

HISTORIC OREGON ENGINEERING RECORD
PROSPECT DIVERSION PROJECT
JACKSON COUNTY, OREGON

Names: Prospect Nos. 1, 2, and 4 Hydroelectric Project
(Federal Energy Regulatory Commission [FERC] Project No. 2630)

Historically, the Prospect Diversion Project
(California Oregon Power Company [COPCO] Project No. 2001)

Location: Approximately 45 miles northeast of Medford, Oregon, near the town of Prospect, Jackson County, Oregon.

Middle Fork Diversion Dam:

Township 33S, Range 3E, Section 1, NENE

GPS: 42°44'8.55"N, 122°24'6.03"W (center of dam)

Middle Fork Warming Shed:

Township 33S, Range 3E, Section 1, NENE

GPS: 42°44'8.74"N, 122°24'6.038"W

Middle Fork Gauge Shelter:

Township 33S, Range 3E, Section 1, NENE

GPS: 42°44'7.58"N, 122°24.6.33"W

Red Blanket Diversion Dam:

Township 32S, Range 3E, Section 27, SESE

GPS: 42°45'9.52"N, 122°26'37.95"W (center of dam)

Red Blanket Canal Intake:

Township 32S, Range 3E, Section 27, SWSE

GPS: 42°45'14.82"N, 122°26'49.07"W

Red Blanket Gauge Shelter:

Township 32S, Range 3E, Section 27, SESW

GPS: 42°45'8.41"N, 122°27'1.16"W

Barr Creek Gauge Shelter:

Township 32S, Range 3E, Section 28, SESW

GPS: 42°45'6.80"N, 122°28'14.64"W

North Fork Diversion Dam:

Township 32S, Range 3E, Section 29, NWSW

GPS: 42°45'22.90"N, 122°29'53.42"W (center of dam)

Prospect Diversion Project (including canals, pipelines, and siphons):

Township 33S, Range 3E, Sections 1, 2, and 3;

Township 32S, Range 3E, Sections 28, 29, 33, and 34

Construction Date: 1931

Engineers: Byllesby Engineering & Management Corporation

Builder: California Oregon Power Company

Present Owner: PacifiCorp (formerly Pacific Power & Light)

Historic Use: Hydroelectric power facility

Present Use: Hydroelectric power facility

Significance: Prospect Nos. 1, 2, and 4 Hydroelectric Project meets the National Register of Historic Places (NRHP) eligibility criteria as a historic district under Criterion A, for associations with events that made a significant contribution to the broad patterns of local history, specifically hydroelectric power production and development in the Rogue River Valley. Though no formal NRHP nomination has been completed, preliminary evaluation of the Prospect Nos. 1, 2, and 4 Project indicates a period of significance extending from 1911 to 1933.¹ The presumed Prospect Hydroelectric System historic district includes the linear water conveyance system, diversion dams, powerhouses, and auxiliary residential and administrative buildings of Prospect Nos. 1, 2, and 4. The Prospect Diversion Project, completed in 1931, is a component of the overall Prospect Nos. 1, 2, and 4 Project, and includes the Middle Fork and Red Blanket dams and associated flumes, canals siphons and gauge shelters.

Report Prepared by: Natalie K. Perrin, MS, Architectural Historian
Heather Lee Miller, PhD, Historian
Historical Research Associates, Inc.
909 N. Beech Street, Suite 210
Portland, OR 97227

Photographer: Natalie K. Perrin

Report Date: October 2010

¹ PacifiCorp, "Historic Resource Inventory & Assessment Report: Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630," 2003, PacifiCorp Headquarters, Portland, Oregon.

I. Introduction

Prospect Nos. 1, 2, and 4 Hydroelectric Project (Project) is located in Jackson County, Oregon, on the Rogue River and two tributary streams approximately 45 miles northeast of Medford, Oregon, near the town of Prospect. The Project consists of three concrete diversion dams located on the Middle Fork Rogue River (Middle Fork dam), Red Blanket Creek (Red Blanket dam), and the Rogue River (North Fork dam). The dams divert water through approximately 9.25 miles of water conveyance system to a forebay. The forebay supplies water to three powerhouses, with a total capacity of approximately 36.75 megawatts (mW) (3.75 mW from Prospect No. 1 powerhouse, 32 mW from Prospect No. 2 powerhouse, and 1 mW from Prospect No. 4 powerhouse).

In 1995, the Oregon State Historic Preservation Office (SHPO) determined that Prospect project facilities appeared to meet the eligibility criteria for listing in the National Register of Historic Places (NRHP).² No formal determination of the project's NRHP eligibility has been completed, nor have district boundaries or identification of contributing and noncontributing resources been determined aside from inventory conducted as part of the relicensing process and drafting of the Project's Historic Properties Management Plan (HPMP).³ Based upon a historic context and site history prepared by Historical Research Associates, Inc. (HRA), Prospect Nos. 1 and 2 meet NRHP eligibility criteria as a historic district under Criterion A, with a period of significance extending from 1911 to 1933.⁴ As defined in the HPMP, the presumed Prospect Hydroelectric System historic district includes the linear water conveyance system, diversion dams, powerhouses, and auxiliary residential and administrative buildings of Prospect Nos. 1, 2, and 4.

The Prospect Diversion Project (California Oregon Power Company [COPCO] Project No. 2001) was constructed in 1931, and included diversion dams constructed on the Middle and South Forks of the Rogue River as well as Red Blanket Creek. Though the South Fork dam, Prospect No. 3 powerhouse and water conveyance system is regulated as Prospect No. 3 (Federal Energy Regulatory Commission [FERC] Project No. 2337), the bulk of the Prospect Diversion Project was absorbed into what is regulated as Prospect Nos. 1, 2, and 4 Hydroelectric Project (FERC Project No. 2630).

Ongoing new license implementation plans at the Project will affect resources located within the Prospect Hydroelectric Project historic district. Implementation plans require removal of the Middle Fork, Red Blanket, and Barr Creek gauge shelters, the Middle Fork and North Fork warming sheds, and alterations to the Middle Fork canal headgate and Red Blanket dam. With the exception of the North Fork warming shed, affected project resources were constructed for use during planning of or as part of the Prospect Diversion Project; the North Fork warming shed was built concurrent with the North

² PacifiCorp, "Historic Properties Management Plan for Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630," May 2005, 1, PacifiCorp Headquarters.

³ Ibid.; and PacifiCorp, "Historic Resource Inventory & Assessment Report: Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630," 2003, PacifiCorp Headquarters.

⁴ PacifiCorp, "Historic Resource Inventory & Assessment Report: Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630," 2003.

Fork dam, completed in 1928, and predates other affected project resources. This Historic Oregon Engineering Record (HOER) focuses specifically on the construction of the Prospect Diversion Project.⁵ This HOER was commissioned by PacifiCorp in consultation with SHPO as mitigation for effects to these resources caused by new license implementation plans.⁶

II. Historic Context

In the 1850s, brothers Dr. Charles R. and Col. Frank H. Ray established the Braden Mine and Mill on Gold Hill, now the town of Gold Hill in Jackson County, Oregon. Encouraged by technological advances in hydroelectric power production⁷ and frustrated by the cost and limitations of steam power, the Rays incorporated the Condor Water & Power Company and sold bonds to cover the cost of hydroelectric development on the Rogue River.⁸ By 1902, they had completed construction of a hydroelectric facility at Gold Ray. Production was substantially augmented in 1911 with construction of the Prospect Hydroelectric Plant (now Prospect No. 1 powerhouse) on the Rogue River. The water-conveyance system, powerhouse, and transmission line from Prospect to the Gold Ray plant were completed in 1911. Prospect not only powered the Ray brothers' milling operation but also provided electricity to the communities of Medford, Jacksonville, Central Point, Grants Pass, and Ashland, Oregon, thereby directly contributing to the region's early twentieth-century agricultural (orchard) boom.⁹

In 1912, the California Oregon Power Company, better known as COPCO, purchased the Rays' interest in the Prospect plant.¹⁰ By 1921, preliminary studies were being conducted to increase the capacity of the Prospect Development. In 1926, COPCO initiated construction of a greatly expanded Rogue River hydroelectric system that

⁵ The South Fork dam, Prospect No. 3 powerhouse, and associated water conveyance features, known collectively as the Prospect No. 3 Hydroelectric Project, were constructed concurrent with the Prospect Diversion Project. However, these resources are regulated under separate license from Prospect Nos. 1, 2, and 4, and will not be affected by ongoing license implementation plans. With the exception of where information is included in developing the historic context for the Prospect Diversion Project, Prospect No. 3 resources are not included in this report.

⁶ Julie Osborne to Russ Howison, RE: SHPO Case No. 10-1021, Prospect Hydroelectric Project Addendum, Prospect, Jackson County, August 26, 2010, 1.

⁷ Hydroelectric power development in the Pacific Northwest depended upon significant technological advances, including development of the large capacity hydroturbogenerator (1895); advances in power transmission (1891–1900); and development of the free jet tangential impulse, or “Pelton,” turbine (ca. 1900). All three advances were employed at Prospect No. 1 and subsequent developments. See Lisa Soderberg, “Hydroelectric Power Plants in Washington State, 1890–1938,” National Register of Historic Places Multiple Property Documentation Form, 1988, Washington Department of Archaeology and Historic Preservation (DAHP), Olympia, Washington.

⁸ In 1907, Condor Water and Power reorganized as Rogue River Electric. In 1913, Rogue River Electric merged with northern California's Siskiyou Light and Power, creating the California Oregon Power Company (COPCO). In 1961, COPCO merged with Pacific Power and Light, predecessor of PacifiCorp. John Dierdorff, *How Edison's Lamp Helped Light the West: The Story of Pacific Power & Light Company and Its Pioneer Forebears* (Portland, Ore.: Pacific Power & Light Company, 1971).

⁹ PacifiCorp, “Historic Properties Management Plan for Prospect Nos. 1, 2, and 4,” May 2005, 7.

¹⁰ “Col. F. H. Ray, Well Known Locally, Passes in East,” *Medford Mail Tribune*, April 13, 1925, page 5, as quoted in Southern Oregon History, Revised, “Co. Frank H. and Dr. Charles R. Ray,” <http://id.mind.net/~truwe/tina/rays.html> (accessed September 23, 2010).

incorporated the original 1911 Prospect facilities. Byllesby Engineering & Management Corporation assumed responsibility for the design and construction of the new facilities, which included the North Fork diversion dam and pond, 7,000 feet of canal, a forebay, 3,100 feet of wood-stave flowline, a surge tank, penstocks, and the Prospect No. 2 powerhouse. This system comprised Phase I of the “North Fork Development,” which went into service in January 1928.

Expansion of the existing Prospect facilities and construction of Prospect No. 2 were only the first steps in expanding hydroelectric power production on the Rogue River. Drawings dated October 5, 1921, indicate initial interest in a canal line stretching from the Middle Fork to the North Fork of the Rogue River.¹¹ By September 1924, survey crews were actively exploring the area around the Middle and South Forks in anticipation of further expansion for what was being called the South Fork Development, also known as Prospect No. 3.¹² Simultaneously, preliminary geological reports were conducted for regulation, diversion, pondage and storage projects being considered for further expansion of Prospect No. 2.¹³ Of the projects considered, only the diversion project, encompassing the South Fork Development and subsequently Prospect No. 3, would ultimately be undertaken.

From June 20 to August 6, 1925, extensive survey work was conducted on the Middle Fork of the Rogue River. A road was constructed to branch off from the main road between Prospect and Butte Falls to approximately one-half mile below (downstream from) the gauging station, as reported by COPCO engineer E. C. Koppen in a 1926 report. Koppen further noted that “in connection with the investigations at Prospect, gaging [*sic*] stations were established on the Middle Fork and on Mill and Red Blanket Creeks. A Continuous recording clock gage was installed on the Middle Fork and staff gages on Mill and Red Blanket Creeks. . . . The station on the South Fork was established previous to 1925. The gaging stations are visited and maintained by the Company employees at Prospect.”¹⁴

Koppen’s report concluded that “the power house location and probably also the location for the dam seems to be definitely fixed at the rock reef, a short distance above the gaging [*sic*] station.”¹⁵ Though a powerhouse on the Middle Fork was never constructed, it must have been considered in conjunction with the regulation, pondage, or

¹¹ “Preliminary Prospect Development Middle Fork Canal Line,” Drawing PP No. G-60102, California Oregon Power Company, October 5, 1921, P-8 Electronic Archives, PacifiCorp Headquarters.

¹² John F. Partridge and R. G. Hackett, “Report on Reconnaissance and Preliminary Survey: South and Middle Forks, Rogue River, Prospect No. 3 Development,” California Oregon Power Company, January 1925, PDX.014994, Rogue Development Prospect Project Unlicensed Plant Data 1926-1962, Box 30936, PacifiCorp Headquarters Archives.

¹³ Map of Regulation, Diversion, Pondage, and Storage Projects being considered for Prospect No. 2, 1925, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, PacifiCorp Headquarters Archives.

¹⁴ E. C. Koppen, “Preliminary Surveys and Investigations, Prospect No. 3 Development (Part on Middle Fork of Rogue River), California Oregon Power Company, May 24, 1925, 1, PDX.014994 Rogue Development Prospect Project Unlicensed Plant Data 1926-1962, Box 30936, PacifiCorp Headquarters Archives.

¹⁵ *Ibid.*, 2.

storage projects. During these preliminary investigations, Koppen initially “had in mind a dam that would raise the water level about 25 to 30 feet with a concrete section across the stream for the spillway and an earth and rock fill section on the flat area north of the creek. . . . The location of the dam or the height thereof depends on the location and height of the proposed dam on the North Fork; also on the amount of head required for the conduit extending from the Middle Fork to the North Fork. As neither of these were available, no definite location or preliminary layouts were made.”¹⁶ Koppen also noted that the 1925 investigations for the South Fork development “consisted mainly of walking over and getting familiar with the ground.”¹⁷

By 1926, construction of the North Fork dam, the Prospect No. 2 powerhouse, and the associated water conveyance system was well underway. In January 1928, the North Fork Development was complete and the Prospect No. 2 powerhouse went into service. During and following construction of the North Fork Development, continued studies were made to “determine the relationship between the several streams or parts of streams that are or ultimately will be tributary to the Prospect No. 2 Plant or the proposed Regulation Project.”¹⁸ Concurrently, further surveys for the “Prospect 3-A Development” were being conducted; Prospect 3-A appears to have been a hybrid of what had previously been referred to as Prospect No. 3, the South Fork Development, and/or the Diversion Project. Maps depicting 1926 survey results for Prospect 3-A show both an upper and lower location for dam sites on the Middle Fork, as well as three possible powerhouse and penstock locations for the South Fork.¹⁹

The role of the gauging stations in determining what developments were ultimately constructed is clearly expressed by Koppen in a March 1929 water supply study of the Rogue River and its tributaries. The stream-flow data contained in Koppen’s report was vital, “because we are apparently getting very close to the design and construction of the Diversion, Pondage, and Regulation projects.”²⁰ Koppen’s study clearly outlines the relative flows of the streams to be included in the Diversion Project, specifically Red Blanket Creek and the Middle and South Forks of the Rogue River. His findings are based on records of the gauging stations maintained at points along the North Fork of the Rogue River for more than twenty years, as well as those on Red Blanket Creek and the Middle and South Forks of the Rogue River installed in 1924-1925. Koppen’s water supply study also noted that as of 1929, no water-flow evaluations had been made for either the pondage or regulation projects.

