FINAL REPORT

on

THE CONSTRUCTION OF THE CANALIZATION FEATURE

of the

RIO GRANDE CANALIZATION PROJECT

BY

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Project Engineer

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DEPARTMENT OF STATE

INTERNATIONAL BOUNDARY COMMISSION

UNITED STATES AND MEXICO

UNITED STATES SECTION

REPORT ON THE CONSTRUCTION OF THE CANALIZATION FEATURE OF THE RIO GRANDE CANALIZATION PROJECT

1. INTRODUCTION

The engineering investigations of the Rio Grande between Caballo Dam, New Mexico and El Paso, Texas, the construction of the Canalization Project, the construction of the American Dam and Canal and the erection of the nine concrete river bridges were authorized by four Acts of Congress. These Acts were as follows:

(A) Public Resolution No. 4, First Session, 74th Congress, approved February 13, 1935(1), authorizing the American Section of the International Boundary Commission, United States and Mexico, to conduct an engineering investigation and to make a report to the Secretary of State on the feasibility and best means for controlling and canalizing the Rio Grande from Caballo, N. M., to El Paso, Texas.

(B) Public Resolution No. 392, Act of August 29, 1935(2), 74th Congress authorized the construction of the American Dam and Canal.

(C) Public Resolution No. 648, Act of June 4, 1936(3), 74th Congress authorized the Canalizing of the Rio Grande from Caballo, New Mexico to El Paso, Texas.

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(1) See Appendix - Exhibit A
(2) See Appendix - Exhibit B
(3) See Appendix - Exhibit C

(D) Public Resolution No. 472, Act of April 22, 1940(4), 76th Congress authorized the reconstruction of nine bridges over the Rio Grande in Dona Ana County, New Mexico and El Paso County, Texas.

The canalising of the Rio Grande from Caballo Dam, New Mexico to El Paso, Texas authorized by these four Acts of Congress has been finished in accordance with these laws and the best engineering practices.

Final reports have been written and submitted to the Commissioner of the International Boundary Commission, United States Section, on all phases of this project other than the canalization works. This report relates the progress and construction of the canalization works with references to the preliminary investigations, the construction of the American Dam and Canal and the erection of the nine bridges over the Rio Grande river.

The main purpose for building all of these various works along the Rio Grande in New Mexico, and Texas, was to facilitate the United States Government in complying with the provisions of the Treaty with Mexico concluded May 21, 1906, providing for the equitable division of the waters of the Rio Grande and to regulate and control to the fullest extent the water supply for the two countries. The Canalization Project, by vesting a strip of right of way along the Rio Grande from El Paso to the Caballo Dam in the United States Government, by protecting the Valley lands from overflow during floods and by straightening the river channel, has provided the Government with the means to carry out the Treaty of May 21, 1906.

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(4) See Appendix - Exhibit D

2. DESCRIPTION

The Rio Grande Canalization Project (1) extends 112 miles along the river from Caballo Dam, New Mexico to El Paso, Texas. It is located in the southerly part of Sierra County, New Mexico, extends completely across Dona Ana County, New Mexico, and reaches to the westerly limits of the city of El Paso in El Paso County, Texas. In general the project consists of a long narrow flood channel confined by two, more or less, parallel levees approximately seven hundred feet apart. In the center of this flood channel, the normal low flow channel is situated. Its purpose is to carry the normal irrigation requirements of the Rio Grande Reclamation Project. The capacity of the flood channel varies from 22,000 cubic feet per second in the vicinity of the Hatch-Rincon Railroad Bridge to 12,000 cubic feet per second near El Paso. The capacity of the normal channel is approximately 2,500 second feet.

3. WORK ACCOMPLISHED

Construction work on the project commenced on February 23, 1938 in the vicinity of the Santo Tomas Bridge with a crew of laborers clearing right of way.

Excavation operations began on July 6, 1938 when Dragline No. 4 commenced building the West Levee, approximately two miles above the Country Club Bridge in El Paso County, Texas.

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(1) See Appendix - Exhibit G

During the five years since January 1938, project construction forces have cleared and grubbed 3,446.42 acres of land, moved 13,241,059 cubic yards of earthwork, installed 73.37 miles of fence revetment in the river channel, constructed 136 bridges, culverts and other small structures, leveled 3,296.28 acres of land on the floodways and built 125.92 miles of levees. This work was all performed by Government crews with Government owned equipment at unit prices comparable to large contract jobs. The cost of the canalization project, as of January 31, 1943, including the American Dam and Canal was $3,890,744.12. The cost of the canalization feature was $2,996,052.11.

A summary of the volume of work performed is shown in TABLE I. The overall cost of the project excluding the cost of the river bridges is as shown on page 6.

4. PRELIMINARY INVESTIGATIONS

The preliminary investigations of the Rio Grande, from the Caballo Dam to El Paso, began April 13, 1935 and were completed on December 15, 1935. The engineering field and office work, the studies of flood conditions, the value to be gained by controlling the river and the preliminary plans and estimates of cost were summarized and compiled into the "Final Report - Control and Canalization of the Rio Grande, Caballo Dam site, New Mexico to Courchesene Bridge at El Paso".

The report emphasizes the need for the control of the river by the United States Government in order to comply with and regulate the diversion of waters to Mexico as required by the convention of 1906. It outlines the investigation work accomplished, explains the plans for the control of the river by means of a flood channel, normal flow channel and levees and shows the estimated cost of the project.

The field engineering surveys consisted of a closed traverse along both banks of the river from El Paso to the Caballo Dam, a line of bench levels and numerous topographical surveys. The preliminary surveys were used during construction for checking elevations, the alignment of levees and property lines.

The capacities of the flood channel, the method of computing the flood water elevations and the aerial photographs of the valley, all of which were made during the preliminary investigations and summarized in the "Final Report", were used as a basis for planning and designing the finished project.

5. CONSTRUCTION

Headquarters: Headquarters for construction and maintenance work in the Mesilla Valley were located on south Melendres Street in Las Cruces. They consisted of a 2.50 acre storage yard, engineering office, clerical office, warehouse, shop and car shed. The headquarters were built in the first six months of 1938 and cost $13,224.93.

The Rincon Valley headquarters was located about two miles north of Hatch, New Mexico, on U.S. Highway 85, near the bridge across the river. It contains about 5.00 acres of land, and the layout there is similar in construction to the Las Cruces yards. The buildings are a combination shop and warehouse, a dwelling house for the Maintenance Foreman, a garage and several sheds. The clerical building was moved from the Las Cruces yard to the Hatch yard in July 1941. This layout cost $26,972.46.

Plan and Method: The plan of construction work followed was to build generally upstream, beginning at the El Paso Electric Light Plant and working toward the Caballo Dam. This plan had several advantages. It provided early flood protection to the valley lands in the lower reaches of the project, gave more time to study and design the channel in the upper and more difficult reaches of the valley, and formulated construction methods.

The method of construction varied from the plan proposed in the original report in that suction dredges were not used. The difficulty in moving a suction dredge past the numerous river bridges and the variations in the low flow of the river throughout the year were the deciding factors against the dredge proposed. The principal method employed was to build the levees with draglines from borrow pits and then to fill the pits with bulldozers or carryalls securing the earthwork from higher ground on the floodway or the river channel. However

this method was not universally employed. In many sections the levees were built entirely with carryalls borrowing earthwork from the floodways, river channel or cut-offs. Some cut-offs were built entirely by tractors and carryalls.

Equipment: The principal items of equipment employed on the construction work were as follows:

1 - P. & H. Dragline	3	Cu.Yd.	Bucket,	110'	boom
1 - Bucyrus-Erie Dragline, Model 111	3	"	"	105'	"
2 - P. & H. Draglines, Model 750 Special	2	"	"	68'	"
2 - P. & H. Draglines, Model 944	2	"	"	70'	"
1 - Convertable P. & H. Dragline and Shovel, Model 355	3/4	"	"	40'	"

4 - R.D. 8 and D. 8 Caterpillar Tractors
2 - Model F-D Cletrac Tractors
2 - L.D. Allis-Chalmers Tractors
2 - S.C. Allis-Chalmers Tractors
2 - T.D. 40, International Tractors
3 - 12 Cubic yard capacity carryalls
2 - 8 Cubic yard capacity carryalls
2 - Caterpillar motor graders
1 - Austin-Western Motor Grader
1 - Electric Welder (Portable)
1 - Complete Well point system- Jetting pump, pump & 60 well points
1 - Air compressor (portable)
4 - Tractor Mowers
1 - 1/2 cubic yard concrete mixer
3 - Small concrete mixers
1 - 1000 Gal. capacity tank sprinkling truck
1 - 1500 Gal. capacity tank sprinkling truck
1 - I.H.C. 3 Ton Dump Truck
1 - I.H.C. 3 Ton Stake Body Truck with winch
1 - I.H.C. 2 Ton Stake Body Truck with winch
11 - Passenger cars
7 - Station wagons
9 - 1/2 Ton Pick-up trucks
2 - 1 Ton Light trucks
2 - Jetting pumps (force pumps)
6 - 100 Gallon per minute Centrifugal pumps

The equipment cost about $339,736.97 all of which has been depreciated into project construction costs.

Organization: The schedule of construction work mapped out proposed the completion of work in the Mesilla Valley before doing any work but surveying in the Rincon Valley. Therefore the crews, organization and equipment used in the Mesilla Valley were transferred to Hatch for work in the Rincon Valley after work was completed between Leasburg Dam and the El Paso Electric Light Plant. The construction and engineering organization throughout the construction period was approximately as shown on the attached Organization Chart for the first three years of construction work. It varied somewhat from this general chart due to the kind of work being performed and the equipment employed. When clearing operations were underway more laborers were employed and as excavation operations increased more men were employed in the shop and on the tractors and draglines.

The draglines, except machine No. 10, and tractors were operated two shifts each day with repair and service crews taking care of the machinery on the third shift. The mechanical shop also worked two shifts and for awhile an electric welder worked on the third shift. This method of operation kept the equipment in a better state of repair and produced a greater volume of earthwork each month. The carpenter, revetment and clearing crews worked only on the day shift.

Clearing and Grubbing Right of Way: As previously stated the clearing of right of way commenced near the Santo Tomas Bridge in the

RIO GRANDE CANALIZATION PROJECT
ORGANIZATION CHART

September 30, 1940

PROJECT ENGINEER

FIELD ENGINEER

1 - Junior Engineer
1 - Engineering Aid
3 - Chiefs of Party
1 - Instrumentman
1 - Junior Engineer
1 - Engineering Aid
5 - Rodmen
1 - Chainman
1 - Apprentice Chainman
1 - Truck Driver
5 - Laborers
1 - Apprentice Rodman

OFFICE ENGINEER

4 - Junior Engineers
1 - Chief Draftsman
1 - Senior Draftsman
3 - Junior Draftsmen
1 - Right of way Clerk
1 - Stenographer
1 - Rodman
1 - Apprentice Rodman

CONSTRUCTION SUP'T.

7 - Chief Operating Engineers
3 - Construction Foremen
3 - Squad Foremen
5 - Truck Drivers
6 - Junior Guards
4 - Operator-Dragline
16- Oper.-Tractor over 60 H.P.
3 - Oper.-Motor Grader
2 - Oper.-Tractor under 60 H.P.
14- Oilers-Dragline
16- Semi-skilled laborers
113- Laborers

CHIEF CLERK

1 - Clerk
1 - Assistant Clerk
2 - Under Clerks
1 - Stenographer
1 - Ass't. Property & Supply Clerk
1 - Jr. Property & Supply Clerk
3 - Junior Guards
1 - Laborer

MECHANICAL SUP'T.

