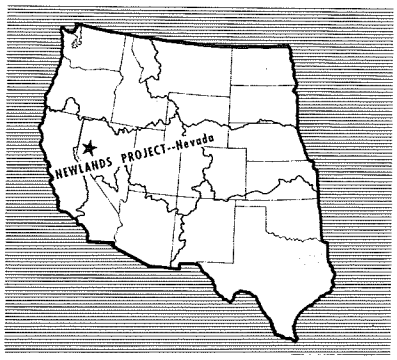
Newlands Project



NEVADA, Churchill, Lyon, Storey, and Washoe Counties

REGION 2, Bureau of Reclamation

PROJECT HEADQUARTERS, Fallon, Nev.

The Newlands project (formerly Truckee-Carson), one of the first Reclamation projects, conserves and diverts water from the Truckee and Carson Rivers to irrigate 71,566 acres in western Nevada east of the Sierra Nevada.

Project features include Lahontan Dam and Reservoir, outlet works at Lake Tahoe, Derby Diversion Dam, Carson River Diversion Dam, Lahontan Powerplant, 104 miles of main canals, 504 miles of laterals, and 335 miles of open drains.

PLAN

The Truckee River flows from Lake Tahoe in California into Nevada and empties into Pyramid and Winnemucca Lakes, while the Carson River flows from the slopes of the Sierra Nevada onto the plains and into the Carson Sink. Water made available by storage in Lake Tahoe and Boca Reservoir is diverted from the Truckee River at the Derby Diversion Dam, about 20 miles east of Reno, Nev., into the Truckee Canal. Land along the canal receives some of the water, but the greater amount is discharged at the canal terminus either directly into the Carson River through the penstock of Lahontan Powerplant or through a chute into the Lahontan Reservoir for storage and use on lands of the Carson division.

Lahontan Dam impounds direct flow of the Carson River as well as water diverted from the Truckee River. Releases from Lahontan Reservoir are diverted into the T and V canals at the Carson River Diversion Dam, whence they are carried to the largest area of project lands in the vicinity of Fallon, Nev.

Lahontan Dam, Reservoir, and Powerplant

Lahontan Dam and Reservoir are on the Carson River 18 miles west of Fallon, Nev. The dam is a zoned earthfill structure forming the reservoir that stores Carson River water and water diverted through the Truckee Canal. The dam is 162 feet high and has a volume of 733,000 cubic yards. A hydroelectric powerplant, built as part of the original works and located at the dam, supplies electricity to the surrounding area. The powerplant has three generators with a combined capacity of 1,640 kilowatts.

Carson River Diversion Dam

The Carson River Diversion Dam heads the main canals of the project. It is a concrete structure, 23 feet high, on the Carson River about 5 miles below Lahontan Dam.

Lake Tahoe Dam

Lake Tahoe Dam is a concrete control structure 16 feet high with 17 outlet gates. It regulates the elevation of the water surface of the lake and controls releases of irrigation water and water for power generation. It is located at the outlet of Lake Tahoe to the Truckee River in California.

Boca Dam and Reservoir

Boca Dam and Reservoir are on the Little Truckee River in California immediately upstream from its confluence with the Truckee River. Some of the stored water is available to the Newlands project. This feature is fully described in the section on the Truckee Storage project.

Derby Diversion Dam

Derby Diversion Dam, on the Truckee River about 20 miles east of Reno, is a concrete dam with an earth embankment wing. This 31-foot-high dam diverts project water into the Truckee Canal.