By 1929, criticisms from fisherman and the irrigation interests regarding water fluctuations downstream from Prospect No. 2 accelerated COPCO’s need to regulate the

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ E. C. Koppen, “Water Supply Study: Rogue River and Tributaries, Prospect Developments,” California Oregon Power Company, March 25, 1929, 1, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, PacifiCorp Headquarters Archives.

¹⁹ “Prospect 3-A Development Middle Fk. Rogue River, Jackson Co. ORE., T. 32 & 33S, R.4E., W.M., Key Map – Preliminary Survey of 1926,” Drawing F-4693, California Oregon Power Company, February 7, 1928, P-8 Electronic Archives, PacifiCorp Headquarters.

²⁰ Koppen, “Water Supply Study: Rogue River and Tributaries,” March 25, 1929. 1.

Rogue River to a uniform flow below the Prospect No. 2 plant.²¹ At this time, it appears that only two alternatives were considered: the diversion project and the pondage project. As its name suggests, the diversion project provided for “diverting the flow of the Red Blanket and the Middle and South Forks of the Rogue to a point above the diversion on the North Fork for Prospect No. 2.”²² The pondage project, which would have provided pondage at a point approximately four miles above Prospect Plant No. 2, was abandoned in favor of the diversion project.

In 1931, the Prospect Diversion Project (COPCO Project No. 2001) was completed, supplying additional water to the Prospect Nos. 1 and 2 powerhouses by diverting water from the Middle Fork Rogue River and Red Blanket Creek into the Rogue River at the North Fork diversion dam, thereby regulating fluctuations on downstream flows.²³ Both the Red Blanket Creek and Middle Fork diversion dams, and the majority of the extant water conveyance system, date to this period of development.

III. Physical Description

The Prospect Diversion Project, as constructed, included three diversion dams located on the Middle and South Forks of the Rogue River and Red Blanket Creek. The diversion project also included miles of flumes, canals, and siphons. Since initial construction of the project almost eighty years ago, numerous changes due to maintenance concerns, technological improvements, and other factors have occurred. Additionally, the Prospect No. 3 Project, incorporating the South Fork diversion dam, Prospect No. 3 powerhouse and associated penstocks, pipelines, siphons, and flumes, is now regulated under a separate FERC license (FERC Project No. 2337) than other components of the Prospect Diversion Project absorbed into Prospect Nos. 1, 2, and 4 Hydroelectric Project (FERC Project No. 2630). The physical description given here depicts the current resources of the Prospect Nos. 1, 2, and 4 Hydroelectric Project constructed as part of the Prospect Diversion Project and does not include Prospect No. 3 facilities.

Middle Fork Diversion Dam

The Middle Fork diversion dam is the eastern-most resource. The Middle Fork diversion dam is a low concrete weir with an uncontrolled spillway, canal intake and fish ladder. The intake has a spillway section and trash racks, and is controlled by means of a Waterman gate. The dam was built of reinforced concrete and completed in 1931.

²¹ E. C. Koppen, “Regulation Project Rogue River,” June 1929, PDX.008386, Box 26316, Hydro-Rogue River Geologic/ North Umpqua Repairs-Reports, 1927-1982, Folder: 534.07, Prospect Development NO 3-A, D. G. MacBean’s Report of the Middle Fork of Rogue River – 1928, 2, PacifiCorp Headquarters Archives.

²² Koppen, “Regulation Project Rogue River,” June 1929, 2.

²³ The Prospect No. 3 project, which conveys water from the South Fork Rogue River to the Middle Fork canal via the Prospect No. 3 powerhouse, was also built as part of the Prospect Diversion Project. Prospect No. 3 came on-line in 1933, operates under separate FERC license (FERC Project No. 2337), and will not be affected by the proposed project.

Middle Fork Warming Shed

A small warming shed is located west of and adjacent to the canal intake, nestled between the canal to the east and a steep hillside to the west. Although an exact construction date of the warming shed is unknown, it is assumed (based on photo documentation) that the warming shed was completed within the first few years of the dam's operations, c. 1933. The Middle Fork warming shed is a single-story, single-bay building. The foundation is partially post-and-pier and partially poured concrete, utilizing the canal intake deck of the Middle Fork dam for the porch floor on the north side. The warming shed is rectangular in plan, with a roughly square interior space to the south and a covered exterior porch on the north elevation. The building has a front-gable roof clad in corrugated metal. The warming shed is clad in horizontal board siding and features a single, four-light wood sash window on the east (canal-side) elevation. The interior is accessed by a wooden door located beneath the porch on the north elevation.

Middle Fork Gauge Shelter

The Middle Fork diversion dam channels water in one of two ways: either through the canal or via the spillway. Water released through the spillway continues downstream on the Middle Fork of the Rogue River. Approximately 500 feet downstream of the dam on the Middle Fork is the gauge shelter. This structure houses equipment that records the flow in the Middle Fork canal. The Middle Fork gauge shelter is square in plan, has a poured concrete foundation and a moderately slopping shed roof. The structural system is platform frame (stud wall). The building is clad in original, vertical board siding, and features a single, four-light wood sash window on the west (canal-side) elevation. The interior of the gauge shelter is accessed via a narrow wooden door on the south elevation, constructed of the same vertical boards as the siding. The door features an original brass knob and escutcheon. The interior of the building is clad in horizontal board siding. The wooden floor features a central, square well with a gauge to measure water flow. The extant Middle Fork gauge shelter dates to 1931, as evidence by original blueprints; it is unclear when the first, 1926 Middle Fork gauge shelter was moved or to where.

Middle Fork Water Conveyance System

Water that flows through the Middle Fork canal travels approximately 3.5 miles (5.5 km) through a water conveyance system before merging with water from the Red Blanket diversion. The Middle Fork water conveyance system includes closed metal pipes and siphons; open, concrete-lined, trapezoidal shaped canals; and a steel flume.²⁴

Red Blanket Diversion Dam

Approximately 2.5 miles northwest of the Middle Fork dam, as the crow flies, is the Red Blanket dam. The Red Blanket Creek diversion dam consists of a low concrete spillway section and an earth embankment. The concrete spillway is constructed of stepped, reinforced concrete and stone. The earthen embankment is approximately 970

²⁴ Historically, eight wooden flumes were located throughout the Prospect Diversion Project system. Of the original eight flumes, five were removed entirely and replaced with enclosed steel pipes or open, concrete-lined canals. Three were replaced with steel flumes in the exact profile of the original wooden flumes.

feet (296 m) long, aligned southeast to northwest, and enables water to be diverted to the canal intake northwest of the dam. The poured concrete canal intake and lateral spillway are of approximately the same design as the Middle Fork diversion dam, and features a Waterman gate.

Red Blanket Gauge Shelter

Approximately 1,112 feet (339 m) downstream of the Red Blanket canal intake is the Red Blanket gauge shelter which houses equipment recording Red Blanket canal flow. The Red Blanket gauge shelter dates to 1926, is square in plan, and sits on a poured concrete foundation. The building has a moderately slopping shed roof and was constructed in platform frame (stud wall). The building is clad in T1-11 vertical board siding. The interior of the gauge house is accessed via a narrow plywood door. The Red Blanket gauge shelter has been altered since initial construction and features newer siding that has obscured the original window, located on the canal-side elevation. The original door is no longer extant, and has been replaced with a plywood door.

Red Blanket Water Conveyance System

Continuing downstream, the Red Blanket canal is an unlined, earthen canal bordered on either side by wooden piles. Historically, the piles supported wooden boards, though these and the piles have mostly deteriorated or rotted away altogether. With the exception of a segment adjacent to the Red Blanket gauge shelter where it is concrete lined, the Red Blanket canal is unlined until approximately 145 feet (44 m) before it merges with the Middle Fork water conveyance system. Once the Red Blanket and Middle Fork systems merge, the canal, trapezoidal in shape and concrete-lined, conveys water through two additional steel flumes to a point just upstream from the North Fork diversion dam.

Barr Creek Gauge Shelter

Approximately .75 miles (1.16 km) downstream from the confluence of the Middle Fork and Red Blanket canals is the Barr Creek gauge shelter. Like both the Red Blanket and Middle Creek gauge shelters, the Barr Creek gauge shelter is square in plan, sits on a poured concrete foundation, and has a moderately slopping shed roof. The structural system is platform frame (stud wall). The building is clad in T1-11 vertical board siding. The interior of the gauge house is accessed via a narrow plywood door. The Barr Creek gauge shelter dates to 1926, but has been altered since initial construction. The building features newer siding, which has obscured the original window. The original door is no longer extant, and has been replaced with a plywood door.

North Fork Warming Shed

Continuing downstream, the merged Middle Fork and Red Blanket canals divert water to a point upstream of and adjacent to the North Fork diversion dam. On the opposite (west) bank from the canal is the North Fork warming shed, a single-story, single-bay building believed to sit on a poured concrete foundation. The warming shed is rectangular in plan, with a front-gable roof. The warming shed is clad in rolled roofing paper on the south (reservoir-side) elevation, and cedar shingles on the east elevation. The building features a single, four-light wood sash window and vertical board door on

the south (reservoir-side) elevation. The interior of the warming shed is clad in horizontal boards and has a wooden floor. The North Fork warming shed was built concurrently with the North Fork dam, completed in 1928. The building is largely intact, though the wall and roof claddings appear to have been altered. The building was used in the winter months as a warming shed for Project staff, though the building has been mostly abandoned in recent years.

IV. Construction and Maintenance History

By May 1927, costs were being calculated for the “Middle Fork–Red Blanket Diversion.”²⁵ Preliminary drawings for the Middle Fork dam depict a log diversion dam: a simple, triangular-shaped structure to be constructed of 18” average diameter timbers covered by 3x12” planks, on a bedrock foundation with concrete footings.²⁶ Accompanying computation sheets show the cost of such a structure to be estimated at \$73,750, with additional costs for the flume out of Middle fork (\$206,830), the siphon from the flume to the North Fork (\$388,860), costs associated with the Red Blanket Diversion (\$77,650), and construction of roads and trails (\$10,000) bringing the assumed estimated project costs to a subtotal of \$757,090.²⁷

Early cost calculations show that while various components of the Prospect Diversion Project were being built to include considerations for water diverted from the South Fork diversion dam and Prospect No. 3 powerhouse, cost estimates for the South Fork project were not being calculated in conjunction with the Prospect Diversion Project No. 2001. Flumes, siphons, and pipelines were engineered to carry South Fork water, but as early as 1927, the South Fork Diversion (now Prospect No. 3) was being thought of as a separate entity in terms of construction costs and estimates. Although the two projects were constructed simultaneously, COPCO ultimately built and maintained them as separate entities.

It is also important to note that prior to finalizing the design of the Diversion Project, other projects were still being considered, specifically the pondage, regulation and storage projects, which exist in preliminary concept drawings only and were never finalized or built. However, by September 1929, locations for two dams on the Middle Fork with an associated powerhouse were still being considered.²⁸

²⁵ J. F. Partridge and H. P. Bosworth, Jr., “Cost of Middle Fork-Red Blanket Diversion, May 17, 1927, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, Folder: Middle Fork-Red Blanket Diversion Prospect No. 2, PacifiCorp Headquarters Archives.

²⁶ J. F. P., “Cross Section and Profile of Log Diversion Dam, Middle Fork of Rogue River,” May 1, 1927, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, Folder: Middle Fork-Red Blanket Diversion Prospect No. 2. PacifiCorp Headquarter Archives.

²⁷ J. F. P., “Summary, Estimated Cost, Middle Fork and Red Blanket Diversion (with capacity in conduits to include South Fork),” July 23, 1927, PDX.008386 Hydro – Rouge River Geologic / North Umpqua Repairs – Reports, Box 26316, Folder: Middle Fork-Red Blanket Diversion Prospect No. 2. PacifiCorp Headquarter Archives.

²⁸ Byllesby Engineering & Management Corporation, “Dam Sites on Middle and South Forks, Prospect Diversion Project,” Drawing AA-31271, California Oregon Power Company, P-8 Electronic Archives, PacifiCorp Headquarters.

As calculations, designs, and cost estimates for the Prospect Diversion Project were being finalized, the North Fork diversion dam, warming shed, Prospect No. 2 powerhouse, and miles of associated canals and pipelines were completed. By January 1928, the North Fork diversion was complete, and Prospect No. 2 powerhouse was online. Within two years of the completion of North Fork, construction for the Prospect Diversion Project would be fully underway.

In July 1929, Preliminary Layout No. 3 for the Prospect Diversion Project was produced by Byllesby Engineering & Management Corporation.²⁹ The drawing appears to be the first look at what would become, more-or-less, the final layout for the Prospect Diversion Project, and includes the contours for the South Fork diversion as well. The combination of wood-stave pipelines, canals, penstocks, and diversion dams are all depicted, though the locations for flumes are not shown.

By July 1931, the location and configuration plans for the Middle Fork diversion dam were complete.³⁰ Crews began clearing the site shortly thereafter, and by August 13, 1931, the west bank of the Middle Fork Rogue River was bare except for a few remaining tree stumps in anticipation of construction of the Middle Fork diversion dam.³¹ Construction for the Red Blanket dam and canal intake structure, as well as the connecting flumes and canals that would ultimately feed North and South Fork and Red Blanket Creek waters to the North Fork diversion, were also underway.

Two camps, one each at Middle Fork and Red Blanket, were established to house workers and staff. Construction continued through fall 1931. Photographs from November of that year depict the Middle Fork dam, intake, and canal largely complete in time for the first snow, though the temporary bridge crossing above the dam was still in place. The canal, as originally constructed, was unlined on the west bank from the intake to a point approximately 200 feet downstream.

The Middle Fork warming shed was not built concurrently with the Middle Fork dam; historic photographs show that, while the dam was completed in November 1931, by September 1932, the warming shed had not been constructed.³² It is assumed that the Middle Fork warming shed was constructed c.1933, within the period of significance of the Prospect Hydroelectric Project historic district.

Historic photographs and original blueprints archived with PacifiCorp do an excellent job of detailing the specifics of construction. Board-forming of the canals, intakes, and dams, construction of trestles for the flumes, grading and moving earth for the Red

²⁹ Byllesby Engineering & Management Corporation, "Preliminary Layout No. 3, Prospect Diversion Project," Drawing AA-31263, California Oregon Power Company, July 25, 1929, P-8 Electronic Archives, PacifiCorp Headquarters.

³⁰ Byllesby Engineering & Management Corporation, "Location of Diversion Dam on Middle Fork of Rogue River," Drawing B-35151, California Oregon Power Company, July 25, 1929, P-8 Electronic Archives, PacifiCorp Headquarters.

³¹ California Oregon Power Co. Prospect Diversion Project No. 2001, Middle Fork Dam Site – View from S.E. end of dam along [centerline] of Dam, Photo No. 38, August 13, 1931, PDX.025375 Prospect No. 3 Construction Photos, PacifiCorp Headquarters Archives.