2 - Shop Foremen
1 - Truck Driver
6 - Mechanics
3 - Welders
10- Handymen-Automotive
3 - Helpers-Mechanic
1 - Truck Helper
1 - Laborer

Total Number Project Employees 272
Gross Payroll Earnings $29,150.28

Mesilla Valley on February 23, 1938. This clearing was done by hand with axes and grub hoes. The crew was large, the foreman green at the job and the area cleared during the first few months small. A second crew employing about the same number of men and tools started work on the Zack White farm near the Country Club Bridge in March of 1938. As the cost of the work was high under this method and tractor equipment became available, each crew was supplemented with an International Harvester T.D. 40 Tractor. The tractor was used to pull or knock down the larger trees and the hand labor employed in cutting the smaller brush. A shop-made grubber was built and hooked on the T.D. 40 in place of the bull-dozzer blade. These worked well; however, the tractors were not powerful enough to root out the larger trees. To overcome this objection two large R.D. 8 Caterpillar tractors were purchased equipped with winches. The bulldozer was replaced with a revised shop-made grubber and the tractors put to work. The D-8 Caterpillar with the grubber attached was a highly successful piece of equipment for clearing and grubbing. They did all the heavy clearing.

Two labor crews and these tractors were employed below the Mesilla Dam. Above the Mesilla Dam in the Mesilla Valley, also in the Rincon Valley, only one labor crew was employed. Right of way clearing and grubbing was finished on February 28, 1942.

The cost of clearing and grubbing in the four features is as follows:

Feature	Acres	Total Cost	Cost per acre
101	831.55	$ 42,053.64	$50.57
201	867.85	39,139.70	45.10
301	986.49	35,139.50	35.62
401	760.53	30,005.66	39.45
Total	3,446.62	$146,338.50	$42.46
Re-Clearing			
101	50.07	304.76	6.09
201	273.89	2,716.62	9.92
301	19.38	98.60	5.09
401	137.69	667.96	4.85
Total	481.03	$3,787.94	$7.87
Total Reclearing & Clearing	3927.45	$150,126.44	$38.22

Revetment Installations: In order to straighten the low flow channel of the river, protect sharp bends from erosion and to confine the river to a well defined channel varying in width from 150 feet to 300 feet, it was necessary to use some form of river training jetties or revetment. This revetment took the form of a woven wire fence with the front face located on the proposed low flow channel banks and cross-fences or back fences connecting this front line back to the established banks of the river. The purpose of the back or cross-fences was to slow down the velocity of the current and to protect the banks from erosion. The slower current caused silt to deposit and form additional floodway.

The fence was constructed of creosoted piling 5" to 8" in diameter from 16 feet to 22 feet long and spaced from 15 feet to 30 feet apart depending on the river condition at the site of installation. A heavy cable and woven wire fence was stretched along the line of piles. The piles were set usually about three to three and one half feet above the low water surface of the river. The piling were all jetted into place with powerful jetting pumps and work was usually done during the low water season. A typical installation and layout is pictured on the next page. See Plan No. 3223-48.

The revetment construction was stronger, the piles spaced closer together and heavier cable used on all work in the Rincon Valley. The first installations in the upper valley, built according to Mesilla Valley standards, were not able to withstand the flood conditions occurring in that reach of the project. The heavier fence was built due to this situation.

The construction crews employed to install the revetment usually consisted of a foreman, one revetment placer, two or three revetment helpers, a pump operator and about twenty laborers. This crew under normal conditions could jet from forty to fifty piles in place and stretch the woven wire on about 1000 feet of piling in a day. They used a powerful pressure pump with two nozzles or jets to wash the holes out for the piles. As a rule the revetment program was carried on during the winter time, however, during other periods it was often necessary to work to prevent bank erosion.

The amount installed during the five years of construction was 387,376 linear feet, or 73.37 miles. The cost and location is summarized as follows:

Feature	Linear Feet	Cost	Cost per foot
101	51,380	$ 29,180.96	.5679
201	97,005	46,086.22	.4751
301	105,817	59,300.22	.5604
401	133,174	89,501.51	.6721
Total	387,376	224,068.61	.5784

Excavation and Embankment: The building of the levees, excavation of the river cut-offs and the grading of the floodways of the project were all performed by the tractors and carryalls. In many locations the material had to be rehandled by the draglines to place it in the desired levee location. A great deal of long distance hauling of earthwork was done with the tractors pulling a carryall. The material excavated from the river channel cut-offs was placed in the levees or moved upstream or downstream into lower ground. This hauling was done by the carryalls.

In many instances only sandy material was available for levee construction. In these cases clay had to be hauled for some distances to plat the slopes and crowns of the levees to prevent blowing and to make a serviceable embankment.

There were seven draglines, twelve tractors, five carryalls, three motor graders and a large number of 3-cubic yard capacity dump trucks employed on the excavation operations. The volume of earthwork moved by this equipment is shown in all reports as 13,241,059

cubic yards. Many changes in plans and improvements to the finished job are always made where work is performed by force account which increases the quantities materially. Usually in order to get a true picture of the quantities moved, accurate surveys are required. On force account jobs, unless there is a very good reason for performing such surveys, the quantities are estimated and generally under estimated. On the canalization project it is, therefore, believed the equipment moved large volumes of earthwork without credit in quantities. The floodways were leveled and sloped from the levee toe to the river channel by the tractors. The tractors were given credit for this work by acres under floodway leveling. This sloping and leveling required the moving of a large volume of earthwork. In many instances considerable drifting of earthwork was done; that is moving the higher ground on the floodway to lower ground either upstream or downstream. The volume of such work was difficult to ascertain and in all probability a greater quantity was moved by the machines than they were allowed. A rough estimate is that 30% more earthwork was moved than shown in the reports.

The equipment listed in previous pages of this report for moving earthwork were all employed on construction operations in the Mesilla Valley. Due to the lighter and more scattered work in the Rincon Valley and to the cost of moving, Draglines No. 5 and 6 were not used on that reach of the project. They are heavy slow machines and in order to

produce economically, require heavy concentrations of earthwork. No work of this nature was available in the Rincon Valley. The following items of work were constructed by all equipment:

Excavation and embankment	13,241,059 cu. yds.
Levee	125.92 miles
Floodway leveled	3296.28 acres
Channel cut-offs	10.00 miles

The periods of construction for the various features of the project are as follows:

Feature	Work Began	Work Completed
101	July 6, 1938	December 18, 1939
201	August 1, 1938	July 1, 1940
301	October 14, 1939	March 20, 1941
401	July 15, 1940	July 1, 1942
501	April 1, 1942	February 15, 1943

TABLES II and III are a summary of the dragline and tractor operations.

Levee Surfacing: The levees throughout the project were surfaced with selected pit run gravel. This material varied from pit to pit depending on the gravel, amount of clay binder and gradation of the gravel in each borrow area. The material was screened and tested by an inspector and if more binder was needed the shovel was moved to clay material, if the gravel was too coarse the shovel operator was again directed to move to a section of the pit where the material came nearer to complying with the specified sizes.

The gravel was loaded by shovel No. 10 into 3-cubic-yard capacity rented dump trucks. They delivered the material to the levee

where it was processed, sprinkled and spread. Two motor graders and three 1000-gallon to 1500-gallon capacity sprinkling trucks were employed in the spreading and wetting operations. Between twenty-five and thirty-five dump trucks were contracted by the Government at an hourly rate for hauling the material to the levees.

Gravel pits were located along the foot hills throughout the project at intervals of about 15 miles. These pits were accessible to the main highways and roads leading to the levees and very few haul distances were over fifteen miles. The quantity of gravel hauled, the cost and unit costs are as follows:

	FEATURE			
	101	201	301	401
Miles	27.16	36.62	30.19	31.95
Quantity Placed	48,389	80,631	59,726	90,442
Cu. Yds. per Station	33.7	41.7	37.5	55.0
Thickness	6"	6"	6"	6"
Cost per Cu. Yd.	.6132	.5711	.5267	.4972
Cost per mile	$ 1,092.47	$ 1,257.42	$ 1,042.08	$ 1,407.51
Total Cost	$29,671.51	46,047.05	31,460.28	44,969.96

SUMMARY OF MECHANICAL ANALYSIS

		FEATURE			
Percent Retained		101	201	301	401
Oversize	2"	.76	0	0	2.2
Rock	¼"	41.2	35.9	35.9	44.7
Fines	No. 8	49.8	47.3	50.5	55.1
Clay-Sand	No. 200	88.8	88.7	88.6	79.6
Binder Passing 200 mesh		11.2	11.3	11.4	20.4

Arroyo Diversions: Two large arroyos, the Jaralosa and the Crow draining a large area south of the Rio Grande empty into the river south of Garfield, New Mexico. They both, according to various estimates, discharge from 15,000 second feet to 20,000 second feet of water. In 1935 the Crow ran heavily, filled the river channel with silt, rock and debris and flooded several hundred acres of valuable farm lands on the north side of the river. As the canalization channel was menaced by the probability of frequent occurances of similar floods, plans were developed diverting these arroyos into areas where they could do little damage to the channel and deposit silt for many years without harming project works.

The Jaralosa was diverted northeasterly into a low-lying bosque area of about 125 acres through a channel 50 feet on the bottom. This channel has a capacity of 2,300 second feet at a four foot depth of water. The grade of the channel is S= .0065 and it was assumed it would wash larger during floods.

The Crow arroyo was diverted to the east into another large bosque area of about 200 acres through a channel 25 feet on the bottom with a grade of S= .003. It was again assumed the channel would cut itself out during floods. The floods in these arroyos during the summer of 1942 cut and scoured the channels considerably over the constructed size. The location of these diversions is shown on Alignment Maps No. 29 and 30.

Structures: The structures on the canalization project were all small. They consisted of 20-ton capacity treated-timber bridges, a few 4' x 4' concrete box culverts with gates to control the backwater, 48", 36", 30" and 24" diameter concrete pipe culverts with automatic drainage gates on the outlet ends, a few corrugated pipe culverts and a number of small timber irrigation structures built in relocated laterals.

The main structures were located in the levees at their intersection with the Reclamation wasteways and drain outlets. Generally bridges were built over the drains and main wasteways where larger water openings were required and the banks of the drain or wasteway built up to prevent flooding of adjacent farm lands by backwater during high floods in the river. The concrete pipe culverts were used on the smaller wasteways and provided with an automatic drainage gate to prevent flooding of lands by backwater.

As the structures were small and scattered up and down the valley they were all built by one small structure crew. Generally the dewatering system was required to build the culverts as the grade of all were below the level of the water table. The piles on the timber bridges were jetted into place rather than being driven. Most of the piling had a penetration of from eight to ten feet.

A summary of the structures built are as follows:

Treated Timber Bridges - all types	29
Concrete Pipe Culverts	49

Major Concrete Structures Drops - 4'x4' Box Culverts - Special 48" Diam. Concrete Pipes	5
Corrugated Metal Culverts, 24", 30" and 42"	5
Timber and concrete checks and turnouts	46
Cattle guards	2

River Bridge Work: The specifications and contract with Kelliher Construction Company for the construction of the nine river bridges specified that the removal of the old bridges and the building of the approaches to the new bridges would be done by the Government.

