. If in the judgment of the Contracting Officer there is a substantial increase in the work estimated under this contract by reason of any changes, additions, or additional requirements not contemplated under the "Plan of Operation" for Section ----- of the Alaska-Canada Highway, an adjustment in the fixed fee may be made if it is determined by the Contracting Officer that an adjustment will be justified and will be within the authority of law. In no event shall such fixed fee exceed the limitation prescribed by law.

3. The title to all work completed, or in the course of construction, shall be in the Government. Likewise, upon delivery at the site of the work, or at an approved storage site, title to all materials, tools, machinery, equipment, and supplies for which the Contractor shall claim and receive reimbursement under Article II shall vest in the Government. These provisions as to title being vested in the Government shall not operate to relieve the Contractor from any duties imposed under the terms of the contract.

4. The work shall be executed in the best and most workmanlike manner by qualified, careful, and efficient workers in strict conformity with best standard practices.

5. Except as otherwise authorized by the Engineer, all materials shall be of the best quality of their respective kinds. If the Engineer requires that the Contractor submit for prior approval samples of materials proposed for use in the work covered by the contract, the Contractor shall make no commitments for such materials until the submitted sample has been approved by the Engineer.

ARTICLE II. COST OF THE WORK

1. *Reimbursement for Contractors' Expenditures.*—The Contractor shall be reimbursed in the manner hereinafter described for such of his actual expenditures in the performance of the work as may be approved or ratified by the Contracting Officer or his authorized representative and as are included in the following items:

(a) All labor, materials, tools, machinery, equipment, supplies, services, power, and fuel necessary for either temporary or permanent use for the benefit of the work. All articles of machinery or equipment valued at \$300.00 or less shall be classed as tools and may be charged directly to the work. Title thereto shall pass to the Government upon reimbursement therefor.

(b) All subcontracts made in accordance with the provisions of this agreement: Provided, however, That regardless of the form of any subcontract, payments or reimbursements to the Contractor on account thereof will be limited to the actual costs incurred thereunder by the subcontractor in conformity with the terms and provisions of this contract and shall not include any fee to the subcontractor. The fees of any such subcontractor shall not be considered to be part of the costs of the work for which the Contractor shall be entitled to reimbursement under this article.

(c) All equipment used by the Contractor, other than Government-owned equipment, whether owned or rented by him, shall be at rates prescribed by and shall be based upon the terms and conditions specified in the Equipment Rental Schedule of the Public Roads Administration, Federal Works Agency, approved May 1942, which Equipment Rental Schedule is made a part of this Contract.

(d) Reimbursement for the loading and unloading of construction equipment owned or rented by the Contractor, or provided by the Government, shall be made on the basis of the terms and conditions set forth in the Equipment Rental Schedule of the Public Roads Administration, Federal Works Agency, approved May 1942.

(e) Reimbursement shall be made for the transportation charges on equipment, materials, and supplies, to and from the work and in accordance with the terms and conditions set forth in the Equipment Rental Schedule above referred to, except that where transportation facilities are furnished by the Government no charges shall be applicable. Charges for transportation of construction equipment over distances in excess of 2,000 miles must have prior written authorization of the Engineer.

(f) Transportation and traveling expenses, except where transportation and subsistence is furnished by the Government, to and from the work of the necessary field forces for the economical and successful prosecution of the work; expenses of procuring labor and expediting the production and transportation of material and equipment. Reimbursement under these items must have the approval of the Engineer.

(g) Salaries of superintendents, timekeepers, foremen, and other field employees of the Contractor in connection with the work. In case the full time of any field employee of the Contractor is not applied to the work, his salary shall be included in this item only in proportion to the actual time applied thereto. The qualifications, experience, and salary of any person, other than a laborer or mechanic, assigned to service by the Contractor shall be subject to approval by the Engineer. No compensation of such employee shall be reimbursed by the Government except in accordance with the salary schedules approved by the Engineer for this work. The Contractor shall submit, for the approval of the Engineer, an organization chart showing all officers and employees, other than laborers and mechanics, to be assigned to the work.

(h) Buildings and equipment required for necessary field offices, camps, and other facilities, and the cost of maintaining and operating said offices and other facilities, including minor expenses such as telegrams, telephone service, expressage, and postage. The cost of maintaining and operating camps, buildings, and utility service will be reimbursed. All facilities shall be subject to such sanitary regulations as the Engineer may prescribe or approve.

(i) Premiums on such bonds and insurance policies as the Contracting Officer may require or which the Contracting Officer may approve in writing in advance as necessary for the protection of the Contractor, his employees, or the Government.

(j) Losses and expenses not compensated by insurance or otherwise (including settlements made with the written consent of the Contracting Officer) actually sustained by the Contractor in connection with the work and found and certified by the Engineer to be just and reasonable.

(k) The cost of reconstructing and replacing any of the work destroyed or damaged and not covered by insurance, but expenditures under this item must have written approval of the Engineer.

(l) Payments from his own funds made by the Contractor under the Social Security Act, and any disbursements required by law which the Contractor may be required on account of this contract to pay on or for any plant, equipment, process, organization, materials, supplies, or personnel; and, if approved in writing by the Contracting Officer in advance, permit and license fees and royalties on patents used.

(m) If the Contractor and/or his representatives shall be required to travel, the Government will reimburse the Contractor for the transportation, including Pullman where necessary, and will allow for such travel six dollars (\$6.00) per day in lieu of all other expenses. Transportation by automobile on such required travel shall be reimbursed at the rate of five cents (\$.05) per mile per vehicle as representing the actual cost of such transportation.

All travel shall be either authorized or approved in writing by the Engineer. Should the Contractor, or any representative thereof, remain in a travel status in excess of six (6) days at any one time, not including the time consumed in travel, the cost of such excess travel shall be at the expense of the Contractor, unless otherwise ordered in writing by the Engineer.

(n) Such other items as should, in the opinion of the Engineer, be included in the cost of the work. When such an item is allowed by the Engineer, it shall be specifically certified as being allowed under this paragraph.

GENERAL

2. The Government reserves the right to furnish any materials, construction equipment, machinery, or tools necessary for the completion of the work. The Contractor shall cause such property to be suitably marked with an identifying mark or symbol indicating that such items are the property of the United States. The Contractor shall be responsible for any Government property lost through his negligence. Upon the completion of this contract, or upon demand, the Contractor shall return such equipment and machinery to the place designated by the Engineer.

3. The Government reserves the right to pay directly to common carriers any or all freight charges on construction equipment, materials, and supplies.

4. The Government reserves the right to pay directly to the persons concerned all sums due from the Contractor for labor, materials, or other charges.

5. No salaries of the Contractor's executive officers, and no part of the expense incurred in conducting the Contractor's main office or regularly established branch offices, and no overhead expenses of any kind for such offices shall be included in the cost of the work; nor shall any interest on capital employed or on borrowed money be included in the cost of the work.

6. The Contractor shall, to the extent of his ability, take all cash and trade discounts, rebates, allowances, credits, salvage, commissions, and bonifications, and when unable to take advantage of such benefits, he shall promptly notify the Engineer to that effect and the reason therefor. In determining the actual net cost of articles and materials of each kind required for the purposes of this contract, there shall be deducted from the gross cost thereof all cash and trade discounts, rebates, allowances, credits, salvage, commissions, and bonifications which have accrued to the benefit of the Contractor or would have so accrued except for the fault or negligence of the Contractor. Such benefits lost through no fault or negligence on the part of the Contractor, or lost through fault of the Government, shall not be deducted from gross costs.

7. All revenue from the operations of facilities necessary or required for the project (except such facilities as may be conducted by the Contractor purely for the personal convenience of the employees, such as for the sale of clothing, tobacco, candy, etc.), or from rebates, discounts, refunds, etc., shall be accounted for by the Contractor and credited on the cost of the work chargeable to the Government.

ARTICLE III. PAYMENTS

1. *Reimbursement for Cost.*—The Government will currently, at the option of the Contractor, reimburse the Contractor for or pay directly to the persons concerned all direct costs incurred in accordance with Article II upon approval by

the Engineer. Reimbursement will be made weekly, semimonthly, or monthly as requested by the Contractor.

2. *Rental for Contractor's Equipment.*—Rental as provided in Article II for construction equipment or parts thereof as the Contractor may own or furnish, shall be paid monthly upon presentation of the proper vouchers.

3. *Payment of the Fixed Fee.*—The fixed fee prescribed in Article I shall be compensation in full for the services of the Contractor, including profit and all general overhead expenses. Eighty percent (80%) of the said fixed fee shall be paid as it accrues in monthly installments, based on the percentage of the completion of the work as determined from estimates made and approved by the Engineer. Upon completion of the work and its final acceptance, any unpaid balance of the fee shall be paid to the Contractor.

4. *Payments by Contractor.*—If bills for purchase of material, machinery, or equipment, or pay rolls covering employment of laborers or mechanics incurred by the Contractor or by any subcontractor hereinunder are not promptly paid by the Contractor or subcontractor, as the case may be, the Contracting Officer or his authorized representative may, in his discretion, withhold from payments otherwise due the Contractor an amount equivalent to the amount of any such bill or pay roll. Should the Contractor neglect or refuse to pay such bills or pay rolls or to direct any subcontractor to pay such bills or pay rolls within five (5) days' notice from the Engineer to do so, the Government shall have the right to pay such bills or pay rolls directly. In such event a deduction equal to five (5) percent of the amount so paid directly shall be made from the Contractor's fee.

5. *Final Payment.*—Upon completion of the work and its final acceptance in writing by the Engineer, the Government shall pay to the Contractor the unpaid balance of the cost of the work determined under Article II hereof, and of fee, less any sum that may be necessary to settle unsettled claims for labor or materials, or any claim the Government may have against the Contractor. The Engineer shall accept the completed work with reasonable promptness. The Contractor shall if required, furnish the Government with a release of all claims against the Government arising under and by virtue of this contract other than such claims, if any, as may be specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein.

ARTICLE IV. RECORDS AND ACCOUNTS—INSPECTION AND AUDIT

1. The records, accounts, inspection, and audit for the work to be performed hereunder are to be undertaken and performed by the Project Manager of the Public Roads Administration. The Contractor agrees that he will furnish said Project Manager the necessary data upon which he may keep records and books of accounts on a cost-accounting basis as prescribed by Public Roads Administration showing the actual cost to him and the distribution of such cost to the various operations and items of work of all labor, materials, equipment, supplies, services, and other expenditures of whatever nature for which reimbursement is authorized under the provisions of this contract. The system of accounting to be employed shall be such as is satisfactory to the Engineer.

2. The Engineer, or any other authorized representative of the Government, shall at all times be afforded proper facilities for inspection of the work, and shall at all times have access to the premises, work, and materials, to all books, records, correspondence, instructions, plans, drawings, receipts, vouchers, and memoranda of every description of the Contractor pertaining to said work; and the Contractor shall preserve, without additional compensation therefor, for a period of three (3) years after completion or termination of this contract, all the books, records, and other papers herein mentioned which have not been delivered to the Project Manager.

3. Any duly authorized representative of the Contractor shall be afforded the privilege of examining the books, records, and papers of the Project Manager and of the Engineer relating to the cost of the work for the purpose of checking and verifying such cost.

4. The Contracting Officer shall have the right to decide which functions of checking and auditing are to be performed exclusively by the Government and to prescribe procedures to be followed by the Contractor and the Project Manager in such accounting, checking, and auditing functions as he may continue to perform. The employment and number of personnel to be engaged for checking, auditing, and accounting work shall be subject to the approval of the Engineer and if, in the opinion of the Engineer, the number of employees engaged in checking, auditing, and accounting work is excessive, such reductions in force as the Engineer deems necessary shall be made.

ARTICLE V. SPECIAL REQUIREMENTS

1. The Contractor hereby agrees that he will—

(a) Perform all of the work and furnish all of the services required by the provisions of this contract under the direction and in accordance with the instructions of the Project Manager, subject at all times to the approval of the Engineer.

(b) Procure and thereafter maintain such bonds and insurance in such forms and in such amounts and for such periods of time as the Contracting Officer or his authorized representative may approve or require. In every instance where this contract requires the United States to reimburse the contractor the premium on a bond or insurance policy, the bond or insurance policy shall contain an indorsement or other recital excluding by appropriate language any claim on the part of the insurer or obligor to be subrogated, on payment of a loss or otherwise, to any claim against the United States.

(c) Unless this provision is waived in writing by the Contracting Officer, refuse to writing every contract in excess of two thousand dollars (\$2,000.00) made by him for the purpose of the work hereunder for services, materials, supplies, machinery, or equipment, or for the use thereof, insert therein a provision that such contract is assignable to the Government, make all such contracts in his own name and not bind or purport to bind the Government, or the Contracting Officer thereunder. No purchases in excess of five hundred dollars (\$500.00) shall be made or placed without the approval of the Engineer, and all purchases in excess of such amount shall be made only after solicitation of competitive bids whenever feasible and practicable, as determined by the Engineer.

(d) Enter into no subcontract for any portion of the work except in the form prescribed by the Commissioner of Public Roads, nor without the written approval of the Engineer. Subcontracts are defined as contracts entered into by the Contractor with others, which involve the performance wholly or in part, at the site of the work, of some part of the work described in Article I hereof.

(e) At all times during the progress of the work, keep at the site thereof a duly appointed and qualified representative who shall receive and execute on the part of the Contractor such notices, directions, and instructions as the Engineer may give.

(f) Dismiss from the work such employee or employees as the Engineer or Project Manager deems incompetent, careless, or insubordinate or whose continued employment is deemed inimical by the Engineer to the public interest. The Contractor shall make every reasonable effort in the selection of his employees and in the prosecution of the work under this contract to safeguard plot drawings and schematic drawings furnished him and drawings and specifications, and to prevent the theft or unauthorized use of the same.

(g) Furnish sufficient technical, supervisory, and administrative personnel to insure the prosecution of the work in accordance with a progress schedule approved by the Engineer. If, in the opinion of the Engineer, the Contractor falls behind a progress schedule approved by the Engineer, the Contractor shall take such steps as may be necessary to improve his progress and the Engineer may direct him to increase working days or hours of labor per day. Failure to promptly comply with such directions shall be deemed sufficient cause to terminate the contract for the fault of the Contractor.

(h) Employ no person who is or has been employed by any other contractor engaged in the construction of the Alaska Highway without the consent of such other contractor, such employment in any event to be approved in writing by the Engineer and the Project Manager.

2. *Construction Work by Government Forces.*—The Government is constructing a truck trail road which in general will be adjacent and parallel to the work covered by this contract. It is intended that the work to be performed under this contract shall be so planned that the Government forces engaged on the truck trail road and the Contractor's forces will each, insofar as practicable, proceed on different sections of or from different points on the road without interference with the other's operations. In the event it is found during the course of construction that the Government forces complete certain sections of the truck trail road before the end of the construction season, the right is reserved to have such forces proceed with certain construction work on sections of the road covered by this contract where this can be done without physical interference with the Contractor's operations. In such cases the Government shall have the right to undertake with its forces clearing operations for widening the road, or for clearing and grading, or for the construction of bridges, as its best interests may appear, in order that the highway may be completed at the earliest possible date. Where the Government forces and the Contractor's crews are engaged in the same

vicinity, the work shall be coordinated by the Engineers in charge in such manner as to permit operations by the respective working forces to go forward without interference.

3. The Contractor further agrees that upon the termination of this contract, or upon the termination of the services of any of his employees recruited in and brought from the United States, he will return such employees immediately to the place of their recruitment or, at the option of the employees, to some other place in the United States at equivalent or less cost. The expense of returning employees to the United States hereunder shall be a reimbursable charge under the contract.

ARTICLE VI. TERMINATION OF THE CONTRACT BY GOVERNMENT

1. Should the Contractor at any time refuse and neglect or fail to prosecute the work with promptness and diligence, or default in the performance of any of the agreements herein contained, or should conditions arise which make it advisable or necessary in the interest of the Government to cease work under this contract, the Government may terminate this contract by a notice in writing from the Contracting Officer to the Contractor. Such termination shall be effective in the manner and upon the date specified in said notice, and shall be without prejudice to any claims which the Government may have against the Contractor. Upon receipt of such notice, the Contractor shall, unless the notice directs otherwise, immediately discontinue all work and the placing of all orders for materials, facilities, and supplies in connection with the performance of this contract, and shall proceed to cancel promptly all existing orders and terminate work under all subcontractors insofar as such orders and/or work are chargeable to this contract.

2. If this contract is terminated by the fault of the Contractor, the Contracting Officer or his authorized representative may enter upon the premises and take possession, for the purpose of completing the work contemplated in this contract, of all materials, tools, equipment, and appliances which may be owned by or in the possession of the Contractor, including all options, privileges, and rights of the Contractor with respect to facilities for performing the work, and may complete or employ any other person, or persons, to complete said work. In such event the Contractor shall be paid equipment rentals as provided in paragraph 1 (c) of Article II hereof.

3. Upon the termination of this contract as hereinbefore provided, full and complete settlement of all claims of the Contractor arising out of this contract shall be as follows:

(a) The Government shall assume and become liable for all obligations, commitments, and claims which the Contractor may have theretofore in good faith undertaken or incurred in connection with said work and in accordance with the provisions of this contract; and the Contractor shall, as a condition of receiving the payments mentioned in this Article, execute and deliver all such papers and take all such steps as the Contracting Officer or his authorized representative may require for the purpose of fully vesting in the Government the rights and benefits of the Contractor under such obligations or commitments.

(b) The Government shall reimburse the Contractor for all expenditures made in accordance with Article II and not previously reimbursed.

(c) The Government shall reimburse the Contractor for such further expenditures, made after the date of termination, for the protection of Government property and for accounting services in connection with the settlement of this contract as are required or approved by the Contracting Officer.

(d) The Government shall pay to the Contractor any unpaid balance for the rental of the Contractor's equipment in accordance with Article II to the date of termination.

(e) If the contract is terminated for the convenience of the Government, the Contractor will be paid that proportion of the prescribed fee which the work actually completed bears to the entire work under this contract, less fee payments previously made, plus not to exceed fifty percent, as may be agreed upon between the Contracting Officer and the Contractor, of the remaining portion of the fee which would have been payable to the Contractor had he continued the work to completion: Provided, That in no event shall the fee agreed upon or paid exceed the limitation imposed by law. If the contract is terminated due to the fault of the Contractor, no additional payment on account of the fee will be made in excess of the fee already earned at the time of termination.

(f) The obligation of the Government to make any of the payments required by this Article, or by Paragraph 4, Article III, of this contract shall be subject

to any unsettled claims in connection with this contract which the Government may have against the Contractor.

4. Prior to final settlement, the Contractor shall furnish a release as required in Section 5 of Article III hereof.

ARTICLE VII. CONVICT LABOR

The Contractor shall not employ any person undergoing sentence of imprisonment at hard labor.

ARTICLE VIII. LABOR

1. (a) The rates of wages to be paid all mechanics and laborers shall be not less than the minimum rates nor more than the maximum rates specified in the wage schedule submitted by the Contractor and approved by the Engineer. Under special circumstances higher rates may be approved in writing by the Engineer. The Contractor shall furnish for the approval of the Engineer the schedule of wage rates he or any subcontractor proposes to pay; and, similarly, from time to time any proposed changes to be made in said rates shall be submitted to the Engineer for his consideration and approval. The wage rates so fixed and approved shall govern regardless of any contractual relationship which may be alleged to exist between the contractor or subcontractor and such mechanics and laborers, and the approved scale of wages to be paid shall be posted by the Contractor in a prominent and easily accessible place at the site of the work. The Engineer shall have the right to withhold from the Contractor so much of his claims for reimbursement as may be considered necessary by the Engineer to pay to laborers and mechanics employed by the Contractor or any subcontractor on the work the difference between the rates of wages approved for each individual and the rates of wages received by such individual.

(b) In the event it is found by the Engineer that any laborer or mechanic employed by the Contractor or any subcontractor directly on the site of the work covered by the contract has been, or is being paid a rate of wages less than the minimum rate of wages approved as aforesaid, the Government may, by a written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been a failure to pay said required wages, and prosecute the work to completion by contract or otherwise, and the Contractor shall be liable to the Government for any excess cost occasioned the Government thereby.

(c) Should the Contractor or any subcontractor pay to any laborer or mechanic a wage based upon a rate in excess of the wage rate for the classification in which said laborer or mechanic is included, as approved for the work by the Contracting Officer or his authorized representative, such increased wage shall be at the expense of the Contractor and shall not be reimbursed by the United States. When, in connection with the audit and check by the Engineer, or his authorized representative, of the Contractor's pay rolls, it is found that one or more laborers or mechanics have been paid wages at rates in excess of the approved wage rates established for such laborers or mechanics, the reimbursement made to the Contractor on account of such pay rolls will not include such excess payments.

2. The Contractor shall compensate laborers and mechanics for all hours worked by them in excess of eight (8) hours in any one calendar day at a rate of one and one-half times the basic rate of pay of such laborers and mechanics, and shall include a stipulation in each subcontract that laborers and mechanics will be paid at a rate of one and one-half times their basic rate of pay for all hours worked by them in excess of eight (8) hours in any one calendar day.

3. (a) The Contractor shall furnish the Engineer, or his authorized representative, within seven (7) days after the regular payment date of each and every pay roll, an affidavit in the form and pay roll in the form furnished by the Engineer. The affidavit shall be sworn to by the Contractor or the subcontractor concerned, or by the authorized officer or employee of the Contractor or subcontractor supervising such payment, to the effect that each and every person employed on the work has been paid in full the wages shown on the pay roll covered by the affidavit; that no rebates have been or will be made, either directly or indirectly, to or on behalf of the Contractor or such subcontractor, from the full wages earned as set out on such pay roll; and that no deductions other than permissible deductions have been or will be made, either directly or indirectly, from the full wages earned as set out on such pay roll.

(b) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relating to this work to insure fulfillment of the requirements of this Article.

ARTICLE IX. WORKMEN'S COMPENSATION INSURANCE

During the life of this contract the Contractor will provide and maintain, for all employees of the Contractor engaged in work under this contract, Workmen's Compensation Insurance or such other protection for employees as may be required by Federal, State, Canadian, or Provincial statutes in the jurisdiction in which such work is performed, or such protection for employees as may be required by the Contracting Officer in those places where there are no such statutory requirements, under direction of the Contracting Officer. If the whole or any part of the work under this contract is sublet, the same protection provided for employees of the Contractor will be provided for the protection of the employees of the subcontractors. The Contractor shall supply the Engineer with proof of compliance with this Article.

ARTICLE X. MEDICAL, SURGICAL, AND HOSPITAL CARE

If required by the Contracting Officer or his authorized representative, the Contractor shall take out such insurance as may be necessary to provide proper medical, surgical, or hospital care of such of his employees who may be injured or contract illness in cases where such injury or illness is not covered by the Workmen's Compensation Insurance hereinabove provided for.

ARTICLE XI. PHYSICAL EXAMINATION OF CONTRACTOR'S EMPLOYEES

No laborer, mechanic, or other individual shall be employed for work at the site of the project unless and until he shall first have been examined by medical officer of the United States, or by a duly qualified physician approved by the Contracting Officer or his authorized representative, and found to be physically fit to perform the tasks to which he is to be assigned. Such employees shall be subject to further medical examination upon arrival at their places of employment before they are actually assigned to work.

ARTICLE XII. ACCIDENT PREVENTION

In the performance of this contract, the Contractor will comply with all pertinent provisions of the Federal requirements for safety in excavation, building, and construction work, and will furnish and cause to be used such additional safeguards, safety devices, and protective equipment as the Engineer may determine to be reasonably necessary to protect the life and health of its employees. The Contractor will maintain an accurate record of, and will report to the Engineer on forms prescribed and furnished by the Contracting Officer, all accidents arising out of and in the course of employment on work under this contract resulting in death, occupational disease, or injury requiring medical attention or causing loss of time from work.

ARTICLE XIII. OFFICIALS NOT TO PROFIT

No Member or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract, or to any profit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general profit.

ARTICLE XIV. APPROVAL REQUIRED

This contract shall be subject to the written approval of the Commissioner of Public Roads, and shall not be binding until so approved.

ARTICLE XV. COVENANT AGAINST CONTINGENT FEES

The Contractor warrants that he has not employed any person to solicit or secure this contract upon any agreement for commission, percentage, brokerage, or contingent fee. Breach of this warranty shall give the Government the right to terminate the contract or, in its discretion, deduct from payments to the Contractor the amount of such commission, percentage, brokerage, or contingent fee. This warranty shall not apply to collections payable by contractors upon contracts of sales secured or made through bona fide established commercial or sales agencies maintained by the Contractor for the purpose of securing business.

ARTICLE XVI. DISPUTES

Except as otherwise specifically provided herein, all disputes concerning questions of fact arising under the contract shall be decided by the Engineer, subject to written appeal by the Contractor within thirty (30) days to the Commissioner of Public Roads or his duly authorized representative, whose decision shall be final and conclusive upon the parties hereto. In the meantime, the Contractor shall diligently proceed with the work as directed.

ARTICLE XVII. CONTRACTOR'S ORGANIZATION AND METHODS

Upon the execution of this contract, the Contractor shall submit to the Engineer a chart showing the executive and administrative personnel to be regularly assigned for full- or part-time services in connection with the work under the contract, together with a written statement of the duties of each person and the administrative procedure to be followed by the Contractor for the control and direction of the work; and the data so furnished shall be supplemented as additional pertinent data become available. There shall also be submitted to the Engineer by the Contractor, charts of the various field organizations showing all personnel other than artisans, mechanics, helpers, and laborers, to be assigned for full- or part-time services outside of the central office organization, together with a written statement of the duties and rates of pay of each person and the procedure proposed to be followed by the Contractor for the accomplishment of all field work, including temporary requirements; and the data so furnished shall be supplemented as additional pertinent data become available. Statements of procedure shall include purchasing, disbursing, accounting, transportation, storage, employment, housing, sanitation, subsistence, recreation, and similar activities and methods, including statements of construction procedure.

ARTICLE XVIII. NONDISCRIMINATION

In the performance of this contract, the Contractor shall not discriminate against any worker because of race, creed, color, or national origin.

ARTICLE XIX. DEFINITIONS

- 1. The term "Commissioner of Public Roads" shall mean the Commissioner of Public Roads, Public Roads Administration, Federal Works Agency.
- 2. The term "his duly authorized representative" shall mean any person authorized by the Commissioner of Public Roads to act for him.
- 3. The term "Contracting Officer" shall mean the Commissioner of Public Roads or any officer signing the contract in behalf of the United States, or authorized to act for the Commissioner of Public Roads.
- 4. The term "Engineer" shall mean the District Engineer of the Public Roads Administration in whose district the project is located, or his duly authorized representative. The District Engineer is hereby designated an authorized representative of the Contracting Officer.
- 5. The term "Project Manager" shall mean the individual, partnership, or corporation engaged by the Government to supervise the Contractor's operations on the project.

ARTICLE XX. ALTERATIONS

The following changes were made in this contract before it was signed by the parties hereto:

In witness whereof, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA,
FEDERAL WORKS AGENCY,
PUBLIC ROADS ADMINISTRATION,

By _____
Commissioner of Public Roads.
(Contracting Officer)

Witness as to signature of Contractor:

Contractor:

(Name)

By _____

(Address)

(Title) _____

(Special provisions identical with those shown in exhibit 1 of this appendix were made a part of this contract when with American contractors for work in Canada.)

EXHIBIT 3
Labor Statistics—Construction of Alaska Highway
NUMBER OF PUBLIC ROADS ADMINISTRATION CONTRACTORS

Canadian.....	18
United States.....	63
Total.....	81

TOTAL LABOR FORCE AT PEAK OF CONSTRUCTION (SEPTEMBER 1943)

Canadian.....	3,700
United States.....	10,400
Public Roads Administration.....	1,850
Total.....	15,950

AVERAGE HOURLY WAGE RATE

Canadian.....	\$0.86
United States.....	1.57
Weighted average.....	1.38

LABOR TURN-OVER

	<i>Percent per month</i>
Canadian.....	19
United States.....	10
Average.....	12

Source: Public Roads Administration Completion Report, January 1944.

EXHIBIT 4

WAR DEPARTMENT,
OFFICE OF THE DIVISION ENGINEER,
NORTHWEST DIVISION,
Edmonton, Alberta, Canada, March 8, 1943.

Subject: Wage rates.

To: Office, Chief of Engineers, United States Army, Washington, D. C.

In compliance with your teletype SPEOF 1146 dated March 4 and our answer of March 8, 1943, there is attached hereto copies of wage rates used on construction in Alaska and Canada by American and Canadian contractors for United States employees and another for Canadian employees.

For the division engineer:

R. J. HAFNER,
Captain, Corps of Engineers.

(Two enclosures: (1) Wage rates for American employees, and (2) wage rates for Canadian employees.)

FEDERAL WORKS AGENCY—PUBLIC ROADS ADMINISTRATION
ALASKA HIGHWAY DISTRICT

WAGE RATES AND LABOR CLASSIFICATIONS (AMERICAN CONTRACTORS, CANADA
AND ALASKA)

HIGHWAY CONSTRUCTION

JANUARY 1, 1943.

Wage rates to be paid mechanics and laborers from the United States

Trade or class of labor	Per hour	Trade or class of labor	Per hour
Acetylene burner.....	\$1.56½	Painter:	
Aggregate screen plant operator.....	1.60	Journeyman.....	\$1.41½
Air compressor operator.....	1.50	Spray gun.....	1.56½
Air hammer operator.....	1.31½	Steel construction.....	1.54
Auto electrician.....	1.56½	Pile-driver foreman.....	1.76½
Auto mechanic.....	1.56½	Pile-driver—boomman.....	1.51½
Auto mechanic helper.....	1.06½	Pile-driver engineer.....	1.60
Axman.....	.96½	Pile-driver rigger.....	1.46½
Blacksmith.....	1.56½	Pile-driver man.....	1.46½
Blacksmith helper.....	1.25	Pipefitter.....	1.61½
Blade grade operator.....	1.60	Pitman.....	1.30
Carpenter.....	1.41½	Plumber.....	1.61½
Cement finisher (sidewalks, curbs, and gutters).....	1.44	Plumber helper.....	1.00
Chaser.....	1.16½	Plumber fifth year of junior wages.....	1.11½
Chaser (second).....	.96½	Plumber second 6 months of fifth year.....	1.41½
Choker setter.....	1.16½	Powderman:	
Concrete bridge-deck finisher.....	1.44	Open cut.....	1.31½
Concrete mixer operator (more than 5 sacks).....	1.60	Open-cut helper.....	.96½
Concrete mixer operator (less than 5 sacks).....	1.60	Pumpman.....	1.60
Concrete vibrator operator.....	1.16½	Reinforcing steel worker.....	1.41½
Concrete worker for structures (wet and dry).....	.96½	Reinforcing steel worker apprentice.....	.96½
Crusher operator:		Rigger.....	1.61½
Over 400 tons per 8-hour day.....	1.60	Rigger slinger.....	1.16½
Under 400 tons per 8-hour day.....	1.60	Roller operator (finishing high type pavement including subgrade for same).....	1.75
Ditchdigger.....	.96½	Roller operator.....	1.45
Dragline operator.....	2.00	Sawyer (sawmill).....	1.60
Driller.....	1.31½	Sewerman (including pipe laying).....	1.16½
Dumpman.....	1.16½	Setter (sawmill).....	1.25
Electrical worker.....	1.61½	Sheet-metal worker.....	1.58½
Edgerman (sawmill).....	1.25	Sheet-metal helper.....	1.06½
Fireman.....	1.30	Sloper.....	1.00
Flagman.....	.96½	Spreader box man.....	.96½
Grader operator (towing or motor, rough work).....	1.60	Steamfitter.....	1.61½
Greaseman (or monkey).....	1.06½	Stone mason.....	1.73½
Handyman (sawmill and logging).....	1.25	Structural steel foreman.....	2.00
Hoistman.....	1.60	Structural steel worker.....	1.75
Hook tender.....	1.61½	Structural steel worker apprentice.....	1.16½
Laborer (bridge).....	.96½	Straw boss (timber and sawmill).....	1.20
Laborer (miscellaneous unskilled).....	.96½	Shoemaker.....	1.25
Launchman.....	1.25	Teamster.....	.96½
LeTourneau operator.....	1.70	Timber buckler.....	.96½
Lineman.....	1.61½	Timber faller.....	.96½
Lineman 4-year apprentice.....	1.20	Tire vulcanizer.....	1.46½
Lineman, apprentice.....	1.12½	Tool dresser (sawmill and logging).....	1.35
Machinist.....	1.56½	Tractor driver (50 horsepower and over—with or without attachments).....	1.60
Machinist helper.....	1.06½	Tractor driver (under 50 horsepower with or without attachments).....	1.60
Mechanic (trouble shooter).....	1.56½	Truck driver (5 cubic yards and over or cargo truck over 7 ton).....	1.55
Oiler (power shovels or cranes).....	1.30	Truck driver (less than 5 cubic yards or cargo truck 2½ ton to 7 ton).....	1.40
Operator:		Truck driver (service and flatrack) 2½ ton or less.....	1.20
1. (Of power shovel or other excavating equipment, shovel-type controls, ¼ cubic yard or more).....	2.00	Truck driver (pick-up).....	1.10
2. (Power shovel or crane operator less than ¼ cubic yard).....	2.00	Wagon drill operator.....	1.55
3. Derrick steel erection.....	1.70	Welder.....	1.56½
4. Derrick excavation.....	1.85	Woodsmen, skilled (logging and sawmill).....	1.16½
5. Derrick—all others.....	1.70		
6. Winch and hoist.....	1.60		

All time in excess of 8 hours worked in any calendar day will be paid at rate of "time and one-half". Foreman \$0.12½ per hour minimum over journeyman scale.

*Alaska Highway—Project F (Dawson Creek-Fort St. John)—Proposed wage schedule
(Canadian employees)*

Trade or class of labor	National War Labor Board rates June 1	Rates to be approved
Axman per hour	\$0.60	\$0.60
Asphalt rakers..... do.	.70	.70
Asphalt tampers, smoothers, and spreaders..... do.	.60	.60
Blacksmiths or steel sharpeners..... do.	.90	.90
Blacksmiths' or steel sharpeners' helpers..... do.	.70	.70
Boatmen, rowboats..... do.	.....	.20
Carpenter foremen..... do.	.....	1.20
Carpenters and joiners..... do.	.98½	1.00
Carpenters' helpers..... do.	.....	.75
Cement finishers..... do.	.98½	1.00
Cement and concrete mixer operators:		
Steam..... do.	.98½	1.00
Gasoline or electricity..... do.	.68½	.70
Compressor operators..... do.	.68½	.70
Cooks:		
Chef..... per month and board	.....	225.00
Second..... do.	.....	175.00
Bull..... do.	.....	120.00
Cookees:		
Head..... do.	.....	140.00
Dishwashers and waiters..... do.	.....	90.00
Crossed culvert assemblers..... per hour	.....	.75
Crusher operators..... do.	.....	1.10
Dragline operators (steam or gasoline)..... do.	1.12½	1.15
Dragline firemen..... do.	.74½	.75
Dragline oilers..... do.	.60	.60
Drivers..... do.	.60	.60
Drivers, horse and cart, owner to furnish feed..... do.	.75	.75
Drivers, team and wagon, owner to furnish feed..... do.	1.00	1.00
Drill runners..... do.	.70	.70
Electricians..... do.	.....	1.00
Engineers, crane (steam, gasoline, or electricity)..... do.	1.08½	1.10
Enginemen, stationary..... do.	.....	.75
Foremen, grading or bridge:		
General..... per month	.....	370.00
Assistant..... do.	.....	325.00
Substitute (straw bosses)..... do.	.....	260.00
Hoist operators, tower (gasoline or electricity)..... per hour	.70	.70
Laborers..... do.	.60	.60
Lighting-plant maintenance men..... do.	.....	.75
Machinists..... do.	.98½	1.00
Machinists' helpers..... do.	.70	.70
Mechanics:		
Diesel..... do.	.....	1.10
Truck..... do.	.....	.90
Mechanics' helpers..... do.	.....	.75
Motortruck drivers..... do.	.65	.65
Motorboat operators..... do.	.....	.70
Oilers..... do.	.....	.60
Pile-driver foremen..... do.	.....	1.25
Pile-driver and derrick engineers..... do.	.....	1.15
Pile-driver boommen..... do.	.....	.80
Pile-driver bridgemen..... do.	.....	.75
Pile driver and derrickmen (rigging, setting, and signaling)..... per hour	.....	.80
Pile driver and derrick firemen..... do.	.....	.75
Powdermen..... do.	.70	.70
Pumpmen:		
Gasoline..... do.	.....	.70
Steam..... do.	.....	.75
Riggers, general..... do.	.....	.75
Rodmen, reinforced steel..... do.	.....	.80
Road-grader operators:		
Horse-drawn..... do.	.65	.65
Including team..... do.	1.05	1.05
Gasoline: Patrol or leaning wheel..... do.	.70	.70
Road-roller operators (steam or gasoline)..... do.	.98½	1.00
Shovel operators (gasoline)..... do.	1.12½	1.15
Steam-shovel engineers..... do.	1.12½	1.15
Steam-shovel crane-men..... do.	.90	.90
Steam-shovel firemen..... do.	.74½	.75
Steam-shovel oilers..... do.	.60	.60
Team and harness (only), contractor furnish feed..... per month	.....	75.00
Team, harness, and wagon (only) contractor furnish feed..... do.	.....	100.00
Teamsters (only)..... do.	.....	175.00

*Alaska Highway—Project F (Dawson Creek-Fort St. John)—Proposed wage schedule
(Canadian employees)—Continued*

Trade or class of labor	National War Labor Board rates June 1	Rates to be ap- proved
Timbermen and cribmen (measuring, scribing, and by the use of the ax, adze, etc., cutting and fitting timber)..... per hour.....		.75
Tractor operators (LeTourneau scrapers and bulldozers)..... do.....	1.00	1.00
Tractor operators (small)..... do.....	.75	.75
Tractor trailer operators..... do.....		1.00
Truss assemblers and erectors (wood)..... do.....		.75
Watchmen..... do.....	.45	.45
Welders..... do.....		1.25

Approval is requested from beginning of work to Aug. 31, 1942, with the above rates based on 10-hour day, with overtime at time and a half. Approval is requested from Sept. 1, 1942, for the above rates based on an 8-hour day, with overtime at time and a half.

Where board is not indicated as furnished, deduction of \$1.25 per day is to be made.

*Alaska Highway—Canadian section, project D (Canadian employees, Fort Nelson to Watson Lake)—Proposed schedule of rates to be effective after Sept. 1, 1942
(also comparison between Yukon schedule and proposed)*

	July 11, 1942, Yukon rates	Project D proposed rates effective Sept. 1, 1942
Asphalt rakers..... per hour.....	\$0.85	\$0.70
Asphalt tampers, smoothers, and spreaders..... do.....	.75	.60
Axman..... do.....	.75	.60
Blacksmiths or steel sharpeners..... do.....	1.10	1.00
Blacksmiths' helpers..... do.....	.85	.75
Boatmen (rowboats)..... do.....	.75	.65
Boilermakers on construction or erection..... do.....	1.10	
Boilermakers' helpers..... do.....	.85	
Brick and hollow-tile layers..... do.....	1.35	
Brick and hollow-tile layers' helpers (mixing and tempering mortar)..... do.....	.90	
Carpenter foremen..... do.....		1.20
Carpenters' helpers..... do.....		.75
Carpenters and joiners..... do.....	1.20	1.00
Cement finishers..... do.....	1.00	1.00
Cement and concrete mixer operators:		
Steam..... do.....	1.00	1.00
Gasoline or electricity..... do.....	.85	.75
Compressor operators (gasoline or electricity)..... do.....	.85	.90
Creosoted culvert assemblers..... do.....		.75
Crusher operators..... do.....		1.10
Dragline operators (steam or gasoline)..... do.....	1.35	1.25
Dragline firemen..... do.....	.90	.85
Dragline oilers..... do.....	.75	.75
Drivers (teamsters)..... do.....	.75	.60
Driver, horse and cart (owner supplies food)..... do.....	.95	.75
Driver, team and wagon (owner supplies food)..... do.....	1.25	1.00
Drill runners..... do.....	.85	.90
Electricians (inside wiremen)..... do.....	1.20	1.00
Engineers, operating, steam:		
Single or double drums..... do.....	1.10	
Three or more drums..... do.....	1.35	
Engineers on steel erection..... do.....	1.35	
Engineers, crane (steam, gasoline, or electricity)..... do.....	1.10	
Engineers, stationary..... do.....		.85
Foremen, grading or bridge:		
General..... per month.....		370.00
Assistant..... do.....		325.00
Substitute..... do.....		280.00
Hoist operators, tower (gasoline or electricity)..... per hour.....	.85	.85
Laborers..... do.....	.75	.60
Lathers:		
Metal..... do.....	1.20	
Wood..... do.....	.95	
Lighting-plant maintenance men..... do.....		.75
Linoleum layers..... do.....	.85	

Alaska Highway—Canadian section, project D (Canadian employees, Fort Nelson to Watson Lake)—Proposed schedule of rates to be effective after Sept. 1, 1942 (also comparison between Yukon schedule and proposed)—Continued

	July 11, 1942, Yukon rates	Project D proposed rates effective Sept. 1, 1942
Machinists..... per hour.....	\$1.00	\$1.00
Machinists' helpers..... do.....	.85	.70
Marble setters..... do.....	1.35	-----
Marble-setters' helpers (all men assigned to help tradesmen)..... do.....	.85	-----
Mastic floor layers..... do.....	1.05	-----
Mastic floor rubbers and finishers..... do.....	.90	-----
Mastic floor kettlemen..... do.....	.90	-----
Mastic floor laborers..... do.....	.80	-----
Mechanics:		
Diesel..... do.....	-----	1.10
Truck..... do.....	-----	.90
Mechanics' helpers..... do.....	-----	.75
Millwrights..... do.....	1.10	1.10
Motorboat operators..... do.....	.85	.80
Motortruck drivers..... do.....	.85	.75
Ornamental-iron workers..... do.....	1.20	-----
Painters (spray)..... do.....	1.00	-----
Painters and glaziers..... do.....	.95	-----
Pile-driver foremen..... do.....	1.35	1.35
Pile-driver and derrick engineers..... do.....	1.25	1.25
Pile-driver boommen..... do.....	1.10	.90
Pile-driver bridgemen..... do.....	1.10	.90
Pile-driver and derrickmen (rigging, setting, and signaling)..... do.....	1.10	.90
Pile driver and derrick firemen..... do.....	.90	.85
Pipe fitters (surface—temporary work)..... do.....	.90	.85
Pipe-layers, calkers, and solderers..... do.....	.85	.80
Plasterers..... do.....	1.20	-----
Plasterers' helpers (mixing and tempering material)..... do.....	.85	-----
Plumbers and steam fitters..... do.....	1.25	1.10
Plumbers and steam fitters' helpers (all men assigned to help tradesmen)..... do.....	.85	.75
Powdermen..... do.....	.85	.75
Pumpmen..... do.....	.85	.70
Riggers (general)..... do.....	.90	.80
Road-grader operators:		
Horse-drawn..... do.....	.80	.65
Including team..... do.....	1.25	1.05
Gasoline, patrol, or leaning wheel..... do.....	.85	1.10
Road-roller operators (steam or gasoline)..... do.....	1.10	1.00
Rodmen, reinforced steel..... do.....	.95	.80
Roofers, felt and gravel; patent; composition..... do.....	.85	-----
Roofers, sheet-metal..... do.....	1.20	-----
Sheet-metal workers..... do.....	1.20	-----
Shinglers (wood, asbestos)..... do.....	1.20	-----
Steam-shovel engineers..... do.....	1.35	1.25
Steam-shovel cranimen..... do.....	1.10	.90
Steam-shovel firemen..... do.....	.90	.85
Steam-shovel oilers..... do.....	.75	.75
Shovel operators (gasoline)..... do.....	1.35	1.25
Structural-steel workers..... do.....	1.35	-----
Stonecutters..... do.....	1.20	-----
Stonemasons..... do.....	1.35	-----
Stonemasons' helpers (mixing and tempering mortar)..... do.....	.85	-----
Terrazzo layers..... do.....	1.10	-----
Terrazzo finishers and helpers..... do.....	.85	-----
Team and harness only (contractor feeds)..... per month.....	-----	75.00
Team, harness, and wagon only (contractor feeds)..... do.....	-----	100.00
Teamster..... do.....	-----	175.00
Tile setters:		
Asphalt..... per hour.....	.95	-----
Ceramic..... do.....	1.35	-----
Tile setters' helpers (all men assigned to help tradesmen)..... do.....	.85	-----
Tractor operators:		
Small—hauling use..... do.....	.90	.75
Letourneau, bulldozer, etc..... do.....	1.20	1.10
Tractor trailer truck drivers..... do.....	.90	1.00
Truss assemblers and erectors (wood)..... do.....	.90	.85
Timbermen and cribmen (measuring, scribing, and, by the use of the ax, adze, etc., cutting and fitting timber)..... do.....	.90	.85
Watchmen..... per week.....	35.00	-----
Do..... per hour.....	-----	.45
Waxers and polishers (floor)..... do.....	.80	-----
Welders and burners:		
Acetylene or electric..... do.....	1.00	1.25
On steel erection..... do.....	1.35	-----

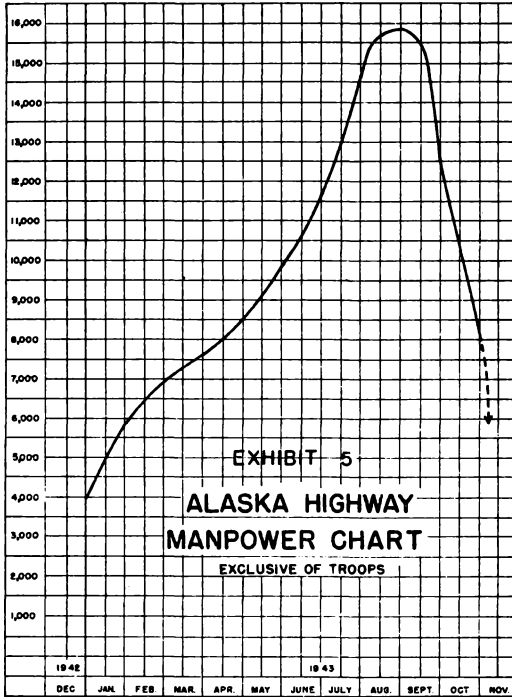


EXHIBIT 5
ALASKA HIGHWAY
MANPOWER CHART
 EXCLUSIVE OF TROOPS

APPENDIX K

(Chapter XI)

Exhibit Copy of prime contract between War Department and Foley Bros., Inc., and Rohl-Connelly Co. for construction of the Haines lateral road.....	1	Exhibit Copy of prime contract between War Department and Bates & Rogers Construction Co. for completion of permanent bridge program on the Alaska Highway.....	2
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EXHIBIT 1

Contractor: Foley Bros., Inc., and Rohl-Connelly Co.
 For: Construction of the Haines cut-off road, necessary dockage at Haines Point, Alaska, and other work and services herein set forth.
 Approved, this 10th day of August 1943.

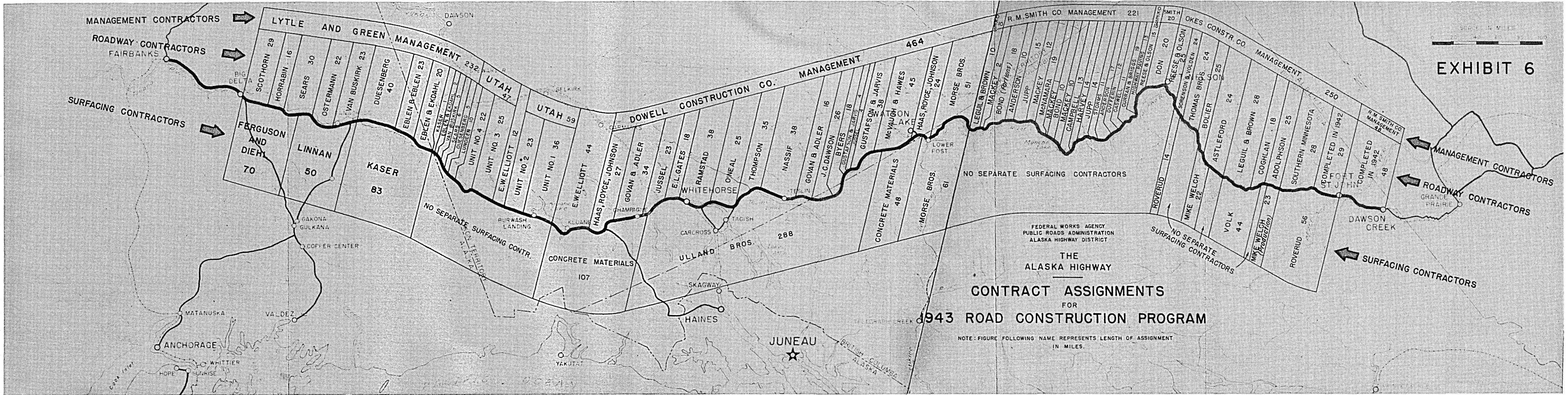
E. REYBOLD,
Major General,
Chief of Engineers.

Contract No. W-3416-Eng-51
 Negotiated contract
 C. M. C.

FIXED-FEE CONSTRUCTION CONTRACT .

WAR DEPARTMENT

Contractor and address: Foley Bros., Inc., 900 New York Building, St. Paul, Minn., and Rohl-Connelly Co., 4351 Valley Boulevard, Los Angeles, Calif. (joint venturers).
 Contract for designing and construction of: The Haines cut-off road, necessary dockage at Haines Point, Alaska, and other work and services hereinafter set forth.



Location: In the vicinity of Haines Point, Alaska, and between the United States or Prince Rupert, British Columbia, and Haines Point, Alaska.

Fixed-fee: \$352,000 (United States currency).

Estimated construction cost exclusive of fixed-fee: \$11,000,000.

Payment: To be made by finance officer, United States Army, Edmonton, Alberta, Canada.

The supplies and services to be obtained by this instrument are authorized by, are for the purposes set forth in, and are chargeable to, the following procurement authorities, the available balances of which are sufficient to cover the cost of the same:

Eng. 30403 P430-10 A0905-23.

This contract is authorized by the following laws: First War Powers Act, 1941, and Executive Order No. 9001, December 27, 1941.

FIXED-FEE CONSTRUCTION CONTRACT

This contract, entered into this 9th day of February 1943, by the United States of America (hereinafter called the Government), represented by the Contracting Officer executing this contract, and Foley Brothers, Inc., a corporation organized and existing under the laws of the State of Delaware, and Rohl-Connolly Co., a corporation organized and existing under the laws of the State of Nevada, Joint Venturers (hereinafter called the Contractor), Witnesseth that:

Whereas the Government desires to engage the services of a Contractor to perform the work and services hereinafter set forth; and

Whereas the accomplishment of the said work under a fixed-fee contract entered into after negotiations approved by the Secretary of War, and without advertising for proposals, is authorized by law and will facilitate the prosecution of the war; and

Whereas as a result of such negotiations the Secretary of War has directed that the Government enter into a fixed-fee contract with the Contractor for the accomplishment of the said work;

Now, THEREFORE, the parties hereto do mutually agree as follows:

ARTICLE I-A. DESCRIPTION OF THE PROJECT

1. The site of the project shall be located at or in the vicinity of Haines, Alaska. The project to be constructed shall be known as the Haines Cut-Off Road, with its southern terminus located in or near Haines, Alaska. Such road shall extend in a northwesterly direction from its southern terminus for a distance of approximately 144 miles, where it shall connect with the Alaska military road at approximately 108 miles west of Whitehorse in the Yukon.

2. It is contemplated by the parties hereto that additional work and services, other than that specified in this contract, will be required to be performed by the Contractor, relating to the construction of terminal facilities, docks, wharfs, and Marine construction, as such additional work and services may, from time to time, be ordered and approved by the Contracting Officer.

ARTICLE I-B. STATEMENT OF THE WORK

1. The Contractor shall, in the shortest reasonable time for the performance of the work under this contract, establish and maintain an office at or near the site of the work under the full-time resident direction of the Contractor; or of one or more principal partners if the Contractor is a partnership, or, in case the Contractor is a corporation, association, or similar legal entity, one or more corporate officers thereof; or a responsible representative approved by the Contracting Officer.

2. In the event office space at or near the site of the work is not provided by the Government in sufficient time to permit the work and services described herein to be performed efficiently and expeditiously, the Contractor, if approved in advance in writing by the Contracting Officer, may rent or lease such space at a convenient location, or if such rented or leased space is not available, may arrange by subcontract or otherwise for the construction of a temporary structure or structures to meet his immediate needs, on Government owned or controlled property or on privately owned property leased for such purpose.

3. Further, the Contractor shall perform the following engineering services:

a. Make all necessary topographical and other surveys and maps; arrange for and supervise necessary test borings and other subsurface investigations; provided, however, that this provision is not to be deemed to require the Contractor to make real-estate or boundary surveys.

b. Prepare, subject to the approval of the Contracting Officer, preliminary studies, sketches, and lay-out plans and reports, including estimates of cost of the proposed project and of all structures, utilities, and appurtenances thereto.

c. Adapt Government designs, drawings, specifications, and standards for buildings and other structures as necessary to meet the requirements of the approved lay-out of the proposed project, and prepare detailed designs, specifications, and drawings in required form for which Government designs are incomplete or unavailable.

d. Prepare estimates of material quantities required to construct the project.

e. When preliminary drawings are approved in writing by the Contracting Officer, prepare final designs, detailed working drawings and specifications in accordance with Government standards necessary for the effective coordination and efficient execution of the construction work and revise such drawings and specifications if necessary. All reservation, topographical, utility, and unit lay-out maps and all other drawings for structures and other items may be made in pencil. Prepare copies of the specifications and sets of full-size copies of working drawings in such manner and in such numbers as the Contracting Officer may require. There shall be included in the specifications all provisions which the Contracting Officer may direct to have incorporated therein relating to the negotiating or awarding of contract or contracts, conditions under which the work shall be done, and any special provisions required by statute or existing War Department regulations or instructions.

f. Prepare an estimate of the cost of the proposed project based on the approved designs, drawings, and specifications therefor.

g. Establish a permanently monumented base line, with elevations, tied into North American Datum, unless specifically exempted by written instructions of the Contracting Officer.

4. The Contractor shall, in the shortest possible time, furnish the labor, materials, tools, machinery and equipment, facilities, supplies not furnished by the Government, and services, and do all things necessary for the construction of the facilities and work described under Article I-A of this contract, all in accordance with the drawings and specifications or instructions to be furnished by the Contractor, subject in every detail to the approval, supervision, direction, and instruction of the Contracting Officer.

a. The Contractor shall furnish to the Government the Marine equipment listed in the attached "Appendix A", hereby made a part hereof, which equipment shall be used by the Government for the transportation of personnel, materials, and supplies from the United States or Prince Rupert, British Columbia, to Haines, Alaska, or elsewhere, as necessary in the performance of this contract and as directed and approved by the Contracting Officer. The Contractor is authorized, subject to the direction and approval of the Contracting Officer, to lease from third parties and furnish to the Government such other Marine equipment as the Contractor may be able to secure for transporting personnel, materials, and supplies.

b. The Contractor shall provide and/or construct the necessary dockage at Haines Point to accommodate the transfer of equipment, materials, supplies, and personnel from ship to dock, for the construction, maintenance, and operation of the necessary camps, warehouses, and other facilities as necessary for the contemplated construction.

c. All construction shall be performed in accordance with the drawings and specifications to be furnished later by the Contracting Officer, and subject in every detail to his supervision, direction, and instruction.

d. The Contractor shall also perform management services which shall include, among other functions, the scheduling and/or purchasing of items of material and equipment to avoid any delays in the prosecution of the work hereunder. The Contractor shall advise and consult with the subcontractors, if any, on this project, and shall direct and supervise their work, subject to the provisions of Article VII herein; and shall, subject to the direction of the Contracting Officer, store materials and equipment for use in connection with the project.

5. It is estimated that the cost of the performance of the work under this contract will be Eleven Million Dollars (\$11,000,000), exclusive of the Contractor's fee, and that the work herein contracted for will be ready for utilization by the Government on or before November 30, 1943. It is expressly understood, however, that neither the Government nor the Contractor guarantee the correctness of either of these estimates. In consideration of its undertaking under this contract, the Contractor shall receive the following:

a. Reimbursement for expenditures as provided in Article II.

b. Rental for Contractor's Marine equipment, as provided in Article II.

c. A fixed fee in the amount of Three Hundred and Fifty-two Thousand Dollars (\$352,000.00), which shall constitute complete compensation for the Contractor's services, including profit and all general overhead expenses.

6. When in the opinion of the Contracting Officer it is to the best interest of the Government, the Contractor shall, when so ordered or authorized, subcontract any or all items or classifications of work required under this contract or subsequently added thereto. Such subcontracting of work, or the performance thereof with the Contractor's own forces, regardless of the amount and/or extent of work performed or subcontracted, all with the prior written approval or order of the Contracting Officer, shall entail no adjustment in the fixed-fee stipulated in Section 5-c of this Article. The fixed fee stipulated in Section 5-c of this Article has been determined in the light of the fact that all of the work may be subcontracted pursuant to the foregoing provision. Such fee includes compensation for the services which may be rendered by the Contractor in the negotiation, supervision, and coordination of any work subcontracted and the responsibilities assumed by the Contractor in connection therewith, and is deemed to be reasonable, regardless of the amount or extent of work performed or subcontracted.

7. The Contracting Officer may at any time by written order issue additional instructions, require additional work or services or direct the omission of work or services covered by this contract. If such changes cause a material increase or decrease in the amount or character of the work to be done under this contract an equitable adjustment of the amount of the fixed fee to be paid the Contractor shall be made and the contract shall be modified in writing accordingly. Any claim for adjustment under this Article must be asserted within ten (10) days from the date the change is ordered (unless the Contracting Officer, with the approval of the Secretary of War or his duly authorized representative, shall grant a further period of time prior to the date of final settlement of the contract). Nothing provided in this Article shall excuse the Contractor from proceeding with the prosecution of the work so changed. There shall be no adjustment in the amount of the fixed fee as provided herein, nor any claim therefor because of any errors and/or omissions made in computing the estimated cost of the construction of the work under this contract or where the actual cost varies from the estimated cost.

ARTICLE II. COST OF THE WORK

1. *Reimbursement for Contractor's Expenditures.*—The Contractor shall be reimbursed in the manner hereinafter described for such of his actual expenditures in the performance of the work as may be approved or ratified by the Contracting Officer and as are included in the following items:

a. All labor, materials, tools, machinery, equipment, supplies, services, utilities, power, and fuel necessary for either temporary or permanent use for the benefit of the work.

b. All subcontracts made in accordance with the provisions of this contract.

c. Rental actually paid by the Contractor, at rates not to exceed those approved by the Contracting Officer, for construction plant in sound and workable condition exceeding \$300 in value as may be necessary for the proper and economical prosecution of the work. Each contract for the rental of construction plant or parts thereof by the Contractor from third parties shall be in a form prescribed by the Contracting Officer.

d. Unloading and assembling at the site of the work of construction plant owned or rented by the Contractor; transportation thereof to the place or places where it is to be used in connection with said work; dismantling, unloading, and return transportation to the point of original shipment or equivalent mileage, but in no event will the payment made for return transportation exceed the payment made for transportation to the job site unless such excess cost results solely from an increase of freight rates, or is required by Government transfer of such equipment to another site more distant from the point of origin than the site of the work set out in Article I hereof.

e. Repairs and repair parts as are not included in the rental or are not made necessary by the fault or negligence of the Contractor's corporate officers or project manager.

f. Transportation and traveling expenses to the work of the necessary field forces for the economical and successful prosecution of the work, and return when such services are no longer required; expense of procuring labor and expediting the production and transportation of material and equipment. Expenditures under these items shall be either authorized or approved in writing by the Contracting Officer.

g. Transportation charges on materials and supplies.

h. Salaries of resident engineers, superintendents, timekeepers, foremen, and other field employees of the Contractor in connection with the work. In case the full time of any field employee of the Contractor is not applied to the work, his salary shall be included in this item only in proportion to the actual time applied thereto. No person shall be assigned to service by the Contractor as superintendent of construction, chief engineer, chief purchasing agent, chief accountant or similar position in the Contractor's field organization, or as principal assistant to any such person, until there has been submitted to and approved by the Contracting Officer a statement of the qualifications, experience, and salary of the person proposed for such assignment. The payment of any excess salary over such scheduled amounts shown in the approved salary schedule shall not be reimbursable, unless and until the Chief of Engineers has so approved in writing.

i. Buildings, trade fixtures, and equipment required for necessary field offices, commissaries, hospitals, and other facilities, and the cost of maintaining and operating such field offices, commissaries, hospitals, and other facilities; provided that the Contractor may enter into a contract with any third party or parties for the operation of the commissaries, hospitals, or other facilities provided for herein, in which event such contract shall be reduced to writing and the terms thereof subject to the prior written approval of the Contracting Officer.

j. Temporary rights in land required in connection with the work.

k. Such bonds and insurance policies as have been approved or required by the Contracting Officer.

l. The amount of losses or expenses not compensated by insurance or otherwise (including settlements made with the written consent of the Contracting Officer) actually sustained by the Contractor in connection with the work and found and certified by the Contracting Officer to be just and reasonable, unless reimbursement therefor is expressly prohibited; provided that such reimbursement shall not include any amount for which the Contractor would have been indemnified or compensated by insurance except for failure of the Contractor to procure or maintain bonds or insurance in accordance with the requirements of the Contracting Officer.

m. The cost of reconstructing and replacing any of the work or property destroyed or damaged and not covered by insurance, but expenditures under this item must have the written authorization of the Contracting Officer in advance.

n. The cost, including incidental expenses and premiums (if any), of providing such death, injury, internment, and other benefits to the Contractor's employees engaged in performing services under this contract as the Contracting Officer may approve or require.

o. Payments from his own funds made by the Contractor under the Social Security Act, and any disbursements required by law, which the Contractor may be required on account of this contract to pay on or for any plant, equipment, process, organization, materials, supplies, or personnel; and, if approved in writing by the Contracting Officer in advance, permit and license fees and royalties on patents used, including those owned by the Contractor.

p. If the Contractor and/or its representatives shall be required to travel, the Government will reimburse the Contractor for the transportation, including Pullman where necessary, and will allow for such travel Six Dollars (\$6.00) per day in lieu of all other expenses while traveling within the continental limits of the United States, and will allow for such travel Seven Dollars (\$7.00) per day in lieu of all other expenses while traveling in Alaska or outside the continental limits of the United States. Transportation by automobile on such required travel shall be reimbursed at the rate of Five Cents (\$.05) per mile as representing the actual cost of such transportation.

All travel shall be either authorized or approved in writing by the Contracting Officer. Should the Contractor, or any representative thereof, remain in a travel status in excess of six (6) days at any one time, not including the time consumed in travel, the cost for such excess travel status shall be at the expense of the Contractor, unless otherwise ordered in writing by the Contracting Officer.

q. When specifically approved in advance by the Contracting Officer, a reasonable allowance for work done in the Contractor's general offices exclusively for and directly chargeable to the work.

r. Disbursements incident to payment of pay rolls, including but not limited to the cost of disbursing cash, necessary guards, cashiers, paymasters, and costs on the transfer of funds. If payments to employees are made by check, facilities for cashing checks must be provided without expense to employees, and the Contractor shall be reimbursed therefor.

s. It is mutually recognized that there are details relative to employment of labor and personnel with reference to payment of wages and salaries, and allot-

ments thereof, insurance, and other matters which will be covered by separate agreements to be entered into between the Constructor and its employees. Such employment contracts will be advantageous in the accomplishment of the work and services under this contract and the Constructor may, subject to the written approval of the Contracting Officer, enter into such agreement or agreements of employment not inconsistent with any of the express provisions of this contract as may be deemed necessary or desirable. All disbursements under the provisions of such approved employment agreements shall be considered as labor costs reimbursable under this contract.

t. Such other items not expressly excluded by other provisions of this contract as should, in the opinion of the Contracting Officer, be included in the cost of the work. When such an item is allowed by the Contracting Officer, it shall be specifically certified as being allowed under this Subsection.

u. All expenditures for which reimbursement has not been made pursuant to Letter Contract dated February 9, 1943, a copy of which is attached hereto. Such Letter Contract is hereby merged into and superseded by this contract.