³² Photo No. 239, Middle Fork Dam and Canal Intake View Looking Upstream, September 13, 1932, PDX.025375, Hydro Generation, PacifiCorp Headquarters Archives.

Blanket dam, placing the concrete canal lining with a Rex Paver, and using a pile driver for the wooden piers flanking the Red Blanket canal were all carefully recorded in large-format photos and negatives. These pictures depict not only the details of the construction of the Prospect Diversion Project but also the men who built it.

In 1953, the first of what would eventually be numerous alterations to the Prospect Diversion Project was necessitated. A partial realignment and construction of a new gunite lined canal was being constructed to replace Flume No. 8, presumably due to deterioration or failure of the wood and/or ongoing maintenance concerns.³³ Flume No. 8 was the first flume to be replaced by a canal; by the turn of the twenty-first century, all wooden flumes had been replaced, either with new canal features or with steel flumes in the same size, shape, and configuration as the original timber. Three steel flumes remain in the Project.

In 1977, repairs to the Middle Fork fishway required installation of rebar and repairs to the existing concrete. Other alterations to the Project have been necessitated by FERC in accordance with license implementation, health and life-safety concerns, and innovations in hydroelectric power production. Alterations include relining original concrete canals and replacing wood-stave flowlines with steel flowlines of the same size, shape, and configuration. Pending alterations, which necessitated this report, include removal of the Middle Fork, Red Blanket, and Barr Creek gauge stations, which will be upgraded with new gauging technology; removal of the Middle Fork warming shed to enable installation of an automated system in a new structure at the Middle Fork canal intake; installation of a new structure for automation at the Red Blanket canal intake of the same size and shape as the Middle Fork automation structure; installation of a flow release structure on the Red Blanket dam; and removal of the now deteriorated and unused North Fork warming shed.

V. References Cited

Dierdorff, John. *How Edison's Lamp Helped Light the West: The Story of Pacific Power & Light Company and Its Pioneer Forebears*. Portland, Ore.: Pacific Power & Light Company, 1971.

PacifiCorp Headquarters Archives, Portland, Oregon. P-8 Electronic Archives, PacifiCorp Headquarters, Portland, Oregon.

PacifiCorp. "Historic Resource Inventory & Assessment Report: Prospect Nos. 1, 2, and 4 Hydroelectric Project Relicensing, FERC Project No. 2630. 2003. PacifiCorp Headquarters Archives.

----- . Historic Properties Management Plan for Prospect Nos. 1, 2, and 4 (FERC Project No. 2630). May 2005. PacifiCorp Headquarters Archives.

³³ T. R. Lytle, E. B. Hedberg and E. E. Stearns, "Prospect Middle Fork Diversion Project, 1953 Partial Realignment," Drawing F-7314, California Oregon Power Company, March 26, 1953. P-* Electronic Archives, PacifiCorp Headquarters.

VI. Maps

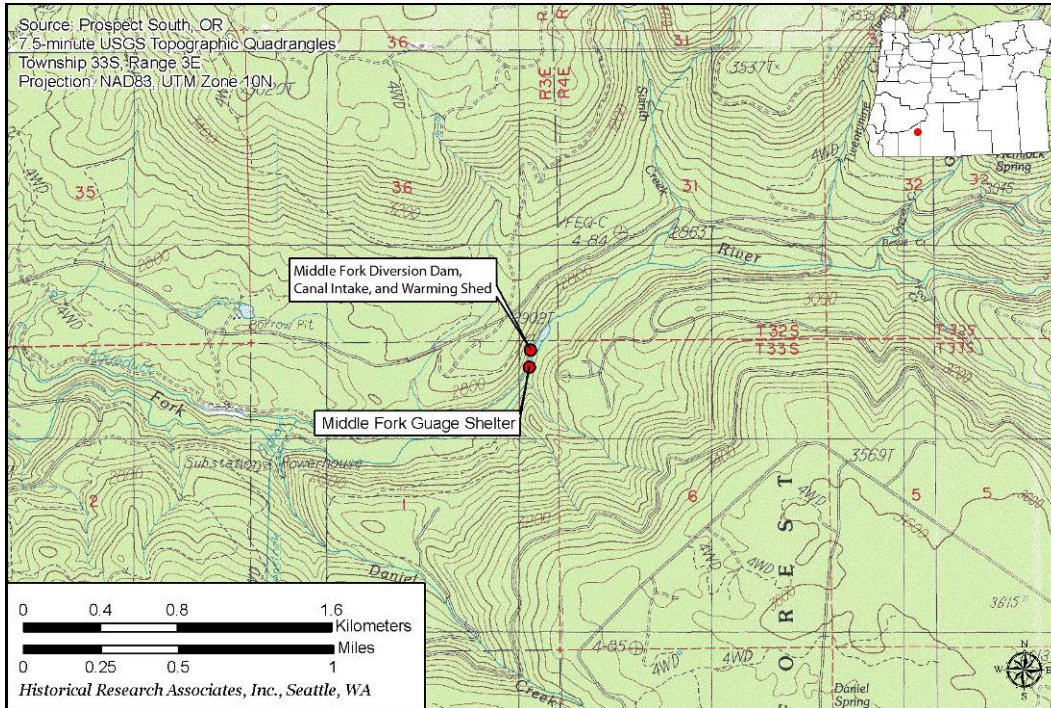


Figure 1. Location of Middle Fork diversion dam, canal intake, warming shed and gauge shelter.

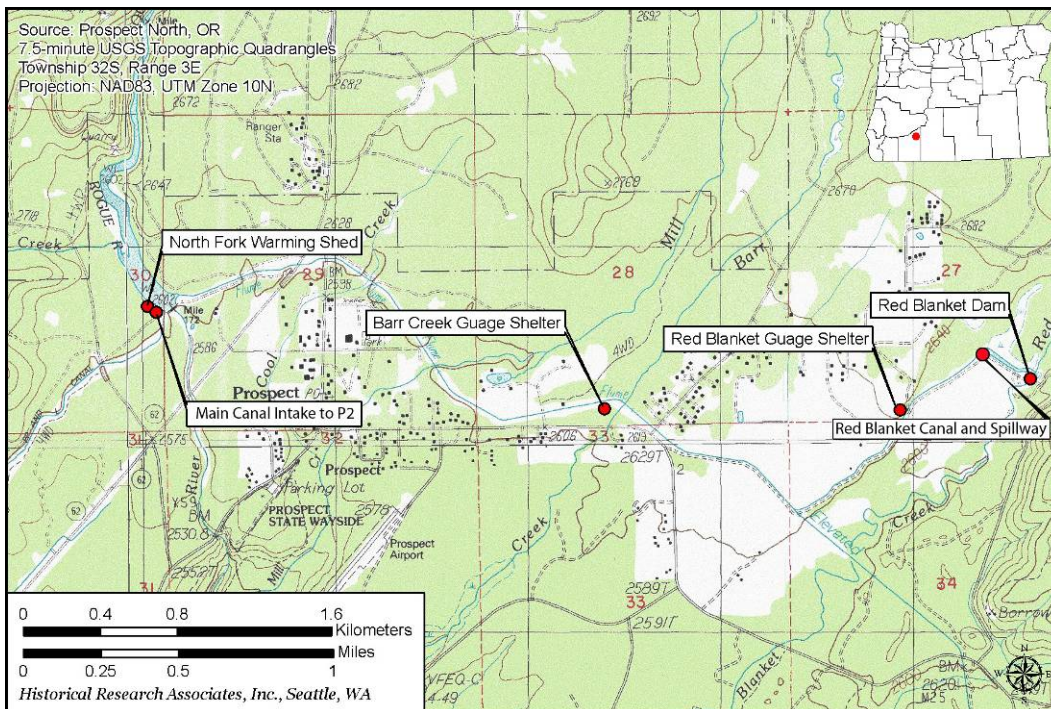


Figure 2. Location of Red Blanket dam, canal, spillway and gauge shelter, Barr Creek gauge shelter, North Fork warming shed, and intake for the main canal, which leads to the Prospect No. 2 development.

VII. Current Photographs

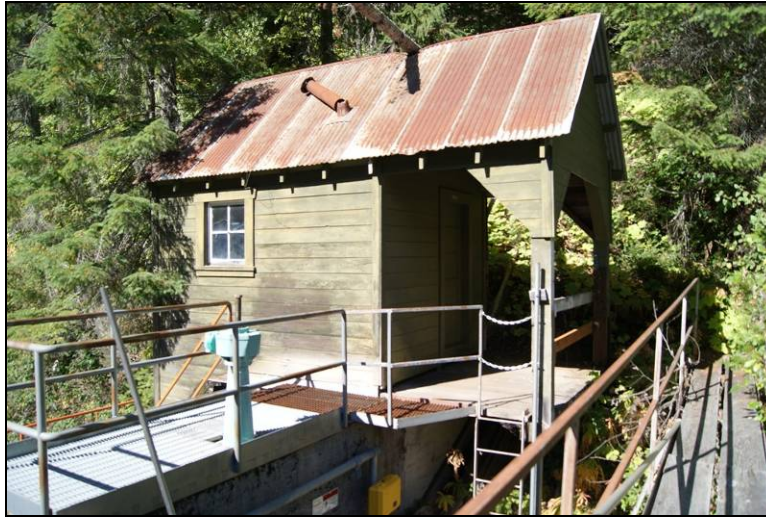


Figure 3. Middle Fork warming shed, 2009.



Figure 4. Middle Fork diversion dam, 2009.



Figure 5. Middle Fork canal, intake, and dam, 2009.



Figure 6. Enclosed steel pipe (also known as an inverted siphon) downstream of the Middle Fork dam, 2009.



Figure 7. Typical view of the trapezoidal-shaped canal of the Prospect Diversion Project. Shown here, a relined segment adjoins the historic canal, 2009.



Figure 8. Steel flume, which replaced a wood flume of the same size, shape, and alignment. Note original concrete footings, which were reused for the steel flume, 2009.



Figure 9. Red Blanket canal at intersection of unlined and lined segments just before Red Blanket canal merges with Middle Fork canal, 2009.



Figure 10. Red Blanket dam, 2009.



Figure 11. Red Blanket intake, canal, and lateral spillway, 2009.



Figure 12. Red Blanket canal and gauge station, 2009.



Figure 13. Steel flume on wooden trestle, downstream of Barr Creek gauge shelter, 2009.

VIII. Historic Photographs

Historic photographs reproduced here are courtesy of PacifiCorp Headquarters Archives in Portland, Oregon.

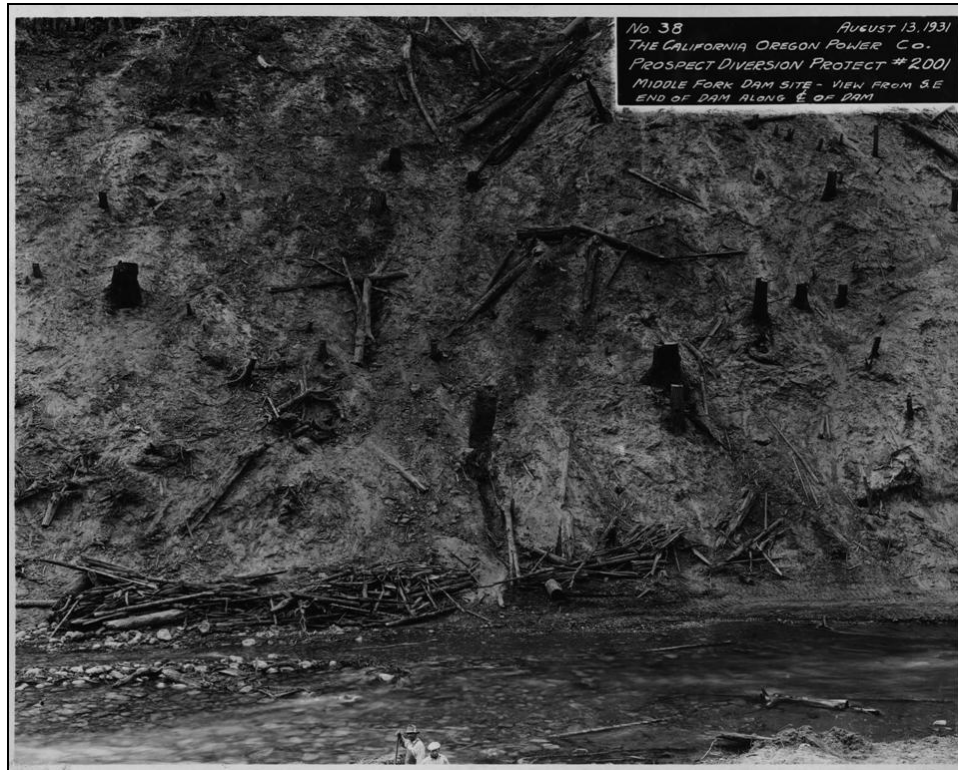


Figure 14. COPCO Prospect Diversion Project No. 2001, Photo No. 38, Middle Fork Dam Site – View from southeast end of dam along centerline of dam, August 13, 1931.



Figure 15. COPCO Prospect Diversion Project No. 2001, Photo No. 41, Flume No. 2 – Trestle and Inlet Transition, view downstream, August 13, 1931.

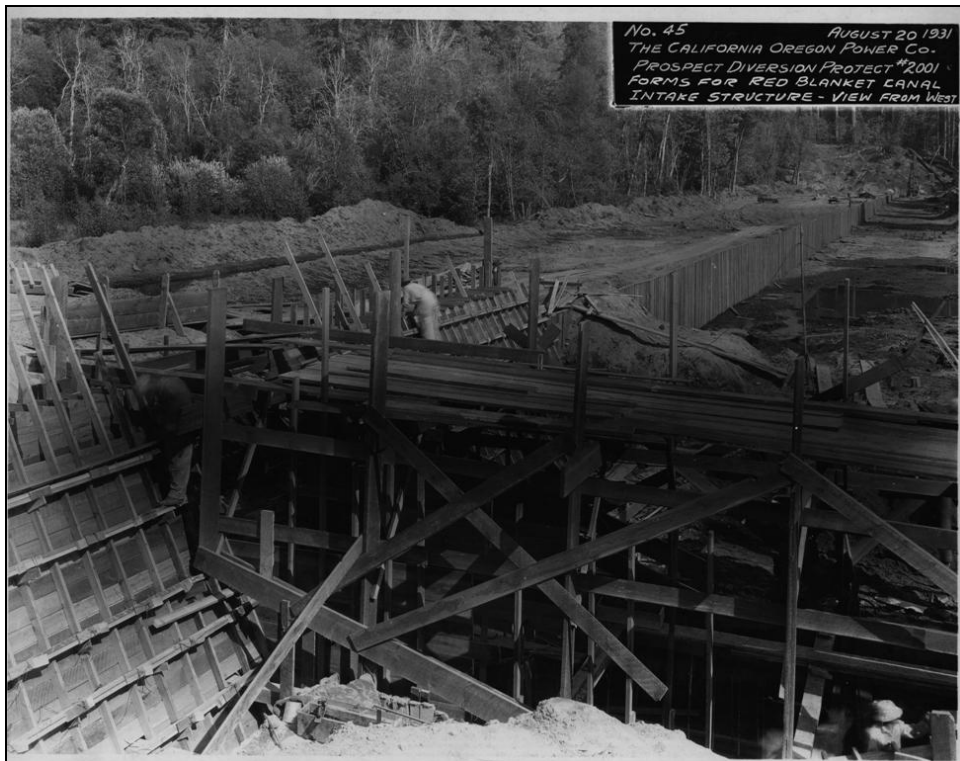


Figure 16. COPCO Prospect Diversion Project No. 2001, Photo No. 45, Forms for Red Blanket Canal Intake Structure – View from West, August 20, 1931.



