NPS Form 10-900 (Rev. 8-86) OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

NATIONAL REGISTER

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name: Grand Valley Diversion Dam

other names/site number: Bureau of Land Management Designation 5 ME 301

2. Location

street & number: 8 miles northeast of town on Colorado River [ ] not for publication

city, town: Palisade [ ] vicinity

state: Colorado code: CO county: Mesa code: 077 zip code: 81526

[Note: older literature references site as on "Grand River" Colorado.]

3. Classification

Ownership of Property
- [ ] private
- [ ] public-local
- [ ] public-State
- [X] public-Federal

Category of Property
- [ ] building(s)
- [X] district
- [ ] site
- [ ] structure
- [ ] object

Number of Resources within Property

Contributing	Noncontributing	
1		buildings
		sites
2		structures
		objects
		Total

Name of related multiple property listing: N/A

Number of contributing resources previously listed in the National Register: 0

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this [X] nomination [ ] request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property [X] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

A. K. [signature] 8/22/91

Signature of certifying official Date

U.S. Dept of the Interior, Bureau of Reclamation, ~~Upper Colorado Region~~

State or Federal agency and bureau

In my opinion, the property [X] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

[signature]

Signature of commenting or other official Date

Colorado State Historic Preservation Officer

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:

- [✓] entered in the National Register. [ ] See continuation sheet. Beth Boland 10/8/91
- [ ] determined eligible for the National Register. [ ] See continuation sheet.
- [ ] determined not eligible for the National Register.
- [ ] removed from the National Register.
- [ ] other, (explain:)

Signature of the Keeper Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)	Current Functions (enter categories from instructions)
Industry: Waterworks	Industry: Waterworks

7. Description

Architectural Classification (enter categories from instructions)

Other: Roller gate type dam.

Materials (enter categories from instructions)

foundation	N/A
walls	Concrete
roof	Ceramic tiles
other	Concrete
	Steel

Describe present and historic physical appearance.

The Grand Valley Diversion Dam crosses the Colorado River at the bottom of a canyon that the river has formed. Here the river flows virtually due south, though a sharp incised meander is present less than one half mile above the dam. The immediate locale is quite spectacular, as is much of the course of the Colorado River. The River has carved through several hundred feet of Cretaceous aged shales and sandstones of the Mesa Verde group of geologic formations which lie relatively flat in the immediate area of the dam. A bench mark placed by the U.S. Geological Survey at the eastern end of the dam shows an elevation of 4784 feet. Just over 1000 feet farther east, another surveyed point at the top rim of the canyon has an elevation of 5611 feet. Thus the canyon wall is over 800 feet high on the eastern side of the canyon. The dry climate, averaging 8 inches of rainfall per year, limits vegetation to occasional juniper and a scattering of other plants on the shaly portions of the canyon walls. Otherwise, most of the canyon walls are simply exposed bare rock. Along the immediate edge of the river, grasses are present.

To the south of the dam the canyon broadens into a wider valley with sufficient space for farming. Various irrigation projects sponsored by local groups had been ongoing in the valley since the later 1800s extending over a major portion of Mesa County, Colorado, in areas along the river where topography allowed the location of various water delivery facilities. Essentially these systems are present in lengthy strips on both sides of the River. However, the early system encountered problems of maintaining even water distribution and in losing much of the growing season by early run off. When the U.S. Reclamation Service began to operate in 1902 it immediately became involved in the local area to supplement and support the local water users associations already in operation. The Reclamation Service designated the facilities in the area as the Grand Valley Project. The federal agency, with more financial backing than the local groups had been able to raise, drew plans for a major diversion dam along the Colorado River to provide a more even water supply which would continue for a longer season. However, some serious technical problems required special consideration in dam design because of the nature of the site.

The Denver and Rio Grande Western railroad had paralleled the river along the western bank long before the construction of the Grand Valley Diversion Dam. The railroad track along the river is just a few feet above the usual high water mark. Usage of any other dam design would flood the tracks during the spring months. There was no technically feasible alternate transportation route; the highway is also confined to the canyon bottom.

[X] See continuation sheet

The Reclamation Service determined that a special type of dam which uses a system of roller gates would provide an adequate solution to the problem of maintaining an even level behind the dam. Such roller gate designs were then being introduced in Europe. Each roller gate can be raised or lowered, thus providing an adjustable water impoundment capability as may be required for seasonal irrigation needs. The Reclamation service thus constructed the Grand valley Diversion Dam using this system.

The dam redirects a portion of the flow of the Colorado River rather than generating electric power. The flow enters a facility called the Government Highline Canal which begins at the dam. (Thus the very head of the canal is within the nominated district.) The Government Highline Canal runs approximately fifty miles to the east, providing irrigation waters to an area north of the Colorado River. A system of smaller irrigation facilities draw off this larger canal. (The canal itself may be the subject of a future nomination but multiple ownership precludes such action at this time.)

The dam, with roller gates retracted, allows the spring flow to go over the concrete structure. When the flow is lower, the roller gates are extended, thus backing water behind the structure and allowing a controlled flow through the sluice gate and into the irrigation system. The process assures an even water flow for a much longer time each year than was possible prior to construction of the dam.

The dam is a concrete structure 14 feet high and 546 feet across the crest with six steel roller gates on a heavy framework above the concrete portion of the structure. Three roofed substructures called tower houses are spaced along the top of the dam structure. The towerhouses contain the machinery that raises and lowers the gates. One other roofed substructure is similar to the tower houses but is attached to the west end of the dam along the river bank. This substructure contains equipment to control sluice gates for release of water into the irrigation system. The sluice gates, at the head of the canal, should be distinguished from the roller gates on the dam itself. The abutment at the starting location of the canal, including sluice gates, is also referred to as the canal headworks. There are nine separate sluice gates, each seven feet by seven feet. Hoist equipment is included in the headworks and the building. Each sluice gate can be operated separately or all can be operated at once from a common power shaft with power source in the roofed structure. Ordinarily, the sluice gates operate automatically from a water level indicator in the canal. A steel footbridge runs the length of the dam above the roller gates. The foot bridge provides access to the tower houses and sluice gate structure. One other small building with a tile roof and concrete walls much like the tower houses stands just west of the dam on the river bank. This small building serves as a storage facility. (A small, white frame building shown in one photograph is just outside the designated area. It is associated with other structures out of the picture that serve as horse stables which may be nominated in the future in relation to the Civilian Conservation Corps, the agency that constructed them in the 1930s.)

To recapitulate the various facilities in the district classified under item 3:

the dam itself with concrete base, roller gates, tower houses, gates, sluice control structure, and footbridge constitutes one structure,

the head of the Government Highline Canal which is in the district constitutes a second structure, and

the small tile roofed storage building on the west bank of the river is the one building.