2. *Rental for Marine Equipment Owned by Contractor.*—*a.* Rental shall be paid in United States currency to the Contractor for Marine equipment owned and/or furnished by it for the proper and economical prosecution of the work, as shown in the attached "Appendix A," at rental rates listed therein.

b. In the event the Contractor, with the approval of the Contracting Officer, furnishes additional equipment that is not included in "Appendix A," rental for such equipment will be paid in accordance with rental rates approved by the Contracting Officer.

c. Except as otherwise specified herein, rental of Marine equipment shall begin on the dates listed in "Appendix A."

d. All Marine equipment accepted by the Contracting Officer and deemed suitable for use of the work to be performed under this contract, shall be prepared for towing from Terminal Island, California, to Haines, Alaska, by way of Prince Rupert, British Columbia, or Point Hope Shipyard, Victoria, British Columbia, or such other points as may subsequently be determined by the Contracting Officer. All expenses shall be reimbursable which are incurred in preparing such Marine equipment for transfer to the job site, including, but not limiting the generality thereof, towing expenses, purchase of items used on the Marine equipment, alterations and/or additions required for operation in Alaskan or Canadian waters.

e. All Marine equipment furnished by the Contractor to the Government shall, at the expense of the Government, be returned to the Contractor at Terminal Island, California, when the Contracting Officer determines and directs that the said Marine equipment is no longer required. All such Marine equipment shall be returned to the Contractor in the same condition as received and as evidenced by condition surveys thereof; in the event the Government so elects, it may, in lieu of returning the equipment in the same condition as received, furnish and supply the Contractor with all necessary materials and supplies that may be required to restore such marine equipment to approximately a condition equal to that which existed when received by the Government and in addition the Government shall pay all necessary costs (exclusive of the materials and supplies furnished) to effectuate such restoration. A survey by a competent marine surveyor, mutually satisfactory, shall determine the quantity and quality of materials and supplies to be furnished by the Government and the costs necessary for such restoration of marine equipment.

f. The payment of rental shall cease on a date to be established in a written notice by the Contracting Officer to the Contractor, that the marine equipment is no longer required. The date of release thus established shall include an allowance for the time necessary for final repairs and return of equipment to Terminal Island, California.

g. In the event of total loss of any item or items of marine equipment listed in "Appendix A" hereof, or referred to in Paragraph 2-*b* of this Article, the Contractor will be paid an amount equal to the sound appraisals thereof, as determined by a competent marine surveyor approved by Marine Underwriters and mutually satisfactory. Rental rates for such equipment will cease upon notification by the Contracting Officer that such equipment is considered a total loss.

GENERAL

3. Title to all materials, tools, machinery, equipment, and supplies procured in the United States for which the Constructor shall be entitled to reimbursement under Article II shall vest in the Government at the point or points of procurement in the United States and the Contracting Officer shall inspect and accept

such items at such point. Title to all materials, tools, machinery, equipment, and supplies procured in the Dominion of Canada for which the Contractor shall be entitled to reimbursement under Article II shall vest in the Government at such point or points as the Contracting Officer may designate in writing, provided that the right of final inspection and acceptance or rejection of such materials, tools, machinery, equipment, and supplies at such place or places as he may designate in writing is reserved to the Contracting Officer; provided further, that, upon such final inspection, the Contractor shall be given written notice of acceptance or rejection as the case may be.

4. The work shall be executed in the best and most workmanlike manner by qualified, careful, and efficient workers, in strict conformity with the best standard practices.

5. Except as otherwise authorized by the Contracting Officer, all materials shall be of the best quality of their respective kinds. If the Contracting Officer requires that the Contractor submit for prior approval samples of materials proposed for use in the work covered by this contract, the Contractor shall make no commitments for such materials until the submitted sample has been approved by the Contracting Officer.

6. During the performance of this contract, the work shall be under the full-time resident direction of the Contractor, if an individual; of one or more principal partners if the Contractor is a partnership; or in case the Contractor is a corporation, association, or similar legal entity, one or more senior officers thereof; provided, however, that Contractor, whether on individual, a partnership, a corporation, or other legal entity, may be represented in the direction of the work by some person of a class other than those specified above, if the Contracting Officer gives his approval. In any event the Contractor shall not be entitled to be reimbursed for any salary, wages, or like compensation paid for such direction of the work, whether performed by an individual, a partner, a corporate officer, or other representative, unless such salary or wages are approved by the Contracting Officer.

7. a. The Government reserves the right to furnish any materials, construction equipment, machinery, tools, or services, including communication services necessary for the completion of the work. The Contractor shall cause all equipment, machinery, and tools to which title is vested in the Government to be suitably marked with an identifying mark or symbol indicating that such items are the property of the United States. The Contractor shall maintain at all times, in a manner satisfactory to the Contracting Officer, records showing the disposition and/or use of all equipment, machinery, tools, and materials purchased for the work and for which he has been reimbursed by the Government or which have been furnished by the Government. Upon the completion of this contract or upon demand, the Contractor shall return such equipment, machinery, tools, and unused materials to the place designated by the Contracting Officer.

b. *Liability for Government-Owned Property.*—Except as to property the liability for which is fixed by any other instrument or agreement or by some other provision of this contract, the Contractor shall not be liable for loss or destruction of or damage to property of the Government in the possession or control of the Contractor in connection with this contract unless such loss, damage, or destruction results from willful misconduct or failure to exercise good faith on the part of the Contractor's corporate officers or other representatives having supervision or direction of the operation of the whole of the Contractor's business or of the whole of any plant operated by the Contractor in the performance of this contract.

8. a. The Government reserves the right to pay directly to common carriers any or all freight charges on construction plant, materials, and supplies.

9. The Government reserves the right to pay directly to the persons concerned all sums due from the Contractor for labor, materials, or other charges.

10. No salary of the Contractor, partners, or corporate officers of the Contractor's organization shall be included in the cost of the work. No part of the expense incurred in conducting the Contractor's main office or regularly established branch offices, and no overhead expense of any kind, except as specifically authorized in Section 1 of this Article, shall be included in the cost of the work; nor shall any interest on capital employed or on borrowed money be included in the cost of the work.

11. The Contractor shall, to the extent of his ability, take all cash and trade discounts, rebates, allowances, credits, salvage commissions, and bonifications, and when unable to take advantage of such benefits he shall promptly notify the Contracting Officer, with the reason therefor. In determining the actual net cost of articles and materials of every kind required for the purpose of this contract, there shall be deducted from the gross cost thereof all cash and trade discounts,

rebates, allowances, credits, commissions, and bonifications which have accrued to the benefit of the Contractor, or would have so accrued but for the fault or neglect of the Contractor. Such benefits lost through no fault or neglect on the part of the Contractor, or lost through fault of the Government, shall not be deducted from gross costs.

12. The Government shall indemnify and save harmless the Contractor from any and all liens, claims, suits, and expense, demand or cost with respect to the operation, maintenance, or control of the said Marine equipment, arising out of any matter happening or thing occurring while said Marine equipment is in the possession or control or is being used by the Government, its agents, contractors, or designees.

13. All revenue received by the Contractor from the operations of the hospital, commissaries, or other facilities, or from rebates, discounts, refunds, etc., shall be accounted for by the Contractor and, except for any reasonable compensation accruing to a third party or parties for the operation of commissaries, hospitals, or other facilities, applied in reduction of the cost of the work.

14. Time is of the essence of this contract and for the purposes of facilitating the early completion of the work to be done hereunder and insofar as work under this contract is concerned, the Government does hereby waive all Interdepartmental Regulations, as contrasted with laws, ordinarily applicable within the United States, but inconsistent with the provisions of this contract, which waiver will hasten the completion of the project.

ARTICLE III. PAYMENTS

1. *Advance Payments.*—a. At any time and from time to time after the execution of this contract, the Government at the request of the Contractor and subject to the approval of the Chief of Engineers or his duly authorized representative, or the person to whom authority to make advance payments has been delegated, as to the present need therefor, shall advance to the Contractor sums not to exceed thirty per centum (30%) of the estimated cost of this contract (exclusive of the Contractor's fixed fee), as it may be amended from time to time. On the unliquidated balance of the advance payments outstanding, the Contractor agrees to pay interest at the rate of two and one-half per centum (2½%) per annum to be computed in accordance with the provisions of Paragraph *f* hereof.

b. As a condition precedent to the making of any advance payment or payments as hereinbefore provided, the Contractor shall furnish the Government with such adequate security as the Under Secretary of War or the person to whom authority has been delegated to make advance payments shall prescribe: *Provided, That*, if other security is not prescribed, the terms of this contract shall be considered adequate security for such advance payments: *And provided further*, That if at any time the Under Secretary of War deems the security furnished by the Contractor inadequate, the Contractor shall furnish such additional security, in the form of a surety bond or surety bonds, as shall be satisfactory to the Under Secretary of War.

c. Until all advance payments hereunder are liquidated, all funds received as advance payments under this contract, together with all funds received as reimbursements for the cost of the work under Article II of this contract, exclusive of the Contractor's fixed fee, shall be deposited in a special bank account or accounts at a member bank or banks of the Federal Reserve System or any insured bank within the meaning of the Act creating the Federal Deposit Insurance Corporation (Act of August 23, 1935; 49 Stat. 684, as amended; 12 U. S. C. 264) separate from the Contractor's general or other funds. It is understood that such sums as are necessary to meet current expenses will be deposited in the Bank of Alaska, Skagway, Alaska. Such special bank account or accounts shall be so designated as to indicate clearly to the bank their special character and purpose, and the balance in such account or accounts shall be used by the Contractor exclusively as a revolving fund for carrying out the purposes of this contract and any amendments thereto, and not for other business of the Contractor. Any balances from time to time in such special account or accounts shall at all times secure the repayment of the advances in connection with which the special account or accounts are opened, and the Government shall have a lien upon such balances to secure the repayment of such advances, which lien shall be superior to any lien of the bank or any other person upon such account or accounts by virtue of assignment to it of such contract or otherwise: *Provided, That* the bank shall be under no liability to any party hereto for the withdrawal of any funds from said special account upon checks properly endorsed and signed by the Contractor, except that after the receipt by the bank of written directions from the Chief of Engineers or

his duly authorized representative, the bank shall act thereon and be under no liability to any party hereto for any action taken in accordance with the said written directions. Any instructions or written directions received by the bank through the Contracting Officer upon War Department stationery and purporting to be signed by, or by the direction of, the Chief of Engineers or his duly authorized representative, shall, insofar as the rights, duties, and liabilities of the bank are concerned, be conclusively deemed to have been properly issued and filed with the bank by the Chief of Engineers or his duly authorized representative.

d. It is agreed that the aggregate of the advance payments outstanding under this contract, together with funds received as reimbursement for the cost of the work by the Contractor under Article II of this contract, shall at no time exceed the total estimated cost of the work under this contract as it may be revised from time to time, and any such excess shall be immediately repaid by the Contractor to the Government or if any reimbursement is due from the Government to the Contractor, shall be deducted therefrom: *Provided, however,* That if the total cost of the work under this contract shall be in excess of the amount so paid to the Contractor, including said advance payments, the Government upon presentation of satisfactory evidence shall currently and promptly reimburse the Contractor to the extent of such excess cost (subject to any delay in the availability of appropriated funds).

c. If, upon completion of this contract, or upon the termination thereof for other than the fault of the Contractor, the advance payments made to the Contractor in respect of this contract have not been fully liquidated in the manner herein provided, the unliquidated balance of such advance payments shall be deducted from any payments otherwise due the Contractor in respect of this contract; and if the sum or sums due the Contractor be insufficient to cover such balance, the deficiency shall be paid by the Contractor in cash forthwith after demand and final audit by the Government of all accounts hereunder in respect of this contract: *Provided, however,* That in the event of such termination of the contract for other than the fault of the Contractor, such deduction shall not be made prior to final audit unless, and only to the extent that, the Contracting Officer or his duly authorized representative shall determine that such action is reasonably required in order to secure the eventual repayment in full to the Government of such unliquidated advance payments. In the event of cancellation or termination of this contract because of the fault of the Contractor, the Contractor, notwithstanding any ultimate rights to be reimbursed, agrees to return to the Government, upon demand, without set-off of any sums alleged to be due the Contractor, the unliquidated balance of any advance payment. Furthermore, if, in the opinion of the Chief of Engineers or his duly authorized representative, the unobligated balance of the advance payments made by the Government under Paragraph a hereof exceeds the amount necessary for the current needs of the Contractor, as determined by the Chief of Engineers or his duly authorized representative, the amount of such excess shall, upon demand by the Chief of Engineers or his duly authorized representative, be promptly returned to the Government and will be credited against the balance due the Government on advances previously made. If the demand made in any event set forth in this paragraph is not met upon receipt of such demand by the Contractor, the amount demanded will bear interest at the rate of six per centum (6%) rather than two and one-half per centum (2½%) per annum from the date of the receipt of the demand until payment is made: *Provided, however,* That such additional interest over and above the regular two and one-half per centum (2½%) is hereby waived as to any sums paid by the Contractor within 15 days after the amount becomes due hereunder. If and when the Contractor has, by means of deductions or otherwise, reimbursed the Government in full for payments made, any money remaining in the special bank account or accounts shall be free and clear of any lien hereunder, and the bank or banks concerned shall have authority to pay same to the Contractor and shall thereupon be relieved of any further obligation to the Government on account thereof.

f. On the unliquidated balance of the advance payments outstanding, the Contractor agrees to pay interest at the rate of two and one-half per centum (2½%) per annum. Such interest shall be computed at the end of each calendar month on the average daily balance of the principal of the unliquidated advance payments outstanding. In determining such balance, charges on account of the advance payments to the Contractor hereunder shall be made as of the dates of the checks therefor; credits resulting from disbursements made by the Contractor which are applied against advance payments shall be made upon the approval of the vouchers therefor by the disbursing officer, as of the dates respectively upon

which the Contractor presents to the Contracting Officer or his duly authorized representative full and accurate data for the preparation of each such voucher which date shall, as to each such voucher, be certified by the Contracting Officer or his duly authorized representative on the face thereof; and credits arising from cash repayments to the Government by the Contractor shall be made as of the dates the checks therefor are received by the disbursing officer. As soon as such monthly computations shall have been made, the interest charge so determined shall be deducted from any payments on account of the fixed fee which may be made to the Contractor from time to time under this contract. In the event the accrued interest exceeds any such payment, the excess of such interest shall be carried forward and deducted from subsequent payments on account of the fixed fee. The interest shall not be compounded, and shall, subject to the provisions of Paragraph *e* hereof, cease to accrue upon the termination of the contract for other than the fault of the Contractor, or upon the date found by the Contracting Officer to be the date upon which the Contractor completed his performance under the contract.

g. The Contractor shall, at all times, afford to the Contracting Officer, or his duly authorized representative, proper facilities for the inspection and audit of the Contractor's accounts, and the Contractor hereby agrees that the Contracting Officer, or his duly authorized representative, shall have the right so far as the Contractor's rights are concerned, during business hours, to inspect and make copies of any entries in the books and records of the bank or banks relating to the said special account or accounts.

h. Subject to the approval of the Contracting Officer or his duly authorized representative the Contractor may make payments to subcontractors and materialmen in advance out of the special account, for labor or services, or to pay for materials in advance of delivery at the site of the work or at an approved storage site. Such subadvances shall not exceed thirty per centum (30%) of the sub-contract price or estimated cost, as the case may be, and the subcontractor or materialmen to whom such advances are made shall furnish adequate security therefor. Unless other security is furnished, covenants in subcontracts, expressly made for the benefit of the Government, providing for a subspecial account, with Government lien thereon and for a Government lien on or title to property, tangible or intangible, purchased from the special account, and imposing upon the subcontractor substantially the same duties and giving the Government substantially the same rights as are provided herein between the Government and the Contractor, have been prescribed by the Under Secretary of War as minimum adequate security for such subadvances.

i. Any assignment of moneys due or to become due under this contract shall be subordinate to the rights or claims of the Government arising under this contract or any amendment thereto by virtue of any advance payments authorized herein or otherwise: *Provided*, That, if at any time any claim arising under this contract is assigned or purportedly assigned in any manner inconsistent with the said rights of the Government, the Chief of Engineers or his duly authorized representative shall have the right to suspend further advance payments without notice.

2. Reimbursement for Cost.—The Government will currently reimburse the Contractor for expenditures made in accordance with Article II upon certification to and verification by the Contracting Officer of the original signed pay rolls for labor, the received invoices for materials, and such other documents as the Contracting Officer may require. Generally, reimbursement will be made weekly, but may be made at more frequent intervals if the conditions so warrant.

3. Rental for Contractor's Equipment.—Rental as provided in Article II for such Marine equipment as the Contractor may own and furnish shall be paid monthly upon presentation of proper vouchers.

4. Payment of the Fixed Fee.—Ninety per centum (90%) of the fixed fee set out in Article I shall be paid as it accrues, in monthly installments based upon the percentage of the completion of the work as determined from estimates submitted to and approved by the Contracting Officer. Final payment upon completion of the work and its final acceptance shall be made in accordance with Section 6. If the contract is terminated by the Government, payment shall be made in accordance with Article VI.

5. Payments by Contractors.—If bills for purchase of material, machinery, or equipment, or pay rolls covering employment of laborers or mechanics incurred by the Contractor or by any subcontractor hereunder are not paid promptly by the Contractor or subcontractor, as the case may be, the Contracting Officer may, in his discretion, withhold from payments otherwise due the Contractor an amount

equivalent to the amount of any such bill or pay roll. Should the Contractor neglect or refuse to pay such bills or pay rolls or to direct any subcontractor to pay such bills or pay rolls within five (5) days after notice from the Contracting Officer so to do, the Government shall have the right to pay such bills or pay rolls directly, and in such event a deduction equal to five per centum (5%) of the amount so paid directly shall be made from the contractor's fee.

6. *Final Payment.*—Upon completion of the work and its final acceptance in writing by the Contracting Officer, the Government shall pay to the Contractor the unpaid balance of the cost of the work determined under Article II hereof, and of the fee, less any sum that may be necessary to settle any unsettled claims in connection with this contract, or any claim the Government may have against the Contractor arising from this contract. The Contracting Officer shall accept the completed work with reasonable promptness. Prior to final payment, and as condition thereto, the Contractor shall furnish the Government with a release of all claims against the Government arising under and by virtue of this contract other than such claims, if any, as are specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein.

ARTICLE IV. RECORDS AND ACCOUNTS, INSPECTION AND AUDIT

1. The Contractor agrees to keep records and books of account, showing the actual cost to him of all items of labor, materials, equipment, supplies, services, and other expenditures of whatever nature for which reimbursement is authorized under the provisions of this contract. The system of accounting to be employed by the Contractor shall be such as is satisfactory to the Contracting Officer.

2. The Contracting Officer shall at all times be afforded proper facilities for inspection of the work and shall at all times have access to the premises, work, and materials, to all books, records, correspondence, instructions, plans, drawings, receipts, vouchers, and memoranda of every description of the Contractor pertaining to said work except such documents as have been submitted in support of reimbursement vouchers; and the Contractor shall preserve such papers without additional compensation therefor, for a period of three (3) years after completion or termination of this contract.

3. Any duly authorized representative of the Contractor shall be accorded the privilege of examining the books, records, and papers of the Contracting Officer relating to the cost of the work for the purpose of checking and verifying such cost.

4. In order to avoid so far as possible duplication in accounting and auditing functions performed by the Contractor and the Government, it is agreed that the following accounting and auditing functions shall be performed by the Government exclusively:

a. Time checking (not time keeping) in the field, or in the Contractor's plant.

b. Audit of original pay rolls of the Contractor (or such portions thereof as are applicable), where such pay rolls are prepared by the Contractor.

c. Checking of equipment rentals and the preparation and delivery of properly approved rental rolls to the Contractor for payment.

d. Such other accounting and auditing functions as may be effectively performed by Government employees and to which the Contracting Officer and the Contractor may mutually agree in writing.

5. It is further agreed that if any of the accounting and auditing functions performed exclusively by the Government do not adequately discharge such accounting and auditing functions to the satisfaction of the Contractor, the Contractor, with the approval in writing of the Contracting Officer, may perform such additional checking and auditing as may be so approved. The Contractor shall be reimbursed for the cost of such additional accounting and auditing functions as are so approved.

ARTICLE V. SPECIAL REQUIREMENTS

1. The Contractor hereby agrees that he will—

a. Procure and maintain such bonds and insurance in such forms and in such amounts and for such periods of time as the Contracting Officer may require.

b. Procure all necessary permits and licenses; obey and abide by all applicable laws, regulations, ordinances, and other rules of the United States of America and the Dominion of Canada, or political subdivision thereof wherein the work is done, or of any other duly constituted public authority.

c. Reduce to writing, unless this provision is waived in writing by the Contracting Officer, every contract in excess of Two Thousand Dollars (\$2,000.00) made by him for the purpose of the work hereunder for services, materials, supplies, machinery, equipment, or for the use thereof; insert therein a provision that such contract is assignable to the Government; make all such contracts in his own name, and not bind or purport to bind the Government or the Contracting Officer thereunder. No purchase in excess of Two Thousand Dollars (\$2,000.00) shall be made or placed without the prior approval of the Contracting Officer.

d. Enter into no subcontract for any portion of the work, except in the form prescribed by the Chief of Engineers with the written approval of the Contracting Officer. Subcontracts are defined as contracts entered into by the Contractor with others which involve the performance, wholly or in part at the site of the work, of some part of the work described in Article I hereof.

e. At all times during the progress of the work, keep at the site thereof a duly appointed and qualified representative who shall receive and execute on the part of the Contractor such notices, directions, and instructions as the Contracting Officer may give.

f. The Contracting Officer may require the Contractor to dismiss from work such employee or employees as the Contracting Officer deems incompetent, careless, or insubordinate or whose continued employment is deemed inimical by the Contracting Officer to the public interest. The Contractor shall make every reasonable effort in the selection of his employees and in the prosecution of the work under this contract, to safeguard plot drawings and schematic drawings furnished him and drawings and specifications, and to prevent the theft or unauthorized use of the same.

g. Furnish sufficient technical, supervisory, and administrative personnel to insure the prosecution of the work in accordance with a progress schedule approved by the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind a progress schedule approved by the Contracting Officer, the Contractor shall take such steps as may be necessary to improve his progress and the Contracting Officer may direct him to increase working days, or hours of labor per day. Failure to promptly comply with such directions shall be deemed sufficient cause to terminate the contract for the fault of the Contractor.

h. Immediately upon termination of third party rental agreement, make all repairs to equipment rented thereunder which are required to be made by the terms of such rental agreements and remove such equipment from the site of the work. In cases where such repairs and removal cannot promptly be made, the Contractor shall notify the Contracting Officer of the reasons for such delay.

ARTICLE VI. TERMINATION OF CONTRACT BY GOVERNMENT

1. The Government may terminate this contract at any time by a notice in writing from the Contracting Officer to the Contractor. Such termination shall be effective in the manner and upon the date specified in said notice and shall be without prejudice to any claims which the Government may have against the Contractor. Upon receipt of such notice, the Contractor shall, unless the notice directs otherwise, immediately discontinue all work and the placing of all orders for materials, facilities, and supplies in connection with performance of this contract and shall proceed to cancel promptly all existing orders and terminate all subcontracts insofar as such orders and/or subcontracts are chargeable to this contract.

2. If this contract is terminated for the fault of the Contractor, the Contracting Officer may enter upon the premises and take possession for the purpose of completing the work contemplated by this contract, of any or all materials, tools, machinery, equipment, and appliances which may be owned by or in the possession of the Contractor and all options, privileges, and rights, and may complete or employ any other person or persons to complete said work. Following such termination, rental shall be paid to the Contractor for such construction plant or parts thereof as he may own, and which the Government may retain at rates prescribed in Article II.

3. Upon the termination of this contract, full and complete settlement of all claims of the Contractor arising out of this contract shall be made as follows:

a. The Government shall assume and become liable for all obligations, commitments, and claims that the Contractor may have theretofore in good faith undertaken or incurred in connection with said work, the cost of which would be reimbursable in accordance with the provisions of this contract; and the Con-

tractor shall, as a condition of receiving the payments mentioned in this Article, execute and deliver all such papers and take all such steps as the Contracting Officer may require for the purpose of fully vesting in the Government the rights and benefits of the Contractor under such obligations or commitments.

b. The Government shall reimburse the Contractor for all expenditures made in accordance with Article II and not previously reimbursed.

c. The Government shall reimburse the Contractor for such further expenditures after the date of termination for the protection of Government property and for accounting services in connection with the settlement of this contract as are required or approved by the Contracting Officer.

d. The Government shall pay to the Contractor any unpaid balance for the rental of the Contractor's equipment in accordance with Article II to date of termination.

e. If the contract is terminated for the convenience of the Government, the Contractor will be paid that proportion of the prescribed fee which the work actually completed bears to the entire work under this contract, less fee payments previously made. If the contract is terminated due to fault of the Contractor, no additional payments on account of the fee will be made.

f. The obligation of the Government to make any of the payments required by this Article, or by Article III of this contract, shall be subject to any unsettled claims in connection with this contract which the Government may have against the Contractor.

4. Prior to final settlement the Contractor shall furnish a release as required in Article III hereof.

ARTICLE VII. CONTRACTING OFFICER'S DECISIONS

The extent and character of the work to be done by the Contractor shall be subject to the general supervision, direction, control, and approval of the Contracting Officer to whom the Contractor shall report and be responsible.

ARTICLE VIII. DISPUTES

Except as otherwise specifically provided in this contract, all disputes concerning questions of fact which may arise under this contract, and which are not disposed of by mutual agreement, shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail a copy thereof to the Contractor at his address shown herein. Within 30 days from said mailing the Contractor may appeal in writing to the Secretary of War, whose written decision or that of his designated representative, or representatives, thereon shall be final and conclusive upon the parties hereto. The Secretary of War may, in his discretion, designate an individual, or individuals, other than the Contracting Officer, or a board as his authorized representative to determine appeals under this Article. The Contractor shall be afforded an opportunity to be heard and offer evidence in support of his appeal. The president of the Board, from time to time, may divide the board into divisions of one or more members and assign members thereto. A majority of the members of the board or of a division thereof shall constitute a quorum for the transaction of the business of the board or of a division, respectively, and the decision of a majority of the members of the board or of a division shall be deemed to be the decision of the board or of a division, as the case may be. If a majority of the members of a division are unable to agree on a decision or if within 30 days after a decision by a division, the board or the president thereof directs that the decision of the division be reviewed by the board, the decision will be so reviewed, otherwise the decision of a majority of the members of a division shall become the decision of the board. If a majority of the members of the board is unable to agree upon a decision, the president will promptly submit the appeal to the Under Secretary of War for his decision upon the record. A vacancy in the board or in any division thereof shall not impair the powers, nor affect the duties of the board or division nor of the remaining members of the board or division, respectively. Any member of the board, or any examiner designated by the president of the board for that purpose, may hold hearings, examine witnesses, receive evidence, and report the evidence to the board or to the appropriate division, if the case is pending before a division. Pending decision of a dispute hereunder the Contractor shall diligently proceed with the performance of this contract. Any sum or sums allowed to the Contractor under the provisions of this Article shall be paid by the United States as part of the cost of the articles of work herein contracted for and shall be deemed to be within the contemplation of this contract.

ARTICLE IX. CONVICT LABOR

The Contractor shall not employ any person undergoing sentence of imprisonment at hard labor. This provision shall not be construed to prevent the contractor or any subcontractor hereunder from obtaining any of the supplies, or any component parts or ingredients thereof, to be furnished under this contract or any of the materials or supplies to be used in connection with the performance of this contract, directly or indirectly, from any Federal, State, or territorial prison or prison industry: *Provided*, That such articles, materials, or supplies are not produced pursuant to any contract or other arrangement under which prison labor is hired by or employed or used by any private person, firm, or corporation.

ARTICLE X. LABOR

1. The Contractor or his subcontractor shall pay all mechanics and laborers employed directly upon the site of the work, unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account, the full amounts accrued at the time of payment, computed at wage rates not less than those approved by the Contracting Officer for the work herein specified and stated in the attached schedule of minimum wage rates.

2. The Contractor shall compensate laborers and mechanics for all hours worked by them in excess of eight hours in any one calendar day at a rate not less than one and one-half times the basic rate of pay of such laborers and mechanics for all hours worked by them in excess of eight hours of any one calendar day.

3. All wage rates, including compensation for overtime under paragraph 2 of this Article, for laborers and mechanics engaged in work under this contract shall be approved in writing by the Contracting Officer, and any amount paid by the Contractor to any laborer or mechanic in excess of the wage rate approved for such laborer or mechanic by the Contracting Officer shall be at the expense of the Contractor and shall not be reimbursed by the Government.

4. There may be withheld from the Contractor so much of the accrued payments as may be considered necessary by the Contracting Officer to pay to laborers and mechanics employed by the Contractor or any subcontractor on the work the difference between the rates of wages required by this contract to be paid laborers and mechanics on the work and the rates of wages received by such laborers and mechanics and not refunded to the Contractor, subcontractors, or their agents.

5. *a.* In the event it is found by the Contracting Officer that any laborer or mechanic employed by the Contractor or any subcontractor directly on the site of the work covered by this contract has been or is being paid a rate of wages less than the rate of wages required by this contract to be paid as aforesaid, the Government may, by written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been a failure to pay said required wages and to prosecute the work to completion by contract or otherwise, and the Contractor shall be liable to the Government for any excess costs occasioned the Government thereby.

b. The regulations of the Secretary of Labor, referred to in Paragraph 6 hereof, allow certain "permissible deductions" from the wages required by this Article to be paid.

6. As to work performed in the United States of America, the Contractor shall comply with the regulations of the Secretary of Labor pursuant to the Act of June 13, 1934, 48 Stat. 948 (U. S. Code, Title 40, Secs. 276b and 276c), and any amendments or modifications thereof, shall cause appropriate provisions to be inserted in subcontracts to insure compliance therewith by all subcontractors subject thereto, and shall be responsible for the submission of affidavits required of subcontractors thereunder, except as the Secretary of Labor may specifically provide for reasonable limitations, variations, tolerances, and exemptions from the requirements thereof.

7. The labor provisions hereinabove set forth govern all manual labor hired by the Contractor where applicable. It is mutually understood and agreed, however, that the parties to this contract will in addition abide by all laws and regulations of the United States and of the Dominion of Canada with regard to Seamen's Acts, and all other statutes enacted for the benefit of workers of all kinds engaged in maritime activities.

ARTICLE XI. ANTIDISCRIMINATION

1. The Contractor, in performing the work required by this contract, shall not discriminate against any worker because of race, creed, color, or national origin.

2. The Contractor agrees that the provision of 1, above, will also be inserted in all of its subcontracts. For the purpose of this Article, a subcontract is defined as any contract entered into by the Contractor with any individual, partnership, association, corporation, estate, or trust, or other business enterprise or other legal entity, for a specific part of the work to be performed in connection with the supplies or services furnished under this contract; provided, however, that a contract for the furnishing of Standard or commercial articles or raw material shall not be considered as a subcontract.

ARTICLE XII-A. ACCIDENT PREVENTION

1. In order to protect the life and health of his employees in the performance of this contract, the Contractor will comply with all pertinent provisions of the "Safety Requirements in Excavation—Building—Construction" approved by the Chief of Engineers December 16, 1941 (a copy of which is on file in the Office of the Contracting Officer), and as may be amended, and will take or cause to be taken such additional measures as the Contracting Officer may determine to be reasonably necessary for this purpose. The Contractor will maintain an accurate record of, and will report to the Contracting Officer in the manner and on the forms prescribed by the Contracting Officer, all cases of death, occupational disease, and traumatic injury arising out of or in the course of employment on work under this contract.

2. The Contractor shall in addition comply with all laws and regulations of the United States and of the Dominion of Canada which have been enacted for the safety of the prevention of accidents to seamen and all other workers engaged in maritime activities.

3. The Contracting Officer will notify the Contractor of any noncompliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately correct the conditions to which attention has been directed. Such notice when served on the Contractor or his representative at the site of the work shall be deemed sufficient for the purpose aforesaid.

4. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or any part of the work. When satisfactory corrective action is taken, a start order will be issued.

ARTICLE XII-B. INSURANCE

1. During the life of this contract, Workmen's Compensation and Public Liability Insurance covering the operation and performance of this contract, as described in Article I hereof, shall be in accordance with all applicable Provincial and Dominion Workmen's Compensation Laws, the Act (United States) entitled "Longshoremen's and Harbor Workers' Compensation Act" (44 Stat. 1424), as amended, and as the same was amended by Public Law No. 208, 77th Congress, approved August 16, 1941, and the War Department Insurance Rating Plan.

2. All losses and expenses not compensated by the above-described laws and plan or by other forms of insurance which have been approved by the Contracting Officer, shall be reimbursed to the Contractor in accordance with Section 1, Subsection "1", Article II, hereof.

ARTICLE XIII. NOTICE TO THE GOVERNMENT OF LABOR DISPUTES

Whenever an actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor will immediately give notice thereof to the Contracting Officer. Such notice shall include all relevant information with respect to such dispute.

ARTICLE XIV. OFFICIALS NOT TO BENEFIT

No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE XV. COVENANT AGAINST CONTINGENT FEES

The Contractor warrants that it has not employed any person to solicit or secure this contract upon any agreement for a commission, percentage, brokerage, or contingent fee. Breach of this warranty shall give the Government the right

to annul the contract, or, in its discretion, to deduct from the contract price or consideration the amount of such commission, percentage, brokerage, or contingent fees. This warranty shall not apply to commissions payable by contractors upon contracts or sales secured or made through bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business.

ARTICLE XVI. CONTRACTOR'S ORGANIZATION AND METHODS

Upon the execution of this contract, the Contractor shall submit to the Contracting Officer a chart showing in general the executive and administrative organization, duties and personnel to be employed in connection with the work under the contract; the data so furnished shall be supplemented as additional information becomes available.

ARTICLE XVII. LOADING AND UNLOADING CARS

The Contractor shall load promptly all railroad cars furnished for loading upon his order and shall unload from railroad cars promptly upon arrival all shipments consigned to him, and shall provide storage facilities and other facilities necessary for these purposes; and the Contractor shall not order railway cars for loading unless they can be loaded promptly and shall not cause or permit shipments to be consigned to him unless they can be unloaded from railroad cars promptly upon arrival.

ARTICLE XVIII. ASSIGNMENT OF CLAIMS

(a) Claims for moneys due or to become due the Contractor from the Government under this contract may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency. Any such assignment shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment may be made to one party as agent or trustee for two or more parties participating in such financing.

(b) In the event of any such assignment, the assignee shall file four signed copies of a written notice of the assignment, together with one copy of the instrument of assignment, with each of the following:

- (i) General Accounting Office;
- (ii) the Contracting Officer;
- (iii) the surety or sureties upon the bond or bonds, if any, in connection with this contract;

(iv) the officer designated in this contract to make payments thereunder.

(c) Any claim under this contract which has been assigned pursuant to the foregoing provisions of this Article may be further assigned and reassigned to a bank, trust company, or other financing institution, including any Federal lending agency. In the event of such further assignment or reassignment the assignee shall file one signed copy of a written notice of the further assignment or reassignment together with a true copy of the instrument of further assignment or reassignment with the Contractor; and shall file four signed copies of such written notice and one copy of such instrument with each of the parties designated in the preceding paragraph.

(d) No assignee shall divulge any information concerning the contract except to those persons concerned with the transaction.

(e) Payment to an assignee of any claim under this contract shall not be subject to reduction or set-off for any indebtedness of the assignor to the United States arising independently of this contract.

(f) Indication of the assignment of claim and of any further assignment thereof and the name of the assignee will be made on all vouchers or invoices certified by the Contractor.

ARTICLE XIX. RENEGOTIATION PURSUANT TO SECTION 403 OF THE SIXTH SUPPLEMENTAL NATIONAL DEFENSE APPROPRIATION ACT, 1942, AS AMENDED

a. Upon the written demand of the Secretary, at such period or periods when, in the judgment of the Secretary, the profits accruing to the Contractor under this contract can be determined with reasonable certainty, the fixed fee specified herein will be renegotiated to eliminate therefrom any amount found as a result of such renegotiation to represent excessive profits. The demand of the Secretary shall fix a place for renegotiation and a time for commencement thereof not

later than one year after the close of the fiscal year of the Contractor within which completion or termination of the contract, as determined by the Secretary, occurs.

b. The Contractor will furnish to the Secretary such statements of actual costs of production and such other financial statements, at such times and in such form and detail as the Secretary may prescribe, and will permit such audits and inspections of its books and records as the Secretary may request.

c. The Government shall retain from amounts otherwise due the Contractor, or the Contractor shall repay to the Government if paid to him, any amount of the fixed fee found as a result of such renegotiation to represent excessive profits and not eliminated through reductions in the fixed fee or otherwise, as the Secretary may direct.

d. The Contractor will include in each subcontract made by it under this contract for an amount in excess of \$100,000, the following provisions:

ARTICLE ———.—RENEGOTIATION PURSUANT TO SECTION 403 OF THE SIXTH SUPPLEMENTAL NATIONAL DEFENSE APPROPRIATION ACT, 1942, AS AMENDED

(1) Upon the written demand of the Secretary, at such period or periods when, in the judgment of the Secretary, the profits accruing to the subcontractor under this contract can be determined with reasonable certainty, the Secretary and the subcontractor will renegotiate the contract price to eliminate therefrom any amount found as a result of such renegotiation to represent excessive profits. The demand of the Secretary shall fix a place for renegotiation and a time for the commencement thereof not later than one year after the close of the fiscal year of the subcontractor within which completion or termination of the contract, as determined by the Secretary, occurs.

(2) The subcontractor will furnish to the Secretary such statements of actual costs of production and such other financial statements, at such times and in such form and detail as the Secretary may prescribe, and will permit such audits and inspections of its books and records as the Secretary may request.

(3) Any amount of the contract price found as a result of such renegotiation to represent excessive profits shall, as directed by the Secretary—

(a) Be deducted by the Contractor from payments otherwise due to the subcontractor under this contract; or

(b) Be paid by the subcontractor directly to the Government if paid to him; or

(c) Be eliminated through reductions in the contract price or otherwise.

(4) The subcontractor agrees that the Contractor shall not be liable to the subcontractor for or on account of any amount paid to the Government by the subcontractor or deducted by the Contractor from payments otherwise due under this contract, pursuant to directions from the Secretary in accordance with the provisions of this Article. Under its contract with the Government, the Contractor is obligated to pay or credit to the Government all amounts withheld by it from the subcontractor hereunder.

(5) The subcontractor agrees (a) upon direction of the Secretary, to include in any subcontract hereunder sections (1) to (6), inclusive, of this Article, and (b) to make no subdivisions of any contract or subcontract for the purpose of evading the provisions of this section, and (c) to repay to the Government the amount of any reduction in the contract price of any such subcontract which results from renegotiation thereof by the Secretary, and which the Secretary directs the subcontractor to withhold from payments otherwise due under such subcontract and actually unpaid at the time the subcontractor receives such direction.

(6) As used in this Article—

(a) The term "Secretary" means the Secretary of War or any duly authorized representative of the Secretary including the Contracting Officer.

(b) The term "subcontract" means any purchase order or agreement to perform all or any part of the work, or to make or furnish any material, part, assembly, machinery, equipment, or other personal property, required for the performance of this contract, unless exempt under or exempted pursuant to Section 403 (i) of the Sixth Supplemental National Defense Appropriation Act of 1942 as amended by Section 801 of the Revenue Act of 1942.

(c) The terms "renegotiate" and "renegotiation" have the same meaning as in Section 403 (b) of the Sixth Supplemental National Defense Appropriation Act, 1942, as amended.

(d) The term "this contract" means this contract as modified from time to time.

e. (1) The Contractor agrees to make no subdivisions of any contract or subcontract for the purpose of evading the provisions of this Article.

(2) If any renegotiation between the Secretary and any subcontractor pursuant to the provisions required by Section (d) hereof results in a reduction of the contract price of the subcontract, the Government shall retain from payments otherwise due to the Contractor, or the Contractor shall repay to the Government, as the Secretary may direct, the amount of such reduction which the Secretary directs the Contractor to withhold from payments otherwise due to the subcontractor under the subcontract and actually unpaid at the time the Contractor receives such direction.

f. As used in this Article—

(1) The term "Secretary" means the Secretary of War or any duly authorized representative of the Secretary, including the Contracting Officer.

(2) The term "subcontract" means any purchase order or agreement to perform all or any part of the work, or to make or furnish any material, part, assembly, machinery, equipment, or other personal property, required for the performance of this contract, unless exempt under or exempted pursuant to Section 403 (i) of the Sixth Supplemental National Defense Appropriation Act of 1942 as amended by Section 801 of the Revenue Act of 1942.

(3) The term "renegotiate" and "renegotiation" have the same meaning as in Section 403 (b) of the Sixth Supplemental National Defense Appropriation Act, 1942, as amended.

(4) The term "this contract" means this contract as modified from time to time.

ARTICLE XX. DEFINITIONS

1. The terms "Secretary of War" and "Chief of Engineers" shall include their duly authorized representatives as the case may be, other than the Contracting Officer.

2. The terms "Secretary of War" and "Chief of Engineers" shall include any person or board authorized by the Secretary of War or the Chief of Engineers, as the case may be, to act for him, other than the Contracting Officer.

3. Except for the original signing of this contract, the term "Contracting Officer" as used herein shall include his duly appointed successor or his authorized representative.

ARTICLE XXI. APPROVAL REQUIRED

This contract shall be subject to the approval of the Chief of Engineers or any person designated by him and shall not be binding unless so approved.

ARTICLE XXII. ALTERATIONS

The following changes were made in this contract before it was signed by the parties hereto:

a. The word "Secretary" in Article XXI, page 29, was deleted, and the word "Chief" was substituted in place thereof.

In witness whereof, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA,
By C. M. CLIFFORD,
Lieutenant Colonel, Corps of Engineers, Contracting Officer.
FOLEY BROTHERS, INC.,
By D. A. DALY, *President.*
ROHL-CONNOLLY CO.,
By E. CONNOLLY, *President.*

Witnesses as to signature of the contractor:

THOMAS S. KELLY,
11141 One Hundred and First Street, Edmonton, Alberta, Canada.

R. D. BRICE,
451 Market Street, San Francisco, Calif.

I, L. D. Suielan, certify that I am the secretary of Foley Brothers, Inc., one of the corporations above named; that D. A. Daly, who signed this contract on behalf of said corporation, was then president of said corporation; that said contract was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said corporation this 29th day of May 1943.

[CORPORATE SEAL]

L. D. SUIELAN, *Secretary.*

I, R. D. Brice, certify that I am the assistant secretary of Rohl-Connolly Co., one of the corporations above named; that T. E. Connolly, who signed this contract on behalf of said corporation, was then president of said corporation; that said contract was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said corporation this 4th day of June 1943.

[CORPORATE SEAL]

R. D. BRICE, *Assistant Secretary.*

APPENDIX A TO CONTRACT NO. W-3416-ENG-51

Available marine equipment

[United States currency]

Quantity	Description of equipment and identifying numbers	Sound value ¹	Monthly rental rate	Date of commencement of rental
1.....	Side-dump barge No. 1; 120 feet long, 38-foot beam, 12-foot depth; capacity, 1,000 tons; official No. 171670. •	-----	\$578	Mar. 12, 1943
1.....	Flat-deck barge No. 3; 120 feet long, 38-foot beam, 12-foot depth; capacity, 1,000 tons; official No. 171751.	-----	551	Mar. 16, 1943
1.....	Derrick barge No. 4; 120 feet long, 38-foot beam, 12-foot depth; 104-foot boom, 12 feet off center; capacity, 40 tons; official No. 171779.	-----	2,000	Mar. 11, 1943
1.....	Tug <i>Dispatch</i> No. 2; 350 horsepower, Diesel engine (superior); official No. 209236.	-----	889	Mar. 24, 1943
1.....	Tug <i>Georgia</i> ; 500 horsepower, steam engine, triple expansion; official No. 86624.	-----	967	Mar. 6, 1943
	Miscellaneous anchors, chains, and floats.....	-----	275	Mar. 21, 1943
1.....	Hopper barge No. 5; 125 feet long, 38-foot beam, 12-foot depth; 1,000-ton capacity; official No. 171679.	-----	1,107	Mar. 10, 1943
1.....	Hopper barge No. 7; 125 feet long, 38-foot beam, 12-foot depth; 1,000-ton capacity; official No. 171689.	-----	1,107	Mar. 12, 1943
1.....	Hopper barge No. 8; 125 feet long, 38-foot beam, 12-foot depth; 1,000-ton capacity; official No. 171750.	-----	1,107	Mar. 26, 1943
1.....	Flat-deck barge No. 9; 120 feet long, 38-foot beam, 12-foot depth; 1,000-ton capacity; official No. 171917.	-----	551	Mar. 7, 1943
1.....	Flat-deck barge No. 10; 120 feet long, 38-foot beam, 12-foot depth; 1,000-ton capacity; official No. 171918.	-----	551	Mar. 16, 1943
1.....	Flat-deck barge No. 11; 120 feet long, 38-foot beam, 12-foot depth; 1,000-ton capacity; official No. 171919.	-----	551	Mar. 6, 1943

¹ The sound value of the equipment listed herein shall be determined by condition survey and appraisal now being made.

Contract No. W-3416-Eng-51 (592)

Negotiated Contract /s/ H. J. W.

H. J. W.

WAR DEPARTMENT,
OFFICE OF THE DIVISION ENGINEER,
NORTHWEST DIVISION,
Edmonton, Alberta, Canada, February 9, 1943.

FOLEY BROS., INC.,
St. Paul, Minn.,

ROHL-CONNOLLY Co.,
Los Angeles, Calif.
(Joint venturers.)

GENTLEMEN: The United States of America, acting through the undersigned Contracting Officer, hereby places an order with you that you shall, in the shortest possible time, furnish the labor, material, tools, machinery, equipment, facilities, supplies not furnished by the United States of America, and services, and do all things necessary to accomplish the following:

1. Construction of the Haines Cut-off Road in its entirety, including engineering location and design.

2. To furnish and operate the necessary marine equipment for the delivery of personnel, materials, and supplies from the United States or from Prince Rupert, B. C., to Haines Point, Alaska, as necessary for the construction contemplated.

3. To provide the necessary dockage at Haines Point to accommodate the transfer of equipment, materials, supplies, and personnel from ship to dock for the construction, maintenance, and operation of the necessary camps, warehouses, and other facilities as necessary for the contemplated construction.

4. It is contemplated that additional work will be assigned to the contractors from time to time with the view of construction of terminal facilities and docks, wharfs, and marine construction as approved from time to time.

5. The estimated cost of the work described above is Eleven Million Dollars (\$11,000,000.00) exclusive of your fee. It is expressly understood, however, that neither the Government nor the contractors guarantees the correctness of this estimate.

6. The work referred to shall be started upon the date of acceptance of this order and reasonable completion shall be assured by November 30, 1943.

7. Funds for carrying out this construction work have been appropriated and are now available for use of the War Department under procurement authority Eng-30403 P430-10 A 0905-23.

8. The Secretary of War finds that it is in the interest of the war effort that this work be not delayed awaiting the negotiation of a formal contract.

9. Pending the execution of such formal contract, each subcontract, orders for materials, equipment, other expenditures, and any commitment made in furtherance of the performance of this contract, entered into by you for a sum in excess of \$8,000.00 shall be subject to the prior written approval of the Contracting Officer.

10. Upon your acceptance hereof, advance payments in accordance with the existing requirements of the War Department may be made to you upon your application.

11. It is contemplated that this contract will be supplemented by the execution of a formal contract between you and the United States of America following, in general, W. D. Contract Form No. 3. That contract will include an appropriate clause providing for the termination of the contract for the convenience of the United States of America. All applicable contract clauses required by Federal Laws, Executive Orders, and War Department Procurement Regulations to be incorporated in such contracts are hereby incorporated herein by reference and will be incorporated in the formal contract and in all subcontracts hereunder.

Pending the execution of such formal contract, reimbursements shall be made in the manner described in and for the items set forth under said W. D. Contract Form No. 3 as reimbursable items when approved or ratified by the Contracting Officer; provided, however, that in no event shall such reimbursements exceed the limitation on obligations set forth in the next to last paragraph of this letter contract.

12. Any claim arising under this contract and any contract supplementing it may be assigned pursuant to the terms of the Assignment of Claims Act of 1940 unless the subject matter of this contract has been classified as secret, confidential, or restricted, and any claims arising under this contract shall not be subject to reduction or set-off for any indebtedness of the assignor to the United States arising independently of this contract.

13. In the event the United States of America is unable to negotiate with you a satisfactory contract to supplement this contract prior to March 11, 1943, this contract will terminate and the United States of America will pay you in full settlement thereof a sum equal to reimbursement for all costs incurred by you in connection with the performance of this contract plus such other sums as have actually been expended by you, in good faith, in settlement of all obligations, commitments, and claims which you may theretofore have incurred, less any reimbursements previously made, but in any event the total payments shall not exceed the sum of One Million Dollars (\$1,000,000.00).

If the foregoing is acceptable to you, it is desired that you so indicate hereon and on the inclosed two copies of this letter and return the original and two copies to the Contracting Officer on or prior to February 11, 1943. Such acceptance will constitute this order a contract and a notice to proceed.

Very truly yours,

THE UNITED STATES OF AMERICA,
By H. J. WOODBURY,
Colonel, Corps of Engineers,
Contracting Officer.

Accepted this 9th day of February 1943.

FOLEY BROS., INC. [CORPORATE SEAL]
By D. A. DALY, *President.*
ROHL-CONNOLLY CO. [CORPORATE SEAL]
By H. W. ROHL.

Certified to be a true copy:

MALCOLM P. MCGREGOR,
Captain, Corps of Engineers.

ASSIGNMENT OF EQUIPMENT RENTAL AGREEMENT

Under Cost-Plus-A-Fixed-Fee Contract No. W-3416-Eng-51, dated 9 February 1943, Between the United States of America and Foley Bros., Inc., & Rohl-Connolly Company

Contractor: Foley Brothers, Inc., and Rohl-Connolly Company.

For: Construction of Haines Cut-off Road, Haines Point, Alaska.

Whereas Foley Brothers, Inc., and Rohl-Connolly Company (hereinafter referred to as the Assignor) entered into the above-numbered contract on the ninth day of February 1943 with the United States of America (hereinafter referred to as the Government) for the construction of the Haines Cut-off Road, Haines Point, Alaska, and the performance of certain other work therein described; and

Whereas, in the performance of said principal contract, the Assignor, on the twentieth day of February 1943, entered into an equipment rental agreement with Bowen & McLaughlin, a partnership consisting of Truman Bowen and J. L. McLaughlin (hereinafter referred to as the lessor), for the use of certain road-construction machinery and equipment, described in said equipment rental agreement; and

Whereas Article 8 of said equipment rental agreement permits of and provides for assigning said agreement to the Government; and

Whereas it has been determined by the Contracting Officer that an assignment shall be made by the Prime Contractor to the Government of the instrument hereinafter described:

Now, therefore, the parties hereto do mutually agree as follows:

ARTICLE 1. The Prime Contractor does hereby assign, transfer, and set over to the United States of America, as of the date hereof, all of its right, title, and interest of, in, and to the above-described equipment rental agreement identified as follows:

Title, Date, and Identification No. of Instrument: Equipment Rental Agreement No. 1 dated 16 February 1943 under Principal Contract No. W-3416-Eng-51 dated 9 February 1943.

Name and Address of Subcontractor: Bowen & McLaughlin, a partnership consisting of Truman Bowen and J. L. McLaughlin, Great Falls, Montana.

Termination claim in the amount of \$162,006.46 covering claims for repairs, replacements, loss of and damage to equipment, repair time allowances, equipment rentals, and any and all claims arising out of termination of said equipment rental agreement.

ARTICLE 2. This assignment to the Government shall not be construed to modify or otherwise affect any right of the Government under the above-mentioned principal contract with the Assignor.

In witness whereof, the Contractor has executed this assignment this 27th day of January 1945.

FOLEY BROTHERS, INC.,
By D. A. DALY, *President*.
ROHL-CONNOLLY COMPANY,
By T. E. CONNOLLY, *President*.

I, L. D. Sinclair, certify that I am the Secretary of Foley Brothers, Inc., one of the corporations above named: that D. A. Daly, who signed this Assignment on behalf of said corporation, was then President of said corporation; that said Assignment was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said corporation this 31st day of January 1945.

[CORPORATE SEAL]

L. D. SINCLAIR, *Secretary*.

I, Irma Dickey, certify that I am the secretary of Rohl-Connolly Company, one of the corporations above named: that T. E. Connolly, who signed this contract on behalf of said corporation, was then President of said corporation; that said Assignment was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said corporation this 6th day of February 1945.

[CORPORATE SEAL]

IRMA DICKEY, *Secretary*.

CONSENT OF SUBCONTRACTOR

In consideration of the obligations assumed by the United States of America by the foregoing assignment, the undersigned do hereby release and forever discharge Foley Brothers, Inc., and Rohl-Connolly Company, the Prime Contractor, from any and all claims, demands, and causes of action arising out of, or in connection with, the aforesaid subcontract, including any and all termination claims thereunder.

BOWEN & McLAUGHLIN,
A partnership, consisting of Truman Bowen and J. L. McLaughlin,
By J. L. McLAUGHLIN, Co-Partner.
By TRUMAN BOWEN, Co-Partner.

Two witnesses:

GLEN A. FOX,
1628 North Eleventh Avenue, Phoenix, Ariz.
J. M. TURNER, Jr.,
Adams Hotel, Phoenix, Ariz.

Accepted:

UNITED STATES OF AMERICA,
By W. D. GREENLEE,
Lieutenant Colonel, Corps of Engineers,
Authorized Representative of the Contracting Officer.

Date: February 15, 1945.

Supplemental Agreement No. 2
Contract No. W-3416-Eng-51
Negotiated Contract

C. M. C.

SUPPLEMENTAL AGREEMENT

This supplemental agreement, entered into this 23rd day of August 1943, by and between the United States of America (hereinafter called the Government), represented by the Contracting Officer executing this agreement, and Foley Brothers, Inc., a Corporation organized and existing under the laws of the State of Delaware, and Rohl-Connolly Co., Inc., a Corporation organized and existing under the laws of the State of Nevada, Joint Venturers (hereinafter called the Contractor);

Witnesseth that:

Whereas, on the 9th day of February 1943, the parties hereto entered into Contract No. W-3416-Eng-51 for Architect-Engineer and Construction services for the Haines Cut-Off Road and necessary dockage and other facilities in the Territory of Alaska and the Province of British Columbia, Dominion of Canada; and

Whereas, on the 15th day of July 1943, the parties hereto entered into Supplemental Agreement No. 1 to Contract No. W-3416-Eng-51, which Supplement provides for the amendment of the Principal Contract for the purpose of clarifying the intention of the parties relative to final payment releases; and

Whereas, in carrying out the work and services covered by said Contract, it is found advantageous and in the best interests of the United States of America to further supplement said Contract to provide for additional work and services relative to the construction of base installations, way stations, and maintenance stations at locations along the Haines Cut-Off Road, which work and services are hereinafter more specifically described; and

Whereas, it has been determined by the Secretary of War that in his judgment the prosecution of the war will be facilitated by the modification of the Principal Contract as hereinafter set forth:

Now, therefore, the parties hereto do mutually agree that the said Principal Contract shall be, and the same hereby is, amended and modified in the following particulars but in no others:

1. The description of the work and services described in Article I-B of said Contract is modified to include the following work and services:

(a) The Contractor shall in the shortest possible time furnish the labor, materials, tools, machinery, facilities, supplies, and services not furnished by the

Government, and do all things necessary for the completion of the following work:

(1) *Base Installations*.—Construction of buildings, warehouses, shops, garages, control stations, and necessary utilities, including water distribution system, well, sewage collection system, and electrical distribution facilities.

(2) *Maintenance and Way Stations*.—Construction of buildings, stations, officers' quarters, barracks, mess halls, hospital dispensary, and necessary utilities, including water, sewage, and electrical distribution facilities.

All of said work and services to be in accordance with the drawings and specifications or instructions to be furnished by the contractor, subject in every detail to the approval, supervision, direction, and instruction of the Contracting Officer.

2. The estimated cost of the additional work and services to be performed under this Supplement is Eight Hundred Sixty-Five Thousand Dollars (\$865,000.00), exclusive of the contractor's fee. It is expressly understood, however, that neither the Government nor the Contractor guarantee the correctness of this estimate.

3. In consideration of its undertakings and obligations described in this Supplement, the Contractor shall receive, in addition to the provisions of the Principal Contract, the following:

An additional fixed fee in the amount of Twenty Thousand Four Hundred Seventy-Four Dollars (\$20,474.00), which shall constitute full and complete compensation for the work to be performed by the Contractor under this Supplemental Agreement including profits and all general overhead expenses.

Except as hereby modified, all provisions of Contract No. W-3416-Eng-51 and Supplemental Agreement No. 1 thereto, shall remain unmodified and in full force and effect and shall also apply in carrying out the provisions of this Supplemental Agreement.

In witness whereof, the parties hereto have executed this agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA,

By C. M. CLIFFORD,
*Lieutenant Colonel, Corps of Engineers,
Contracting Officer.*

FOLEY BROTHERS, INC.

By D. A. DALY,
President.

ROHL-CONNOLLY COMPANY,

By E. CONNOLLY,
President.

Witnesses:

ANNA MARIE ETTTEL,
LOUISE QUINN,
EULELIA WALKER,
ERIC RICHARDSON.

I, H. M. Breimhurst, certify that I am the Assistant Secretary of Foley Brothers, Inc., one of the corporations above named; that D. A. Daly, who signed this Supplemental Agreement on behalf of said corporation was then President of said corporation; that said Supplemental Agreement was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said corporation this 7th day of September 1943.

[CORPORATE SEAL]

H. M. BREIMHURST,
Assistant Secretary.

I, R. D. Brice, certify that I am the Assistant Secretary of Rohl-Connolly Co., one of the corporations above named; that T. E. Connolly, who signed this Supplemental Agreement on behalf of said corporation was then President of said corporation; that said Supplemental Agreement was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said corporation this 13th day of September 1943.

[CORPORATE SEAL]

R. D. BRICE,
Assistant Secretary.

Supplemental Agreement No. 1
Contract No. W-3416-Eng-51

SUPPLEMENTAL AGREEMENT

To Cost-Plus-A-Fixed-Fee Contract No. W-3416-Eng-51, dated February 9, 1943, for construction of the Haines Cut-off Road, necessary dockage at Haines Point, Alaska, and other facilities

Contractor: Foley Bros., Inc., and Rohl-Connolly Co.

Estimated cost (supplemental): \$ (no change).

Fixed fee (supplemental): \$ (no change).

Supplemental agreement for: Amendment to clarify intention of parties.

Payment: To be paid by Finance Officer, United States Army, Edmonton, Alberta, Canada.

This supplemental agreement is authorized by title II of the First War Powers Act, 1941, act of December 18, 1941 (Public Law 354, 77th Cong.), and Executive Order No. 9001, dated December 27, 1941.

This supplemental agreement, entered into this 15th day of July 1943, by and between the United States of America (hereinafter referred to as the "Government"), represented by the Contracting Officer executing this Supplemental Agreement and Foley Brothers, Inc., and Rohl-Connolly Co., (hereinafter referred to as the contractor):

Witnesseth that:

Whereas there is now in full force and effect between the parties hereto a certain contract providing for certain services in connection with the construction of the Haines Cut-off Road, necessary dockage at Haines Point, Alaska, and other facilities, bearing date of February 9, 1943, and being identified as Contract No. W-3416-Eng-51 (hereinafter referred to as the "principal contract"); and

Whereas said principal contract provides, among other things, in Section 6, of Article III, that prior to final payment the Contractor shall furnish the Government with a release of all claims against the Government arising under and by virtue of the contract, other than such claims, if any, as may be specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein; and

Whereas said contract provision above-mentioned was designed and incorporated in said principal contract for the purpose of enabling the Contractor to apprise the Government of anticipated claims and to enable the Government to close up records and paper work in connection with such contract, except for those items which were excepted from the operation of the release, and to protect the Government's interests to the extent of matters not excepted by such release; and

Whereas said provision was in no way intended to become operative as a bar to making payment to the Contractor for items otherwise reimbursable except for the provisions of such release; and

Whereas at the time when final payment might otherwise appropriately be made, third parties may have asserted claims against the Contractor which are not susceptible of being set forth in the release in stated amounts; and at that time it will be impossible for the Contractor to anticipate the amount and character of claims, including claims for wages, overtime, or salaries alleged to be due employees by virtue of the provisions of local, State, or Federal laws or employment agreements; and

Whereas through mistake and error in the preparation and execution of the principal contract, the word "internment" was erroneously inserted for the word "interment" in Article II, Section 1, Paragraph n, of the principal contract, by reason of an error appearing in Paragraph 365.2 (d) of War Department Procurement Regulations, revised as of May 6, 1943; and

Whereas it is desired to clarify said principal contract so as to more clearly set forth the understanding of the parties thereto; and

Whereas the Secretary of War is authorized by the First War Powers Act, 1941, and Executive Order No. 9001, within the limits of the amounts appropriated therefor, to enter into amendments or modifications of contracts, and by agreement to settle claims under contract, whenever in his judgment the prosecution of the war is thereby facilitated; and

Whereas it has been determined by the Secretary of War that in his judgment the prosecution of the war will be facilitated by the modification of the principal contract as hereinafter set out.

Now, therefore, the parties do hereby mutually agree that said principal contract shall be and the same is hereby amended in the following manner:

1. Delete the last sentence of Section 6, Article III, of the principal contract and insert in lieu thereof the following:

"1. Prior to final payment and as a condition thereof the Contractor shall furnish the Government with a release of all claims against the Government arising under and by virtue of this contract, other than (a) such claims, if any, as may be specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein, or in estimated amounts where the amounts are not susceptible of exact statement, and (b) any claim based upon the responsibility of the Contractor to third parties arising out of the performance of this contract not known to the Contractor at the time of furnishing the release.

"2. Even though the existence or amount thereof shall not be determined until after the furnishing of such release as is described next above, reimbursement to be made for payments made by the Contractor shall include, along with wages and salaries otherwise reimbursable, all additional amounts determined (either by approval of the Contracting Officer or by litigation as hereinafter provided) to be due and payable for overtime compensation and allowances under local, State, or Federal laws in connection with such wages and salaries.

"3. The Contractor shall promptly notify the Contracting Officer of any claims of the type described in paragraph 1 (b) above which are asserted subsequent to the execution of the release.

"4. In the event the Contracting Officer shall determine that the best interests of the Government require that the Contractor initiate or defend litigation in connection with claims of third parties arising out of the performance of this contract, the Contractor will proceed with such litigation in good faith and the costs and expenses of such litigation, including judgments and court costs, allowances rendered or awarded in connection with suits for wages, overtime or salaries, and reasonable attorney's fees for private counsel when the Government does not furnish Government counsel, shall be reimbursable under this contract.

2. Effective as of the date of the principal contract, February 9, 1943, and for the purpose of correcting the erroneous insertion of the word "internment" for and instead of the word "interment" in Article II, paragraph 1 n., thereof, said paragraph is hereby modified and corrected to read as follows:

"(n) The cost, including incidental expenses and premiums (if any), of providing such death, injury, interment and other benefits to the Contractor's employees engaged in performing services under this contract as the Contracting Officer may approve or require."

Except as herein modified, all provisions of the principal contract, No. W-3416-Eng-51, are to remain in full force and effect.

In witness whereof, the parties hereto have executed this Supplemental Agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA,
By C. M. CLIFFORD,
*Lieutenant Colonel, Corps of Engineers,
Contracting Officer.*

Contractor:
FOLEY BROTHERS, INC.,
By D. A. DALY,
President.
ROHL-CONNOLLY CO.,
By J. E. CONNOLLY,
President.

Witnesses as to Signature of the Contractor:
ANNA MARIE ETTTEL,
474 West Wheelock Parkway, St. Paul, Minn.
C. G. BEATON,
461 Market Street, San Francisco.

CERTIFICATION

I, L. D. Sinclair, certify that I am the Secretary of Foley Brothers, Inc., one of the corporations above named; that D. A. Daly, who signed this contract on behalf of said corporation was then President of said corporation; that said contract was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said corporation this 28th day of August 1943.

[CORPORATE SEAL]

L. D. SINCLAIR,
Secretary.

I, R. D. Brice, certify that I am the Assistant Secretary of Rohl-Connolly Co., one of the corporations above named; that T. E. Connolly, who signed this contract on behalf of said corporation was then President of said corporation; that said contract was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said corporation this 1st day of September 1943.

[CORPORATE SEAL]

R. D. BRICE,
Assistant Secretary.

EXHIBIT 2

Contract No. W-3416-Eng-736
O. I. 838
Negotiated Contract /s/ C. M. C.
C. M. C.

FIXED-FEE CONSTRUCTION CONTRACT

WAR DEPARTMENT

Contractor and address: Bates & Rogers Construction Corp., 111 West Washington Street, Chicago, Ill.