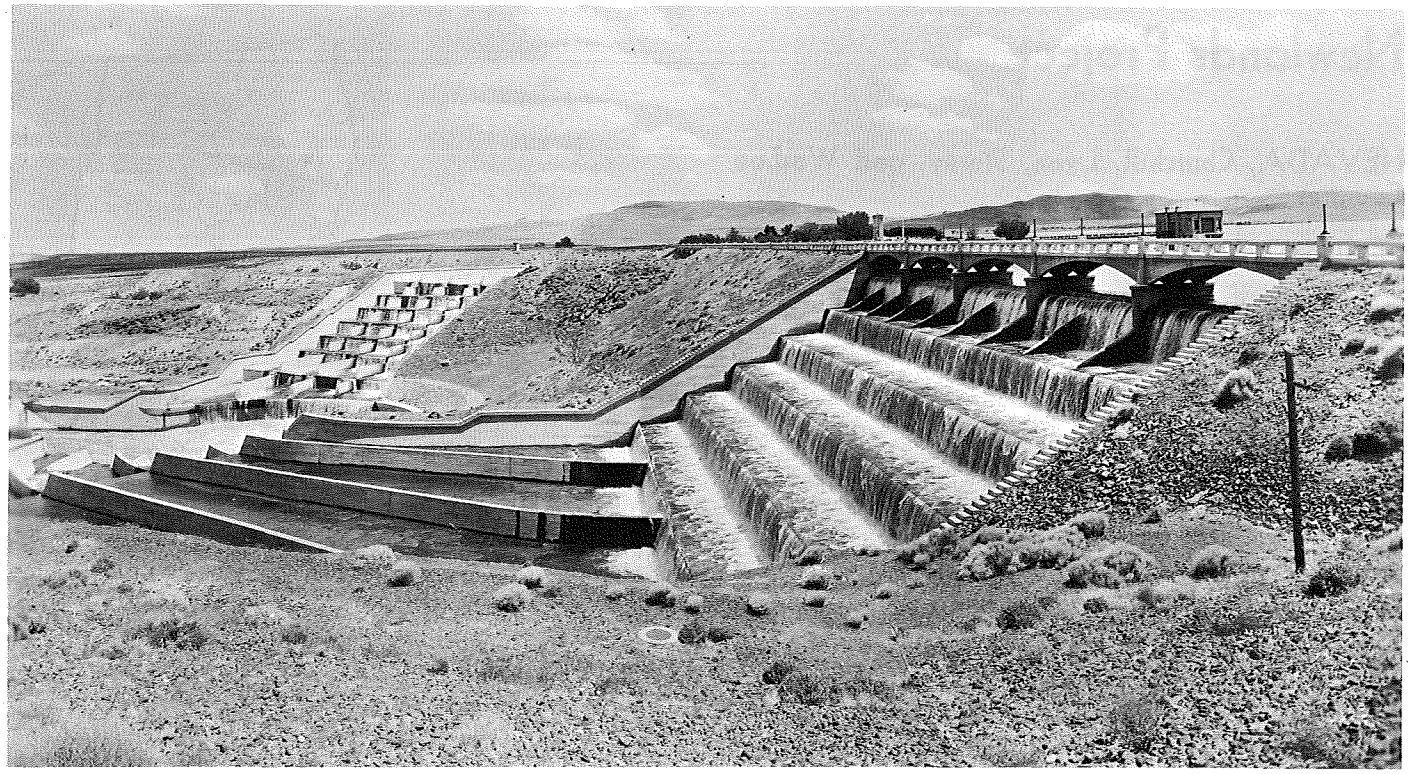
DEVELOPMENT

Early History

The early settlers of the project area irrigated their lands by simple diversions, relying on natural flow for their water supply. Prior to the authorization of the project in 1903, 20,000 acres of land having natural-flow water rights were under cultivation.

Investigations

The first investigations in the Truckee and Carson River Basins were started by the Geological Survey in 1889 and were continued intermittently until the newly organized Reclamation Service commenced investigations in the summer of 1902.



Lahontan Dam.

These investigations consisted of surveys for storage reservoirs, including Lake Tahoe and the present Lahontan Reservoir on the Carson River, and the canal system. The project was among the first five projects recommended by the Director of the Reclamation Service.

Authorization

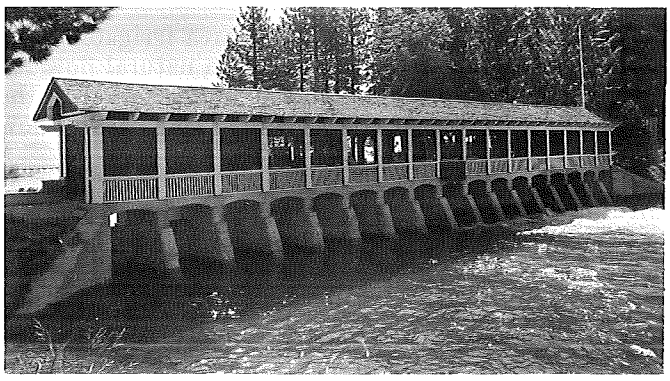
The project was authorized by the Secretary of the Interior on March 14, 1903, as the Truckee-Carson project.

The project was renamed February 27, 1919, in honor of the late Senator Francis G. Newlands of Nevada, who worked for the passage of the original Reclamation Act and for reclaiming the lower Carson Valley lands from recurring floods and drought. The Omnibus Adjustment Act of May 25, 1926, contained a provision to reduce the original scope of the Newlands project. This act determined certain specific repayment adjustments including the areas affected thereby.

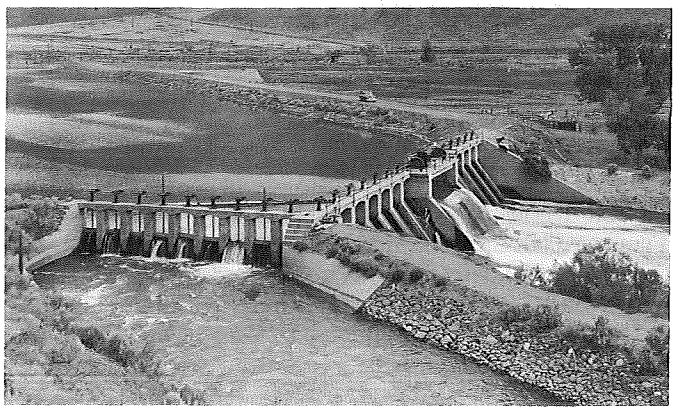
Construction

Construction started in 1903, the same year the project was authorized.

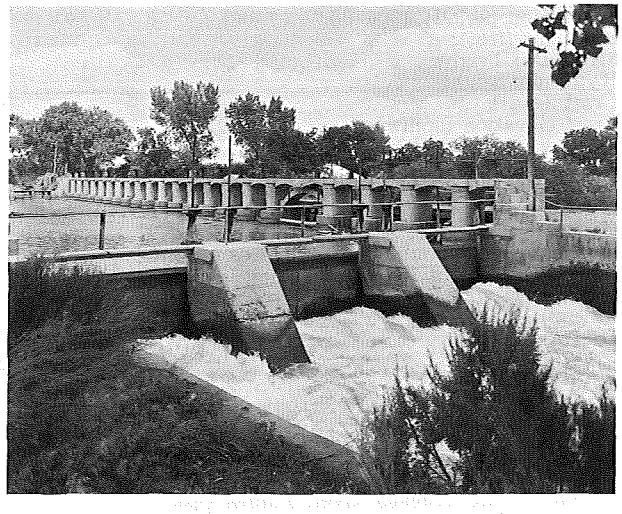
The Truckee River Diversion Dam (as Derby Diversion Dam was originally named), for diversion of water to the Carson River, was completed by June 1905. By September 1905, the Carson River Diversion Dam and main distributing canals for the Carson division had been completed. The Truckee Canal and a timber chute to the Carson River (the chute was later replaced



Lake Tahoe Dam.