The overall physical appearance of the Grand Valley Diversion Dam, including the facilities within the nominated district, remain virtually the same today as when it was constructed, 1913-1916. The function of the facility is the same and is ongoing. Just outside the designated district a white house evident in one photograph and several rock structures which serve as horse stables just outside the photograph date from the 1930s. A future nomination may include these buildings as well since the Civilian Conservation Corps, a well-known Depression Era work program, built them. The highway on the east side of the dam has been upgraded to become a portion of the Interstate system.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:
[X] nationally [ ] statewide [ ] locally

Applicable National Register Criteria [X] A [ ] B [X] C [ ] D

Criteria Considerations (Exceptions) [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [ ] G

Areas of Significance (enter categories from instructions)	Period of Significance	Significant Dates
Engineering	1913-1941	1913
Invention	1913-1941	1916
Social History	1913-1916	1913, 1916
Agriculture	1916-1941	

Cultural Affiliation
N/A

Significant Person
N/A

Architect/Builder
Edward Bazika and Alfred Deinlein (Germany); I.H. Miner, R.F. Walter, F. Teichman (U.S.)

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The Grand Valley Diversion Dam is significant in four areas that clearly reflect the considerations for both Criteria A and C. First, the dam uses a technically interesting set of roller gates which makes it an important site relating to the history of engineering technology. It is the largest roller gate type of dam in the United States and one of only four such dams in the country. Second, the usage of the roller gates represented an early application of a new invention on the largest scale developed. Third, the technical press did not credit the German designers when the dam was completed in 1916 because of the sentiments of World War I. This omission related to the importance of the dam in the social history of the times during which it was constructed. Fourth, when the dam did begin operations in 1916, it soon significantly increased the local acreages that could be irrigated. The relationship to agricultural history is thus quite important.

The dam is most significant because of aspects of engineering technology which were then a relatively new concept. The facility is a diversion dam rather than a power generation dam. The structure redirects a portion of the river flow into a facility called the Government Highline Canal which begins at the dam. A system of irrigation canals draw off the larger canal. However, this particular site presented a novel problem in dam construction. The railroad track along the river stands just a few feet above the usual high water mark. Usage of any other dam design would flood the tracks during the spring months. There was no feasible alternate transportation route; the highway is also confined to the canyon bottom. German firms had developed the roller gate to maintain an even level behind dams in Europe in the early twentieth century so the U.S. Reclamation Service selected this basic design when it constructed an irrigation dam as part of the Grand Valley Project.

The Grand Valley Diversion Dam has significance in the history of invention as the largest of only two roller gate types of irrigation dams in the United States. The only other example, in Idaho, is very small with only one roller gate. Two other roller gate type of dams, in the State of Washington, are electric power generation facilities and are smaller than this one. Even on a world scale, all similar dams had only one or two roller gates. Thus the Grand Valley Diversion Dam represents the largest scale application of the design.

[X] See continuation sheet

9. Major Bibliographical References

U.S. Dept. of the Interior, Water and Power Resources Service, Project Data (Denver: U.S. Government Printing Office, 1981).

U.S. Reclamation Service, "Grand Valley Project, Colorado, Feature History," volumes for 1902-13, 1914, 1915, 1916, 1917 (agency internal reports).

A.G. Hillberg, "Design of Rolling Dams" Engineering Record, vol. 68, p. 654 (Dec. 13, 1913).

F. Teichman, "Large Roller-Crest Dam, Grand Valley Project, Colorado," Engineering News, vol. 76. No. 1, pp. 1-4 (July 6, 1916).

☐ See continuation sheet

Previous documentation on file (NPS):

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☐ recorded by Historic American Engineering Record # _____

Primary location of additional data:

- ☐ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: _____

10. Geographical Data

Acreage of property 4.77 acres

UTM References

	Zone	Easting	Northing
A	12	734800	4341050
B			
C			
D			

☐ See continuation sheet

Verbal Boundary Description

Perimeter description of a tract of land encompassing the Grand Valley Diversion Dam, in the SE 1/4 of the NW 1/4 of Section 13, Township 10 South, Range 98 West of the 6th Principal Meridian, more particularly described as follows:

☒ See continuation sheet

Boundary Justification

The nominated property includes within its boundaries all of the buildings and structures associated with the operation of the Grand Valley Diversion Dam.

☐ See continuation sheet

11. Form Prepared By

name/title Charles W. Miller, Ph.D., Historian
organization U.S. Bureau of Reclamation date 3/14/91
street & number 125 South State Street, Room 7418 telephone FTS 588-6868
city or town Salt Lake City state Utah zip code 84147

★U.S.GPO:1988-0-223-918

The dam also has significance from involvement in a major social issue at the time that it was constructed. When actual building began in 1913, the technical press stressed the German origin and design of the dam. The firm of Hiezu Siebzehn Tafeln of the City of Wien provided basic designs. The individuals with the firm who developed the early concepts were Edward Bazika and Alfred Deinlein. A U.S. Reclamation Service engineering team worked with the German firm in developing more specific plans for this particular site. Adaptation of the roller design from the wet environment of Europe to the dry Southwestern U.S. drew considerable publicity in the technical press. U.S. President William Howard Taft visited the site in 1912. However, the period of construction, 1913-1916, coincided with the start of World War I in Europe. A wave of anti-German sentiment swept the United States, even before the country entered the armed conflict. When the dam's equipment first diverted water into the irrigation system on May 2, 1916, the project again attracted considerable attention in the technical press. By that time, the Journals gave the U.S. Bureau of Reclamation team credit for the project design while slighting the German origin. The War also caused delays in delivery of equipment, both from Germany and from the Lakeside Bridge and Steel Corp. of North Milwaukee, Wisconsin. Use of temporary equipment allowed the dam to divert water in the spring of 1916. By December, 1916, it was functioning as designed. Construction costs at that date were $572,896.55, some 99.6 per cent of the ultimate total.

The dam naturally has significance as an influence on agricultural production in the area, the reason the Reclamation Service constructed it as a major addition to the Grand Valley Project. In calendar year 1917, the dam allowed delivery of 18,715 acre-feet of water to 5,289 acres of farm lands on 193 farms. This compared to 4,224 acre feet of water to 1,561 acres of farm lands on 76 farms in 1916 when the dam was only partially operational, as noted above. The facility made an obvious increase in irrigation with a corresponding increase in agricultural production in the locale.