Contract for: Bridge construction.

Location: Bridge construction along the Alaska Highway within the Yukon Territory and British Columbia, Canada.

Contract No. W-3416-Eng-736
O. I. 838
Negotiated Contract
C. M. C.

FIXED-FEE CONSTRUCTION CONTRACT

WAR DEPARTMENT

Contractor and address: Bates & Rogers Construction Corp., 111 West Washington Street, Chicago, Ill.

Contract for: Bridge construction.

Location: Bridge construction along the Alaska Highway within the Yukon Territory and British Columbia, Canada.

Estimated total cost, exclusive of fixed fee: \$3,792,808 (United States funds).

Fixed fee: \$114,825 (United States funds).

Payment: To be made by finance officer, United States Army, Edmonton, Alberta, Canada.

The supplies and services to be obtained by this instrument are authorized by, are for the purpose set forth in, and are chargeable to the following procurement authority or authorities, the available balances of which are sufficient to cover the cost of same:

8-30403 P430-10 A0905-24

This contract is authorized by the following laws: Act approved June 2, 1940 (Public Law 703, 76th Cong.), as amended by the act approved June 5, 1942 (Public Law 580, 77th Cong.); title II of the First War Powers Act, 1941; act of December 18, 1941 (Public Law 354, 77th Cong.); and Executive Order No. 9001, dated December 27, 1941.

FIXED-FEE CONSTRUCTION CONTRACT

This contract, entered into the 25th day of October 1943, between the United States of America (hereinafter referred to as the Government), represented by the Contracting Officer executing this contract, and Bates & Rogers Construction Corp., a corporation organized and existing under and by virtue of the laws of the State of Delaware, having its principal office at 111 West Washington Street, Chicago, Ill. (hereinafter referred to as the contractor);

Witnesseth that:

Whereas the Government desires to engage the services of a contractor to perform the work and services hereinafter set forth; and

Whereas the accomplishment of the said work under a fixed-fee contract entered into after negotiations approved by the Secretary of War, and without advertising for proposals, is authorized by law and will facilitate the prosecution of the war; and

Whereas, as a result of such negotiations, the Secretary of War has directed that the Government enter into a fixed-fee contract with the contractor for the accomplishment of the said work;

Now, therefore, the parties hereto do mutually agree as follows:

ARTICLE I. STATEMENT OF WORK

1. The contractor shall, in the shortest possible time, furnish the labor, materials, tools, machinery, and equipment, facilities, supplies not furnished by the Government, and services, and do all things necessary for the construction and completion of bridges over the rivers and streams hereinafter listed intersecting the Alaska Highway at points and places in the Yukon Territory and British Columbia, Canada, as follows:

WHITEHORSE DISTRICT

Bridge No.	Name of river or stream	Description of work
441.....	Snag.....	Construct steel bridge.
440.....	Beaver.....	Do.
435.....	Donjek.....	Do.
431.....	Duke.....	Do.
420.....	Lewes.....	Do.
416.....	Teslin.....	Do.
406.....	Upper Rancheria.....	Do.
404.....	Lower Rancheria.....	Do.
403.....	Big Creek.....	Do.
402.....	Little Rancheria.....	Do.
438.....	White.....	Complete bridge now under construction.
400.....	Upper Liard.....	Do.
415.....	Deadman.....	Replace timber deck with concrete.
411.....	Togjam.....	Do.
410.....	Screw.....	Do.
409.....	Partridge.....	Do.
408.....	Seagull.....	Do.
401.....	Albert.....	Do.

DAWSON CREEK DISTRICT

147.....	Contact.....	Construct timber bridge.
143.....	Iron.....	Do.
125.....	Station 5745.....	Construct concrete bridge.
124.....	107 Mile.....	Construct steel bridge.
123.....	Station 5548.....	Construct concrete bridge.
134.....	Toad.....	Complete remaining superstructure.
129.....	Racing.....	Do.
128.....	McDonald.....	Do.
119.....	Tetsa (mile 93).....	Do.
114.....	Muskwa.....	Paint existing steel.

All work and services hereunder shall be performed in accordance with specifications, special provisions, plans, and drawings on file in the office of the contracting officer and subject in every detail to his supervision, direction, and instructions.

2. The work and services required to be performed by the Contractor shall include, among other functions, the scheduling and/or purchasing of items of materials and equipment to avoid any delays in the prosecution of the work hereunder. The Contractor shall advise and consult with the subcontractors on this project, if any, and shall direct and supervise their work, subject to the provisions of Article VII; and shall, subject to the direction of the Contracting Officer, store materials and equipment for use in connection with the project.

3. It is estimated that the cost of the work listed in Section 1 of this Article will be Three Million Seven Hundred Ninety-Two Thousand Eight Hundred Eight Dollars (\$3,792,808.00), exclusive of the Contractor's fee, and that the work herein contracted for will be ready for utilization by the Government in the shortest possible time. It is expressly understood, however, that neither the

Government nor the Contractor guarantee the correctness of either of these estimates. In consideration of his undertaking under this contract the Contractor shall receive the following:

- a. Reimbursement for expenditures as provided in Article II.
 - b. Rental for Contractor's equipment as provided in Article II.
 - c. A fixed fee in the amount of One Hundred Fourteen Thousand Eight Hundred Twenty-Five Dollars (\$114,825.00), which shall constitute complete compensation for the Contractor's services including profit and all general overhead expenses.
4. When, in the opinion of the Contracting Officer, it is to the best interest of the Government, the Contractor shall, when so ordered or authorized, subcontract any or all items or classifications of work required under this contract or subsequently added thereto. Such subcontracting of work, or the performance thereof with the Contractor's own forces, regardless of the amount and/or extent of work performed or subcontracted, all with the prior written approval or order of the Contracting Officer, shall entail no adjustment in the fixed fee stipulated in Section 3c of this Article. The fixed fee stipulated in Section 3c of this Article has been determined in the light of the fact that all of the work may be subcontracted pursuant to the foregoing provision. Such fee includes compensation for the services which may be rendered by the Contractor in the negotiation, supervision, and coordination of any work subcontracted and the responsibilities assumed by the Contractor in connection therewith, and is deemed to be reasonable, regardless of the amount or extent of work performed or subcontracted.

5. The Contracting Officer may at any time by written order issue additional instructions, require additional work or services, or direct the omission of work or services covered by this contract. If such changes cause a material increase or decrease in the amount or character of the work to be done under this contract an equitable adjustment of the amount of the fixed fee to be paid the Contractor shall be made and the contract shall be modified in writing accordingly. Any claim for adjustment under this Article must be asserted within 10 days from the date the change is ordered (unless the Contracting Officer, with the approval of the Secretary of War or his duly authorized representative, shall grant a further period of time prior to the date of final settlement of the contract). Nothing provided in this Article shall excuse the Contractor from proceeding with the prosecution of the work so changed. There shall be no adjustment in the amount of the fixed fee as provided herein, nor any claim therefor because of any errors and/or omissions made in computing the estimated cost of the construction of the work under this contract or where the actual cost varies from the estimated cost.

ARTICLE II. COST OF THE WORK

1. Reimbursement for Contractor's Expenditures: The Contractor shall be reimbursed in the manner hereinafter described for such of his actual expenditures in the performance of the work as may be approved or ratified by the Contracting Officer and as are included in the following items:

a. All labor, materials, tools, machinery, equipment, supplies, services, utilities, power, and fuel necessary for either temporary or permanent use for the benefit of the work.

b. All subcontracts made in accordance with the provisions of this contract.

c. Rental actually paid by the Contractor, at rates not to exceed those approved by the Contracting Officer, for construction plant in sound and workable condition exceeding \$300 in value as may be necessary for the proper and economical prosecution of the work. Each contract for the rental of construction plant or parts thereof by the Contractor from third parties shall be in a form prescribed by the Contracting Officer and shall be subject to his approval and shall include provisions 1, that title to such construction plant or parts thereof free of all liens and encumbrances shall vest in the Government when and if the total rental paid and/or accrued to the lessor for any item of construction plant or parts thereof shall equal the approved value thereof plus one percent (1%) of the approved value per month for each contract month or fraction thereof such piece of equipment shall have been in use, and that on demand the lessor will deliver to the Contracting Officer such evidences of title as he shall demand; and 2, that at any time prior to termination of such rental agreement, the Government may at its option purchase any piece of equipment by paying the lessor the difference between the valuation of such piece of equipment plus one percent (1%) of

the approved value per month for each contract month or part thereof such piece of equipment shall have been in use, and the total rental theretofore paid for such piece of equipment; provided, however, that either of such provisions may be omitted from such rental agreements if the omission is approved by the Chief of Engineers.

d. Unloading and assembling at the site of the work of construction plant owned or rented by the Contractor; transportation thereof to the place or places where it is to be used in connection with said work, dismantling, unloading, and return transportation to the point of original shipment or equivalent mileage, but in no event will the payment made for return transportation exceed the payment made for transportation to the job site unless such excess cost results solely from an increase of freight rates, or is required by Government transfer of such equipment to another site more distant from the point of origin than the site of the work set out in Article I hereof. Loading at the site of origin and unloading when returned to the original shipping point or other return shipping point will not be paid by the Government and is not a reimbursable item.

e. Repairs and repair parts as are not included in the rental or are not made necessary by the fault or negligence of the Contractor or his employees.

f. Transportation charges on materials and supplies.

g. Transportation and traveling expenses of the necessary employees from the point of hire to the job site and to such other point or points thereafter; transportation and traveling expenses for the return to the point of hire of all such employees who have complied with the provisions of employment contract hereinafter referred to in Paragraph 1, Subparagraph (t) of this Article. Traveling expenses shall be on an actual expense basis or on a per diem basis whichever is approved by the Contracting Officer and if on a per diem basis, the amount shall be determined by the Contracting Officer. In no event shall the per diem as authorized by the Contracting Officer be in excess of Six Dollars (\$6.00) per day for travel in the United States or in excess of Seven Dollars (\$7.00) per day for travel in Canada and Alaska. Expenses of procuring labor and expediting the production and transportation of material and equipment. Expenditures under these items shall be either authorized or approved in writing by the Contracting Officer.

h. Salaries of resident engineers, superintendents, timekeepers, foremen, and other field employees of the Contractor in connection with the work. In case the full time of any field employee of the Contractor is not applied to the work, his salary shall be included in this item only in proportion to the actual time applied thereto. No person shall be assigned to service by the Contractor as superintendent of construction, chief engineer, chief purchasing agent, chief accountant, or similar position in the Contractor's field organization, or as principal assistant to any such person, until there has been submitted to and approved by the Contracting Officer a statement of the qualifications, experience, and salary of the person proposed for such assignment. The payment of any excess salary over such scheduled amounts shown in the approved salary schedule, Appendix C, attached hereto and made a part hereof shall not be reimbursable, unless and until the Chief of Engineers has so approved in writing.

i. Buildings, trade fixtures, and equipment required for necessary field offices, commissaries, hospitals, and other facilities, and the cost of maintaining and operating such field offices, commissaries, hospitals and other facilities; provided that the Contractor may enter into a contract with any third party or parties for the operation of the commissaries, hospitals, or other facilities provided for herein in which event such contract shall be reduced to writing and the terms thereof subject to the prior written approval of the Contracting Officer.

j. Temporary rights in land required in connection with the work.

k. Such bonds and insurance policies as have been approved or required by the Contracting Officer.

l. Losses or expenses not compensated by insurance or otherwise (including settlements made with the written consent of the Contracting Officer) actually sustained by the Contractor in connection with the work and found and certified by the Contracting Officer to be just and reasonable, unless reimbursement therefor is expressly prohibited; provided that such reimbursement shall not include any amount for which the Contractor would have been indemnified or compensated by insurance except for failure of the Contractor to procure or maintain bonds or insurance in accordance with the requirements of the Contracting Officer.

m. The cost of reconstructing and replacing any of the work or property destroyed or damaged and not covered by insurance, but expenditures under this item must have the written authorization of the Contracting Officer in advance.

n. The cost, including incidental expenses and premiums (if any) of providing such death, injury, interment, and other benefits to the Contractor's employees

engaged in performing services under this contract as the Contracting Officer may approve or require.

o. Payments from his own funds made by the Contractor under the Social Security Act, and any disbursements required by law, which the Contractor may be required on account of this contract to pay on or for any plant, equipment, process, organization, materials, supplies, or personnel; and, if approved in writing by the Contracting Officer in advance, permit and license fees and royalties on patents used, including those owned by the Contractor.

p. If the Contractor and/or his representative shall be required to travel, the Government will reimburse the Contractor for the transportation, including Pullman where necessary, and will allow for such travel Six Dollars (\$6.00) per day in lieu of all other expenses. Transportation by automobile on such required travel shall be reimbursed at the rate of Five Cents (\$0.05) per mile as representing the actual cost of such transportation.

All travel shall be either authorized or approved in writing by the Contracting Officer. Should the Contractor, or any representative thereof, remain in a travel status in excess of six (6) days at any one time, not including the time consumed in travel, the cost for such excess travel status shall be at the expense of the Contractor, unless otherwise ordered in writing by the Contracting Officer.

q. When specifically approved in advance by the Contracting Officer, a reasonable allowance for work done in the Contractor's general offices exclusively for and directly chargeable to the work.

r. Disbursements incident to payment of pay rolls, including but not limited to the cost of disbursing cash, necessary guards, cashiers, paymasters, exchange charges, and costs on the transfer of funds. If payments to employees are made by check, facilities for cashing checks must be provided without expense to employees, and the Contractor shall be reimbursed therefor.

s. In the event the Contracting Officer shall determine that the best interests of the Government require that the Contractor initiate or defend litigation in connection with claims of third parties arising out of the performance of this contract, the Contractor will proceed with such litigation in good faith and the costs and expenses of such litigation, including judgments and court costs, allowances rendered or awarded in connection with suits for wages, overtime or salaries, and reasonable attorneys' fees for private counsel when the Government does not furnish Government counsel, shall be reimbursable under this contract.

t. It is mutually recognized that there are details relative to employment of labor and personnel with reference to payment of wages and salaries and allotments thereof, insurance and other matters which will be covered by separate agreements to be entered into between the Contractor and his employees. Such employment contracts will be advantageous to the accomplishment of the work and services under this contract and the Contractor may, subject to the written approval of the Contracting Officer, enter into such agreement or agreements of employment not inconsistent with any of the express provisions of this contract as may be deemed desirable. All disbursements under the provisions of such approved employment agreements shall be considered as labor costs reimbursable under this contract.

u. Such other items not expressly excluded by other provisions of this contract as should, in the opinion of the Contracting Officer, be included in the cost of the work. When such an item is allowed by the Contracting Officer, it shall be specifically certified as being allowed under this Subsection.

2. Rental for Construction Plant Owned by Contractor.—*a.* Rental shall be paid to the Contractor for construction plant in sound and workable condition, owned and furnished by him for the proper and economical prosecution of the work, as shown in the attached Appendix A hereby made a part hereof, at rental rates prescribed by the Contracting Officer.

b. In the event the Contractor, with the approval of the Contracting Officer, furnishes additional equipment that is not included in Appendix A, rental for such equipment will be paid in accordance with rates prescribed by the Contracting Officer.

c. Except as otherwise specified herein, rental shall begin on the date of delivery of the construction plant to a common carrier for shipment to the site of the work, as evidenced by bill of lading or other satisfactory evidence covering such shipment. In the event the construction plant is conveyed by the Contractor, the rental shall start at the time transportation to the site begins; however, the rental paid shall not exceed that for the equivalent time of shipment by common carrier.

d. If such construction plant is not in sound and workable condition, to the satisfaction of the Contracting Officer, when delivered at the site of the work, the rental period therefor shall not begin until the construction plant shall have been

placed in sound and workable condition at the expense of the Contractor, and rental therefor shall not be paid for any prior period.

e. If such construction plant cannot be placed in sound and workable condition within reasonable time to the satisfaction of the Contracting Officer, no transportation charges for the shipment thereof, to or from the site of the work, shall be paid.

f. The approved value of the construction plant as shown in Appendix A shall be deemed binding unless the Contracting Officer shall, within twenty days after such plant has been set up and working modify or change such valuation. In the event a change is made in the valuation of the construction plant, a corresponding change shall be made in the rental rate. Thereafter the valuation and the related rental rate shall be binding unless the rental is modified as specified below.

g. Furnish within fifteen days of the date of the receipt of written notice from the Contracting Officer, construction plant listed in Appendix A provided that the date upon which the Contractor is required to furnish such plant shall not precede the date on which such construction plant is listed as available in said Appendix A. In the event the Contractor fails to furnish construction plant as required by such notice, the additional cost of acquiring replacement construction plant from any source other than the Contractor shall be paid by the Contractor and shall not be a reimbursable expenditure.

h. Rental for time consumed for repairs, in excess of the time normally required for such repairs as determined by the Contracting Officer shall be deducted from the rental in the amount of one-thirtieth of the monthly rental rate for each day determined to be in excess. When in the opinion of the Contracting Officer the amount of repairs or maintenance is excessive, a deduction shall be made from the rental.

i. The payment of rental shall cease on a date to be established in a written notice by the Contracting Officer to the Contractor, that the construction plant is no longer required. The date of release thus established shall include an allowance for the time necessary for final repairs, dismantling, and loading for shipment.

GENERAL

3. *Reservations by the Government.*—Title to all materials, tools, machinery, equipment, and supplies for which the Contractor shall be entitled to reimbursement under Article 11 shall vest in the Government at such point or points as the Contracting Officer may designate in writing; provided that the right of final inspection and acceptance or rejection of such materials, tools, machinery, equipment, and supplies at such place or places as he may designate in writing is reserved to the Contracting Officer; provided further, that, upon such final inspection, the Contractor shall be given written notice of acceptance or rejection as the case may be. In the event of rejection, the Contractor shall be responsible for the removal of the rejected property within a reasonable time.

4. The work shall be executed in the best and most workmanlike manner by qualified, careful, and efficient workers, in strict conformity with the best standard practices.

5. Except as otherwise authorized by the Contracting Officer, all materials shall be of the best quality of their respective kinds. If the Contracting Officer requires that the Contractor submit for prior approval samples of materials proposed for use in the work covered by this contract, the Contractor shall make no commitments for such materials until the submitted sample has been approved by the Contracting Officer.

6. *Full-time resident direction of the Contractor—nonreimbursable.*—During the performance of this contract, the work shall be under the full-time resident direction of the Contractor, if an individual; of one or more principal partners if the Contractor is a partnership; or in case the Contractor is a corporation, association, or similar legal entity, one or more senior officers thereof; provided, however, that the Contractor, whether an individual, a partnership, a corporation, or other legal entity, may be represented in the direction of the work by some person of a class other than those specified above, if the Contracting Officer gives his approval. In any event the Contractor shall not be entitled to be reimbursed for any salary, wages or like compensation paid for such direction of the work, whether performed by an individual, a partner, a corporate officer or other representative.

7. a. The Government reserves the right to furnish any materials, construction equipment, machinery, tools, or services, including communication services necessary for the completion of the work. The Contractor shall cause all equipment, machinery, and tools to which title is vested in the Government to be

suitably marked with an identifying mark or symbol indicating that such items are the property of the United States. The Contractor shall maintain at all times, in a manner satisfactory to the Contracting Officer, records showing the disposition and/or use of all equipment, machinery, tools, and materials purchased for the work and for which he has been reimbursed by the Government or which have been furnished by the Government. Upon the completion of this contract or upon demand, the Contractor shall return such equipment, machinery, tools, and unused materials to the place designated by the Contracting Officer.

b. *Liability for Government-Owned Property.*—Except as to the property the liability for which is fixed by any other instrument or agreement or by some other provision of this contract, the Contractor shall not be liable for loss or destruction of or damage to property of the Government in the possession or control of the Contractor in connection with this contract unless such loss, damage, or destruction results from willful misconduct or failure to exercise good faith on the part of the Contractor's corporate officers or other representatives having supervision or direction of the operation of the whole of the Contractor's business or of the whole of any plant operated by the Contractor in the performance of this contract.

8. The Government reserves the right to pay directly to common carriers any or all freight charges on construction plant, materials, and supplies.

9. The Government reserves the right to pay directly to the persons concerned all sums due from the Contractor for labor, materials, or other charges.

10. *Salary of the Contractor, partners or corporate officers—nonreimbursable.*—No salary of the Contractor, partners, or corporate officers of the Contractor's organizations shall be included in the cost of the work. No part of the expense incurred in conducting the Contractor's main office or regularly established branch offices, and no overhead expense of any kind, except as specifically authorized in Section 1 of this Article, shall be included in the cost of the work; nor shall any interest on capital employed or on borrowed money be included in the cost of the work.

11. *Discounts.*—The Contractor shall, to the extent of his ability, take all cash and trade discounts, rebates, allowances, credits, salvage, commissions, and bonifications, and when unable to take advantage of such benefits he shall promptly notify the Contracting Officer with the reason therefor. In determining the actual net cost of articles and materials of every kind required for the purpose of this contract, there shall be deducted from the gross cost thereof all cash and trade discounts, rebates, allowances, credits, commissions, and bonifications which have accrued to the benefit of the Contractor or would have so accrued but for the fault or neglect of the Contractor. Such benefits lost through no fault or neglect on the part of the Contractor, or lost through fault of the Government, shall not be deducted from gross costs.

12. *Revenue.*—All revenue received by the Contractor from the operations of the hospital, commissaries, or other facilities, or from rebates, discounts, refunds, etc., shall be accounted for by the Contractor and, except for any reasonable compensation accruing to a third party or parties for the operation of commissaries, hospitals, or other facilities, applied in reduction of the cost of the work.

13. *Insurance.*—a. The Contractor shall procure and thereafter maintain such bonds and insurance in such forms and in such amounts and for such periods of time as the Contracting Officer may require in writing and shall be reimbursed for the cost thereof;

b. In every instance where this contract requires the United States to pay the premium on a bond or insurance policy, the bond or insurance policy shall contain an endorsement or other recital excluding by appropriate language any claim on the part of the insurer or obligor to be subrogated, on payment of a loss or otherwise, to any claim against the United States;

c. *Uninsured claims and litigation.*—The Contractor shall give the Contracting Officer or his representative immediate notice in writing of any suit or action filed against the Contractor arising out of the performance of this contract and of any claim against the Contractor the cost and expense of which are reimbursable under the provisions of Article II hereof, and the risk of which is then uninsured or in which the amount claimed exceeds the amount of insurance coverage. The Contractor shall furnish immediately to the Contracting Officer copies of all pertinent papers received by the Contractor. Insofar as the following shall not conflict with any policy or contract of insurance, and upon request of the Contracting Officer, the Contractor shall do any and all things to effect an assignment and subrogation in favor of the Government of all Contractor's rights and claims except against the Government, arising from or growing out of such asserted claims, and, if required by the Contracting Officer, shall authorize representatives of the Government to settle and/or defend any such claim and to represent or take charge of any such litigation affecting the Contractor.

ARTICLE III. PAYMENTS

1. *Advance Payments.*—a. At any time and from time to time after the execution of this contract, the Government at the request of the Contractor and subject to the approval of the Chief of Engineers, or his duly authorized representative, or the person to whom authority to make advance payments has been delegated, as to the present need therefor, shall advance to the Contractor sums not to exceed thirty per centum (30%) of the estimated cost of this contract (exclusive of the Contractor's fixed fee), as it may be amended from time to time. On the unliquidated balance of the advance payments outstanding, the Contractor agrees to pay interest at the rate of two and one half per centum (2½%) per annum to be computed in accordance with the provisions of paragraph *f* hereof.

b. As a condition precedent to the making of any advance payment or payments as hereinbefore provided, the Contractor shall furnish the Government with such adequate security as the Under Secretary of War or the person to whom authority has been delegated to make advance payments shall prescribe: *Provided*, That, if other security is not prescribed, the terms of this contract shall be considered adequate security for such advance payments: *And, provided further*, That if at any time the Under Secretary of War deems the security furnished by the Contractor inadequate, the Contractor shall furnish such additional security, in the form of a surety bond or surety bonds, as shall be satisfactory to the Under Secretary of War.

c. Until all advance payments hereunder are liquidated, all funds received as advance payments under this contract together with all funds received as reimbursements for the cost of the work under Article II of this contract, exclusive of the Contractor's fixed fee, shall be deposited in a special bank account or accounts at a member bank or banks of the Federal Reserve System or any "insured" bank within the meaning of the Act creating the Federal Deposit Insurance Corporation (Act of August 23, 1935; 49 Stat. 684, as amended; 12 U. S. C. 264) separate from the Contractor's general or other funds. It is understood and agreed that such sums as are necessary to meet current expenses of the Contractor may be deposited in a chartered bank or banks of the Dominion of Canada and/or The Bank of Alaska, Territory of Alaska. Such special bank account or accounts shall be so designated as to indicate clearly to the bank their special character and purpose, and the balance in such account or accounts shall be used by the Contractor exclusively as a revolving fund for carrying out the purposes of this contract and any amendments thereto, and not for other business of the Contractor. Any balances from time to time in such special account or accounts shall at all times secure the repayment of the advances in connection with which the special account or accounts are opened, and the Government shall have a lien upon such balances to secure the repayment of such advances, which lien shall be superior to any lien of the bank or any other person upon such account or accounts by virtue of assignment to it of such contract or otherwise: *Provided*, That the bank shall be under no liability to any party hereto for the withdrawal of any funds from said special account upon checks properly endorsed and signed by the Contractor, except that after the receipt by the bank of written directions from the Chief of Engineers or his duly authorized representative, the bank shall act thereon and be under no liability to any party hereto for any action taken in accordance with the said written directions. Any instructions or written directions received by the bank through the Contracting Officer upon War Department stationery and purporting to be signed by, or by the direction of, the Chief of Engineers, or his duly authorized representative, shall, insofar as the rights, duties, and liabilities of the bank are concerned, be conclusively deemed to have been properly issued and filed with the bank by the Chief of Engineers, or his duly authorized representative.

d. It is agreed that the aggregate of the advance payments outstanding under this contract, together with funds received as reimbursement for the cost of the work by the Contractor under Article II of this contract, shall, at no time, exceed the total estimated cost of the work under this contract as it may be revised from time to time, and any excess shall be immediately repaid by the Contractor to the Government or if any reimbursement is due from the Government to the Contractor shall be deducted therefrom: *Provided, however*, That if the total cost of the work under this contract shall be in excess of the amount so paid to the Contractor, including said advance payments, the Government upon presentation of satisfactory evidence shall currently and promptly reimburse the Contractor to the extent of such excess cost (subject to any delay in the availability of appropriated funds).

e. If, upon completion of this contract, or upon the termination thereof for other than the fault of the Contractor, the advance payments made to the Contractor in respect to this contract have not been fully liquidated in the manner herein provided, the unliquidated balance of such advance payments shall be deducted from any payments otherwise due the Contractor in respect of this contract; and if the sum or sums due the Contractor be insufficient to cover such balance, the deficiency shall be paid by the Contractor in cash forthwith after demand and final audit by the Government of all accounts hereunder in respect of this contract: *Provided, however,* That in the event of such termination of the contract for other than the fault of the Contractor, such deduction shall not be made prior to final audit unless, and only to the extent that, the Contracting Officer or his duly authorized representative shall determine that such action is reasonably required in order to secure the eventual repayment in full to the Government of such unliquidated advance payments. In the event of cancellation or termination of this contract because of the fault of the Contractor, the Contractor, notwithstanding any ultimate rights to be reimbursed, agrees to return to the Government upon demand, without set-off of any sums alleged to be due the Contractor, the unliquidated balance of any advance payment. Furthermore, if, in the opinion of the Chief of Engineers or his duly authorized representative, the unobligated balance of the advance payments made by the Government under paragraph a. hereof exceeds the amount necessary for the current needs of the Contractor, as determined by the Chief of Engineers or his duly authorized representative, the amount of such excess shall, upon demand by the Chief of Engineers or his duly authorized representative, be promptly returned to the Government and will be credited against the balance due the Government on advances previously made. If the demand made in any event set forth in this paragraph is not met upon receipt of such demand by the Contractor, the amount demanded will bear interest at the rate of six percent (6%) rather than two and one-half percent (2½%) per annum from the date of the receipt of the demand until payment is made: *Provided, however,* That such additional interest over and above the regular two and one-half percent is hereby waived as to any sums paid by the Contractor within 15 days after the amount becomes due hereunder. If and when the Contractor has, by means of deductions or otherwise, reimbursed the Government in full for payments made, any money remaining in the special bank account or accounts shall be free and clear of any lien hereunder, and the bank or banks concerned shall have authority to pay same to the Contractor and shall thereupon be relieved of any further obligation to the Government on account thereof.

f. On the unliquidated balance of the advance payments outstanding, the Contractor agrees to pay interest at the rate of two and one-half percent (2½%) per annum. Such interest shall be computed at the end of each calendar month on the average daily balance of the principal of the unliquidated advance payments outstanding. In determining such balance, charges on account of the advance payments to the Contractor hereunder shall be made as of the dates of the checks therefor; credits resulting from disbursements made by the Contractor which are applied against advance payments shall be made upon the approval of the vouchers therefor by the disbursing officer, as of the dates respectively upon which the Contractor presents to the Contracting Officer or his duly authorized representative full and accurate data for the preparation of each such voucher which date shall, as to each such voucher, be certified by the Contracting Officer or his duly authorized representative on the face thereof; and credits arising from cash repayments to the Government by the Contractor shall be made as of the dates the checks therefor are received by the disbursing officer. As soon as such monthly computations shall have been made, the interest charge so determined shall be deducted from any payments on account of the fixed fee which may be made to the Contractor from time to time under this contract. In the event the accrued interest exceeds any such payment, the excess of such interest shall be carried forward and deducted from subsequent payments on account of the fixed fee. The interest shall not be compounded, and shall, subject to the provisions of paragraph e. hereof, cease to accrue upon the termination of the contract for other than the fault of the Contractor, or upon the date found by the Contracting Officer to be the date upon which the Contractor completed his performance under the contract.

g. The Contractor shall, at all times, afford to the Contracting Officer, or his duly authorized representative, proper facilities for the inspection and audit of the Contractor's accounts, and the Contractor hereby agrees that the Contracting Officer, or his duly authorized representative, shall have the right so far as the Contractor's rights are concerned, during business hours, to inspect and make

copies of any entries in the books and records of the bank or banks relating to the said special account or accounts.

h. Subject to the approval of the Contracting Officer or his duly authorized representative the Contractor may make payments to subcontractors and materialmen in advance out of the special account, for labor or services, or to pay for materials in advance of delivery at the site of the work or at an approved storage site. Such subadvances shall not exceed thirty percent (30%) of the subcontract price or estimated cost, as the case may be, and the subcontractor or materialmen to whom such advances are made shall furnish adequate security therefor. Unless other security is furnished, covenants in subcontracts, expressly made for the benefit of the Government, providing for a subspecial account with the Government lien thereon and for a Government lien on or title to property, tangible or intangible, purchased from the special account, and imposing upon the subcontractor substantially the same rights as are provided herein between the Government and the Contractor, have been prescribed by the Under Secretary of War as minimum adequate security for such subadvances.

i. Any assignment of moneys due or to be become due under this contract shall be subordinate to the rights or claims of the Government arising under this contract or any amendment thereto by virtue of any advance payments authorized herein or otherwise; Provided that, if at any time any claim arising under this contract is assigned or purportedly assigned in any manner inconsistent with the said rights of the Government, the Chief of Engineers or his duly authorized representative shall have the right to suspend further advance payments without notice.

2. Reimbursement for cost.—The Government will currently reimburse the Contractor for expenditures made in accordance with Article II upon certification to and verification by the Contracting Officer of the original signed pay rolls for labor, the receipted invoices for materials, and such other documents as the Contracting Officer may require. Generally, reimbursement will be made weekly but may be made at more frequent intervals if the conditions so warrant.

3. Rental for Contractor's Equipment.—Rental as provided in Article II for such construction plant or parts thereof as the Contractor may own and furnish shall be paid monthly upon presentation of proper vouchers.

4. Payment of the Fixed Fee.—Ninety percent (90%) of the fixed fee set out in Article I shall be paid as it accrues, in monthly installments based upon the percentage of the completion of the work as determined from estimates submitted to and approved by the Contracting Officer. Final payment upon completion of the work and its final acceptance shall be made in accordance with Section 6. If the contract is terminated by the Government, payment shall be made in accordance with Article VI.

5. Payments by Contractor.—If bills for purchase of material, machinery, or equipment, or pay rolls covering employment of laborers or mechanics incurred by the Contractor or by any subcontractor hereunder are not paid promptly by the Contractor or subcontractor as the case may be, the Contracting Officer may, in his discretion, withhold from payments otherwise due the Contractor an amount equivalent to the amount of any such bill or pay roll. Should the Contractor neglect or refuse to pay such bills or pay rolls or to direct any subcontractor to pay such bills or pay rolls within five (5) days after notice from the Contracting Officer so to do, the Government shall have the right to pay such bills or pay rolls directly, and in such event a deduction equal to five percent (5%) of the amount so paid directly shall be made from the Contractor's fee.

6. Final Payment.—Upon completion of the work and its final acceptance in writing by the Contracting Officer, the Government shall pay to the Contractor the unpaid balance of the cost of the work determined under Article II hereof, and of the fee, less any sum that may be necessary to settle any unsettled claims in connection with this contract or any claim the Government may have against the Contractor. The Contracting Officer shall accept the completed work with reasonable promptness.

a. Prior to final payment and as a condition thereof the Contractor shall furnish the Government with a release of all claims against the Government arising under and by virtue of this contract, other than (1) such claims, if any, as may be specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein, or in estimated amounts where the amounts are not susceptible of exact statement, and (2) any claim based upon the responsibility of the Contractor to third parties arising out of the performance of this contract not known to the Contractor at the time of furnishing the release.

b. Labor Claims.—Even though the existence or amount thereof shall not be determined until after the furnishing of such release as is described next above,

reimbursement to be made for payments made by the Contractor shall include, along with wages and salaries otherwise reimbursable, all additional amounts determined (either by approval of the Contracting Officer or by litigation as hereinafter provided) to be due and payable for overtime compensation and allowance under local, State, or Federal laws in connection with such wages and salaries.

c. The Contractor shall promptly notify the Contracting Officer of any claims of the type described in paragraph a (2) above which are asserted subsequent to the execution of the release.

d. *Third Party Claims—Litigation.*—In the event the Contracting Officer shall determine that the best interests of the Government require that the Contractor initiate or defend litigation in connection with claims of third parties arising out of the performance of this contract, the Contractor will proceed with such litigation in good faith and the costs and expenses of such litigation, including judgments and court costs, allowances rendered or awarded in connection with suits for wages, overtime, or salaries, and reasonable attorneys' fees for private counsel when the Government does not furnish Government counsel, shall be reimbursable under this contract.

ARTICLE IV. RECORDS, ACCOUNTS, INSPECTION, AND AUDIT

1. The Contractor agrees to keep records and books of account, showing the actual cost to him of all items of labor, materials, equipment, supplies, services, and other expenditures of whatever nature for which reimbursement is authorized under the provisions of this contract. The system of accounting to be employed by the Contractor shall be such as is satisfactory to the Contracting Officer.

2. The Contracting Officer shall at all times be afforded proper facilities for inspection of the work and shall at all times have access to the premises, work, and materials, to all books, records, correspondence, instructions, plans, drawings, receipts, vouchers, and memoranda of every description of the Contractor pertaining to said work except such documents as have been submitted in support of reimbursement vouchers; and the Contractor shall preserve such papers without additional compensation therefor, for a period of three (3) years after completion or termination of this contract.

3. Any duly authorized representative of the Contractor shall be accorded the privilege of examining the books, records, and papers of the Contracting Officer relating to the cost of the work for the purpose of checking and verifying such cost.

4. In order to avoid so far as possible duplication in accounting and auditing functions performed by the Contractor and the Government, it is agreed that the following accounting and auditing functions shall be performed by the Government exclusively:

a. Time checking (not timekeeping) in the field, or in the Contractor's plant.

b. Audit of original pay rolls of the Contractor (or such portions thereof as are applicable), where such pay rolls are prepared by the Contractor.

c. Checking of equipment rentals and the preparation and delivery of properly approved rental rolls to the Contractor for payment.

d. Such other accounting and auditing functions as may be effectively performed by Government employees and to which the Contracting Officer and the Contractor may mutually agree in writing.

5. It is further agreed that if any of the accounting and auditing functions performed exclusively by the Government do not adequately discharge such accounting and auditing functions to the satisfaction of the Contractor, the Contractor, with the approval in writing of the Contracting Officer, may perform such additional checking and auditing as may be so approved. The Contractor shall be reimbursed for the cost of such additional accounting and auditing functions as are so approved.

ARTICLE V. SPECIAL REQUIREMENTS

1. The Contractor hereby agrees that it will:

a. *Permits, Licenses, Compliance with Laws.*—Procure all necessary permits and licenses; obey and abide by all applicable laws, regulations, ordinances, and other rules of the United States of America, of the State, Territory, or political subdivision thereof, and of the Dominion of Canada and Provinces thereof, wherein the work is done, or of any other duly constituted public authority.

b. *Subcontracting.*—Reduce to writing, unless this provision is waived in writing by the Contracting Officer, every contract in excess of two thousand dollars (\$2,000) made by him for the purpose of the work hereunder for services, materials,

supplies, machinery, equipment, or for the use thereof; insert therein a provision that such contract is assignable to the Government; make all such contracts in its own name, and not bind nor purport to bind the Government or the Contracting Officer thereunder. No purchase in excess of two thousand dollars (\$2,000) shall be made or placed without the prior approval of the Contracting Officer.

c. Subcontracting.—Enter into no subcontract for any portion of the work except in the form prescribed by the Chief of Engineers, with the written approval of the Contracting Officer. Subcontracts are defined as contracts entered into by the Contractor with others which involve the performance, wholly or in part at the site of the work, of some part of the work described in this contract.

d. Contractor's Representative.—At all times during the progress of the work, keep at the site thereof a duly appointed and qualified representative who shall receive and execute on the part of the Contractor such notices, directions, and instructions as the Contracting Officer may give.

e. Dismissal of Employees.—The Contracting Officer may require the Contractor to dismiss from work such employee or employees as the Contracting Officer deems incompetent, careless, or insubordinate or whose continued employment is deemed inimical by the Contracting Officer to the public interest.

f. Technical, Supervisory, and Administrative Personnel.—Furnish sufficient technical, supervisory, and administrative personnel to insure the prosecution of the work in accordance with schedules approved by the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind such schedules approved by the Contracting Officer, the Contractor shall take such steps as may be necessary to improve his progress and the Contracting Officer may direct him to increase working days, or hours of labor per day. Failure to promptly comply with such directions shall be deemed sufficient cause to terminate the contract for the fault of the Contractor.

g. Repairs to Equipment under Third-Party Rental Agreements.—Immediately upon termination of third-party rental agreement, make all repairs to equipment rented thereunder which are required to be made by the terms of such rental agreements and remove such equipment from the site of the work. In cases where such repairs and removal cannot promptly be made, the Contractor shall notify the Contracting Officer of the reasons for such delay.

Special Provisions to be inserted in Cost-Plus-A-Fixed-Fee Subcontracts

2. The Contractor will include in each cost-plus-a-fixed-fee subcontract made under this contract, provisions as follows:

"a. There shall be included as an allowable item of cost hereunder any amount paid by the Subcontractor to settle any claim of the Government for loss or destruction of or damage to property of the Government in the possession or control of the Subcontractor in connection with this subcontract, unless such loss, damage or destruction results from wilful misconduct or failure to exercise good faith on the part of Subcontractor's corporate officers or other representatives having supervision or direction of the operation of the whole of the Subcontractor's business or of the whole of any plant operated by the Subcontractor in the performance of this subcontract.

"b. The Subcontractor shall not be reimbursed for the cost of any insurance on any property of the Government.

"c. As used herein the term 'Government' shall be deemed to mean the United States of America."

3. The Contractor will, if so requested by the Contracting Officer, include in any particular cost-plus-a-fixed-fee subcontract, a provision as follows:

"a. The Subcontractor shall procure and thereafter maintain such insurance as is specified in writing by the Contracting Officer. The cost of such insurance and losses or expenses (including settlements made with the written consent of the Contracting Officer who executed the principal contract or his duly authorized successor or representative) not compensated by insurance or otherwise and found and certified by the Contractor and said Contracting Officer or his duly authorized successor or representative to be just and reasonable, actually sustained by the Subcontractor in the defense and/or discharge of such claims of others on account of death or bodily injury of persons or loss or destruction of or damage to property as may arise out of or in connection with the performance of the work under this subcontract shall be allowable items of cost hereunder; provided that such reimbursement shall not include any amount for which the Subcontractor would have been indemnified or compensated except for the failure of the Subcontractor to procure or maintain insurance in accordance with the requirements of this subcontract.

"b. The Subcontractor shall give the Contractor immediate notice in writing of any suit or action filed against the Subcontractor, arising out of the performance of this subcontract and of any claims against the Subcontractor, the cost and expense of which is reimbursable under the provisions of this subcontract pertinent to allowable items of cost, and the risk of which is then uninsured or in which the amount claimed exceeds the amount of insurance coverage. The Subcontractor shall furnish immediately to the Contractor copies of all pertinent papers received by the Subcontractor. Insofar as the following shall not conflict with any policy or contract of insurance, and upon request of the Contractor, the Subcontractor shall do any and all things to effect an assignment and subrogation in favor of the Contractor or its nominee of all Subcontractor's rights and claims, except rights and claims of the Subcontractor against the Contractor or such nominee, arising from or growing out of such asserted claim, and, if required by the Contractor, shall authorize representatives of the Contractor or of its nominee to settle and/or defend any such claim and to represent the Subcontractor in or take charge of any such litigation.

"c. Every policy for insurance authorized under this paragraph shall contain an indorsement or other recital excluding by appropriate language any claim on the part of the insurer or obligor to be subrogated on payment of a loss or otherwise to any claim against the Contractor or the Government."

ARTICLE VI. TERMINATION FOR CONVENIENCE OF THE GOVERNMENT

1 The Government may terminate this contract at any time by a notice in writing from the Contracting Officer to the Contractor. Such termination shall be effective in the manner and upon the date specified in said notice and shall be without prejudice to any claim which the Government may have against the Contractor. Upon receipt of such notice, the Contractor shall, unless the notice directs otherwise, immediately discontinue all work and the placing of all orders for materials, facilities, and supplies in connection with performance of this contract and shall proceed to cancel promptly all existing orders and terminate all subcontracts insofar as such orders and/or subcontracts are chargeable to this contract.

2. If this contract is terminated for the fault of the Contractor, the Contracting Officer may enter upon the premises and take possession, for the purpose of completing the work contemplated by this contract, of any or all materials, tools, machinery, equipment, and appliances which may be owned by or in the possession of the Contractor and all options, privileges, and rights, and may complete or employ any other person or persons to complete said work. Following such termination, rental shall be paid to the Contractor for such construction plant or parts thereof as he may own, and which the Government may retain at rates prescribed in Article II.

3. Upon the termination of this contract, full and complete settlement of all claims of the Contractor arising out of this contract shall be made as follows:

a. The Government shall assume and become liable for all obligations, commitments, and claims that the Contractor may have theretofore in good faith undertaken or incurred in connection with said work, the cost of which would be reimbursable in accordance with the provisions of this contract; and the Contractor shall, as a condition of receiving the payments mentioned in this article, execute and deliver all such papers and take all such steps as the Contracting Officer may require for the purpose of fully vesting in the Government the rights and benefits of the Contractor under such obligations or commitments.

b. The Government shall reimburse the Contractor for all expenditures made in accordance with Article II and not previously reimbursed.

c. The Government shall reimburse the Contractor for such further expenditures after the date of termination for the protection of Government property and for accounting services in connection with the settlement of this contract as are required or approved by the Contracting Officer.

d. The Government shall pay to the Contractor any unpaid balance for the rental of the Contractor's equipment in accordance with Article II to date of termination.

e. If the contract is terminated for the convenience of the Government, the Contractor will be paid that proportion of the prescribed fee which the work actually completed bears to the entire work under this contract, less fee payments previously made. If the contract is terminated due to fault of the Contractor, no additional payments on account of the fee will be made.

f. The obligation of the Government to make any of the payments required by this Article, or by Article III of this contract, shall be subject to any unsettled

claims in connection with this contract which the Government may have against the Contractor.

4. Prior to final settlement the Contractor shall furnish a release as required in Article III hereof.

ARTICLE VII. CONTRACTING OFFICER'S DECISIONS

The extent and character of the work to be done by the Contractor shall be subject to the general supervision, direction, control, and approval of the Contracting Officer to whom the Contractor shall report and be responsible.

ARTICLE VIII. DISPUTES

Except as otherwise specifically provided in this contract, all disputes concerning questions of fact which may arise under this contract, and which are not disposed of by mutual agreement, shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail a copy thereof to the Contractor at his address shown herein. Within 30 days from said mailing the Contractor may appeal in writing to the Secretary of War, whose written decision or that of his designated representative or representatives thereon shall be final and conclusive upon the parties hereto.

The Secretary of War may, in his discretion, designate an individual, or individuals, other than the Contracting Officer, or a board as his authorized representative to determine appeals under this Article. The Contractor shall be afforded an opportunity to be heard and offer evidence in support of his appeal. The president of the board, from time to time, may divide the board into divisions of one or more members and assign members thereto. A majority of the members of the board or of a division thereof shall constitute a quorum for the transaction of the business of the board or of a division, respectively, and the decision of a majority of the members of the board or of a division shall be deemed to be the decision of the board or of a division, as the case may be. If a majority of the members of a division are unable to agree on a decision or if within 30 days after a decision by a division, the board or the president thereof directs that the decision of the division be reviewed by the board, the decision will be so reviewed, otherwise the decision of a majority of the members of a division shall become the decision of the board. If a majority of the members of the board is unable to agree upon a decision, the president will promptly submit the appeal to the Under Secretary of War for his decision upon the record. A vacancy in the board or in any division thereof shall not impair the powers, nor affect the duties of the board or division nor of the remaining members of the board or division, respectively. Any member of the board, or any examiner designated by the president of the board for that purpose, may hold hearings, examine witnesses, receive evidence, and report the evidence to the board or to the appropriate division, if the case is pending before a division. Pending decision of a dispute hereunder the Contractor shall diligently proceed with the performance of this contract. Any sum or sums allowed to the Contractor under the provisions of this Article shall be paid by the United States as part of the cost of the articles of work herein contracted for and shall be deemed to be within the contemplation of this contract.

ARTICLE IX. LABOR

1. *Wage Rates.*—The Contractor or his Subcontractor shall pay all mechanics and laborers employed directly upon the site of the work, unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less or more than those stated in Appendix B, regardless of any contractual relationship which may be alleged to exist between the Contractor or Subcontractor and such laborers and mechanics; and the scale of wages to be paid shall be posted by the Contractor in a prominent and easily accessible place at the site of the work. The Contracting Officer shall have the right to withhold from the Contractor so much of accrued payments as may be considered necessary by the Contracting Officer to pay to laborers and mechanics employed by the Contractor or any Subcontractor on the work the difference between the rates of wages required by the contract to be paid laborers and mechanics on the work and the rates of wages received by such laborers and mechanics on the work and the rates of wages received by such laborers and mechanics and not refunded to the Constructor, Subcontractors, or their agents.

2. In the event it is found by the Contracting Officer that any laborers or mechanics employed by the Contractor or any Subcontractor directly on the site of the work covered by the contract has been or is being paid a rate of wages less than the rate of wages required by the contract to be paid as aforesaid, the Government may, by written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been a failure to pay said required wages and prosecute the work to completion by contract or otherwise, and the Contractor and his sureties, if any, shall be liable to the Government for any excess costs occasioned the Government thereby.

3. The minimum wages to be paid laborers and mechanics on this project are set forth in Appendix B attached hereto and made a part hereof.

4. No laborer or mechanic doing any part of the work contemplated by this contract, in the employ of the Contractor or any Subcontractor contracting for any part of said work contemplated shall be required or permitted to work more than eight (8) hours in any one calendar day upon such work at the site thereof, except upon the condition that compensation is paid to such laborer or mechanic in accordance with the provisions of this article. The wages of every laborer and mechanic employed by the Contractor or any Subcontractor engaged in the performance of this contract shall be computed on a basic day rate of eight (8) hours per day and work in excess of eight (8) hours per day is permitted only upon the condition that every such laborer and mechanic shall be compensated for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.

5. *Excess Wage Rates on Overtime Compensation—Nonreimbursable.*—All wage rates, including compensation for overtime under Section 4 of this article, for laborers and mechanics engaged in work under this contract shall be approved in writing by the Chief of Engineers or his authorized representative, and any amount paid by the Contractor to any laborer or mechanic in excess of the wage rate approved for such laborer or mechanic by the Chief of Engineers or his authorized representative shall be at the expense of the Contractor and shall not be reimbursed by the Government. When, in connection with the audit and check by the Contracting Officer or his authorized representative, of the Contractor's pay rolls prior to reimbursement as contemplated in Section 1 of Article II hereof, it is found that one or more laborers and/or mechanics have been paid wages at rates in excess of the wage rates approved as herein provided, the reimbursement made to the Contractor on account of such pay rolls shall not include any such excess payments.

6. The labor provisions hereinabove set forth govern all manual labor hired by the Contractor where applicable. It is mutually understood and agreed, however, that the parties to this contract will in addition abide by all laws and regulations of the United States and of the Dominion of Canada, and all other statutes enacted for the benefit of workers of all classes, applicable within the jurisdiction and area where the work is being performed.

ARTICLE X. ACCIDENT PREVENTION

1. In order to protect the life and health of its employees in the performance of this contract, the Contractor will comply with all pertinent provisions of the "Safety Requirements in Excavation—Building—Construction" approved by the Chief of Engineers December 16, 1941, (a copy of which is on file in the Office of the Contracting Officer), and as may be amended, and will take or cause to be taken such additional measures as the Contracting Officer may determine to be reasonably necessary for this purpose. The Contractor will maintain an accurate record of, and will report to the Contracting Officer in the manner and on the forms prescribed by the Contracting Officer, all cases of death, occupational disease, and traumatic injury arising out of or in the course of employment on work under this contract.

2. The Contracting Officer will notify the Contractor of any noncompliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately correct the conditions to which attention has been directed. Such notice when served on the Contractor or his representative at the site of the work shall be deemed sufficient for the purpose aforesaid.

3. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or any part of the work. When satisfactory corrective action is taken, a start order will be issued.

ARTICLE XI. INSURANCE

1. During the life of this contract the Contractor will provide and maintain Public Liability Insurance covering the operation and performance of this contract, as described in Article I hereof, and Workmen's Compensation Insurance for all employees of the Contractor engaged in work under this contract or such other protection for employees as may be required by Federal, State, Dominion of Canada, or Provincial statutes, including the Act entitled "Longshoremen's and Harbor Workers' Compensation Act" (44 Stat. 1424), as amended, and as the same was amended by Public Law No. 208, 77th Congress, approved August 16, 1941, and Public Law No. 784, 77th Congress, approved December 2, 1942, and War Department Insurance Rating Plan, applicable in the jurisdiction in which such work is performed. Prior to commencement of operations under this contract, the Contractor will furnish the Contracting Officer with proof of compliance with the provisions of this article.

ARTICLE XII. NOTICE TO THE GOVERNMENT OF LABOR DISPUTES

Whenever an actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor will immediately give notice thereof to the Contracting Officer. Such notice shall include all relevant information with respect to such dispute.

ARTICLE XIII. OFFICIALS NOT TO BENEFIT

No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE XIV. COVENANT AGAINST CONTINGENT FEES

The Contractor warrants that it has not employed any person to solicit or secure this contract upon any agreement for a commission, percentage, brokerage, or contingent fee. Breach of this warranty shall give the Government right to annul the contract, or, in its discretion, to deduct from the contract price or consideration the amount of such commission, percentage, brokerage, or contingent fees. This warranty shall not apply to commissions payable by contractors upon contracts or sales secured or made through bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business.

ARTICLE XV. CONTRACTOR'S ORGANIZATION AND METHODS

Upon the execution of this contract, the Contractor shall submit to the Contracting Officer a chart showing in general the executive and administrative organization, duties, and personnel to be employed in connection with the work under contract; the data so furnished shall be supplemented as additional information becomes available.

ARTICLE XVI. LOADING AND UNLOADING RAILWAY CARS

The Contractor shall load promptly all railroad cars furnished for loading upon his order and shall unload from railroad cars promptly upon arrival all shipments consigned to him and shall provide storage facilities and other facilities necessary for these purposes; and the Contractor shall not order railway cars for loading unless they can be loaded promptly and shall not cause or permit shipment to be consigned to it unless they can be unloaded from railroad cars promptly upon arrival.

ARTICLE XVII. ASSIGNMENT OF CLAIMS

1. Claims for moneys due or to become due the Contractor from the Government under this contract may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency. Any such assignment shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment may be made to one party as agent or trustee for two or more parties participating in such financing.

2. In the event of any such assignment the assignee shall file four signed copies of a written notice of the assignment, together with one copy of the instrument of assignment, with each of the following:

- (i) General Accounting Office;
- (ii) the Contracting Officer;
- (iii) the surety or sureties upon the bond or bonds, if any, in connection with this contract;
- (iv) the officer designated in this contract to make payments thereunder.

3. Any claim under this contract which has been assigned pursuant to the foregoing provisions of this Article may be further assigned and reassigned to a bank, trust company, or other financing institution, including any Federal lending agency. In the event of such further assignment or reassignment the assignee shall file one signed copy of a written notice of the further assignment or reassignment together with a true copy of the instrument of further assignment or reassignment with the Contractor; and shall file four signed copies of such written notice and one copy of such instrument with each of the parties designated in the preceding paragraph.

4. No assignee shall divulge any information concerning the contract except to those persons concerned with the transaction.

5. Payment to an assignee of any claim under this contract shall not be subject to reduction or set-off for any indebtedness of the assignor to the United States arising independently of this contract.

6. Indication of the assignment of claim and of any further assignment thereof and the name of the assignee will be made on all vouchers or invoices certified by the Contractor.

ARTICLE XVIII. RENEGOTIATION PURSUANT TO SECTION 403 OF THE SIXTH SUPPLEMENTAL NATIONAL DEFENSE APPROPRIATION ACT, 1942, AS AMENDED

1. Upon the written demand of the Secretary, at such period or periods when, in the judgment of the Secretary, the profits accruing to the Contractor under this contract can be determined with reasonable certainty, the fixed fee specified herein will be renegotiated to eliminate therefrom any amount found as a result of such renegotiation to represent excessive profits. The demand of the Secretary shall fix a place for renegotiation and time for commencement thereof not later than one year after the close of the fiscal year of the Contractor within which completion or termination of the contract, as determined by the Secretary, occurs.

2. The Contractor will furnish to the Secretary such statements of actual costs of production and such other financial statements, at such times and in such form and detail as the Secretary may prescribe, and will permit such audits and inspections of its books and records as the Secretary may request.

3. The Government shall retain from amounts otherwise due the Contractor, or the Contractor shall repay to the Government if paid to it, any amount of the fixed fee found as a result of such renegotiation to represent excessive profits and not eliminated through reductions in the fixed fee or otherwise, as the Secretary may direct.

4. The Contractor will include in each subcontract made by it under this contract for an amount in excess of \$100,000.00, the following provisions:

ARTICLE ——. RENEGOTIATION PURSUANT TO SECTION 403 OF THE SIXTH SUPPLEMENTAL NATIONAL DEFENSE APPROPRIATION ACT, 1942, AS AMENDED

1. Upon the written demand of the Secretary, at such period or periods when, in the judgment of the Secretary, the profits accruing to the subcontractor under this contract can be determined with reasonable certainty, the Secretary and the Subcontractor will renegotiate the contract price to eliminate therefrom any amount found as a result of such renegotiation to represent excessive profits. The demand of the Secretary shall fix a place for renegotiation and a time for the commencement thereof not later than one year after the close of the fiscal year of the Subcontractor within which completion or termination of the contract, as determined by the Secretary, occurs.

2. The Subcontractor will furnish to the Secretary such statements of actual costs of production and such other financial statements, at such times and in such form and detail as the Secretary may prescribe, and will permit such audits and inspections of its books and records as the Secretary may request.

3. Any amount of the contract price found as a result of such renegotiation to represent excessive profits shall, as directed by the Secretary—

a. Be deducted by the Contractor from payments otherwise due to the subcontractor under this contract; or

b. Be paid by the Subcontractor directly to the Government if paid to him; or

c. Be eliminated through reductions in the contract price or otherwise.

4. The Subcontractor agrees that the Contractor shall not be liable to the subcontractor for or on account of any amount paid to the Government by the subcontractor or deducted by the Contractor from payments otherwise due under this contract, pursuant to directions from the Secretary in accordance with the provisions of this Article. Under its contract with the Government, the Contractor is obligated to pay or credit to the Government all amounts withheld by it from the Subcontractor hereunder.

5. The Subcontractor agrees a upon direction of the Secretary, to include in any subcontract hereunder sections 1 to 6, inclusive, of this Article, and b to make no subdivisions of any contract or subcontract for the purpose of evading the provisions of this section, and c to repay the Government the amount of any reduction in the contract price of any such subcontract which results from renegotiation thereof by the Secretary, and which the Secretary directs the Subcontractor to withhold from payments otherwise due under such subcontract and actually unpaid at the time the subcontract receives such direction.

6. As used in this Article—

a. The term "Secretary" means the Secretary of War or any duly authorized representative of the Secretary including the Contracting Officer.

b. The term "subcontract" means any purchase order or agreement to perform all or any part of the work, or to make or furnish any material, part, assembly, machinery, equipment, or other personal property, required for the performance of this contract, unless exempt under or exempted pursuant to Section 403 (i) of the Sixth Supplemental National Defense Appropriation Act of 1942 as amended by Section 801 of the Revenue Act of 1942.

c. The terms "renegotiate" and "renegotiation" have the same meaning as in Section 403 (b) of the Sixth Supplemental National Defense Appropriation Act, 1942, as amended.

d. The term "this contract" means this contract as modified from time to time.

5. a. The Contractor agrees to make no subdivisions of any contract or subcontract for the purpose of evading the provisions of this Article.

b. If any renegotiation between the Secretary and any Subcontractor pursuant to the provisions required by Section 4 hereof results in a reduction of the contract price of the subcontract, the Government shall retain from payments otherwise due to the Contractor, or the Contractor shall repay to the Government as the Secretary may direct, the amount of such reduction which the Secretary directs the Contractor to withhold from payments otherwise due to the Subcontractor under the subcontract and actually unpaid at the time the Contractor receives such direction.

6. As used in this Article—

a. The term "Secretary" means the Secretary of War or any duly authorized representative of the Secretary, including the Contracting Officer.

b. The term "subcontract" means any purchase order or agreement to perform all or any part of the work, or to make or furnish any material, part, assembly, machinery, equipment, or other personal property, required for the performance of this contract, unless exempt under or exempted pursuant to Section 403 (i) of the Sixth Supplemental National Defense Appropriation Act of 1942 as amended by Section 801 of the Revenue Act of 1942.

c. The terms "renegotiate" and "renegotiation" have the same meaning as in Section 403 (B) of the Sixth Supplemental National Defense Appropriation Act, 1942, as amended.

d. The term "this contract" means this contract as modified from time to time.

ARTICLE XIX. DEFINITIONS

1. The terms "Secretary of War" and "Chief of Engineers" shall include their duly authorized representatives as the case may be other than the Contracting Officer.

2. The terms "Secretary of War" and "Chief of Engineers" shall include any person or board authorized by the Secretary of War or the Chief of Engineers, as the case may be, to act for him, other than the Contracting Officer.

3. Except for the original signing of this contract, the term "Contracting Officer" as used herein shall include his duly appointed successor or his authorized representative.

4. The term "construction plant" shall include any part thereof.

In witness whereof, the parties hereto have executed this contract as of the day and year first above written.

By THE UNITED STATES OF AMERICA,

C. M. CLIFFORD,

*Lieutenant Colonel, Corps of Engineers,
Contracting Officer.*

BATES AND ROGERS CONSTRUCTION CORPORATION,

By F. L. COPELAND, *Vice President.*

Witnesses:

C. T. SMITH,

Whitehorse, Yukon Territory.

J. W. MAXWELL,

Edmonton, Alberta.

CERTIFICATE

I, D. B. Cassell, certify that I am the Secretary of the Corporation named as Contractor herein; that F. L. Copeland, who signed this contract on behalf of the Contractor, was then Vice President of said Corporation; that said contract was duly signed for and on behalf of said Corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said Corporation this 25th day of October 1943.

[CORPORATE SEAL]

D. B. CASSELL,
Secretary.

SCHEDULE A
Bates & Rogers Construction Corp., 111 West Washington St., Chicago, Ill.

[Contract No. W-3416-eng-735 (O. I. 838)]

Quantity	Item	Serial No.	Model	Year	Shipping date	Original point of shipment	Work site	Fair market value	Rental rate by month
	Marion crane	6862	361	1937	Nov. 1, 1943	Chicago, Ill.		\$28,000.00	\$731.25
	do.	7139	362	1939	do.	Fort Wayne, Ind.		21,300.00	1,125.00
	do.	4871	362	1941	do.	Provo, Utah		21,900.00	1,125.00
	Northwest crane	4884	6	1941	do.	Chicago, Ill.		19,117.00	931.25
	Osgood crane	29643		1939	do.	Fort Wayne, Ind.		7,442.00	370.00
	Air compressor (pneumatic)	33780	P. O. 4	1939	do.	Chicago, Ill.		5,565.00	270.00
	do.	33784	P. O. 42-315	1942	do.	do.		4,445.00	310.00
	do.	30334	315	1938	do.	do.		5,665.00	270.00
	do.	33779	P. O. 42-315 OF	1940	do.	do.		5,665.00	310.50
	American Hoist & Derrick Co. derrick	1406 (5 T.)		1940	do.	do.		1,631.83	83.75
	do.	1407 (5 T.)		1940	do.	do.		1,631.83	83.75
	Swinging-pile lead	71948		1943	do.	do.		350.00	5.25
	do.	71949		1943	do.	do.		350.00	5.25
	do.	20447		1943	do.	do.		350.00	5.25
	American Hoist & Derrick Co. engine, hoist, 3 drums.	18470		1912	do.	do.		4,530.00	131.25
	do.	1860-F		1911	do.	do.		4,530.00	131.25
	American Hoist & Derrick Co. engine, slewing, 4 by 6.	460-D		1923	do.	do.		990.00	26.25
	do.	460-D		1922	do.	do.		990.00	26.25
	American Hoist & Derrick Co. drum, counter-weight.	102		1913	do.	do.		170.00	18.75
	do.	103		1919	do.	do.		170.00	18.75
	Mckiernan-Terry pile hammer No. 7	8441		1935	do.	Provo, Utah		1,550.00	105.00
	do.	8625		1925	do.	Chicago, Ill.		1,550.00	105.00
	Mckiernan-Terry steam hammer	7657	9-B-2, 2 1/4 by 20 9-B-3, 2 1/4 by 20 Inches.	1929	do.	do.		2,300.00	155.25
	Mckiernan-Terry pile hammer	8646	9-B-3, 2 1/4 by 20 Inches.	1937	do.	do.		2,300.00	155.25
	Pile hammer, Casagrain esp		R30	1922	do.	do.		132.00	5.25
	Ingersoll-Rand air sheeting hammer	371000	R30	1930	do.	Provo, Utah		360.00	40.50
	Mckiernan-Terry steam hammer	6781	Size 5, 4 1/4 by 11 3/4 Inches.	1925	do.	Chicago, Ill.		825.00	65.25
	do.	9146	do.	1942	do.	do.		825.00	65.25
	Vulcan drop hammer.	1418	7 1/4 by 19 by 45 Inches, No. 2500.	1922	do.	do.		246.00	18.75
	Vulcan pile extractor.	2146	400-A, No. 2850.	1930	do.	do.		1,450.00	97.50
	Jaeger centrifugal pump.	P-8734	6-I unit, No. 13021.	1937	do.	do.		1,139.00	83.75
	do.	P-7307	6-inch.	1937	do.	do.		1,139.00	83.75

do	P-7317	6-inch #	1937	do	1,139.00	93.75
Barber-Greene conveyor	250862-1	.....	1939	do	2,245.00	127.50
do	250862	.....	1939	do	2,245.00	127.50
do	157845	.....	1930	do	2,245.00	127.50
Smith concrete mixer	48671	285	1934	do	4,675.00	157.50
do	46771	148	1928	do	2,100.00	116.25
do	46711	148	1928	do	2,100.00	116.25
Johnson portable bin	3621	.....	1928	do	1,228.00	67.50
Blaw-Knox bucket, clamshell	B-6643	.....	1935	do	781.00	43.00
do	B-6690	.....	1935	do	702.00	36.25
Owen bucket, clamshell	7472	.....	1937	do	694.00	36.25
Williams bucket, clamshell	1906	.....	1911	do	1,086.00	58.75
Page bucket, dragline	266-2711	.....	1935	do	680.00	36.75
Insley side-tip bucket	101	40 by 26 by 26 inches ⁴	1924	do	234.00	13.00
do	113	36 by 40 by 34 inches ⁴	1924	do	234.00	13.00
do	121	38 by 42 by 28 inches	1924	do	234.00	13.00
do	117	41 by 42 by 27 inches	1924	do	234.00	13.00
do	120	38 by 46 by 28 inches	1924	do	234.00	13.00
do	123	37 by 48 by 28 inches	1924	do	234.00	13.00
Skid pile driver	19431	.....	1943	do	1,635.00	7 25.20
do	19432	.....	1943	do	1,635.00	7 25.20
do	19433	.....	1943	do	1,635.00	7 25.20
do	19434	.....	1943	do	1,635.00	7 25.20
Mercury sedan coupe	.....	.....	1942	do	1,413.82	84.83
Mercury forlor sedan	.....	.....	1942	do	1,413.82	84.83
Mercury sedan coupe	.....	.....	1942	do	1,413.82	84.83

1 Equipment will be moved north and south of Whitehorse for construction on various bridges.

2 Based on 2 percent of actual cost of \$350

3 Based on smallest size shown in O.P.A. schedule, which is 3 by 6.

4 Based on difference between O.P.A. rate of \$175 for 3 drums with boiler and \$150 for 2-inch hoist with boiler.

5 Complete with suction hose and strainers.

6 Based on 9 percent replacement value of \$1,828 per O.P.A.

7 Based on 30 days at rate of \$1,197 per day, as paid by P.R.A.

8 Figured 75 percent of \$1,413.82, 8 percent of \$1,060.36.

NOTE.—All equipment to be shipped to Chicago, Ill., when contract is terminated.