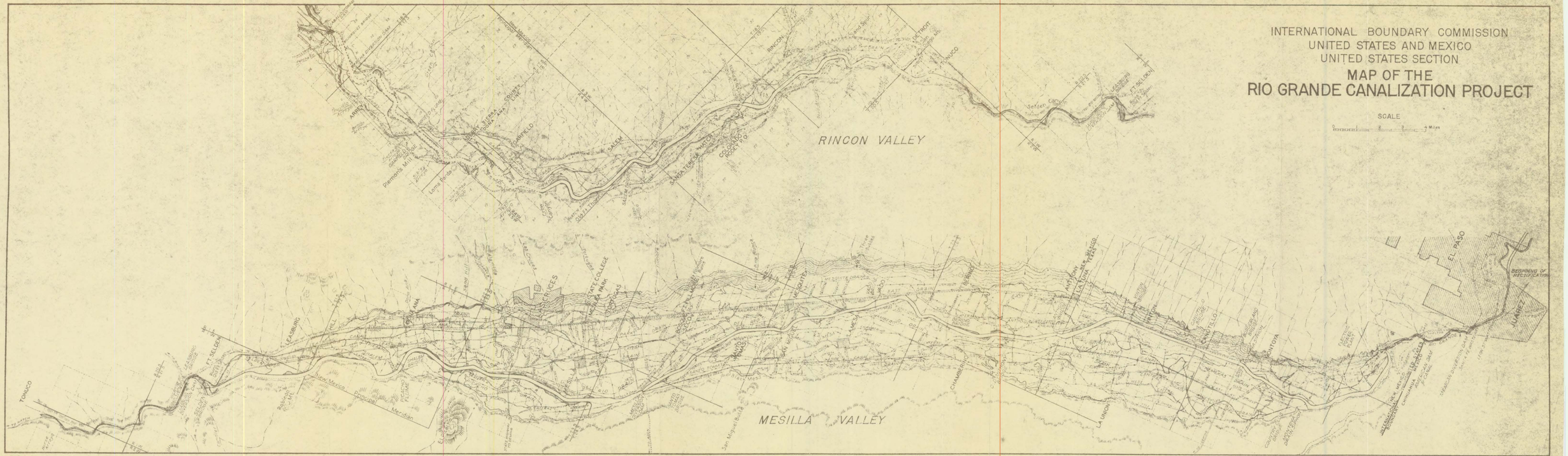
The demolition of the old bridges and the building of the new approaches was usually done at the same time. Generally the floor of the bridge and the superstructure were taken off with a winch truck and a group of laborers. The piling were broken off at the bed of the river, or a foot or so below by pulling with a D-8 Caterpillar tractor.

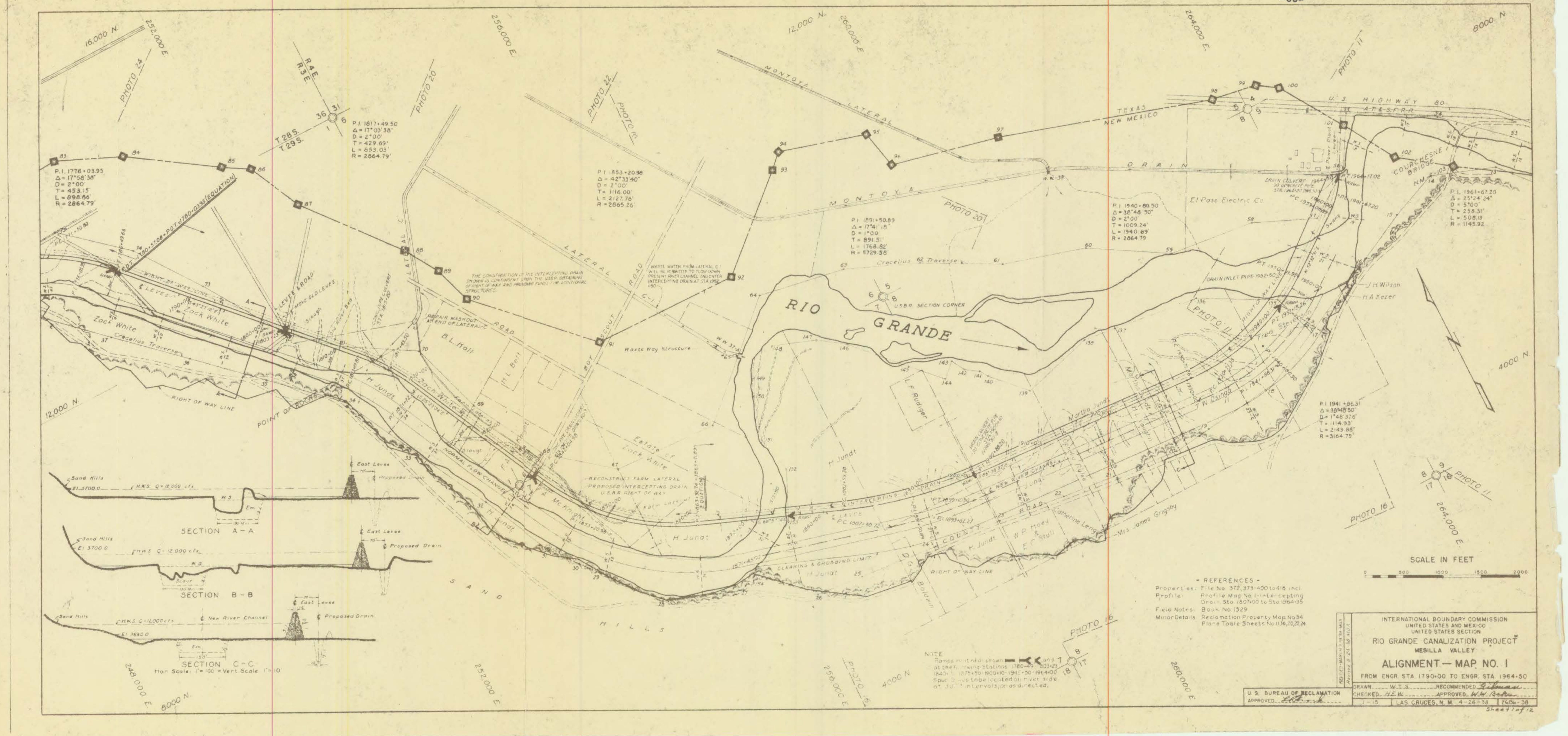
Care was taken to save as much of the good timber as possible, however, the bridges were old, rotten and not much good timber could be salvaged. In all cases the steel trusses were salvaged in reasonably good shape. The total cost of removing the nine old bridges was $2,788.50, an average of $309.80 per bridge. The earthwork cost $3,724.17 for 22,600 cubic yards at 16½ cents per cubic yard. The cost to the Government for each bridge for removal and the building of the approaches was $723.60.

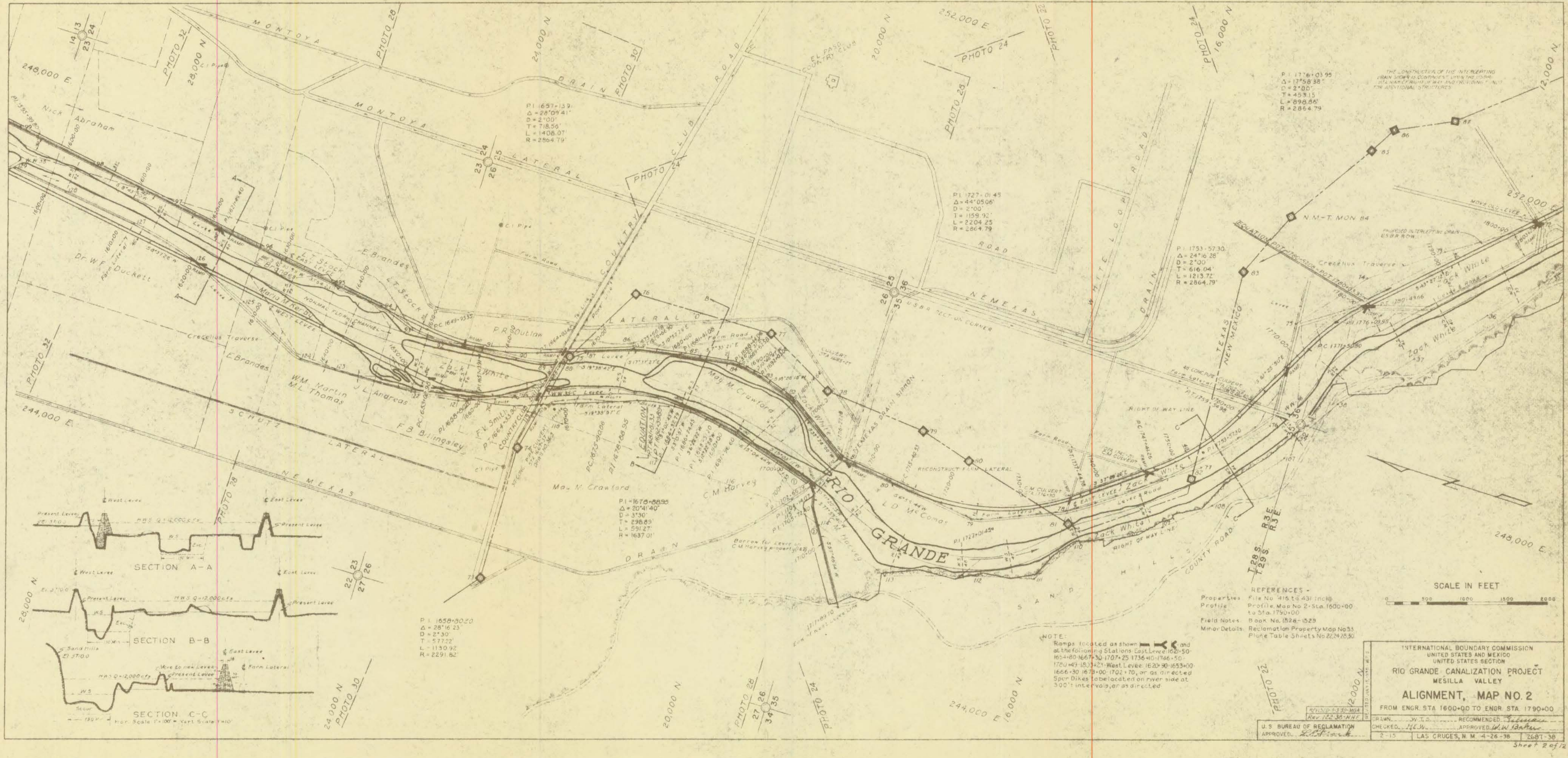
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION

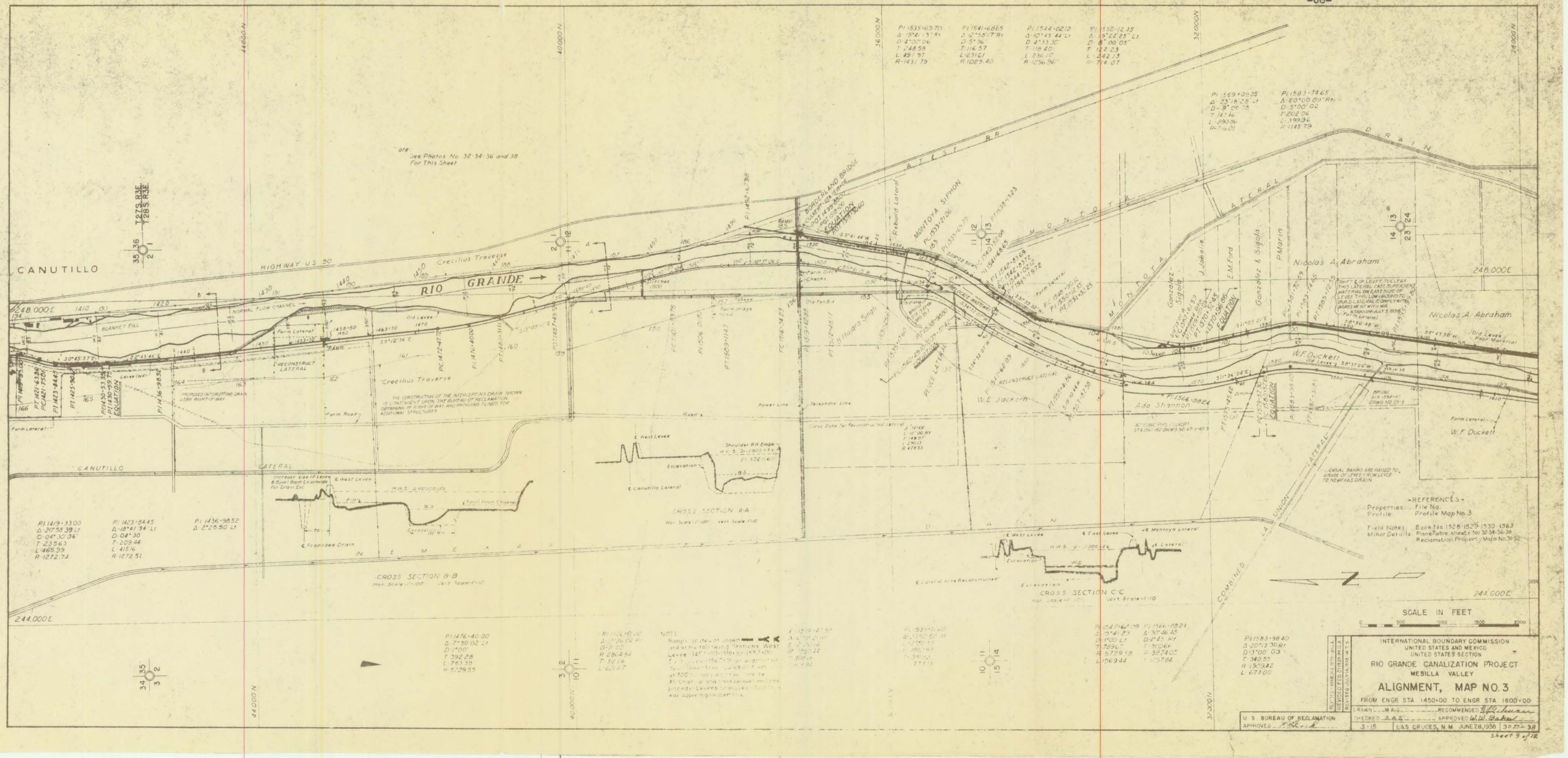
MAP OF THE RIO GRANDE CANALIZATION PROJECT

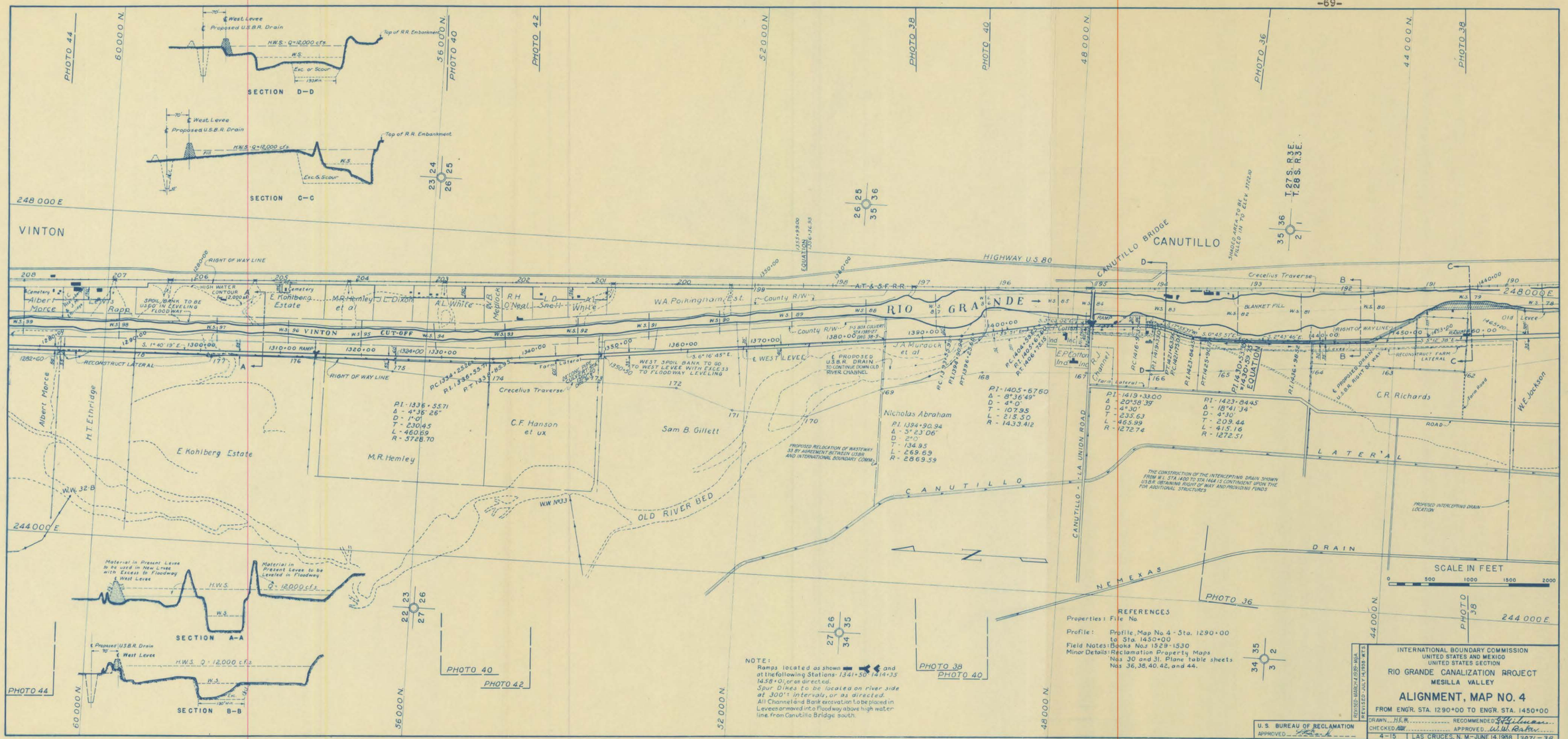
SCALE




RIO GRANDE
MONTOYA LATERAL
MONTOYA DRAIN
LATERAL C
U.S. HIGHWAY 80
TEXAS
NEW MEXICO
COURCHESNE BRIDGE
El Paso Electric Co
USBR SECTION CORNER
SAND HILLS
POINT OF ROCKS
RIGHT OF WAY LINE
NORMAL FLOW CHANNEL
INTERCEPTING DRAIN
NEW RIVER CHANNEL
COUNTY ROAD
CLEARING & GRUBBING LIMIT
BOY SCOUT ROAD
Waste Way Structure
Estate of Zack White
Zack White
Crecelius Traverse
H Jundt
B.L. Hall
L.F. Rudiger
J.H. Wilson
H.A. Kezer
Mrs James Grigsby
Catherine Leng
W.P. Hoey
E.C. Stull
P.I. 1776+03.95 Δ = 17°58'38" D = 2°00' T = 453.15' L = 898.86' R = 2864.79'
P.I. 1817+49.50 Δ = 17°03'38" D = 2°00' T = 429.69' L = 853.03' R = 2864.79'
P.I. 1853+20.98 Δ = 42°33'40" D = 2°00' T = 1116.00' L = 2127.76' R = 2865.26'
P.I. 1891+50.89 Δ = 17°41'18" D = 1°00' T = 891.51' L = 1768.82' R = 5729.58
P.I. 1940+80.50 Δ = 38°48'50" D = 2°00' T = 1009.24' L = 1940.69' R = 2864.79
P.I. 1941+86.31 Δ = 38°48'50" D = 1°48'37.6" T = 1114.93' L = 2143.88' R = 3164.79'
P.I. 1961+67.20 Δ = 25°24'24" D = 5°00' T = 258.31' L = 508.13 R = 1145.92
SECTION A-A
SECTION B-B
SECTION C-C
Hor. Scale: 1" = 100' - Vert. Scale 1" = 10'
SCALE IN FEET
0 500 1000 1500 2000
- REFERENCES -
Properties: File No. 372, 373-400 to 416 incl.
Profile: Profile Map No. 1-Intercepting Drain, Sta. 1807+00 to Sta. 1964+35
Field Notes: Book No. 1529
Minor Details: Reclamation Property Map No 34, Plane Table Sheets No. 11, 16, 20, 22, 24
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT — MAP NO. 1
FROM ENGR. STA. 1790+00 TO ENGR. STA. 1964+50
DRAWN W.T.S. RECOMMENDED Gilman
CHECKED H.E.W. APPROVED W.W. Baker
U.S. BUREAU OF RECLAMATION
APPROVED
1-15
LAS CRUCES, N. M. 4-26-38
2686-38
Sheet 1 of 12


RIO GRANDE
MONTOYA DRAIN
MONTOYA LATERAL
NEMEXAS ROAD
SCHUTZ LATERAL
NEMEXAS DRAIN
COUNTRY CLUB ROAD
EL PASO COUNTRY CLUB
WHITE LOOP ROAD
SAND HILLS
TEXAS
NEW MEXICO
SECTION A-A
SECTION B-B
SECTION C-C
SCALE IN FEET
0 500 1000 1500 2000
REFERENCES -
Properties File No. 416 to 431 Incl.
Profile Profile, Map No. 2 - Sta. 1600+00 to Sta. 1790+00
Field Notes Book No. 1528-1529
Minor Details Reclamation Property Map No. 33. Plane Table Sheets No. 22, 24, 28, 30
NOTE:
Ramps located as shown and at the following Stations: East Levee: 1621+50, 1654+80, 1667+30, 1707+25, 1736+10, 1746+50, 1780+49, 1803+21 - West Levee: 1620+90, 1653+00, 1666+30, 1678+00, 1702+70, or as directed
Spur Dikes to be located on river side at 300'± intervals, or as directed
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 2
FROM ENGR. STA. 1600+00 TO ENGR. STA. 1790+00
DRAWN W.T.S. RECOMMENDED
CHECKED H.E.W. APPROVED W.W. Baker
2-15 LAS CRUCES, N.M. 4-26-38 2687-38
U.S. BUREAU OF RECLAMATION
APPROVED
Rev. 12-2-38-HHF
Sheet 2 of 12


CANUTILLO
HIGHWAY US 80
RIO GRANDE
Crecilius Traverse
NORMAL FLOW CHANNEL
BLANKET FILL
RECONSTRUCT LATERAL
Old Levee
Farm Lateral
PROPOSED INTERCEPTING DRAIN USBR RIGHT-OF-WAY
THE CONSTRUCTION OF THE INTERCEPTING DRAIN SHOWN IS CONTINGENT UPON THE BUREAU OF RECLAMATION OBTAINING OF RIGHT OF WAY AND PROVIDING FUNDS FOR ADDITIONAL STRUCTURES
Farm Road
Road
Power Line
Telephone Line
CANUTILLO LATERAL
BORDERLAND BRIDGE
MONTOYA SIPHON
Rebuild Lateral
A.T.&S.F. RR
MONTOYA LATERAL
MONTOYA
DRAIN
Nicolas A. Abraham
W.F. Duckett
W.E. Jackson
Ada Shannon
Gonzalez Sigala
J. Jabalie
E.M. Ford
Gonzalez & Sigala
P. Marin
B. Hluara Singh
PEACE LATERAL
RECONSTRUCT LATERAL
EQUATION
248,000E
244,000E
44000N
40000N
36000N
32000N
28000N
Note: See Photos No. 32-34-36 and 38 For This Sheet
CROSS SECTION A-A
CROSS SECTION B-B
CROSS SECTION C-C
NEMEXAS DRAIN
COMBINED LATERAL UNION
CANAL BANKS ARE RAISED TO GRADE OF LEVEE FROM LEVEE TO NEMEXAS DRAIN
-REFERENCES-
Properties: File No.
Profile: Profile Map No. 3
Field Notes: Book No. 1528-1529-1530-1563
Minor Details: Planetable sheets No. 32-34-36-38, Reclamation Property Maps No. 31-32
SCALE IN FEET
0 500 1000 1500 2000
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 3
FROM ENGR STA 1450+00 TO ENGR STA 1600+00
DRAWN M.A.G. RECOMMENDED
CHECKED S.A.I. APPROVED W.W. Baker
U.S. BUREAU OF RECLAMATION
APPROVED
3-15
LAS CRUCES, N.M. JUNE 28, 1938
3073-38
Sheet 9 of 12
NOTE



REFERENCES

Properties: File No.