Figure 17. COPCO Prospect Diversion Project No. 2001, Photo No. 46, Red Blanket Dam Site – View from southeast parallel with centerline of dam, August 20, 1931.

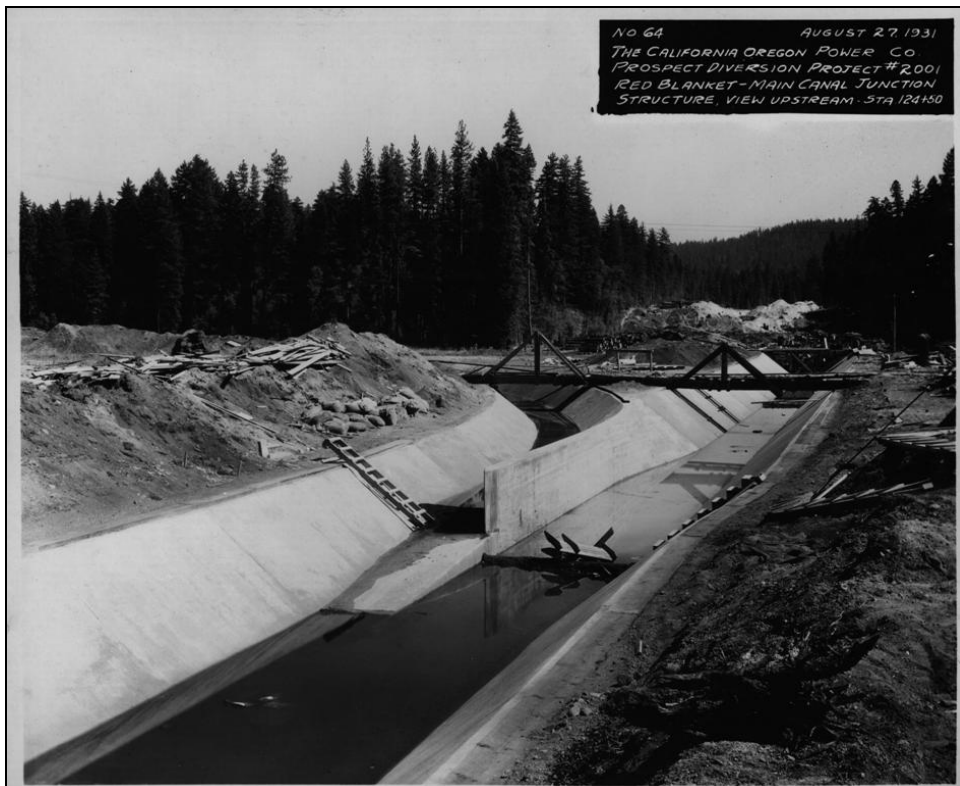


Figure 18. COPCO Prospect Diversion Project No. 2001, Photo No. 64, Red Blanket-Main Canal Junction Structure, View upstream, August 27, 1931.



Figure 19. COPCO Prospect Diversion Project No. 2001, Photo No. 66, Placing Canal Lining with Rex Paver, August 27, 1931.



Figure 20. COPCO Prospect Diversion Project No. 2001, Photo No. 69, Middle Fork Dam site – View from southeast along centerline of dam, August 27, 1931.



Figure 21. COPCO Prospect Diversion Project No. 2001, Photo No. 81, Flume No. 1, view thru shell from inlet trans., September 17, 1931.



Figure 22. COPCO Prospect Diversion Project No. 2001, Photo No. 83, Red Blanket Dam, view from southeast, September 17, 1931.



Figure 23. COPCO Prospect Diversion Project No. 2001, Photo No. 84, Red Blanket Dam – Spillway, forms viewed from downstream, September 17, 1931.



Figure 24. COPCO Prospect Diversion Project No. 2001, Photo No. 85, Red Blanket Canal Intake and Spillway Structure, September 17, 1931.



Figure 25. COPCO Prospect Diversion Project No. 2001, Photo No. 86, Red Blanket Canal Intake and Spillway Structure, September 17, 1931.



Figure 26. COPCO Prospect Diversion Project No. 2001, Photo No. 87, Red Blanket Canal Pile Driver, view upstream, September 17, 1931.



Figure 27. COPCO Prospect Diversion Project No. 2001, Photo No. 93, Red Blanket Canal – view downstream, September 24, 1931.



Figure 28. COPCO Prospect Diversion Project No. 2001, Photo No. 121, Middle Fork Dam, view of downstream side showing temporary passage, October 15, 1931.

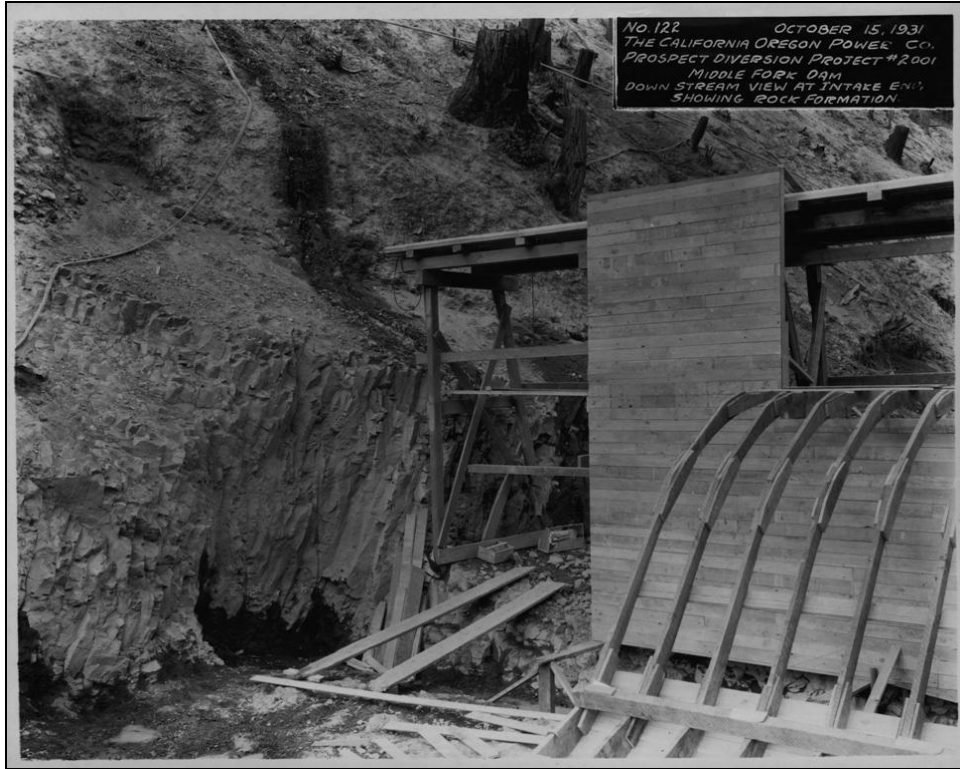


Figure 29. COPCO Prospect Diversion Project No. 2001, Photo No. 122, Middle Fork Dam, downstream view at intake end showing rock formation, October 15, 1931.



Figure 30. COPCO Prospect Diversion Project No. 2001, Photo No. 136, Red Blanket Dam Spillway, view from downstream side, October 22, 1931.



Figure 31. COPCO Prospect Diversion Project No. 2001, Photo No. 137, Red Blanket Dam, View from southeast end, October 22, 1931.

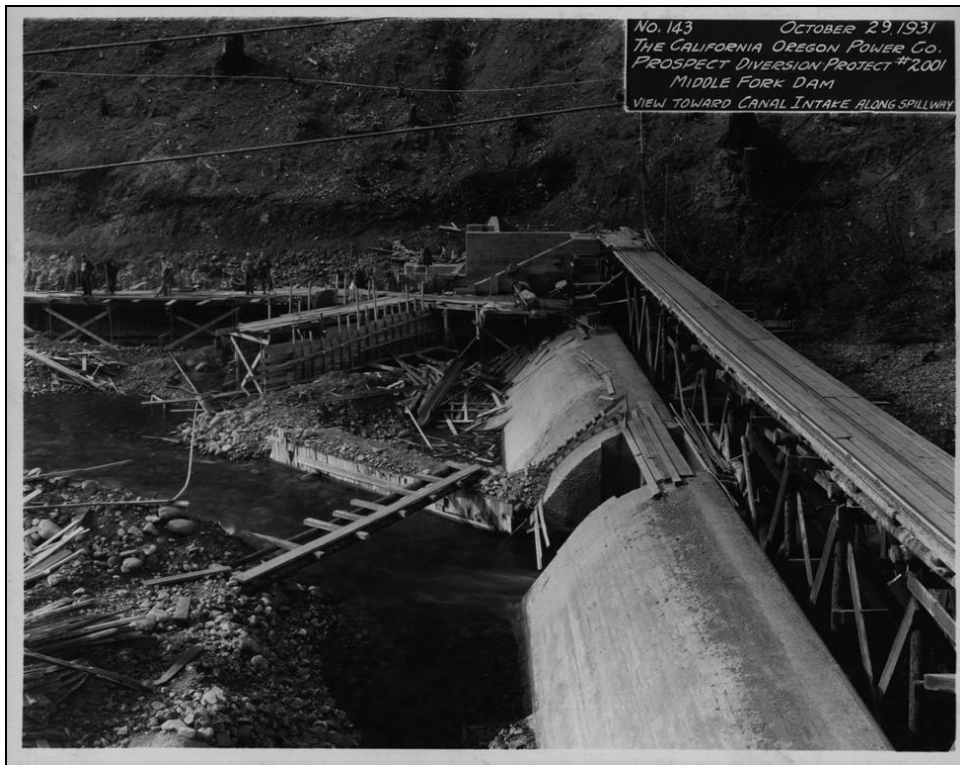


Figure 32. COPCO Prospect Diversion Project No. 2001, Photo No. 143, Middle Fork Dam, view toward canal intake along spillway, October 29, 1931.

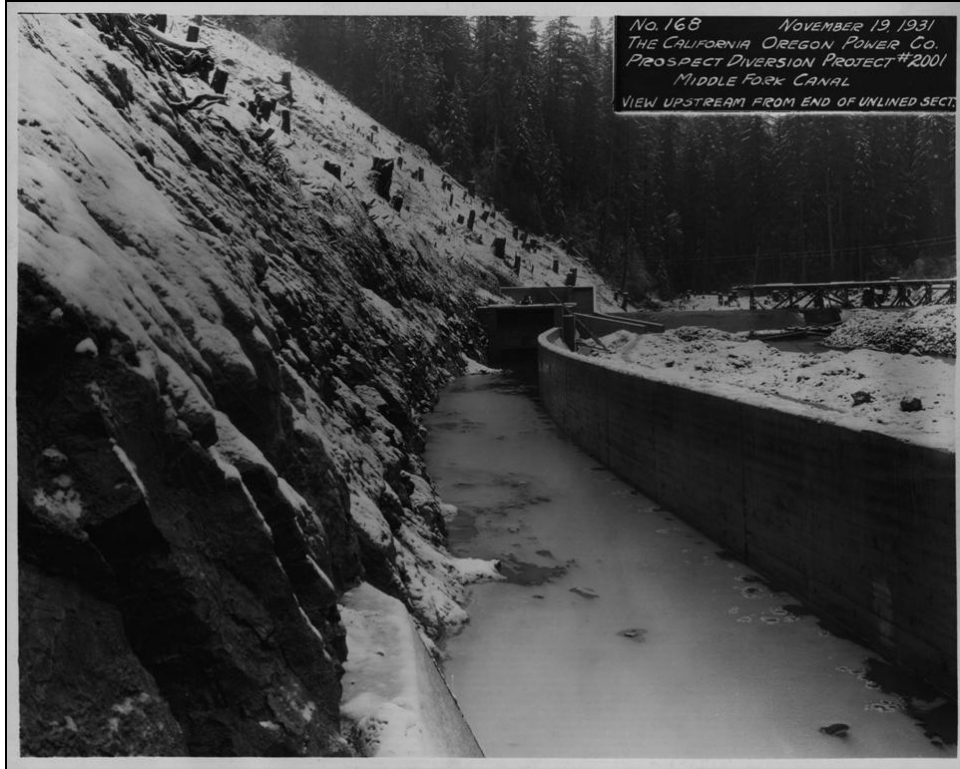


Figure 33. COPCO Prospect Diversion Project No. 2001, Photo No. 168, Middle Fork Canal, view upstream from end of unlined section, November 19, 1931.

VIII. Historic Drawings

Historic drawings and blueprints reproduced here are courtesy of PacifiCorp Headquarters P-8 Electronic Archives.

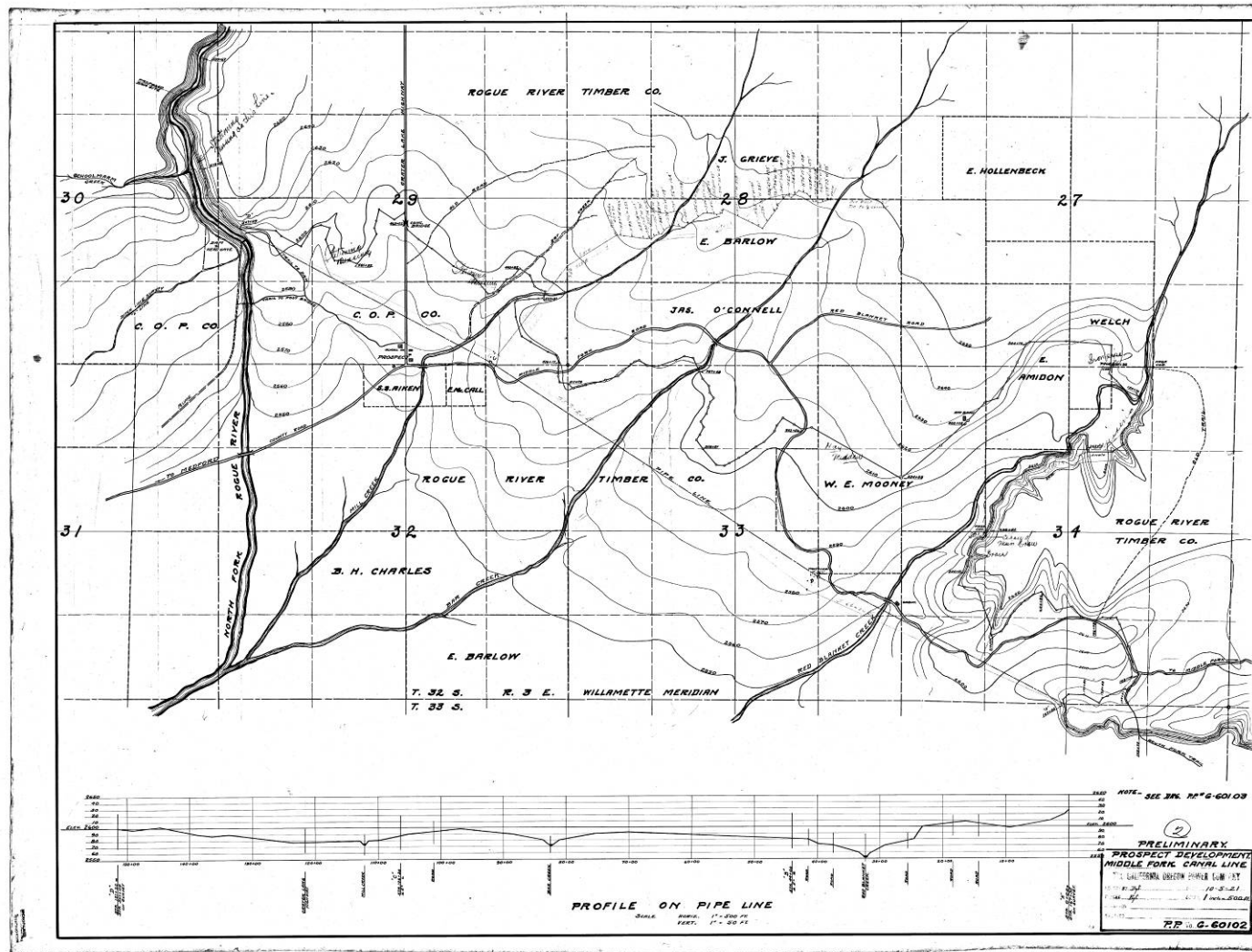


Figure 34. Prospect Development, Middle Fork Canal Line, October 5, 1921.