APPENDIX TO SCHEDULE A

COMPUTATIONS OF RENTAL

ARTICLE I. 240-HOUR MONTHLY BASIS

All items of equipment shown on the attached Schedule A, consisting of five pages, except the last three items shown on page 5, namely, 2 Mercury Sedan Coupes and 1 Mercury Fordor Sedan, are rented on a 240-hour monthly basis.

For any such piece of equipment rented by the month and—

(1) Which is not in actual use for more than 240 hours during one monthly period, the rental price shall be the rental price calculated upon the basis of the applicable rate "per month" in the Table of Rates set forth in this Schedule;

(2) Which is in actual use for more than 240 hours during one monthly period, the rental price for each additional hour, or part thereof, of actual use shall be the rental price calculated upon the basis of 1/480th of such applicable rate "per month";

(3) Which remains in the possession of the Lessee for a part of a monthly period beyond one or more full monthly periods, the rental price for such equipment for such part of the monthly period shall be the higher of the following: (i) 1/30th of the applicable rate "per month" for each daily period, or part thereof, of possession or (ii) 1/240th of the applicable rate "per month" for each hour, or part thereof, of actual use: *Provided*, That if such equipment is in actual use during such part of a monthly period for more than 240 hours, the rental shall be the rental price determined in accordance with subparagraphs (1) and (2) of this Article.

ARTICLE 2. FLAT MONTHLY BASIS

The 2 Mercury Sedan Coupes and the Mercury Fordor Sedan (the last three items on page 5 of Schedule A) are rented on a flat monthly basis of \$84.83 for each vehicle, irrespective of the number of hours in use.

(APPENDIX B)

Wage-rate schedule (laborers and mechanics), Northwest division, May 29, 1943

Classifications	Alaska and western Canada ¹	South of Resolution ²	North of Resolution ³
Acetylene burner.....	\$1.565	\$1.565	-----
Air-hammer operators, open cut.....	1.315	1.315	-----
Asbestos workers.....	1.515	1.50	-----
Asphalt-tile layers.....	1.465	1.465	-----
Auto mechanics.....	1.565	1.50	\$1.65
Helpers.....	1.065	1.065	1.17
Apprentices:			
First year.....	.815	.815	-----
Second year.....	.965	.965	-----
Third year.....	1.19	1.19	-----
Fourth year.....	1.34	1.34	-----
Blacksmiths.....	1.565	1.50	1.65
Blacksmiths' helpers.....	1.25	1.20	1.32
Boilermakers.....	1.615	1.615	1.78
Boilermakers' helpers.....	1.44	1.44	-----
Bricklayers.....	1.725	1.50	1.65
Bricklayer mortarmen.....	1.265	1.265	-----
Buckers and fallers:			
Clearing and grubbing.....	.965	.965	-----
Merchantable timber.....	1.166	1.165	-----
Cable splicers (riggers).....	1.615	1.615	-----
Carpenters:			
Journeyman.....	1.415	1.50	1.65
Anchorage only.....	1.50	-----	-----
Apprentices:			
First year.....	.965	.965	-----
Second year.....	1.065	1.065	-----
Third year.....	1.215	1.215	-----
Fourth year.....	1.315	1.315	-----
Cement dumpers.....	1.315	1.315	-----
Cement finishers.....	1.44	1.50	1.65

See footnotes at end of table, p. 232.

(APPENDIX B)—continued

Wage-rate schedule (laborers and mechanics), Northwest division, May 29, 1943—
Continued

Classifications	Alaska and western Canada ¹	South of Resolution ²	North of Resolution ³
Cement apprentices:			
First year.....	\$1.065	\$1.065	-----
Second year.....	1.165	1.165	-----
Third year.....	1.315	1.315	-----
Cement unloaders (fuller-kinyon).....	1.315	1.315	-----
Choker setters (rock and timber).....	1.165	1.165	-----
Chuck tenders.....	1.165	1.165	-----
Concrete chippers.....	1.315	1.315	-----
Concrete finishers.....	1.44	1.50	-----
Concrete helpers (mortar mixers).....	.965	1.00	-----
Concrete form strippers:			
Building construction.....	.965	1.00	-----
Heavy construction.....	.965	1.00	-----
Concrete rodders.....	1.315	1.315	-----
Concrete spreaders:			
Paving and floors.....	1.315	1.315	-----
All others.....	.965	.965	-----
Ditch diggers.....	.965	1.00	-----
Dumpmen and spotters.....	1.165	1.165	-----
Electricians.....	1.615	1.60	\$1.65
Apprentices:			
First year.....	1.125	1.125	-----
Second year.....	-----	-----	-----
Third year.....	-----	-----	-----
Fourth year.....	1.20	1.20	-----
Cable splicers.....	1.75	1.50	1.65
Groundmen.....	1.125	1.125	-----
Firemen and oilers.....	1.30	1.25	1.375
Floor layers (hardwood).....	1.515	1.515	-----
Glassworkers.....	1.365	1.365	-----
Ironworkers:			
Reinforcing.....	1.415	1.415	1.56
Apprentices.....	.96	.96	-----
Do.....	1.065	1.065	-----
Laborers:			
Building.....	.965	1.00	-----
Concrete.....	.965	1.00	-----
General.....	.965	1.00	1.10
Heavy construction.....	.965	1.00	-----
Lathers (metal and wood).....	1.615	1.615	-----
Linemen.....	1.615	1.615	-----
Machinists.....	1.565	1.50	1.65
Machinists' helpers.....	1.065	1.065	1.17
Machinists' apprentices:			
First year.....	.815	.815	-----
Second year.....	.965	.965	-----
Third year.....	1.19	1.19	-----
Fourth year.....	1.34	1.34	-----
Marble setters.....	1.725	1.725	-----
Marble-setters' helpers.....	1.25	1.25	-----
Nippers (outside).....	.965	1.00	-----
Painters:			
Brush.....	1.415	1.50	1.65
Anchorage only.....	1.50	-----	-----
Sign writer.....	1.715	1.715	-----
Spray gun.....	1.565	1.565	-----
Structural steel.....	1.64	1.54	-----
Apprentices:			
First year.....	.965	.965	-----
Second year.....	1.065	1.065	-----
Third year.....	1.165	1.165	-----
Fourth year.....	1.265	1.265	-----
Pile-driver men.....	1.465	1.50	1.65
Pipe fitters.....	1.615	1.50	1.65
Plasterers.....	1.75	1.75	-----
Hodcarriers.....	1.265	1.265	-----
Plumbers.....	1.615	1.50	1.65
Powderman:			
Open cut.....	1.315	1.25	1.375
Powderman, helper.....	.965	.965	-----
Power-equipment operator:			
Aggregate screen plant operator.....	1.60	1.60	-----
Air compressors.....	1.50	1.25	1.375
Operator, building.....	1.70	1.60	-----
Backfilling machines.....	1.75	1.75	-----
Bulldozer.....	1.60	1.60	1.65
Cableways.....	1.85	1.85	-----

See footnotes at end of table, p. 232.

(APPENDIX B)—continued

Wage-rate schedule (laborers and mechanics), Northwest division, May 29, 1943—
Continued

Classifications	Alaska and western Canada ¹	South of Resolution ²	North of Resolution ³
Power-equipment operator—Continued			
Concrete-mixer operator:			
Paving type.....	1.85	1.85	
Dual drum.....	2.00	2.00	
All others.....	1.60	1.25	1.375
Concrete pump operators.....	1.50	1.50	1.65
Conveyors:			
Elevator construction.....	1.655	1.655	
Helper.....	1.16	1.16	
Maintenance men.....	1.49	1.49	
Maintenance helper.....	1.04	1.04	
Core drillers.....	1.50	1.50	
Helpers.....	1.20	1.20	
Cranes, locomotive or clamshells.....	1.35	1.75	1.925
Crusher operators.....	1.60	1.50	1.65
Complete plant maintenance.....	1.60	1.60	
Derricks:			
Excavating.....	1.55	1.75	
Steel erection.....	1.70	1.70	
All others.....	1.70	1.70	
Draglines.....	2.00	1.75	1.925
Finishing machines (concrete).....	1.60	1.50	1.65
Loader machines.....	1.75	1.75	
Motor graders.....	1.60	1.50	1.65
Pile-driver:			
Engineers.....	1.60	1.60	
Boommen.....	1.515	1.515	
Riggers.....	1.465	1.465	
Power shovel and shovel converted into crane.....	2.00	1.75	1.925
Pumps.....	1.60	1.60	
Roller:			
Plant-mix material.....	1.75	1.75	
Operator.....	1.45	1.45	1.595
All others.....			
Shovels.....	2.00	1.75	1.925
Tractors.....	1.60	1.50	1.65
Trenching machine:			
Under 16 inches.....	1.75	1.50	1.65
Over 16 inches.....	1.95	1.95	
Timbermen.....	1.165	1.165	
Winch and hoist.....	1.60	1.60	
Riggers:			
High line.....	1.615	1.50	1.65
Slings:			
Logging.....	1.165	1.165	
Apprentices.....	1.065	1.065	
Roofers:			
Composition.....	1.415	1.415	
Kettlemen.....	1.065	1.065	
Sewerman:			
Including pipe laying.....	1.165	1.165	
Calkers.....	1.165	1.165	
Sheet-metal workers.....	1.565	1.565	1.72
Helpers.....	1.065	1.065	1.17
Soft floor layers (linoleum).....	1.285	1.285	
Station diggers and timberman.....	1.165	1.165	
Steam fitters.....	1.615	1.50	1.65
Stonemasons, finish, wall, rubble.....	1.725	1.725	
Terrazzo workers.....	1.60	1.60	
Helpers.....	1.25	1.25	
Tile setters.....	1.725	1.725	
Trackmen.....	.965	1.00	
Truck driver:			
Dump, 5 cubic yards and under.....	1.40	1.40	1.54
Over 5 cubic yards.....	1.55	1.55	
Pick-up.....	1.10	1.10	
Service and flat-rack, 2¼-ton.....	1.20	1.20	1.32
Vibrator man.....	1.165	1.165	
Wagon-drill operator.....	1.55	1.55	
Welders.....	(^b)	1.50	1.65

¹ Western Canada—British Columbia and Yukon Territory.

² Resolution, Northwest Territory on the Mackenzie River.

³ Receive rate prescribed for craft performing operation to which welding is incidental.

NOTE.—The rate for foremen shall be from 12¼ to 25 cents above journeyman's scale.

(APPENDIX B)

*Supplement No. 1 to wage rate schedule (laborers and mechanics), Northwest division
May 29, 1943*

Classifications	Alaska and Western Canada ¹	South of Resolution ²	North of Resolution ³
Drillers.....	\$1.315	\$1.315	\$1.315
Mechanics, heavy-duty.....	1.650	1.650	1.650
Scrapers, carry-alls.....	1.700	1.700	1.700
Truck driver, cargo body, 2½ to 7 tons.....	1.400	1.400	1.400
Truck driver, cargo body over 7 tons.....	1.550	1.550	1.550
Welders (pipe line and tank).....	1.750	1.750	1.750
			Western Canada (only)
Machinists.....			\$1.75
Ironworkers, structural.....			1.75
Bridge laborers.....			1.25
Yard laborers.....			1.25

¹ Western Canada—British Columbia and Yukon Territory.² Resolution, Northwest Territory on the Mackenzie River.

(APPENDIX B)

WAR DEPARTMENT,
OFFICE OF THE DIVISION ENGINEER,
NORTHWEST DIVISION,
Edmonton, Alberta, Canada, July 28, 1943.

Division Circular Letter No. 97 (Labor Relations No. 13) (Supplement No. 2).

Subject: Additions to or revisions of wage rate schedule (laborers and mechanics) dated May 29, 1943 (enclosure No. 1 to division circular letter 97).

To: District engineers, area engineers, contractors, and others concerned.

1. The following classifications and wage rates are additions to or revisions of rates and classifications listed in the Wage Rate Schedule dated May 29, 1943, attached to Northwest Division Circular Letter No. 97 of the same date.

[Rates per hour]

Classification	Alaska only	Western Canada	South of Resolu- tion	North of Resolu- tion
Asphalt raker.....	\$1.30	\$1.30	\$1.30	\$1.30
Asphalt paving machine operator.....	1.60	1.60	1.60	1.60
Asphalt plant operator.....	1.60	1.60	1.60	1.60
Carpenters.....	1.50	1.50	1.50	1.65
Heavy-equipment mechanic.....	1.75	1.75	1.75	1.75
Mechanics' helpers:				
Auto.....	1.065	1.25	1.25	1.32
Carpenter.....	1.25	1.25	1.25	1.32
Electrician.....	1.25	1.25	1.25	1.32
Machinist.....	1.065	1.25	1.25	1.32
Pipefitter.....	1.25	1.25	1.25	1.32
Pipe-line.....	1.25	1.25	1.25	1.32
Plumber.....	1.25	1.25	1.25	1.32
Sheetmetal.....	1.065	1.25	1.25	1.32
Steamfitter.....	1.25	1.25	1.25	1.32
Welder.....	1.25	1.25	1.25	1.32
Refrigeration mechanic.....	1.615	1.615	1.50	1.65

2. Above rates effective August 1, 1943, except where approval has previously been granted.

For the division engineer:

H. E. THURSTON,
Major, Corps of Engineers,
Executive Assistant.

(APPENDIX C)

Monthly salary schedule: administrative, supervisory, and nonmanual salaries for Canada and Alaska, May 29, 1943

[United States citizens (United States funds)]

	Minimum	Maximum		Minimum	Maximum
Accountant, chief (1).....	\$400	\$500	Interviewer.....	\$250	\$350
Accountant, senior.....	350	425	Janitor.....	100	175
Accountant.....	250	350	Labor relations manager (1).....	400	500
Administration manager (1).....	650	750	Labor relations, assistant.....	300	400
Administration manager, assistant.....	600	700	Laundryman.....	225	300
Architect, construction.....	500	650	Machine operator.....	125	200
Auditor, chief (1).....	450	500	Maid.....	75	125
Auditor.....	250	350	Master mechanic.....	500	650
Axman.....	120	200	Mate, first.....	250	450
Baker.....	250	400	Mate, second.....	175	300
Barber.....	200	250	Mate, third.....	125	200
Boat captain.....	300	550	Matron.....	150	250
Buyer.....	225	350	Messenger.....	100	140
Canteen manager.....	250	350	Motion-picture operator.....	250	300
Canteen clerk.....	225	275	Motorboat operator.....	200	400
Chainman.....	150	300	Office manager.....	350	450
Checker, materials.....	150	250	Office manager, assistant.....	300	400
Clerk, chief.....	250	400	Oiler, marine.....	100	250
Clerk, field.....	165	300	Partsman.....	250	400
Clerk, senior.....	200	300	Paymaster.....	250	350
Clerk.....	110	200	Pay-roll manager (1).....	400	450
Commissary helper.....	225	250	Pay-roll manager, assistant.....	300	400
Comptometer operator.....	150	225	Personnel manager (1).....	450	550
Comptroller (1).....	500	600	Photographer.....	250	300
Comptroller, assistant.....	400	500	Photostat operator.....	150	200
Contracts, manager (1).....	500	550	Pilot, air.....	200	700
Contracts, man.....	350	400	Pilot, marine.....	250	550
Cook, first.....	400	400	Project manager (1).....	650	750
Cook, second.....	300	300	Property supervisor.....	400	600
Deckhand.....	200	250	Property supervisor, assistant.....	350	500
District administrator.....	500	650	Property man.....	250	350
District, manager.....	650	750	Purchasing agent, chief (1).....	550	650
District manager, assistant.....	650	700	Purchasing agent.....	450	500
District superintendent.....	650	750	Purchasing agent, assistant.....	350	450
Dog team driver.....	125	200	Receptionist.....	150	175
Draftsman, chief.....	500	700	Rodman.....	200	350
Draftsman.....	350	525	Seaman.....	100	200
Driver.....	125	200	Secretary.....	160	250
Employment agent, chief.....	400	500	Service and supply manager (1).....	650	700
Employment agent.....	300	400	Service and supply manager, assistant.....	450	600
Employment agent, assistant.....	225	350	Shoemaker (plus shop profits).....	150	250
Engineer, chief (1).....	600	750	Stenographer.....	130	180
Engineer, district.....	650	750	Stenographer, technical.....	160	225
Engineer, senior.....	500	750	Steward, chief.....	500	600
Engineer.....	350	500	Steward, camp.....	400	450
Engineer, air.....	100	600	Stokekeeper.....	250	400
Engineer, cost, chief (1).....	500	650	Superintendents.....	600	750
Engineer, cost (1).....	450	500	Superintendent, assistant.....	450	600
Engineer, marine.....	250	550	Superintendent, general (construction).....	650	750
Engineer, safety.....	300	400	Superintendent, general assistant.....	350	450
Expeditor, chief (1).....	400	550	Supply, chief (1).....	500	600
Expeditor.....	250	400	Telephone operator.....	125	200
File supervisor.....	175	225	Teletype operator.....	125	200
First-aid man.....	200	300	Timekeeper, chief (1).....	350	500
Foreman, general.....	500	650	Timekeeper.....	150	300
General manager (1).....	600	750	Transportation, chief (1).....	450	650
General manager, assistant (1).....	600	700	Transportation, chief, assistant.....	300	500
Guard.....	150	200	Traffic manager.....	450	550
Guides.....	150	300	Traffic man.....	350	400
Housing chief (1).....	400	500	Typist.....	120	150
Housing agent.....	225	300	Waitress.....	150	250
Inspectors, senior.....	400	600	Warehouseman.....	200	350
Inspectors.....	200	400	Wheelman.....	150	300
Instrument man.....	250	400			
Insurance man.....	250	400			

NOTE.—In addition to the monthly rate given for pilots, compensation will be paid at the rate of \$5 per hour for all hours in excess of 60 hours' actual flying time up to a total of 100 flying hours per month. For individuals flying in excess of 100 hours per month, no additional bonus will be paid.

Supplemental Agreement No. 1

SUPPLEMENTAL AGREEMENT

To Cost-Plus-a-Fixed-Fee Contract No. W-3416-Eng-736, dated October 25, 1943, for the construction of bridges along the Alaska Highway

Contractor and address: Bates & Rogers Construction Corp., 111 West Washington Street, Chicago, Ill.

Supplemental agreement for: Reduction of bridge construction.

Estimated cost: Reduced to \$2,247,640.

Fixed fee: Reduced to \$75,000.

Payment to be made by: Finance officer, United States Army at United States Engineer Office, Edmonton, Alberta, Canada.

The supplies and services to be obtained by this instrument are authorized by, are for the purposes set forth in, and are chargeable to the following procurement authority, the available balance of which is sufficient to cover the cost of same: 8-30403 PA30-10 A0905-24

This supplemental contract is authorized by the First War Powers Act, and Executive Order No. 9001, December 27, 1941.

Supplemental Agreement No. 1
Contract No. W-3416-Eng-736

SUPPLEMENTAL AGREEMENT

This supplemental agreement entered into this 10th day of February 1944, between the United States of America (hereinafter referred to as the "Government"), represented by the Contracting Officer executing this Agreement, and Bates and Rogers Construction Corporation, a corporation organized under and by virtue of the laws of the State of Delaware, having its principal office at 111 West Washington Street, Chicago, Illinois (hereinafter referred to as the "Contractor");

Witnesseth that:

Whereas on the 25th day of October 1943, the parties hereto entered into Contract No. W-3416-Eng-736 for the construction of new and the completion of existing bridges over certain rivers and streams intersecting the Alaska Highway at points and places lying within the Whitehorse District, Yukon Territory, and the Dawson Creek District, British Columbia, Canada; and

Whereas by virtue of the power vested in the Contracting Officer under the provisions of Article I, paragraph 5, of said Principal Contract, the Contracting Officer may at any time require additional work or services or direct the omission of work or services covered by the Principal Contract, provided, however, that if such changes cause a material increase or decrease in the amount or character of the work to be done thereunder, an equitable adjustment of the amount of the fixed fee to be paid the Contractor shall be made and the Contract shall be modified accordingly; and

Whereas in order to facilitate the prosecution of the war, the Government and the Contractor desire to modify said Principal Contract by deleting therefrom the construction and completion of certain bridges in the Whitehorse and Dawson Creek Districts and adding thereto the construction and completion of certain bridges in the Fairbanks District, Fairbanks, Alaska;

Now, therefore, the parties hereto mutually agree that said Principal Contract No. W-3416-Eng-736 shall be and the same is hereby modified in the following manner and upon the terms and conditions hereinafter set forth.

1. The statement of work described in Article I of said Principal Contract is hereby modified to include the following work and services:

FAIRBANKS DISTRICT

Bridge No.	Name of river or stream	Description of work
717	Chisana.....	Construct steel bridge, place concrete deck.
704	Tanana.....	Install timber deck and paint.
705	Tok No. 1.....	Erect steel and place concrete deck.
706	Yerrick.....	Paint.
707	Robertson.....	Erect steel and place concrete deck.
710	Berry.....	Construct steel and concrete bridge.
712	Johnson.....	Erect 1 (160 foot) span, place timber deck on 160 foot span; rivet 4 (200 foot) spans; paint.
714	Big Gerstle.....	Erect steel and place concrete deck.
700	Scottie.....	Paint.
701	Gardner.....	Do.
703	Bitters.....	Do.

During construction of the Chisana, Tanana, Tok No. 1, Robertson, and Big Gerstle bridges, the contractor shall maintain the temporary timber bridges and shall remove the same upon completion of new construction. All materials shall be stock piled at the bridge sites under the direction of the Contracting Officer.

2. Delete and omit all work and services hereinafter described in connection with construction of the following bridges:

WHITEHORSE DISTRICT

Bridge No.	Name of river or stream	Description of work
441	Snag.....	Construct steel bridge.
440	Beaver.....	Do.
435	Donjek.....	Do.
431	Duke.....	Do.
420	Lewes.....	Do.
406	Upper Rancheria.....	Do.
404	Lower Rancheria.....	Do.
403	Big Creek.....	Do.
402	Little Rancheria.....	Do.
415	Deadman.....	Replace timber deck with concrete.
411	Logjam.....	Do.
410	Screw.....	Do.
409	Partridge.....	Do.
408	Seagull.....	Do.
401	Albert.....	Do.

3. The work and services required to be performed by the Contractor in connection with the remaining bridges in the Whitehorse District shall remain unchanged.

Bridge No.	Name of river or stream	Description of work
400	Upper Liard.....	Complete bridge under construction.
416	Teshin.....	Construct steel bridge.
433	White.....	Complete bridge under construction.

4. Delete and omit all work and services hereinafter described in connection with construction of the following bridges:

DAWSON CREEK DISTRICT

Bridge No.	Name of river or stream	Description of work
125	Station 5745.....	Construct concrete bridge.
124	107 mile.....	Construct steel bridge.
123	Station 5548.....	Construct concrete bridge.

5. The only work and services required to be performed by the Contractor in connection with the remaining bridges in the Dawson Creek District which were included in the Principal Contract (indicated by an asterisk below) shall be as hereinafter described; in addition to which the Contractor shall perform the work herein described on additional bridges not included in the Principal Contract.

Bridge No.	Name of river or stream	Description of work
*114	Muskwa.....	Paint.
116	Kledo.....	Do.
117	Steamboat.....	Do.
118	Mill.....	Do.
*119	Tetsa.....	Install timber deck and paint.
120	do.....	Paint.
*123	McDonald.....	Do.
*129	Racing.....	Do.
*134	Toad.....	Install timber deck and paint.
135	Peterson.....	Paint.
136	do.....	Do.
137	Trout.....	Do.
139	Lower Llard.....	Do.
141	Smith.....	Do.
142	Coal.....	Do.
*143	Iron.....	Construct timber trestle bridge.
144	Hyland.....	Paint.
146	Peterson.....	Do.
*147	Contact.....	Construct timber trestle bridge.

6. The Contractor shall perform such other work and services in connection with and incidental to the construction of the bridge work as may be directed by the Contracting Officer or his authorized representative. All work and services shall be performed in accordance with plans, drawings, and specifications on file in the office of the Contracting Officer and shall be subject in every detail to his supervision, direction, instructions, and approval.

7. It is understood and agreed by and between the parties that by reason of the foregoing additions, deletions, and modifications, the original estimated cost of the work, \$3,792,808.00, set forth in Article I, paragraph 3 of said Principal Contract, is decreased by \$1,545,168.00, thus revising the estimated cost of the work to \$2,247,640.00. It is expressly understood, however, that neither the Government nor the Contractor guarantees the correctness of this estimate.

8. It is further understood and agreed that by reason of the foregoing modifications, the fixed fee of \$114,825.00, set forth in Article I, paragraph 3 (c) of the Principal Contract is decreased by \$39,825.00, and the revised fixed fee to be paid the Contractor for the work required to be performed under said contract, as modified herein shall be \$75,000.00, which shall constitute complete compensation for the contractor's services, including profit and all general overhead expenses.

9. Article X of the Principal Contract, covering "Labor," is hereby amended and modified as follows:

(a) *Wage Rates in Alaska.*—It is mutually understood and agreed that, effective upon the date hereof, the wage rates for laborers and mechanics set forth in Appendix "B" to the Principal Contract shall be inapplicable to any part of the work performed in the Territory of Alaska. In lieu thereof, the Contractor or any Subcontractor shall pay all laborers and mechanics employed directly upon the site of the work in Alaska unconditionally and not less often than once a week the full amount of wages accrued at the time of payment, computed at the prevailing rates not less or more than those set forth in the attached wage determination of the Secretary of Labor, dated December 30, 1943, marked Appendix "A" and made a part hereof, regardless of any contractual relationship which may exist between the Contractor or Subcontractors and such laborers and mechanics.

(b) Any class of laborers and mechanics not listed in Appendix "A", which will be employed in Alaska on this contract, as amended herein, shall be classified or reclassified conformably to Appendix "A" by mutual agreement between the Contractor and class of labor concerned, subject to the prior approval of the Contracting Officer. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question, accompanied by the recommendation of the Contracting Officer, shall be referred to the Secretary of Labor for final determination. The wages specified in Appendix "A" shall be the maximum wages to be

paid, subject, however, to Executive Order No. 9250 and the General Orders and Regulations issued thereunder.

(c) Paragraph 4 of Article X of said Principal Contract is amended by the inclusion of the following provision:

For each violation of the requirements of this article in Alaska, a penalty of \$5 shall be imposed upon the Contractor for each laborer or mechanic for every calendar day in which such employee is required or permitted to labor more than 8 hours upon said work without receiving compensation computed in accordance with this article, and all penalties thus imposed shall be withheld for the use and benefit of the Government: *Provided*, That this stipulation shall be subject in all respects to the exceptions and provisions of U. S. Code, title 40, section 321, 324, 325, and 326, relating to hours of labor, as modified by the provisions of Section 303 of Public Act No. 781, 76th Congress, approved September 9, 1940, relating to compensation for overtime.

(d) *Nonrebate of Wages*.—The Contractor shall comply with the regulations of the Secretary of Labor pursuant to the Act of June 13, 1934, 48 Stat. 948 (U. S. Code, title 40, secs. 276b and 276c), and any amendments or modifications thereof, shall cause appropriate provisions to be inserted in subcontracts to insure compliance therewith by all Subcontractors subject thereto, and shall be responsible for the submission of affidavits required of Subcontractors thereunder, except as the Secretary of Labor may specifically provide for reasonable limitations variations, tolerances, and exemptions from the requirements thereof.

(e) The regulations of the Secretary of Labor, referred to in Section (d), above, allow certain "permissible deductions" from the wages required to be paid.

(f) *Antidiscrimination*.—The Contractor, in performing the work required by this contract, as modified herein, shall not discriminate against any worker because of race, creed, color, or national origin.

(g) *Convict Labor*.—The Contractor shall not employ any person undergoing sentence of imprisonment at hard labor.

10. Except as herein modified, all terms and conditions of Contract No. W-3416-Eng-736 shall remain in force and effect.

In witness whereof, the parties hereto have executed this Agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA,
By C. M. CLIFFORD,

*Lieutenant Colonel, Corps of Engineers,
Contracting Officer.*

BATES AND ROGERS CONSTRUCTION CORPORATION,
By F. L. COPELAND,

Vice President.

Witnesses:

E. N. MARTIN.

W. P. LUNDENMEYER.

I, D. B. Cassell, certify that I am the Secretary of the Corporation named as Contractor herein; that F. L. Copeland, who signed this contract on behalf of the Contractor was then Vice President of said Corporation; that said contract was duly signed for and on behalf of said Corporation by authority of its governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my hand and the seal of said Corporation this 28th day of February 1944.

[CORPORATE SEAL]

D. B. CASSELL, *Secretary.*

(APPENDIX "A")

DEPARTMENT OF LABOR,
OFFICE OF THE SOLICITOR,
Washington 25, December 30, 1943.

Lt. Col. C. D. BARKER (CE),
Chief, Labor Relations Branch,

*Construction Division, War Department,
Washington 25, D. C.*

DEAR COLONEL BARKER: Enclosed you will find copy of the decision of the Secretary of Labor with respect to contracts for the construction of buildings, including fortifications, roads, utilities, etc., in the Territory of Alaska. A decision was rendered in these cases on August 14, 1942, as modified June 8, 1943,

and August 10, 1943, and as superseded on September 28, 1943. Since that time additional data and more current information have been assembled and the instant decision is intended to supersede the decision of August 14, 1942, as subsequently modified and superseded.

Very truly yours,

ARTHUR D. HILL, Jr.,
Assistant Solicitor.

(Enclosure.)

(Agency)
December 30, 1943.

DECISION OF THE SECRETARY

These cases were first before the Department of Labor pursuant to requests of August 7, 1942, by the Corps of Engineers of the War Department, for wage predetermination under the Davis-Bacon Act, as amended (act of August 30, 1935 (49 Stat. 1011, U. S. C. title 40, sec. 276 (a)) and as further amended on June 15, 1940 (Public Law 633)), with respect to contracts for the construction of buildings, including fortifications, roads, utilities, etc., in the Territory of Alaska.

They are again before the Department of Labor pursuant to a request dated November 4, 1943, for correction or confirmation of previous findings.

In accordance with the terms of the regulations promulgated by the Secretary of Labor (reg. 503, dated September 30, 1935), a study was made of wage conditions in the locality on the basis of the data submitted by the War Department and other information assembled by the Department of Labor. A decision based on such information was rendered on August 14, 1942, as modified June 8, 1943, and August 10, 1943, and as superseded on September 28, 1943. Since that time additional data and more current information have been assembled, and the instant decision is designed to supersede the decision of August 14, 1942, as subsequently modified and superseded.

The following are hereby found to be the prevailing rates of wages for the requested crafts:

Wage-rate schedule for laborers and mechanics in Alaska

	Per hour		Per hour
Asbestos workers.....	\$1.515	Concrete finisher's helpers (mortar mixers)	\$1.015
Acetylene burners.....	1.615	Concrete form strippers, building construction	1.015
Aggregate screen plant operators.....	1.600	Concrete form strippers, heavy construction	1.015
Air hammer operators—open cut.....	1.315	Concrete mixer operators, paving type.....	1.850
Asphalt tile layers.....	1.465	Concrete mixer operators, dual drum.....	2.000
Auto mechanics.....	1.565	Concrete mixer operators, all others.....	1.600
Auto mechanic's helpers.....	1.065	Concrete pump operators.....	1.600
Auto mechanic's apprentices:		Concrete rudders.....	1.315
First year.....	.815	Concrete spreaders—paving and floors.....	1.315
Second year.....	.965	Concrete spreaders—all others.....	1.015
Third year.....	1.190	Conveyors—elevator construction.....	1.655
Fourth year.....	1.340	Conveyor's helpers.....	1.160
Axmen.....	1.015	Conveyor's maintenance men.....	1.490
Blacksmiths.....	1.565	Conveyor's maintenance helpers.....	1.040
Blacksmith's helpers.....	1.250	Core drillers.....	1.500
Boilermakers.....	1.615	Core driller's helpers.....	1.200
Boilermaker's helpers.....	1.440	Crusher operators.....	1.600
Bricklayers.....	1.780	Crusher operators complete plant maintenance	1.600
Bricklayer's mortar men.....	1.265	Ditch diggers.....	1.015
Buckers and fallers, clearing and grubbing.....	1.015	Dumpmen and spotters.....	1.165
Buckers and fallers, merchantable timber.....	1.165	Electricians.....	1.680
Carpenters, journeyman.....	1.500	Electrician's apprentices:	
Carpenter's apprentices:		First year.....	1.125
First year.....	.965	Fourth year.....	1.200
Second year.....	1.065	Electricians, groundmen.....	1.125
Third year.....	1.215	Electricians, cable splicers.....	1.750
Fourth year.....	1.315	Firemen and oilers.....	1.300
Cement jumpers.....	1.315	Flagmen.....	1.015
Cement finishers.....	1.500	Floor layers—hardwood.....	1.515
Cement finisher's apprentices:		Glass workers.....	1.365
First year.....	1.065	Trench machine timbermen.....	1.665
Second year.....	1.165	Painters, sign writers.....	1.715
Third year.....	1.315	Ironworkers, structural.....	1.680
Cement unloaders—tuller-kinyon.....	1.315	Ironworkers, structural apprentices.....	1.065
Chasers.....	1.015	Ironworkers, reinforcing.....	1.480
Choker setters—rock and timber.....	1.165		
Chucktenders.....	1.165		
Concrete chippers.....	1.315		
Concrete finishers.....	1.500		

Wage-rate schedule for laborers and mechanics in Alaska—Continued

	Per hour		Per hour
Ironworkers, reinforcing apprentices.....	\$1. 015	Power equipment operators—Continued	
Laborers, building.....	1. 015	Motor graders.....	\$1. 600
Laborers, concrete.....	1. 015	Pile-drivers' engineers.....	1. 600
Laborers, unskilled.....	1. 015	Power shovel and shovel converted into crane.....	2. 000
Lathers—wood.....	1. 615	Pumps.....	1. 600
Lathers—metal.....	1. 680	Rollers, plant mix material.....	1. 750
Linemen.....	1. 665	Rollers, operators, all others.....	1. 450
Machinists.....	1. 065	Shovels.....	2. 000
Machinists' helpers.....	1. 065	Tractors.....	1. 600
Machinists' apprentices:		Trenching machines (under 16-inch).....	1. 750
First year.....	. 815	Trenching machines (over 16-inch).....	1. 950
Second year.....	. 965	Winch and hoist.....	1. 600
Third year.....	1. 190	Sewermen (including pipe laying).....	1. 165
Fourth year.....	1. 340	Sewermen culkers.....	1. 165
Marble setters.....	1. 725	Sheet-metal workers.....	1. 630
Marble setters' helpers.....	1. 250	Sheet-metal workers' helpers.....	1. 065
Miners.....	1. 400	Slopes.....	1. 015
Nippers.....	1. 015	Soft floor layers (linoleum).....	1. 265
Painters, brush.....	1. 600	Station diggers and timbermen.....	1. 165
Painters, spray gun.....	1. 665	Steam fitters.....	1. 680
Painters, structural steel.....	1. 640	Stone masons, finish, wall and rubble.....	1. 780
Painters' apprentices:		Teamsters.....	1. 015
First year.....	. 965	Terrazzo workers.....	1. 600
Second year.....	1. 065	Terrazzo workers' helpers.....	1. 250
Third year.....	1. 165	Tile setters.....	1. 725
Fourth year.....	1. 265	Trackmen.....	1. 015
Pile-driver men.....	1. 530	Truck drivers, dump, 5 yards, or less.....	1. 350
Pile-driver men boom men.....	1. 580	Truck drivers, dump, over 5 and including 12 yards.....	1. 550
Pipe fitters.....	1. 680	Truck drivers, dump, over 12 and including 20 yards.....	1. 700
Plasterers.....	1. 750	Truck drivers, dump, over 20 yards.....	1. 850
Plasterers' hodcarriers.....	1. 265	Truck drivers, service and flatrack, 2½ tons.....	1. 200
Plumbers.....	1. 680	Truck drivers, pick-up.....	1. 100
Plumbers' helpers.....	1. 065	Roofers.....	1. 480
Powderman—open cut.....	1. 375	Roofers' kettlemen.....	1. 065
Powderman helpers.....	1. 015	Riggers, highline—receive rate prescribed for craft performing operation to which rigging is incidental.....	1. 165
Power equipment operators:		Riggers' apprentices.....	1. 065
Air compressors.....	1. 500	Vibrator men.....	1. 550
Air compressors, building.....	1. 700	Wagon-drill operators.....	
Backfilling machines.....	1. 750	Welders receive rate prescribed for craft performing operation to which welding is incidental.....	
Bulldozers.....	1. 700		
Cableways.....	1. 850		
Cranes, locomotive or clamshells.....	2. 000		
Derricks, excavating.....	1. 850		
Derricks, steel erection.....	1. 700		
Derricks, all others.....	1. 700		
Draglines.....	2. 000		
Finishing machines (concrete).....	1. 600		
Le Tourneau.....	1. 700		
Loader machines.....	1. 750		

¹ Department of Labor Determination dated January 22, 1944, changes rate of truck drivers, dump, 5 yards or less, to \$1.40 per hour.

These rates are to be considered prevailing from the date of this decision unless the decision is changed, which changes will be applicable only to contracts awarded subsequent to the date of the change.

In accordance with the provisions of the said Davis-Bacon Act, as amended, these are the minimum wages to be inserted in the specifications for said contracts, and any class of laborers and mechanics (including apprentices) not listed in the preceding paragraph, which will be employed on these contracts, shall be classified or reclassified conformably to the foregoing schedule. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question, accompanied by the recommendation of the Contracting Officer, shall be referred to the Secretary of Labor for final determination.

By direction of the Secretary of Labor.

D. W. TRACY, Assistant Secretary.

APPENDIX L

(Chapter XII)

<i>Exhibit</i>	<i>Exhibit</i>
Report on maintenance of the Alaska Highway submitted to Chief of Engineers by Maj. W. H. Harvie, dated Aug. 11, 1944.....	1
Summary of monthly maintenance costs on the Alaska Highway, November 1943 through March 1945 (source: War Department files) ..	2
Total labor and equipment required for maintenance of Alaska Highway within Canada, September 1944 to April 1945 (source: War Department files).....	3
Monthly Maintenance Report covering Alaska Highway, Access Roads, Flight Strips, and Facilities for month ending Aug. 31, 1945.....	4
Maximum snow depths on the Alaska Highway (source: War Department files).....	5
Memorandum for Maj. Gen. Guy V. Henry, Sr., U. S. Army member, Permanent Joint Board of Defense, re abandonment of United States military facilities in Canada.....	6

EXHIBIT 1

ARMY SERVICE FORCES,
NORTHWEST SERVICE COMMAND AND NORTHWEST ENGINEER DIVISION,
DISTRICT HEADQUARTERS,
APO 702, Minneapolis, Minn., August 11, 1944.

Subject: Maintenance of the Alaska Highway.

To: Chief of Engineers, United States Army, Washington, D. C.

1. Introduction: On October 18, 1943, the Alaska Military Highway became a reality. An all-weather military road had been completed. Military authorities had been assured of uninterrupted flow of traffic.

2. Looking back over the construction period many obstacles had been conquered. Engineering and quartermaster troops completed a "tote" road in October 1942 in a short span of 8 months.

3. The Corps of Engineers was given the assignment of maintaining the highway, feeder roads, and flight strips. The lower section, 620 miles, was maintained with labor hired direct by the Corps of Engineers, while the remainder of the highway was under contract with three separate contractors, each responsible for their respective section of highway.

4. These various methods of maintenance permitted the Corps of Engineers to determine the relative costs and future maintenance standards. After a trial period it was demonstrated conclusively that purchase and hire method was the more economical.

5. Having direct control over the maintenance personnel permits the maintenance engineer to have a flexible organization and be consistent with the volume of traffic.

6. On June 1, 1944, the commanding officer, Northwest Service Command, issued a directive establishing a separate Alaska Highway Maintenance Division to take over the entire road maintenance, using hired labor. The original district boundaries were eliminated and the road maintenance headquarters were established at Whitehorse.

7. A treaty between Canada and the United States requires the United States to maintain the highway for the duration of the war and 6 months thereafter unless both parties agree to change such treaty. Believing the Canadian Government is interested in the continued maintenance of this highway, Canadians were recruited to replace American contractor employees. With qualified Canadians established in camps and maintaining the highway, our Government will be in a position to turn over to the Canadian Government a complete working organization. This recruitment program is complete except the anticipated usual employment turn-over.

8. Organization: Based on previous experience in the maintenance of the highway, routine maintenance camps have been established approximately every 40 miles between Dawson Creek and the Alaska border. Approximately every 100 miles the routine camps have an additional function of messing, housing, and dispensing of petroleum products to authorized transients traveling the highway. Where feasible, the hotel service, mentioned above, has been incorporated into

the established relay stations. The location of the camps, noted by miles from Dawson Creek, are as follows:

	<i>Mile</i>	
	0	Dawson Creek.
	20	Routine maintenance.
	49	Routine maintenance and equipment repair shop.
Blueberry-----	101	Routine maintenance and hotel service.*
	163	Routine maintenance.
Trutch-----	201	Routine maintenance and hotel service.
	245	Routine maintenance.
	278	Do.
Fort Nelson-----	300	Routine maintenance and hotel service.
	351	Routine maintenance.
Summit Lake-----	390	Routine maintenance and hotel service.
Muncho Lake-----	456	Do.
	496	Routine maintenance.
Coal River-----	543	Routine maintenance and hotel service.
	596	Routine maintenance.
Watson Lake-----	635	Routine maintenance and hotel service.
	670	Routine maintenance.
	710	Routine maintenance and hotel service.
	770	Routine maintenance.
Johnson Crossing--	804	Do.
	843	Routine maintenance and hotel service.
	883	Routine maintenance.
	911	Headquarters, Alaska highway maintenance, routine maintenance.
	956	Routine maintenance.
	1016	Routine maintenance and hotel service.
	1056	Routine maintenance.
Destruction Bay---	1083	Routine maintenance and hotel service.
	1156	Do.
	1206	Routine maintenance.
	1221	Alaska border.

9. An average of 11 employees will be required to maintain each section of the highway and operate a routine maintenance camp. An average of eight additional employees will be required to take care of the hotel service (messing, housing, and dispensing of petroleum products). The highway is divided into three sections, each under the jurisdiction of a general superintendent who reports direct to the division headquarters.

10. The primary objective of the maintenance organization is to develop permanent working conditions. To do this, families are permitted and are encouraged to establish residences at these camps. Quarters and living facilities are furnished. As families are incorporated in this plan, at routine maintenance camps, mess halls are closed, which will reduce the number of employees required as kitchen help.

11. Supply: Food subsistence and petroleum products are delivered to all camps from Dawson Creek to mile 479. The remainder of the highway is supplied direct from Whitehorse. Families desiring to do their own housekeeping are permitted to buy their food and other necessities direct from commissary stores established at Fort St. John, Fort Nelson, Watson Lake, and Whitehorse. These commissary stores are located in the vicinity of airports which permit employees of the Northwest Service Command to purchase necessities.

12. Equipment repair shops: Equipment repair shops have been established at Fort St. John, Fort Nelson, Watson Lake, and Whitehorse. These shops repair equipment assigned to the air bases, signal Corps, authorized users of the highway, and road maintenance.

13. Highway maintenance:

(a) Roads: Road maintenance is defined as a maintenance necessary to keep a road in a condition for which it was originally designed. Normally the standard of maintenance must be flexible, based on the type and volume of traffic.

(b) The Alaska Highway is subject to seasonal changes requiring attention without consideration being given to the volume of traffic. During the spring and summer seasons slides occur, flash floods are numerous, based on temperature melting mountain snow and seasonal rains.

(c) The section of the highway in the vicinity of Fort Nelson is subject to flash floods which cause numerous slides and sections of the road to be washed out during this summer season.

(d) The section of the highway from Kluane Lake, mile 1056, to the border, caused considerable difficulty in keeping the road open for traffic. The warm summer melting snow on the mountains and numerous rains develops streams crossing the road that could not be previously determined. These streams washed out portions of the highway which were repaired after the streams subsided, which continued over a period of approximately 1 week. This same section of the highway contained a considerable amount of permafrost which could not be avoided during the original construction. Some sections of this permafrost have settled, causing corrugations in the road which will be corrected with additional gravel material. It is expected that certain sections of the highway built over permafrost will continue to settle during the next 2 or 3 years.

(e) Winter maintenance along this highway is not a serious problem. The snowfall is light and is quite easily removed with proper snow-removal equipment. The only section causing some difficulty in snow removal was between mile 1,016 and mile 1,056 which required rotary snow-plow equipment.

(f) Glacial icing occurs at numerous locations along the entire highway but is not considered a maintenance obstacle with proper equipment for its prevention or removal. Steam generators and inverted hand-made salamanders proved quite satisfactory in icing prevention. Icing over the glacial river beds did not cause any serious maintenance problem.

14. Bridges: A bridge maintenance crew has been recruited with specialists in order to properly maintain timber trestle bridges.

(a) All permanent bridge structures have been completed with the exception of the Teslin River Bridge which is scheduled for completion October 1, 1944. The maintenance of bridges has been confined principally to renailling loose timbers, decking and replacing numerous approach fills which were washed out by the floods, with the following exceptions.

(1) The timber trestle bridge over the Donjek River collected considerable drift during the high-water period which washed out one bent and damaged a number of piles. These piles were replaced twice during the present season. A crane was stationed at this bridge to remove the debris, thereby, preventing further damage.

(2) A timber trestle bridge over the Slims River at the head of Kluane Lake was damaged due to scouring caused by the shifting of the channel. The stream bed is a light sandy loam which erodes very easily in a shifting current. The action scoured out and removed about 20 feet of material below the stream bed which caused 10 bents to settle, dropping the entire bridge floor about 20 feet to the water level. A bridge crew was able to remove the deck and replace the bents within a period of approximately 2 weeks. During this period traffic was directed around the old "tote" road.

(3) The Beaver Creek bridges collected considerable drift changing the course of the stream, thereby, washing out sections of the highway and removing several piles which were replaced by the bridge crew.

(4) Difficulty developed at the Snag River bridge from accumulation of drift causing piles to be replaced.

(b) The original bridge-construction program called for a number of timber trestle bridges to be replaced with steel spans. This steel has been shipped to Whitehorse and is available for future construction for the following bridges.

- (1) North Fork Tetsa No. 1, mile 389.0
- (2) Station 5548, mile 393.6.
- (3) 107 Mile Creek, mile 395.1.
- (4) Station 5745, mile 397.4.
- (5) Little Rancheria, mile 670.2.
- (6) Big Creek, mile 674.0.
- (7) Lower Rancheria, mile 687.2.
- (8) Upper Rancheria, mile 721.6.
- (9) Lewes River, mile 897.6.
- (10) Duke River, mile 1,098.5.
- (11) Donjek Trestle No. 7, mile 1,131.8.
- (12) Beaver Creek No. 1, mile 1,200.3.
- (13) Snag Creek, mile 1,208.0.

For the Commanding Officer:

W. H. HARVIE,
Major, Corps of Engineers, Director, Alaska Highway,
Maintenance Division.

EXHIBIT 2

Alaska Highway maintenance cost

	Miles of highway maintained	Costs from monthly maintenance reports	Cost per mile
1943—November.....	1,617.6	\$1,072,565.86	\$663.06
December.....	1,765.0	978,692.50	554.50
1944—January.....	1,629.9	754,525.91	462.94
February.....	1,555.4	794,062.81	510.52
March.....	1,550.0	681,411.00	439.62
April.....	1,328.2	415,460.96	312.80
May.....	1,511.5	345,317.29	228.46
June.....	1,289.5	255,566.00	198.19
July.....	1,291.5	220,446.13	170.69
August.....	1,291.5	239,689.48	185.59
September.....	1,291.5	242,436.04	187.72
October.....	1,291.5	269,502.10	208.70
November.....	1,291.5	339,117.03	262.58
December.....	1,291.5	282,593.61	218.81
1945—January.....	1,291.5	300,959.58	233.03
February.....	1,291.5	314,253.53	243.32
March.....	1,291.5	348,251.00	257.94
For period:			
Since under maintenance:			
Total.....		7,854,850.83	5,338.47
Average per month.....		462,050.05	314.03
Last 12 months:			
Total.....		3,573,592.75	2,707.83
Average per month.....		297,799.31	225.65

¹ Part of highway in Alaska turned over to Alaska Defense Command who then turned it over to Alaska Road Commission (Interior Department) for maintenance.

EXHIBIT 3

Total labor and equipment required for maintenance of Alaska Highway within Canada¹ during 8-month period, September 1944 to April 1945

Month	Total maintenance employees ¹	Total pieces of equipment
September 1944.....	385	910
October.....	423	918
November.....	424	949
December.....	439	1,010
January 1945.....	450	793
February.....	514	793
March.....	417	679
April.....	250	568

¹ Includes 1,220 miles of Alaska Highway and 71 miles of access roads. Therefore, maintenance force has averaged 1 man for each 3 miles of road maintained. The maintenance of 208 miles of Alaska Highway within Alaska is under the Alaska Road Commission, a civilian agency of the Department of the Interior. Costs of maintenance are believed to be slightly higher on the Alaskan sector than above costs.

² Maintenance force is all of Canadian nationality, with exception of not over 10 supervisory personnel.

³ Decrease is due partly to corrected method of reporting. See attached sample list of equipment in maintenance report for March 1945.

EXHIBIT 4

Monthly maintenance report—Alaska Highway, access roads, flight strips and facilities, month ending Aug. 31, 1945

1. Working estimate: July 1, 1945, to June 30, 1946..... \$2,482,500

2. Description of work:

A. Location: Dawson Creek, British Columbia (mile 0), to Alaska border (mile 1,221.4).

B. Scope:

(1) Alaska Highway (100 percent maintenance) ¹	Miles 1,211.4
(2) Access roads (100 percent maintenance) ²	19.0
(3) Access roads (50 percent maintenance) ³	69.02
(4) Total miles maintained.....	1,299.42

¹ Whitehorse post engineer is responsible for maintenance of the highway from the south limits of McCreae railroad (mile 909) to north limits of Whitehorse (mile 919).

² Access roads shown as 100 percent maintenance are roads to air bases.

³ Access roads shown as 50 percent maintenance refer to roads to weather stations and for maintenance of telephone lines.

Monthly maintenance report—Alaska Highway, access roads, flight strips and facilities, month ending Aug. 31, 1945—Continued

2. Description of work—Continued

C. 8 flight strips as follows:

No.	Location	No.	Location
1-----	Dawson Creek	5-----	Mile 723
2-----	Mile 148.3	6-----	Mile 843
3-----	Mile 221.8	7-----	Mile 1,012.6
4-----	Mile 508	8-----	Mile 1,095

3. Costs (direct and indirect):

	Alaska Highway	Access roads	Flight strips	Camp facilities	Total
A. FDGA (labor).....	\$30,792.18	\$1,698.97	\$849.49	\$2,548.10	\$35,888.74
B. Subsistence.....	5,125.81			424.19	5,550.00
C. Personnel turn-over.....	1,072.49	59.17	29.59	88.75	1,250.00
D. Temporary duty travel.....	205.00				205.00
E. Pay of military personnel.....	1,195.18	65.95	32.97	98.90	1,393.00
F. Materials (including freight).....	34,319.60	1,893.60	946.80	2,840.00	40,000.00
G. Equipment rental.....	41,430.62	2,285.95	1,142.98	3,428.45	48,288.00
Total.....	114,140.88	6,003.64	3,001.83	9,428.39	132,574.74

¹ No figure available. Cost of materials estimated.

4. Unit cost (this month):

A. Labor costs per mile of highway and access roads per month... \$27.62

B. Break-down of cost on highway mileage basis:

(1) Over-all cost, camp facilities per mile per month..... 7.26

(2) Over-all cost per mile of highway and access road per month..... 92.46

(3) Total over-all cost..... 99.72

C. Average cost per flight strip per month..... 375.23

5. Maintenance items. Accumulative cost (will be listed quarterly).

6. Employees last day this month:

Highway.....	145
Access roads.....	8
Flight strips.....	4
Facilities.....	12
Total.....	<u>169</u>

7. Disposition of personnel:

Mile-post	Name	T/O	Apartments	Families on hand	Single on hand	Number of children	School-age children
20	Kliskatinaw.....	7	6	7	0	14	11
101	Blueberry.....	6	6	5	1	14	12
163	Slkanni.....	5	5	4	0	12	10
201	Trutch.....	8	6	6	2	6	4
245	Prophet River.....	6	6	4	0	6	4
300	Fort Nelson Junction.....	7	6	2	5	2	1
392	Summit Lake.....	6	6	5	1	1	0
456	Muncho Lake.....	6	6	4	2	6	3
543	Coal River.....	6	6	4	2	7	2
635	Watson Lake Junction.....	10	6	5	3	9	7
733	Swift River.....	8	7	5	2	7	5
804	Teslin.....	8	6	4	2	7	7
883	Marsh Lake.....	5	5	3	1	6	1
917	Whitehorse (headquarters).....	6	2	2	4		
956	Stoney Creek.....	8	6	4	0	5	1
1,016	Haines Junction.....	9	6	4	2	6	4
1,083	Destruction Bay.....	11	7	7	3	16	16
1,156	Koidern.....	8	6	5	2	5	3
1,206	Snag.....	5	0	0	5		
	Bridge crew.....	14	0	0	11		
	4 repair crews.....	26	0	0	41		
	Total.....	175	104	80	89	128	91

8. Equipment: (will be listed quarterly).

9. Remarks:

The entire Alaska Highway, from Dawson Creek to the Canada-Alaska border, is in excellent condition. The alluvial slide at mile 1,058 has diminished in intensity and caused little delay in traffic during the month. A maintenance camp at Snag Creek, mile 1,206, has been reopened to relieve heavy maintenance load on Koidern Camp, mile 1,156.

The Haines Road is passable from Haines, Alaska, to Haines Junction. The five roving crew members assigned to this road for the purpose of opening it have been withdrawn.

Schools are opening September 1 at Camps Kiskatinaw, Blueberry, Teslin, and Destruction Bay.

Flight strip No. 1 at Dawson Creek was closed August 20 and maintenance discontinued on that date.

By order of Colonel Clifford:

CECIL L. CHEVES,
*Lieutenant Colonel, Corps of Engineers,
Commanding, Alaska Highway Maintenance System.*

EXHIBIT 5

Maximum snow depths, Alaska Highway

Fairbanks (mile 1,522):	<i>Inches</i>
Winter of 1942-43: Maximum depth.....	23. 1
Winter of 1943-44: Maximum depth.....	27. 5
Whitehorse (mile 917):	
Winter of 1942-43: Maximum depth.....	15. 9
Winter of 1943-44: Maximum depth.....	13. 4
Coal River (mile 543):	
Winter of 1942-43: Records not available.	
Winter of 1943-44: Maximum depth.....	21. 9
Blueberry (mile 101):	
Winter of 1942-43: Records not available.	
Winter of 1943-44: Maximum depth.....	10. 5
Dawson Creek (mile 0):	
Winter of 1942-43: Maximum depth.....	10
Winter of 1943-44: Maximum depth.....	3. 5

Comment of Director of Highway Maintenance, Northwest Service Command, in report dated August 11, 1944:

"Winter maintenance along this highway is not a serious problem. The snow-fall is light and is quite easily removed with proper snow removal equipment. The only section causing some difficulty in snow removal was between mile 1,016 and mile 1,056 (between Whitehorse and Lake Kluane) which required rotary snow-pow equipment."

EXHIBIT 6

PERMANENT JOINT BOARD ON DEFENSE, *Washington 25, D. C., November 15, 1944.*

Memorandum to the Assistant Chief of Staff, Operations Division.

Subject: Abandonment of United States military facilities in Canada.

1. Reference is made to Operations Division memorandum, August 29, 1944, in which it was requested that the Permanent Joint Board on Defense, Canada-United States, adopt a recommendation that the maintenance of that portion of the Alaska Highway which lies in Canada be assumed by the Canadian Government, effective as soon as necessary arrangements can be consummated; that a fair and equitable agreement be made on financial responsibility for continuance of maintenance operations; and that a joint survey be made by representatives of the two Governments to determine the money value of equipment, materials, and supplies to be transferred to the Canadian Government.

2. This matter was presented to the Canadian members of the Board at the Board meeting in Montreal, September 6-7, 1944, and has been discussed by various Canadian agencies since that date up to the meeting of the Board in

New York, November 7-8, 1944. As a result of these discussions, the Board agreed, in deference to the Canadian members, to defer a recommendation on this question until a later date.

3. The Board took this action because it is well known that the Canadian Government does not desire to assume, at this time, the maintenance of so much of the Alaska Highway as lies within Canada, either with or without United States financial assistance.

4. It is recommended that the commanding general, Army Service Forces, Chief of Engineers, and the commanding general, Northwest Service Command, be informed of the contents of this memorandum.

GUY V. HENRY,
Major General, United States Army,
Senior United States Army Member.

APPENDIX M

(Chapter XIII)

	<i>Exhibit</i>		<i>Exhibit</i>
Traffic density on the Alaska Highway, September and October 1943 (source: War Department files).....	1	Deliveries of petroleum products by pipe line to points along the Alaska Highway, February 1944 to February 1945, inclusive (source: War Department files).....	6
Traffic density report, October 1944 and February 1945 (source: War Department files).....	2	Seven miscellaneous War Department memorandums and letters relative to capacity of the Alaska Highway.....	7
Statistics on passenger service on Army bus lines operating over the Alaska Highway during 1943 and 1944 (source: War Department files).....	3	Report on interview with Paul G. Greimann, owner, University Bus Lines of Anchorage and Fairbanks, Alaska, relative to trips taken over Alaska Highway by Mr. Greimann in 1943, 1944, and 1945.....	8
Freight hauled on Alaska Highway, January 1943 through March 1945 (source: War Department files).....	4		
Cost of trucking on the Alaska Highway, June 1945 (source: War Department files).....	5		

EXHIBIT 1

Traffic density on Alaska Highway for months September and October 1943: ¹ Daily average number of vehicles clearing stations

Station	Number	Station	Number
Dawson Creek.....	442	Swift River.....	163
Blueberry.....	306	Brooks Brook.....	215
Trutch.....	209	McCrae.....	665
Fort Nelson.....	173	Canyon.....	168
Summit Lake.....	172	Destruction.....	122
Muncho Lake.....	141	Cathedral.....	48
Coal River.....	108	Big Delta.....	122
Watson Lake.....	138	Fairbanks.....	254

¹ From S. Rept. No. 548, subject: "Alaska Highway," 78th Cong., 1st sess.

EXHIBIT 2

Traffic density report—Alaska Highway: Total vehicle count at military police gates for indicated locations

Month	Whitehorse				Blueberry	
	North gate		South gate		North-bound	South-bound
	North-bound	South-bound	North-bound	South-bound		
October 1944.....	603	616	1,231	1,184	1,049	1,077
February 1945.....	433	467	706	667	606	658

EXHIBIT 3

NORTHWEST SERVICE COMMAND PASSENGER SERVICE, ALASKA HIGHWAY ¹

The service command operated bus line from Dawson Creek through to Fairbanks during 1943 and 1944 to facilitate transportation of personnel in connection with construction and operations within the command.

The operating timetable of bus line was:

Dawson Creek to Whitehorse: 34 hours 55 minutes.

Whitehorse to Fairbanks: 21 hours 10 minutes.

Volume of passengers (for 3 representative months)

	North-bound	South-bound
1943—October.....	3,447	3,486
November.....	2,221	2,529
December.....	1,860	2,381

Passenger-miles for 3-month period September–November 1943 averaged 2,752,188 per month.

EXHIBIT 4

Freight hauled, Alaska Highway, January 1943–March 1944

Month	Tonnage for—		Month	Tonnage for—	
	Army, including Air Forces ¹	Construction ¹		Army, including Air Forces ¹	Construction ¹
1943—January–March.....	7,500	(²)	1943—November.....	7,880	3,781
April.....	2,353	297	December.....	9,400	1,858
May.....	2,682	1,261	1944—January.....	11,141	1,875
June.....	4,902	3,885	February.....	³ 9,200	³ 11,199
July.....	8,649	8,816	March.....	5,059	1,584
August.....	10,742	12,095	Total.....	⁴ 107,845	⁴ 66,096
September.....	15,747	10,841			
October.....	12,690	8,604			

¹ Does not include freight hauled by construction contractors for their own operations.

² Record missing.

³ Prior to February 1944, tonnage hauled by commercial contract haulers not included. Prior to same month, petroleum products hauled for Air Forces not included. These figures have been included for February 1944 and following months.

⁴ Totals do not include any of tonnage hauled by or for Canadian Government agencies.

Source: Service command progress reports for months indicated.

¹ From report on supply activities of Northwest Service Command (Gottschalk report), January 1944

Alaska Highway freight movement

TONS HAULED

	Northwest Service Command			Construction			Army Air Forces			Total			Average mileage per ton	
	From Dawson Creek	From Whitehorse	From Fairbanks	From Dawson Creek	From Whitehorse	From Fairbanks	From Dawson Creek	From Whitehorse	From Fairbanks	From Dawson Creek	From Whitehorse	From Fairbanks		
1944—April.....	1,578	1,229	355	3,032	2,550	1,014	1,272	1,398	815	5,882	5,177	2,184	13,243	222
May.....	1,938	1,030	438	4,401	1,554	2,997	1,346	248	714	7,685	2,832	4,139	14,656	213
June.....	2,457	1,779	142	1,749	1,131	1,189	746	355	1,502	4,932	3,265	2,833	11,030	235
July.....	2,013	3,124	-----	1,294	1,206	-----	830	335	-----	4,137	4,665	-----	8,802	258
August.....	1,329	1,529	-----	1,301	1,514	-----	1,067	1,057	-----	3,697	4,100	-----	7,797	267
September.....	2,515	1,824	-----	1,358	685	-----	1,154	1,004	-----	5,027	3,513	-----	8,540	258
October.....	3,638	232	-----	1,225	61	-----	3,056	158	-----	7,919	451	-----	8,370	360
November.....	1,165	308	-----	91	4	-----	1,036	150	-----	2,292	462	-----	2,754	248
December.....	1,461	170	-----	-----	-----	-----	2,177	121	-----	3,638	291	-----	3,929	244
1945—January.....	1,367	389	-----	-----	-----	-----	1,531	167	-----	2,998	556	-----	3,454	260
February.....	1,046	91	-----	-----	-----	-----	990	111	-----	2,035	202	-----	2,237	233
March.....	-----	136	-----	-----	-----	-----	-----	492	-----	3,319	628	-----	3,947	208

NOTE.—Fairbanks inactivated during July 1944.