Profile: Profile, Map No. 4 - Sta. 1290+00 to Sta. 1450+00

Field Notes: Books Nos. 1529-1530

Minor Details: Reclamation Property Maps Nos. 30 and 31. Plane table sheets Nos. 36, 38, 40, 42, and 44.

NOTE:
Ramps located as shown and at the following Stations- 1341+50, 1414+35, 1458+01, or as directed.
Spur Dikes to be located on river side at 300'± intervals, or as directed.
All Channel and Bank excavation to be placed in Levees or moved into Floodway above high water line from Canutillo Bridge south.

U. S. BUREAU OF RECLAMATION
APPROVED _____

INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION

RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY

ALIGNMENT, MAP NO. 4

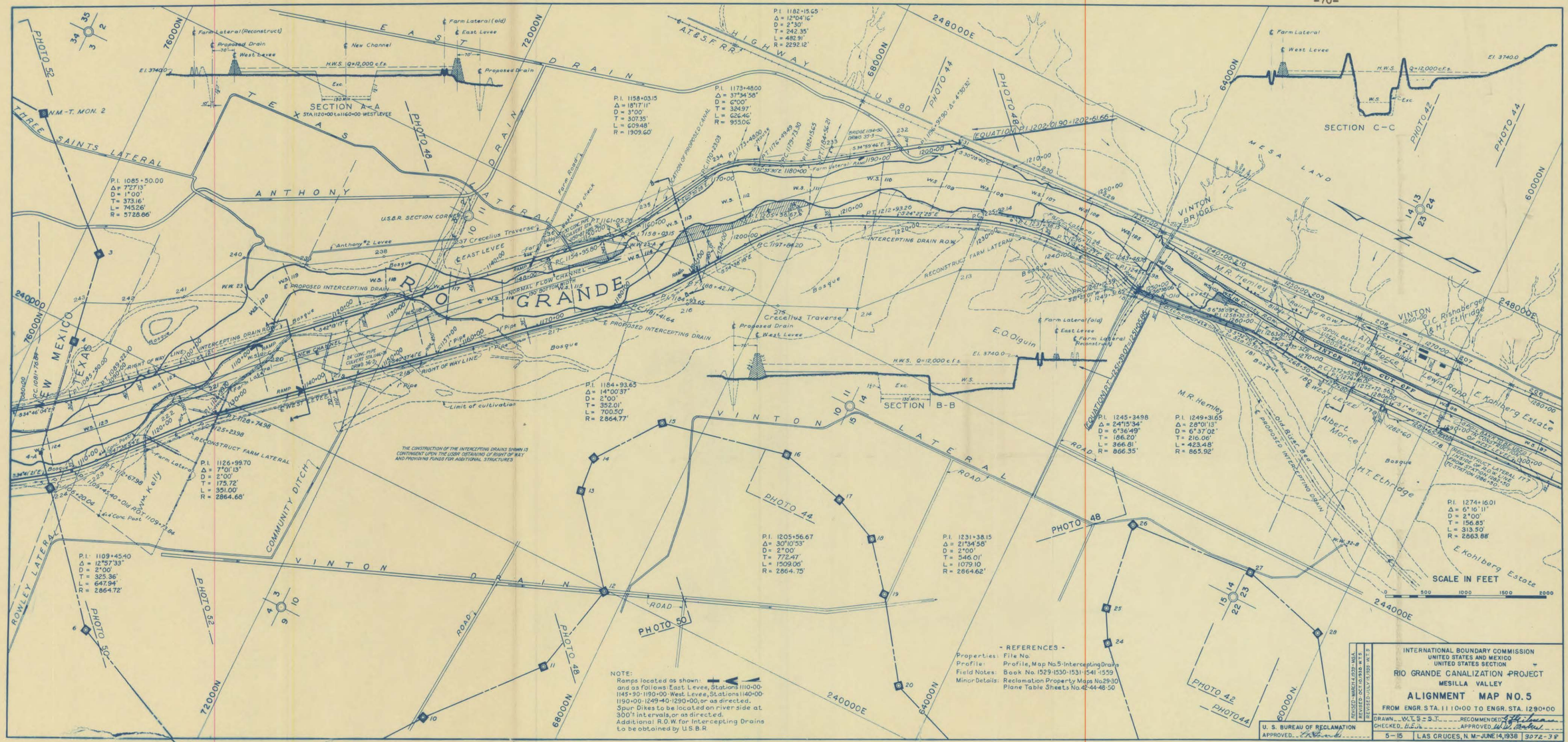
FROM ENG'R. STA. 1290+00 TO ENG'R. STA. 1450+00

REVISED MARCH 4, 1938 - NGA
REVISED JULY 14, 1938 - WTS

DRAWN H.E.W. RECOMMENDED _____
CHECKED _____ APPROVED W.W. Barker

4-15 LAS CRUCES, N. M. - JUNE 14, 1938 3871-38

Sheet 4 of 12



INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION

RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY

ALIGNMENT MAP NO. 5

FROM ENGR. STA. 1110+00 TO ENGR. STA. 1290+00

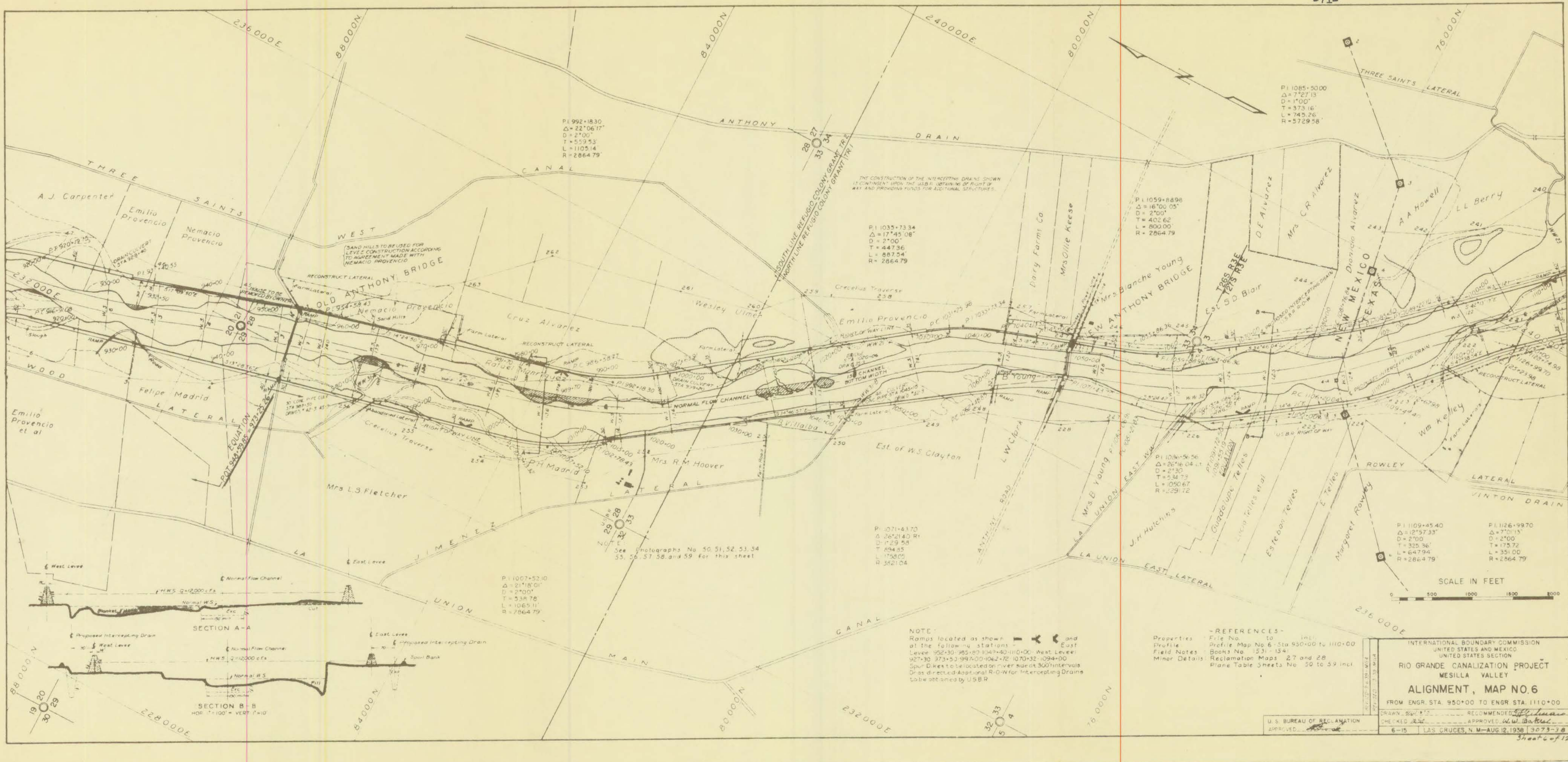
DRAWN W.L.S. - S.T. RECOMMENDED
CHECKED H.E.S. APPROVED H. W. Bashore

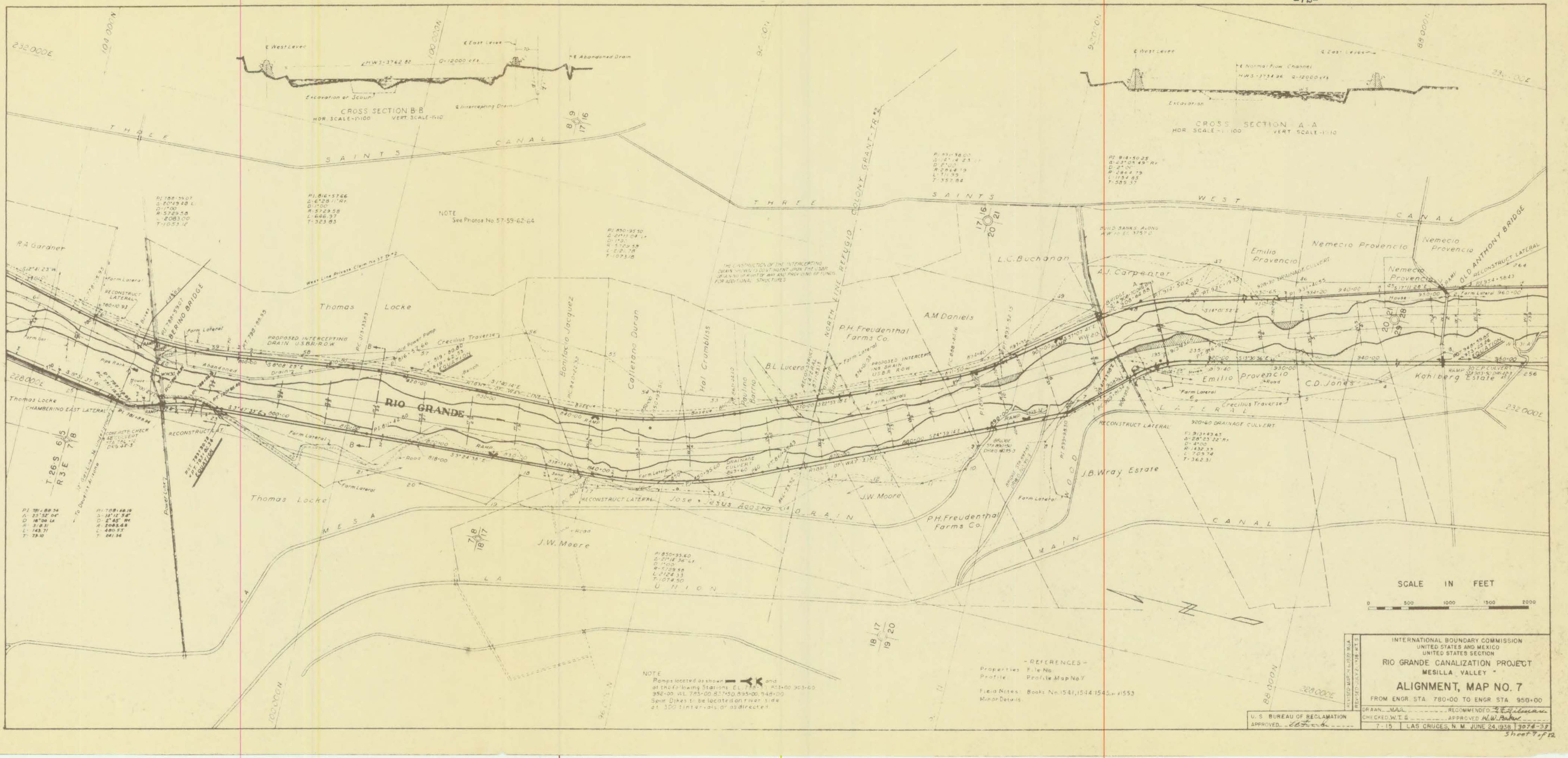
5-15 LAS CRUCES, N.M. JUNE 14, 1938 3072-38