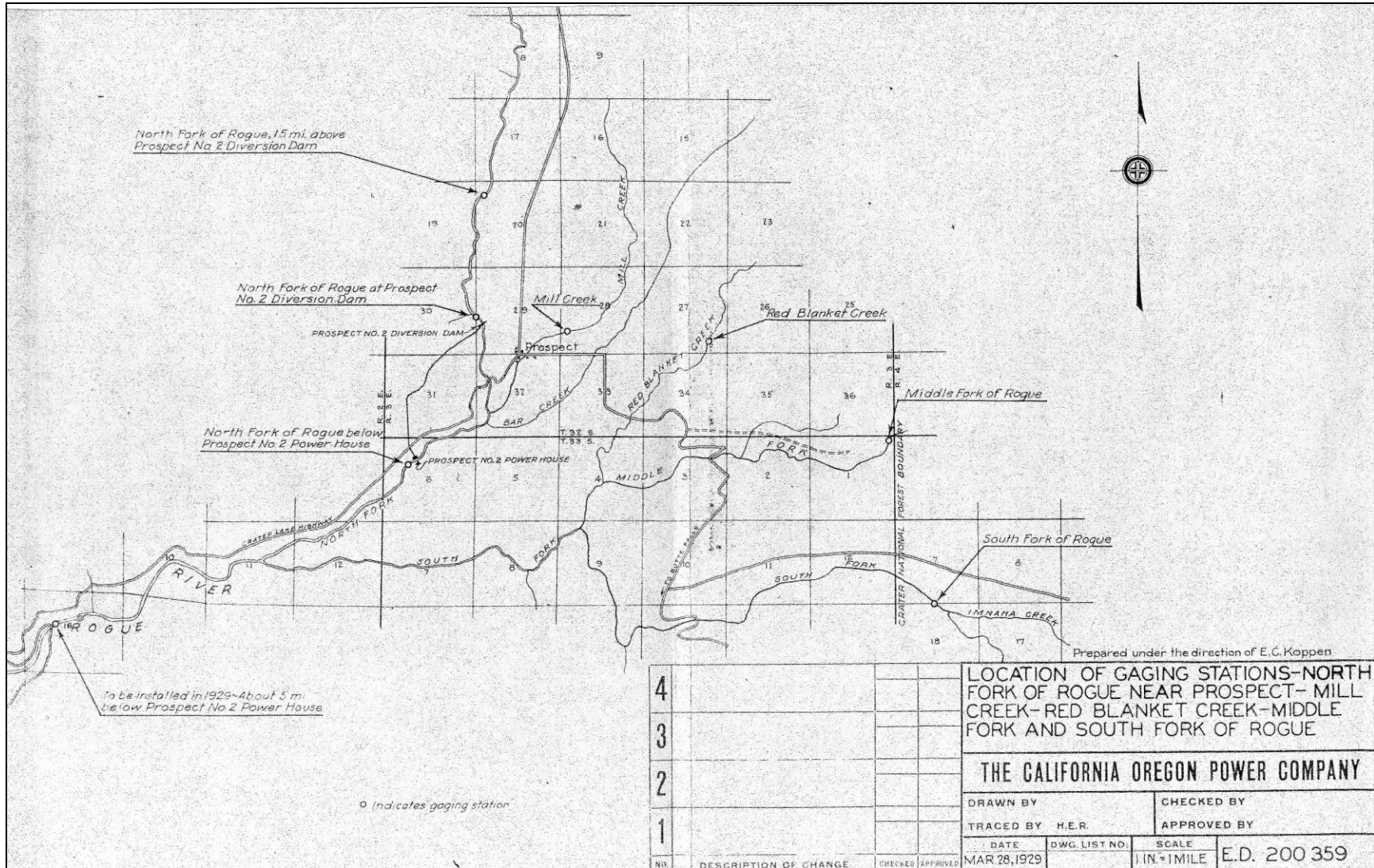


Figure 36. Location of Gaging Stations, March 28, 1929.

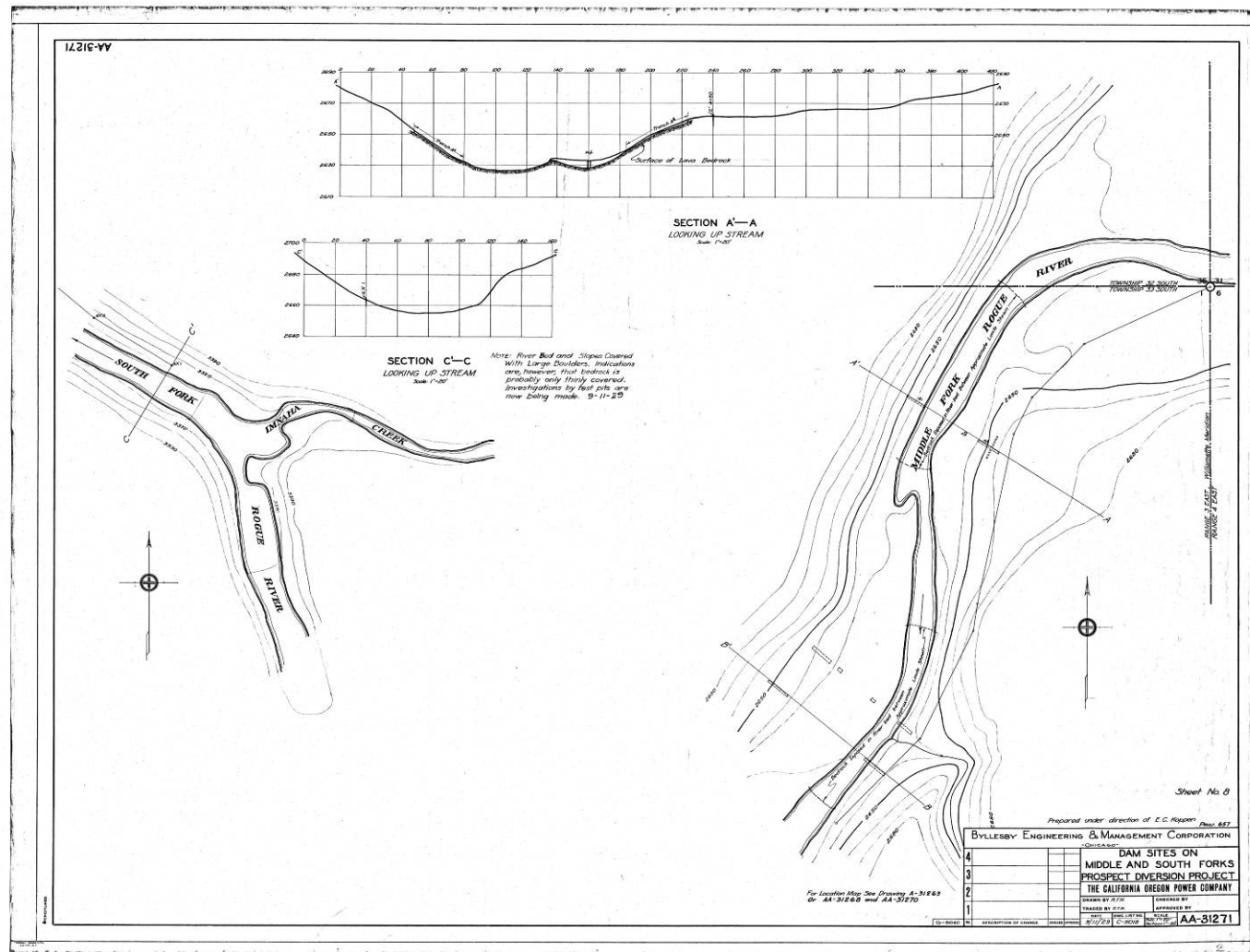


Figure 37. Dam Sites on Middle and South Forks, Prospect Diversion Project, September 11, 1929.

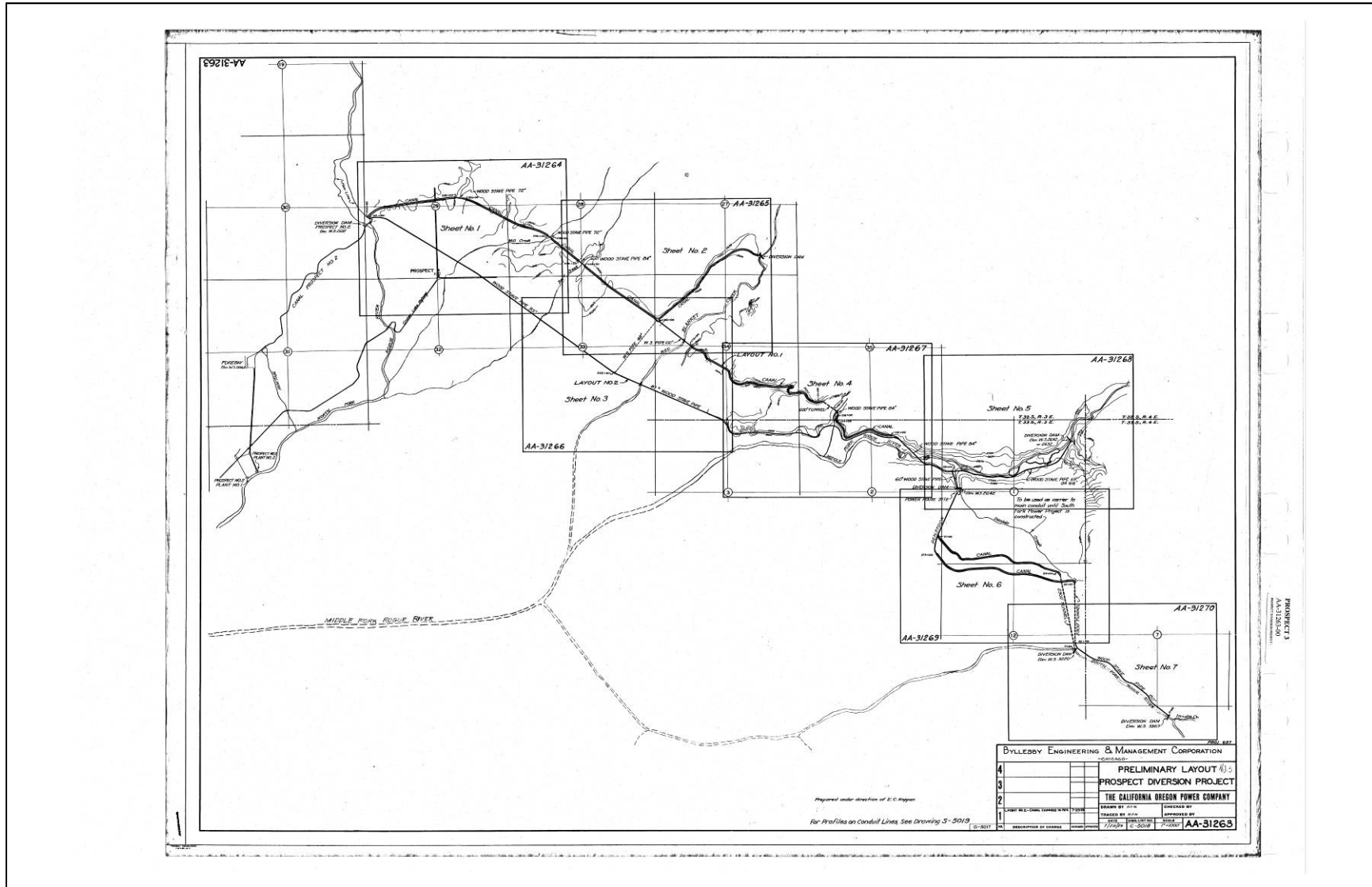


Figure 38. Preliminary Layout, Prospect Diversion Project, July 25, 1929.