United States Department of the Interior
National Park Service

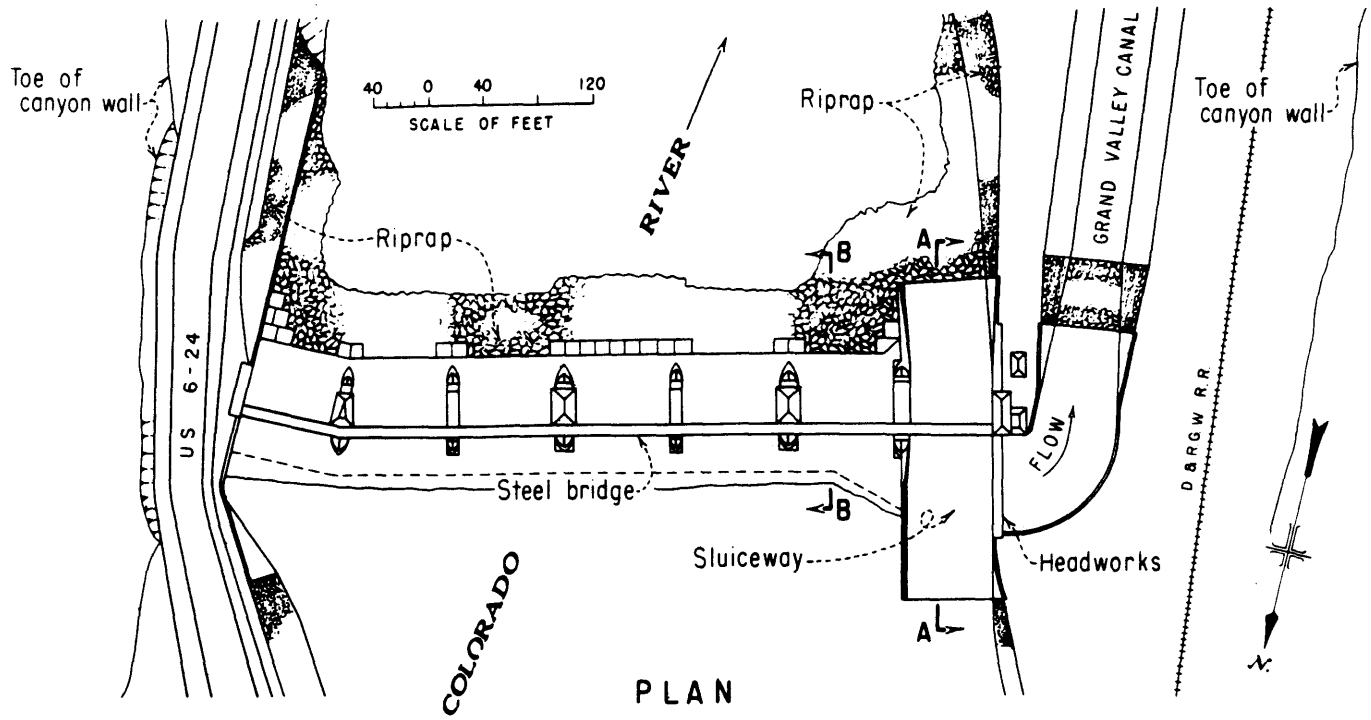
National Register of Historic Places Continuation Sheet

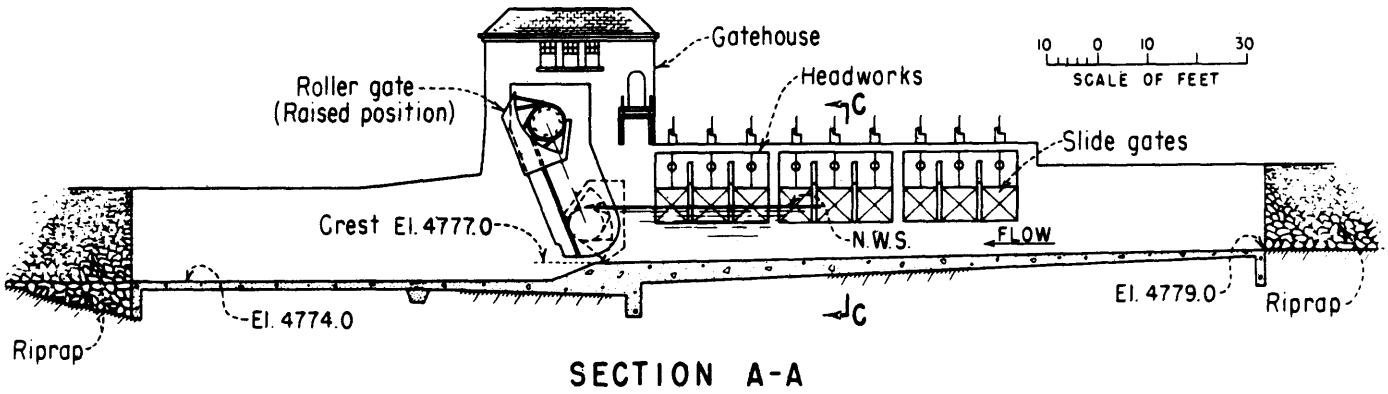
Section number 10 Page 2

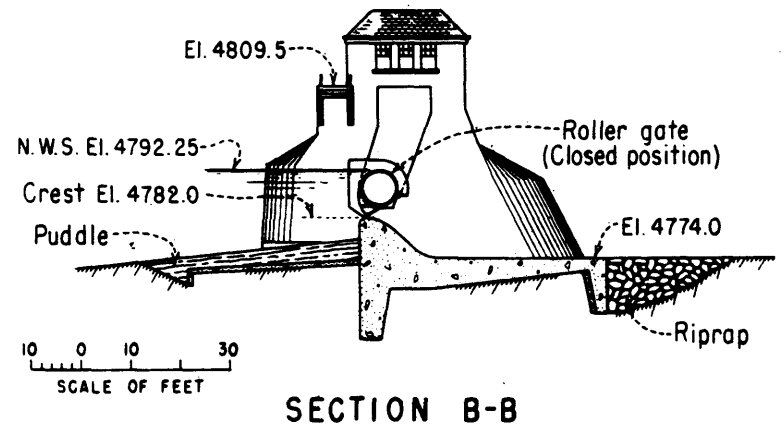
Beginning at the point of intersection of a line projected along west bank of the Government Hihgline Canal, from whence the southwest corner of said Section 13, bears S. 16° 41' W., 4023 feet, and considering the west line of said Section 13 to bear N. 01° E., and all other bearings relative thereto;

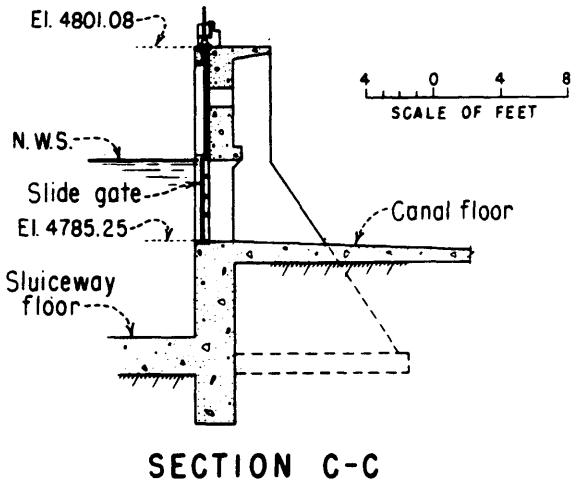
Thence S. 15° E., parallel to and 90 feet west of the west edge of the sluiceway, 150 feet;
Thence parallel to and 150 feet south of the dam axis, the following two courses;
N. 75° E., 545 feet;
N. 89° E., 110 feet;
Thence N., 01° W., parallel to and approximately 50 feet east of the east end of the dam, 300 feet;
Thence parallel to and 150 feet north of the dam axis, the following two courses;
S. 89° W., 147 feet;
S. 75° W., 582 feet;
Thence S. 15° E., parallel to and 90 feet west of the west edge of the sluiceway, 150 feet more or less to the point of beginning.
Said tract contains 4.77 acres more or less.