Derby Diversion Dam.



Carson River Diversion Dam.

by one of concrete which discharges into Lahontan Reservoir) were completed in November 1906. This permitted the diversion of Truckee River water for use in the Carson division for the first time in 1907. Construction began on Lahontan Dam in January 1911 and, aided by the installation of the Lahontan Powerplant, finished November 11, 1911, was completed in June 1915. Construction of a dam for the control of storage in Lake Tahoe was completed in 1913 under an agreement with the Truckee River General Electric Co., which provided for the cooperative use of such storage. The United States assumed control of the dam and appurtenant lands at the outlet of Lake Tahoe on July 1, 1915, pursuant to a decree of the United States District Court dated June 4, 1915.

Operating Agency

The care, operation, and maintenance of the project were transferred to the Truckee-Carson Irrigation District on December 31, 1926, under terms of the contract of December 18, 1926.

BENEFITS

Irrigation

This project has assured the production of crops on what was once desert territory and thus has made possible the establishment of profitable farming and livestock enterprises. Principal crops produced are alfalfa, pasture, wheat, barley, small fruits, and vegetables.

Hydroelectric Power

The power produced serves the towns of Fernley, Wadsworth, Hazen, and Stillwater, and most of the rural sections of the project. The Lahontan plant, operated by the Truckee-Carson Irrigation District, is also interconnected with a private power system.

Recreation

The Lahontan Reservoir area has bathing beaches, picnicking, camping, and boating facilities. Overnight lodging accommodations are located nearby. Trout and warm water fish may be taken from the reservoir.

PROJECT DATA

Land Areas (1958)

Irrigable area (acres): Full irrigation service.	71, 566
Number of irrigated farms	984

Area Irrigated and Crop Value

Year	Area irrigated (acres)	Crop value
1948	53, 894	$3, 216, 677
1949	52, 077	2, 784, 202
1950	55, 411	2, 087, 863
1951	53, 351	2, 471, 930
1952	53, 458	3, 418, 551
1953	54, 128	2, 267, 116
1954	53, 976	2, 599, 405
1955	53, 472	3, 076, 505
1956	54, 763	2, 949, 148
1957	55, 240	2, 553, 170
1958	55, 096	3, 156, 861

Facilities in Operation (June 30, 1958)

Storage dams	2
Reservoir capacity (acre-feet, active)	1, 005, 600
Diversion dams	4
Canals (miles)	104
Laterals (miles)	504
Pumping plants	5
Drains (miles)	335
Powerplants	[1] 3
Plant capacity (kilowatts)	[1] 4, 440
Transmission lines (miles)	16
Substations	3

[1] Operated by the Truckee-Carson Irrigation District.

Climatic Conditions

Annual precipitation (inches)	5. 2
Temperature:	
Maximum	106°
Minimum	−25°
Mean	50. 8°
Growing season (days)	130
Elevation of irrigable area (feet)	4000

Settlement

Number of persons served with project water (1958):	
Farm irrigation service	3, 700
Municipal water service	1, 600
Other water service	[2] 700
Total	6, 000

[2] Urban, and suburban, residential, commercial, and industrial lands.

ENGINEERING DATA

Water Supply

TRUCKEE AND CARSON RIVERS

Drainage area (square miles)	3, 450
Average annual discharge (acre-feet)	900, 000

Storage Facilities

LAKE TAHOE DAM

Type: Concrete slab-and-buttress sluiceway regulator.
Location: On the Truckee River about 10 miles south of Truckee, Calif.
Construction period: 1909–13.
Reservoir, Lake Tahoe:[3]

Average annual outflow, 1903–55 (acre-feet)	180, 100
Active capacity, elevation 6223–6229.1 (acre-feet)	[3] 732, 000
Surface area (acres)	120, 000

Dimensions (feet):

Structural height	16
Hydraulic height	11
Top width	11
Maximum base width	19
Crest length	109
Crest elevation	6223. 0
Volume (cubic yards)	400

Outlet works: Seventeen 5- by 4-foot gates.

Capacity (cubic feet per second)	2, 500

[3] Natural lake, controlled additional storage.

LAHONTAN DAM

Type: Zoned earthfill. Principal embankment in riverbed, long wing or dike on right side.
Location: On the Carson River about 18 miles west of Fallon, Nev.
Construction period: 1911–15. Outlet works modified in 1924.
Reservoir, Lahontan:

Average annual inflow, 1918–55 (acre-feet)	310, 000
Active capacity, elevation 4060.0–4162.0 (acre-feet)	273, 600
Surface area at elevation 4162.0 (acres)	10, 000

Dimensions (feet):

Structural height	162
Hydraulic height	110
Top width	20
Maximum base width	660
Crest length	5, 400
Crest elevation	4174. 0
Total volume (cubic yards)	733, 000

Spillway: 2 concrete, uncontrolled open-channel structures near each end of the dam curving into a common stilling pool at the base of the dam.

Crest length (feet) (each)	250
Crest elevation (feet)	4162. 0
Capacity at elevation 4168.0 (cubic feet per second)	26, 200

Outlet works: 2 conduits through base of dam, controlled by slide gates in gate tower and two 8½-foot cylindrical valves in base of gate tower, and one 5-foot needle valve in valvehouse at stilling basin. Two 3- by 3-foot slide gates at base of gate tower provide for sluicing.

Capacity at elevation 4132 (cubic feet per second)	3, 000

Power: 6-foot steel penstock 500 feet long from Truckee Canal; 6½-foot steel penstock in left outlet conduit.
Foundation: Seamy, badly broken sandstones, mudstones, and shales, sand, gravel, and lake silts, in strata intensely faulted and variously inclined; artesian ground water.
Special treatment: Cement-grout curtain 30 to 50 feet deep beneath cutoff wall.