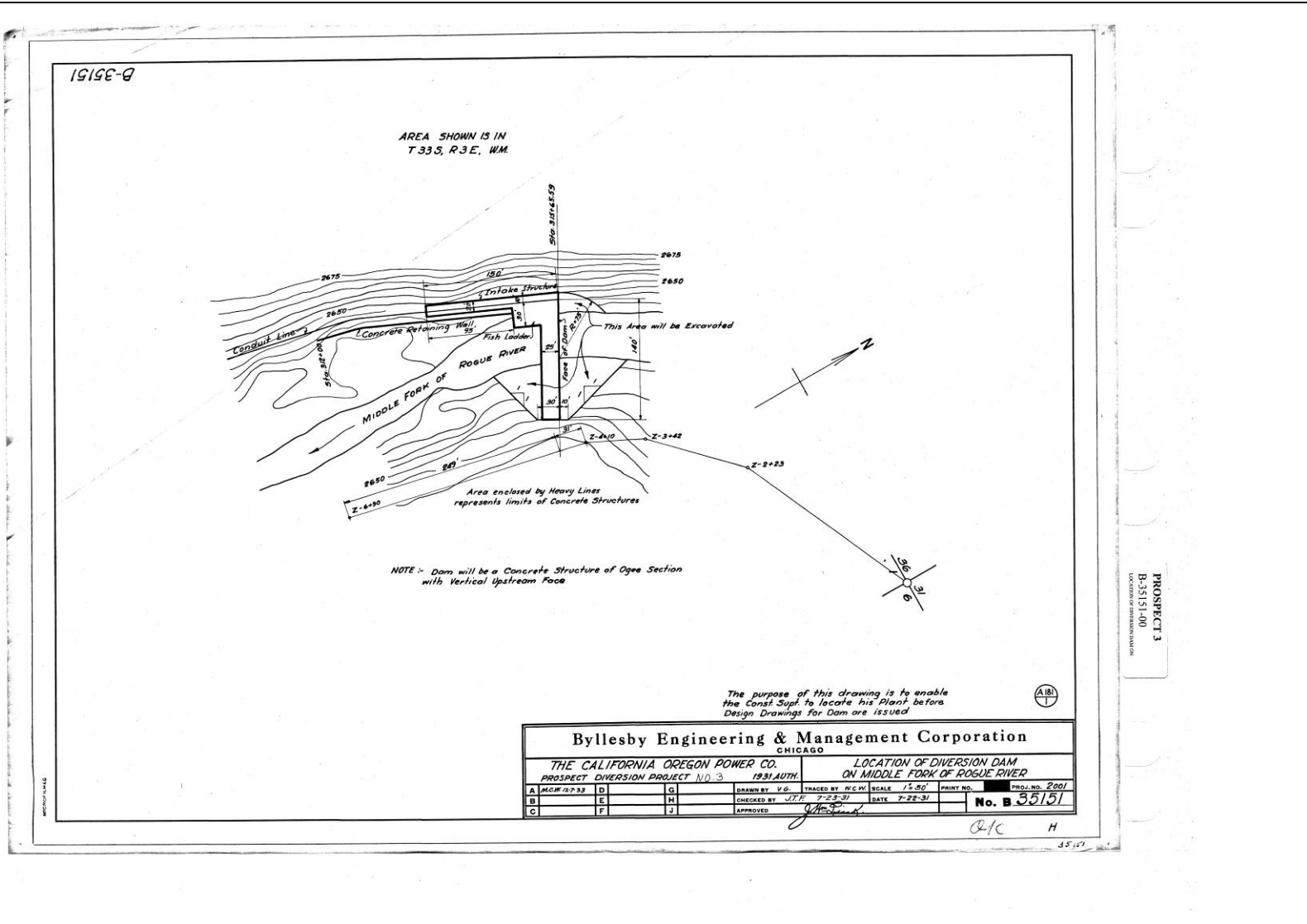


Figure 39. Location of Diversion Dam on Middle Fork of Rogue River, July 27, 1931.

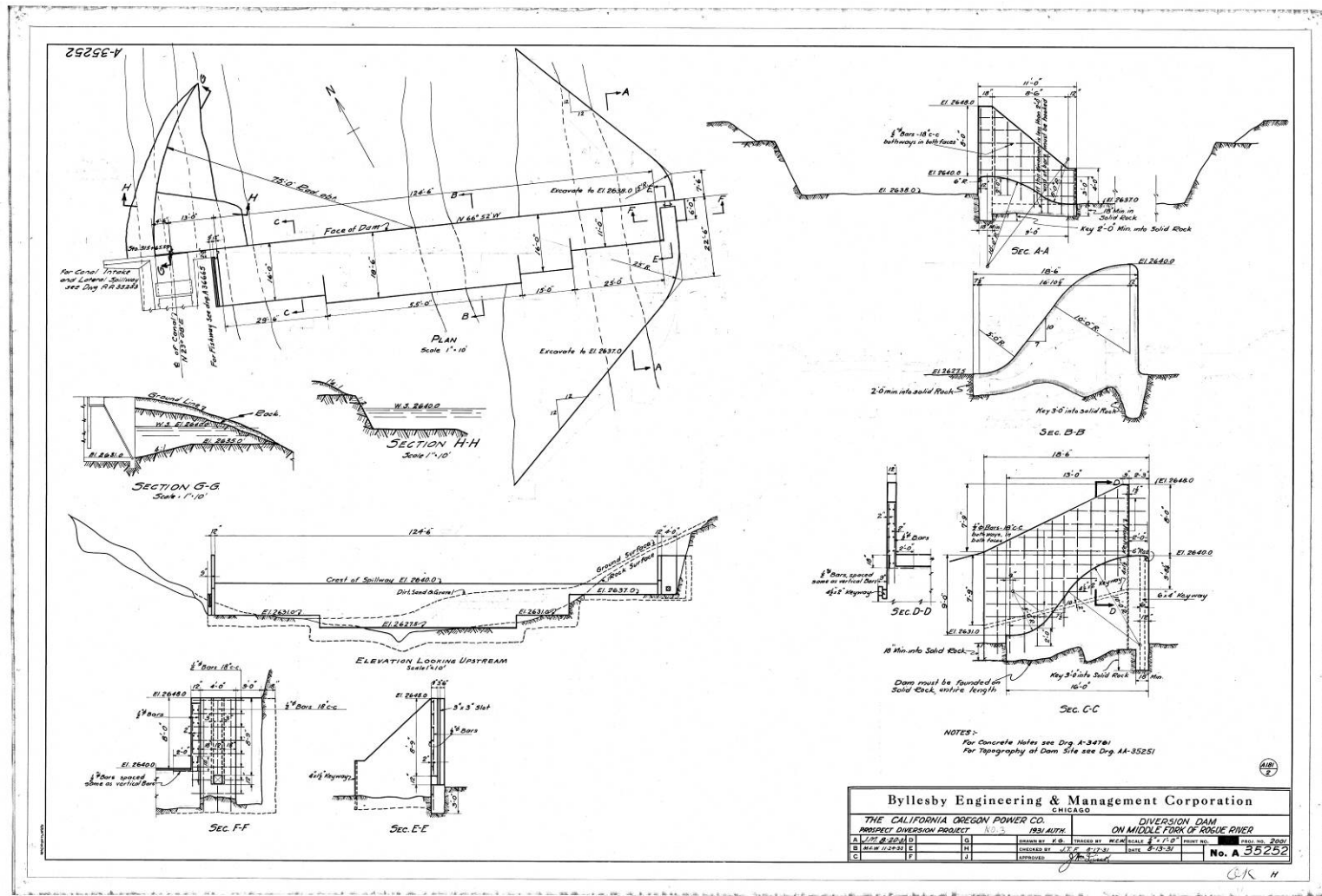


Figure 40. Diversion Dam on Middle Fork of Rogue River. August 13, 1931

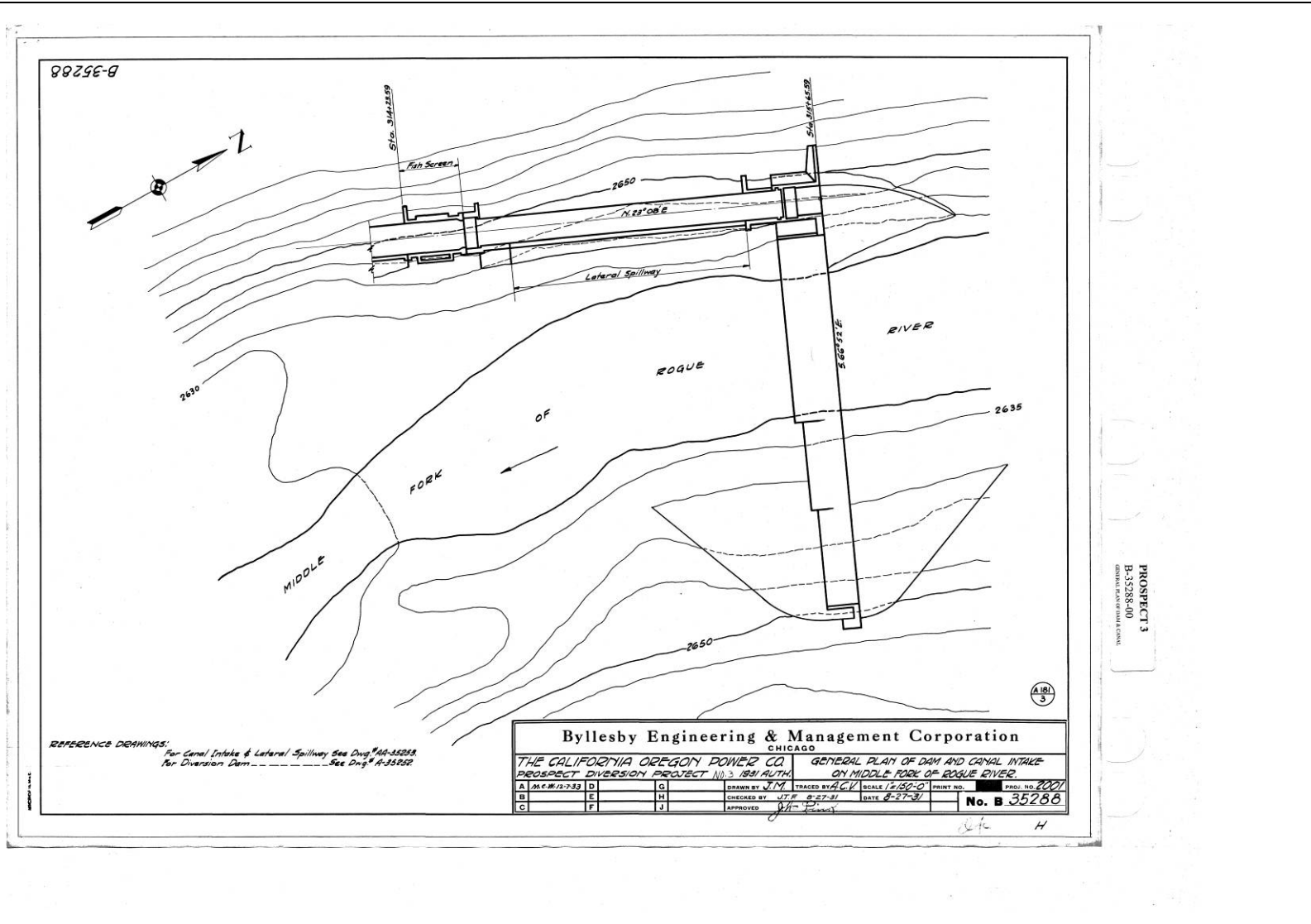


Figure 41. General Plan of Dam and Canal Intake on Middle Fork of Rogue River, August 27, 1931.

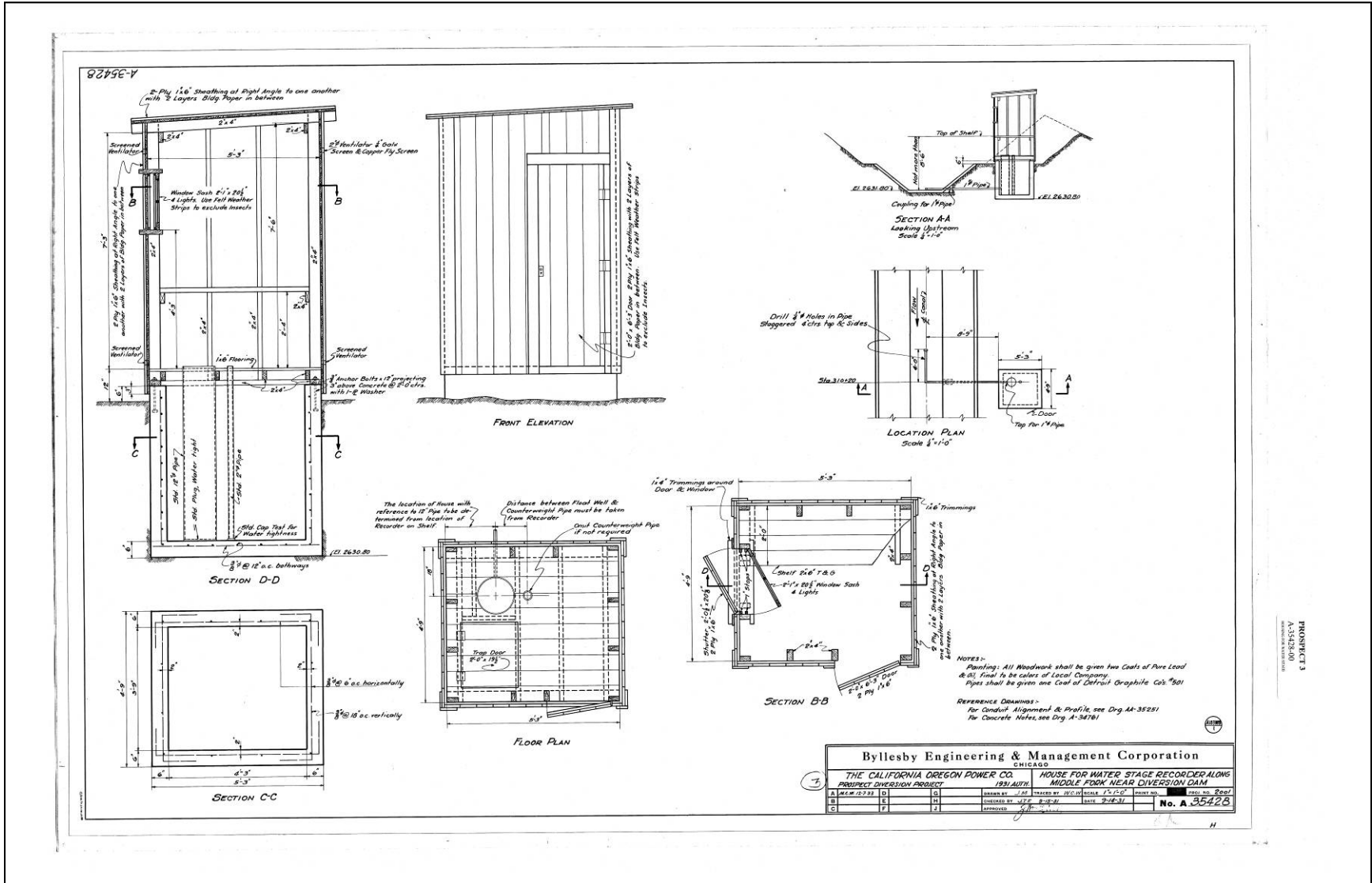


Figure 42. House for water stage recorder along Middle Fork near Diversion Dam, September 14, 1931.