TON-MILES HAULED

	From Dawson Creek		From Whitehorse		From Fairbanks		Total		Total
	Military	Commercial	Military	Commercial	Military	Commercial	Military	Commercial	
1944—April.....	449,686	877,356	616,118	580,595	357,666	55,089	1,423,470	1,513,040	2,936,510
May.....	840,489	1,315,853	205,049	404,179	310,668	39,311	1,356,206	1,759,343	3,115,549
June.....	103,025	1,344,286	231,871	490,403	604,998	43,412	939,894	1,878,081	2,817,975
July.....	195,007	1,062,485	300,534	714,211	-----	-----	495,541	1,766,696	2,272,237
August.....	93,432	950,550	366,979	671,117	-----	-----	460,411	1,621,667	2,082,078
September.....	83,308	1,125,448	232,835	762,919	-----	-----	315,143	1,888,367	2,203,510
October.....	-----	2,837,388	21,684	150,462	-----	-----	21,684	2,987,850	3,009,534
November.....	-----	515,778	47,630	119,221	-----	-----	28,018	139,285	682,629
December.....	-----	856,564	4,833	95,944	-----	-----	4,833	952,508	957,341
1945—January.....	-----	734,017	4,593	159,717	-----	-----	4,593	893,734	898,327
February.....	-----	466,666	-----	53,733	-----	-----	-----	520,399	520,399
March.....	-----	559,565	-----	161,936	-----	-----	-----	821,601	821,601

EXHIBIT 5

COST OF TRUCKING ON ALASKA HIGHWAY (JUNE 1945)

The best available index of the cost of trucking on the Alaska Highway is the table of rates under which commercial haulers operate on the highway, furnishing their own vehicles and gasoline and oil.

I. *Dawson Creek to Muncho Lake (mile 456)*.—North American Trucking Co.:

General commodities: 9 cents per ton-mile.

Perishables: 9 cents per ton-mile plus 25 percent.

II. *Muncho Lake to Canada-Alaska border*.—British-Yukon Navigation Co.:

General commodities: 11 cents per ton-mile.

Perishables: 11 cents per ton-mile plus 25 percent.

III. *Within Alaska*.—Trucking rates are approximately 1 to 2 cents per ton-mile higher than above rates.

EXHIBIT 6

Deliveries of petroleum products by pipe line to points along Alaska Highway between Watson Lake and Fairbanks, inclusive, during 13-month period, February 1944–February 1945

Month	Barrels delivered by—	
	Canol No. 3 pipe line	Canol No. 4 pipe line
1944—February.....	8,830	53,934
March.....	13,094	13,221
April.....	7,000	18,000
May.....	3,000	.....
June.....	9,000	6,000
July.....	11,900	32,900
August.....	3,700	41,000
September.....	14,500	28,700
October.....	9,800	28,200
November.....	12,400	41,300
December.....	7,200	38,600
1945—January.....	11,700	29,700
February.....	7,100	33,100
Total.....	119,424	364,655
Grand total.....	1 484,079	

¹ 64,566 tons (or an average of approximately 5,000 tons per month).

EXHIBIT 7

MEMORANDUM OF CONFERENCE, THURSDAY AND FRIDAY, JANUARY 7–8, 1943

The following persons were present: Gen. Philip B. Fleming, Administrator, Federal Works Agency; Mr. Thos. H. MacDonald, Commissioner, Public Roads Administration; Mr. Ernest E. Hall, Executive Officer, Federal Works Agency; Mr. J. S. Bright, Public Roads Administration; General Robins, Colonel Wyman, Colonel Strong, Colonel Burton, Captain Lloyd, Office of the Chief of Engineers, War Department.

1. During the course of the discussions, Colonel Wyman advised as follows with regard to the transportation of material and supplies expected to be moved to the interior of Alaska and other points.

(1) Four Quartermaster regiments consisting of approximately 16,000 men will be assigned to this transportation problem, beginning January 10, 1943.

(2) This Quartermaster unit is to so organize itself as to undertake the responsibility of transportation over the highway as rapidly as possible and be in a position to haul 60,000 tons per month by July 1 and increase this tonnage as the need may develop.

(3) Freight activities by the Quartermaster Corps would be carried on until the spring break-up, at which time all freight movement other than that required to supply troops and contractors will be discontinued during the period of the spring thaw.

(4) Colonel Wyman estimated that approximately 260,000 tons of material are now earmarked for clearance through Skagway to Whitehorse between now and July 1.

(5) Colonel Wyman further stated that the highway from Haines to Fairbanks should be designed to provide the movement of 200,000 tons monthly.

2. With regard to the presently designated Alaska Highway, the immediate objective will be to make the necessary improvements and carry on the necessary maintenance to provide the transportation facilities outlined above. This will necessitate a program approximately as follows:

(1) An immediate physical survey by Colonel Wyman of the War Department and Mr. Bright of the Public Roads Administration for an agreement on the improvements and minor relocations necessary. In general terms these improvements should be—

(a) The construction of permanent bridges across all streams.

(b) The widening of the grade to provide a 24-foot traveled way and graveled shoulders sufficiently wide to park a vehicle. As a general rule, the width of the grade from shoulder to shoulder in level country should be 36 feet, and in deep cuts and in mountainous country the ditches may be coincident with shoulders.

(c) The correction of alignment, grade, and curvature. Insofar as possible, the final line should by-pass all muskeg areas.

(d) The final grade should in general be built to provide a higher level than that of the surrounding ground in order to provide adequate drainage. In order to accomplish these objectives, it is suggested that Public Roads Administration undertake promptly the rehabilitation of all contractors which would include the securing of personnel and repair and replacement of equipment.

(2) The preparation for the placing of an estimated 4,000,000 yards of gravel on the highway following the spring break-up.

(3) The preparation of both equipment and supplies for necessary dust palliation.

3. In considering the moving in of contractors' personnel, the number brought in should be closely coordinated with Colonel Wyman in order that the problem of supply will be coordinated. Colonel Wyman advised that he had ordered fourteen 37-passenger Greyhound busses which will run a scheduled service from Dawson Creek to Fairbanks. Arrangements may be made to use this means of transportation of getting personnel into various points along the highway. Baggage limitation will be 50 pounds per man.

4. With regard to the Haines cut-off, the present directive is for an Army supply route which should be put through from Haines to Champagne as rapidly as possible. It was agreed that the present contractors of the Public Roads Administration should continue on this work for the winter with the understanding that they would be transferred back to their operation on the Alaska Highway as soon as work on the highway opens up. If the final directive indicates a truck route designed to handle 200,000 tons monthly, it was agreed that this road should have as a minimum a 24-foot traveled way with graveled shoulders sufficiently wide to park a vehicle. In open country the width from shoulder to shoulder should be not less than 36 feet with necessary ditch adjustments in cuts in mountainous areas. It is further understood that the Public Roads Administration will, through its own organization and its contractors, carry forward any work required by the Army. It was also agreed that Colonel Wyman and his assistants will deal directly with the Public Roads Administration's engineers and will not issue orders directly to contractors.

5. It was understood that the general organization would provide for the Division Engineer at Edmonton, three District Engineers, one stationed at Dawson Creek, one at Whitehorse, and one at Fairbanks, with three area Engineers under each District Engineer. Each Area Engineer is to be held directly responsible for securing the necessary construction work and maintenance operations to meet the transportation objectives. It is further understood that the Public Roads Administration will parallel this organization in order that there shall be continual and complete coordination and cooperation between the two organizations.

6. In order to further effectuate the requirements previously outlined, Mr. MacDonald suggested that the Public Roads organization be so established as to provide under each contractor a unit which would work on the necessary maintenance and minor improvements requested by Colonel Wyman, and another unit which would work on the major construction and betterment operations with the understanding that in emergencies the full organization would be used to meet such conditions.

7. Colonel Wyman suggested that any difficulties developed in the securing of transporting of necessary equipment to be taken up with his office where every effort would be made to render assistance in the expediting of both the purchase and transportation.

8. Following further discussion of the joint responsibilities, General Robins stated that in his opinion the construction of road to the above agreed upon standards would provide for the transportation of a minimum of 60,000 tons of material per month and fully meets the responsibilities of the United States Government in its agreement with the Government of Canada. This was fully concurred in by the Federal Works Agency and full responsibility for detailed operations have been delegated to Mr. Bright for the Public Roads Administration and to Colonel Wyman for the Office of the Chief of Engineers. In order to be currently advised of the status of work and the estimated future operations, General Robins requested that arrangements be made for monthly reporting of not only the work accomplished but of work projected. It was agreed that such reports would be furnished.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, February 10, 1943.

Subject: Capacity—Alcan Highway.

To: Assistant Chief of Staff of Operations. S. O. S.

(Attention: Colonel Heileman.)

1. Reference is made to confidential War Department letter dated February 14, 1942, subject: "International Highway," and to exchange of international correspondence which constitutes the agreement with Canada on construction of the Alcan Highway. Copies of the above mentioned communications are attached hereto as Inclosures Nos. 1 and 2, respectively.

2. In accordance with the War Department directive of February 14, 1942, a pioneer road has been constructed and improved to the maximum extent permitted by available labor, materials, and equipment. Engineer troops have been assisted in such work by forces of the Public Roads Administration contractors. Work has been initiated on the construction of permanent bridges and plans are now being made for construction operations necessary for completion of the project, which it is expected can be accomplished by November 30, 1943.

3. Since completion of the project is to be carried out by contracts entered into by the Public Roads Administration it is necessary to establish specifications covering horizontal curves, gradients, site distance, width and thickness of base course, etc., which will serve as a general guide in preparing plans for and completing the project. The use of standards higher than required will of course result in increased cost and unnecessary use of manpower, critical materials and equipment. A determination of minimum standards cannot be made however without knowing the maximum traffic which the road may be required to carry.

4. The Transportation Corps and the Commanding General, Northwest Service Command, have both made studies on manpower and trucks required to move certain quantities of pay freight. On November 1, 1942, the Commanding General, Transportation Corps, submitted a memorandum to the Commanding General, S. O. S., subject: "Supplies via Alcan Highway," indicating that as of that date approximately 14,000 tons per month was required to supply Ground and Air Forces in Alaska and that a like amount was required to supply construction forces in the Northwest Service Command. If all such supplies were to be moved over the Alcan Highway there would therefore have been approximately 28,000 pay tons of freight per month dispatched from Dawson Creek, of which one-half, or 14,000 tons, would move over the entire length of the highway to Fairbanks. The memorandum indicated that movement of such freight via the Alcan Highway would have released 2 EC-2 and 2 5,000-ton, or 5 5,000-ton ships. The memorandum further indicated that the movement of such freight over the Alcan Highway would require approximately 14,000 enlisted men and 3,650 trucks. A previous study by the Transportation Corps indicates that approximately 2,000 10-ton tractor trucks would be required to move 1,000 tons per day pay load over the highway from Dawson Creek to Fairbanks.

5. The Commanding General, Northwest Service Command, in letter of October 12, 1942, to the Commanding General, S. O. S., through the Chief of Engineers, subject: "Review Report, Trans-Canadian-Alaskan Railroad," which was forwarded by 1st endorsement of this office on November 3, 1942, indicated that the Service Commander was of the opinion that 200,000 tons per month pay load could be moved to Fairbanks from Dawson Creek by the Alcan Highway or from

Haines Point via the Haines Point Cut-off Military Road and the northern section of the Alcan Highway, and that such procedure was much preferable to construction of a military railroad from Prince George to Fairbanks. Exhibit B to this letter indicated that if 10-ton trucks could be furnished 90,000 tons of cargo could be moved over the Alcan Highway from Dawson Creek to Fairbanks by March 15, 1943. Further, that the theoretical capacity of the road according to the Public Roads Administration would be in excess of 1,500,000 tons per month.

6. Confidential letter of November 10, 1942, from the Commanding General, S. O. S., to the Commanding General, Northwest Service Command, authorized construction of road from the vicinity of Haines Point, south of Skagway, to the vicinity of Champagne on the Alcan Highway. This letter was amplified by directive dated January 7, 1943, from the Director, Requirements Division, to the Chief of Engineers, subject: "Haines Cut-off Military Road," file SPRMC 611 Alaska (12-19-42). Since the cut-off road will only serve as a feeder road to the Alcan Highway, it is the opinion of this office that the same standard of construction should be used for the cut-off road as used for the Alcan Highway.

7. As indicated above, it is necessary that the maximum required capacity of the road be determined in order that *minimum* standards of the construction can be fixed. Accordingly it is requested that such determination be made and that this office be advised thereof at the earliest practicable date.

For the Chief of Engineers:

JOHN R. HARDIN,
Colonel, Corps of Engineers,
Executive Assistant.

HEADQUARTERS, SERVICES OF SUPPLY,
Washington, D. C., February 25, 1943.

To CHIEF OF ENGINEERS.

1. The following maximum highway capacities may be assumed for purposes of design and construction:

- (a) Dawson Creek-Whitehorse:
West-bound: 2,500 short tons per day.
East-bound: 834 short tons per day.
- (b) Whitehorse-Mile 108 (Junction with Haines Point cut-off road):
West-bound: 2,500 short tons per day.
East-bound: 1,668 short tons per day.
- (c) Mile 108-Fairbanks:
West-bound: 3,000 short tons per day.
East-bound: 1,668 short tons per day.

These are cargo tonnages. They do not include the weight of vehicles. Traffic densities are the same in both directions of traffic as trucks will return to points of origin.

2. The maximum capacity of the Haines Point cut-off road should be assumed to be the same as paragraph 1c above.

3. Maximum speed of military vehicles may be assumed at 40 m. p. h.

4. The above maximum highway capacities are assumed for purposes of design and construction only.

5. The type of road to be finally developed should be cleared with Requirements Division, Services of Supply.

BREHON SOMERVELL,
Lieutenant General, Commanding.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, March 9, 1943.

Maj. Gen. PHILIP B. FLEMING,
Administrator, Federal Works Agency,
Washington, D. C.

DEAR GENERAL FLEMING: Receipt is acknowledged of Memorandum of Conference, Thursday and Friday, January 7 and 8, 1943, which was forwarded to this office by your Mr. Hall.

I think that the memorandum correctly outlines the problem. Procedure described for completion of the work is in general acceptable to this office. There

are certain points, however, which should perhaps be further clarified and are commented upon as follows:

(a) Subparagraph 1 (5), page 1, makes reference to design of the highway from Haines to Fairbanks to provide for the movement of 200,000 tons monthly. In this connection a directive has now been issued by higher authority stating that the following maximum highway capacities may be assumed for purposes of design and construction of the Alcan and Haines Point cut-off highways.

Section	Direction of traffic	Daily cargo tonnage in short tons (exclusive of vehicle weight)
Dawson Creek to Whitehorse.....	West-bound...	2,500
Do.....	East-bound...	834
Total.....		3,334
Whitehorse to mile 108 (junction with Haines Point cut-off road).....	West-bound...	2,500
Do.....	East-bound...	1,668
Total.....		4,168
Mile 108 to Fairbanks and Haines cut-off road.....	West-bound...	3,000
Do.....	East-bound...	1,668
Total.....		4,668

The directive further states that traffic densities will be the same in both directions as trucks will return to points of origin, that maximum speed of military vehicles may be assumed at 40 miles per hour, and that the type of road to be finally developed shall be cleared by higher military authority.

Movement of freight, even in the quantities indicated above, is unlikely for any prolonged period or under other than emergency conditions. Accordingly it is not necessary nor will War Department policy permit that the roads in question be built to the same standards which would be used in case of a highway designed to handle such tonnages of comparable peacetime commercial traffic.

(b) Subparagraph 2 (1) (a) on page 2 calls for construction of permanent bridges across all streams. War Department construction policy will not permit replacement with permanent bridges of any temporary bridges already built and which will be satisfactory for military traffic during the next 4 or 5 years.

(c) Subparagraph 2 (1) (b) on page 2: The widths of surfacing specified are believed highly desirable if not in fact necessary. However, since the necessity for continuous operation of the highway will hardly permit placing surfacing material to full width in the first instance, but rather will require a gradual widening over the full length, it is not believed that any hard and fast rule can be established at this time. This matter will be given careful and continuing consideration by the division engineer, Northwest Division, for the next 5 or 6 months, during which time military traffic on the road will be increasing and widening of the surfacing will be in process, with a view to determining minimum widths of surfacing on various sections of the road necessary for satisfactory movement by military forces of the maximum tonnages tabulated in paragraph (a) above.

(d) Subparagraph 2 (1) (d) on page 2: Adequate drainage must, of course, be provided if the road is to be satisfactory for military traffic. However, the question of method by which drainage is to be provided can, it is believed, only be determined on the ground. Final grades should not be built to a higher level than surrounding ground if adequate drainage can be provided at less cost and in less time by enlarging and deepening drainage ditches.

(e) Subparagraph 2 (2) on page 2 makes reference to placing an estimated 4,000,000 yards of gravel following the spring break-up. Wherever possible the placing of gravel should proceed between now and the time of the spring break-up.

(f) Paragraph 4 (last paragraph) on page 2 again makes reference to width of traveled way. The same remarks apply as in paragraph (c) above. It is stated in this paragraph that the Public Roads Administration will carry forward any work required by the Army. The Army will request the Public Roads Administration to undertake such work in addition to that on the Alcan Highway (not limited to the Haines cut-off military road) as deemed advisable and in the best interest of the war effort and it is understood that the Public Roads Administration agrees to carry out such work to the best of its ability.

(g) Paragraph 6 (second paragraph) on page 3 makes reference to Mr. MacDonald's suggestion that the Public Roads Administration have each of its contractors so organized as to provide two separate units, one of which will work on necessary maintenance and minor improvements, and the other of which will be engaged in new construction and/or betterment operations. It appears advisable that the contractor engaged on the improvement of a section of the road be required to maintain a road for traffic during the period of its construction or improvement in accordance with standard practice in the United States, including responsibility for providing suitable detours or otherwise maintaining the road under improvement in a condition suitable for through traffic to permit passage of tonnages as indicated in paragraph (a) above. Immediately upon completion of the construction of a particular section of the highway allotted to a particular contractor, it is expected that the responsibility for maintenance thereof will be taken over by the division engineer.

(h) Paragraph 8 on page 3 makes reference to the furnishing of monthly reports on status of work and estimated future operations. As indicated in my letter of January 16, 1943, to Mr. MacDonald, Colonel Wyman has been requested to submit a monthly field progress report on Alcan Highway as well as on other projects under his control. In order that this report can be complete Mr. MacDonald was requested to instruct his field forces to keep current information and data pertinent to the field progress report and furnish information thereon to Colonel Wyman as promptly as possible after the end of each month. Paragraph 8 of the memorandum states that reports will be furnished but does not indicate to whom they will be submitted. In accordance with the above, it is desired that such information be furnished by Public Roads Administration field forces directly to Colonel Wyman.

In view of the requirement indicated in paragraph (a) above that the type of road to be finally developed shall be cleared by higher authority, instructions have been issued to the division engineer at Edmonton through the commanding general, Northwest Service Command, to submit to this office report or reports including maps showing the location and sketches showing cross sections of the proposed final-type road prior to construction thereof. These will serve as the basis for recommendation by this office to higher authority.

Very truly yours,

E. REYBOLD,
Major General,
Chief of Engineers.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, May 20, 1943.

Subject: Alcan Highway.

To: The Division Engineer, Northwest Division, 11412 One Hundred and Twenty-eighth Street, Edmonton, Alberta, Canada.

Through: The Commanding General, Northwest Service Command, Whitehorse, Yukon Territory, Canada.

1. Reference is made to the following correspondence:

(a) Letter from the Chief of Engineers to Col. W. M. Hoge, Corps of Engineers, Engineer Replacement Training Center, Fort Belvoir, Va., dated March 3, 1942, subject: "Construction of Canadian-Alaskan Military Highway."

(b) Letter from the Chief of Engineers to the Administrator, Federal Works Agency, dated March 6, 1942, file CE 611 (United States-Canada-Alaska) T, which requested services of Public Roads Administration to cooperate with the War Department in location and construction of the highway.

(c) Mimeograph letter from the Chief of Engineers dated April 29, 1942, subject: "Specifications for Alcan Highway Construction."

2. This directive supersedes the provisions of all previous directives which have been issued concerning construction or improvements of the Alcan Military Highway for work to be performed after this date.

3. You are authorized to proceed with the construction or improvement of a military road between Dawson Creek, British Columbia, Canada, and Big Delta, Alaska, generally following the Army pioneer road as previously constructed on location substantially as indicated on the strip map enclosed with the letter from the division engineer, Northwest Division, dated April 10, 1943.

4. The following are the estimated pay-load tonnages to which the several sections of highway may be subjected:

- (a) Dawson Creek-Whitehorse:
West-bound: 2,500 short tons per day.
East-bound: 834 short tons per day.
- (b) Whitehorse-Mile 108 (junction with Haines Point cut-off road):
West-bound: 2,500 short tons per day.
East-bound: 1,668 short tons per day.
- (c) Mile 108-Fairbanks:
West-bound: 2,000 short tons per day.
East-bound: 1,668 short tons per day.

5. Based upon the above pay-load (net) tonnages and a maximum speed for military vehicles of 40 miles per hour, the following standards will govern construction:

(a) The maximum roadbed width will be 26 feet, extending from outside shoulder line to shoulder line. The road surface will provide for two lanes of traffic and the surfacing material shall be placed to a width of 20 to 22 feet and will consist of select local materials, including gravel or crushed stone, placed to a depth necessary to support military traffic loads. Shoulders will be stabilized with local select material, including gravel or crushed stone.

(b) The road will be constructed with maximum gradients not to exceed 10 percent.

(c) Curvature and sight distance will be that generally controlled by the alignment and grade of the existing pioneer road as further improved in accordance with this directive. Realignment or relocation by deviation from the pioneer road will only be made where necessary to permit free movement of the above-indicated net tonnages or to improve the traffic service when such work can be done without greater cost or expenditure of time than that necessary to bring the pioneer road to the above standards. All proposed major deviations from the pioneer road shall be reported to the Chief of Engineers.

(d) New bridges constructed will in general provide two lanes for traffic and have a clear width not to exceed 24 feet. Existing bridges of adequate capacity and durability should not be replaced even though they are of less than two-lane width. New timber bridges will have a capacity of H-15; new steel bridges, a capacity of H-20.

6. Full use will be made of Public Roads Administration forces and contractors. These forces may be supplemented by the division engineer as is necessary to complete the construction directed.

7. Construction shall be completed not later than December 31, 1943.

By order of the Chief of Engineers:

J. L. PERSON,
Colonel, Corps of Engineers,
Chief, Military Construction Branch, Construction Division.

DECEMBER 11, 1943.

Subject: Senate investigation, estimated tonnage capacity of Alaska Highway.
To: Secretary of War.

(Attention: Mr. Julius H. Amberg, Special Assistant to the Secretary of War.)

1. Reference is made to memorandum dated December 2, 1943, subject as above, for the commanding general, Army Service Forces, in which request is made for an estimate of the tonnage which can be conveyed by motortruck from the southern terminus of the Alaska Highway to Fairbanks, Alaska, or beyond. Copy is enclosed for ready reference.

2. The question presented is most difficult and has received very serious consideration in this office. A road, in common with all other lines of communications, has flexible characteristics. There is a maximum capacity which can be attained and maintained under the duress of military conditions provided a sufficient maintenance force is deployed. Under these conditions, if the mission is accomplished, uneconomical deployment is justified. On the other hand, if a road is to be maintained at a practicable cost in money and in maintenance forces, a practicable capacity vastly different from that that could be attained during a period of emergency is determined.

3. Under the pressures of military necessity and with the deployment of the required maintenance forces, it is estimated that the capacity of the Alaska

Highway to Fairbanks can be established at approximately 700,000 tons per annum.

4. Based upon operating under more normal conditions lacking the pressure of military necessity and balancing output against maintenance and also taking into account the weather conditions prevailing in this area, it is estimated that a figure of approximately 400,000 tons per year is practicable.

W. D. STYER,
Major General, United States Army,
Commanding.

EXHIBIT 8

ALASKA HIGHWAY INVESTIGATION

Memorandum: Report of conference at Fairbanks, Alaska, on August 11, 1945.

By: Dan W. Eastwood, special investigator.

Place: Merchants Bank of Fairbanks.

Present: Hon. J. W. Robinson, chairman, House Committee on Roads; Mr.

T. H. McDonald, Commissioner, Public Roads Administration; Mr. Philip Johnson, vice president, Merchants Bank of Fairbanks; Mr. Paul G. Greimann, owner, University Bus Lines, of Anchorage and Fairbanks (a going business since 1925); Dan W. Eastwood.

Discussion: Mr. Johnson arranged the conference for the purpose of having Mr. Greimann tell Chairman Robinson et al. of his three experiences in driving motor busses from the United States to Fairbanks, Alaska, via the Alaska Highway in the years 1943, 1944, and 1945, as follows:

1. 1943 trip

Mr. Greimann stated that he and Mr. E. L. Schermer drove two Ford transit busses from St. Louis, Mo., to Fairbanks in 15 days, leaving St. Louis late in March and arriving in Fairbanks in early April. (Exact dates not given, but he was clear in his memory that total trip only lasted 15 days.)

His itinerary was as follows: St. Louis; Topeka, Kans.; Sheridan, Wyo.; Billings, Shelby, and Sweetgrass, Mont.; Lethbridge, Calgary, Edmonton, and Dawson Creek, Alberta; then via Alaska Highway to Fairbanks.

Mr. Greimann says difficulty was encountered on three hills which were slippery because of lack of sufficient gravel top and the cars had to be helped across these hills. If, however, the cars had been equipped with chains, he says they could have gone through under their own power.

2. 1944 trip

In August 1944 Mr. Greimann, accompanied by his wife, drove an International bus, equipped with a K-5 body from Yakima, Wash., to Fairbanks in 17 days. The truck carried 1½ tons of supplies. The route after leaving the United States was the same as that used on the 1943 trip. No transportation difficulties were encountered.

3. 1945 trip

In May 1945 Mr. Greimann and another man drove two C. D. Beck & Co. busses (33 passenger recliners) from a point 50 miles east of St. Louis, Mo., to Fairbanks, Alaska, in 9 days. No transportation difficulties were encountered.

APPENDIX N

(Chapter XIV)

Exhibit	Exhibit
List of camps on the Alaska Highway system, including the Haines lateral road, from Dawson Creek to the Canada-Alaska boundary (source: War Department files).....	3
Memorandum furnished House Committee on Roads by War Department relative to cost and use of typical highway maintenance camp (camp at Klauane Lake, Destruction Bay, used as example).....	2
1 | Map of highway maintenance camps and related facilities, Dawson Creek to Alaska-Canada border (source: War Department).....	3
1 | Map of highway maintenance camps and related facilities, Fairbanks to Muncho Lake (source: War Department).....	4
2 | Maintenance system map of Haines lateral road (source: War Department).....	5

EXHIBIT 1

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1945

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Milepost 1:			Mile 48 (Fort Alcan):		
NOTE.—Highway contractors' camps in Dawson Creek consisting of R. Melville Smith camps, Dowel construction camp, Okes construction camp, and Bates and Rogers camp were sold with base installations under valuation report prepared in accordance with Thirty-third Recommendation of the Permanent Joint Board of Defense, Canada=United States, at an estimated consideration of \$376,363 (United States funds) and cannot be separated and distributed to the buildings in camps above mentioned.			18.....	Prefabricated.	20 by 80.
Milepost 14.5:			5.....	do.	20 by 80.
5.....	Prefabricated.	20 by 60.	1.....	do.	20 by 80.
1.....	do.	20 by 60.	11.....	do.	20 by 80.
1.....	Frame.	20 by 30.	1.....	do.	20 by 110.
1.....	do.	12 by 20.	1.....	do.	20 by 40.
Milepost 20 (highway maintenance):			1.....	do.	20 by 100. ¹
1.....	do.	54 by 96.	1.....	Frame.	20 by 30. ¹
1.....	CCC	20 by 38.	1.....	do.	12 by 16.
3.....	do.	20 by 40.	1.....	do.	12 by 24.
2.....	do.	20 by 57.	1.....	do.	30 by 60.
1.....	do.	20 by 68.	1.....	do.	12 by 24.
1.....	Frame.	30 by 58.	1.....	do.	16 by 30.
1.....	CCC	20 by 20.	1.....	do.	16 by 40.
2.....	do.	20 by 50.	Mile 48.9:		
2.....	Frame.	24 by 26.	3.....	Prefabricated.	20 by 120.
1.....	do.	24 by 32.	1.....	do.	20 by 150.
1.....	do.	20 by 30.	1.....	do.	20 by 60.
1.....	do.	20 by 100.	Mile 49 (PRA camp):		
1.....	CCC.	6 by 20.	13.....	Frame.	120 by 20.
Milepost 22:			2.....	do.	120 by 20.
4.....	Prefabricated.	20 by 30.	1.....	do.	120 by 20.
1.....	do.	20 by 30.	1.....	do.	70 by 20.
1.....	Frame.	25 by 64.	1.....	do.	120 by 20.
1.....	do.	20 by 80.	1.....	do.	120 by 20.
1.....	do.	16 by 20.	3.....	do.	120 by 20.
Milepost 34.5:			1.....	do.	140 by 30.
4.....	Prefabricated.	20 by 60.	1.....	do.	40 by 20.
1.....	do.	20 by 60.	1.....	do.	50 by 20.
1.....	Frame.	20 by 20.	1.....	do.	140 by 20.
1.....	do.	24 by 40.	1.....	do.	120 by 20.
1.....	Prefabricated.	20 by 20.	1.....	do.	100 by 20.
1.....	Frame.	24 by 30.	1.....	Prefabricated.	120 by 20.
1.....	do.	30 by 60.	1.....	Frame.	20 by 20.
1.....	do.	40 by 50.	1.....	do.	20 by 20.
1.....	do.	18 by 30.	Mile 49 (R. M. Smith camp):		
Mile 35 (Dufferin):			3.....	do.	140 by 20.
NOTE.—Transferred to L. H. Finney in lieu of restoration and land rent.			2.....	do.	120 by 20.
Mile 35 (Roebling):			1.....	do.	100 by 20.
NOTE.—Sold to Peace River Coal Mines for \$1,300 (Canadian funds).			5.....	do.	120 by 20.
1.....	Prefabricated.	20 by 50.	1.....	do.	40 by 20.
1.....	do.	20 by 70.	1.....	do.	50 by 20.
1.....	Frame.	20 by 40.	1.....	do.	140 by 20.
2.....	do.	20 by 50.	1.....	do.	120 by 20.
1.....	Prefabricated.	20 by 70.	1.....	do.	100 by 20.
See footnotes at end of table, p. 269.			1.....	Prefabricated.	120 by 20.
			1.....	Frame.	20 by 20.
			1.....	do.	20 by 20.
			2.....	do.	20 by 120.
			1.....	do.	20 by 20.
			Mile 49 (Waterous, Ltd.):^{1 4}		
			1.....	do.	20 by 30.
			1.....	CCC	20 by 40.
			1.....	do.	20 by 60.
			2.....	do.	20 by 120.
			Mile 52:		
			1.....	Frame.	30 by 60.
			Mile 54:		
			5.....	Steel prefabricated.	20 by 48.
			5.....	Frame.	20 by 100.
			1.....	do.	30 by 100.
			1.....	do.	20 by 60.
			1.....	Prefabricated.	20 by 80.
			1.....	Frame.	20 by 60.
			1.....	do.	20 by 120.
			1.....	do.	24 by 50.
			1.....	do.	20 by 50.
			1.....	do.	20 by 25.
			1.....	do.	24 by 140.
			1.....	do.	20 by 50.
			Milepost 68:		
			1.....	Prefabricated.	20 by 50.
			1.....	do.	20 by 70.
			1.....	Frame.	20 by 40.
			2.....	do.	20 by 50.
			1.....	Prefabricated.	20 by 70.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1945—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Milepost 68—Con.			Mile 136:		
1	Frame	20 by 40.	3	Prefabricated.	20 by 120.
1	do.	20 by 20.	2	do.	20 by 30.
Mile 74.9:			1	do.	20 by 120.
4	Prefabricated.	20 by 120.	1	do.	{20 by 120.
2	do.	20 by 120.	1	do.	20 by 50.
1	do.	{20 by 120.	1	do.	20 by 50.
1	do.	{20 by 40.	2	Frame	20 by 20.
1	Frame	20 by 60.	1	Prefabricated.	20 by 20.
1	do.	20 by 30.	1	Frame	20 by 60.
1	do.	30 by 80.	2	do.	30 by 40.
Mile 83:			1	do.	30 by 80.
1	Prefabricated.	20 by 60.	1	do.	20 by 120.
1	Frame.	20 by 60.	Mile 142.5:		
1	do.	20 by 120.	3	Prefabricated.	20 by 40.
1	do.	20 by 120.	1	do.	20 by 40.
1	do.	20 by 20.	5	do.	20 by 50.
1	do.	20 by 30.	1	Frame	30 by 60.
1	do.	20 by 40.	1	do.	30 by 60.
1	do.	20 by 40.	1	do.	{20 by 120.
1	do.	20 by 40.	1	do.	20 by 40.
1	do.	20 by 30.	1	do.	20 by 20.
1	do.	20 by 30.	1	Log	{20 by 70.
Mile 92:			1	do.	20 by 20.
1	Prefabricated.	20 by 40.	Mile 149:		
1	do.	20 by 60.	2	Frame	20 by 120.
1	do.	20 by 20.	1	do.	20 by 120.
Mile 93:			1	Prefabricated.	20 by 100.
4	do.	20 by 120.	1	do.	20 by 48.
2	Frame	20 by 120.	1	do.	20 by 48.
1	Prefabricated	20 by 50.	1	Frame	30 by 110.
1	do.	{20 by 120.	1	Prefabricated.	20 by 20.
1	do.	20 by 40.	Mile 162.5:		
1	Frame	20 by 20.	1	do.	20 by 48.
1	do.	20 by 60.	2	Frame	20 by 20.
1	do.	20 by 60.	2	do.	20 by 20.
1	do.	40 by 60.	1	do.	20 by 40.
1	do.	30 by 30.	1	Log	20 by 30.
1	do.	20 by 30.	Mile 162:		
1	do.	30 by 70.	2	Prefabricated.	20 by 120.
Mile 98.3:			1	do.	{20 by 100.1
2	Prefabricated.	20 by 60.	1	do.	20 by 40.1
1	do.	20 by 80.	1	do.	16 by 20.1
1	do.	20 by 60.	1	Frame	12 by 16.
1	do.	20 by 30.	1	do.	20 by 60.
3	Frame	20 by 20.	Mile 163 (Miller):		
1	do.	20 by 30.	1	do.	20 by 30.
1	do.	40 by 80.	1	do.	30 by 60.
Mile 101 (highway maintenance camp) (part):			Mile 163 (Volck):		
1	do.	20 by 126.	1	Frame quarters.	20 by 140.
3	do.	20 by 124.	1	do.	20 by 120.
3	do.	20 by 100.	1	do.	20 by 60.
1	do.	32 by 82.	1	Prefabricated.	20 by 30.
1	do.	20 by 50.	1	Frame	20 by 25.
1	do.	20 by 48.	1	do.	{20 by 100.1
1	do.	20 by 126.	1	do.	20 by 30.1
1	do.	64 by 144.	1	do.	35 by 40.
1	do.	64 by 144.	2	do.	20 by 30.
1	do.	20 by 50.	1	do.	30 by 120.
Mile 118:			1	do.	20 by 40.
6	Prefabricated.	20 by 120.	1	do.	25 by 80.
1	do.	20 by 100.	Mile 163 (highway maintenance camp):		
1	do.	20 by 30.	1	Prefabricated.	20 by 44.
1	Frame	{20 by 120.	1	Frame	{28 by 85.
1	do.	{20 by 30.	1	do.	26 by 30.
1	Prefabricated.	20 by 140.	1	do.	20 by 30.
1	do.	40 by 40.	1	do.	58 by 80.
1	do.	20 by 60.	1	do.	22 by 32.
1	do.	20 by 40.	1	do.	16 by 18.
1	do.	12 by 16.	1	do.	20 by 40.
1	do.	{20 by 60.	1	do.	20 by 20.
1	do.	{20 by 20.	1	do.	20 by 118.
1	do.	40 by 40.	4	do.	20 by 120.1
1	do.	20 by 20.	1	do.	20 by 32.
1	do.	20 by 40.	1	do.	16 by 20.
1	do.	20 by 40.	Mile 135:		
1	Prefabricated.	20 by 50.	1	Frame	20 by 100.
Mile 135:			1	do.	40 by 80.

See footnotes at end of table, p. 260.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1945—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 173.8:			Mile 236—Continued		
1	Prefabricated	20 by 20.	1	Frame	{20 by 100.
1	do	20 by 80.	2	do	{20 by 60.
1	Frame	20 by 100.	1	do	10 by 12.
1	do	10 by 10.	1	do	16 by 20.
Mile 180:			Mile 245 (highway-maintenance camp):		
1	Prefabricated	20 by 100.	1	Prefabricated	20 by 38.
4	do	20 by 120.	1	Frame	24 by 36.
1	Frame	20 by 120.	1	do	24 by 40.
2	do	20 by 60.	2	do	24 by 30.
1	Prefabricated	20 by 60.	1	do	20 by 30.
1	Frame	40 by 120.	1	do	20 by 82.
1	do	24 by 20.	3	do	20 by 120.
1	do	12 by 20.	1	do	{20 by 120.
2	do	10 by 10.	1	do	{24 by 40.
1	do	30 by 136.	1	do	24 by 32.
Mile 201 (highway maintenance camp) (part):			Mile 262.8:		
1	do	20 by 120.	9	Prefabricated	20 by 48.
3	do	20 by 120.	1	Frame	30 by 160.
2	do	20 by 120.	1	do	20 by 120.
1	do	20 by 120.	1	do	{20 by 100.
1	do	20 by 120.	1	do	{20 by 30.
1	do	20 by 120.	1	do	16 by 20.
1	Prefabricated	20 by 48.	1	do	20 by 25.
1	Frame	20 by 48.	Mile 264:		
1	do	20 by 130.	2	Prefabricated	20 by 48.
1	do	64 by 144.	2	do	20 by 48.
1	do	6 by 6.	3	Frame	20 by 120.
1	do	10 by 10.	1	do	20 by 120.
Mile 204.8:			1	do	{20 by 120.
3	do	20 by 120.	1	do	{20 by 48.
1	do	20 by 40.	1	Prefabricated	20 by 48.
1	do	20 by 80.	1	Frame	16 by 16.
1	do	30 by 70.	1	do	20 by 30.
1	do	20 by 40.	Mile 273.8:		
1	do	20 by 30.	1	do	30 by 40.
1	do	{20 by 120.	1	do	20 by 120.
1	do	{20 by 120.	1	do	16 by 16.
Mile 213:			Mile 278:		
4	do	20 by 100.	1	do	20 by 48.
2	do	20 by 120.	1	do	28 by 68.
1	do	20 by 100.	Mile 278:		
1	do	20 by 100.	1	do	30 by 80.
1	do	20 by 45.	1	do	18 by 20.
1	do	20 by 30.	1	do	{20 by 122.
1	do	20 by 30.	1	do	{16 by 20.
1	do	16 by 0.	1	do	{20 by 130.
2	do	10 by 12.	1	do	{20 by 20.
1	do	24 by 30.	1	do	16 by 16.
1	do	16 by 30.	1	do	20 by 80.
1	do	40 by 60.	1	do	20 by 118.
1	do	40 by 60.	Mile 295:		
1	do	{40 by 80.	5	do	20 by 120.
1	do	{20 by 30.	1	do	20 by 140.
1	do	20 by 60.	1	do	{20 by 150.
1	Prefabricated	20 by 20.	1	do	{20 by 20.
Mile 227.8:			1	do	20 by 120.
6	do	20 by 48.	1	do	20 by 40.
6	do	20 by 48.	1	do	20 by 30.
1	do	20 by 96.	1	do	20 by 80.
1	Frame	20 by 20.	1	do	20 by 120.
Mile 233:			1	do	{30 by 80.
1	do	20 by 80.	1	do	{20 by 30.
2	do	20 by 60.	Mile 299:		
1	do	20 by 30.	1	do	20 by 80.
1	do	20 by 60.	1	do	20 by 60.
1	do	20 by 60.	1	do	20 by 40.
1	do	10 by 12.	Mile 300 (highway maintenance camp) (part):		
1	do	30 by 60.	1	Prefabricated	20 by 48.
Mile 236:			6	do	20 by 48.
4	Prefabricated	20 by 48.	1	Frame	20 by 48.
1	Frame	20 by 50.	1	do	20 by 48.
1	do	20 by 60.	1	do	20 by 48.
1	do	20 by 120.	1	Prefabricated	20 by 48.
1	do	20 by 120.	Mile 307:		
1	Prefabricated	20 by 30.	3	Frame	20 by 60.
1	Frame	20 by 40.	1	do	20 by 60.
1	do	20 by 120.			

See footnotes at end of table, p. 269.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1945—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 307—Continued			Milepost 340.1—Con.		
2	Frame	20 by 30.	1	Frame	20 by 20.
1	do	(20 by 120.	Mile 351:		
1	do	20 by 70.	1	Prefabricated	16 by 16.
1	do	40 by 60.	4	Frame	16 by 16.
1	do	30 by 80.	4	Prefabricated	20 by 48.
1	do	20 by 30.	1	Frame	20 by 60.
1	do	12 by 16.	6	do	24 by 115.
1	do	10 by 20.	1	do	(24 by 115.
Mile 307.9:			1	do	24 by 80.
4	do	20 by 120.	1	do	(24 by 36.
1	Log	20 by 120.	1	do	16 by 24.
1	do	20 by 60.	1	Prefabricated	30 by 60.
1	Frame	20 by 120.	1	Frame	12 by 12.
1	do	(25 by 150.	1	do	20 by 26.
1	do	20 by 110.	1	do	58 by 80.
1	Log	20 by 90.	1	do	30 by 45.
1	do	20 by 40.	Mile 363:		
1	Frame	16 by 24.	2	do	20 by 100.
1	do	16 by 16.	2	do	20 by 60.
1	Prefabricated	(2) by 140.	1	do	20 by 50.
1	do	20 by 50.	1	Prefabricated	20 by 48.
1	do	20 by 180.	1	Frame	20 by 100.
1	do	20 by 120.	1	do	16 by 30.
5	do	20 by 48.	1	do	20 by 60.
2	do	20 by 40.	2	do	10 by 16.
2	do	20 by 30.	1	do	(20 by 80.
1	Log	40 by 90.	1	do	20 by 60.
1	Frame	16 by 24.	1	do	30 by 40.
2	do	16 by 20.	2	do	20 by 20.
1	do	16 by 16.	2	do	12 by 16.
Mile 308:			2	do	30 by 32.
3	do	16 by 24.	1	do	12 by 16.
1	do	16 by 16.	2	do	12 by 16.
1	Prefabricated	20 by 48.	Mile 363 (Miller):		
1	Frame	(20 by 48.	2	Prefabricated	20 by 48.
1	do	20 by 30.	1	do	14 by 16.
2	do	20 by 50.	1	do	20 by 48.
1	do	20 by 50.	1	Frame	10 by 12.
1	do	20 by 20.	Mile 375:		
Mile 324.8:			2	do	20 by 100.
5	Steel prefabricated quarters.	20 by 48.	3	do	20 by 120.
2	Frame	20 by 120.	3	do	20 by 80.
1	do	20 by 60.	2	do	20 by 60.
1	do	20 by 140.	1	do	20 by 90.
1	do	40 by 60.	1	do	20 by 80.
1	Prefabricated	40 by 60.	1	do	20 by 80.
1	Frame	16 by 16.	1	do	20 by 30.
Milepost 335 (Curran and Briggs):			1	do	(20 by 80.
1	do	20 by 60.	1	do	20 by 60.
1	do	20 by 40.	1	do	20 by 80.
1	do	20 by 20.	1	do	30 by 40.
1	Log	20 by 40.	1	do	30 by 60.
1	Frame	20 by 60.	1	do	20 by 50.
1	do	20 by 60.	1	do	16 by 38.
5	do	16 by 20.	6	do	12 by 16.
1	do	12 by 16.	1	do	30 by 100.
2	do	16 by 24.	Mile 388:		
1	do	16 by 40.	4	Prefabricated	16 by 36.
1	do	(20 by 80.	4	Frame	20 by 60.
1	do	20 by 40.	2	do	20 by 36.
1	do	20 by 30.	1	do	20 by 50.
Milepost 335 (Dunigan):			3	do	16 by 16.
6	Steel prefabricated.	20 by 48.	1	do	(20 by 60. ^a
1	Frame	20 by 80.	1	do	20 by 60.
1	do	30 by 40.	1	do	20 by 80.
1	do	(20 by 80.	1	do	30 by 40.
1	do	20 by 60.	1	do	20 by 20. ^t
1	do	20 by 20.	1	do	20 by 120.
1	do	16 by 32.	1	do	40 by 40.
1	do	16 by 24.	1	do	20 by 30.
Milepost 340.1:			1	do	10 by 16.
4	Prefabricated	20 by 48.	Mile 391.5:		
1	Frame	20 by 45.	1	Prefabricated	35 by 64.
1	do	16 by 16.	1	do	32 by 84.
			3	do	20 by 50.
			1	do	(20 by 60.
			4	do	20 by 40.
			1	do	12 by 16.
			1	Frame	20 by 80.

See footnotes at end of table, p. 260.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1945—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 392 (highway maintenance camp) (part):			Mile 449.5:		
1	Frame	20 by 48.	2	Frame	20 by 80.
1	Prefabricated.	20 by 48.	4	do	20 by 60.
2	do	20 by 48.	1	do	30 by 150.
1	do	20 by 48.	1	do	48 by 60.
1	do	20 by 48.	2	do	16 by 30.
1	do	20 by 48.	2	do	12 by 25.
1	do	20 by 48.	3	do	12 by 16.
1	do	20 by 48.	1	do	20 by 60.
1	do	20 by 60.	1	do	20 by 40.
1	Frame	30 by 30.	1	do	{25 by 80.
1	do	30 by 120.	1	do	{20 by 60.
1	do	64 by 144.	1	do	20 by 30.
Mile 407:			1	do	30 by 50.
5	do	24 by 70.	1	do	16 by 20.
1	do	16 by 24.	Mile 456 (highway maintenance camp) (part):		
1	do	24 by 100.	1	Prefabricated.	20 by 48.
1	do	{24 by 70.	1	Frame	20 by 104.
1	do	{24 by 70.	1	Prefabricated.	20 by 48.
1	do	24 by 110.	1	do	20 by 48.
1	do	40 by 80.	1	do	20 by 48.
1	do	40 by 40.	1	do	20 by 48.
1	do	24 by 70.	1	do	20 by 48.
1	do	12 by 20.	1	do	30 by 50.
1	do	24 by 80.	1	Frame	64 by 44.
1	do	16 by 70.	1	Prefabricated.	20 by 48.
1	do	20 by 20 ¹	1	do	20 by 48.
1	do	12 by 30.	Mile 458:		
1	do	30 by 30.	2	Frame	24 by 60.
1	do	30 by 80.	1	do	{24 by 60.
1	do	25 by 30.	1	do	{74 by 48.
1	do	24 by 60.	2	do	30 by 48.
1	do	20 by 80.	1	do	{24 by 72. ¹
1	do	35 by 40.	1	do	{20 by 40. ¹
1	do	24 by 70.	2	do	16 by 20.
1	do	24 by 60.	1	do	10 by 16.
2	do	14 by 16.	1	do	{12 by 20.
1	do	20 by 40.	1	do	{10 by 10.
4	do	16 by 20.	1	do	6 by 10.
1	do	20 by 35.	Mile 460:		
1	do	12 by 20.	1	do	22 by 40.
1	do	20 by 50.	2	do	20 by 40.
1	do	20 by 60.	1	do	10 by 20.
Mile 408:			1	do	6 by 8.
9	do	20 by 55.	Mile 462:		
1	do	{30 by 80. ²	1	do	24 by 50.
2	do	{20 by 50. ¹	1	do	24 by 60.
2	do	20 by 55.	1	do	22 by 38.
2	do	20 by 30.	1	do	{24 by 120.
1	do	20 by 55.	1	do	{22 by 72.
1	do	30 by 75.	3	do	{25 by 60. ²
1	do	25 by 140.	1	do	{20 by 20. ¹
1	do	30 by 50.	1	do	30 by 30.
1	do	30 by 40.	1	Log	40 by 40.
1	do	20 by 20.	1	Frame	30 by 40.
1	do	20 by 20.	1	do	46 by 78.
1	do	12 by 20.	1	do	30 by 100.
3	do	16 by 20.	1	do	22 by 50.
1	do	16 by 30.	1	do	20 by 40.
Mile 422 (Miller):			2	do	12 by 16.
2	Prefabricated.	36 by 60.	1	do	12 by 18.
1	Frame	20 by 25.	1	do	32 by 96.
1	do	30 by 30.	1	do	6 by 8.
Mile 443.5:			1	do	30 by 40.
3	do	20 by 80.	1	do	14 by 14.
1	do	20 by 50.	1	do	12 by 16.
2	do	20 by 40.	1	do	6 by 12.
1	do	20 by 30.	1	do	10 by 10.
1	do	20 by 100.	1	do	10 by 14.
1	do	20 by 36.	1	do	6 by 8.
1	do	25 by 100.	Mile 463.1:		
1	do	25 by 120.	1	Log	16 by 16.
1	do	20 by 60.	1	Frame	22 by 32.
1	do	{20 by 100.	Mile 472:		
1	do	{25 by 60.	3	do	22 by 100.
3	do	16 by 20.	1	do	22 by 50.
2	do	12 by 16.	1	do	22 by 80.
1	Log	30 by 30.	1	do	22 by 96.
2	do	20 by 30.	1	do	22 by 36.

See footnotes at end of table, p. 269.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1914—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 472—Continued			Mile 497.5—Con.		
1	Frame	{22 by 72.	1	Frame	20 by 40.
1	do	{22 by 40.	1	do	16 by 20.
1	do	30 by 30.	1	do	20 by 120.
3	do	6 by 6.	1	do	12 by 30.
1	do	8 by 12.	1	Log	20 by 60.
1	do	32 by 96.	1	do	16 by 16.
1	do	8 by 16.	1	Prefabricated.	20 by 48.
1	do	10 by 16.	Mile 502:		
2	do	12 by 12.	1	do	80 by 48.
2	do	8 by 12.	3	Frame	16 by 24.
1	do	8 by 14.	1	do	30 by 40.
1	do	12 by 14.	1	do	30 by 50.
1	do	14 by 16.	1	do	10 by 10.
2	do	22 by 48.	1	do	12 by 12.
1	do	24 by 30.	4	do	6 by 8.
Milepost 476.3:			1	do	20 by 24.
1	do	14 by 60.	1	do	14 by 20.
1	do	12 by 20.	1	do	8 by 24.
Milepost 492:			Mile 514.1:		
1	do	14 by 40.	7	Prefabricated.	20 by 48.
1	do	12 by 14.	1	Frame	15 by 40.
1	do	10 by 10.	1	do	10 by 12.
1	do	8 by 10.	1	do	24 by 30.
1	do	6 by 6.	1	do	30 by 72.
1	do	12 by 2'.	1	do	20 by 48.
1	Log	10 by 12.	1	do	{20 by 36.
1	do	12 by 18.	1	do	{15 by 15.
Mile 495:			2	Log	6 by 8.
1	do	14 by 17.	1	do	4 by 6.
2	do	20 by 30.	1	do	20 by 48.
1	do	10 by 14.	1	do	16 by 30.
1	do	12 by 16.	Mile 528:		
1	Frame	14 by 16.	1	Prefabricated.	20 by 48.
1	do	14 by 20.	1	Frame	24 by 48.
1	do	12 by 24.	1	do	{24 by 40.
1	do	12 by 16.	1	do	{20 by 48.
2	do	8 by 10.	1	do	20 by 30.
Mile 496:			1	do	12 by 48.
2	do	22 by 96.	1	Log	16 by 16.
3	do	22 by 120.	1	Frame	74 by 40.
1	do	24 by 36.	1	do	16 by 16.
2	do	24 by 60.	1	do	18 by 24.
2	do	22 by 72.	3	do	6 by 10.
6	do	22 by 48.	1	do	8 by 10.
4	do	16 by 24.	1	do	8 by 8.
4	do	12 by 14.	1	do	4 by 6.
4	do	16 by 16.	1	do	4 by 6.
1	do	{20 by 120.	2	do	6 by 8.
1	do	{24 by 50.	1	do	10 by 10.
1	do	{20 by 28.	Mile 533:		
3	do	{10 by 10.	1	do	30 by 60.
1	do	40 by 96.	1	do	12 by 12.
1	do	36 by 60.	1	do	10 by 24.
1	do	30 by 40.	1	do	{20 by 120.
1	do	{24 by 30.	1	do	{20 by 50.
1	do	{12 by 20.	1	do	20 by 48.
1	do	12 by 30.	1	do	16 by 30.
1	do	48 by 48.	Mile 537:		
5	do	6 by 10.	1	do	8 by 8.
1	do	10 by 12.	2	do	20 by 30.
2	do	8 by 10.	1	do	12 by 30.
2	Prefabricated.	20 by 48.	1	do	20 by 96.
Milepost 496.3:			Mile 540:		
1	Frame	20 by 72.	1	do	16 by 16.
1	do	16 by 24.	1	do	30 by 50.
5	do	6 by 10.	2	do	10 by 10.
6	do	24 by 60.	1	do	20 by 60.
1	do	{24 by 120.	1	do	14 by 16.
1	do	{30 by 60.	2	do	6 by 8.
1	do	20 by 30.	1	do	12 by 14.
1	do	10 by 48.	1	do	20 by 48.
2	do	15 by 30.	1	do	14 by 18.
1	do	12 by 16.	1	do	20 by 76.
1	do	10 by 10.	1	do	20 by 30.
1	do	22 by 96.	2	Prefabricated.	20 by 48.
Mile 497.5:			1	Frame	20 by 40.
2	do	20 by 60.	1	do	20 by 27.
2	do	16 by 16.	1	do	8 by 14.
1	do	10 by 20.	4	Prefabricated	20 by 48.
			1	Frame	24 by 60.

See footnotes at end of table, p. 269.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1945—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 540—Continued			Mile 635—Continued		
1	Frame	{20 by 60. 20 by 30.	1	Prefabricated	20 by 48.
1	Prefabricated	12 by 20.	1	Frame	20 by 40.
1	Frame	4 by 6.	1	Prefabricated	20 by 48.
1	do	10 by 10.	1	Frame	32 by 64.
1	do	12 by 24.	Mile 642.6:		
1	Prefabricated	12 by 24.	1	do	13 by 20.
Mile 543 (highway maintenance camp) (part):			1	do	16 by 20.
1	do	20 by 48.	Mile 642.7:		
1	do	20 by 140.	1	do	10 by 80.
1	do	20 by 40.	1	do	16 by 24.
1	do	20 by 48.	1	do	8 by 10.
1	do	20 by 48.	2	Prefabricated	20 by 48.
1	do	20 by 48.	1	Frame	{20 by 150 20 by 48.
1	do	20 by 48.	1	do	{12 by 12. 10 by 12.
1	Frame	64 by 144.	2	do	22 by 48.
1	do	20 by 48.	1	Prefabricated	20 by 48.
1	do	10 by 16.	1	Frame	20 by 48.
1	do	10 by 16.	1	do	14 by 18.
1	do	10 by 20.	Mile 652.5:		
1	do	10 by 12.	9	Prefabricated	20 by 48.
1	do	12 by 14.	2	do	22 by 48.
1	Prefabricated	20 by 48.	3	Log	22 by 50.
1	do	20 by 96.	3	do	12 by 14.
1	Frame	20 by 150.	1	do	18 by 36.
Mile 578:			1	do	32 by 122
1	do	16 by 20.	1	Frame	12 by 20.
1	Log	20 by 96.	2	do	20 by 48.
1	Frame	10 by 10.	1	do	14 by 18.
1	do	14 by 20.	1	do	{20 by 120 8 by 10.
1	do	20 by 36.	1	do	18 by 22.
1	do	8 by 10.	1	do	4 by 8.
Mile 596:			Mile 670:		
1	do	20 by 60.	4	Prefabricated	20 by 48.
1	do	20 by 160.	1	Frame	18 by 22.
1	do	20 by 20.	1	do	5 by 7.
1	do	20 by 50.	1	do	8 by 10.
1	do	45 by 120.	1	Prefabricated	10 by 12.
1	do	20 by 40.	1	do	22 by 48.
Mile 606.3:			1	Frame	20 by 48.
6	Prefabricated	20 by 48.	1	do	8 by 8.
2	do	20 by 48.	1	do	30 by 30.
1	Frame	20 by 36.	1	do	6 by 8.
1	do	12 by 76.	1	do	4 by 6.
2	do	8 by 10.	1	do	20 by 120.
1	do	30 by 78.	1	Log	10 by 12.
1	do	20 by 30.	1	do	4 by 6.
1	do	14 by 26.	Mile 687:		
1	Log	20 by 25.	1	Frame	20 by 75.
Mile 619.7:			4	do	20 by 52.
1	Frame	{16 by 72. 10 by 20.	1	do	12 by 30.
1	do	20 by 48.	1	do	10 by 16.
1	do	20 by 32.	1	do	20 by 32.
Mile 631.9:			1	do	12 by 20.
3	Prefabricated	20 by 48.	1	do	24 by 24.
3	do	20 by 48.	1	do	6 by 8.
1	Frame	20 by 96.	1	Log	18 by 20.
1	do	24 by 32.	1	do	15 by 26.
1	do	8 by 12.	Mile 710:		
1	do	10 by 12.	5	do	20 by 50.
1	do	10 by 16.	6	Prefabricated	20 by 48.
1	do	6 by 16.	3	Frame	20 by 48.
1	do	30 by 45.	1	do	18 by 24.
1	Log	30 by 35.	1	Frame and log	{20 by 120 12 by 28.
2	do	20 by 20.	1	Prefabricated	20 by 96.
Mile 635 (highway maintenance camp) (part):			1	Log	12 by 20.
1	Prefabricated	20 by 48.	1	do	9 by 12.
1	do	20 by 48.	1	do	22 by 24.
1	do	20 by 48.	1	Frame	12 by 16.
1	do	20 by 48.	1	Log and frame	{30 by 60. 30 by 40.
1	do	20 by 48.	1	Frame	16 by 24.
1	do	20 by 48.	1	do	8 by 10.
1	do	20 by 48.	1	Log	8 by 10.
1	do	20 by 48.	1	do	12 by 18.
1	Log	20 by 48.	1	Frame	10 by 12.
1	Frame	32 by 30.	1	Log	20 by 30.

See footnotes at end of table, p. 269.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1946—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 722.1:			Mile 777.7—Con.		
1	Prefabricated	{20 by 96.	1	Frame	6 by 8.
1	do	{20 by 48.	1	do	20 by 30.
1	do	20 by 48.	1	do	20 by 40.
1	do	8 by 16.	Mile 796.6:		
1	Frame	{10 by 20.	1	Log	25 by 60.
		{10 by 10.	2	do	25 by 42.
Mile 722:			1	do	25 by 40.
4	Log	12 by 14.	1	do	22 by 40.
Mile 727.3:			1	do	18 by 24.
1	Frame	30 by 66.	Mile 790.7:		
1	do	50 by 64.	1	Frame	10 by 16.
1	do	12 by 16.	Mile 804 (highway maintenance camp):⁶		
Mile 733 (highway maintenance camp) (parts):			Mile 829.7:		
1	do	23 by 122.	1	do	{20 by 160.
1	do	20 by 105.	1	Prefabricated	{18 by 28.
1	do	20 by 52.	1	Frame	16 by 20.
1	do	20 by 30.	1	do	6 by 10.
1	do	20 by 30.	1	do	16 by 20.
1	Prefabricated	20 by 30.	1	Log	20 by 26.
1	Frame	20 by 20.	1	Frame	22 by 22.
1	do	32 by 88.	2	Prefabricated	20 by 20.
1	do	32 by 64.	1	Frame	6 by 8.
1	do	64 by 144.	8	do	20 by 52.
1	do	64 by 144.	1	do	{20 by 124.
1	do	20 by 48.	1	do	{12 by 20.
1	do	16 by 30.	1	do	32 by 50.
1	do	16 by 30.	1	do	32 by 64.
			1	do	8 by 20.
Mile 741.6:			1	do	12 by 15.
1	Prefabricated	20 by 40.	1	do	8 by 10.
3	do	20 by 48.	Mile 843.9:		
12	Frame	20 by 48.	1	do	20 by 24.
1	do	20 by 60.	1	do	{20 by 80.
1	do	16 by 40.	1	do	{20 by 48.
1	do	{120 by 120.	1	do	10 by 10.
1	do	20 by 48.	1	do	20 by 20.
1	do	20 by 30.	1	do	10 by 30.
1	do	8 by 15.	1	do	12 by 15.
1	do	12 by 16.	Mile 865.4 (Junction Carcross Wye Rd.):		
1	do	10 by 12.	NOTE.—Camp located about 15 miles from Junction at Tagish, Yukon Territory.		
1	do	8 by 10.	1	do	15 by 20.
1	do	4 by 4.	1	do	30 by 48.
2	Log	20 by 42.	1	do	20 by 15.
1	do	30 by 60.	1	do	20 by 40.
Mile 759.3:			NOTE.—4 buildings transferred to the use of Canada in settlement of claim to them for rental of land.		
All buildings have been removed.			Mile 865.8:		
Mile 770:			1	Log	30 by 60.
1	Frame	{30 by 56.	Mile 883 (highway maintenance camp):		
		{14 by 30. ³	1	Frame	20 by 48.
2	Log	20 by 40.	3	CCC	20 by 30.
1	Frame	20 by 120.	1	Frame	20 by 48.
3	do	20 by 32.	1	do	20 by 20.
8	do	20 by 48.	1	CCC	Oil storage.
1	do	20 by 30.	1	Butler	20 by 48.
1	Prefabricated	20 by 30.	1	do	20 by 48.
1	Frame	12 by 20.	1	Frame	32 by 100.
1	Prefabricated	20 by 45.	1	Butler	
1	Frame	10 by 12.	Mile 897.6:		
1	do	12 by 16.	1	Frame	5 by 7.
1	do	18 by 20.	1	do	7 by 10.
1	do	18 by 18.	1	Prefabricated	20 by 30.
Mile 775.8:			1	do	30 by 120.
1	do	{24 by 50.	2	Frame	20 by 40.
		{30 by 60.	1	do	20 by 50.
1	Log	18 by 22.	2	Prefabricated	20 by 50.
Mile 777.3:			1	Frame	4 by 6.
1	do	22 by 32. ³	1	do	7 by 12.
Mile 777.7:			Mile 911:		
4	Frame	20 by 52.	1	do	{24 by 120.
1	do	20 by 72.	2	do	{24 by 36.
1	do	22 by 32.			24 by 120.
1	do	12 by 16.			
1	Log	16 by 30.			
1	do	12 by 14.			
1	do	6 by 10.			
1	Frame	12 by 16. ²			
1	do	22 by 22.			