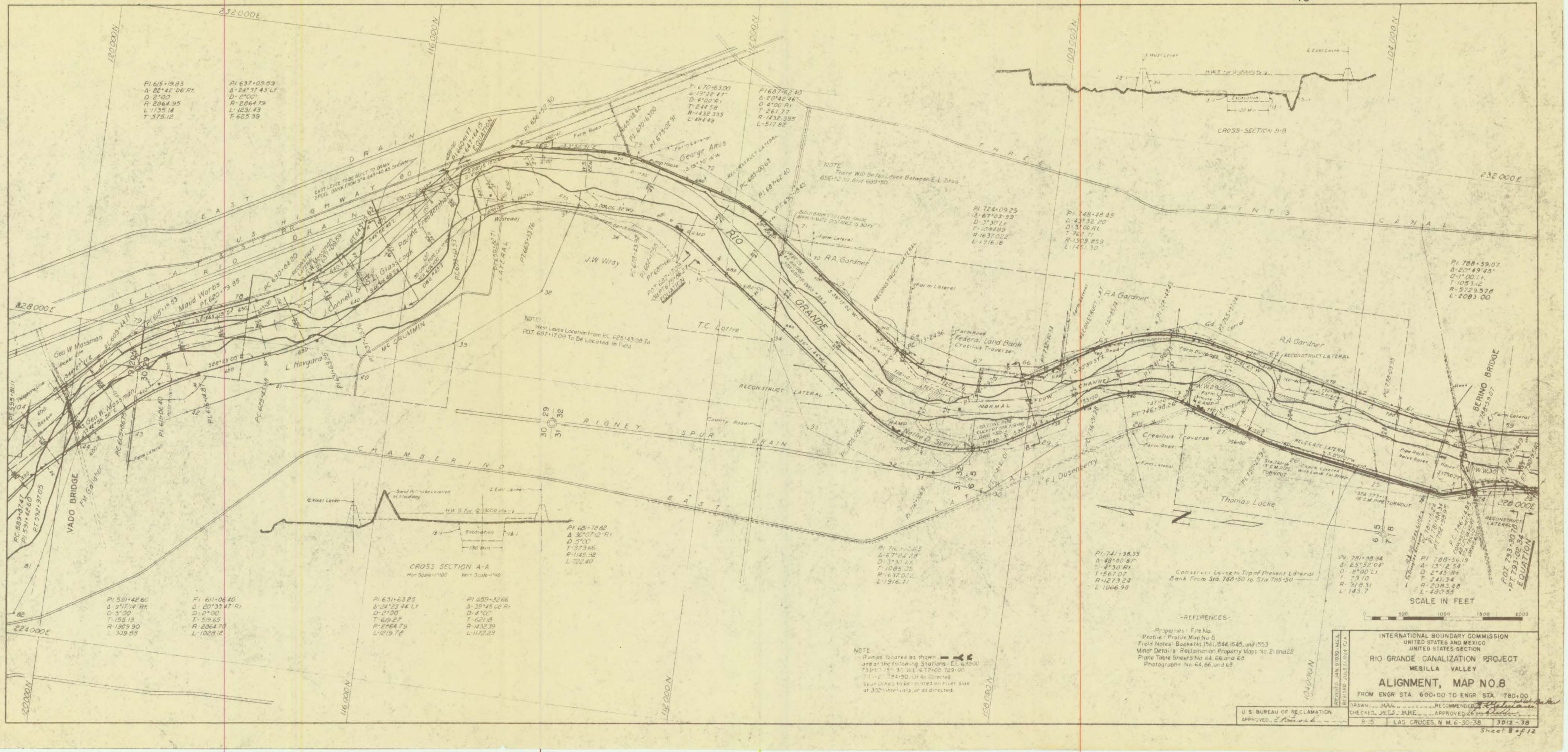
U. S. BUREAU OF RECLAMATION
APPROVED

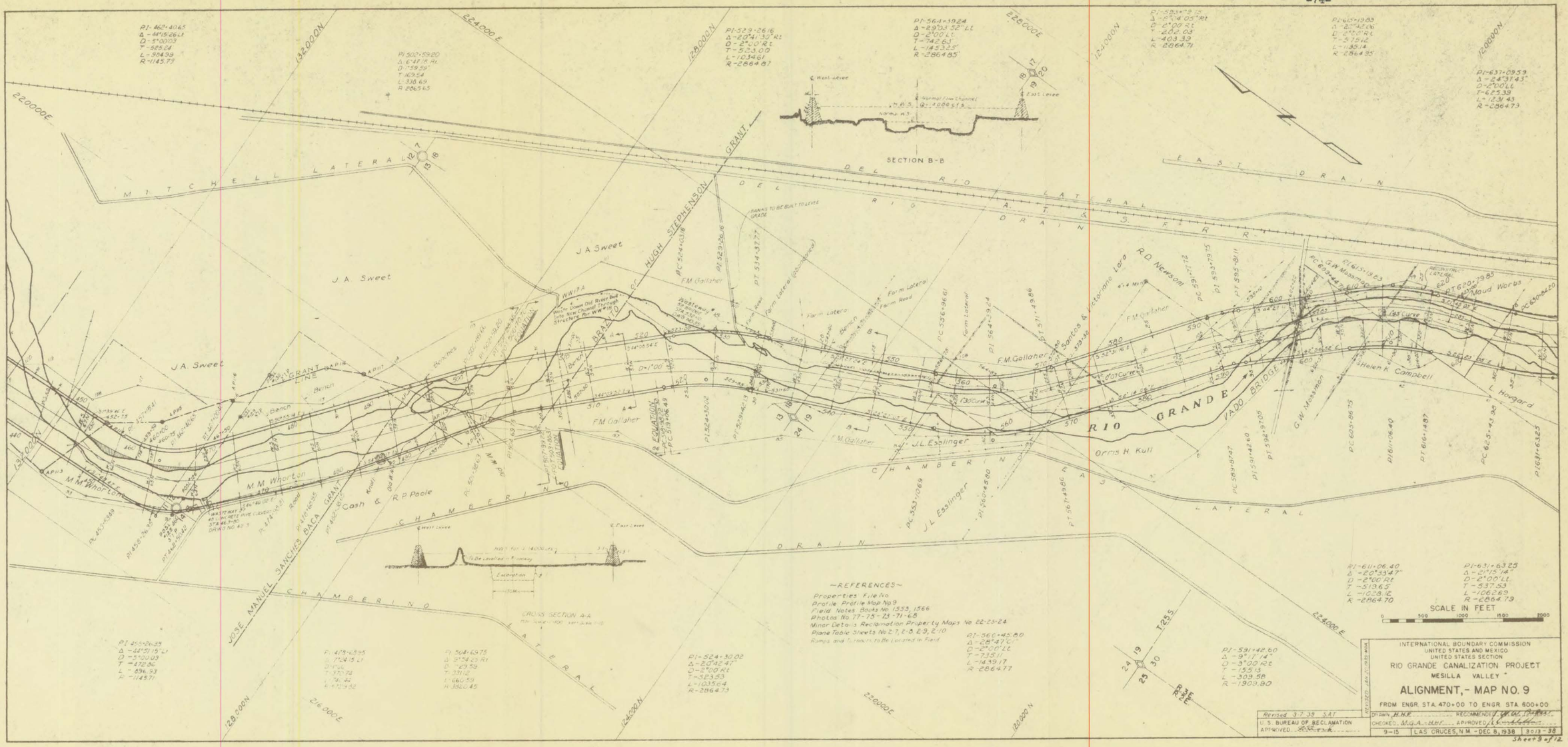
REVISED - MARCH 4, 1939 - W.L.S.
REVISED - OCT. 10, 1938 - W.T.S.
REVISED - JULY 15, 1938 - W.T.S.

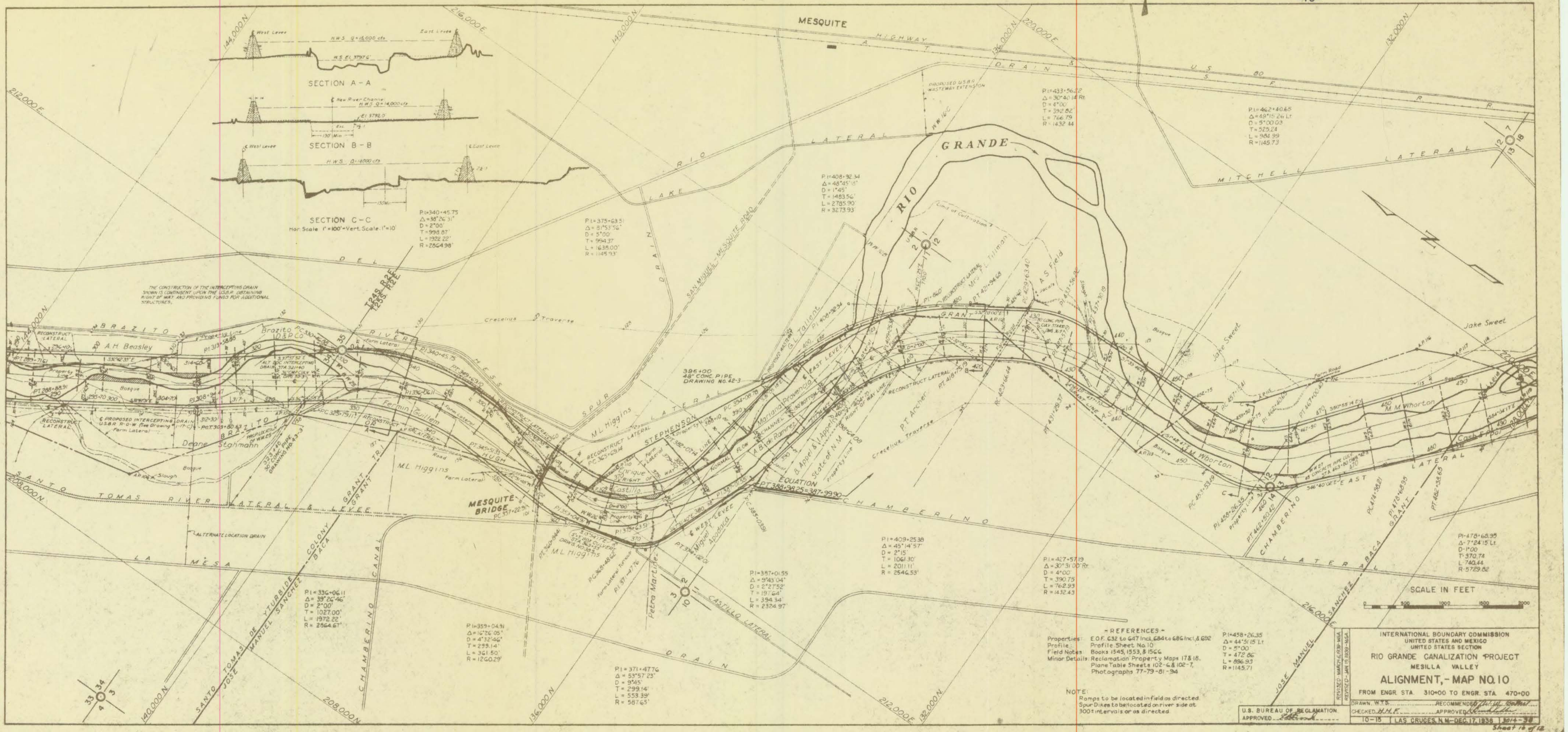
Sheet 5 of 12.