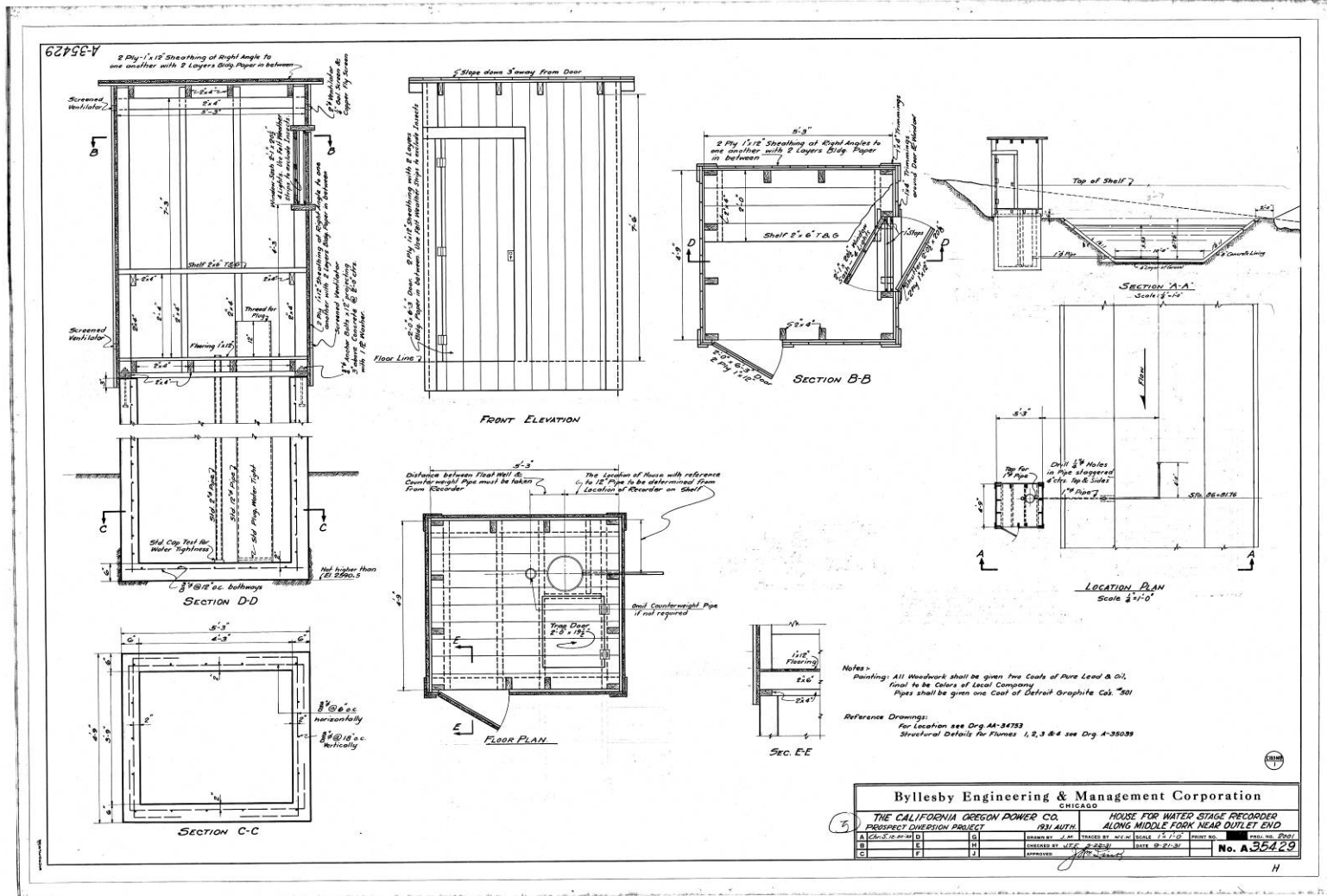


Figure 43. House for water stage recorder along Middle Fork near outlet end. September 21, 1931.

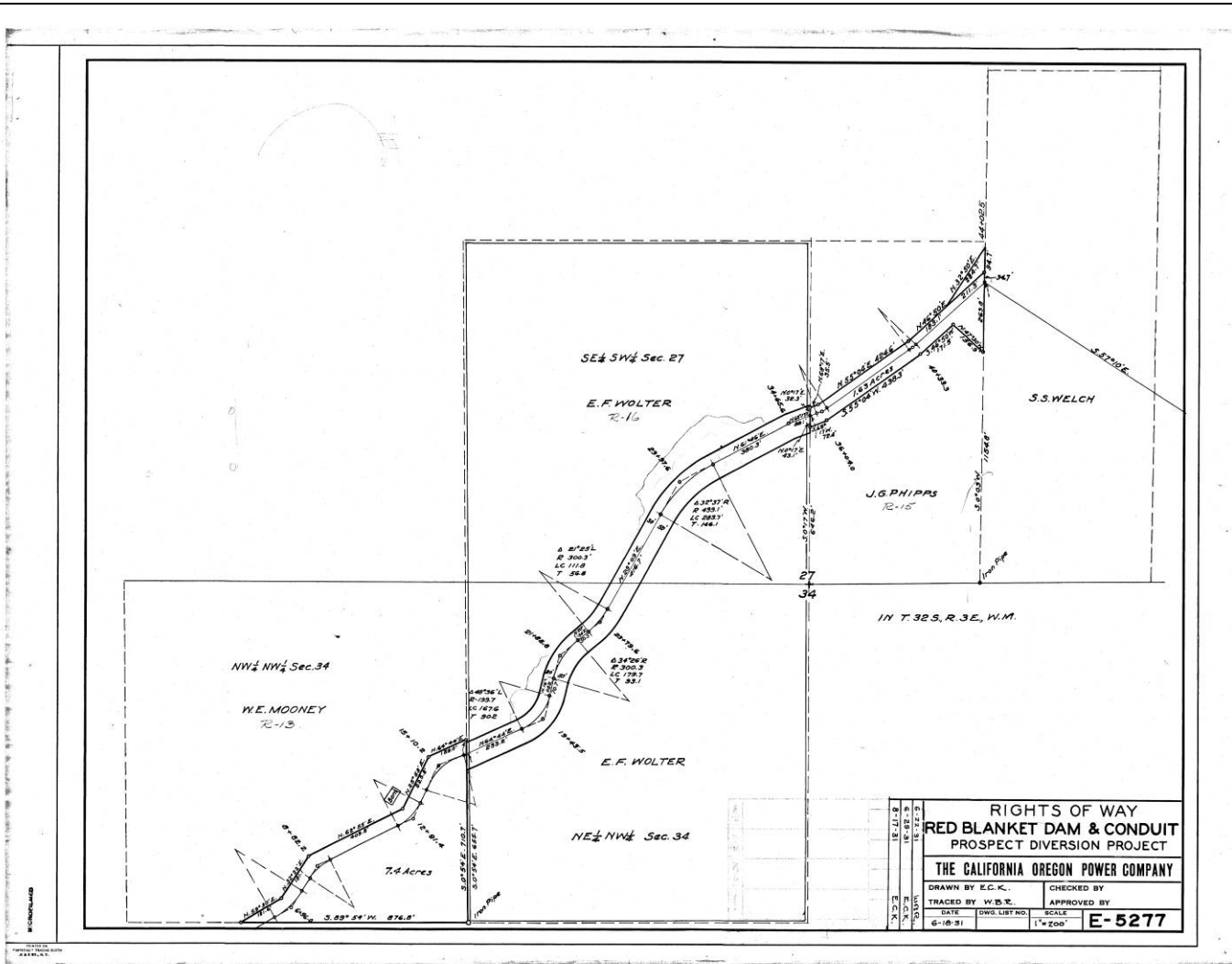


Figure 44. Red Blanket Dam & Conduit, July 18, 1931.

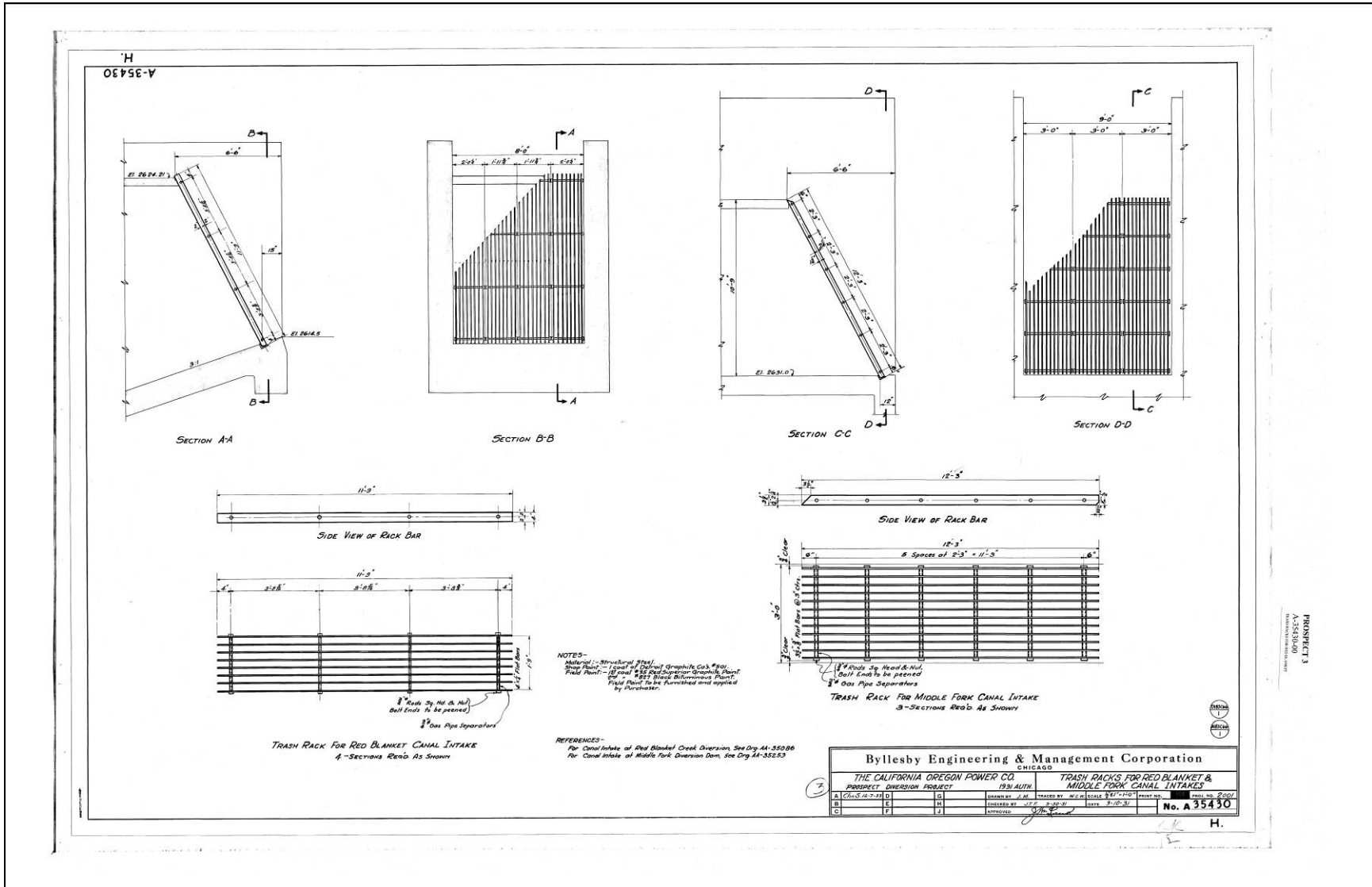
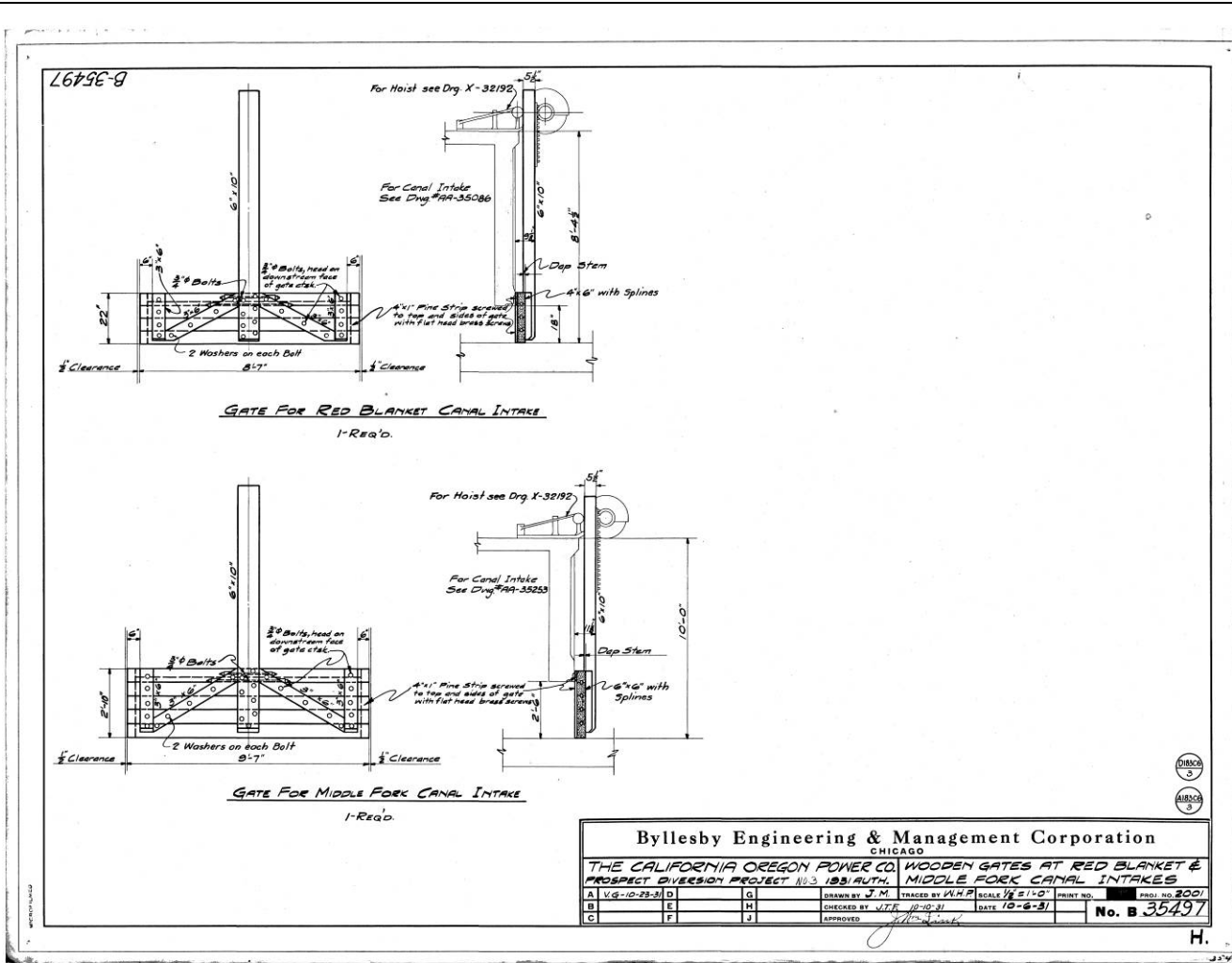


Figure 45. Trash Racks for Red Blanket & Middle Fork Canal Intakes, September 10, 1931.



PROSPECT 3
 B-35497-00
 WORKSHEET IN REVISIONS

DISCO 3
 ARCO 3

Figure 46. Wooden gates at Red Blanket and Middle Fork Canal Intakes. October 6, 1931.