Diversion Facilities

CARSON RIVER DIVERSION DAM

Type: Concrete gate structure.
Location: On the Carson River, 5 miles northeast of Lahontan Dam.
Construction period: 1904–05.
Dimensions (feet):

Structural height	23
Hydraulic height	14
Crest length	241
Crest elevation (spillway)	4024. 0
Volume (cubic yards)	2, 700

Spillway: Twenty-one 5- by 10-foot double leaf slide gates and one 15- by 10-foot gate.

Capacity (cubic feet per second)	30, 000

Headworks: Three double leaf slide gates, each 5 by 15 feet, for V Canal heading. Two wood gates 7 by 5 feet for T Canal heading.
Diversion capacity (cubic feet per second):

V Canal	1, 500
T Canal	450

DERBY DIVERSION DAM

Type: Concrete gate structure, embankment wing.
Location: On the Truckee River, 5 miles west of Derby, Nev.
Construction period: 1903–05.
Dimensions (feet):

Structural height	31
Hydraulic height	15
Crest length	1, 331
Crest elevation (spillway)	4024. 0
Volume (cubic yards)	36, 600

Spillways: One 25- by 10-foot hinged steel weir gate and thirteen 5- by 10-foot double-leaf slide gates.

Capacity (cubic feet per second)	30, 000

Headworks: Nine double-leaf slide gates, each 5- by 10-foot.

Diversion capacity (cubic feet per second)	1, 500

Carriage Facilities

TRUCKEE CANAL

Location: From Derby Diversion Dam southeast to Lahontan Dam.
Construction period: 1903–06.

Length (miles)	31
Diversion capacity (cubic feet per second)	1, 500

Typical maximum section in earth:

Bottom width (feet)	20. 0
Side slopes	1½:1
Water depth (feet)	13. 0

Typical maximum section, concrete-lined:

Bottom width (feet)	20. 4
Side slopes	½:1
Water depth (feet)	13. 0
Lining thickness (inches)	4

V CANAL

Location: East from Carson River Diversion Dam south of Carson River to vicinity of Fallon, Nev.
Construction period: 1904–05.

Length (miles)	27
Diversion capacity (cubic feet per second)	1, 500

Typical maximum section in earth:

Bottom width (feet)	22. 0
Side slopes	2:1
Water depth (feet)	12. 0

T CANAL

Location: East from Carson River Diversion Dam north of Carson River to vicinity of Fallon, Nev.
Construction period: 1904–05.

Length (miles)	9
Diversion capacity (cubic feet per second)	450

Typical maximum section in earth:

Bottom width (feet)	10. 0
Side slopes	2:1
Water depth (feet)	6. 0

PUMPING PLANT—LAHONTAN-SWINGLE BENCH

Location: Lahontan Dam.	
Number of units	2
Total capacity (cubic feet per second)	70
Total dynamic head (feet)	70
Four drainage pumping plants on the project each have a capacity of 2 second-feet and a total pumping lift of 36.74 feet.	

Power Facilities

LAHONTAN POWERPLANT[4]

Location: Lahontan Dam.	
Year of initial operation: 1911.	
Year last generator placed in operation: 1915.	
Nameplate capacity (kilowatts)	1, 640
Number and nameplate capacity of generators (kilowatts)	(1) 640, (2) 500
Maximum head (feet)	125

LAHONTAN POWERPLANT[5]

Location: Lahontan Dam.	
Year of initial operation: 1949.	
Year last generator placed in operation: 1949.	
Nameplate capacity (kilowatts)	2, 000
Number and nameplate capacity of generators (kilowatts)	(2) 1, 000

"V" CANAL POWERPLANT[6]

Location: "V" Canal drop, 6 miles west of Fallon, Nev.	
Year of initial operation: 1955.	
Year last generator placed in operation: 1955.	
Nameplate capacity (kilowatts):	
Existing	800
Ultimate	1, 600
Number and nameplate capacity of generators (kilowatts):	
Existing	(2) 400
Ultimate	(4) 400
Maximum head (feet)	26