(Also, see map of boundaries.)

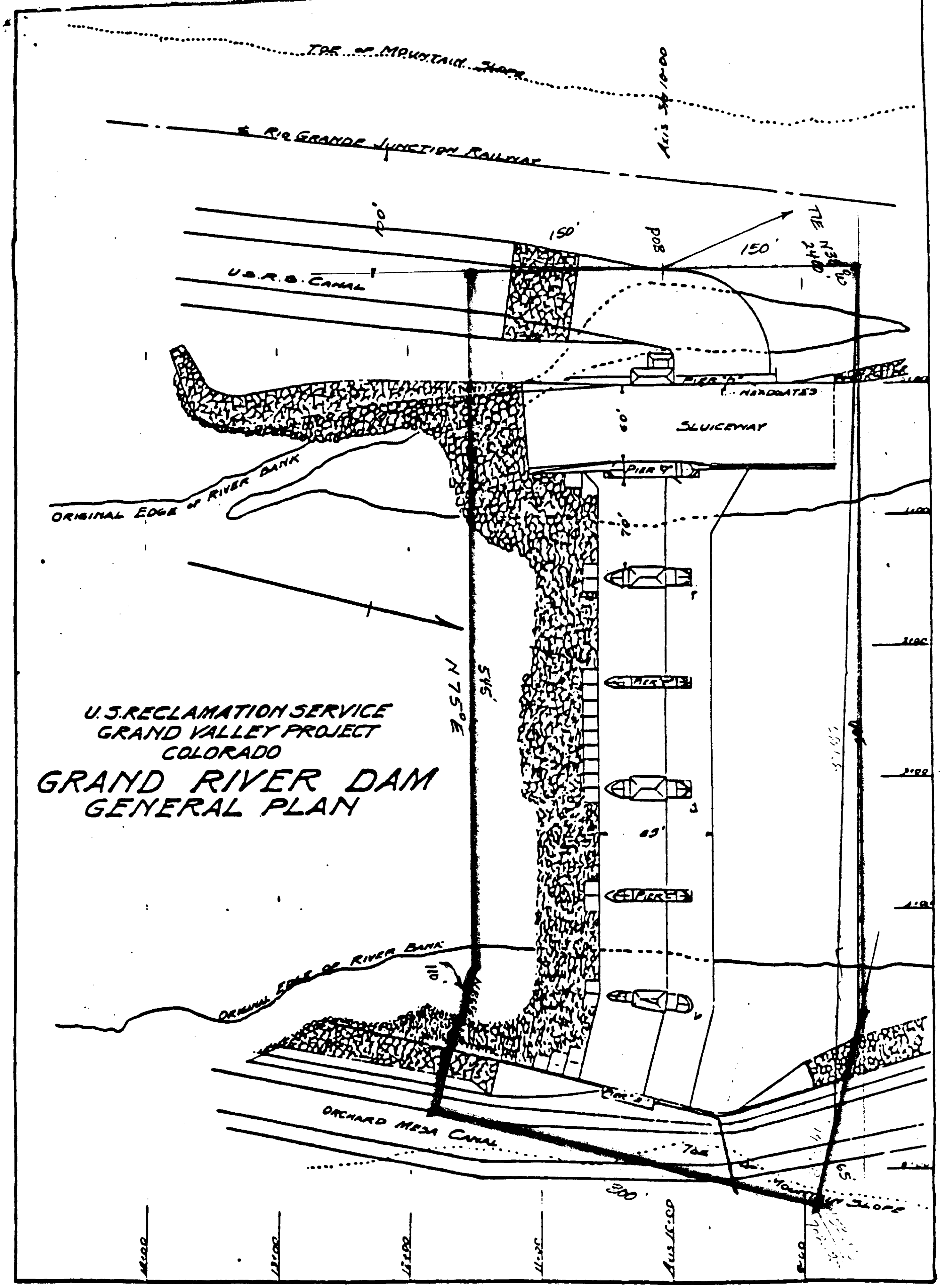


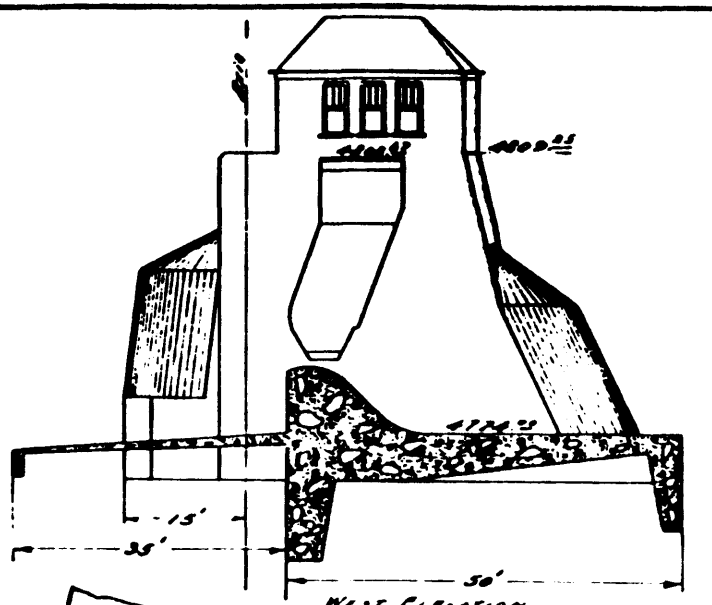






Grand Valley Diversion Dam, Plan and Sections


U.S. RECLAMATION SERVICE
GRAND VALLEY PROJECT
COLORADO
GRAND RIVER DAM
GENERAL PLAN
TOP OF MOUNTAIN SLOPE
℄ RIO GRANDE JUNCTION RAILWAY
U.S.R.S. CANAL
ORIGINAL EDGE OF RIVER BANK
SLUICEWAY
HEADGATES
ORCHARD MESA CANAL
MOUNTAIN SLOPE
N 75° E
1 inch = 100 feet