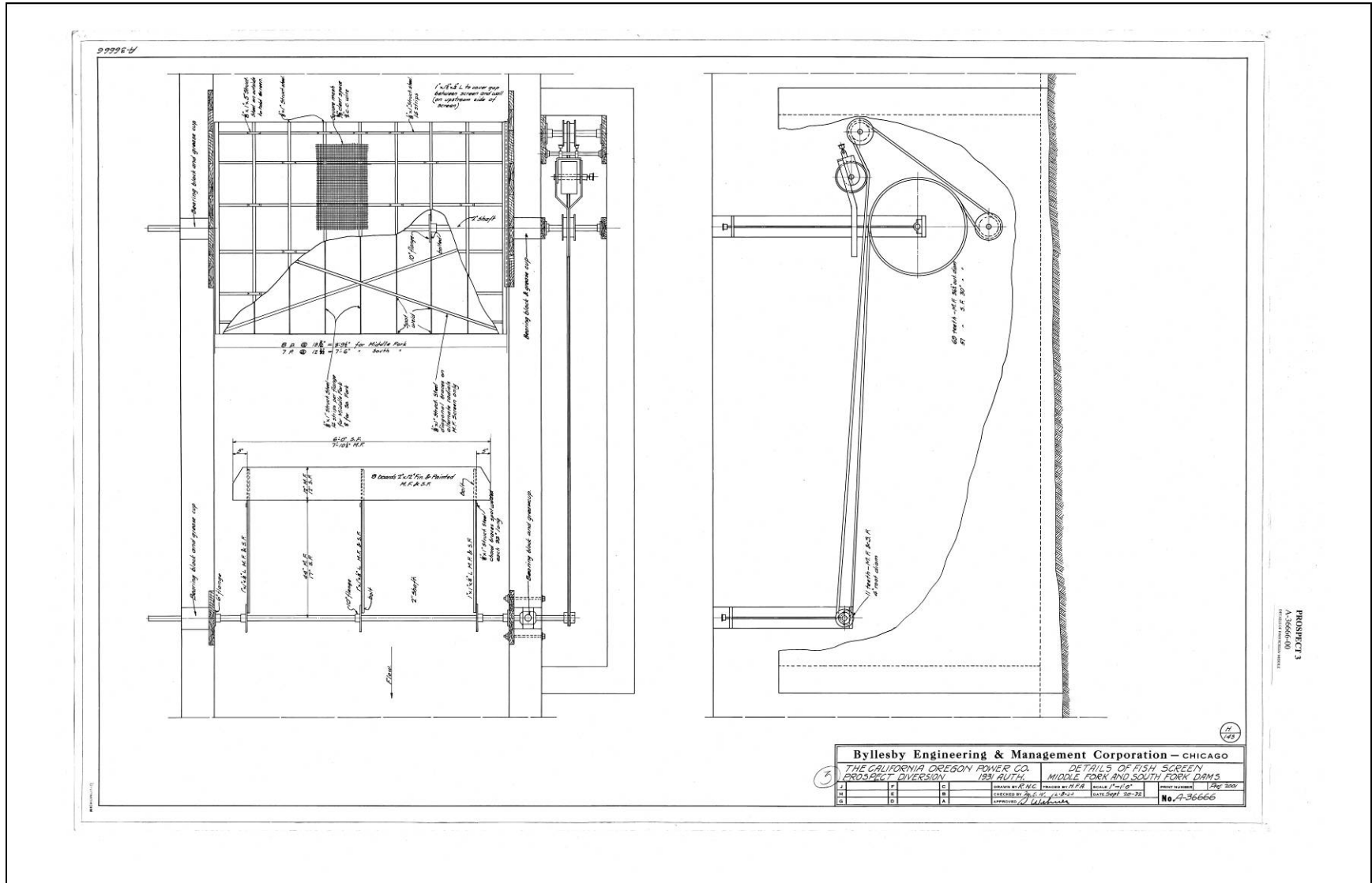


Figure 47. Details of Fish Screen, Middle Fork and South Fork Dams, September 20, 1932.

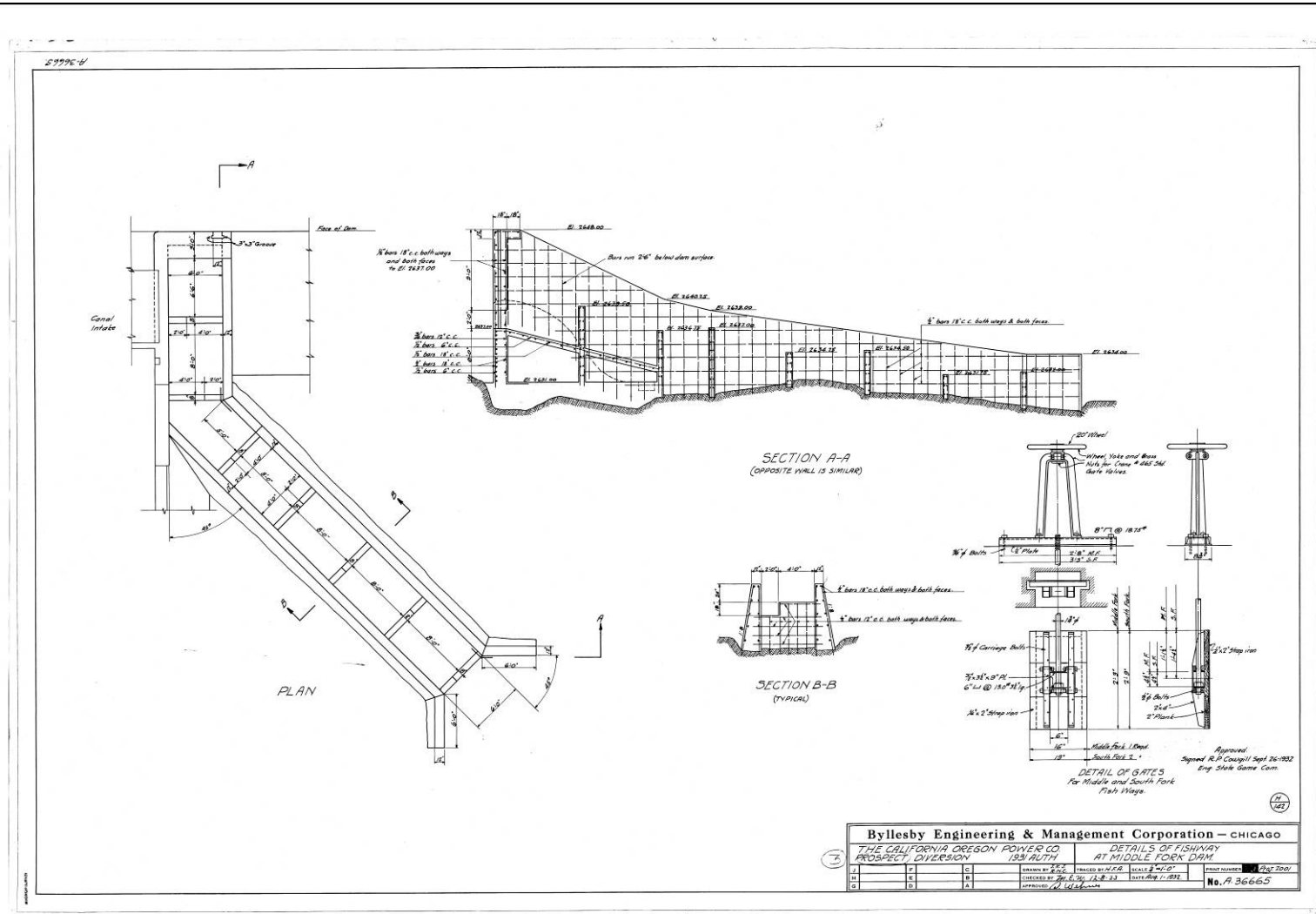


Figure 48. Details of Fishway at Middle Fork Dam, August 1, 1932.

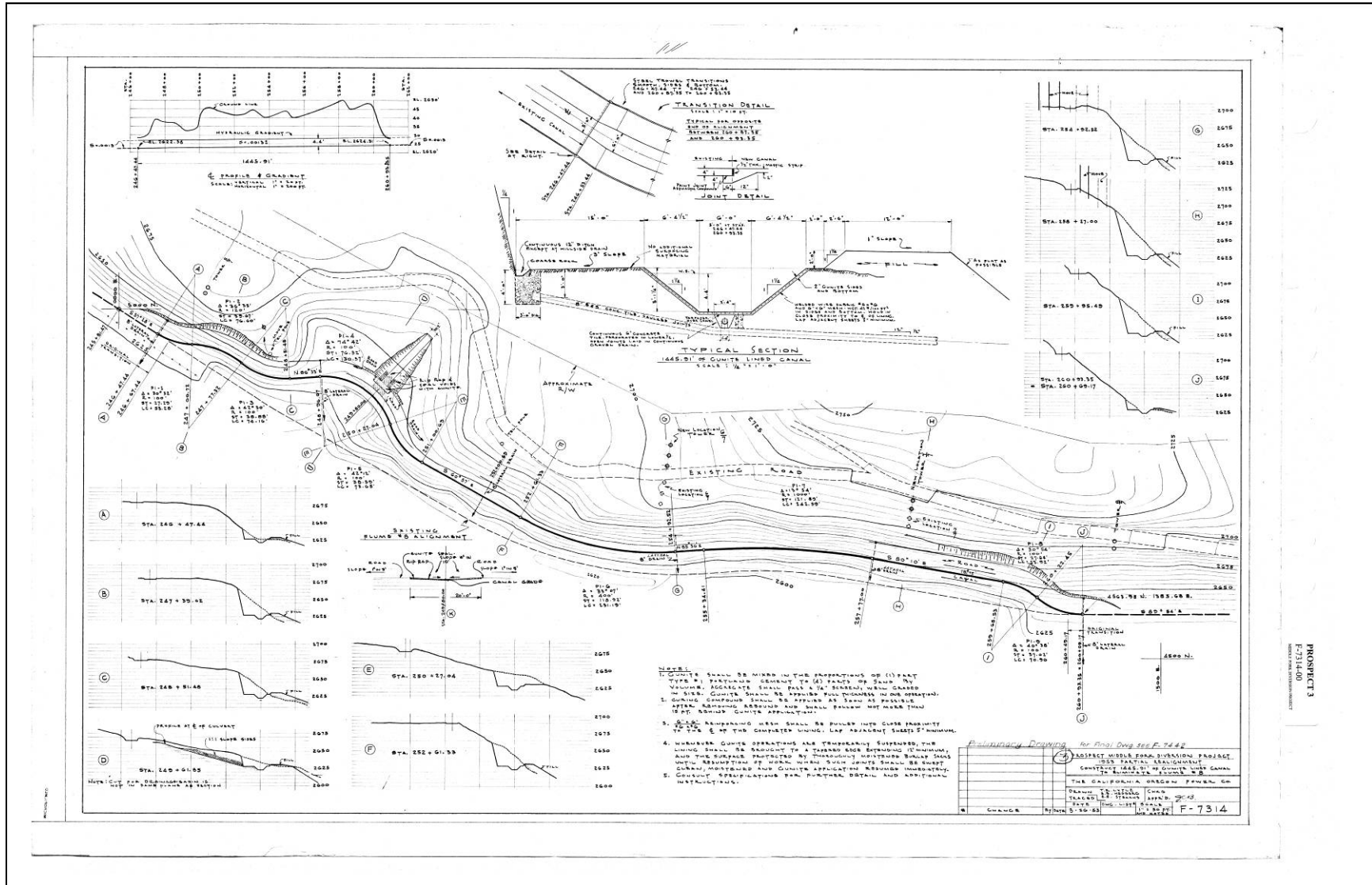


Figure 49. Prospect Middle Fork Diversion Project, 1953 Partial Realignment, March 26, 1953.

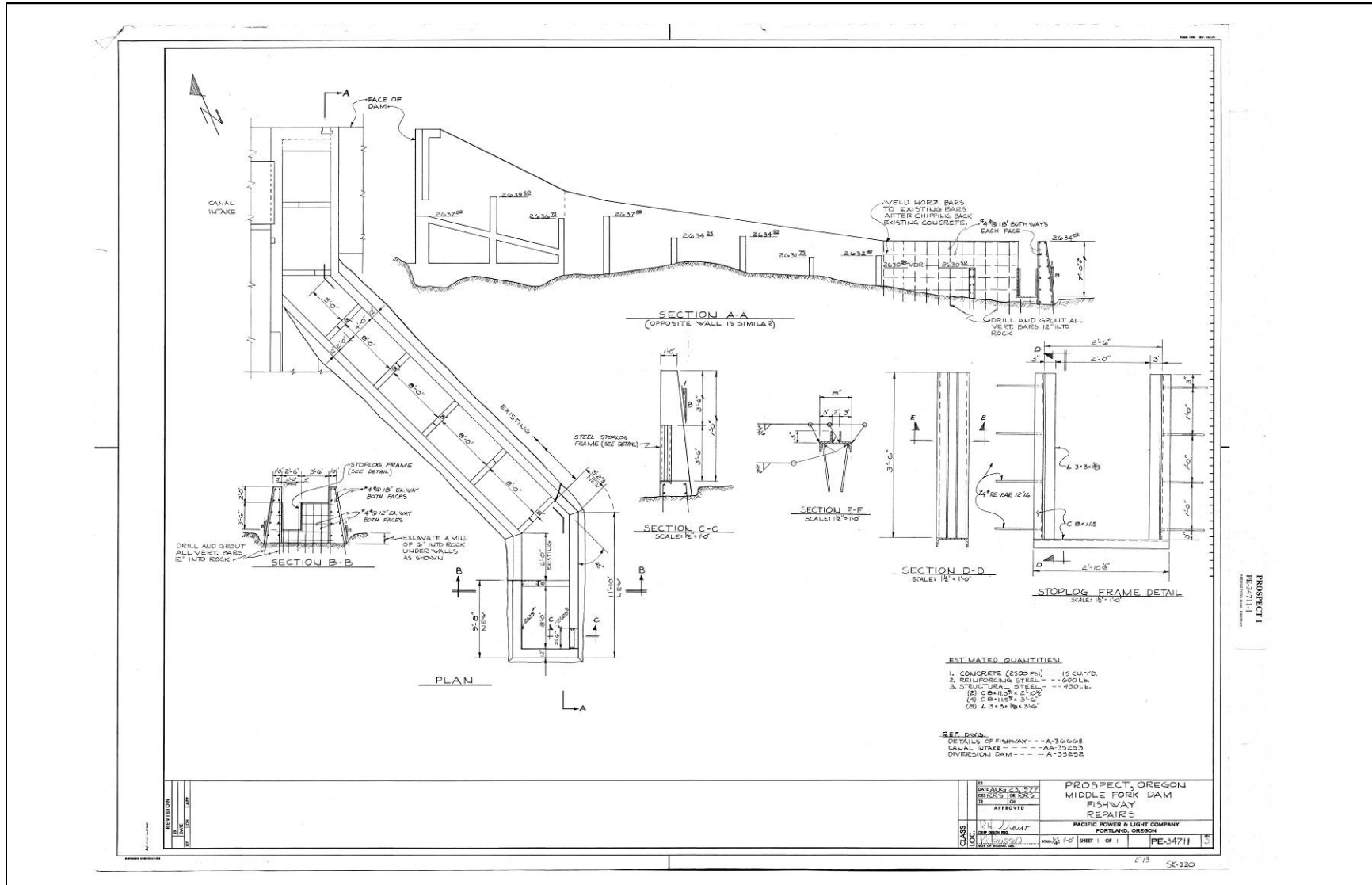


Figure 50. Middle Fork Dam Fishway Repairs, August 23, 1977.