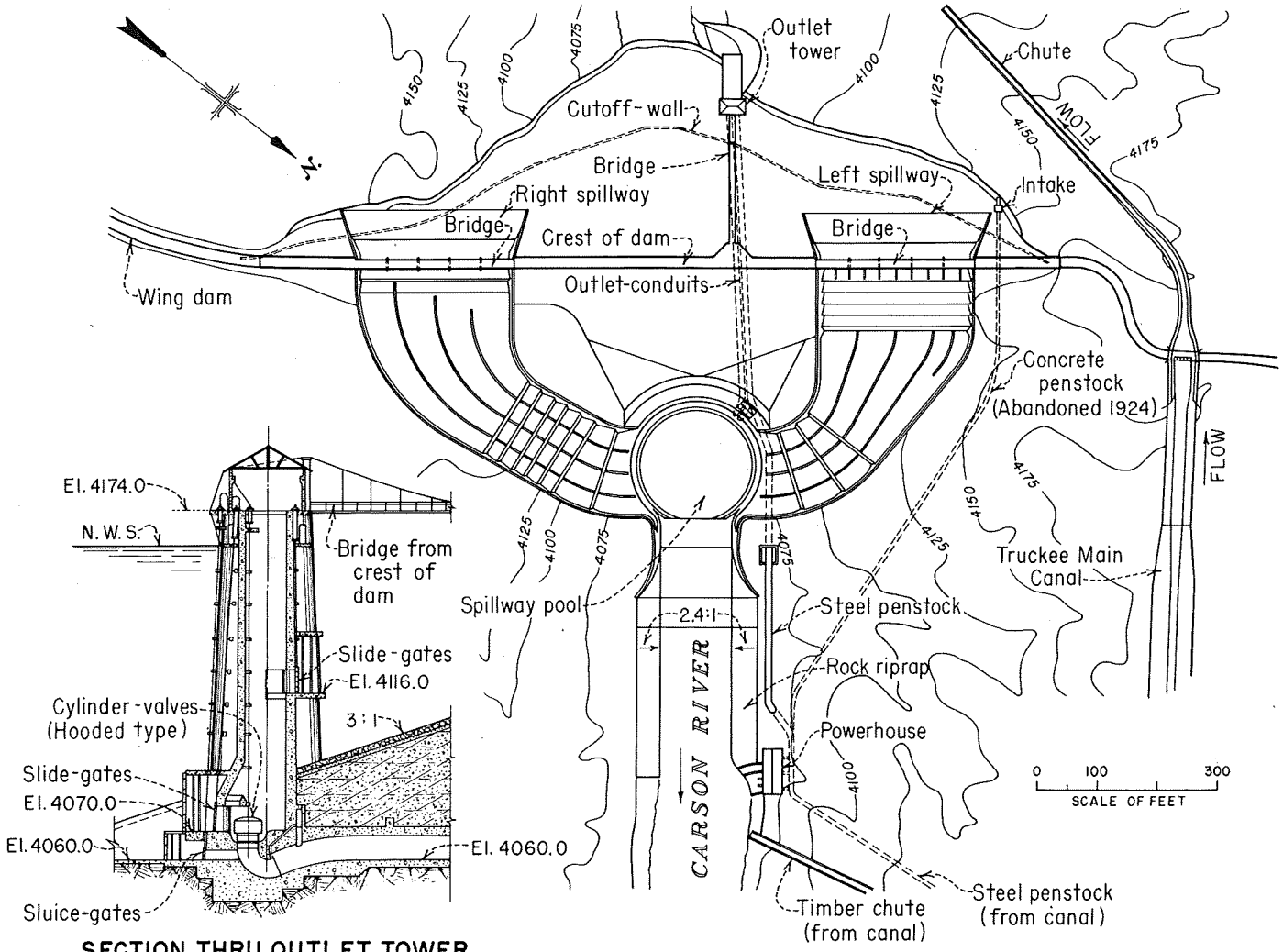
TRANSMISSION LINES

Total number of lines	1
Total circuit miles	16
Kilovolt capacity	33/69

[4] Plant constructed by Bureau of Reclamation, operated by Truckee-Carson Irrigation District.

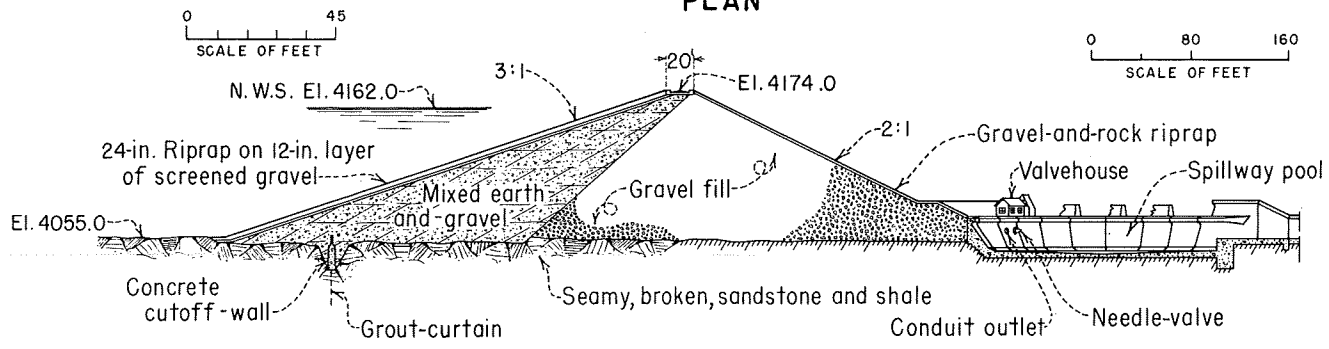
[5] A diesel-powered plant, constructed by Truckee-Carson Irrigation District using its own funds and operated by the district.

[6] Plant constructed by Truckee-Carson Irrigation District using its own funds, operated by the district.