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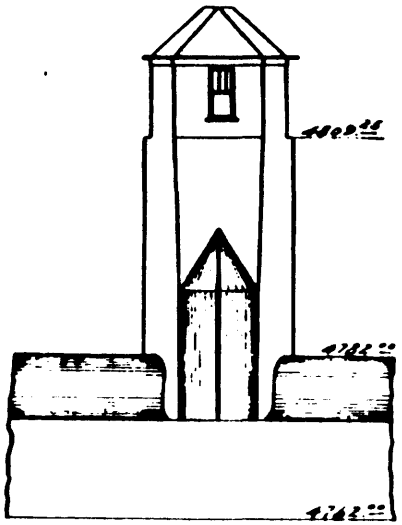

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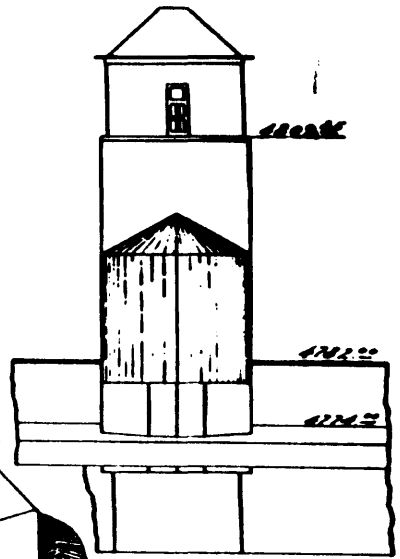
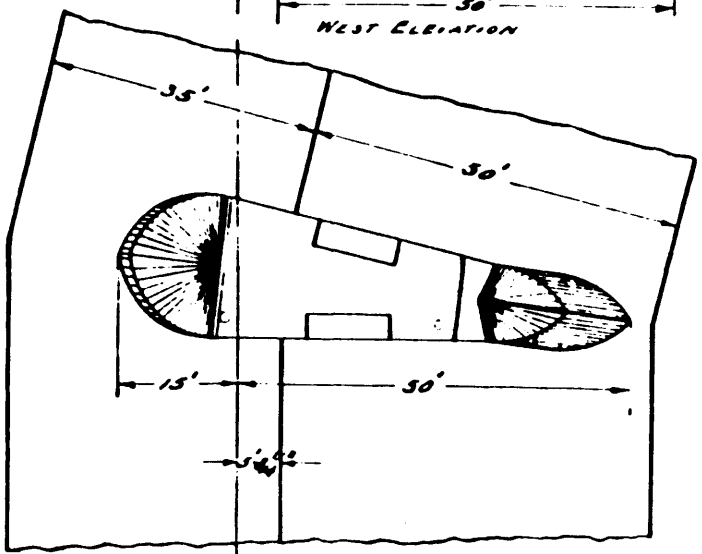
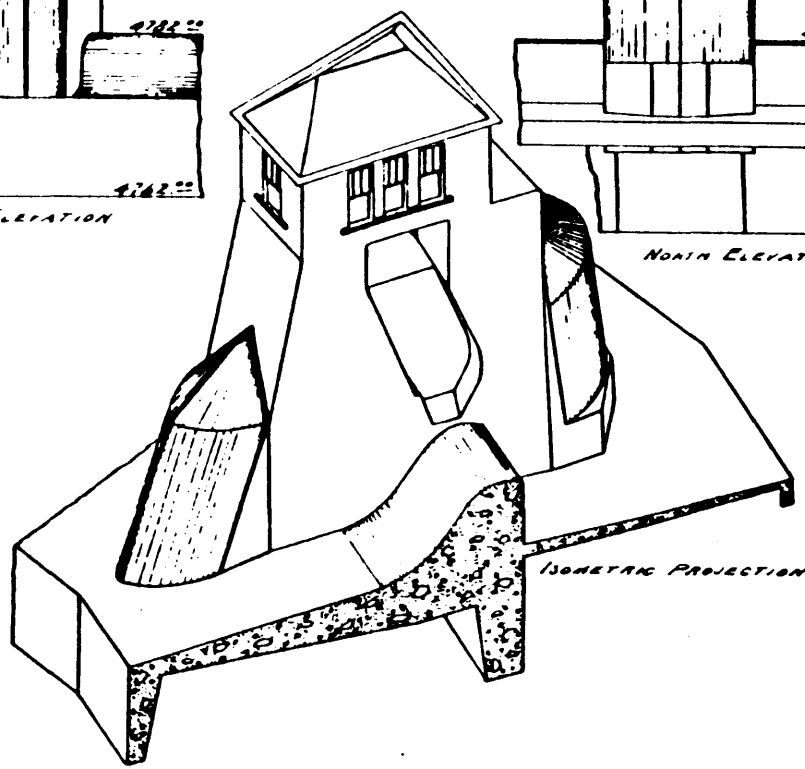


NORTH ELEVATION



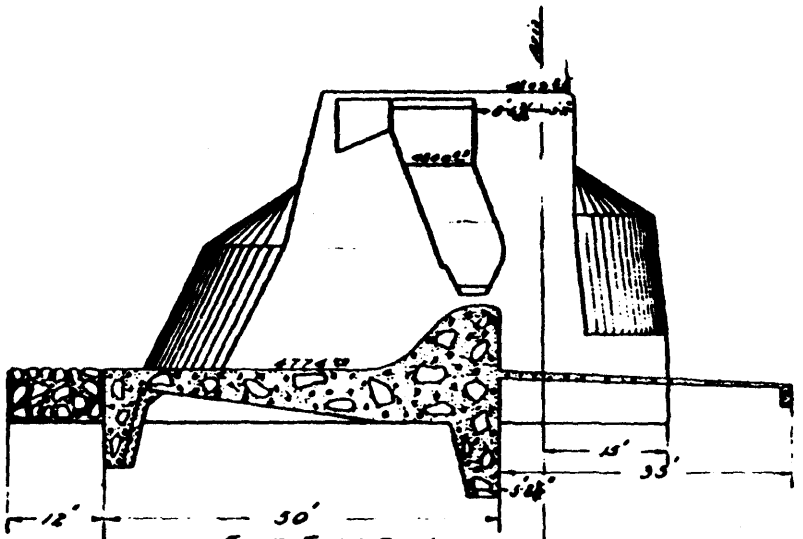
PLAN



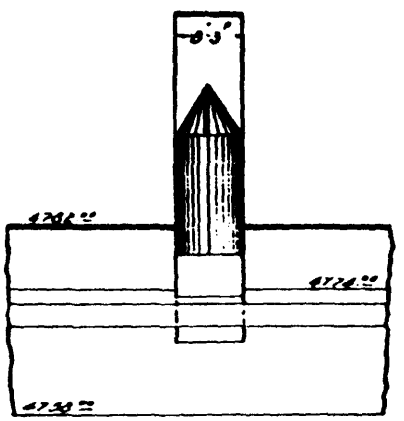
ISOMETRIC PROJECTION

U.S. RECLAMATION SERVICE
GRAND VALLEY PROJECT
COLORADO

GRAND RIVER DAM
DETAILS -- PIER "B"