See footnotes at end of table, p. 269.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1945—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 911—Continued			Mile 987.5—Con.		
1	Frame	{24 by 56. 8 by 15. 16 by 20.	1	Frame	20 by 48.
3	Prefabricated	20 by 120.	1	do	12 by 20.
1	do	{20 by 111. 20 by 70. 24 by 152.	1	do	12 by 20.
1	Frame	{11 by 23. 16 by 20. 12 by 14.	1	do	20 by 20.
1	do	{25 by 56. 20 by 36. 20 by 48.	1	do	12 by 14.
1	Prefabricated	{19 by 37. 10 by 15. 20 by 48.	1	do	10 by 14.
1	do	24 by 60.	1	do	20 by 30.
1	Frame	12 by 16.	1	do	31 by 61.
1	do	22 by 38.	1	do	20 by 40.
1	do	{15 by 25. 10 by 15. 10 by 25.	1	do	20 by 30.
1	do	8 by 12.	1	do	11 by 15.
1	do	{24 by 122. 16 by 122. 12 by 24.	1	do	
1	Prefabricated	{20 by 24. 19 by 274. 14 by 14.	1	do	
2	Frame	{30 by 64. 12 by 24. 10 by 15.	1	do	
1	Log		1	do	
2	Frame		1	do	
Mile 917 (junction of road to village of Whitehorse):			Aishibik Camp: All buildings have been removed.		
2	CCC	20 by 40.	Mile 1006:		
NOTE.—2 buildings in the Dowell area transferred to owner in lieu of land rent.			1	do	{20 by 70. 12 by 36. 0 by 36. 10 by 12. 8 by 10.
Mile 936:			1	do	12 by 12.
1	Log	22 by 24.	3	do	20 by 48.
1	Prefabricated	20 by 20.	1	do	12 by 20.
1	Frame	20 by 120.	1	do	16 by 32.
1	Prefabricated	20 by 120.	1	do	{20 by 40. 20 by 30.
1	Frame mess-hall.	20 by 120.	1	do	12 by 10.
1	Frame	20 by 120.	1	do	
1	do	15 by 20.	Mile 1016 (highway maintenance camp):		
2	do	20 by 30.	1	T. O.	20 by 48.
1	do	6 by 8.	1	CCC	20 by 120.
1	Log	32 by 62.	2	Log	20 by 30.
1	Frame	20 by 48.	1	CCC	20 by 30.
Mile 946.4:			1	Frame	20 by 70.
8	do	20 by 48.	1	Log	16 by 24.
1	do	20 by 48.	2	do	30 by 90.
1	do	{20 by 48. ¹ 24 by 30. ¹	1	Frame	10 by 48.
1	do	10 by 11.	1	do	
Mile 956:			1	do	{20 by 120. 24 by 43.
6	CCC	20 by 40.	1	Frame	12 by 20.
1	T. O.	20 by 48.	1	Log	10 by 30.
1	Frame	20 by 48.	1	Frame	10 by 12.
1	Log	{30 by 60. 30 by 40.	1	Log	20 by 30.
Mile 968:			1	CCC	20 by 120.
1	Frame	20 by 20.	Mile 1036.2:		
5	do	20 by 52.	1	Frame	20 by 70.
1	do	10 by 14.	1	do	20 by 24.
1	do	12 by 16.	Mile 1038:		
1	do	20 by 22.	1	do	20 by 96.
1	do	20 by 24.	1	do	20 by 30.
Mile 974.7:			Mile 1054:		
1	do	{20 by 40. 20 by 34. 8 by 8.	4	do	20 by 52.
Mile 987.5:			1	do	12 by 16.
5	do	20 by 120.	Mile 1056:		
1	do	{24 by 148. 24 by 44.	9	do	20 by 100.
1	do	20 by 48.	1	do	{20 by 118. 20 by 96. 20 by 31.
			1	do	20 by 80.
			1	do	79 by 100.
			1	do	9 by 12.
			1	do	17 by 17.
			1	do	7 by 9.
			1	do	8 by 12.
			1	do	9 by 13.
			1	do	6 by 10.
			1	do	20 by 48.
			4	Prefabricated	20 by 48.
			1	Frame	20 by 90.
			1	do	20 by 25.
			1	do	16 by 16.
			1	do	17 by 17.
			Mile 1,064.1:		
			1	do	{20 by 96. 10 by 10. 4 by 8.
			1	do	

See footnotes at end of table, p. 269.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1945—Continued

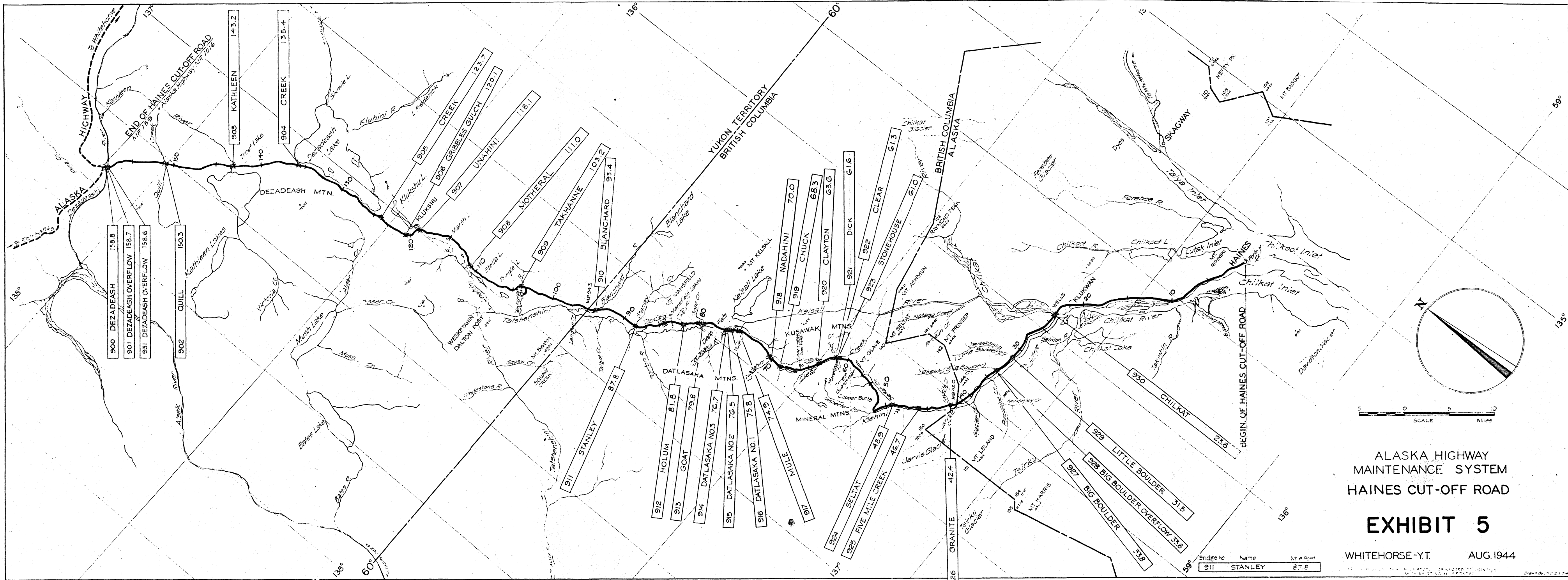
Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 1,082.9:			Mile 1,156 (highway maintenance camp):		
1.....	Frame.....	18 by 46.	9.....	Plywood.....	25 by 40.
1.....	do.....	20 by 144.	1.....	T. O.....	30 by 170.
1.....	do.....	60 by 144.	1.....	do.....	25 by 40.
Mile 1,083 (highway maintenance camp) (part):			1.....	Plywood.....	25 by 120.
1.....	do.....	20 by 48.	1.....	T. O.....	25 by 120.
1.....	do.....	20 by 48.	1.....	do.....	25 by 60.
1.....	do.....	20 by 48.	1.....	do.....	25 by 45.
1.....	do.....	20 by 48.	1.....	Plywood.....	25 by 120.
1.....	do.....	20 by 48.	1.....	T. O.....	28 by 100.
1.....	do.....	20 by 48.	1.....	do.....	36 by 100.
1.....	do.....	20 by 48.	1.....	do.....	27 by 29.
1.....	do.....	20 by 109.	1.....	do.....	30 by 150.
1.....	do.....	20 by 48.	1.....	Plywood.....	16 by 24.
1.....	do.....	20 by 98.	1.....	do.....	20 by 30.
1.....	do.....	20 by 20.	Mile 1,164:		
1.....	do.....	32 by 88.	5.....	Prefabricated.	22 by 48.
1.....	do.....	32 by 64.	1.....	do.....	20 by 48.
1.....	do.....	32 by 64.	1.....	do.....	16 by 20.
1.....	do.....	32 by 64.	2.....	do.....	16 by 16.
Mile 1,083.8:			1.....	Frame.....	10 by 12.
1.....	do.....	24 by 130.	1.....	do.....	20 by 32.
3.....	do.....	24 by 130.	1.....	do.....	20 by 100.
1.....	do.....	24 by 130.	1.....	do.....	11 by 28.
2.....	Prefabricated.	22 by 48.	1.....	do.....	7 by 18.
1.....	Frame.....	30 by 66.	Mile 1,168.6:		
Burwash Camp:			6.....	Prefabricated.	20 by 48.
1.....	Log.....	16 by 16.	1.....	Frame.....	20 by 40.
1.....	Frame.....	10 by 20.	1.....	do.....	20 by 48.
Mile 1,098:			1.....	do.....	24 by 50.
1.....	do.....	12 by 24.	1.....	do.....	12 by 12.
1.....	do.....	20 by 50.	1.....	do.....	16 by 24.
1.....	Log.....	21 by 21.	1.....	do.....	20 by 48.
13.....	Frame.....	20 by 48.	1.....	do.....	34 by 92.
1.....	do.....	20 by 120.	1.....	do.....	12 by 12.
1.....	do.....	28 by 80.	Mile 1,171:		
1.....	do.....	10 by 20.	1.....	do.....	32 by 117.
1.....	do.....	16 by 29.	1.....	do.....	16 by 20.
1.....	do.....	30 by 60.	1.....	do.....	12 by 16.
1.....	Log.....	20 by 40.	2.....	do.....	10 by 20.
1.....	Frame.....	6 by 8.	2.....	Prefabricated.	22 by 48.
1.....	do.....	4 by 8.	1.....	Frame.....	20 by 24.
1.....	do.....	20 by 30.	1.....	do.....	8 by 10.
1.....	do.....	10 by 12.	1.....	do.....	12 by 16.
1.....	Prefabricated.	22 by 48.	1.....	do.....	16 by 30.
Mile 1,130:			1.....	do.....	10 by 18.
2.....	Frame.....	10 by 10.	2.....	do.....	4 by 8.
1.....	do.....	20 by 130.	Mile 1,176:		
7.....	do.....	20 by 48.	1.....	do.....	10 by 24.
1.....	do.....	20 by 25.	Mile 1,184:		
1.....	do.....	6 by 12.	5.....	Prefabricated.	22 by 48.
1.....	do.....	8 by 12.	1.....	do.....	22 by 96.
3.....	do.....	10 by 16.	1.....	do.....	20 by 48.
Mile 1,130.1:			1.....	do.....	24 by 96.
1.....	do.....	24 by 120.	1.....	Frame.....	24 by 56.
1.....	do.....	10 by 14.	1.....	do.....	20 by 48.
1.....	do.....	24 by 120.	1.....	do.....	16 by 24.
5.....	do.....	20 by 52.	1.....	do.....	18 by 28.
1.....	do.....	20 by 52.	1.....	do.....	10 by 18.
1.....	Prefabricated.	22 by 48.	1.....	do.....	6 by 8.
1.....	Frame.....	20 by 24.	1.....	do.....	10 by 10.
1.....	do.....	24 by 28.	1.....	do.....	4 by 6.
1.....	do.....	36 by 114.	2.....	do.....	20 by 35.
Mile 1,137:			1.....	do.....	35 by 80.
2.....	Prefabricated.	22 by 48.	Mile 1,191.5:		
1.....	Frame.....	60 by 120.	1.....	do.....	20 by 48.
1.....	do.....	20 by 26.	1.....	do.....	6 by 8.
1.....	do.....	10 by 12.	Mile 1,200:		
1.....	do.....	12 by 16.	1.....	do.....	24 by 28.
1.....	do.....	6 by 24.	3.....	Prefabricated.	18 by 12.
Mile 1,146.5:			1.....	do.....	20 by 56.
1.....	Prefabricated.	22 by 48.	1.....	do.....	20 by 32.
1.....	Frame.....	28 by 38.	1.....	do.....	12 by 30.
3.....	do.....	8 by 10.	1.....	do.....	10 by 12.
1.....	do.....	6 by 8.	1.....	do.....	20 by 40.
1.....	do.....	14 by 16.	1.....	Frame.....	12 by 24.
Mile 1,150:			1.....	do.....	10 by 16.
1.....	Prefabricated.	16 by 40.	1.....	do.....	8 by 10.

See footnotes at end of table, p. 269.

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1946—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 1,200—Con.			Haines Rd., mile 40:		
1	Frame	4 by 4.	5	Prefabricated	20 by 120.
Mile 1,200.7:			1	do	20 by 72.
1	do	18 by 90.	1	do	20 by 30.
1	do	14 by 20.	1	do	20 by 72.1
1	do	32 by 52.	1	do	20 by 60.1
1	Log	30 by 40.	1	do	15 by 20.1
1	Frame	20 by 90.	1	do	8 by 16.
1	do	16 by 24.	1	do	9 by 13.
1	do	8 by 10.	1	do	20 by 60.
1	do	14 by 22.	1	Frame	10 by 16.
4	Log	16 by 20.	1	do	64 by 144.
7	do	16 by 16.	Haines Rd., mile 43:		
1	do	12 by 18.			12 by 56.
1	Frame	16 by 15.	1	do	12 by 12.
1	do	10 by 12.			24 by 48.
1	Prefabricated	16 by 16.			12 by 30.
Mile 1,206 (highway maintenance camp):			1	do	6 by 8.
1	Frame	10 by 20.	1	do	10 by 16.
1	Log	14 by 24.	1	do	8 by 9.
1	Prefabricated	20 by 48.	1	do	6 by 8.
1	Frame	12 by 48.	Haines Rd., Haines:		
1	Prefabricated	20 by 48.	1	do	20 by 160.1
1	Frame	12 by 20.			20 by 145.1
1	do	10 by 10.	1	do	40 by 64.1
1	do	12 by 26.			20 by 25.1
1	Frame	6 by 12.	1	do	20 by 25.1
1	Prefabricated	20 by 48.			10 by 40.1
1	do	20 by 48.	1	do	20 by 180.1
1	do	20 by 48.	1	do	20 by 60.1
1	do	20 by 48.			20 by 40.1
1	Frame	38 by 76.	1	do	20 by 156.1
1	do	10 by 15.			20 by 190.1
1	do	10 by 12.	1	do	10 by 20.1
Mile 1,213:			1	do	20 by 30.1
4	do	20 by 40.	1	Prefabricated	20 by 120.
1	do	24 by 50.	1	do	20 by 100.
1	do	20 by 36.	1	Frame	20 by 180.1
1	do	12 by 20.	1	do	20 by 80.1
1	do	20 by 66.	1	do	20 by 260.1
2	do	20 by 48.	2	do	20 by 100.1
Mile 1,213.1:			2	do	64 by 96.
1	Prefabricated	22 by 48.	2	do	20 by 150.
Mile 1,220:			2	Prefabricated	20 by 24.
1	Frame	36 by 55.	1	do	20 by 30.
1	do	20 by 48.	1	do	20 by 28.
1	do	12 by 30.	1	Frame	64 by 160.
1	do	6 by 8.	1	do	53 by 173.
Mile 1,221.4			2	Prefabricated	20 by 120.
			2	do	10 by 12.
ALASKA—CANADA BOUNDARY					20 by 120.
Haines Rd., mile 6.6:			1	do	20 by 70.
3	Prefabricated	20 by 120.			20 by 20.
1	do	20 by 120.	2	Frame	20 by 120.
1	do	8 by 8.	1	do	20 by 140.
1	Frame	20 by 20.	1	do	20 by 30.
1	do	8 by 30.	1	do	20 by 296.1
1	do	20 by 20.	2	do	60 by 300.
1	Prefabricated	20 by 75.	1	do	60 by 150.
1	do	10 by 15.	1	do	20 by 20.
Haines Rd., mile 17.7:			Haines Rd., mile 51:		
3	do	20 by 120.	1	do	4 by 6.
1	do	20 by 120.	1	do	7 by 7.
1	do	20 by 26.	1	do	5 by 7.
1	do	30 by 60.	1	do	10 by 12.
1	do	10 by 20.	8	Floor	20 by 40.
1	do	5 by 9.	4	do	16 by 20.
1	do	10 by 12.	Haines Rd., mile 61:		
1	do	8 by 12.	1	Frame	5 by 10.
1	do	12 by 25.	1	do	5 by 7.
Haines Rd., mile 28:			1	do	8 by 16.
3	do	20 by 120.	1	do	12 by 20.
3	do	20 by 48.	1	do	16 by 80.
1	do	20 by 120.	1	do	10 by 16.
1	do	20 by 20.	Haines Rd., mile 75:		
1	do	20 by 20.	1	do	15 by 20.
1	Frame	30 by 60.	1	do	64 by 144.
1	do	10 by 16.	1	do	16 by 40.
1	do	10 by 10.	1	do	14 by 16.
			1	do	6 by 12.
			9	Prefabricated	20 by 48.

See footnotes at end of table, p. 269.

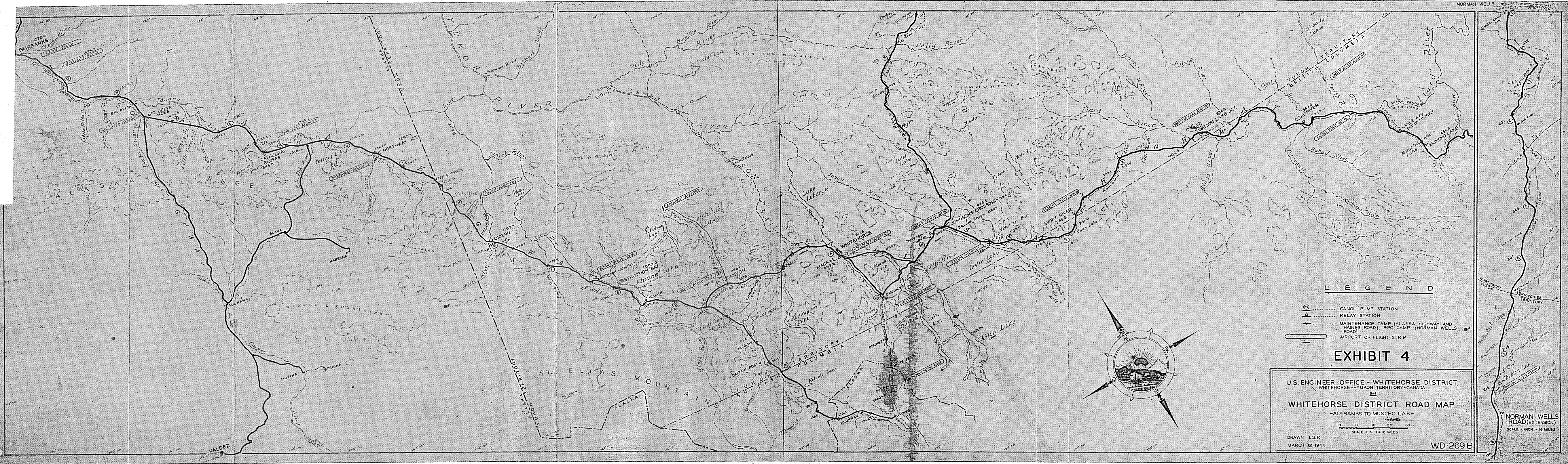


ALASKA HIGHWAY
MAINTENANCE SYSTEM
HAINES CUT-OFF ROAD

EXHIBIT 5

WHITEHORSE-Y.T. AUG. 1944

Bridge No.	Name	Mile Post
911	STANLEY	87.8



LEGEND

- ⊙ CANOL PUMP STATION
- △ RELAY STATION
- ⊕ MAINTENANCE CAMP (ALASKA HIGHWAY AND HAINES ROAD) BPC CAMP (NORMAN WELLS ROAD)
- ✈ AIRPORT OR FLIGHT STRIP

EXHIBIT 4

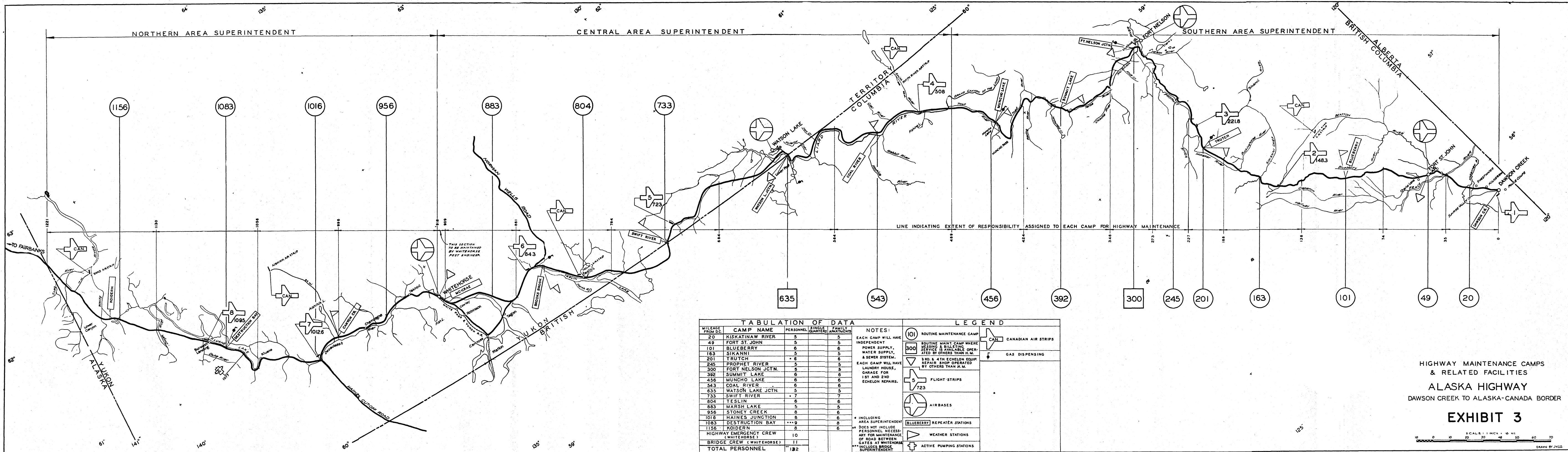
U.S. ENGINEER OFFICE - WHITEHORSE DISTRICT
 WHITEHORSE--YUKON TERRITORY-CANADA

WHITEHORSE DISTRICT ROAD MAP
 FAIRBANKS TO MUNCHO LAKE

0 10 20 30
 SCALE 1 INCH = 16 MILES

DRAWN: L.S.P.
 MARCH 12-1944

WD-269B



TABULATION OF DATA

MILEAGE FROM D.C.	CAMP NAME	PERSONNEL	SINGLE QUARTERS	FAMILY APARTMENTS
20	KISKATINAW RIVER	5	5	5
49	FORT ST. JOHN	5	5	5
101	BLUEBERRY	6	6	6
163	SIKANNI	5	5	5
201	TRUTCH	6	6	6
245	PROPHET RIVER	5	5	5
300	FORT NELSON JCTN.	5	5	5
392	SUMMIT LAKE	6	6	6
456	MUNCHO LAKE	6	6	6
543	COAL RIVER	6	6	6
635	WATSON LAKE JCTN.	5	5	5
733	SWIFT RIVER	7	7	7
804	TESLIN	6	6	6
883	MARSH LAKE	5	5	5
956	STONEY CREEK	8	8	8
1016	HAINES JUNCTION	8	8	8
1083	DESTRUCTION BAY	9	9	9
1156	KOIDEREN	8	8	8
	HIGHWAY EMERGENCY CREW (WHITEHORSE)	10		
	BRIDGE CREW (WHITEHORSE)	11		
	TOTAL PERSONNEL	132		

NOTES:
 EACH CAMP WILL HAVE INDEPENDENT POWER SUPPLY, WATER SUPPLY, & SEWER SYSTEM.
 EACH CAMP WILL HAVE LAUNDRY HOUSE, GARAGE FOR 1ST AND 2ND ECHELON REPAIRS.
 * INCLUDING AREA SUPERINTENDENT
 ** DOES NOT INCLUDE PERSONNEL NECESSARY FOR MAINTENANCE OF ROAD BETWEEN GATES AT WHITEHORSE
 *** INCLUDES BRIDGE SUPERINTENDENT

LEGEND

- (101) ROUTINE MAINTENANCE CAMP
- (300) ROUTINE MAINT. CAMP WHERE MESSING & BILLETING SERVICE IS AVAILABLE OPERATED BY OTHERS THAN H.M.
- 5 3 RD. & 4TH ECHELON EQUIP. REPAIR SHOP OPERATED BY OTHERS THAN H.M.
- 5 FLIGHT STRIPS
- 723
- AIRBASES
- BLUEBERRY REPEATER STATIONS
- WEATHER STATIONS
- ACTIVE PUMPING STATIONS
- CAN CANADIAN AIR STRIPS
- GAS DISPENSING

LINE INDICATING EXTENT OF RESPONSIBILITY ASSIGNED TO EACH CAMP FOR HIGHWAY MAINTENANCE

List of camps from Dawson Creek to the Canada-Alaska boundary on the Alaska Military Highway System, including Haines Road, Sept. 1, 1945—Continued

Number of buildings	Type	Size (feet)	Number of buildings	Type	Size (feet)
Mile 1,221.5—Con. ALASKA—CANADA BOUNDARY—Con. Haines Rd., mile 88— Continued			Mile 1,221.4—Con. ALASKA—CANADA BOUNDARY—Con. Haines Rd., mile 88— Continued		
1	Prefabricated	20 by 96.	1	Prefabricated	14 by 16.
1	do	20 by 44.	1	do	12 by 12.
1	do	20 by 48.	Haines Rd., mile 126:		
1	do	10 by 15.	1	Frame	32 by 80.
1	do	15 by 8.	2	Prefabricated	20 by 96.
		10 by 10.	1	do	20 by 72.
		13 by 13.	1	do	14 by 16.
Haines Rd., mile 88:			1	do	10 by 20.
1	do	20 by 96.	1	do	14 by 16.
1	do	20 by 72.	Haines Rd., mile		
2	do	20 by 36.	138.3:		
2	do	20 by 96.	1	Frame	20 by 25.
3	do	20 by 48.	1	do	12 by 16.
1	do	11 by 22.	1	Prefabricated	20 by 48. ¹
1	do	32 by 40.	1	do	10 by 20. ²
1	do	32 by 94.	1	do	8 by 10.
1	do	8 by 10.			

Note.—Transferred to land owner in lieu of restoration and land rent.

¹ 2 CCC (20 by 120) sold to Bowes-Herron Co. for \$500 and in lieu of restoration and land rent.

² Transferred to Waterous, Ltd., in lieu of restoration and land rent: 1 frame, 20 by 30; 1 CCC, 20 by 40; 1 CCC, 20 by 60; 2 CCC, 20 by 120.

³ See the following:

Camp 804, Teslin

No.	Type	Size (feet)	Use	Cap-acity	Condi-tion
1	Frame	20 by 48	Office and apartment		Good.
2	do	30 by 48	Apartment	1	Do.
3	do	20 by 48	do	1	Do.
4	do	20 by 48	do	1	Do.
5	do	20 by 48	do	1	Do.
6	do	20 by 48	do	1	Do.
7	do	20 by 48	Laundry and reefer		Do.
8	do	20 by 120	Recreation hall, emergency		Do.
8	do	30 by 30	Mess, housing		Do.
9	do	10 by 16 by 20.	Pumphouse		Do.
10	Log	30 by 120	Garage		Do.
11	CCC	15 by 20	Excess (powerhouse)		Do.
12	Frame	12 by 18	Gas dispensary		Do.
13	do	20 by 60	Oil and grease storage		Do.
14	do	30 by 100	Excess (tire, battery shop)		Do.
15	CCC	15 by 20	Excess		Fair.
16	Frame	20 by 60	do		Good.
17	N. H.	20 by 48	do		Do.
18	do	20 by 48	do		Do.
19	do	20 by 48	do		Do.
20	do	20 by 48	do		Poor.
21	do	20 by 48	do		Do.
22	do	20 by 48	do		Do.

EXHIBIT 2

COST OF DESTRUCTION BAY (KLUANE LAKE)

The highway maintenance camp at Destruction Bay (Kluane Lake) was built by Public Roads Commission contractor for housing and shop facilities for contractor employees. The camp had a housing capacity of 250 and is estimated to have cost \$170,000.

At the present time, several buildings of the old construction camp have been remodeled for family use and barracks remodeled for approximately 30 men. The estimated cost of the remodeling of 8 buildings for family use and barracks is \$5,000. The remodeling consists of installation of bath and kitchen facilities

in family-type buildings and lining and sealing of barracks buildings. Any painting or other improvements has been made by individual workers in off-duty hours.

The expense in remodeling these buildings has been more than offset by the reduction in personnel turn-over. The retention of maintenance workers in isolated areas has proven unsuccessful unless workers are permitted to bring families into the area. Since housing was available with small remodeling costs, the family plan was adopted during 1944 and at the present time 77 families reside in maintenance camps along the highway.

APPENDIX O

(Chapter XV)

Exhibit	|	Exhibit
Disposal procedures covering surplus War Department property in Canada under the provisions of the thirty-third recommendation of the Permanent Joint Board on Defense, Canada-United States, dated May 14, 1945 (source: War Department files).....	1	Detailed list of Government-owned ordnance and engineer equipment utilized by the Chief of Engineers, United States Army, for construction, maintenance, and operation of military projects in northwest Canada and Alaska, dated September 25, 1945 (source: War Department).....
Copy of article in American Aviation, September 1, 1944, relative to sale of airfields on northwest staging route to Canada.....	2	

EXHIBIT 1

WAR DEPARTMENT,
THE ADJUTANT GENERAL'S OFFICE,
Washington 25, D. C., May 14, 1945.

Subject: Disposal procedures for surplus War Department property in Canada under the provision of the thirty-third recommendation of the Permanent Joint Board on Defense, Canada-United States.

To: Commanding generals: Northwest Service Command; North Atlantic Division, Air Transport Command; Alaskan Division, Air Transport Command; and commanding officer, United States Forces, central Canada.

1. *Scope.*—*a.* This letter outlines procedures for the disposition of War Department property in Canada.

b. There are two procedures that may be followed for the disposal in Canada of this property.

(1) War Department movable property may be transferred to the Canadian Government when such transfers are made in the furtherance of the joint war effort, in accordance with WD Circular 203, 1944, as amended by section V, WD Circular 455, 1944, and War Department letter (AG 400 (Nov. 29, 44) OB-S-D), December 4, 1944. Reports of such transfers will be made in accordance with WD letter (AGMP-M 400 (Feb. 24, 1945) OB-P-SPLLC), February 28, 1945, subject: Reporting the transfer of War Department property in Canada.

(2) War Department property declared surplus will be transferred to the Canadian Government for disposal under the provision of the thirty-third recommendation in accordance with procedures outlined in paragraphs 4, 5, 6, 7, and 8 below.

c. Procedures contained herein shall not apply to property which is made the subject of other agreements with respect to disposal, including:

(1) Facilities described in the document, known as note 238, which was approved by the Permanent Joint Board on Defense, Canada-United States, at their meetings April 25 and 26, 1944, and later by both Governments, under which ownership of certain facilities constructed in Canada by the United States was relinquished to the Canadian Government. These facilities are—

(*a.*) Airfields in the northwest staging route, landing strips along the Canol pipe line and other airfields, landing strips, and permanent air-route facilities constructed by the United States in northwest Canada;

(*b.*) Airfields in central and northeast Canada;

(*c.*) Airfields at Mingan, Quebec;

(*d.*) Alaskan Communication System (that part of which is in Canadian Territory).

The transfer of United States interest in the facilities has no bearing on existing arrangements for the maintenance, operation, and defense of the facilities by the United States. The Chief of Engineers will arrange for the release to Canada of all rights of the United States in the property covered by note 238.

(2) The Canol project (includes Canol projects 1, 2, 3, and 4).

(3) The Alaskan Highway (the highway proper including all maintenance camps and construction camps except those camps listed on the list of February 11, 1945, see par. 4A). All maintenance equipment and furnishings in maintenance camps will be disposed of as outlined in paragraph 5, "Disposal of Movables."

(4) Property subject to disposal under procurement contracts placed by the United States Government through War Supplies, Ltd., an agent of the Canadian Government, or to property for which the United States Government may be obligated to dispose of under the terms or provisions of a subcontract made by a United States war contractor with a corporation doing business in the Dominion of Canada.

(5) Maritime equipment and supplies located in Canada. All such property declared surplus to the needs of the War Department will be cleared with the Readjustment Division, Army Service Forces, for disposal instructions.

2. *Definitions.*—For the purpose of this letter—

a. War Department property includes all military property and all property which was purchased by civilian contractors either military or civilian, where contractual relations were direct with the United States Government in the construction of United States defense facilities in Canada.

b. Immovable property is all construction and improvements permanently affixed to land and such other property as may constitute integral and permanent parts thereof.

c. Movable property is all property other than that defined as immovable.

d. Marine property includes ships and related personal property such as machinery, equipment, and materials.

3. *Policy.*—a. Under the provisions of the thirty-third recommendation of the Permanent Joint Board on Defense, Canada-United States, which was approved by both Governments, the Canadian Government has designated War Assets Corporation (WAC) as its agent for the disposal of surplus United States War Department property in Canada. Surplus United States War Department property in Canada will be reported to WAC through Crown Assets Allocation Committee (CAAC) which committee is responsible for recommending policy to the Canadian Government.

b. Theater commanders will be responsible for the storage, maintenance, preservation, and repair of all War Department property until the Canadian Government has assumed responsibility for such property.

c. Sales of all War Department property by the WAC or its representatives are duty and tax-free.

4. *Disposition of immovables.*—a. The immovables which will be paid for by the Canadian Government (hereinafter referred to as facilities) include only those facilities which are located at the places named in the list submitted to the Canadian Government by the United States Government dated February 11, 1945. In general, these facilities include all United States weather stations, command installations, storage, and water facilities throughout Canada, relay stations on the Haines and Alcan Highways and port facilities of Prince Rupert, British Columbia.

b. Any existing facility not included in paragraph 1 c, and a above, shall be relinquished without cost to the Crown, either—

(1) In the right of Canada, or

(2) In the right of the Province in which the same or any part thereof lies, as may be directed by the Canadian Government.

c. Facilities declared excess by the theater commander will be processed for declaration of surplus in accordance with applicable War Department directives.

d. Surplus facilities reported to the Canadian Government for disposal (see a above) will be processed as follows:

(1) The theater commander shall report surpluses for disposal to the CAAC on CAAC Form 2239 as outlined in enclosure 1.

(2) After a facility is declared surplus by the War Department, the Chief of Engineers shall appoint an appraiser who will, with an appraiser appointed by WAC, appraise such facility in order to determine the fair market value thereof at the time and place of appraisal. If the two appraisers cannot agree on the fair market value, they will select a third appraiser to determine this value.

(3) The total appraisal value will be shown in Canadian dollars.

(4) Distribution of each appraisal report will be as follows: One copy to each appraiser; three copies to Chief of Engineers; one copy to the CAAC; one copy to the Special Commissioner for Defense Projects in the case of facilities located within the Northwest Service Command, and in the case of facilities outside the Northwest Service Command, this copy to be routed to CAAC; and one copy to United States representative with CAAC, Ottawa, Canada.

(5) Surplus movables may be included in any such appraisal by mutual arrangement.

(6) By mutual agreement, occupancy in part or whole of any facility included in the list of February 11, 1945, referred to in a above may be accomplished prior to the time the facility has been declared surplus by the War Department. The transfer of physical possession of all other facilities not previously occupied but included in that list of February 11, 1945, will be accomplished within 60 days following the issuance of official advice by CAAC to the Canadian department or agency authorized to take possession of the property. Official advice will be issued by CAAC using Form CAAC 2240, enclosure 2, copies of which will be forwarded to the theater commander by CAAC. The designated Canadian Government or agency will accept responsibility, signing the applicable copy of Form CAAC 2239, amended as may be necessary. Two signed copies and one unsigned copy of the Form CAAC 2239 will be forwarded to War Assets Corporation, Montreal, by the agent authorized to sign for the property on behalf of the Canadian Government. The War Assets Corporation will forward one signed copy and the unsigned copy to the United States representative with the CAAC. After comparing the two documents to ensure that they are identical the United States representative with the CAAC will note such comparison on the unsigned copy for his file and forward the signed copy to the appropriate theater commander for use as a credit voucher to the applicable property account.

(7) Property responsibility will be assumed by the Canadian Government at the time of transfer of physical possession.

(8) The Chief of Engineers will be notified by the theater commander of the date of transfer of physical possession.

(9) The Chief of Engineers will furnish the senior United States member of the Permanent Joint Board on Defense, Canada-United States, a copy of each appraisal report. The Chief of Engineers will forward a statement of the amount due on any report of appraisal to the War Assets Corporation requesting payment. The War Assets Corporation will forward a check payable to the Treasurer of the United States for the amount due to the United States to the United States Embassy, Ottawa (Attention: Office of military attaché). The office of the military attaché will prepare the standard Form 1044, Schedule of Collections, in five copies, disposition as follows: The first three copies to the nearest United States Army disbursing officer located in Canada, accompanied by the check. The triplicate copy will be received by the disbursing officer and returned to the military attaché. At this time the military attaché will forward the quadruplicate copy to the Army Regional Accounting Office, 336 West Adams Street, Chicago, Ill., and will forward the quintuplicate copy to the Chief of Engineers (Real Estate Division). Both quadruplicate and quintuplicate copies will be annotated by the military attaché to reflect the following information which was shown in the disbursing officer's receipt on the triplicate copy: Date received; name; symbol of disbursing officer and collection voucher number assigned. The disbursing officer will take the check into his accounts in accordance with procedures to be issued by the Fiscal Director, ASF. Checks received prior to receipt of such instructions will be taken into his special deposits. It will be the responsibility of the Chief of Engineers to determine that payments have been properly made for all facilities contained in the list of February 11, 1945.

5. *Disposal of movables.*—a. Three methods for the disposal of movables (hereinafter referred to as property) have been established. These methods are—

(1) The Government of the United States shall remove from Canada all those items which it desires, in accordance with applicable War Department instructions.

(2) The Government of Canada shall arrange through the appropriate Governmental agencies for the transfer from the Government of the United States of such items required for the furtherance of the joint war effort in accordance with procedures outlined in paragraph 1 b (1).

(3) All surplus movables, including scrap, shall be reported to the CAAC and shall be sold or disposed of by the WAC or under its direction or supervision, the net proceeds to be paid to the Government of the United States, in accordance with the following procedures:

(a) Surplus property and scrap will be reported to the Crown Assets Allocation Committee in the manner outlined in enclosure 1.

(b) Within a period not to exceed 60 days following the issuance of official advice by CAAC to the Canadian Government department or agency authorized to take possession of the property, the said department or agency will take responsibility for the property. Official advice is issued by CAAC using Form CAAC 2240 (enclosure 2), copies of which will be forwarded to the theater commander by

CAAC. The designated Canadian Government department or agency will accept responsibility, signing the applicable copy of Form CAAC 2239, amended as may be necessary. Two signed copies and one unsigned copy of the Form CAAC 2239 will be forwarded to War Assets Corporation, Montreal, by the agent authorized to sign for the property on behalf of the Canadian Government. The War Assets Corporation will forward one signed copy and the unsigned copy to the United States representative with the CAAC. After comparing the two documents to insure that they are identical the United States representative with the CAAC will note such comparison on the unsigned copy for his file and forward the signed copy to the appropriate theater commander or use as a credit voucher to the applicable property account.

(c) The Canadian Government will exercise reasonable care in protecting such property until final disposition is made.

(d) Property reported to the CAAC may be withdrawn by the theater command provided the approval of CAAC is obtained.

(e) When it is necessary to transport property for any purpose in connection with its sale, the United States War Department will not bear any responsibility.

(f) The actual sale of surplus property will be carried out by the WAC or its designated agent provided that in connection with the sale the War Department shall be represented by an officer designated by it for that purpose, who shall have an equal voice in the approval and interpretation of general policies regarding the setting of prices, the allocation of priorities, the assessment of legitimate sales cost, and other matters concerning the sale or other disposition of property.

(g) The net proceeds from the sales of movable surplus War Department property will be forwarded to the United States Treasurer by the WAC through the American Embassy, Ottawa, Canada (Attention: Office of military attaché). The office of the military attaché will follow the same procedure for the disposition of proceeds as described in paragraph 4 d (9) (Disposition of immovables), except that it will not be necessary to issue the fifth copy of Form 1044, Schedule of Collections.

(h) *Prohibition of reimport.*—Whenever surplus property which was originally produced in the United States and which is readily identifiable as such is sold, the Canadian Government has agreed that the terms of sale shall include a condition that the property will not be exported to the United States in the same or substantially the same form; provided, however, that such a condition need not be imposed in any case—

(1) Where the purchaser certifies that the property is being purchased (1) for consignment to the original producer or to a person controlled by or acting for the original producer or, (2) for consignment to a person or firm in the United States for reconditioning and export.

(2) Where the property is sold to a member of the United States armed forces in Canada who certifies that he is purchasing the property for the purpose of bringing it into the United States for his personal use. The certificate required by this paragraph will be incorporated in all contracts and bills of sale covering such property.

6. *Final disposal of unsold property.*—a. Any property remaining unsold at the end of 2 years from the time it is transferred to the Canadian agency shall either be declared of no value and the account closed or, at the option of the United States, shall be removed from Canada by the United States. The date of issuance of official advice by the CAAC to the Canadian Government department or agency authorized to take possession of the property shall constitute the date of transfer for the purpose of computing the 2-year period.

b. At any time after the 2-year period the Canadian Government will advise the War Department of property remaining unsold and the War Department will either accept responsibility for the return of such property or will authorize that the account be closed.

7. *Reports required by the War Department.*—a. The theater commander will complete Surplus Property Declaration Form SPB 3 at the time accountability is dropped as outlined in paragraphs 4 and 5 above in quadruplicate with distribution as follows: two copies to accompany the Surplus Property Report of Declaration, one copy to the United States representative with the CAAC, one copy retained for files.

b. The procedures for completing the forms in a above, the monthly Surplus Property Report, Report of Declarations, and Quarterly Scrap Report, will be complied with as outlined in WD Memorandum 700-45, May 9, 1945.

c. It will be assumed that the War Department is the disposal agency for the purpose of these reports.

8. *Records.*—*a.* Theater commanders will maintain records pertaining to all transactions with respect to the disposal of surplus property and scrap sufficiently comprehensive to provide detailed information upon request of proper authority.

b. Upon deactivation of an installation or a theater, the theater commander will request instructions from the next higher headquarters as to the movement and disposition of any records relating to transactions in surplus property as contemplated herein. Such records will be preserved until specific instructions as to destruction or other disposal are issued by the Fiscal Director, Army Service Forces.

c. The United States representative with the CAAC will maintain sufficient records to enable him to furnish the commanding general, Army Service Forces (Readjustment Division), necessary reports regarding the sale of surplus property and scrap in Canada.

d. The United States Government reserves the right to make or cause to be made such audits of the CAAC and WAC records as it deems necessary.

e. The Canadian Government has agreed that the CAAC and the WAC or its agents will maintain and preserve full and complete records concerning disposition of surplus War Department property. These records will be maintained for such period of time as agreed upon by both Governments.

By order of the Secretary of War:

J. A. ULIO,
Major General,
The Adjutant General.

[Enclosure 1 to War Department letter (AGMP-M 400.703 (May 10, 1945) SPRCS), May 14, 1945]

1. Form CAAC 2239 attached will be completed in reporting all declared War Department surplus facilities and movable property, including scrap to the CAAC as provided for under the thirty-third recommendation.

2. *For reporting movable property.*—*(a)* The reporting officer will indicate United States War Department in lieu of the Government in the space provided.

(b) Date: The date the report is forwarded to the CAAC.

(c) Report number: Reports will be serially numbered. Each camp, post, or station will insert its official designation before the number:

Example: The first report from camp 550 will be camp 550-1.

(d) Item number: All items will be reported using United States standard commodity classification (use basic break-down, first two digits of 88 Classification). This schedule may be obtained from Headquarters ASF (Readjustment Division) upon request.

(e) Details: Prepare separate Forms (CAAC 2239) for each basic classification. Best possible description of item should be given showing model, type, etc., and condition of items will be shown per United States classification as follows:

Code	Means	Code	Means
N.....	New.....	1	Excellent.
E.....	Used—reconditioned.....	2	Good.
O.....	Used—usable without repairs.....	3	Fair.
R.....	Used—repairs required.....	4	Poor.
X.....	Items of no further value for use as originally intended but of possible value other than as scrap.	-----	

Where the above condition code does not provide an accurate description of the condition of the property, use appropriate language to describe the condition entitled "Details." Do not use any code when declaring scrap.

(f) Original cost: Show original cost, if available; if not available, give estimated cost of present day purchase and indicate that the figures are estimated.

(g) Ten copies of CAAC Form 2239 will be completed and the following distribution made: 6 copies to the CAAC, Ottawa, Canada; 1 copy to the special commissioner for defense projects in the case of property located in the Northwest Service Command; 1 copy to be retained by officer filing report; 1 copy to the theater commander or service commander; 1 copy to the United States representative with CAAC.

If, because of new conditions arising, it is found necessary to reduce or cancel entirely a report already made, such reduction or cancellation should be made in

exactly the manner as was used for the original report (Form CAAC 2239) clearly marked "Amendment" or "Cancellation." Such commitments as may have been entered into prior to the reduction or cancellation will, unless otherwise ruled by the Crown Assets Allocation Committee, take precedence over the amendment or cancellation.

3. *Reporting of immovables.*—Same as paragraph 2 except under details, a fair description of the facility will be shown, such as number of buildings, location, and general condition.

CAAC No. 2239
(As amended)

FOR THE USE OF THE REPORTING GOVERNMENT AGENCY

To: The Minister of Reconstruction,
c/o Crown Assets Allocation Committee,
Ottawa, Canada.

From: The Government of _____

The undernoted is surplus to our requirements in Canada and is submitted for appropriate action in accordance with agreed procedures.

Date: _____

Report No. _____
Declarer File _____
CAAC File _____
CAAC Serial No. _____
War Assets Corporation Ref. _____

Authorized signature _____

Item No.	Quantity or weight	Details	Original cost

Location: _____
Comments and recommendations: _____
Above-described facilities and/or property received: _____
Date: _____
Authorized Canadian Government Representative _____

[Enclosure 2 to War Department letter (AGMP-M 400.703 (May 10, 1945) SPRCS), May 14, 1945]
CAAC No. 2240

MINISTER OF RECONSTRUCTION
CROWN ASSETS ALLOCATION COMMITTEE
OTTAWA, CANADA

ADVICE OF SURPLUS (IN CANADA) THE PROPERTY OF
GOVERNMENT OTHER THAN THE CANADIAN GOVERNMENT

To: _____ CAAC File _____
CAAC Serial No. _____

The Government of the United States of America has reported as surplus under date _____ their file number _____ assets in accordance with the attached form CAAC 2239.

These assets are referred to your Department and/or Corporation for action in accordance with agreed procedures.

The following recommendations are made in connection with the disposition or sale of the assets covered by this advice.

For the Minister of Reconstruction:
Date: _____
Chairman, Crown Assets Allocation Committee

Copies distributed to War Assets Corporation or Department designated (2), Department of National Revenue (Customs and Excise) (1), Government agency reporting surplus (2), Crown Assets Allocation Committee (1).

EXHIBIT 2

[From American Aviation, September 1, 1944]

CANADA GETS READY-MADE SYSTEM OF BASES

NETWORK BOUGHT FROM UNITED STATES TO BE PART OF POSTWAR PLANS; "LOSS"
\$13,872,020

(By Eric Bramley)

Canada has acquired a ready-made system of air bases leading to the northwest and the northeast as the result of a \$76,811,511 purchase from the United States. These bases undoubtedly will play an important part in the postwar air plans not only of the Dominion but also of other countries.

This construction program, which is playing a vital part in the ferrying of aircraft to both Europe and Russia, has heretofore been shrouded in secrecy. Now, however, it is possible to see exactly what Canada gets for its \$76,811,551 that will be useable in the postwar period and also to get some idea of the vast bases which the United States has built in the northern wilds.

For \$76,811,551, Canada will get:

1. Nine air bases along the northwest staging route leading to Alaska—and to the Orient and Russia. Of these nine bases, three cost more than \$5,000,000 each.
2. A \$3,262,687 system of flight strips along the Alaskan Highway—a development that might assume importance in postwar private flying.
3. A \$1,264,150 system of flight strips on the Mackenzie-Athabaska route, serving the Canol project.
4. Six air bases along the Hudson Bay air route, which some officials believe will play an important part in future trans-Atlantic air travel. Four of these bases cost in excess of \$5,000,000 each.

In all, the United States spent \$90,683,571, on Canadian bases and flight strips. However, Canada will not pay for items of nonpermanent value, which total \$13,872,020.

IMPROVEMENTS PROVIDED

In addition to paying the United States \$76,811,551, Canada has agreed to stand the cost of an additional \$34,760,963 worth of improvements requested by the United States—\$18,395,953 development on the northwest staging route, \$5,161,000 for additional work on the same route, \$1,290,000 in northeast Canada, and \$9,950,000 on the important base at Goose Bay, Labrador.

On the northwest staging route, the United States spent \$37,320,226 and will be reimbursed in the sum of \$31,311,196 for permanent facilities. Locations of these bases, total amount spent by the United States, and the amount for which the United States will be reimbursed, follow:

Location	Total spent	Paid to United States	Location	Total spent	Paid to United States
Edmonton air base.....	\$5, 248, 822	\$2, 836, 835	Whitehorse air base.....	\$8, 297, 429	\$7, 395, 881
Edmonton satellite field....	6, 853, 683	6, 264, 495	Calgary air base.....	28, 517	28, 517
Grande Prairie air base.....	1, 968, 015	1, 719, 956	Prince George air base.....	165, 732	164, 732
Fort St. John air base.....	4, 415, 441	3, 974, 683	Total.....	37, 320, 226	31, 311, 196
Fort Nelson air base.....	6, 186, 892	5, 477, 354			
Watson Lake air base.....	4, 156, 695	3, 448, 743			

Of the \$6,009,030 temporary facilities for which the United States will not be reimbursed, \$3,143,151 was for troop housing, the remainder for mess facilities and miscellaneous buildings.

Along the Alaskan Highway, the United States spent \$3,262,687 constructing flight strips and will be paid for the entire expenditure. Locations and costs of the strips follow:

Location	Expenditure	Location	Expenditure
Dawson Creek.....	\$428, 220	Squanga Lake.....	\$297, 101
Sikanni Chief.....	599, 947	Pon Lake.....	417, 227
Prophet River.....	422, 084	Burwash.....	219, 362
Liard Canyon.....	537, 584	Total.....	3, 262, 687
Pine Lake.....	287, 162		

Location of flight strips along the Mackenzie-Athabaska Route, entire sum to be paid to the United States, follow:

<i>Location</i>	<i>Expenditure</i>	<i>Location</i>	<i>Expenditure</i>
Waterways.....	\$108, 754	Fort Simpson.....	\$162, 701
Embarras.....	59, 112	Wrigley.....	93, 372
Fort Smith.....	110, 230	Norman Wells.....	298, 075
Resolution.....	65, 803	Canol Camp.....	111, 746
Hay River.....	100, 030		
Providence.....	111, 252	Total.....	1, 264, 150
Mills Lake.....	43, 075		

The most expensive base constructed on the northwest staging route was Whitehorse. Here is how the \$7,395,881 was spent: General grading, \$1,304,055; drainage, \$71,625; roads and parking areas, \$29,949; runways, \$1,134,282; taxiways, \$575,122; parking apron, \$1,090,303; hangar, \$1,474,317; warehouses, \$365,552; Navy facilities, \$160,451; weather tower, \$5,330; electrical, \$343,526; gasoline storage, \$139,620; water system, \$244,773; sewerage system, \$76,193, and runway extension, \$380,783.

ROUTE PREVIOUSLY SECRET

In northeast Canada, the United States constructed bases along a ferry route which has heretofore been so secret that all mention of the points involved was prohibited. These bases, the amount spent, and the amount to be paid to the United States, follow:

<i>Location</i>	<i>Total spent</i>	<i>Paid to United States</i>
The Pas, Manitoba.....	\$415, 000	\$415, 000
Churchill, Manitoba.....	9, 385, 700	8, 208, 800
Southampton Island, Northwest Territory.....	7, 043, 200	5, 318, 870
Frobisher Bay, Baffin Island.....	8, 065, 700	8, 833, 190
Fort Chimo, Quebec.....	9, 756, 500	8, 686, 470
Total.....	34, 668, 100	27, 460, 330

In addition, the United States spent \$4,285,200 at Mingan, Quebec (reimbursed for \$3,627,980) and \$543,000 at the vast Goose Bay base (reimbursed for \$543,000).

The most expensive base on this northeast route was the one at Fort Chimo, Quebec. Here is what is included in the \$8,686,470 worth of permanent facilities: Clearing and grubbing, site grading and drainage, \$154,645; roads and grading, \$298,200; runways, taxiways, and aprons, \$5,265,230; dock facilities, \$92,440; fuel-oil storage, \$71,680; gasoline storage, \$51,900; hangars, \$669,340; warehouses, root cellars, \$157,050; refrigeration, cold storage, \$538,400; hospital, \$570,410; radio ranges, communications, \$63,010; water system, \$96,670; electric system, \$330,670; and sewerage system and waste disposal, \$69,820.

Of the \$34,760,963 which Canada is spending in addition to the \$76,811,551 paid to the United States, \$18,359,953 is on northwest staging route facilities. Of the \$18,359,953, the total of \$14,535,071 had already been expended as of April 1, 1944, and it is probable that much of the remainder has now been used.

The \$18,359,953 is being expended as follows:

<i>Location</i>	<i>Canadian expenditure</i>
Aishihik, Yukon, airport.....	\$1, 021, 921
Beatton River, British Columbia, airport.....	941, 407
Calgary, Alberta, airport.....	512, 178
Edmonton, Alberta, airport.....	3, 634, 759
Fort Nelson, British Columbia, airport.....	1, 070, 822
Fort St. John, British Columbia, airport.....	1, 297, 132
Grande Prairie, Alberta, airport.....	1, 255, 110
Kamloops, British Columbia, airport.....	1, 037, 237
Lethbridge, Alberta, airport.....	142, 274
Namao, Alberta, airport.....	200, 000
Prince George, British Columbia, airport.....	438, 761
Regina, Saskatchewan, airport.....	135, 975
Smith River, British Columbia, airport.....	1, 018, 398

<i>Location</i>	<i>Canadian expenditure</i>
Snag, Yukon, airport.....	\$855, 399
Teslin, Yukon, airport.....	862, 100
Watson Lake, Yukon, airport.....	1, 218, 685
Whitehorse, Yukon, airport.....	2, 717, 795
Total	18, 359, 953

In addition to this sum, Canada, at the request of the United States, is spending \$1,250,000 at Edmonton, \$1,500,000 at Grande Prairie, \$1,803,000 at Fort Nelson, and \$608,000 at Watson Lake. In northeast Canada, \$36,160 is being spent at Mingan and \$1,253,850 at The Pas. The expenditure at Goose Bay is \$9,950,000.

There is no doubt in Canada that Goose Bay in Labrador will play an important part in the postwar air picture. There is, however, a difference of opinion on the so-called Hudson Bay air route.

ROUTE NOT FULLY UTILIZED

Canadian Prime Minister Mackenzie King, speaking in the House of Commons last month, took no position on whether the route will be useful. He did, however, point out that, because of the changing fortunes of war, the route had never been fully utilized.

The Prime Minister first reviewed briefly the history of trans-Atlantic ferry operations. He told the House that the first staging route for relative short-range aircraft became available after Canada had secured a 99-year lease to the Goose Bay base, and after United States bases in Greenland and Iceland had been obtained.

"With the entry of the United States into the war * * * the strain on the existing ferry routes became even heavier," he said. "In May 1942, the United States Army Air Forces proposed to the Permanent Joint Board on Defense the establishment of air routes over northeastern Canada to ferry long-, medium-, and short-range aircraft to Europe."

He then revealed for the first time the routes followed: "From the factories of the United States Pacific coast aircraft would be ferried across the Canadian prairies to The Pas and Churchill. From this Hudson Bay port, planes would fly to Southampton Island, Frobisher Bay, Greenland, and Iceland and from there to their destination. Planes from another great focal point of United States aircraft production in the Midwest States would fly across Ontario and Quebec to Fort Chimo on Ungava Bay at the northernmost tip of Quebec and from there would link up with the other northeast air route at Frobisher * * *."

"On June 9, 1942, the Permanent Joint Board on Defense approved of the proposal of the United States Army Air Forces * * *."

"For several reasons the Hudson Bay leg of the northeast route has not been used to the extent anticipated, and the original plans were never completely implemented. As the submarine menace was mastered there was a parallel improvement in the shipping situation, permitting the transportation of more aircraft by ship. Increased facilities at Goose airbase and at Newfoundland airports permitted a greater flow of aircraft through these fields. Amazing technological advances * * * made the route from Goose airbase more serviceable for the short-range planes."

The Ottawa correspondent of the Financial Post asserted in a recent article that Canada had bought a route (the Hudson Bay route) "which Canada knows will be of little or no use in the immediate or predictable future." Decision to buy the route, he said, was based on two considerations: (1) "It's unwise to have any major air installations, however useless, located on Canadian territory but owned by another power; (2) the 27.4 million dollars represented part of a surplus of United States dollars which we have to get rid of anyway, on account of our agreement with the United States Treasury following the Hyde Park Declaration."

ON AIRWAY TO EUROPE






The correspondent added, however, that most of the 76.8 million dollars paid to the United States "will go for bases of indisputable postwar value. The northwest staging route will be the main artery to the Orient and to Russia via Siberia * * *. Goose Bay * * * will be an invaluable way station on the airway to Europe * * *."

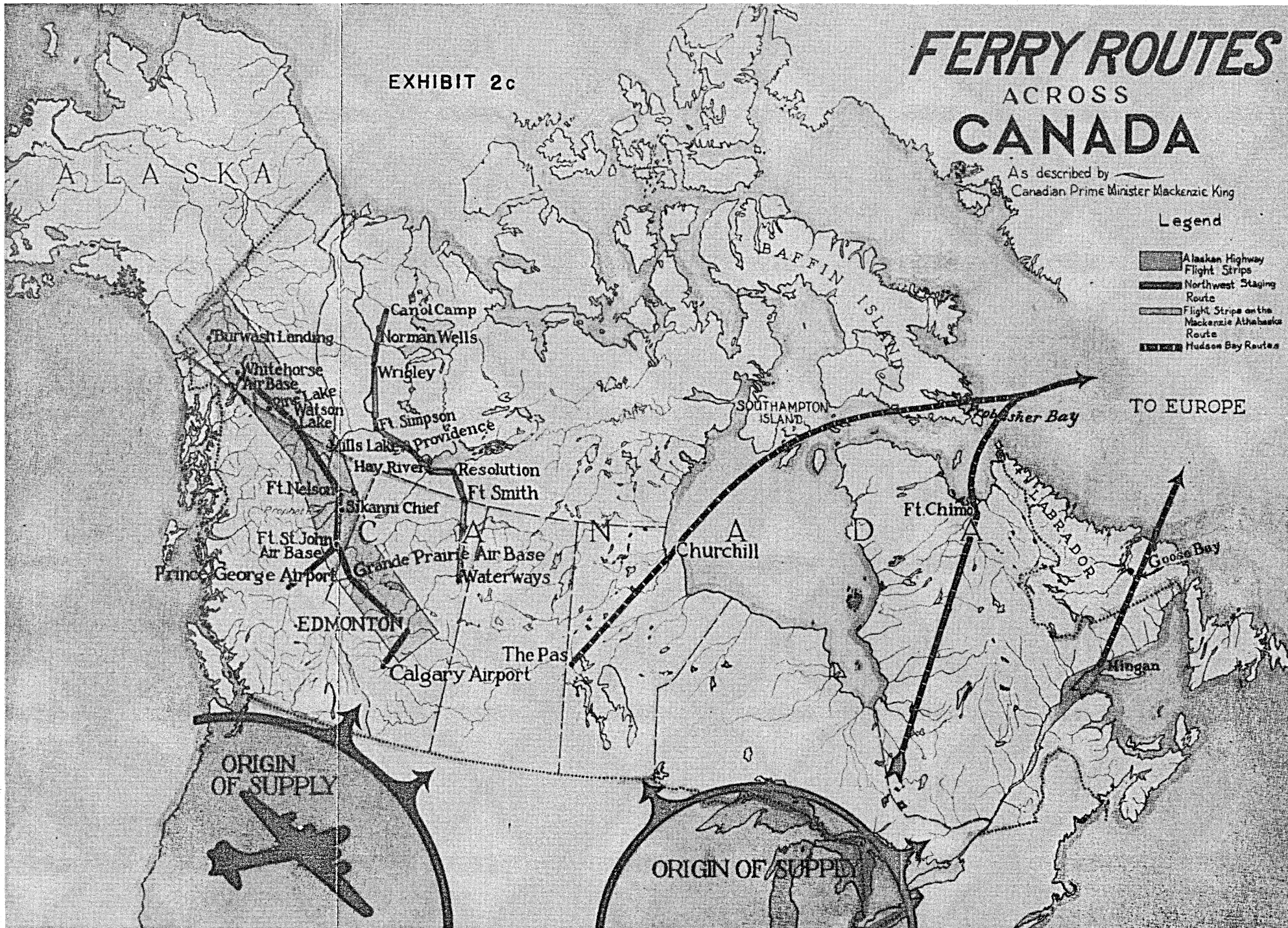
EXHIBIT 2c

FERRY ROUTES ACROSS CANADA

As described by
Canadian Prime Minister Mackenzie King

Legend

-  Alaskan Highway
-  Flight Strips
-  Northwest Staging Route
-  Flight Strips on the Mackenzie Athabasca Route
-  Hudson Bay Routes



"Of the Hudson Bay air route, however, little postwar use is expected. Even under war conditions, when profit was not a consideration, the route has not proved feasible—bad weather is almost constant at the major way stations, and little more than experimental flights along the route have been made."

On the other hand, Canadian Minister of Munitions and Supply C. D. Howe, asked in the House of Commons if bases purchased from the United States will be worked into the national airways system, answered: "It is intended that all airports built for war purposes will be utilized for postwar purposes to the extent that they can be useful."

"There is a line of bases extending from Winnipeg to The Pas, Churchill, Southampton Island, two bases in Greenland, a base in Iceland, and a base in the United Kingdom. That is a route where the airports are not more than 900 miles apart. That will be a useful route, in my opinion, for postwar aviation."

"I visualize that aviation across the Atlantic after the war will divide itself into two classes—the high-speed luxury crossing, of the type we have now so far as speed is concerned from Montreal to Scotland, and a slower and less expensive crossing, with a number of stops, such as can be had on the route I have just mentioned. A study is being made of the bases and their possibilities * * *. If the route can be used for postwar aviation, it will be made available for that purpose."

List of Government-owned ordnance and engineer equipment utilized by the Chief of Engineers, U. S. Army, for construction, maintenance, and operation of military projects in northwest Canada and Alaska, Sept. 25, 1945—Continued

ENGINEERING CONSTRUCTION EQUIPMENT—Continued

Item No.	Nomenclature	Maximum quantity utilized	Transferred to War Department in United States	Worn-out and surveyed	Sold to Canadian Government	Transferred to Alaska Department	Transferred to Imperial Oil Explorations project	Transferred to Rupert support	Canal Road Inventory	Retained for maintenance and operation	Shortage being accounted for
43	Load luggers w/truck	65	55	0	0	0	0	0	0	0	0
44	Laundry unit, Troy (QM)	2	2	0	0	0	0	0	0	0	0
45	Mixer concrete, gasoline engine driven	128	72	8	3	25	0	2	0	9	2
46	Motors, electric, all sizes	125	57	4	1	11	8	0	6	30	8
47	Motors, outboard—all sizes	67	24	16	0	7	5	0	0	6	9
48	Paver, concrete—7E to 34E	8	7	0	1	0	0	0	0	0	0
49	Pile driver	85	50	16	0	1	9	0	8	0	0
50	Plows, snow, John Deere	41	30	1	0	1	1	0	0	0	0
51	Plows, snow rotary (Sno-G-6)	41	30	1	0	4	0	0	0	0	1
52	Plows, snow, straight blade—1-way	331	30	1	4	10	7	0	23	20	1
53	Plows, snow, V-blade	235	23	16	0	10	7	0	0	4	4
54	Plows, snow, underbody blade	235	216	7	0	0	0	0	0	2	0
55	Pumps, 1 to 2 inch, including 2-inch	803	453	111	24	48	70	3	23	10	61
56	Pumps, 2 to 3 inch to and including 3-inch	321	178	47	1	23	29	1	0	13	13
57	Pumps, over 3-inch to and including 4-inch	134	17	13	1	10	6	0	0	45	0
58	Pumps, over 4-inch to and including 6-inch	66	20	14	0	0	20	0	0	9	0
59	Pumps, over 6-inch	2	0	0	0	0	0	0	0	0	3
60	Power control units—all sizes	920	556	125	49	65	60	2	12	51	0
61	Roller, road, pneumatic	28	4	3	12	6	0	0	0	2	0
62	Roller, sheepfoot	139	125	7	4	3	0	0	0	0	0
63	Roller, earth	26	23	0	0	2	0	0	0	0	0
64	Roller, road, 3-tooth	189	154	9	3	17	5	0	15	5	4
65	Saw-rigs, all sizes	145	89	5	3	0	3	0	20	3	3
66	Scrapers, road, towed-type, 6-12 cubic yards	139	100	3	4	25	6	0	25	4	0
67	Scrapers, road, towed-type, 12-20 cubic yards	195	133	10	5	25	6	0	2	14	0
68	Scrapers, road, towed-type, 20-33 cubic yards	7	7	0	0	0	0	0	0	0	0
69	Spreader, sand	163	79	17	0	12	0	0	0	44	1
70	Sweeper, rotary (Grace) pull type	18	3	1	0	5	0	0	0	0	0
71	Sweeper, rotary (Grace) W/tractor	9	0	0	0	0	0	0	0	9	0
72	Subgraders	4	4	0	0	0	0	0	0	0	0
73	Tractors crawler, caterpillar, D-4 or equivalent	304	223	32	18	0	0	0	13	13	2
74	Tractor crawler, w/Ford lift caterpillar, D-4 or equivalent	3	0	0	0	0	0	0	0	0	0
75	Tractor crawler, caterpillar, D-6 or equivalent	180	18	0	0	20	0	0	3	3	0
76	Tractor crawler, caterpillar, D-8 or equivalent	400	302	19	17	42	89	0	17	0	6
77	Tractor crawler, caterpillar, D-8 or equivalent	500	248	29	14	45	30	2	83	38	10
78	Tractor crawler—less than D-4 rating	37	28	8	0	0	0	0	0	0	0
79	Tractor, farm-type	13	6	4	0	0	0	0	0	3	0

APPENDIX P

(Chapter XVI)

Report by Mr. W. F. Wright, staff correspondent, Great Falls (Mont.) Tribune, relative to the future of the Alaska Highway.....	Exhibit	|	Letter to Congressman Hugh Peterson, chairman, House Committee on Territories, from comptroller, White Pass and Yukon route, relative to bus service on the Alaska Highway (letter submitted by Congressman Peterson to House Committee on Roads).....	Exhibit
	1	|		2

EXHIBIT 1

THE FUTURE OF THE ALASKA HIGHWAY

(Published by the Great Falls Chamber of Commerce, Great Falls, Mont.)