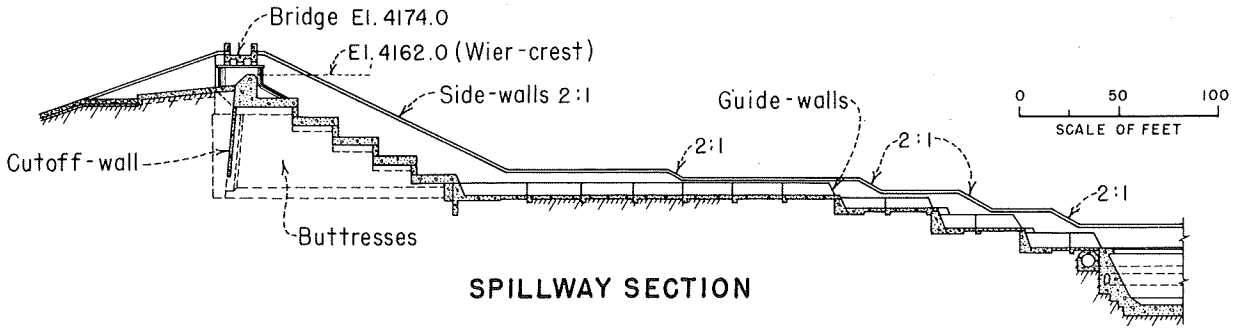


SECTION THRU OUTLET TOWER

PLAN

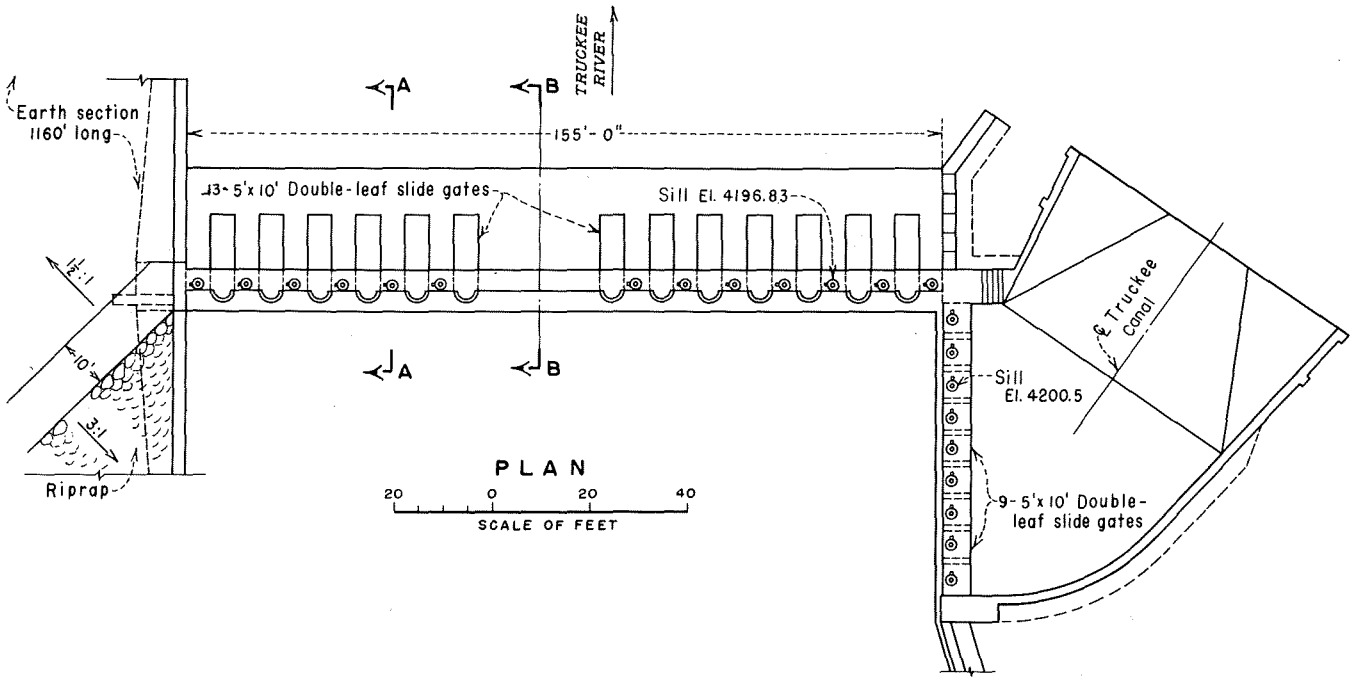


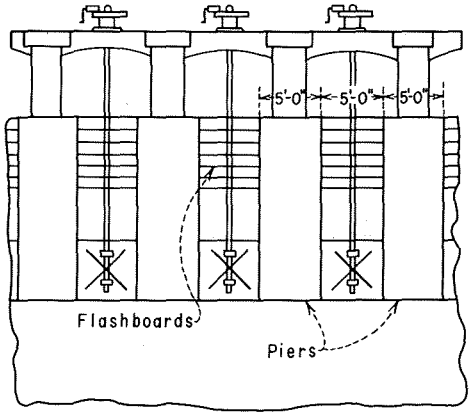
MAXIMUM SECTION



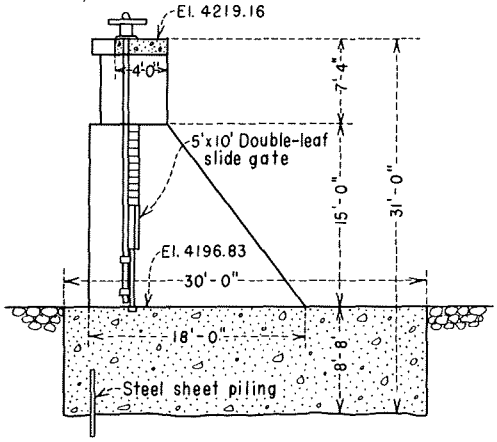
SPILLWAY SECTION

Lahontan Dam—Plan and sections.



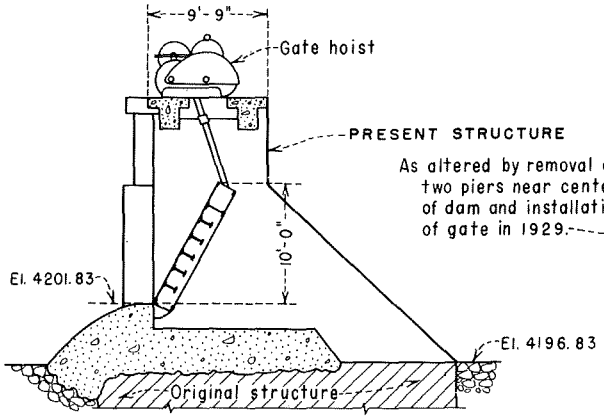


UPSTREAM ELEVATION

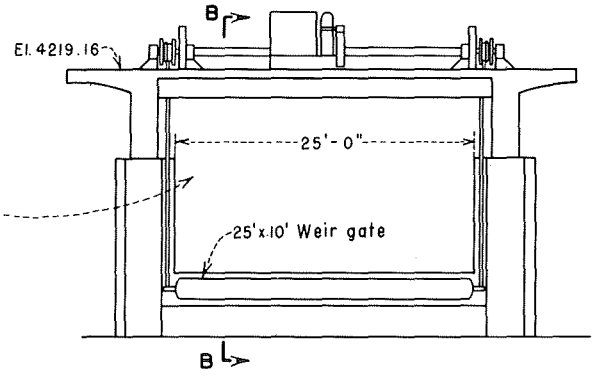


SECTION A-A

(ORIGINAL CONSTRUCTION)