EAST ELEVATION



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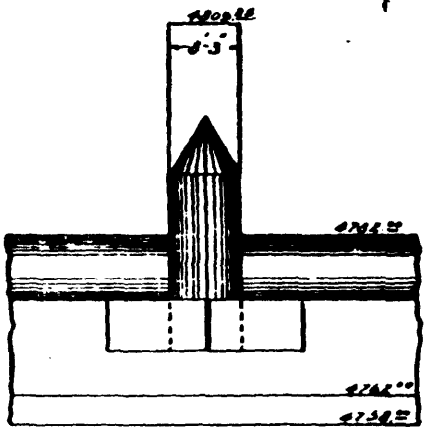

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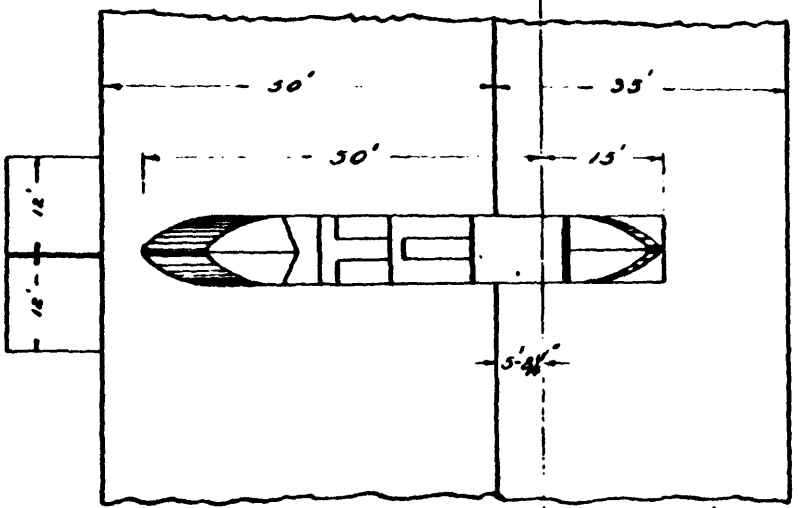

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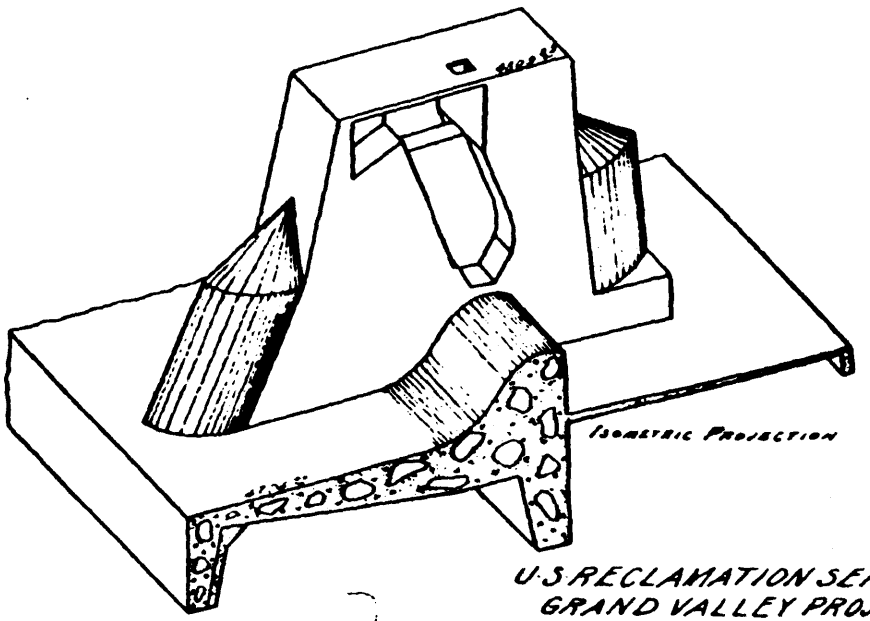
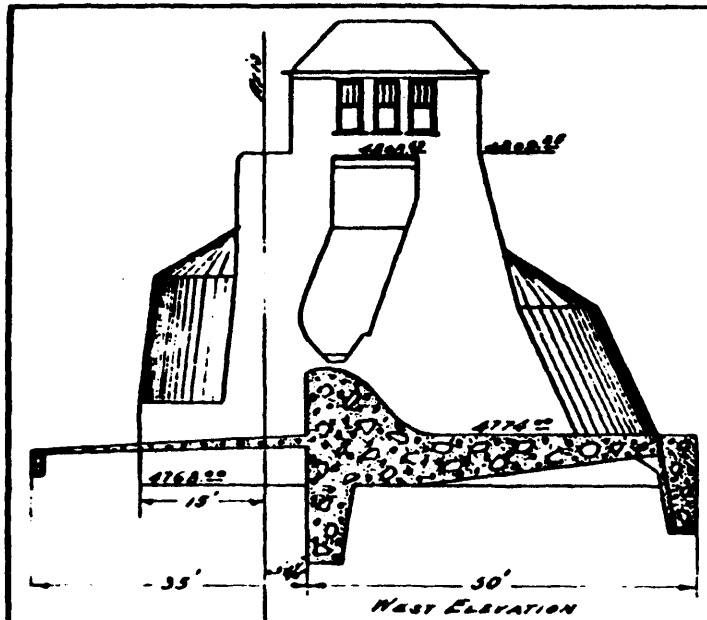


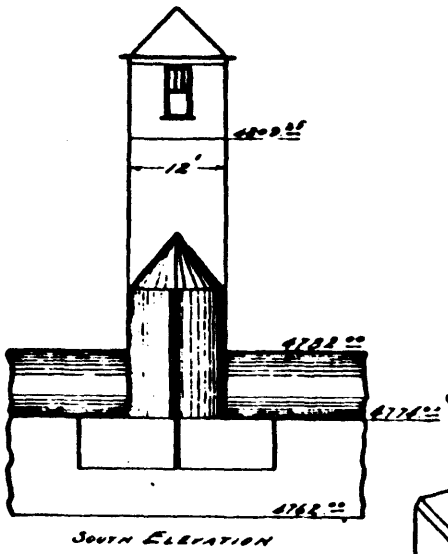
ISOMETRIC PROJECTION

U.S. RECLAMATION SERVICE
GRAND VALLEY PROJECT
COLORADO

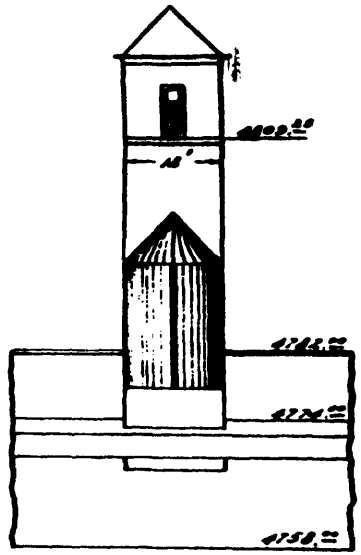
GRAND RIVER DAM
DETAILS ~ PIERS 'C' & 'E'