In a desire to get the true story of the future of the Alaska Highway, not alone for the present but from the long-range standpoint, the Great Falls Tribune designated a staff correspondent, Mr. W. F. (Luke) Wright, to make a special motor trip over the entire 2,600-mile route from Fairbanks, Alaska, to Great Falls, Mont.

Mr. Wright was accompanied by the following members of the Great Falls Chamber of Commerce: Dr. Harry J. McGregor, good roads committee; Mr. Errol F. Galt, vice president of First National Bank, chairman of livestock committee; Mr. William R. Davis, chairman of communications section, airways committee; Mr. J. J. Flaherty, chairman of public relations section, airways committee and vice president, Montanans, Inc.

These 12 articles are here reproduced all based on official reports and conversations with military and civilian engineers, civic leaders and men on the street. They contain substantial and well thought out reasons, all indicating that the Alaska Highway will be a substantial and well-traveled road in the years to come.

We believe that the Alaska Highway is important enough to both Canada and the United States to warrant its becoming a permanent all-weather, well-maintained highway.

A properly equipped and controlled air route to Alaska is indispensable to the defense of the American Continent. Toward this end Canada has purchased from the United States the airports now located at frequent intervals along the Alaska Highway. In order to service this most feasible air route there must be a land route. The present road serves as a guide to flying as well as an essential part of the service of supplies. Its maintenance will determine the permanent value of the air route.

The Alaska Highway is in good shape today, according to reports of Mr. Thomas MacDonald, Chief of the United States Bureau of Public Roads, and first-hand reports of our members who have traveled the road recently in company with the writer of the following articles. Bridges along the road are all of permanent construction. Only 310 miles of highway from Edmonton to Fort St. John remain to be built to connect this important Canadian terminus in Alberta with the well-constructed part of the highway, north.

The direct and indirect values to be obtained from permanent maintenance of the Alaska Highway are as follows:

1. It will provide an indispensable part of the maintenance of an air route to Alaska which all agree is essential to our military defense;
2. It will make possible the maintenance of present telephone and telegraph communications between the States and Alaska, already constructed by the Army;
3. It will open up a whole new area for tourist travel and development and indications from tourist travel and other sources indicate that interest in this highway and region is very extensive in the United States.

To these ends, we recommend—

1. That a permanent Alaska Highway Commission of five members be established and that at least one of these members be appointed from the Mountain States, and

2. That possible consideration should be given to a request to the Congress of the United States to extend financial aid to Alaska and Canada in the maintenance of this highway.

Respectfully submitted.

GREAT FALLS CHAMBER OF COMMERCE,
 E. B. COGSWELL, *President*.
 L. F. CURRY, *First Vice President*.
 C. B. ANDERSON, *Second Vice President*.
 A. J. BREITENSTEIN, *Secretary*.
 ROBERT M. DARLING, *Executive Vice President*.

FUTURE OF ALASKA HIGHWAY STILL FAR FROM CLEAR

REGIONAL DISPUTES, COSTS, UTILIZATION, ALL HAVE BEARING ON FINAL DECISION

"A pioneer road is to be pushed to completion with all speed within the physical capacity of the troops. The objective is to complete the entire route at the earliest practical date to a standard sufficient only for the supply of the troops engaged in the work. Further refinements will be undertaken only if additional time is available."

With these orders, United States Army engineers started to work in early March 1942, just a few months after the Pearl Harbor attack, and by late October months ahead of schedule, trucks were rolling along the entire route from Fairbanks to Dawson Creek, British Columbia, the end of the rail line that connects with Edmonton.

The average American was willing to agree with the War Department that it was an "engineering feat of first magnitude." But in the minds of many, the Alaska Highway still is just a trail cut through the wilderness.

All-year route

Actually it is an all-year, all-weather route. No one who will travel over the highway can doubt that it is well graded and generally well drained. There are, it is true, a few miles that should be rebuilt if the highway is to remain on the map. But there are hundreds of other miles that need only an oil coat to make it then fully as attractive to travel as the primary road system in Montana.

The story of how the Alaska Highway was converted from a rough pioneer trail, impassable in some sections at certain times of the year, into a standard roadway, 24 feet wide, capable of carrying a large flow of traffic with a minimum of maintenance is one that the average American does not know. The "further refinements" mentioned in the original orders of the Chief of Engineers of the Army were accomplished but war news elsewhere made the headlines.

Survey made early

Actually, before the pioneer road was completed, surveys for a standard highway had been made by the public roads administration headed by T. H. MacDonald, of Washington. Thousands of troops divided into engineer regiments were followed by other thousands of civilian employees of private contractors. Crude wooden bridges that backed up ice and debris each winter were replaced by high steel spans. At places the pioneer road was widened and surfaced. At others the Public Roads Administration survey carried the route a considerable distance from the original road so as to obtain a better grade.

About 1 year after the pioneer road had been pushed through, the standard road was accepted and the contractors moved out. Maintenance has been under the supervision of the Army engineers since, although a representative of the Public Roads Administration still is on hand as a civilian consultant.

No one challenged the Army's decision that an inland highway was needed to meet the threat of a Japanese invasion. For years Alaska had been served by water routes, but the inland passage from Seattle and Vancouver to railheads at Skagway and Seward was vulnerable to submarine attack. There was some argument as to the location of the route, because western interests long had worked for a coastal road that would attract tourist travel and the new highway was on the east, rather than the west, side of the Rocky Mountains. But the new route served to link a chain of airports already in operation along the east slope and since this was to be a "military" highway and most everyone recognized that aviation would play an important role in victory, it was generally agreed that the route was a logical one.

Canada gets control

Now the war is over. Under the terms of the agreement made with Canada, the Canadian section is to be turned over to the Dominion within 6 months after the formal termination of hostilities.

Old sectional prejudices are being revived. Economy-minded individuals are protesting against the cost of maintenance of a highway that runs through a wilderness. The Dominion Government has not yet indicated that it will be in a position to maintain the road to present standards. The British Columbia provincial government has served notice that it will not contribute to its upkeep. The Alberta government hasn't the funds at present to build standard highways to connect the Alaska Highway with existing routes in the United States. The Alaska Road Commission may be expected to keep up its section of the highway, both as a matter of national defense and as a means of opening up new territory for mining, lumbering, and agriculture, but for every mile of main highway in Alaska there are 4 miles in Yukon Territory and British Columbia.

Decision due soon

Within a matter of weeks, perhaps, important decisions must be made in Ottawa and Washington. A journey down the highway brings many suggestions; ranging from a simple proposal to abandon the whole thing and charge it off as one of the costs of war to a rather elaborate plan to pave the present highway, extend it from Fairbanks to Nome, install an automobile ferry across the Bering Sea and connect up with a road that would cross Siberia and lead to important population centers in Europe.

No matter how logical it may seem to Montanans and Albertans that the highway ought to be maintained to give Alaskans access to the United States, it must be admitted that most Alaskans still consider Seattle as their metropolis and that this attitude, built up over a half century, is not going to be destroyed within a few weeks.

The fact remains, however, that there has been a tremendous investment in the present highway. It may prove more practical to invest additional millions in maintenance and improvements for several years than to start all over when development of the area is sufficient to justify such a highway. No one can doubt that maintenance of the present route will open a vast area to further exploitation. Canada and the United States are interdependent on any military defense plan involving the north Pacific area. They have proved ability to cooperate in defense and production in time of war. The question of whether similar cooperation for economic development might not also pay dividends now is before the governments and their peoples.

Future articles will take up some of the phases of possible development in the area served by the highway.

ALASKA ROAD TO IMPLEMENT AIRWAY TRAVEL OVER ARCTIC

Don't write off international air travel over the Arctic regions as just another grandiose dream.

This is the only advice that can be given after a study of what has been accomplished in the north country as a matter of military necessity and an inquiry into plans that have been made for the future.

In the first place, commercial aviation was an accomplished fact in Canada, the Yukon, and Alaska long before the war clouds gathered. Some of the high-ranking commercial airlines officials in Canada today got their start as "bush pilots" in the days when wheels were seldom used because of the absence of landing fields. Pontoons in summer and skis in winter were the only logical types of landing equipment.

All that is changed now. Trans-Canada airlines operates three transcontinental flights daily from Victoria, British Columbia, to St. John's, Newfoundland. Canadian Pacific airlines flies from the international boundary on the south to Aklavik on the Arctic Ocean and serves old trading posts and newly opened mining areas that, until a few years ago, were accessible only by river steamer and dog sleds. Pan American Airways flies up the west coast and into Alaska. Numerous short routes fan out from Fairbanks to Alaskan coastal points and to isolated inland spots. Western air lines connects the American grid of aerial highways to the Canadian systems at Lethbridge and both western and north-west have had favorable reports on applications for permission to increase and extend their northern service.

Doubters appear

Now that the war is over, there are some who doubt that aviation over the Arctic will be commercially practicable. They say that profitable operation of an air line depends upon serving the more populous areas along the coast rather than the sparsely settled interior. Some doubt if paying passengers will be interested in flying over an area where temperatures drop so low in winter that a forced landing might mean death from freezing.

But there is another side to that story. In the air age-old standards of speed and distance are abolished. An airplane flight from San Francisco to Nome would require approximately the same time if routed through Great Falls and Edmonton as if it went up the coast. The inland route has the added advantage that the chances of being grounded by weather would be less than along the coast. As for temperatures, long-distance flying of the future probably will be at high altitudes and temperatures at 30,000 feet are about the same at the equator and the North Pole.

Still more important, the inland route permits the installation of radio direction finders, visual beacons and other safety devices that will not be available over the ocean. Emergency landings would be possible on the numerous lakes and flight strips that dot the northern areas. Weather reports are readily obtainable along the route and valuable data has already been compiled as a result of military operations in the area.

Highway is vital

The Alaska Highway is a vital part of this inland aerial route to the orient. One of the factors leading to its construction was that the permanent fields built for war, but since acquired by Canada, required roads over which fuel and supplies for aerial operations could be moved.

The main highway had to be built to fit the contours of the land. The main airports at Edmonton, Fort St. John, Fort Nelson, Whitehorse, and Fairbanks connect with the highway but the aerial routes between these points often are several miles from the road. Commercial air liners undoubtedly will continue to ride the radio beams, as giant air transport command planes do today, but pilots and passengers always will have the satisfaction of knowing that eight flight strips, located at strategic points in the wilderness, are also available and that they are readily accessible to the highway.

These strips, constructed at an average cost of \$295,000, were built under the supervision of the old Northwest Service Command, now a unit of the Sixth Service Command, with headquarters in Chicago. They were invaluable in the days when thousands of small military planes, unequipped with radio direction-finding apparatus, were being flown north for delivery to Russia. There is every reason to believe that, in addition to serving as auxiliaries to the principal airports, they will speed the postwar development of the area because aerial tourists, big-game hunters, trappers, miners, and small cargo plane operators could use them to advantage. But the value of the flight strips will decline or increase in exactly the same ratio as the value of the Alaska Highway. Unless the access road is maintained, so that fuel can be trucked in, aerial travelers can be assured ground communications when they arrive, and maintenance machinery can be moved about to service the strips themselves, they cannot be of value for long.

INLAND ROUTE PART OF PLAN FOR BUILDING NORTHWEST

Edmonton residents chuckled the other day. And Montanans could well join in the merriment because the factors that make Alberta an important center of aviation apply equally well to her neighbor on the south.

The reason for the chuckle was an editorial in a Seattle newspaper following a flight of an Air Transport Command plane from Japan to Seattle.

Including a 1 hour stop for refueling in the Aleutians, this plane covered the 4,585 air miles from Japan to Boeing Field in 21 hours and 40 minutes.

The Seattle editorial proclaimed:

"By actual flying performance it fixed Seattle as the hub for the most desirable transoceanic route linking the American mainland and Alaska with the continent of Asia.

"And it completely discredited the theoretic Edmonton-Twin Cities route which examiners of the Civil Aeronautics Board but a few days previously had announced as their choice for the trans-Pacific main line. * * *

"The examiners of the CAB have clearly indicated they propose but one route.

"And that route should be the shortest, the safest, and the most economical in operation.

"The Army chose just that route—the route through Seattle."

Inland route flight

The Seattle newspaper crowed that the ink was hardly dry on the examiner's report recommending the inland route for postwar commercial travel before the army proved that the Seattle-Aleutian route was preferable. But the ink was hardly dry on the newspaper editorial before it was equally discredited by a flight of three Superfortresses from Tokyo to Washington over the inland route.

The one ATC plane that traveled to Seattle made 4,585 miles with one stop for fuel. The three planes that traveled to Washington via Edmonton made 5,995 miles before landing in Chicago for fuel. Strong headwinds prevented a 6,500-mile nonstop flight to Washington but had engine trouble or fuel shortage developed earlier the planes never would have been far from a landing field, fully equipped with fuel facilities, radio and telephone communications and connections with highways, trains or commercial airlines.

Recent revelation that Soviet Russia had established observation stations in Siberia indicates that Government is not ignoring the possibility of air transport over the Arctic regions. One of the first exploratory jobs of the British Government after VE-day was a series of flights over the Magnetic Pole area in Canada. It was generally understood that this work was in connection with determination of postwar aerial routes for empire-based planes.

Another good sign

Alberta residents, however, have another reason to believe that postwar air traffic is to go north over the prairie route, which is comparatively fog-free. That comes from recent erection of billboards in Edmonton, Calgary, and Lethbridge, advertising the Lockheed Constellation plane. These big signs, showing the giant 64-passenger plane in flight, do not actually say that Constellations soon will be flying over these Alberta communities. But the fact that the signs were placed along the highways leading to the airports, plus the recent visit of the Constellation, first of the postwar global transport planes to get into production, to a number of Canadian cities, are strong evidence that Lockheed is anxious to let the public become better acquainted with its product and many believe the first commercial route flown by the Constellation will be northward to the Orient.

It would be foolish to presume that Seattle will be deprived of air connections with Asia in the postwar years. But a good many Albertans and leaders in Montana's aviation program think the west coast boosters are taking the wrong attitude as they seek to destroy the development that already has been done east of the Rockies in an effort to insure a route for themselves.

They argue that if postwar aviation does develop into a profitable or lucrative business there will be need for more than one route, just as there undoubtedly will be need for more roads to Alaska and the Yukon if the natural resources of these areas are properly exploited.

The Great Falls Chamber of Commerce delegation that recently inspected the highway and the adjoining air facilities made it plain, in a statement issued at Edmonton, that Montana would not take a dog-in-the-manger attitude toward requests and demands for improved roads west of the Rockies.

Asks Cooperation

This group called for cooperation in the development of the great Northwest and North Pacific area. It suggested that an alternate route would actually improve the value of the present highway because it would permit the tourist to go one way and return by another. It warned that:

"Full utilization of the highway will be possible only if the automobile, the coastwise and inland steamer, the airplane, and the railroad all are available and the various units of transportation work together for service to the visitor rather than for the protection of their own particular interests against the inroads of other forms of transportation."

In Fairbanks the committee found civic leaders unconvinced that the Alaska Highway below Whitehorse would ever be of value to Alaska. But they also found a sincere desire for a new highway that will permit the motorist to travel to Mount McKinley National Park, now served only by rail.

Alaskans called attention to the fact that they were well ahead of the United States in registration of private planes on a per capita basis and in the use of the airplane for moving commercial cargo. The committee came away convinced that the north country could teach "the States" some valuable lessons, but that

nothing would be gained by permitting abandonment or deterioration of the highway and landing fields while the North Pacific boosters prepared plans and sought finances for the developments that they hold advisable.

HUGE EXPENSE OF MAINTAINING ALASKA ROAD CASTS DOUBT ON ITS VALUE AS TOURIST ROUTE

"Alaska Highway starts nowhere and runs to nowhere."

This terse description was given by a major in the Army engineers at Whitehorse in the course of a discussion of the postwar possibilities of one of the major engineering feats of the entire war.

It was obvious that he would be happy to be reassigned to "the States." Many officers and enlisted men, after 2 or 3 years in the north country, feel the same way. When construction work was heavy and there always was a possibility of a Japanese attack, there was a certain thrill to the Alaska assignment. But now they're anxious to get out to a place where there are people and pavements.

But there is some truth in what the major said.

Economically, under existing conditions, the Alaska Highway cannot be justified. As an insurance policy against attack in 1942 and 1943 its construction was justified on a military basis. The question now arises:

"What justification is there to maintain this road to nowhere?"

If it were possible to preserve the highway just as it is for 10 to 25 years and then reopen it, there might be enough traffic in sight to justify its maintenance. But, unhappily, roads cannot be put into storage. Competent engineers report that the cost of maintenance would be about the same whether the road were heavily or lightly traveled. They also point out that if the highway is to be maintained with an eye to heavy travel in future years, a continuing program of betterment, in addition to bare maintenance, would be in order.

One can hear all sorts of estimates as to what the Alaska Highway cost. Since the job was done in a hurry—as shortages of material and manpower were developing rapidly—it is apparent that the cost was higher than had it awaited a return to normal conditions. But if one waits for fire to break out before applying for insurance, costs also are higher than if the policy is taken out when conditions are normal.

The fact is that it may never be possible to determine the cost of the highway to the nearest dollar, or to the nearest thousand dollars. The lowest figure quoted on a recent trip along the road was \$98,000,000. The highest was \$133,000,000, but that included facilities other than the highway. One Army engineer guessed the average cost was around \$60,000 a mile, which would mean a little more than \$90,000,000. A civilian engineer, who has been closely associated with the highway from its inception, estimated that the cost was at least three times as great as it would have been had construction started 3 years earlier, or later.

\$3,000,000 a year

All that is water under the bridge. The cost of maintenance now is important. Canadian sources place the maintenance expense for their section of the road at around \$2,000,000 annually. A semiofficial source in Alaska suggested the budget for the entire highway should be \$3,000,000 for bare maintenance or \$5,000,000 if decision is reached to gradually improve the road until it is a first-class tourist highway.

There is nothing on the highway to indicate that it lies in two countries, except a sign where Alaska and Yukon territory meet. If a highway in Canada were essential for national defense in 1943 it may again be essential at some distant date and there are many who believe that American control of the entire route must be preserved.

But national sovereignty is just as important to the Canadians as to us. They would not look kindly upon a proposal that Canada deed a strip across Alberta, British Columbia, and Yukon territory. A 99-year lease probably would be just as objectionable. But a plan to place the road under an international commission, with the maintenance costs to be shared on a basis of benefits might prove attractive.

If such a commission were formed it is entirely possible that the major share of the costs would have to be borne by the United States. To obtain appropriations from Congress it probably would be necessary to conduct an education campaign to convince taxpayers that highway expenditures for national defense are just as logical as buying battleships that may never fire a shot.

There are other proposals that bear investigation.

Toll system suggested

One suggestion has been that an international corporation be set up to operate the highway as a toll road. Such a plan worked in the case of the Suez Canal, where the British, French, and Egyptian Governments all have shares in the corporation that operates the project.

If this plan were adopted Canada and the United States probably would be entitled to shares on a basis of original investment plus miles within their respective national boundaries or some similar formula. Toll charges could be based upon a mileage-and-ton basis for commercial vehicles and mileage zones for tourists. The difficulty is that before the highway would be of real value connecting links with the United States highways would have to be established.

Another suggestion occasionally heard is that some big organization might be interested in leasing the highway from the two governments. At present tourist travel is banned because of the lack of housing, fuel, and service facilities. A large oil company might be willing to establish service stations in exchange for the privilege of charging a definite price for gasoline. A bus company might, for exclusive privileges, set up small hotels and operate regular service from one end of the highway to the other. If suitable bus and housing facilities were available the need for access roads would be reduced, for it would be possible to reach the highway by bus, train, or airplane and take trips of varying length with every assurance of being able to get back home.

BACKERS BELIEVE DEVELOPMENT OF ALASKA WOULD JUSTIFY COST OF KEEPING UP ROAD

The speed of construction of the Alaska Highway has been described as an "engineering feat of first magnitude."

The cost of construction, when time was the principal factor, also was amazing. The cost of maintenance appears high, now that the threat of invasion has been eliminated by victory. But many believe the maintenance cost can be justified by proving that maintenance charges now will be more than repaid through rapid development of the area served by the highway.

There are others who will disagree. It took a born optimist to believe that the original purchase of Alaska was a good investment. William H. Seward, Secretary of State under Andrew Johnson, was roundly condemned for negotiating a contract to pay Russia \$7,200,000 for the Territory in 1867, yet the Territory has produced, since then, more than 100 times its purchase price in minerals, principally gold and copper. Alaska's fisheries produce approximately \$40,000,000 worth of fish each year. Furs long have been an important item in the economy, and in recent years agriculture has been coming to the fore.

Resources scarcely touched

Anyone who travels to Alaska and sees gardens in Fairbanks with vegetables that would win prizes at any State fair; anyone who travels through dense forest regions that have enormous possibilities for commercial lumbering and pulpwood; anyone who has viewed the mountains and deep canyons in the vicinity of the Continental Divide knows that Alaska's surface resources have not been touched. What further prospecting of mineral resources will reveal is still a guess, but certainly they have not been exhausted by a few gold rushes.

The present Alaska Highway connects with the seacoast only at Anchorage and Valdez in the north and at Haines, not far from Skagway. Supplementing the highway are the Alaska Railroad, that runs from Seward to Fairbanks, and the White Pass and Yukon narrow-gauge road from Skagway to Whitehorse.

It would be unfair to say that the Alaska Highway opens all of Alaska to development and connects it with the United States. The railroads, the coast-wise and inland steamers, and the airways all will be necessary for the proper exploitation of the inland resources.

But Alaska is not just a land of ice and snow and Eskimos.

Fairbanks modern city

Fairbanks, northern terminus of the present highway, is a modern city that boasts it is the "golden heart of Alaska." There was a time when it was a sprawling mining camp, where men made and lost fortunes. Today it is the third largest city in the Territory. Mining still is its chief industry but agriculture is becoming increasingly important. Government officials believe they have located vast oil resources only a short distance north. Coal, copper, lumber, hunting, and scenery are assets that hardly have been touched.

Proceeding down the highway, the first settlement of importance is Big Delta, where the Richardson Highway branches off to reach the coast. The road

between Big Delta and Whitehorse crosses great rivers and timberland that may prove to be important as the prime timber in other sections nearer the coast is logged off.

Not far from Whitehorse another road branches off to Haines. A new port is being prepared nearby to accommodate large ships. Eventually it will rival, if not surpass, Skagway, the end of the railroad.

From Whitehorse south the road touches several points that long have been on Canadian maps. Watson Lake, Fort Nelson, Lower Post, and Fort St. John all are old trading posts that were served by dogsled and winter roads long before anyone ever suspected the automobile would be invented. Most of the trading posts were established to serve the trappers, but crab apples, potatoes, tomatoes, cabbage, and other vegetables have been grown in the area—commercial operations being prevented only by the lack of suitable transportation.

Twenty hours of sunshine

No one will deny that temperatures drop well below zero in the winter months. But during the summer the sun shines about 20 hours a day. So plant life is prolific and amazing crops are produced. Montana grain-growers are well acquainted with the fact that wheat and oats from the Peace River district consistently place high in the International hay and grain show in Chicago.

How much the population of this region would increase if an all-year, all-weather highway were available for civilian travel is a matter of conjecture. But there can be no doubt that proper transportation facilities will speed the development of any area adapted to agriculture because they would provide a means of moving surpluses, above purely local demand, to other markets. It is within the realm of reason to predict that the day may not be far off when trucks will be moving perishable crops from British Columbia, Alberta, the Yukon, and Alaska to metropolitan centers in the United States and Canada. Already plans are being drawn to transport strawberries and tomatoes from Louisiana to northern United States markets by air, in the well-founded belief that the higher costs of air travel will be more than offset by the speed with which produce is moved and the lack of need for refrigeration. Boosters for the far North say that if traffic from the Gulf coast, where crops mature early, proves successful there is every reason to believe that fresh fruits and vegetables can be moved south to the same markets from areas where maturity comes late.

ENGINEERS LEARN TO COPE WITH PROBLEMS OF FAR NORTH IN BUILDING ALASKA ROAD

Speed was essential when orders were given early in 1942 for the construction of an inland highway to serve in the defense of Alaska.

Every short cut known in the engineering world was brought into play to speed the work. And short cuts were only natural in designations for the separate projects.

Thus the Alaska-Canadian Highway became the Alcan Highway. The Canadian oil project was called Canol. The Canadian-Alaska telephone line, that parallels the highway, was dubbed Catel. And when permanent frost was encountered in the course of excavation for highways and other projects it was promptly labeled "permafrost."

Almost everyone has heard about the muskeg that was encountered in connection with the building of the highway. Those stories about trucks and tractors sinking into the muskeg and disappearing forever can be written off as tall tales, which are common in the north country, but permafrost extends from the Arctic Ocean south as far as the Yukon-British Columbia-Alberta boundary and undoubtedly will continue to present a challenge to engineering genius for many years to come.

Frost depth varies

Permanent frost is found at some places only a few inches under the surface. It extends downward a few feet or a few hundred feet. Whenever the surface covering is removed, piles are driven or concrete foundations are laid for giant hangers, the permafrost area is distributed and Mother Nature reacts in strange ways.

The active layer, so-called because it expands and contracts and lifts and falls with the weather, varies in depth according to the terrain. Engineers soon discovered that if they removed the protective layer of muskeg or sod from a permafrost area they simply allowed another layer to melt and permanence of some sections of the Alaska Highway become possible only by increasing the depth of the insulating layer.

When it came to driving piles for bridges, and poles for telephone lines it was found that it was possible to sink holes by application of steam but once the poles were in place they became subject to the heaving action of the earth and were thrown up and out of line as the temperatures changed. Bench marks, so essential to accurate surveys, were lifted sufficiently to destroy their value.

In unsettled regions

Although approximately one-fifth of the earth's surface is underlaid by permanent frost, most of it is in sparsely habited regions, and engineers had little information to work with when they tackled the problems in connection with building the Alaska Highway and the auxiliary projects. They learned, however, that the active layer is comparatively shallow. Today benchmark stakes are driven as much as 50 feet into the ground and then a 10- to 20-foot pipe of slightly larger diameter is driven to encase the stake. The heaving action lifts and drops the larger pipe and does not disturb the benchmark.

On piling and telephone poles experiments have been made with tar-paper sleeve. Liberal application of grease between the sleeve and the pole permits the paper to rise and fall with the active layer of earth and the pole remains in its original position.

Floors of some of the large hangars had a tendency to sink when the buildings were heated because the permafrost melted and turned into mud. By pumping in additional mud sufficient pressure was obtained to jack the floors back into place.

Engineers say permafrost cannot be conquered. But effective compromises with nature can be obtained. If piles are put into place and allowed to rest for approximately one season the permafrost table becomes reestablished and troubles are reduced. If it is possible to keep an area permanently thawed, as under hangar floors, a uniform condition prevails.

Value in peacetime

These lessons, learned in an emergency born of war, undoubtedly will be of value to peacetime engineers as the country develops and more buildings are erected. Residents of Alaska and the Yukon long ago learned that it was possible to keep water pipes from freezing by laying them in the frozen ground and running a steam pipe alongside. Placer mining operations in the Tanana Valley that had proved unprofitable because of the frozen ground now promise to be successful through the application of floods of water that gradually thaw out the frost so that dredges may operate.

American engineers have instituted a long-term study of permafrost, and new lessons undoubtedly will be revealed. Russians also are studying the problem, with the view of further development of Siberia. If the information so obtained is interchanged by the two nations construction worries in permafrost areas should be materially reduced.

CANOL PROJECT MAY ASSIST IN DEVELOPMENT OF ALASKA ROAD AS TRUCKING, TOURIST ROUTE

The aerial traveler who prepares to land at Whitehorse, principal community in Yukon territory, is almost certain to see a completely modern oil refinery and tank farm on a hillside on the edge of town.

That refinery and the crude-oil pipe line that runs to Norman Wells on the Mackenzie River are two important units of the original Canol project, initiated in April 1942. Neither is in operation now.

Canol has been labeled as one of the big mistakes of the war. Construction of this project is warmly defended in other circles. No one denies that completion of the refinery and pipe lines, in an area where distances were tremendous, temperatures varied as much as 130°, and facilities were virtually nonexistent, was an unusual engineering assignment. There were men of considerable authority in the engineering world who said it could not be done. But it was done, thanks to the cooperation of thousands of troops and civilians and close coordination between high officials in Ottawa and Washington.

Room for argument

The fact that the Whitehorse refinery was shut down within a few months after it started operations must be considered proof that it was an uneconomical operation. But there still is plenty of room for argument in behalf of the original idea. And, as few suspect, a considerable portion of the pipe line is serving the purpose for which it was intended, even today.

When the project was conceived, the Japanese Navy had yet to suffer its first major defeat. Invasion of Kiska and Attu was in the making. It was not unreasonable to suspect that Japanese troops would land in continental Alaska and Canada. Certainly a few Japanese submarines could have effectively halted deliveries of gasoline and oil to the Alaska defense centers by way of the inland passage along the Canadian and Alaskan coasts.

Military men could have gambled on the comeback of the American Fleet in the Pacific. But, since there was a small oil field already operating at Norman Wells and since a losing gamble might have been disastrous, decision was reached to expand the Norman project.

Whole refinery shipped

More than 1,000 miles of road had to be bulldozed over ice and snow to carry in the first essential supplies. A Texas refinery was dismantled and shipped by rail to Prince Rupert, British Columbia, thence by water to Skagway and then over a narrow-gauge railroad to Whitehorse.

An air freight service from Edmonton was inaugurated by the Army Air Forces. The railroad from Edmonton to Waterways, Alberta, carried many times the traffic for which it was designed. Caterpillar trains—large sleds drawn by crawler-type tractors—carried pipe, welding equipment, and living quarters for the men who were to construct the line.

Completion of the Alaska Highway to Whitehorse was followed by an improved route north to Norman, where a drilling program had increased the supply of crude available. The first crude reached Whitehorse April 16, 1944, and the first refined products flowed into storage tanks April 30.

By then the Japanese menace from the sea had diminished. American firms had speeded up the construction of tankers. Domestic oil fields and refineries increased their output. The picture was completely different than when the project was initiated and the Canol refinery was subjected to attack in the Halls of Congress as an obvious mistake.

Only part of project

But the refinery and its crude supply line are only a part of the Canol project. Operating today, as in the days, immediately after completion, is a welded pipe line, with booster stations, running from tidewater at Skagway to Whitehorse. There it branches, one section running north to Fairbanks and the other south and east to Watson Lake. Aviation gasoline, regular gasoline for trucks and cars, and Diesel fuel for tractors and heating are pulled through these lines to suitable storage spots along the line. The pipe lies on top of the ground because it is subject to less strain than if buried in the permanently frozen earth. The line closely follows the route of the Alaskan Highway for ease of maintenance. If the day comes when it is decided to oil-coat the highway, it would be a comparatively simple matter to run road oil through the same pipe but, unhappily, the type of crude produced at Norman Wells is not suited for this purpose.

Utilization of the Whitehorse refinery in peace is dependent upon economic factors. At present it is cheaper to bring California refined products up the coast by tanker or barge. But the pipe line from Skagway inland can be used to advantage if there is a fair amount of air traffic along the inland route from the United States to the Orient, or if the Alaskan Highway develops into a tourist or commercial trucking route.

ALASKA-HELENA TELEPHONE LINE MAINTENANCE REQUIRES WELL-KEPT ALASKA ROAD

Back in 1865, about the time Montana started to have growing pains the need for more rapid means of communication between the reunited States and Europe and Asia became evident to farsighted American businessmen.

Only two routes were available—across the Atlantic Ocean, or by land except for the short stretch of water that separates Alaska and Siberia in the Bering Straits.

Hiram Sibley, then president of the infant Western Union Telegraph Co., asked Col. Charles S. Buckley, of the United States Army engineers, if he thought he could survey the land route across northwest British Columbia, Yukon territory, and Russian American (the United States did not acquire Alaska until 1867) to the Bering Sea.

Colonel Buckley started on the ambitious project across an uncharted wilderness. Units of the survey party were well across the central portion of Alaska when the news came that the Atlantic submarine cable had been completed.

The immediate need for a land line vanished; the project was abandoned and soon was forgotten.

Alaska remained isolated from direct communication with the States until the fall of 1943 when United States Army signal corpsmen took over the operation of one of the longest open-wire telephone and telegraph lines in the world.

It ran, and still runs, from Fairbanks, in the heart of Alaska to Helena, Mont., where it connects with the northern transcontinental commercial telephone line, uniting points along the line with almost any city in the United States one may select, and with undersea cables and radio circuits extending to all sections of the globe.

As an experiment, this correspondent stopped at one of the repeater stations of the Fairbanks-to-Helena line recently, and asked to be connected with Great Falls. From a point 185 miles south of Fairbanks, the call was placed. The soldier-operator lifted combined receiver and transmitter that appeared to be identical with that provided with a regular commercial set. The call was given to Edmonton and almost instantly was relayed to Helena. In another moment the connection was made with the Great Falls switchboard. The listener on the Great Falls end commented later that he could hear me as plainly as if the call came from Boston heights.

Repeater, or booster, stations are located every 100 miles or so the length of the line, which parallels the Alaska Highway. Each station is equipped to handle calls 24 hours a day, 7 days a week. Ordinarily two linemen are assigned to patrol the line 50 miles in each direction.

The Signal Corps was responsible for the difficult task of making the original survey and preparation of final plans. Construction was done under contract, supervised by the Army engineers. In less than 4 months after survey work started at Edmonton the first call was made to Dawson Creek. The line north to Fairbanks was strung in the coldest months of the year, but the work progressed at a rate of 10 miles a day.

Shortly after completion, 3 miles of line were consumed by a forest fire. Thirteen hours later it was functioning again. In summer when floods washed out several sections, service was disrupted for 5 days, but since then maintenance has been more or less routine—routine at least for the hardy men who are accustomed to meeting difficulties that would stump men who think the snows and cold of the United States are tough.

The future of the telephone line from Helena to Fairbanks is undecided at this moment. But even those who doubt the wisdom of building the Alaska Highway agree that the future development of Alaska and the Yukon will be speeded to a considerable degree by a permanent communications system between Alaska and the States. When it is realized that the telephone system probably could not be maintained for long without the highway, that permits maintenance trucks quickly to reach any spot along the line where trouble develops, the interdependence of the two units becomes obvious. The telephone line, in turn, permits quick communication between highway maintenance stations, so that repair equipment may be moved from one spot to another to anticipate trouble or to meet emergencies.

Perhaps there will not be sufficient demand, in the near future, for telephonic communication between Helena or Great Falls and Fairbanks to warrant maintenance of the present system. But so long as the highway is available to make maintenance easy the cost of maintenance probably will be less than the cost of rebuilding at some future date when there is a real demand for such service.

WRITER PINS DOWN, FINDS UNTRUE, TALES COMING OUT OF ALASKA ROAD TERRITORY

Alaska is supposed to have been derived from a native Eskimo word, Alakh-Skhak, which means "great country."

Since the present Territory is about one-fifth as large as the continental United States it is obvious that the name is a proper one. But it also is a land of exaggeration in conversation and the average American probably remembers the exaggerations and devotes little time to seeking out the truth. The purpose of this article is to dissipate some of the illusions that are common in the States.

Robert W. Service in the Cremation of Sam McGee emphasized the cold north country, but Montanans know that Sam wasn't cremated for he spent several years as a resident of Great Falls. Actually temperatures along the coast are well above those in Montana because the Japanese Current carries warm air and water to that region.

60 below to 90 above

In the interior of Alaska and the Yukon temperatures are extreme—from around 90 above in summer to 60 below in winter. But Montanans know that extremely low temperatures seldom bring precipitation so the snow removal problem along the route of the Alaska Highway is no worse, and often is easier, than on Montana and North Dakota highways.

Men who came back to the States after the construction of the pioneer road from Dawson to Fairbanks told about the muskeg, where machinery disappeared in the spring thaw. Your correspondent can assure you this is also an exaggeration. Muskeg is simply a layer of vegetation that acts like a sponge. If it happens to lie over gumbo, as it often does, muskeg presents a problem to road builders but it is not insuperable. Muskeg control primarily is a matter of drainage. Ditches alongside the Alaska Highway, combined with laterals that lower the water table, have made a stable roadbed. Where this has not been done, muskeg continues to cause trouble when the spring thaws occur.

In the Fairbanks area, and elsewhere, there is tundra, which simply is a series of solid vegetable and earthen mounds surrounded by sloppy mud during the thaw season. Anyone who ventures into tundra in the summer is assured a good soaking unless he watches his step. But even tundra can be conquered by building up an insulation layer of poles and gravel to prolong the period when the area is frozen. In winter the mounds of vegetation can be leveled off by bulldozer and a smooth road for "cat trains"—huge sleds drawn by caterpillar tractors—is obtained.

Don't you believe it!

This correspondent made the trip in September, after the first frosts in the north country, and only can relay information from presumably reliable persons, but most of the stories about mosquitoes originating in that area can be believed—except, perhaps the story about the mosquitoes that lifted a man out of his bed and dragged him outdoors.

The two mosquitoes, elated by their prowess, so the story goes, halted at the doorstep. One proposed that they go back and get the man's wife.

"What?" asked the other. "Why should we take a chance of leaving this one here for the big ones to get?"

The tale about the mosquito landing on the airfield at Watson Lake and Air Force mechanics filling it with 50 gallons of high-octane gasoline before they discovered it wasn't a P-38 has been thoroughly discredited upon official investigation.

Admittedly mosquitoes do present a problem in relation to personal comfort for 3 or 4 months each year. But so do mosquitoes in New Jersey and in tropical countries. Whether the marvels of sanitary engineering ever will be able to conquer this particular problem remains to be seen, but it is known that insect-control methods have received a tremendous boost as a result of life in the Pacific and it is not unreasonable to suspect that liberal applications of oil and DDT in the vicinity of Alaskan and Yukon lakes will make future summer living a pleasure.

ALASKA ROAD ATTRACTS ATTENTION OF NUMEROUS PROSPECTIVE TOURISTS

"I've heard so much about the Alaska Highway I should like to make a trip over it."

"After having inspected the Alaska Highway from end to end, would you, personally, recommend that I take a similar trip?"

Remarks and questions such as these have been frequent since my return from Alaska.

There is no doubt there is intense interest in the Alaska Highway as a tourist route. Many requests for permission to travel over the road reached the northwest district headquarters of the Sixth Service Command at Edmonton even before the end of the war. Chambers of commerce and tourist agencies in the United States have found the lure of the Alaska Highway almost as strong as the spell of the Yukon in the gold-rush days.

But the situation must be faced realistically. And the first thing to consider is that no one knows, right now, what the situation will be by the time the next tourist season comes around.

Not United States owned

The Alaska Highway, under the terms of the agreement reached at the time of its construction, does not belong to the United States. Only about one-fifth

of the mileage between Fairbanks and Dawson Creek lies in Alaska. The remainder, in the not too distant future, is to be turned over to Canada. Ottawa, so far, has not revealed its plans for maintenance.

At present, tourist travel is not encouraged. A civilian who seeks to use the road north of Fort St. John, British Columbia, or south from Big Delta, Alaska, is required to have a permit signed by both the American and Canadian representatives on the Joint Control Board.

Actually, American military forces would like to have more people see the highway so that they might appreciate the fact that a first-class gravel surfaced route has been laid out over an area that only a few years ago was a wilderness. But the United States Army does not have facilities to care for the visitors and has no intention of going into the hotel and filling station business.

North from Dawson Creek one may travel a considerable distance and obtain gasoline from commercial pumps. But after the first day the only facilities are at highway maintenance camps established and operated by the service command. At Whitehorse it is possible to obtain hotel and automobile service facilities from private operators. The same situation exists at Fairbanks. But none but the born explorer, fully equipped for an expedition, rather than a vacation, should attempt to tackle the trip until he is assured more places where he can get gasoline, meals, repair facilities, and hotel accommodations.

Connecting roads inadequate

One of the biggest handicaps the prospective tourist faces is the lack of adequate roads to reach the start of the Alaska Highway. When leaving the oiled road at Coutts one must travel to Lethbridge over a very ordinary road. A new grade is being constructed and may be oiled by next summer. But latest information is that construction will be north only as far as Craddeek for the present. Some dispute has arisen as to the route from the vicinity of Raymond, Alberta, north, and until it is settled the public works ministry is not expected to move.

From Lethbridge to Edmonton the road is good. From Edmonton north to Athabasca and thence west to Lesser Slave Lake the route is comparable in most respects with the Alaska Highway itself. But for several miles on either side of High Prairie and again just east of Dawson Creek the provincial roads—to put it bluntly—are no better than the graded but unsurfaced secondary roads in any Montana County.

The question of whether a trip over the Alaska Highway is worth while will have to be left to each individual. Between Fort Nelson and Watson Lake one will find scenery equal in grandeur to that found in Glacier National Park. Muncho Lake, Kluane Lake, and numerous other lakes along the route are just as attractive as any to be found in Montana's mountain country.

Many interesting places

Whitehorse and Fairbanks have historic interest. The Peace River country should interest anyone engaged in agriculture. Along much of the route one may occasionally see moose, deer, bear, and coyotes. Some of the lakes produce fish on a commercial basis and there are scores of others, not too far from the highway, that probably never have been fished at all.

Since the highway was laid out as a military route, and not as a tourist highway, no attempt was made to take the traveler into the most scenic sections of British Columbia and the Yukon. For miles and miles one sees only a thick forest of spruce, aspen, and poplar at the side of the road and the mountains off in the distance.

When one considers that it is approximately as far from Great Falls to Fairbanks as from Great Falls to New York, it should be apparent that few are going to travel the length of the Alaska Highway and return on a 2-week vacation. But there are countless opportunities and attractions for the man or the family that likes to pioneer and goes equipped with trailer or camping outfit.

WEST COAST GROUPS ADMIT NEED FOR INLAND HIGHWAY

Decision of military engineers to build the Alaska Highway northwestward from Dawson Creek, British Columbia, came as something of a shock to a number of Washington and British Columbia boosters who long ago envisioned a tourist highway connecting Seattle and Vancouver with the far north.

Announcement of the selection of the route was greeted with loud protests and demands that the decision be rescinded. But military security was all-important at the time and the prairie route was logical because it served to connect the airfields already in use along the east slope of the Rockies.

For a time it appeared the west coast scenic road boosters would fight for their route to the exclusion of all others. But there seems to have been a change of late. The feeling now is that the Alaska Highway must be "completed," meaning that the coastal leg must be built, but that the existing road also should be maintained.

Branded as quislings

Donald McDonald, one of the most ardent advocates of the coastal route, recently told Fairbanks businessmen that he would campaign to promote construction of "necessary changes" in the route, but he also assailed as quislings those Alaskans who are indifferent or opposed to maintenance of existing stretches.

Even if funds can be found for the construction of a new route along the coast a considerable portion of the existing highway would be utilized to reach the north country. One proposal is for a road north from Vancouver to Prince George and thence, almost on a straight line, to Whitehorse. The other would go from Prince George and connect with the existing highway in the vicinity of Watson Lake. Either of these projects undoubtedly would require funds from the Dominion Government.

But British Columbia's Premier John Hart is not waiting for the Dominion to act. Already surveys have been made and contracts let for a portion of a highway that eventually will connect Prince George with Fort St. John, only a few miles from the southern terminus of the Alaska Highway. This, at the start at least, will not be the American tourist's idea of a first-class highway, but it may pave the way for a circle tour from the Prairie States through Edmonton, the Peace River country, and the Canadian Rockies down to Vancouver and Seattle where connection again would be made with United States primary highways.

Trying to draw trade

British Columbia's move is reported to be initially designed to attract trade from the rich Peace River agricultural district away from Edmonton and into Vancouver. Albertans realize this and are studying means of meeting the threat. Already a survey has been made for a completely new highway from Whitecourt, northwest of Edmonton, to Valley View, Alberta, that would cut about 100 miles off the distance from Edmonton to Fort St. John.

If this cut-off were constructed, Edmonton would be the logical trading center for the Peace River people, no matter what British Columbia did about the other road. But Alberta is short of road funds and W. A. Fallow, Minister of Public Works, told this correspondent only recently that he feared it would be impossible to start new construction before the present road that runs through Slave Lake and Athabasca is improved and surfaced. It simply is a matter of votes. There are communities and voters along the present road. The Whitecourt cut-off would cross a wilderness. And voters are just as important in the planning of highway programs in Alberta as in any American State.

Look to Uncle Sam

A traveler along the southern section of the Alaska Highway occasionally hears the statement that the Americans should have built the road all the way to Edmonton. Some have the idea that Uncle Sam has plenty of money and that it is not yet too late. But since the present highway starts at the end of a standard-gage railroad, and since the military pressure is off, there does not seem to be much likelihood of additional American funds being used for road construction in Alberta.

Alberta's gasoline tax goes into the provincial general fund. Farsighted Albertans realize that so long as this condition exists the likelihood of getting sufficient money to build and maintain primary and market roads is slim. But no one yet has found a means of convincing the Government—regardless of what party was in power—that gasoline taxes should be reserved, as they are in Montana, exclusively for highway purposes.

Alarming as is the threat of British Columbia's drive to take the Peace River block trade away from Edmonton, some Albertans feel it may be a good thing. Their hope is that it will spur the Government into improving existing roads, and perhaps the construction of new ones, purely as a matter of self-defense.

There seems to be no doubt that British Columbia is after trade, and will push vigorously for completion of a coastal route to open a new scenic region to tourists. Until Alberta adopts a similar attitude the full value of the Alaska Highway is not likely to be realized.

QUICK DECISION ON UPKEEP ESSENTIAL TO ALASKA ROAD

"We have the highway. Now let's put it to work."

A citizen of Fort St. John, British Columbia, made this remark to members of the Great Falls delegation that recently toured the Alaska Highway from one end to the other. The Montanans agreed it was a perfectly logical suggestion, in spite of the many obstacles that prevent full utilization in the immediate months ahead.

When this series was outlined, it was planned to conclude with "What the Alaska Highway means to Montana." But the deeper one goes into the study of the highway the more he becomes convinced that it doesn't belong to Montana, or Alaska, any Canadian Province or even the great northwest sector of the United States.

The Alaska Highway is an international highway. If it is maintained, and suitable access roads are built, it probably will only be a matter of time until it will be possible to travel from Fairbanks, Alaska, to Buenos Aires, Argentina, or Valparaiso, Chile.

Few travel entire route

Obviously, few motorists ever are going to travel from the lower end of the Southern Hemisphere to the Arctic Circle—for business or pleasure. It is possible to travel from Seattle to Boston over United States highways, but few do. Yet no one will argue that there is no need for a transcontinental route.

It is about as far from Edmonton to Fairbanks as it is from Great Falls to New York. Since the Alaska Highway starts at Dawson Creek, British Columbia, rather than Edmonton, the situation is similar to that which would prevail if the improved section of a Great Falls-New York highway stopped at Glasgow or Wolf Point.

The full value of the Alaska Highway then, cannot be realized until suitable access roads are created. But the writer joins with others who have traveled the route in saying that it would be an international tragedy if the Alaska Highway were to be allowed to deteriorate pending the completion of the access roads, because the incentive to construct access routes would diminish as it became evident that the existing route was losing its value.

It is probable that the section of the highway in Alaska, and perhaps the two legs that connect it with the sea at Haines and Valdez will be maintained, either by Army engineers, as a matter of national security, or by the Interior Department, in the interests of development of the territory.

May keep up road

Despite the professed lack of interest in the highway on the part of the British Columbia provincial government, it seems likely that a section of the road at the southern end will be maintained to serve the residents north of Dawson Creek and Fort St. John. There have been reports, apparently well-founded, that the Dominion Government might keep up the road as far as Fort Nelson in the hope of attracting settlers.

But, if the section between Fort Nelson and Watson Lake or Whitehorse, one of the most scenic areas along the entire route, is allowed to deteriorate there will no longer be an Alaska Highway. Instead there will be two regional roads.

The best estimates obtainable at present are that it will take from \$3,000,000 to \$5,000,000 annually to keep up the present highway. Part of it can be charged to national defense; part to exploitation and development. But if the Canadian section is turned over to the Dominion Government within 6 months after the formal end of hostilities there is a decided danger that the road will not be maintained to the same standards from one end to another. All that may be fatal to present hopes of preservation of the highway as a unit until proper access roads are available.

The Interior Department, which controls most of the lands in Alaska, has set aside a strip 5 miles on either side of the highway with the idea of supervising an orderly development of the area. Dr. Ruth Gruber, long a friend of the north, recently toured the highway and is understood to be preparing a report on post-war possibilities that will be submitted to Harold L. Ickes, Secretary of the Interior. Not so long ago a congressional roads committee traveled the route and soon will make its recommendations to Congress.

United States shows interest

This chain of events indicates clearly that the United States is interested in making the most of the Alaska Highway, now that it is an actuality. But so far there has been no clear indication from Ottawa that the Dominion Government is

as anxious to put the road to work. There are well-founded beliefs that the Dominion lacks the funds to properly maintain the highway, even if it wanted to.

From these facts, and those revealed in previous articles, the following conclusions may be drawn:

1. Interior Alaska, the Yukon, northeastern British Columbia, and western Alberta constitute an area of vast natural resources, and development undoubtedly will be speeded so long as the highway is available.

2. Rapid expansion of tourist travel may be expected only when one or more access roads connecting with the United States primary system are available.

3. The Alaska Highway, the chain of airports along the inland route, the pipe line paralleling the road, and the telephone line that connects Alaska with the United States for the first time all are important units of a transportation system, and should be considered as one system regardless of sovereignty.

4. Since sovereignty is important, establishment of an international commission to supervise the maintenance and betterment of the highway and its auxiliaries appears to be worthy of consideration by both Washington and Ottawa.

5. Speedy decision is essential. Some sections of the highway would last for years with virtually no maintenance, but others would deteriorate rapidly.

6. We have the road. Now let's put it to work.

EXHIBIT 2

HOUSE OF REPRESENTATIVES,
COMMITTEE ON THE TERRITORIES,
Washington, D. C., October 24, 1945.

HON. J. W. ROBINSON,
*Chairman, Committee on Roads,
House Office Building, Washington, D. C.*

DEAR WILL: As was suggested during our conversation, I am enclosing herewith a most interesting letter I have just received from K. B. Hannan, comptroller, White Pass & Yukon Route, Skagway, Alaska.

In view of the fact that this letter deals primarily with the road development and usage, I felt that you might like to have this information to use in connection with a report you are making on our recent trip to Alaska.

Sincerely,

HUGH PETERSON.

WHITE PASS & YUKON ROUTE,
OFFICE OF COMPTROLLER,
Skagway, Alaska, October 16, 1945.

The Honorable HUGH PETERSON,
*Chairman, Committee on the Territories,
House of Representatives, Washington, D. C.*

DEAR MR. PETERSON: Please accept our thanks for your letter of September 22. It was a pleasure to extend the little courtesy to your party, and we are glad you were able to take the trip over our road.

You may be interested to know that shortly after talking with you I made survey trips over both the Haines and the Alaska Highways, and as a result we have inaugurated a bus service on the Alaska Highway between Whitehorse and Dawson Creek. At present we are operating by virtue of a contract with the United States Army, to handle personnel, mail, and express along the highway for them. As soon as the present restrictions are removed, we intend to continue the operation as a commercial venture.

I found that most of this highway runs through gravel country, which makes for easy maintenance. There are a few spots on the southern end of the road where there is muskeg trouble, and some relocation may be necessary.

We plan a year-round service, as there is very little snowfall along the route, taken by the Alaska Highway. This is in direct contrast to the Haines route where, on account of excessive snowfalls, we would not be able to operate for more than 4 or 5 months in the year. We further feel that until 40 to 50 miles of this road are relocated and improved, a commercial operation on it would be a risky venture. Our present understanding is that the road is now impassable on account of slides.

During our conversation you expressed interest as to highway connections with the southern end of the Alaska Highway. I happened to run into a bunch of fellows from Chicago who had just made the trip from Edmonton to Dawson

Creek by auto. They told me that there is no highway, only a dirt road, and except under ideal conditions, it is pretty tough.

However, contracts have been let to connect Dawson Creek by highway to Prince George, which really means that the Pacific Northwest will have a connection with the Alaska Highway through British Columbia.

We were also told that there is a movement afoot to have the area around Muncho Lake, British Columbia, made into a national park. There is about 160 miles of fine scenery along the lower end of the highway, with Muncho Lake, roughly, in the center.

Hoping to again have the pleasure of seeing you, and with kindest personal regards,

Sincerely,

K. B. HANNAN.

APPENDIX Q

(Chapter XVIII)

Exhibit

War Department report on inspection of all construction work and related functions under the jurisdiction of the United States division engineer in the Northwest Service Command (report submitted by Col. L. George Horowitz to Col. F. S. Strong, Jr., dated Mar. 15, 1943)..... 1

MARCH 15, 1945.

Report covering an inspection of all construction work and related functions under the jurisdiction of the United States division engineer in the Northwest Service Command.

To Col. F. S. STRONG, Jr.
From Col. L. GEORGE HOROWITZ.

This report, on the above-named subject, has been prepared on the basis of the following studies and observations:

(a) A study of many if not all directives and communications from the Headquarters, Services of Supply, to the Office, Chief of Engineers, and from the latter to the division engineer, Northwest Service Command. Many other documents of a miscellaneous but important and pertinent character have also been carefully scrutinized.

(b) An intensive and extensive analysis over a period of 2 months (December 1942 and January 1943) of all the field progress reports submitted by the division engineer, Northwest Service Command, to the Office, Chief of Engineers.

(c) Observations made by the undersigned and Maj. H. C. Helgerson, Corps of Engineers, during the course of an inspection trip throughout the Northwest Service Command, from February 7 to March 6, 1943. An outline of our itinerary is attached to this report.

Our observations and investigations have developed personal reactions on our part from which have sprung the many opinions and beliefs expressed herein. Because it is our conviction that many matters require immediate remedial action by the authorities charged with the responsibility for executing the construction tasks and corrective action by higher authority in those matters beyond the control of the former, we have decided to treat the subject by an elaboration under the headings which follow. We feel that the presentation in this form will give the most comprehensive portrayal in the simplest, most direct, and most graphic manner.

- I. Leadership.
 - A. Northwest Service Command.
 - B. Northwest Division Engineer Office.
- II. Planning.
- III. Scheduling.
- IV. Organization.
- V. Personnel, Labor, and Morale.
- VI. Work Requirements and Work Accomplishment.
- VII. Military Liaison and Cooperation.
- VIII. Thumbnail Sketches.
- IX. General Conclusions.
- X. Recommendations.

I. LEADERSHIP

The leadership on the part of the Commanding General, Northwest Service Command, and the United States division engineer is, in our opinion, of a low order. This has manifested itself in many ways, such as:

1. Lack of respect and open expression of such lack of respect by many officers, in the rank from captain to colonel, for the ability and capacity of the two above-mentioned officers to successfully effectuate the construction and supply tasks which have been mandated to them by directives from higher authority.

2. The complete lack of organization, except on paper, after several months, as one understands the meaning and connotation of that word in both a military and construction sense.

3. The vacillation, superficiality, and belated actions involving thinking in terms of concepts; planning of tasks and procedures; scheduling of work in sound sequence and in an integrated program and accomplishment sense; mobilization of military forces at various locations and the assignment of missions to them; method of awarding contracts to private construction firms; direction and supervision of the efforts of these firms in preparing designs, plans, specifications, procurement of material, mobilization of personnel and labor forces, and in the execution of the work.

4. Lack of proper and sufficient liaison and practical cooperation between the Headquarters of the Northwest Service Command and the office of the division engineer; the office of the division engineer and the offices of the district engineers; the Northwest Service Command and the Alaska Defense Command; the Corps of Engineers, the Army Air Forces, and the Signal Corps; the engineer for the Commanding General, Alaska Defense Command, and the northwest division engineer; and the office of the northwest division engineer and the field representatives of the Public Roads Administration.

5. The low state of morale and spirit of frustration which obtain at Edmonton, Dawson Creek, Fort Nelson, Whitehorse, and Skagway and the sense of helplessness which pervades the hearts and minds of officers and employees at Fairbanks and Prince Rupert.

A. Northwest Service Command

Our observations, attendance at conferences, and conversations with many officers and civilians have given us the distinct reaction that General Order No. 44, War Department, Washington, D. C., September 4, 1942, will not prove workable because of the personalities involved and the conditions and circumstances which exist.

The Commanding General, Northwest Service Command, has established a hybrid organization which consists of an antiquated corps area set-up, infiltrated with task command officers, recently appointed officers from civil life, and civilians, all of whom are supposedly to function as specialists. In addition to a chief of staff, a deputy chief of staff, the four staff G's, there is an Alcan Highway commanding officer, a northern and southern sector commander, a railhead commander at Dawson Creek, an officer in charge of equipment and parts, an office, in charge of automotive transportation on the Alcan Highway, and, we presume others.

Whether the organization is orthodox or heterodox is of little moment in the final analysis if there is a high type of leadership, a systematic arrangement of all procedure, and an efficient execution of all work. But unfortunately, the diametrically opposite conditions obtain. The commanding general seems to vacillate, apparently because of his susceptibility to advice from many and the latest quarters; seems to issue orders which are not properly channeled and about which there is timely lack of knowledge on the part of officers who should know about them; and he is inclined to command spasmodically, so to speak, not on a basis of perspicacity and advance planning but as crucial moments occur or a stalemate or impasse arises. As a result, the entire atmosphere at Whitehorse is one of confusion, frustration, lack of interest, indifference, and low morale. Dynamic, respected, and accomplishment-inspiring leadership are imperative.

One of many illustrations of the lack of or belated planning on the part of the Northwest Service Command is the fact that as late as February 13, 1943, a conference was held at the office of the division engineer at Edmonton, one of the purposes of which was to arrange for the transportation of construction materials

up the Alcan Highway. It was evident, or should have been evident, as early as December 1, 1942, that one of the vitally important tasks was to provide for the movement of construction material up the highway before the April thaw set in, so that physical work-in-place could be performed during the months of April, May, and June, when the road was impassable.

At the conference of February 13, 1943, it was apparent that no workable plans had been formulated until then. The lack of knowledge on the conditions or location of trucks was pathetic. The discussion on lack of gasoline, fuel, kerosene, alcohol, Prestone, spare parts, drivers, facilities for making, and shelter under which to make, repairs bespoke a completely chaotic state of affairs. It became doubly evident that the data on planning, scheduling, work performance, etc., as contained in and submitted in field progress reports, were highly unrealistic and in most cases fantastic. One had no further to look to understand the reason for the jam-up of some thousand freight cars in the Edmonton railroad yards or the large percentage of vehicles and equipment of every description which were on the dead line or otherwise inaccessible and unavailable.

As a result of this conference, Colonel Glandon, who has superseded Colonel Wheeler as the commanding officer of the Alcan Highway, was directed to corral, sequester, and what not, all the trucks in the service command for the purpose of allocating them for specific uses. One of these truck employments was designated as the movement of construction material up the Alcan Highway. At the time I was leaving Edmonton to return to the United States on March 4, 1943, I was informed by Col. Henry Woodbury, assistant division engineer, that practically nothing in that direction had been accomplished since the meeting of February 13, 1943.

Coincident with the failure to make plans and preparations for the overhauling, repair, and disposition of such trucks, so that tonnage of approximately 68,000 tons could be moved over the highway on or before April 15, 1943, evidence appeared of available trucks not being expeditiously used and trucks being assigned to tasks which very ostensibly were of a priority of performance much below the many purposes to which they could and should have been assigned. As an example of the former, we refer to approximately 150 new White 10-ton Diesel-drive trucks which were at Dawson Creek and not being used (no one seemed to know to whom the trucks belonged and everyone volunteered that they were not running because of lack of winterization, lack of Prestone, etc.). As an example of the latter, we refer to the approximately 25 White trucks, later increased to 50, which the Metcalf, Hamilton, and the Kansas City Bridge co-venturers were apparently able to persuade the commanding general to allocate to them for the purpose of building their railheads of fantastic preliminary conception and much more fantastic estimated cost.

The reasons for the other statements relative to the manifestations of the low order of leadership expressed in resume form under "I. Leadership," supra, will become obvious as delineations of facts and conditions are made under headings which follow.

B. Northwest Division Engineer Office

The undersigned, during the course of the past 20 months, has had occasion to study and analyze the construction activity on some 1,500 projects and has personally visited and inspected the work on approximately 500 jobs. I say unhesitatingly that the office of the division engineer, Northwest Service Command, and, as a consequence, all echelons of command under it and all private constructors and others having contractual relations with it, represent the most confused, frustrated, disjointed, heterogeneous, disorganized, demoralized group of organizations with which we have ever come in contact.

Sound processes of ratiocination are conspicuous because of their absence; understanding of military concepts and knowledge and information on the basis of which plans must be made and work executed are nebulous, fragmentary, and disarranged; designs, plans, and specifications are grandiose, expensive to execute, and anachronistic in their preparation; job planning and job scheduling are superficial, fantastic, and in many cases childlike; execution of physical work-in-place is pitifully slow, wasteful, lacks balance between labor, material, and supervision, and is performed in a sequence lacking common sense, let alone that complementarity of effort which is ordinarily necessary for efficient, economic, and speedy work execution.

The entire atmosphere at the office of the division engineer (and several of the districts) reflects mental desuetude, physical paralysis, resort to processes of temporization, empiricism, mysticism, and insouciance.

It is my conviction that the construction work, if ever accomplished, will be prolonged for many months, in some cases as much as a year or more; will involve the unnecessary expenditure of many millions of dollars; and will cause the wasteful and misdirected employment of millions of man-hours and the uneconomic use of hundreds upon hundreds of pieces of all types of heavy equipment and vehicles—automotive, trucks, etc.

A few specific illustrations of the many observations upon which the above opinions are predicated are given herewith.

On the 11th and 12th of February 1943, conferences were held at the office of the United States division engineer between Col. William C. Henry, assistant to the chief signal officer, United States Army, and Col. Theodore Wyman, division engineer, relative to coordinating and accelerating the work on the construction of the communications system throughout the Northwest Service Command. In attendance were representatives of the Alaska Communications Service, members of the division engineer's office, special assistants to commanding general, Northwest Service Command, and members of the firm and key employees of the architect-engineer, Turnbull, Sverdrup & Parcel, and the prime contractor, Bechtel-Price-Callahan. Gen. James A. O'Connor, Col. James K. Tully, General Staff, Washington, D. C., and Maj. Lee E. Scheid and Capt. William T. Carpenter, Jr., of the Services of Supply, Washington, D. C., attended one of these meetings, at which the undersigned was present.

To anyone who has been over the territory covered by the Northwest Service Command for as little as 1 week it is obvious that the communications system is to all practical purposes the sine qua non of efficient construction effort. And yet, when Col. James K. Tully, because of the nature of the conversations, had occasion to express the fact that the General Staff had established the work on the communications system and on the port of Prince Rupert as the Nos. 1 and 2 priorities for accomplishment in the Northwest Service Command, Colonel Wyman registered surprise and stated that it was the first time that such information had been brought to this attention, officially or otherwise.