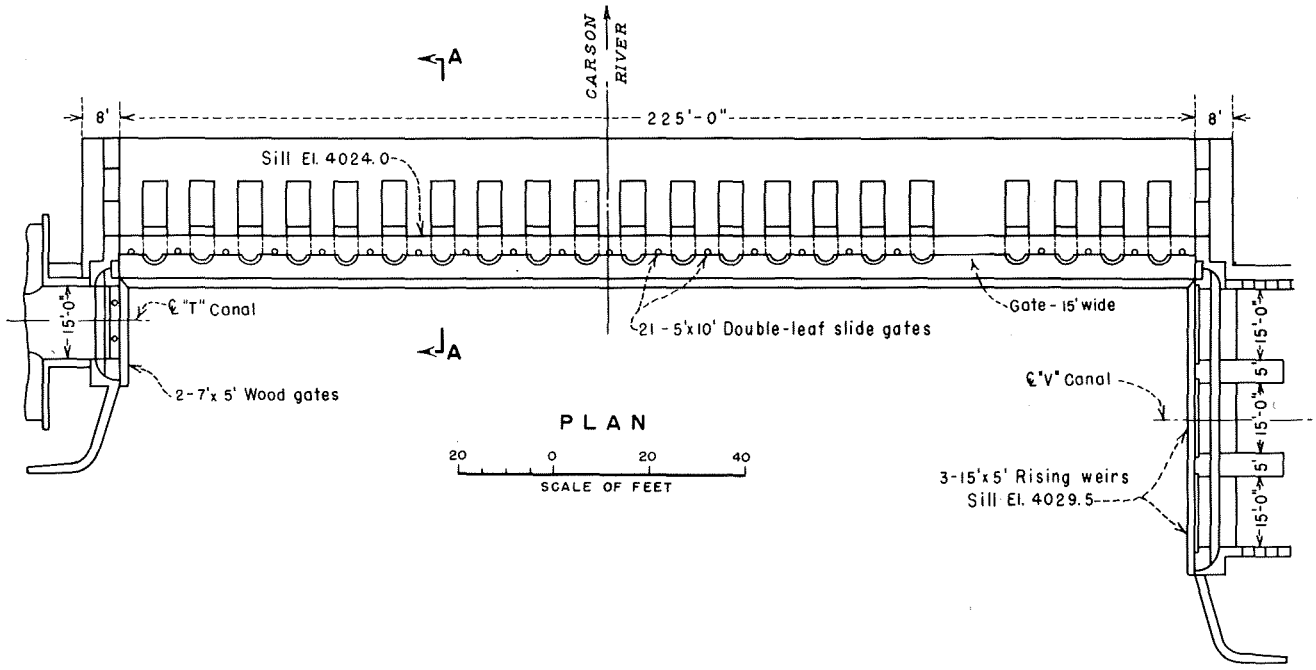


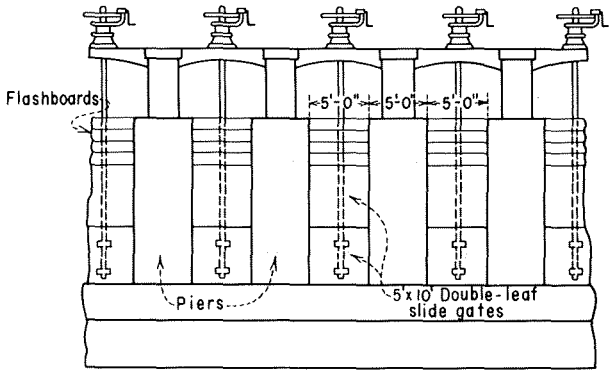
SECTION B-B



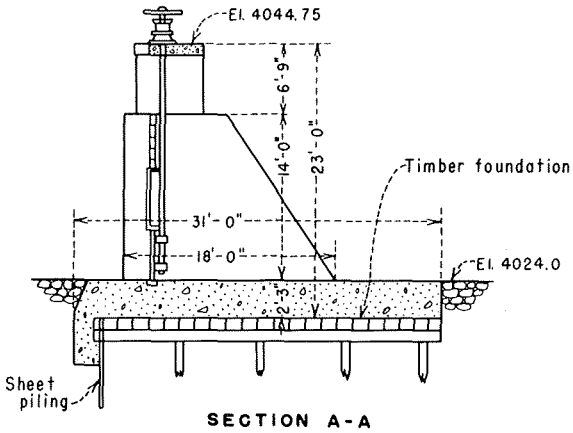
DOWNSTREAM ELEVATION
(GATE FULLY LOWERED)

Derby Diversion Dam—Plan and sections.