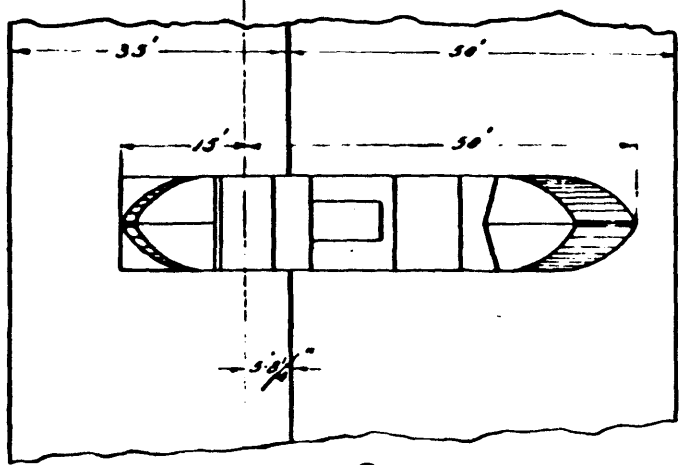
West Elevation



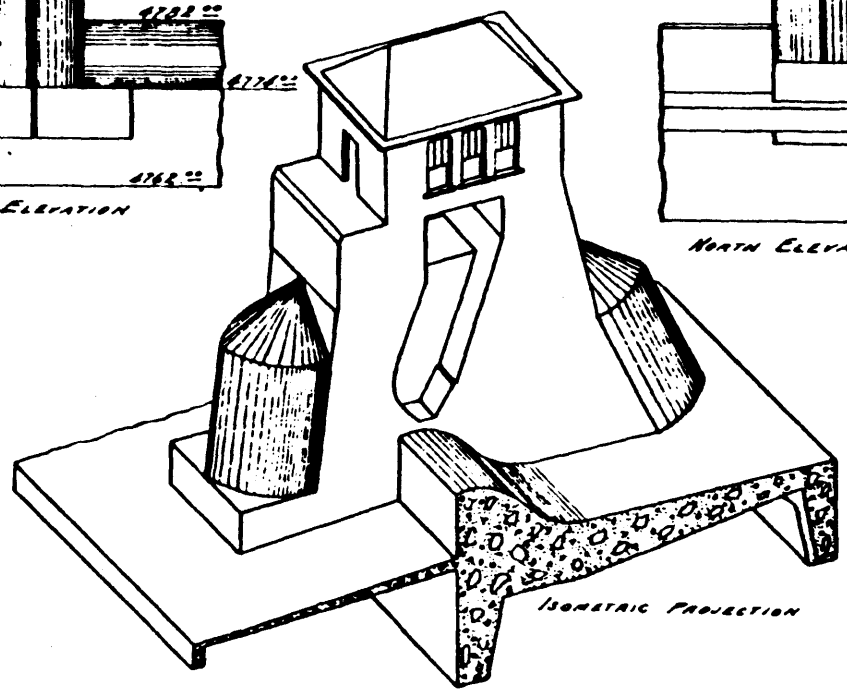
South Elevation



North Elevation



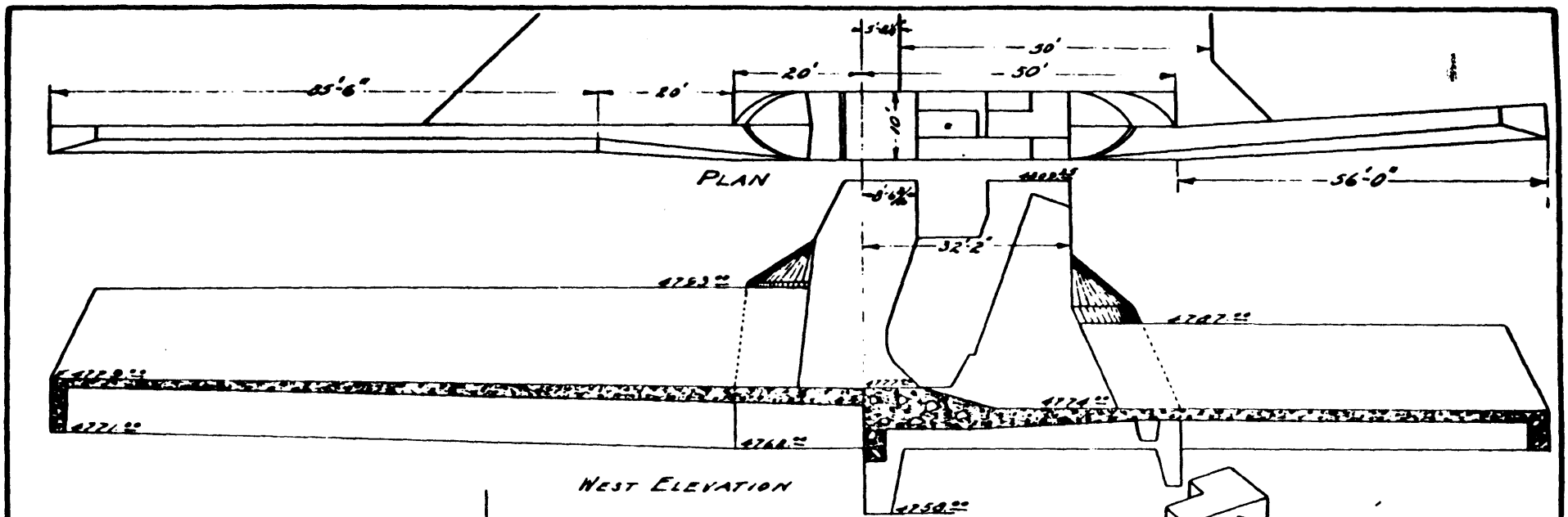
Plan



Isometric Projection

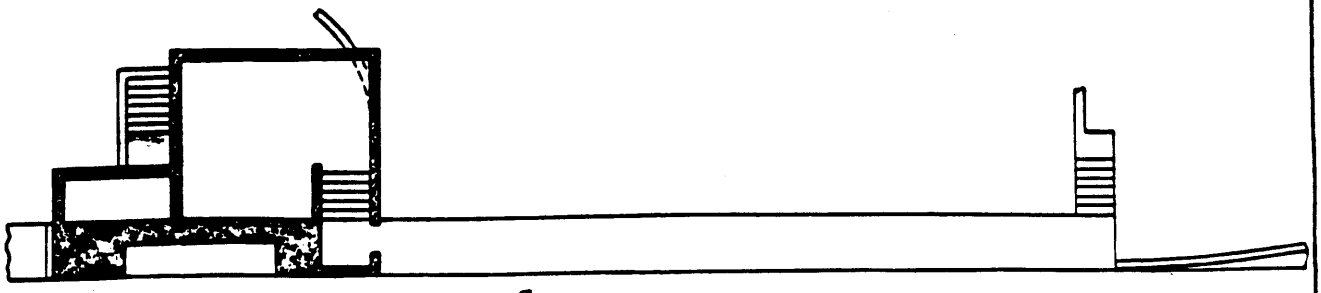
U.S. RECLAMATION SERVICE
GRAND VALLEY PROJECT
COLORADO

GRAND RIVER DAM
DETAILS OF PIERS

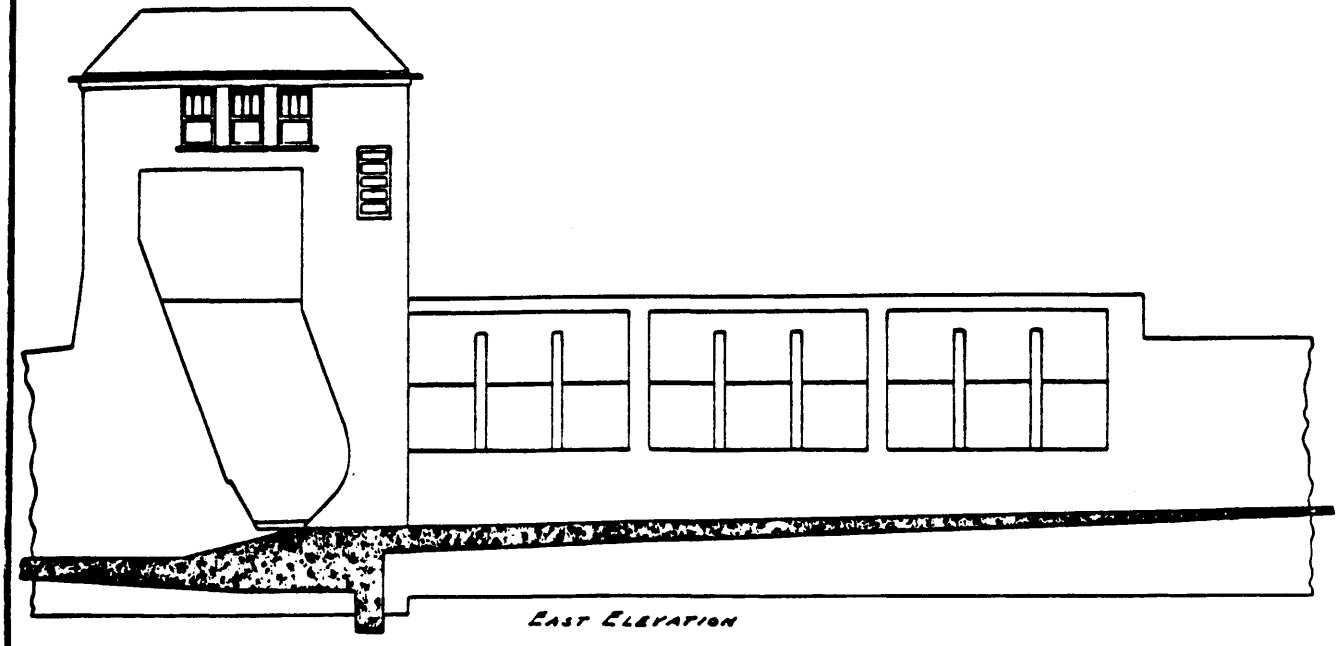