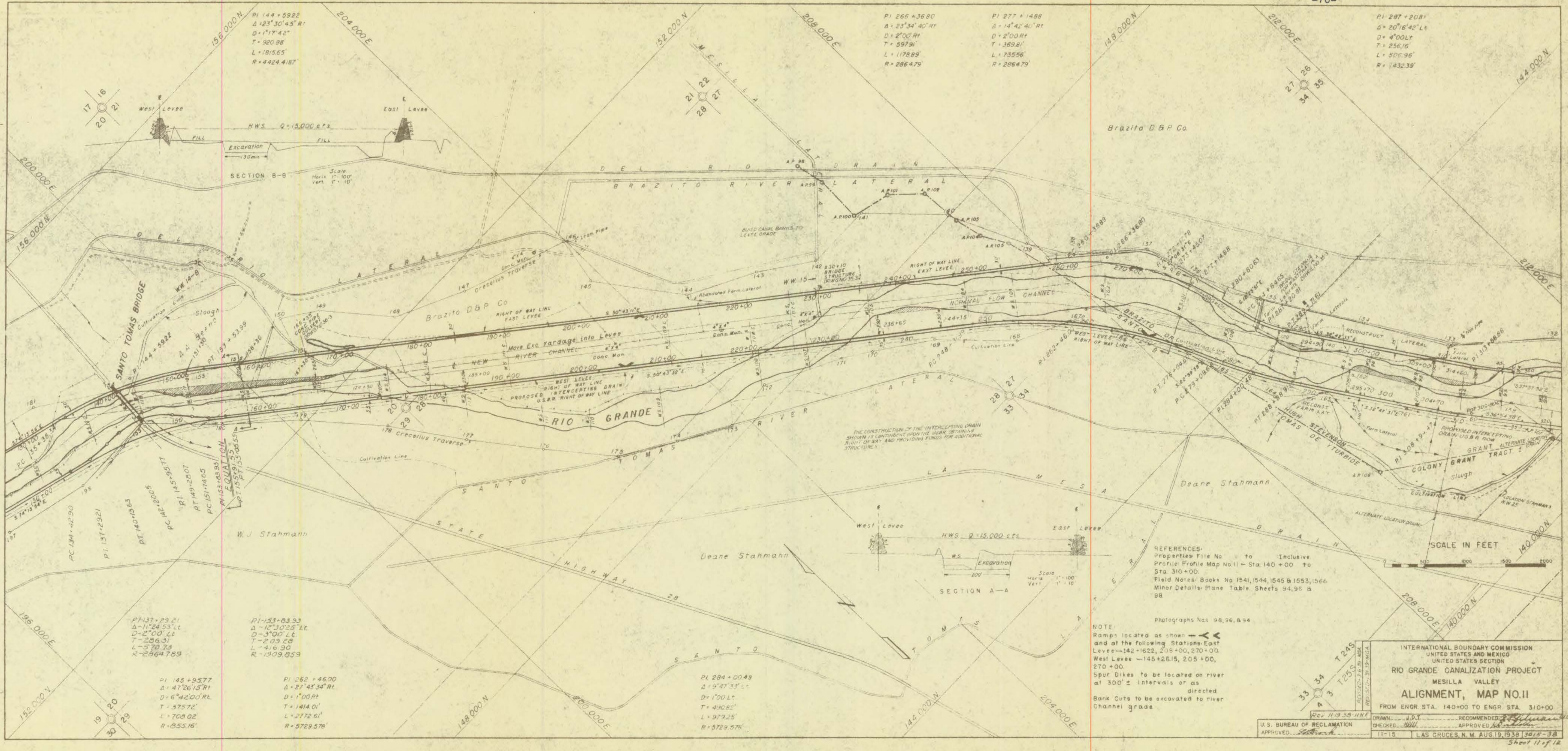

INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 6
FROM ENGR. STA. 950+00 TO ENGR. STA. 1110+00
DRAWN
RECOMMENDED
CHECKED
APPROVED W.W. Baker
6-15
LAS CRUCES, N. M.—AUG. 12, 1938
3073-38
U. S. BUREAU OF RECLAMATION
APPROVED
Sheet 6 of 12
NOTE:
Ramps located as shown and at the following stations - East Levee: 952+30, 985+80, 1049+40, 1110+00. West Levee: 927+30, 973+50, 997+00, 1062+72, 1070+32, 1094+00
Spur Dikes to be located on river side at 300' intervals. Dras directed. Additional R-O-W for Intercepting Drains to be obtained by U.S.B.R.
-REFERENCES-
Properties: File No. to incl.
Profile: Profile Map No. 6 - Sta. 950+00 to 1110+00
Field Notes: Books No. 1531 - 1541
Minor Details: Reclamation Maps 27 and 28
Plane Table Sheets No. 50 to 59 incl.
SCALE IN FEET
0 500 1000 1500 2000
NOTE: See Photographs No. 50, 51, 52, 53, 54, 55, 56, 57, 58, and 59 for this sheet.
THE CONSTRUCTION OF THE INTERCEPTING DRAINS SHOWN IS CONTINGENT UPON THE U.S.B.R. OBTAINING OF RIGHT OF WAY AND PROVIDING FUNDS FOR ADDITIONAL STRUCTURES.
SAND HILLS TO BE USED FOR LEVEE CONSTRUCTION ACCORDING TO AGREEMENT MADE WITH NEMACIO PROVENCIO
OLD ANTHONY BRIDGE
NEW ANTHONY BRIDGE
NEW MEXICO
TEXAS
THREE SAINTS CANAL
WEST LATERAL
ANTHONY DRAIN
THREE SAINTS LATERAL
WOOD LATERAL
JIMENEZ LATERAL
LA UNION MAIN CANAL
LA UNION EAST LATERAL
ROWLEY LATERAL
VINTON DRAIN
NORMAL FLOW CHANNEL
SOUTH LINE REFUGIO COLONY GRANT TR. 2
NORTH LINE REFUGIO COLONY GRANT TR. 1
EQUATION POT 944+59.85 = 973+25.36
T26S R3E
T27S R3E
P.I. 992+18.30 Δ = 22°06'17" D = 2°00' T = 559.53 L = 1105.14 R = 2864.79
P.I. 1007+52.10 Δ = 21°18'01" D = 2°00' T = 538.78 L = 1065.11 R = 2864.79
P.I. 1035+73.34 Δ = 17°45'08" D = 2°00' T = 447.36 L = 887.54 R = 2864.79
P.I. 1059+88.98 Δ = 16°00'05" D = 2°00' T = 402.62 L = 800.00 R = 2864.79
P.I. 1071+43.70 Δ = 26°21'40" R D = 1°29.58 T = 894.65 L = 1758.05 R = 3821.04
P.I. 1085+50.00 Δ = 7°27'13" D = 1°00' T = 373.16 L = 745.26 R = 5729.58
P.I. 1108+56.56 Δ = 26°16'04" D = 2°30 T = 534.73 L = 1050.67 R = 2291.72
P.I. 1109+45.40 Δ = 12°57'33" D = 2°00' T = 325.36 L = 647.94 R = 2864.79
P.I. 1126+99.70 Δ = 7°01'13" D = 2°00' T = 175.72 L = 351.00 R = 2864.79
SECTION A-A
West Levee
Normal Flow Channel
East Levee
H.W.S. Q=12,000 c.f.s.
Normal W.S.
SECTION B-B
HOR. 1" = 100' VERT. 1" = 10'
Proposed Intercepting Drain
Spoil Bank
A. J. Carpenter
Emilio Provencio
Nemacio Provencio
Felipe Madrid
Emilio Provencio et al
Cruz Alvarez
Rafael Manriquez
Wesley Ulmer
Crecelius Traverse
Mrs. L. S. Fletcher
P. H. Madrid
Mrs. R. M. Hoover
B. Villalba
Est. of W. S. Clayton
L. W. Clark
Dairy Farms Co.
Mrs. Ollie Keese
Mrs. Blanche Young
B. Young
Mrs. B. Young
Est. S. D. Blair
D. E. Alvarez
Mrs. C. R. Alvarez
Dionicio Alvarez
A. A. Howell
L. L. Berry
J. H. Hutchins
Guadalupe Telles
Lucia Telles et al
Esteban Telles
E. Telles
Margaret Rowley
Wm. Kelley
236000E
240000E
232000E
228000E
88000N
84000N
80000N
76000N