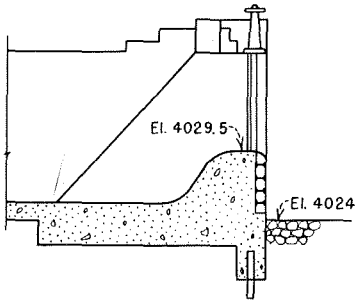


UPSTREAM ELEVATION

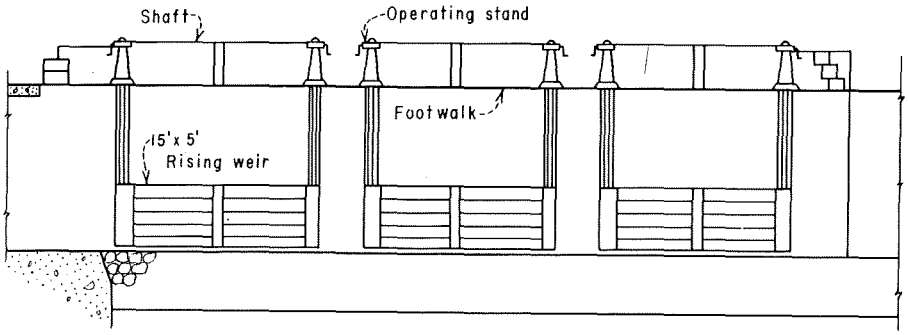


SECTION A-A

SLUICEWAYS



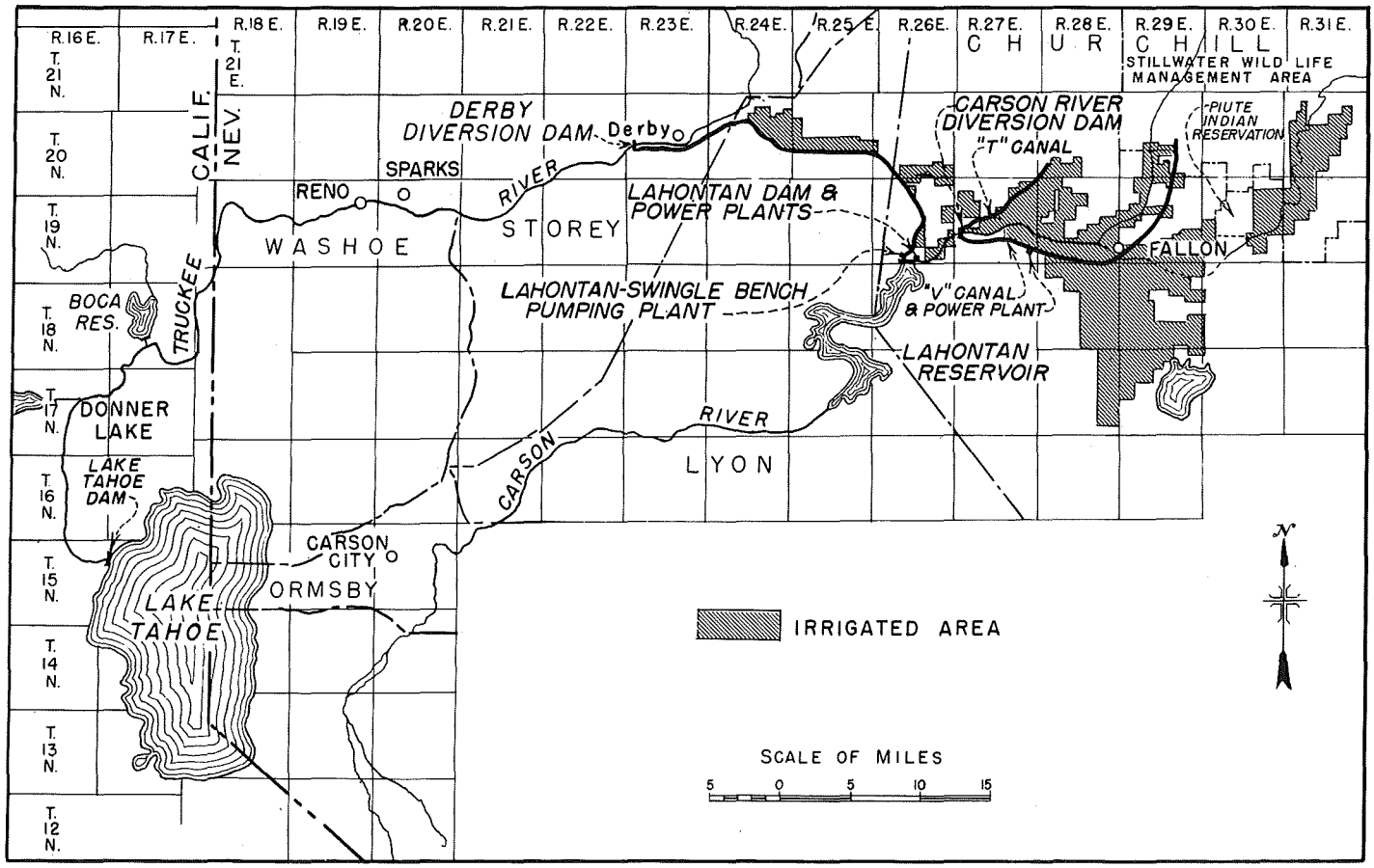
SECTION



ELEVATION

HEADWORKS "V" CANAL

Carson River Diversion Dam—Plan and sections.



Newlands project.

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INDEX MAP

NEWLANDS PROJECT

NEVADA

(REGION IV)

MAP NO. 29-400-4

SCALE OF MILES

2 0 2 4 6 8

MARCH 1950

SUPERSEDES MAP NO. 29-444-A

UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN SECRETARY
BUREAU OF RECLAMATION
MICHAEL W. STRAUS COMMISSIONER

EXPLANATION

BUREAU OF RECLAMATION
COMPLETED AND AUTHORIZED WORKS

- CANAL
- DRAIN
- SUBSTATION
- AREA BENEFITED BY PROJECT WORKS
- POWER PLANT
- TRANSMISSION LINE
- PROJECT HEADQUARTERS

U.B.N.-S.L.C., U.-500 10-50