U.S. RECLAMATION SERVICE
GRAND VALLEY PROJECT
COLORADO

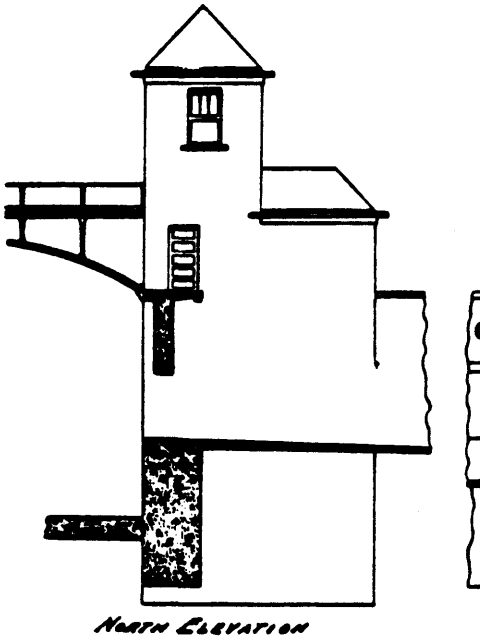
GRAND RIVER DAM
DETAILS OF PIER 9



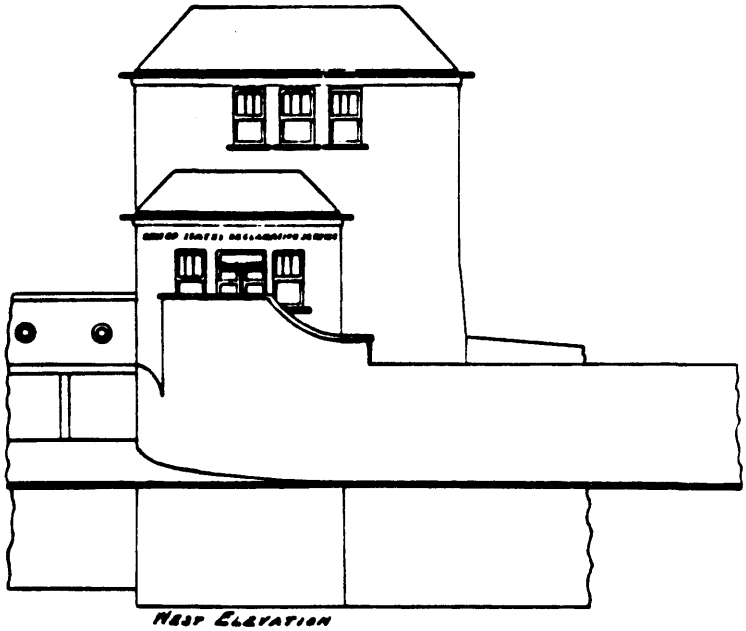
PLAN



EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION

U.S. RECLAMATION SERVICE
GRAND VALLEY PROJECT
COLORADO

GRAND RIVER DAM
DETAILS -- PIER "A"

MINIATURE DRAWING

7