It was apparent to everyone in the room that the work on the communications system had been woefully neglected, and what little that had been done was not in accordance with Signal Corps standards, design, or specifications. Lengthy conversations, much of a superfluous character, ensued between Colonels Henry and Wyman. In my opinion, the hypotheses, the processes of reasoning, and the constructive intentions and purposes of Colonel Henry were sound, logical, practical, and commendable. Colonel Wyman comported himself as one engaged in the art of fencing. The weapons of which he made repetitious and irrelevant use were "the matter of unfortunate personalities and proper or improper jurisdiction." I could not draw any inference other than that, if phobias existed, they were inherent in Colonel Wyman, and it seemed to me that a peculiar psychosis permeated all of Colonel Wyman's reasoning and viewpoints.

The conclusion is inescapable that at least 3 months of valuable time have been lost during which much of the work on the communications system could or should have been accomplished. The lack of progress on this feature of work will decelerate the efforts of all persons engaged in the construction task, Northwest Service Command, in an inordinately large measure.

The discussion, higgling and haggling, which accompanied the attempts to obtain the signature of the commanding general, Northwest Service Command, and the Signal Corps representatives to a memorandum of understanding, have convinced me beyond any shadow of doubt that any accomplishment in the over-all construction task that might and should reflect kudos to the Services of Supply, the Corps of Engineers, and other engaged in this effort, will be exceedingly difficult if not impossible.

At the time of my visit to Edmonton, the office of the division engineer had approximately 180 civilian employees and 30 officers, and the division engineer was in the process of building up a home organization of approximately 450 persons. If an organization that possessed cohesion and coordination and functioned smoothly and efficiently were to result, little fault, if any, might be found with the set-up, regardless of whether or not it contained a small percentage of supernumeraries. But when disconnected, nonused, and misdirected compartmentalization obtains, and it is my opinion that it does and will, deadening effects transcend the considerations of useless expenditure of funds, wasted man-hours, low morale, etc. The inability to get the job done retards the war effort.

In my opinion, Colonel Wyman does not understand the use of or does not choose to employ the members of an organization in the generally accepted sense. Cases have come to my attention where officers have been excoriated in the presence of

fellow officers and others for carrying out the duties, functions, and missions for the very purpose of which they have been secured as members of his organization.

I can conceive of a man being a genius, being possessed of a superlative degree of clairvoyance, omniscience, omnipresence, perspicacity, and perspicuity, and having an indomitable will (incidentally, Colonel Wymann does not, in my opinion, possess any of these qualities to a reasonably desirable degree). A lack of understanding of the elementary principles of good leadership, a lack of tactfulness and diplomacy, a lack of the ability to inspire others and win their respect and cooperation would still cause failure in the accomplishment of a mandated objective. Particularly so, if the task is almost superhuman, as is the construction job in the Northwest Service Command.

Most of the officers in the division office (and in the district offices), whatever their individual ability, capacity, resourcefulness, etc., might be, have good educational backgrounds and have had more or less military training and experience, particularly in the Construction Service. They understand the difference between good organization and bad organization, the distinction between active and dynamic leadership as against passive leadership, whereby complacency is mistaken for confidence and self-satisfaction because of sweeping blanket and not properly thought-out delegation of duties and responsibilities by faulty contractual relationships entered into with private construction companies. As a consequence, most of the officers and civilian personnel as well feel that they are superfluous, are almost morbid, and are impelled to express the fear that they have been relegated to affiliation with a mission which is destined to be a failure.

The slow preparation of plans and specifications; the lack of and faulty planning and scheduling of many features of work; the impractical manner and sequence in which work is executed and the fact that work which should be started and vigorously prosecuted according to common sense and its important significance to other work is not started; the confusion surrounding the procurement and supply of materials and equipment; the complete lack of transportation means months after all facilities should have been in a state of immediate readiness; the lack of organization on the part of the architect-engineer, the contractors and the echelons of the division engineer office; and the low state of morale and feeling of frustration and despair which pervades almost everyone bespeak but one thing. It is vitally necessary that a leadership of vision, imagination, cooperation inspiring, and which will produce results in a quick, efficient, and economic manner be found at once, in the person of a division engineer.

II. PLANNING

The planning of all construction work in the Northwest Service Command seems to be exceptionally poor in many respects.

1. The preparation of designs, plans, and specifications is far too slow, assuming all other phases of activity were reasonably satisfactory, to consummate all the work at the required completion dates as established by higher authority.

2. Many concepts of a strategic and logistic nature on the basis of which directives are issued and construction planning must be predicated are ephemeral in the minds of most persons having a responsibility in the direction, preparation, and supervision of design, plans, and specifications. As a consequence, there is overdesign as in the case of the proposed railheads at Dawson Creek, Whitehorse, and Fairbanks; faulty and underdesign as in the case of the communications system; or no design as in the case of many necessary facilities at Edmonton, Dawson Creek, along the Alcan Highway, at Whitehorse, Fairbanks, and Skagway.

The true significance of the element, time, in a construction program having a triple purpose of defense of a territory, supply of an Allied Nation, and means of an offensive operation against an enemy power, is not fully grasped. If the purpose and urgency of the work were correctly visualized, it would be planned and executed in segments and by phases so that at all intervals of time some use could be made of completed facilities in and to at least a limited part of the finally desired capacity sense or in the priority-of-requirement sense as ordained by higher authority. This procedure would also lend itself to the most rapid, efficient, and economic accomplishment of the construction work.

3. The sequence in which work is planned to be done lacks a sense of understanding of complementarity and integration of all the features of work. For example, motions are gone through, involving proposed transportation of material for Canol No. 1, as though it had a priority of importance over the communications system and the docks and appurtenant facilities at Prince Rupert and

Skagway. Trucks are allocated for the movement of materials for the proposed overdesigned railhead at Dawson Creek, but little attention is paid to the preparation for the repair of the several arteries, such as the road from Edmonton to Dawson Creek, Northern Alberta Railway, Alcan Highway, and White Pass-Yukon Railway, which, if neglected, will cause a general stalemate for months. The sense of correct relativity, proper timing, and general perspective of all the elements of the construction program are distorted. This, in my opinion, is the reason for the overemphasis on the immediate construction of the elaborately conceived railheads for which an allotment of \$81,000,000 was requested, on Canol projects Nos. 1 and 3, and the underemphasis on the ports of Skagway, Haines, and Prince Rupert, on Canol projects Nos. 4 and 5, on the facilities along the Alcan Highway, and on the Haines-Champagne Cut-Off. It is the reason for the overemphasis on warehousing and the underemphasis on all roads, railways, waterways, and the instrumentalities of transportation leading to and from this warehousing.

III. SCHEDULING

The scheduling of work to be accomplished as reflected in the Off-Continent Field Progress Reports submitted by the Northwest Division is meaningless and is being prepared unthinkingly and mechanically. The estimated work schedules shown on the bar graphs cannot possibly be met for any of the projects. Notwithstanding the fact that this data is officially submitted by the division engineer, it is understood and recognized as being impossible of accomplishment by officers, contractors, and employees in the field.

If these prognoses are fanciful, so must be the data and calculations on which they are predicated. One might argue that this was only the matter of the required submission of a piece of paper and the necessity for technical compliance with an order. But such is not the case. The same lack of thinking and planning generates a mobilization of field employees without material to work on so as to accomplish physical work-in-place, and leads to the procurement and delivery of materials in the wrong order, in the wrong place, and without men to work on them.

To a much greater degree than obtains on jobs within the continental limits of the United States, the distances involved, the many forms of resistance and obstacles encountered, the fight against nature in the raw, require scientifically prepared and precise processes of flow engineering of materials and the vital necessity of obtaining balance and timing of and for materials and labor.

The conditions which obtain to the present time are sad to say the least. Employees can be seen at many places with little or nothing to do, and materials are jammed up at Edmonton because of lack of transportation facilities. The order in which materials are finally moved out in many cases adds to the already existing difficulties. No other result can be expected without properly and realistically prepared schedules.

If job control is to be had, and it will have to be established, correct planning and scheduling will have to be insisted upon at once.

IV. ORGANIZATION

The organizations of the architect-engineers, the prime contractors, the Public Roads Administration, and the United States division and district engineer offices, as they are now constituted, are not of the quality, nor have they the direction, the cohesion, and the coordination, to accomplish their missions in a rapid, efficient, and economic manner.

1. It is our opinion that none of the above-named construction entities have become thoroughly and fundamentally indoctrinated with an understanding of the military concepts involved and with a satisfactory translation of those concepts into design, plans, specifications, and physical work in place.

2. All of the organizations need more forceful and inspiring leadership. In the case of the private firms and the PRA, this can be accomplished with the acquirement of better key personnel. In the case of the Corps of Engineers forces, it is necessary to supplant the present leadership, to obtain a reasonable number of specially qualified officers, and to obtain for civilian personnel the best that can be found in the ranks of the Civil Service Commission employees.

3. In quantity, the supervisory, administrative, and technical employees of the architect-engineers and prime contractors are much too great in number; in quality, they are distinctly inferior to what obtains on most jobs in the United States and do not measure up to the requirements of the task at hand.

4. The architect-engineer and particularly the prime contractor Bechtel-Price-Callahan set-ups are too distended between the United States and Canada and have not been molded so as to possess the direction, cohesion, coordination, and smoothness of operation vitally necessary to get the job done.

5. There is a tendency for the architect-engineer, the prime contractor, and the PRA organizations to cling too tenaciously to civilization. Something must be done to inject in them a pioneer and overcome, hardship spirit. Correlative with the above-named propensity is the failure to establish echelons for direction and supervision in the field.

6. Too much temporization with plans and too much extemporization with work execution maintain. The inauguration of proper planning and scheduling, procurement, supply and balancing of Labor and material should cure this defect. The change is necessary forthwith.

7. An organization of the division engineer and the six district engineer offices exists but only on paper. The division engineer delegates responsibilities to his district engineers through the issuance of generalized orders based on directives. But nothing has been done as yet to simultaneously establish authority and create the wherewithal in the district offices on the basis of which the duties can be performed and the responsibilities fulfilled.

The division engineer does not purposefully use his own organization and seems to use the office of the Edmonton district engineer for a multiplicity of purposes, such as for supervision of work in the field, administration by a district engineer over other district engineers, preparation and consummation of contracts, so-called control functions, preparation and submission of field-progress reports, etc. Because of the manner of evolution of the division engineer office, this practice is deleterious in many respects—it causes the district engineer offices to be useful in only a modicum degree for the performance of many tasks for which they are better qualified than the Edmonton office; it causes the district engineers to feel superfluous and unproductive and resentful against the division office and the Edmonton district office: it causes the representatives and key personnel of the firms engaged by the Government to neglect and fail to recognize any authority of the district engineers and to look to Edmonton with a consequent loss of time, efficiency, and coordination.

It is imperative that a sensible and workable channel of command and authority for direction, supervision, and control of the work to be established at once. The organizations of the architect-engineer and contractors must be developed along echelon lines paralleling those of the United States division engineer, so that each district engineer can perform his duties efficiently and in the best interest of the Government. Concomitantly, the necessary liaison and cooperation among the six district engineers must be introduced.

If this is not effectuated, all the District engineer offices are truly superfluous and should be abolished. The only alternative to this method of operation, and a very poor alternative, is the direction and supervision of all work by the person and office of the division engineer through the instrumentality of assistant operations officers or area engineers in the field. With conditions and circumstances as they are, this will in substance be tantamount to running a job bigger than the Panama Canal job from the hat of one man whose head is already befogged.

8. More skillful and learned policy and procedure in the methods and processes of awarding contracts to private firms is essential. This should be done and can be done so as to induce the best features of competitive effort, so as to provide continuous incentives to all who have contractual obligations and so as to generate the highest degree of teamwork and cooperation in every conceivable direction. In my opinion, the division engineer is impulsive, superficial, and wasteful in his methods of delegating work through contractual arrangements.

9. Better judgment than now obtains must be exercised in the disposition and administration of troops and in the assignment to them of their various missions.

(a) The manner in which duties are assigned to troops is carried out too impulsively and with too much substitution back and forth.

(b) The troops are overtaxed because of the assignment of too many missions. This has resulted because of the still existing deficiencies of the private contractors. For example, the troops of one regiment are engaged in providing their own maintenance, digging telephone-pole holes, driving a winter road along a proposed pipe line from Brooks Brook to Sheldon Lake, the assembly of timber for the rebuilding of bridges along sections of the highway, and what-not. The execution of most of this work, incidentally, is provided for by the contracts with firms such as Bechtel-Price-Callahan, Miller Construction Co., and several contractors under the jurisdiction of the PRA.

(c) The troops are not only fed more poorly than are the employees of the private firms with whom they are in close proximity, but use is made of troops in such a manner and at such places as leads to the flaunting in their faces of high wages and other beneficial aspects of conditions of work by and under private contractors. This is morale-breaking to say the least.

10. The field agencies of the Public Roads Administration are possessed, in a measure, of the many deficiencies expressed relative to the organization of the architect-engineers, contractors, and the United States Engineer Offices. The liaison and channelizing through echelons is particularly bad, and direction and supervision are carried on, too preponderantly, at headquarters away from the areas of activity. Because of these conditions, the proper equipment is not at the disposal of contractors at places and times when it should be, and it takes months to effect the sending and receipt of spare parts by requisition.

Because there are so many groups in being for the accomplishment of the construction work; employees, foremen, straw bosses, superintendents, sub-contractors, contractors, collateral contractors, prime contractors, construction-management contractors, field agencies of the PRA, area engineer officers and employees, district engineers and employees, works engineer for the PRA, United States division engineer, commanding general NWSC, and his equipment and maintenance transportation specialists, it will require the highest degree of intelligence and leadership of which one can conceive to unravel periodic snags, let alone getting the job done. This entire set-up requires immediate remedial action, so that the correct chain of authority is clearly defined, the greatest co-operation is established, and the direction and supervision processes are simplified throughout.

V. PERSONNEL, LABOR, AND MORALE

1. Much of the supervisory, administrative, technical, and other key personnel employed by the architect-engineers, prime contractors, and United States engineer offices is not qualified nor competent to assist in carrying out the missions which have been mandated to these agencies.

A lack of specialized training on the part of these employees, which is aggravated by the poor organizational fabric of which they are made a part, causes many mental and physical processes to degenerate to a point where they are meaningless, purposeless, completely mechanical, superfluous, mutually interfering, retardative, and generally confusion-breeding.

The recognition of these facts in the field itself, together with the knowledge of the excessive salaries and wages paid throughout the command, causes a wide propagation of rumors, innuendos, and caustic depreciations. The diatribes and informal indictments have reached a level which is spirit- and morale-shattering to say the least and has resulted in a universal bewailing stated in such terms as "we are bushed, suffering from frustration, destined to failure."

2. The efficiency of labor is very low on practically all of the construction work, when measured in terms of the productivity of labor which obtains in the United States. That the efficiency of the former would be less than the latter was to be expected because of many conditions and circumstances peculiar to work in this part of the world, particularly the hardships caused by distances, climate, temperatures, topography, lack of facilities, etc. However, the unusual depth to which it has fallen is mainly attributable to the poor leadership, lack of planning and scheduling of work, faulty and procrastinated procurement of materials, lack of organization, etc. It is our unmistakable observation that the labor does want to and will put out if all the other elements are placed in congruity. As conditions are, labor is not only nonproductive but its turn-over is so great that it is unnecessarily costly and stymies progress.

3. The morale of a majority of all civilians and officers engaged in the construction task in the Northwest Service Command is as low as has ever come to our personal attention. This is due to all that has been stated heretofore in this report. As bad as the morale is, the lack of good morale is not chronic and can be and must be completely restored, the sooner the better.

VI. WORK REQUIREMENTS AND WORK ACCOMPLISHMENT

The volume of construction work in the Northwest Service Command as provided for by the directives issued from higher authority, at the required completion dates embodied therein, and the volume of construction work which can be accomplished in the same respective periods of time by the persons and organizations charged with the performance thereof are at such great variance that they

cannot be reconciled. Not to recognize this, the organizations, personnel, facilities, status of materials, the weather and ground conditions being what they are, might make still more difficult the general and complete transmutation of all agencies from organisms of disorder and disruption to those of harmony, cooperation, and attainment.

We feel that a priority of execution of all the work by projects and by phases of projects should be established by higher authority, expressed in definitive form and imposed upon all the agencies engaged in the construction task. Simultaneously, a review should be made of all the projects for the purpose of determining required completion dates which are more in consonance with present existing conditions and circumstances and hence more realistic. This may appear as a deceleration on paper but, with the institution of corrective measures, will, in our opinion, bring an acceleration of all physical work-in-place in actuality. If the field is left to its own devices and exercises its own judgment based upon what are now fictitious completion date, the lack of balance between labor and material, the faulty sequence of transportation of material and the misconception of relative significance and importance of project completions will become more pronounced and retard the over-all effort.

To date, for the time already consumed, the physical work-in-place accomplishment is meager and subnormal. Very little physical work-in-place will be performed during the course of the next 3 months because of the failure to plan and execute the transportation of materials and related construction work during the months of December 1942 and January and February 1943. A very substantial volume of physical work-in-place can be accomplished during the months of July, August, September, October, and possibly November, if measures are taken to insure proper planning for labor, material, equipment, and supervision and the preparations are made to supply and transport all possible materials and equipment between now and when the thaw sets in and as soon as feasible after the break-up.

VII. MILITARY LIAISON AND COOPERATION

A number of incidents and conditions came to our attention which reveal that the degree of liaison and cooperation between different divisions and branches of the Army having jurisdiction in contiguous theaters of activity or over functions in the same theater can stand considerable improvement. Cited as examples are: The lack of complete understanding between the Army Air Forces and the Corps of Engineers with respect to the construction of flight strips and miscellaneous facilities; the Signal Corps and the Corps of Engineers with respect to the design and construction of the communications system; the Transportation Corps and the Northwest Service Command with respect to the operation and control of facilities and the methods of administration at Skagway; the Army Air Forces and the Northwest Service Command with respect to the transportation of gasoline and fuel from Fairbanks to Tanana, McGrath, and Galena.

Based on hearsay, gleaned from several conversations with a number of officers, it is our opinion that the cooperation between Colonel Wyman, United States division engineer, and Colonel Tally, engineer for the Alaska Defense Command, is not what it should be, nor is the cooperation between the Alaska Defense Command and the Northwest Service Command developed to a level which a full impregnation of the unity and sameness of purpose should bring forth.

The liaison between the Northwest Service Command and the division engineer office seems to be basically a personal one between General O'Connor and Colonel Wyman, to the exclusion of most of their respective staffs. That between the division engineer and his six district engineers is to all intents and purposes practically nonexistent.

The liaison and cooperation between the Corps of Engineers and the Public Roads Administration hangs on very tenuous connections. The difference between the right men and the wrong men in the respective positions of United States division engineer and field manager of the PRA will spell cooperation or conflict and divergence of effort.

VIII. THUMBNAIL SKETCHES

A. Northern Alberta Railroad and Road from Edmonton to Dawson Creek

The Northern Alberta Railroad runs a distance of approximately 525 miles in a northwesterly direction from Edmonton, Alberta, to Dawson Creek, British Columbia. The topography in general permits of easy access but, notwithstanding, the line skirts a number of rivers and wash areas which is perhaps attributable to the desire in the initial construction to keep costs at a minimum. The

line was completed to Grand Prairie in 1930 and several years later was pushed on to Dawson Creek. So-called muskeg supports much of the road bed; hence, even at this date, the fills are not stable. Previous to the war approximately two trains per week were operated over the line except in the fall when grain was hauled south from the farming regions near the northern terminus.

The entire line was largely constructed from relay rail varying from 85 to 55 pounds with the majority being 65 pounds. At the present time, numerous derailments are caused by cracked rail. The spacing of ties is a maximum for branch line construction, and it is now estimated that 50 to 75 percent of the ties need immediate replacement. No tie plates were used on tangents or curves and even some of the trestles are without them; hence, numerous cases of spread gage and tipped rail delay train operations. Metal ballast is for all practical purposes nonexistent. Spring thaws cause considerable heaving and shifting of the track over the entire line, with the result that the last portion of the line from McLennan to Dawson Creek will not be in operation in the spring unless sufficient manpower is available to care for every part of track day by day. Trestles were generally designed for approximately an E40 loading and have not been maintained. E60 loadings are now being moved over the trestle at very reduced speeds from 3 to 5 miles an hour. Short sidings, which are used as passing tracks only with difficulty, are provided at 16 points along the main track.

Roundhouse facilities, passable for the use which the railroad had during peacetimes but no more, exist only at Edmonton and Dawson Creek. The Dawson Creek roundhouse was partially burned out approximately 6 weeks ago. There is no water supply at Dawson Creek, the northern terminus of the road and all water must be hauled from the Pouce Coupe River approximately 7 miles away. There are, however, approximately six sources of water along the line at which tankage on towers has been installed. All coaling except at Edmonton is done by hand-shoveling, although at certain points passenger locomotives are coaled by means of gasoline-operated cranes.

The rolling stock actually owned by this railroad is in poor condition and of negligible quantity. The Canadian Pacific Railway and the Canadian National Railways, however, have loaned considerable cars and sufficient locomotives to operate the road and are in a position to provide all rolling stock which the road, as it is, is capable of using.

At the present time, the railroad does not have sufficient labor available to maintain the track even at its now questionable condition. It is recognized that it will be necessary to import labor or to use troops on the maintenance of the section from McLennan to Dawson Creek in the spring if the road is to be kept open at all. With a reasonable amount of maintenance and with good luck, it is estimated that approximately 2,000 tons per day may be moved over this road during the summer months. It is, however, questionable, considering the present state of repair, that more than 200,000 tons can be moved over the railroad in one operating year. In order to place the road in a position to carry the estimated capacity of the average single-track line, or approximately 4,000 tons per day, a very considerable sum of money must be spent for delayed maintenance and improvements to the right-of-way and operating installations.

At this point it is well to mention the road which now exists from Edmonton to Dawson Creek, with the view of using motor transportation not to supplant but to augment the present facilities of the Northern Alberta Railroad. This road is of regular country-type construction, such as is found in North Dakota and Montana in the United States. The right-of-way is generally narrow. The ditching is sketchy and in a poor state of maintenance. The surface is of a soil generally known as gumbo. The bridges are of light construction such as is found on any country road. During the months of middle summer and the months of middle winter, the road is passable, and it is possible to operate trucks at a speed of approximately 20 to 25 miles an hour. During the 2 months of freeze-up and the 3 months of thaw, the road is to all practical purposes impassable. It may be said that although the terrain is relatively easy, the road compares unfavorably with most of Alcan Highway. If trucks are to be operated on this road to any considerable degree, appropriate maintenance operations must be initiated at once. Bridges must be reinforced, ditches cleaned, and road metal must be placed at many sections.

B. Dawson Creek railroad

The Dawson Creek railroad as it now exists consists of a series of buildings scattered along the Northern Alberta Railroad just inside and just outside the limits of the village of Dawson Creek itself. All construction is frame except for a number of metal huts which are used to house troops. No water facilities, no

sanitary facilities, and no fire protection facilities exist. The lay-out obviously grew like Topsy; that is, additional buildings were added during the course of the construction of the highway and later as needs developed and manifested themselves. The work was accomplished through the use of two PRA contractors, W. E. Elliott Construction Co. and Curran & Briggs. The activities of the construction companies were augmented by troop labor furnished by the Second Battalion of the Three hundred and Forty-first Engineers. Facilities as now existing at this so-called temporary railhead are as follows: troop housing for approximately 2,000 men, headquarters group consisting of 6 portable-type buildings; 17 warehouses 50 by 200 feet with two 10 by 200 foot loading platforms; 2 third-echelon-type buildings 95 by 186 feet with two wings, one wing 47 by 35 feet and the other wing 60 by 35 feet; 2 fourth-echelon-type buildings 80 by 240 feet, with one 32 by 40 feet wing; one telephone repair station; power line and transformer units; flight strip; earth roads; temporary railroad tracks and unloading ramps; and railroad yard with capacity for approximately 150 cars.

At the time of this inspection, underground tank storage for gasoline was in the process of being installed. Power generating equipment was available on the site but not installed. There exists at the site pipe, hydrants, and other miscellaneous material for installation of a water system and fire-protection system. Unfortunately, potable water cannot be secured from wells driven to any depth at Dawson Creek; hence, if a water system is to be installed, a line must be provided a minimum distance of 7 miles from either the Kiskatinaw River or the Pouce Coupe River.

Sanitary conditions and general living conditions in the village of Dawson Creek are deplorable to say the least. The district engineer, however, is making every effort to influence and to assist the townspeople in making a general clean-up.

The proposed site for the permanent railhead lies to the south and east of Dawson Creek. The terrain is generally rolling and no great amount of grading will be necessary. Water, however, must be piped a considerable distance to this site, even as it is necessary to pipe it to Dawson Creek because of the failure of wells as a supply. The proposed construction here provides for the housing of 80 officers and 5,000 enlisted men; storage and motor repair facilities consisting of 2,300,000 feet; refrigerated warehouses for the storage of food; necessary roads, railroad track, and fire-protection facilities; a 200-bed hospital; dry-cleaning and laundry facilities for the troop strength; and electrical facilities.

We are told that this proposed construction is based on only 28,000 tons of pay freight per month; even so, the quantity of construction materials which must be provided and the number of men which must be employed on the construction will seriously handicap all other activities along the highway to the north. At this point, it is well to state that not only must materials for this project be moved from Dawson Creek railhead but materials for nearly all other construction will be handled from the same point.

Therefore, it is suggested that a study of the existing facilities be made with the view of determining the means of best using and best adapting the existing construction in providing storage for general use during the next year. It is felt that if one 150-bed hospital, 1 fire station, 750 kilovolt-amperes electric generating capacity, 15 additional warehouses 50 by 200 feet, necessary cold-storage facilities, and necessary water-line and fire-protection facilities are constructed immediately, a railhead will be available which will handle all traffic and storage necessary during the next year. It will be noted that such a scheme uses all existing facilities and requires very little additional construction. This will release more materials for Whitehorse and for Fairbanks where the troop housing and storage capacity is more sorely needed at the present time.

C. Alcan Highway

From Dawson Creek to Fort St. John, a distance of approximately 48 miles, the road is to all practical purposes a boulevard. Ditches are deep, well graded, the surface is smooth and well metaled, and the width is more than ample in every case. In this section there are two major structures—the bridges over the Kiskatinaw and Peace Rivers. The latter crossing is now made by passage over a single-lane trestle bridge which has already been partially destroyed this winter by ice, and, it is expected, will be entirely wrecked during the spring break-up. J. A. Roebing & Sons Co. have moved in and are at work on the necessary tower foundations for the proposed cable bridge to be erected at this point. A conversation with the workmen revealed the fact that it was the intention not to spin the 900-foot crossing but to draw the entire rope across in one operation. It is estimated that the bridge will not be ready for use at the spring break-up; hence

it will be necessary to assemble materials and plan on repairing and replacing the timber structures for use during the early months of the summer. To date no activity in this direction has been undertaken, and at the site a physical inspection indicated that no materials were available for this work. The road from Fort St. John to Fort Nelson, a distance of approximately 245 miles, is in good condition for a country road. It is possible to drive a car over most of the distance at a speed of approximately 30 miles an hour. Some realignment and grading has been done. However, no improved structures of any type have been installed, and most of the mileage is not metaled. This section of the road will be impassable during the spring break-up, and it will be necessary to rework ditches and small structures and do additional grading and surfacing in order to make the road usable during the summer. One major stream crossing, that of the Sikanni Chief River, is under construction. The trestle bents are in and at the time of our inspection the PRA representative and the contractor were waiting for the shipment of the balance of the wood truss timbers. Too, approximately 28,000 pounds of bridge hardware had left Vancouver but had not as yet arrived at Dawson Creek for shipment by truck to the site. If the timber and the hardware have arrived at the site by the date of this report, this bridge will be available for use as soon as the road itself is passable after the spring thaws.

From Fort Nelson to Watson Lake, a distance of approximately 360 miles, the road passes through difficult construction country. The initial bad spot occurs at Steamboat Mountain, where sight distances are nonexistent, grades are very steep, and rock cuts have made ditching impossible. There is sufficient activity at this point to keep a medium-size contractor busy all summer. The second source of trouble is a section of approximately 20 miles along or over McDonald Creek. Within this distance, the creek is crossed nine times and a physical inspection revealed that the road here will probably be entirely nonexistent after the spring thaw.

Between mile 170 and mile 180, as measured north and west from Fort Nelson, the road passes on a rock shelf along the side of Muncho Lake. At the present moment, this section of road has a single lane, curves are sharp, and the grades are steep. All work here is in rock and, while this work is being done during the summer, it will probably be necessary to operate a barge service or a ferry service on Muncho Lake in order to allow traffic to bypass this point. Stream crossings must also be made at the Kledo, Racing, Toad, and the Liard Rivers. In addition, numerous creeks and smaller rivers must be crossed. As nearly as could be determined, no construction has been started and no plans have been placed in operation to erect the permanent structures over these rivers. A physical inspection of all the sites revealed that at this time no materials have been ordered or stock piled to reinforce or to rebuild the numerous temporary structures which will surely be destroyed with the coming of spring. Considerable realignment work must be done along this entire section—grading, ditching, and metaling will be necessary before the trail can be really called a road for use in the summer or through the spring and fall changes. At the present time, however, with the exception of the three difficult points mentioned, the road is readily passable, and an average speed of 25 miles an hour can be maintained with a passenger car. Over the bulk of the distance, the road is two-lane and no difficulty is encountered in the passing of vehicles. The surface of the road is now excellent because it consists of ice and packed snow. Only in a few cases is the surface made dangerous by advancing small glaciers.

From Watson Lake to Whitehorse, a distance of approximately 330 miles, the road generally encounters less difficult terrain. The one major stream crossing exists at Teslin Lake. Construction of this crossing is well underway, and completion should be had as soon as the road itself is available for use in the early summer. Crossing is now made over the ice of the lake. Contractors are working at two points on realignment but, generally speaking, maintenance from Watson Lake to Teslin Lake is not as good as the sections of the highway to the south of Watson Lake. Speed of passenger vehicles over this section can be maintained at an average of approximately 25 miles an hour, but more precaution must be taken in passing other vehicles.

Very few contractors have camps in this section and, as far as is known, little provision has been made for work here during the summer. A physical inspection revealed no stock piles of material for minor construction, and this section, too, will certainly be impassable for at least 2 months in the spring.

The road from Whitehorse to Fairbanks, approximately 650 miles, is generally passable and of the same character as most of the road. The Donjek, the White, the Robertson, the Johnson, and the Gerstle are the major streams crossed by

this section of the road. As far as can be determined, no activities to undertake permanent installations over these rivers are visible in the field. The entire highway is generally passable with the exception of the Robertson and Johnson Rivers. These rivers are of a peculiar nature, in that they open and close intermittently. Consequently, it is never possible to estimate accurately when the road will be open and when it will be closed. The river beds change in position and width, as a consequence of which the establishment of permanent crossings presents an unusually difficult if not unsolvable problem. There are no contractors along this section of the road. One PRA representative for the whole 650 miles was on the job, and at the time of our inspection he was concerning himself with the Haines-Champagne Road, hence Alcan itself had none interested. No stock piles for the repair or replacement of temporary structures of any kind are in existence. The only personnel available to maintain and make temporary repairs on this road are Engineer troops (Ninety-seventh Engineers). It is now understood that these troops are to be moved out and used in driving through a road west of Fairbanks.

In summary, it might be said that very little traffic was moving over the entire highway. An average of less than 30 vehicles per day were passed during the 3 days which we spent on the road. Trucks transporting Alcan or Canol supplies seemed to constitute most of these. The balance of the trucks were about equally divided between civilian contractors' trucking and Army vehicles. The road itself offered no handicaps to the operation of trucks, and the passage of at least 200 vehicles per day over any given section should not be difficult.

Various contractors and troop camps are scattered up and down along the highway from Dawson Creek to Watson Lake. The more recently built contractors' camps between the Liard River crossing and Watson Lake are much superior to those further south. Experience here is beginning to pay dividends. Rest stations exist as such at approximately each 100-mile point. Generally speaking, it may be said the housing does exist, but it has been very poorly established and maintained. Sanitary conditions are not good and camp lay-outs are neither uniform nor desirable. Troop housing at scattered points is in place between Whitehorse and Fairbanks. In summation, it should be reiterated that limited housing does exist but that it is of such character as to induce low morale and is not safe from a sanitary and fire standpoint.

D. Alcan telephone line

The Alcan telephone line proper will provide communications between Edmonton and Fairbanks and all intermediate points along the highway. In addition, there is a telephone line being constructed from Skagway to Whitehorse as part of the operations of the Canol pipe line between these two points. Caltel (Alcan telephone line) is under construction through the agency of Miller Construction Co., of Indianapolis, Ind., and the Oman-Smith Co., of Nashville, Tenn. The line from Skagway to Whitehorse is being constructed by the Hatfield Construction Co.

Caltel is of utmost importance to all operations in the Northwest because it is well-known that rapid construction of any undertaking is dependent largely on the availability and dependability of communications. Radio communications in this section of the world are not dependable. Conditions change very rapidly, and sometimes a unit can be heard a distance of 50 miles, then again the same unit can handle messages as far as 300 miles. Thus it is evident that an item of first priority in this entire program is Caltel. Contracts have been awarded and the work has been under way since August 11, 1942. The design work is being handled by the Canol architect-engineer, J. Gordon Turnbull and Sverdrup & Parcel. After these many months, little progress has been made, and at the time of our visit to Edmonton, the division engineer of the northwest division and the commanding general of the Northwest Service Command had just reached an agreement with the Signal Corps so that the design of the line would be according to Army standards and the necessary copper for its completion would be furnished. On the face of it, no matter where the fault lies, this delay is inexcusable.

The pole line itself is now in place and in operation from Edmonton to Fort St. John. Poles and wire have been erected for perhaps 100 miles past Fort St. John toward Fort Nelson. Poles are in place for an additional 50 miles and holes have been dug for yet another 25 miles. Repeater stations between Edmonton and Dawson Creek are 99 percent complete and are in operation. This work at the lower end of the line has been accomplished by the Miller Construction Co. Poles and wire have been erected south of Whitehorse for a distance of approximately 50 miles by the Oman-Smith Co. Poles alone have been erected over another 25 miles by the same company. There are, in addition, scattered at

some few points along the road stock piles of poles to supply immediate construction needs. The intention and plan as announced by the division office is to have the line complete from Whitehorse to Watson Lake by April 15, and entire Caltel complete by May 31. This, of course, is obviously impossible, and it is even questionable at the present rate of progress and state of organization whether the line will be complete by the end of the 1943 construction season. In general, no housing has been accomplished along the line for repeater stations, which are to be located at approximately 100-mile intervals. In the one or two cases where structures have been erected, it was found that the floors were not strong enough to support the equipment to be installed. The materials for construction are available at Edmonton, Dawson Creek, Prince Rupert, and Skagway. Within the week, it is expected that all materials will have been moved from Prince Rupert to either Edmonton or Skagway, so that they may be delivered to the points on the road where they can be used. The contractor has insufficient manpower and insufficient equipment.

E. Whitehorse

Whitehorse, Yukon Territory, is the headquarters for the Northwest Service Command. The Northwest division engineer maintains a district office at this location, and the Bechtel-Price-Callahan Co. (Canol contractors), the Oman-Smith Co. (Caltel contractors), and the Curran & Briggs Co. (PRA contractor) all maintain camps at this village. The Northwest Service Command offices, the officers quarters, and the civilian quarters are all of portable CCC-type construction. Troop housing is either metal huts or portable CCC-type construction. Warehousing space is extremely limited, and materials and supplies are stored in open lots under canvas or not as the case may be. Additional construction materials and supplies are scattered at various locations all along the highway south, for a distance of 7 miles where the so-called Fairbanks freight line has a terminal. Water supply is by means of a well or wells of very limited capacity, which constantly go dry. Sewerage-disposal system is inadequate and, in fact, no system at all. At the time of our visit, water was rationed. Sanitary conditions within the village of Whitehorse itself, as well as fire-protection facilities, are in a most deplorable state. Unless some extensive activity toward a clean-up is undertaken before spring, control of the health of the community will be most difficult. Whitehorse sprang into existence as a village during the gold-rush days because of the fact that it was the terminus of the White Pass & Yukon Railroad over the mountains from Skagway and because of the use of the upper river steamboat operations on the Yukon and Lewes Rivers. At the present time there is practically no additional construction of any type or kind under way in the vicinity of Whitehorse, because nearly all transportation facilities available are required for the mere subsistence of the present population. To reiterate, housing, warehousing, water supply, sanitary disposal, transportation facilities are all very inadequate for the task at hand, and an immediate solution of some character must be undertaken in order to alleviate the present conditions. The Northwest Service Command headquarters and the office of the district engineer are not in agreement as to what should be the location of the proposed railhead—McRae or Robinson. This should be settled as soon as possible.

F. Fairbanks and Alaska

Fairbanks at the present time is the northern terminus of the Alcan Highway and also the Alaska Railroad. The discontinuance of various mines with headquarters in Fairbanks has placed at the disposal of the district engineer located here certain facilities such as equipment, housing, and repair shops. There is, however, no storage space, no troop housing, no quantity supplies of building materials. This, however, is not a problem at the present time because there are no troops to speak of and no freight arrives over the highway or the railroad. There are no representatives of any of the contractors, architect-engineers, or the PRA at Fairbanks as yet. Ample building sites are available. Lumber can be and is being cut at certain points. The small amount of equipment available is being repaired. This, however, is hampered by the lack of repair parts. An occasional truck comes in over the highway to Fairbanks. There is a train twice a week over the Alaska Railroad. Most of the contact with the outside world is by air.

A number of highways exist in the Territory of Alaska which have been constructed in years gone by by the Department of Interior. The Richardson Highway, which is part of Alcan Highway, as far as Big Delta, runs from Fairbanks to Big Delta to Gulkana and thence to Valdez, with a branch that strikes from Copper Center to Chitina. There is also a road which leads from Gulkana

to Anchorage. At the time of our visit, the road from Gulkana to Anchorage was open, the road from Big Delta to Gulkana was closed in two places, and from Gulkana to Valdez was closed in one spot. Two rotary snow plows properly used can keep the Richardson Highway and the road from Gulkana to Anchorage open through the winter months. Valdez itself is an ice-free port, with minor usable docking facilities. These highways are approximately 20 feet wide with a light metal surface. All structures are of wood. They are generally impassible in the fall and particularly in the spring. At the present time, plans are being developed to undertake the construction of winter roads from Fairbanks to McGrath, and from Fairbanks to Tanana. We feel that the traffic facilities in Alaska already in existence are not being improved and maintained as they should be and that they are not being used cooperatively for both the Alaska Defense Command and the Northwest Service Command to the degree that will insure the highest mutual results.

G. White Pass & Yukon Railroad

The White Pass & Yukon Railroad is a narrow-gage (3 feet) line which runs from Whitehorse, Yukon Territory, to Skagway, Alaska, a distance of 110 miles. Mining in the interior led to the construction of this road between 1880 and 1890, with the bulk of the original equipment having been manufactured in the United States around 1889. From 5 hours to a number of days are required for the passage of a train, depending on weather conditions.

Alignment and grades from Whitehorse to Bennett, a distance of approximately 70 miles, are about those which would be expected on any narrow-gage installation. The minimum elevation of track in this section is 2,083 feet at Whitehorse. A maximum elevation of 2,499 feet above sea level occurs at Robinson. From Bennett to Skagway the curves and grades are excessive. It is estimated that the grades run as high as 5.7 percent and curvature as high as 16°; 2,924 feet at Meadows is the maximum elevation in this section, while 15 feet at Skagway is the minimum elevation.

Muskeg provides the foundation for the first 42½ miles of roadbed from Whitehorse to Carcross. Ditching in this section is practically nonexistent and, as a result, changes in season cause the track to shift, heave, or sink. Rock provides the foundation for the last 67½ miles from Carcross to Skagway. Rock cuts are tight both vertically and horizontally; hence, all clearances and subgrade allowances are a bare minimum.

Metal ballast is to all practical purposes nonexistent, and as a consequence it is necessary to shim up the rail with blocks of wood placed between the ties and the rails. Rail is blocked in position with wooden wedges to keep it from turning over. Approximately 50 percent of the ties will have to be replaced. Fifty-six pound rail is the standard installation. Wood trestles to a height of 256 feet exist in the last 40 miles of the line.

In several locations, the trestles are on both vertical and horizontal curves. Condition of some of the structures is such that it is not known how long they will stay in place. To quote train orders received during our trip: "Proceed at a speed not to exceed 5 miles an hour over ——— trestle on account of a sag in it." Rock slides and snow slides often cover the track, wreck trestles, and stop train service for days. There are 19 short sidings on the line and 1 real passing track at Fraser Loop.

Rolling stock consists of equipment originally on the line, new boxcars and flats provided by the Army, and locomotives purchased from the Denver & Rio Grande Western. The Rio Grande locomotives are much heavier than the original equipment and, as a consequence, have increased the rate of deterioration of the track. Insufficient rolling stock causes the rehandling of most freight. Freight is loaded direct from boats to cars because of small dock capacity and then hauled up the valley from one-half mile to a mile where it is unloaded and stored until cars are available to take it over the mountain.

One operating battalion is now running and attempting to maintain the road. They are doing an excellent job as are all troop units in the Northwest in spite of almost insurmountable handicaps. If under present conditions the road delivers an average of 300 tons of pay freight per day to Whitehorse, it will be an excellent job.

Two and sometimes four Rio Grande locomotives are now used to deliver a train up the 5.7-percent grade and over the summit. This operation gives the track a heavy pounding. If Shay-gear-driven locomotives were used on the first 20 miles out of Skagway and the Rio Grande locomotives were used for the balance of the distance when grades are generally less than 3 percent, the amount of track maintenance could be reduced considerably and the delivery of trains would be more certain.

If the plates could be provided for the trestles, trestle approaches, and curves, maintenance effort would be more fruitful and less replacement material would be required. Fourteen side-dump gravel cars, such as every dam builder has used for years, together with a one-half yard Diesel or gas-driven crawler-mounted shovel, would take care of the ballasting and realinement of the most difficult sections. An additional shovel for ditching would help considerably but is not absolutely essential.

Additional boxcars would eliminate the rehandling of freight. Another operating battalion would provide men for the necessary track maintenance.

The adoption of these suggestions on motive power, rolling stock, and maintenance should increase the average pay-load delivery to Whitehorse to 800 to 1,000 tons per day or about three times the present estimated average.

H. Skagway

Skagway is the southern terminus of the White Pass & Yukon Railroad and is a small village located in the narrow valley between the two mountain ranges which reach an elevation of 5,500 feet. Approximately one-third of the valley is cut by the Skagway River which runs full, of course, only in the spring. A dike has been thrown up which prevents the spring freshets from inundating the town. There are perhaps 400 to 500 usable acres of land in this valley. This area must take care of the town, the housing of the Army and contractors' forces, railroad shops, and the storage of freight.

If one faces toward the harbor, the river previously referred to is on the far right. On the far left is the old dock built and used by the White Pass & Yukon Railroad. This dock has been reworked by the forces of Bechtel-Price-Callahan, and in addition a 240-foot extension is underway. Approximately 120 feet of this extension is available for use at the present time, and it is expected that it may be used in its entirety by April 15. The total length of the dock will then be approximately 480 feet.

In the approximate center of the harbor are a series of dolphins supporting a pipe line and anchorage for tankers and gasoline-bearing barges. The total length will finally be 680 feet; 380 feet are now in use and for all practical purposes the 680 feet may be used if required.

On the right of the harbor is a makeshift sort of pile and earth barge unloading dock constructed by the Transportation Corps. The piles were not driven to any great depth; hence they are now tied with cables over the top of the earth fill. This arrangement is being used; however, some better arrangement will eventually have to be made. Many materials and some rolling stock for the railroad have been unloaded by running temporary track down the beach and erecting barge or scow beds to support the loads when the tide is out.

The 15 steel tanks which provide 150,000 barrels of gasoline storage for the Canal project are in place and are being used. The auxiliary buildings for housing the pumps and the personnel are not as yet complete.

There is no shed storage of any kind available in Skagway; hence, freight is stored in every vacant lot available. The port troops are now hard at work attempting to bring order out of the chaos which has existed. Housing for the Bechtel-Price-Callahan group, the port-operating troops, the railroad-operating battalion, and the district engineer is scattered through the town and over the valley. It consists of steel hutments and portable CCC-type buildings. Messing facilities are provided for by the use of former hotels and cafes which existed in the community. Sanitary conditions are about average for a village of this size located in such a section of the country. At the present time nearly all available land is in use; and as a consequence, there is little opportunity or room for much expansion of housing here.

Everything done thus far has been hit or miss. It is thought that a comprehensive plan for the use of the port and the available land area should be prepared, adjustments made, and a certain small amount of new construction settled upon. This new construction would perhaps include an equipment repair shop, additional office facilities, additional housing and warehousing space. The capacity of the port is very limited; consequently it is essential to control the arrival of boats. No more freight must be brought in by barge or ship than can be carried by the railroad over the mountains to Whitehorse because there is insufficient room for any dead storage. The port can adequately serve the railroad and no more; hence, in the final analysis the capacity of the railroad controls the capacity of the port.

I. Inland waterways

The trip from Skagway to Prince Rupert along the Alaskan inland waterway was made aboard the yacht *Westward*. Departure from Skagway was made at

8 p. m. on Wednesday and the boat arrived at Prince Rupert about 2 p. m. on Saturday after a 12-hour lay-over during the trip on account of fog. In spite of the fact that many aids to navigation in the way of buoys and lights have been destroyed by unwieldy tows, this waterway provides an excellent means of transportation by small boat and barge to Alaska.

During the summer months, the operation of tugs and barges through these waters is relatively easy and few hazards exist. In the winter, however, high seas and excessive and changing winds make the handling of large tows extremely difficult. During the past season several tugs and tows have been lost because of the lack of power and size. It is well known that tides all along the Alaskan and British Columbia coast are excessive, and that the currents generated by their changes reach as high as 5 and 6 or even 7 knots in some places. There is one lake just below Petersburg into which the tides run in both directions from both ends making the handling of tows difficult. Most of the crafts that have been employed on the freighting operation have been underpowered for the job. In most cases, the maximum rate of travel is $7\frac{1}{4}$ to 8 knots. Such a tug with a tow bucking a 6-knot current generated by the tide is in a very precarious position when the wind is blowing. Some of the boats used in the transportation of personnel are fast and have sufficient power to buck these currents but are not of the type of construction to withstand the heavy seas which sometimes develop. That is to say, they were built for pleasure and speed and not for work.

An attempt should be made to transport as much freight as possible during the safe period of navigation—the summer. Also, it might be well to conduct a survey of all the small boats and tugs used in transportation to determine their relative type of construction, their power, and their rate of travel. Perhaps by providing a few new heavy-duty engines for the larger boats it will be possible to transfer engines on down the line so that all craft will be equipped with sufficient power. More boats will then be capable of traveling at a sufficient rate to make navigation generally safe through all months of the year. Since the ports thus far available in Alaska are of limited capacity and general storage facilities are not available, it is certainly of interest to attempt to balance water transportation, port facilities, and railroad facilities. This balance should be obtained as much by the adjustment of the amount and kind of equipment as by the control of the operation of the equipment itself.

J. Prince Rupert

The port project at Prince Rupert itself is located on the same island as the city of Prince Rupert. The staging area is located on the mainland, and the ammunition storage and loading docks are being constructed at Watson Island.

The housing for the port troops located on a hill above Prince Rupert is being used and to all practical purposes is complete. The capacity of this group is 1,250 enlisted men and 100 officers. The main dock, the transit shed, the railroad track, the refrigeration building, the marine repair building, and the administration building are from 60 to 70 percent completed and will be ready for use in their entirety on April 15. As a matter of fact, the transit sheds and dock are at the present time being used by the Transportation Corps and have been able to handle all the freight that has thus far been shipped.

The road from Prince Rupert to the mainland where the staging area is located is approximately half complete. Work here has been handicapped by the lack of rock shovels, trucks, and rock crushers. The road from Prince Rupert to the edge of the island was originally built by the Province of British Columbia. The military road running to the staging area begins just across from the bridge leading to the mainland. An examination of the road built by British Columbia reveals the fact that if it is to handle substantial traffic, it will be necessary for certain maintenance and metaling operations to be undertaken. Port operators will probably submit to the district engineer at an early date a request for this work.

The staging area located on the mainland is approximately 50 percent complete and will be available for occupancy by the 15th of April. This staging area site is all muskeg which had been cleared some years ago, with the exception of the stumps, for the use of a town site. Slightly more than half of the buildings are now in place, however, no work has been done on the roads and very little has been accomplished on the water and sewer lines. Construction materials are being handled by truck over plank access roads. The terrain is hilly and this fact together with the muskeg and the stumps will make road construction difficult. Here again, lack of or rather no equipment has prevented the beginning of construction on the roads.

On Watson Island work is under way on the construction of the ammunition loading docks. Progress, however, is slow because all pile driving is being handled

by skid rigs which must brace and cap after each pile bent has been driven before it can be advanced to the driving position for the next line. On the island itself, work is under way in removing large quantities of rock which is being used as fill to provide support for the rail classification yard. Construction of the wooden igloos has not as yet been started. Although this ammunition storage yard and loading dock may be available for use before July 15, a visual inspection indicated that that date would probably be the one of final completion. At a site below the staging area, Bechtel-Price-Callahan Co. have under construction tank car unloading facilities, tank storage, docks and tanker, and oil barge loading facilities. Work on this group is approximately 50 percent complete. At the present time, the dock is in and tank foundations have been poured; one complete tank out of five has been erected. Construction on the permanent houses for operating and on the pump facilities is just now beginning. The concrete footings for the warehouse have been poured.

K. Canadian National Railways—Prince Rupert to Edmonton

The return trip from Prince Rupert to Edmonton was made via the Canadian National Railways. The train leaves Prince Rupert at 6:30 in the evening and is due in Edmonton at 9:45 p. m. on the second following day. On our particular trip, we left on a Monday evening and arrived in Edmonton at 5 o'clock Thursday morning.

The railroad leaves Prince Rupert by traveling south to Watson Island, thence to the mainland until it reaches the valley of the Skenna River. It follows the north bank of the Skenna River east and north until it crosses just below Hazelton, British Columbia. At Hazelton, it leaves the main channel of the Skenna and follows the west bank of a branch which runs due south to Smithers. From Smithers, the road wiggles through the mountains to Prince George and finally Jasper. Just west of Jasper, the line from Prince Rupert makes a junction with the main line of the Canadian National Railways from Vancouver to Edmonton. The roadbed from Prince Rupert to Jasper is generally in poor condition; 50 percent of the ties should be replaced or are being replaced. No tie plates are used and the rail itself is not in the best of condition. From Jasper to Edmonton regular maintenance has been in force, and the entire railroad is generally in good condition. There is a definite limit on the amount of freight that can be handled between Jasper and Prince Rupert because of the fact that a speed limit of 50 miles an hour, necessitated by the poor condition of the track, is in force. The situation is further aggravated by the lack of passing tracks. It might be well to mention at this point that if any holding and reconsignment points are to be constructed in support of Prince Rupert, it might be best to build them east of Jasper. Bottlenecks, if they are to occur on this railroad, will occur between Jasper and Prince Rupert.

L. Canol project

For the period of time during which work has been going on in connection with this entire project, only a moderate amount of physical work in place has been accomplished. The required completion dates cannot possibly be met.

We did not have the opportunity to inspect any part of Canol No. 1A or Canol No. 6; as a consequence, our information relative to these two jobs is predicated entirely on conversations, statements, verbal and written, and a study of three consecutive monthly field progress reports.

The only jobs on which any substantial amount of work has been done are Canol No. 1A, Canol No. 6, and Canol No. 2. The remainder of the work on jobs Canol No. 1, Canol No. 3, Canol No. 4, and Canol No. 5 is either in the category of "barely started" or "not started."

Canol No. 1A is represented as being 60 percent done, and Canol No. 6 as being approximately 20 percent done. On Canol No. 2, the tank farm and facilities at Prince Rupert are approximately 50 percent done, the unloading facilities and storage at Skagway are approximately 60 percent done (but are being used), the pipe line from Skagway to Whitehorse is in place and gasoline is being pumped through it. The line, however, is laid above ground, with no expansion loops, no anchorage, no gate or check valves, and with insufficient pumping capacity. In some cases the line is so close to the construction of the railroad that a minor wreck will break the line and cause a damaging fire because of the high pressure under which the line is operated without check valves. Just what will happen to the line after the spring thaw, landslides, and glacial movements is not known. Terminal storage exists at both Skagway and Whitehorse. Difficulties have been had, however, with excessive leakage because of the type of gasket material used. Pumping operations have to be handled on a hit-or-miss basis, since the operating communication system is only finished to a point 17 miles out of Skagway.

Canol No. 1, the pipe line and appurtenant facilities from Norman Wells to Whitehorse, is only approximately 8 percent accomplished. This work done consists mainly of the pioneer road being built from both ends; that running from Brooks brook toward Sheldon Lake, of which approximately 50 miles is done, is now the mission of the Thirty-fifth Engineers although it is the obligation of Bechtel-Price-Callahan to put it through. No work in place has been done on the refinery at Whitehorse.

Canol No. 3, the pipe line from Carcross to Watson Lake, is approximately 6 percent done. Work started on this project October 7, 1942, and was required to have been completed as of January 31, 1943. The work done consists mainly of partial surveys and the delivery of some of the material.

Canol No. 4, the pipe line from Whitehorse to Fairbanks, might be described as 0 percent accomplished. It is, however, reported to have been started on January 9, 1943, and is required to be completed on April 30, 1943. This performance is manifestly impossible.

Canol No. 5, the pipe line from Fairbanks to Nanana and thence to Tanana, might also be described as 0 percent accomplished. As of January 31, 1943, the job was reported as not started and it has a required completion date of May 15, 1943. This will likewise fail to be accomplished.

There are in addition certain wildcatting operations or oil excavations being carried on in the vicinity of Norman Wells. The exact status of this work could not be ascertained. However, it is known that certain production is already available and that two more wells are in the process of being driven.

The entire Canol project is characterized by all the deficiencies which have been expressed in this report under the headings from I to VII.

M. Division and district offices

1. The division office at Edmonton might be aptly described as a conglomeration of individuals under headless (brainless would be better) guidance and direction, engaged in perpetual but wasteful motion and ensconced in an atmosphere of pandemonium.

Living and working conditions at this office are exceedingly poor, almost scandalous, and conducive of the lowest morale. The new quarters being built are extremely excessive in cost and while they may provide comfort have been erected so close together as to constitute a fire hazard.

We could find no part of the office which might be characterized as having organizational cohesion and coordination.

2. The district office at Edmonton is hybrid and is in reality a suboffice of the division engineer. It is attempting to perform a diversity of functions in the process of which it is losing caste with the other five districts. The office contains some exceptionally good key personnel, who could be used very effectively in a good organization. This district office should be abolished and parts of it absorbed in the division office.

3. The district office at Dawson Creek has the spirit and willingness to perform its duties and responsibilities but is helpless. Several conferences with the district engineer, Lt. Col. Harry A. Schuppner, who incidentally appears to be a capable and enthusiastic officer, convince me that under present conditions it is completely ineffectual. It has no knowledge of construction facts, authority, control, specifically defined objectives, nor the wherewithal to undertake anything intelligently. Most of the work done by this officer has been effected on the basis of his own initiative and without instructions; if he had not so done, he and his staff and civilian employees would be homeless. Most of his officers are not particularly qualified for the work for which they have been designated to perform at this station.

4. The district office at Whitehorse, like the one at Dawson Creek, is also completely ineffectual. Lt. Col. L. E. Laurion is a conscientious and competent officer who is irked by the fact that he wants to do a real job and is stymied in every direction. Being in the shadow of the Northwest Service Command, he receives conflicting instructions, neither of which he can carry out because he lacks the means. The representatives of the contractors will not recognize his authority, the Service Command will not permit him to use his initiative. Briefly, he feels and is beginning to act like a marionette. The morale of his officers and civilian employees is dropping very rapidly.

5. The district office at Fairbanks is similar in nature to those of Dawson Creek and Whitehorse relative to its efficacy in the construction program. Because Col. John Moreland, the district engineer, is an unusually fine person, possessed of high qualities of leadership, judgment, and intelligence, and inspires and endears himself to the persons around him, the morale of his organization

and its quality is superior to that of all the other engineer offices in the Northwest Service Command. If this office were part of an organization under which it could function, it would contribute in a superlative measure to any task that had to be accomplished. This office has no plans and specifications by which to supervise construction, has no liaison with architect-engineer or contractor key personnel, has to resort to circuitous means to get facts, and has practically no means at hand in the way of field employees, equipment, spare parts, etc., to undertake its job. The great responsibility which Colonel Moreland feels and his complete lack of authority and instrumentality to perform a job are worrying him considerably.

6. The district office at Skagway is in the paradoxical position of having a large force of field employees in the vicinity and large quantities of material along the docks and stored in warehouses without being able to direct the building of anything. The Bechtel-Price-Callahan Co. has a field employees' camp at Skagway and materials and equipment are being delivered by boat for shipment over the White Pass & Yukon Railroad. The fact that the contractor will not recognize the authority of the district engineer, Lt. Col. Thomas Hayes, makes this office superfluous. As this officer expressed himself in a letter to the division office, he has been emasculated. He decries the fact that he has no authority nor the opportunity to use initiative. The disease here is the same one that plagues all the other district offices. Lieutenant Colonel Hayes is conscientious and, based upon his record, has all the qualifications to perform the job of district engineer with the highest degree of satisfaction.

7. The district engineer office at Prince Rupert is doing a highly commendable job, and in actuality this is the only place in the entire Northwest Service Command where physical work in place of a substantial amount has been performed during the course of the past 3 months. The district engineer, Lt. Col. Gerald R. Tyler, is deserving of much praise. Notwithstanding the fact that he inherited a bad job in midstream with contractors who had to be put through a process of catalysis, and notwithstanding the fact that the division office has given him rather poor cooperation, he has managed to get much of the job done. If he is given immediate assistance in the procurement of some equipment, particularly two 1½-yard shovels, trucks, and spare parts, we believe that the job can be fully completed by July 1, 1943. The port facilities will be entirely completed by May 1, 1943, possibly sooner. This officer has exhibited exceptionally good business judgment in a number of matters and has demonstrated high administrative ability.

IX. GENERAL CONCLUSIONS

1. The breaking through of the pioneer road (Alcan Highway) was an outstanding and praiseworthy performance.

2. The planning, scheduling, methods of arranging for the execution of work, and the conduct of work performance throughout, subsequent to the breaking through of the pioneer road, have been as disgraceful as the work on Alcan was commendable.

3. The leadership in the Northwest Service Command and in the Northwest Division Engineer Office, particularly the latter, is of a very low order. This leadership and the complete lack of organization which exists have not permitted and will not permit of the rapid, efficient, and economic consummation of the construction task.

4. The requirements for construction work as embodied in the various directives issued and the capacity for the performance of this work with the instrumentalities and agencies, as they exist, are so out of consonance that they cannot be reconciled.

5. Any curtailment or deferment of the work authorized, because of changes in strategic and tactical concepts, caused by changes in war conditions, will not solve the problems in the Northwest Service Command. It is vitally necessary to change the leadership and to reorganize, revitalize, and catalyze the agencies enjoined or engaged for the work performance. We are fully convinced that the present construction program, regardless of its adequacy or necessity, can be performed more rapidly, efficiently, and economically by good organization and under proper leadership than a deleted program can be executed by the present forces and agencies.

6. The liaison and cooperation between the many commands, divisions, and branches of the Army have not as yet reached the stage where they might be termed as completely satisfactory.

X. RECOMMENDATIONS

1. That the commanding general, Northwest Service Command, be relieved, or, alternatively, that the commanding general be assigned a staff of officers, qualified and trained for this particular type of supply and transportation task, who in turn are further implemented in the form of expert technical assistance.

2. That the northwest division engineer be relieved. There is no alternative procedure to this recommendation. The retainment of the division engineer in his present capacity will and must eventuate in disgraceful performance or failure.

Itinerary of Col. L. George Horowitz and Maj. Howard C. Helgerson

February 7, 1943:

Left Washington, D. C., 5:20 p. m. eastern war time, Pennsylvania Railroad.

February 8, 1943:

Arrived Chicago, Ill., 8:45 a. m. central war time.

Visited division engineer's office.

Left Chicago, Ill., 2:45 p. m. central war time, Great Western Railway.

Arrived St. Paul, Minn., 9:25 p. m. central war time.

Left St. Paul, Minn., 10 p. m. central war time, Soo Line.

February 9, 1943:

Arrived Portal, N. Dak., 3:30 p. m. central war time.

Left Portal, N. Dak., 3:30 p. m. mountain war time, Canadian Pacific Railway.

February 10, 1943:

Arrived Calgary, Alberta, Canada, 12 noon mountain war time,

Left Calgary, Alberta, Canada, 5 p. m. mountain war time, Canadian Pacific Railway.

Arrived Edmonton, Alberta, Canada, 11 p. m. mountain war time.

February 11, 1943:

Visited northwest division office.

February 12, 1943:

Visited northwest division office.

Visited contractors and architect, engineer's offices.

Visited Public Roads Administration and Edmonton district offices.

February 13, 1943:

Visited northwest division office.

Left Edmonton, Alberta, Canada, 6 p. m., mountain war time, Northern Alberta Railways.

February 14, 1943:

Arrived Dawson Creek, British Columbia, Canada, 5 p. m. Pacific war time.

February 15, 1943:

Visited district engineer's offices.

Visited existing facilities.

Visited sites for proposed work.

February 16, 1943:

Left Dawson Creek, British Columbia, Canada, 10 a. m. Pacific war time (U. S. Engineer Department car over Alcan Highway).

Arrived Sikanni Chief River, 9 p. m. Pacific war time.

February 17, 1943:

Left Sikanni Chief River, 7 a. m. Pacific war time (U. S. Engineer Department car over Alcan Highway).

Arrived Liard River, 9:30 p. m. Pacific war time.

February 18, 1943:

Left Liard River, 7:30 a. m. Pacific war time (U. S. Engineer Department car over Alcan Highway).

February 19, 1943:

Arrived Whitehorse, Yukon Territory, 2 p. m. Yukon time (traveled all of previous night).

Visited Northwest Service Command Headquarters.

February 20, 1943:

Visited district engineer's office.

Left Whitehorse, Yukon Territory, 5 p. m. Yukon time, Army cargo plane.

Arrived Fairbanks, Alaska, 7:20 p. m. Alaska time.

February 21, 1943:

Visited district engineer's office.

Visited local facilities and inspected roads.

- February 22, 1943:
 Visited district engineer's office.
 Left Fairbanks, Alaska, 9 p. m. Alaska time, Army cargo plane.
- February 23, 1943:
 Arrived Whitehorse, Yukon Territory, 1:25 a. m. Yukon time.
 Visited present facilities and sites for proposed work.
 Left Whitehorse, Yukon Territory, 3:15 p. m. Yukon time, White Pass-Yukon Railroad.
- February 24, 1943:
 Arrived Skagway, Alaska, 1:45 a. m. Yukon time.
 Visited district engineer's office.
 Visited existing facilities and sites for proposed work.
 Visited subport office.
 Left Skagway, Alaska, 8 p. m. Yukon time (yacht *Westward* via inside passage).
- February 25, 1943:
 Aboard the *Westward*.
- February 26, 1943:
 Aboard the *Westward*.
- February 27, 1943:
 Arrived Prince Rupert, British Columbia, Canada, 2 p. m. Pacific war time.
 Visited district engineer's office.
- February 28, 1943:
 Visited construction work at Prince Rupert.
- March 1, 1943:
 Visited work at Prince Edward and Watson Island.
 Visited subport office.
 Left Prince Rupert, British Columbia, 6:30 p. m. Pacific war time, Canadian National Railways.
- March 2, 1943:
 Aboard Canadian National Railways train.
- March 3, 1943:
 Arrived Jasper, Alberta, Canada, 8 a. m. mountain war time.
 Left Jasper, Alberta, Canada, 2 p. m. mountain war time, Canadian National Railways.
- March 4, 1943:
 Arrived Edmonton, Alberta, Canada, 4:30 a. m. mountain war time.
 Visited division engineer's office.
 Left Edmonton, Alberta, Canada, 2:25 p. m. mountain war time, Army cargo plane
 Arrived Minneapolis, Minn., 8:30 p. m. central war time.
 Left Minneapolis, Minn., 11 p. m. central war time, Chicago, Milwaukee, St. Paul & Pacific Railroad.
- March 5, 1943:
 Arrived Chicago, Ill., 8:30 a. m. central war time.
 Visited office of division engineer.
 Left Chicago, Ill., 3:15 p. m. central war time, Pennsylvania Railroad.
- March 6, 1943:
 Arrived Washington, D. C., 9:45 a. m. eastern war time.