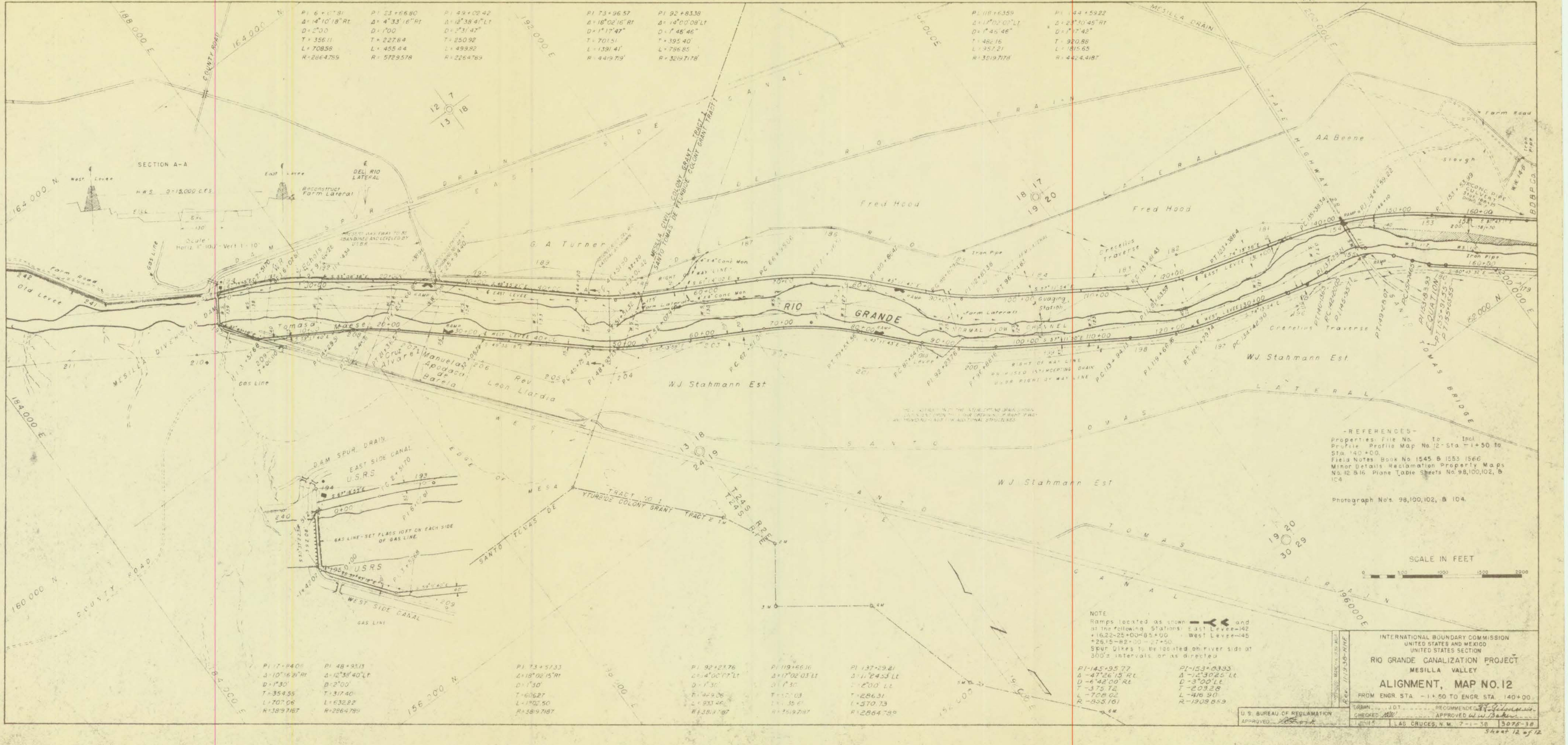

CROSS SECTION B-B
HOR. SCALE-1:100 VERT. SCALE-1:10
CROSS SECTION A-A
HOR. SCALE-1:100 VERT. SCALE-1:10
THREE SAINTS CANAL
THREE SAINTS WEST CANAL
NOTE
See Photos No. 57-59-62-64
RIO GRANDE
BERINO BRIDGE
OLD ANTHONY BRIDGE
CHAMBERINO EAST LATERAL
MESA DRAIN
MAIN CANAL
LA UNION
Thomas Locke
R.A. Gardner
Bonifacio Jacquez
Cayetano Duran
Hal Crumbliss
B.L. Lucero
P.H. Freudenthal Farms Co.
A.M. Daniels
L.C. Buchanan
A.J. Carpenter
Emilio Provencio
Nemecio Provencio
C.D. Jones
Kahlberg Estate
J.B. Wray Estate
J.W. Moore
NORTH LINE REFUGIO COLONY GRANT
RECONSTRUCT LATERAL
PROPOSED INTERCEPTING DRAIN U.S.B.R. ROW
T.26 S. R.3 E.
SCALE IN FEET
0 500 1000 1500 2000
NOTE
Ramps located as shown and at the following Stations
Spur Dikes to be located on river side at 300 ft intervals or as directed
- REFERENCES -
Properties File No.
Profile Profile Map No. 7
Field Notes Books No. 1541, 1544, 1545, 1553
Minor Details
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 7
FROM ENGR. STA. 780+00 TO ENGR. STA. 950+00
DRAWN MAG RECOMMENDED
CHECKED W.T.S. APPROVED W.W. Baker
U. S. BUREAU OF RECLAMATION
APPROVED
7-15 LAS CRUCES, N. M. JUNE 24, 1938 3074-38
Sheet 7 of 12

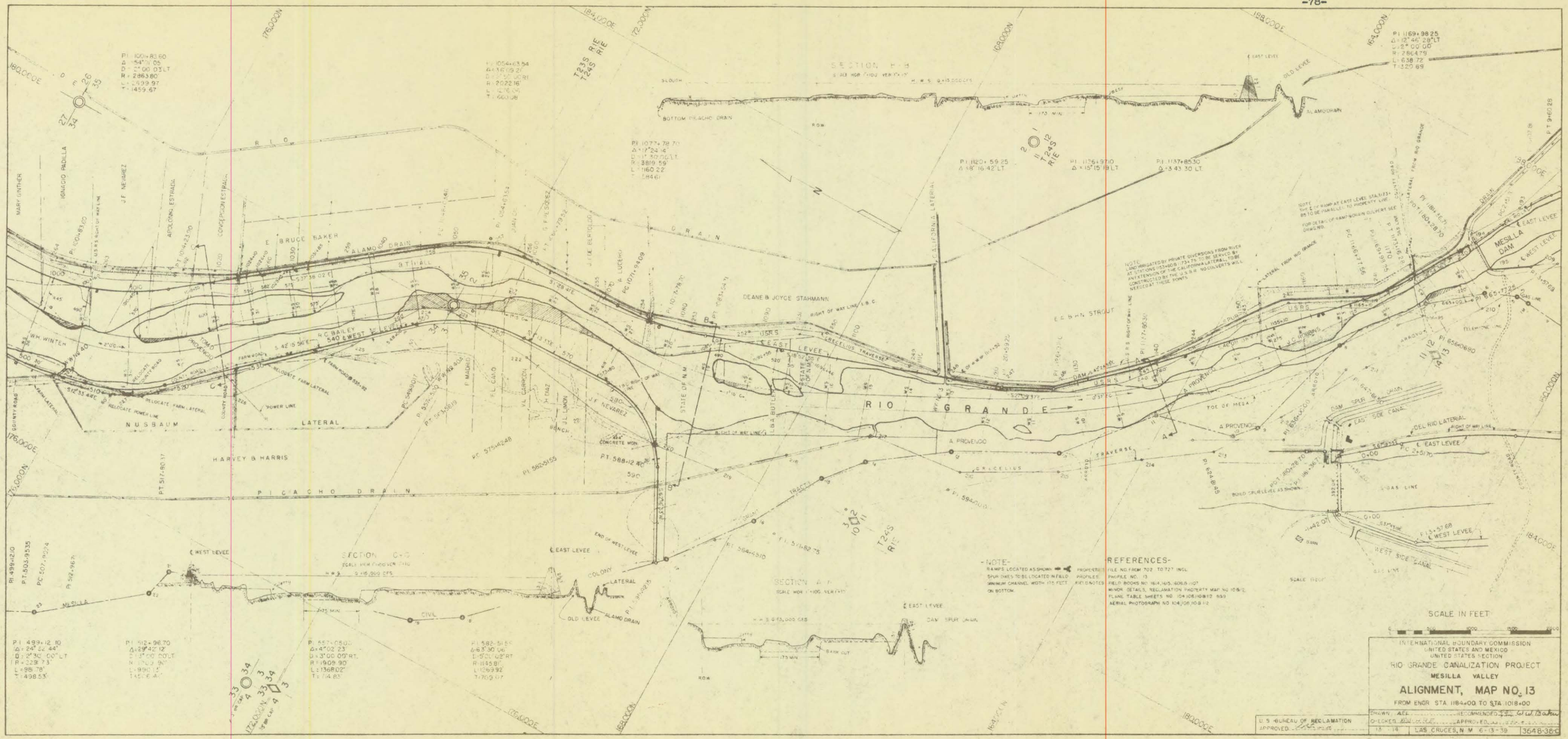

CROSS SECTION B-B
CROSS SECTION A-A
VADO BRIDGE
BERINO BRIDGE
RIO GRANDE
EAST DRAIN
THREE SAINTS CANAL
RIGNEY SPUR DRAIN
CHAMBERINO EAST LATERAL
DEL RIO LATERAL
SCALE IN FEET
-REFERENCES-
Properties: File No.
Profile: Profile Map No. 8
Field Notes: Books No. 1541, 1544, 1545, and 1553
Minor Details: Reclamation Property Maps No. 21 and 22
Plane Table Sheets No. 64, 66, and 68
Photographs No. 64, 66, and 68
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 8
FROM ENGR STA. 600+00 TO ENGR. STA. 780+00
U.S. BUREAU OF RECLAMATION
LAS CRUCES, N.M. 6-30-38
3D12-38
Sheet 8 of 12

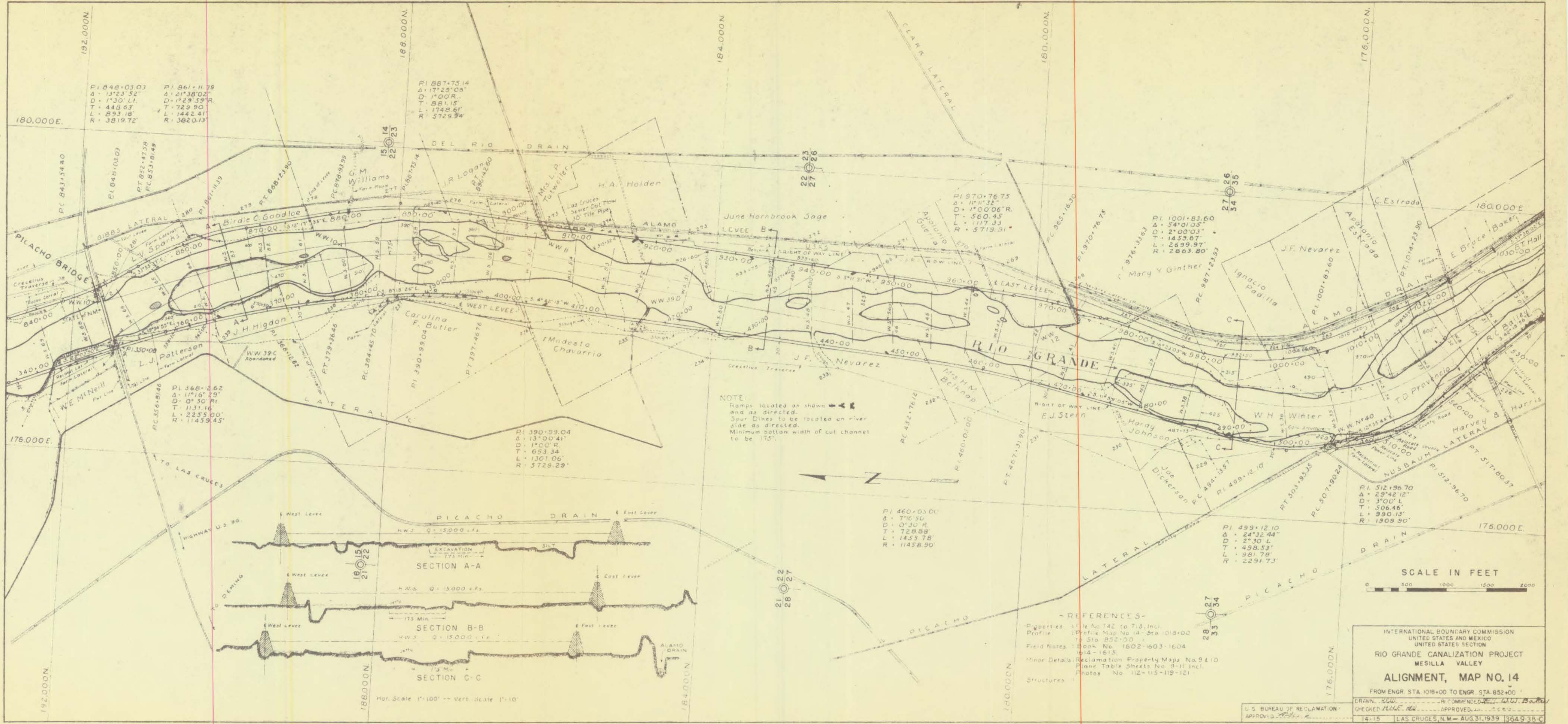

MITCHELL LATERAL
DEL RIO ATASCOSA FARR DRAIN
EAST DRAIN
GRANT
STEPHENSON
BRALIO
RIO GRANDE
VADO BRIDGE
CHAMBERINO
EAST LATERAL
DRAIN
JOSE MANUEL SANCHES BACA GRANT
EQUATION
J A Sweet
F M Gallaher
M M Whorton
R P Poole
Cash &
J L Esslinger
Orris H Kull
Santos & Victorians Lara
R D Nenson
G W Mossman
Helen K Campbell
L Hovgard
Maud Words
SECTION B-B
CROSS SECTION A-A
SCALE IN FEET
0 500 1000 1500 2000
REFERENCES
Properties File No.
Profile Profile Map No 9
Field Notes Books No 1553, 1566
Photos No 77-75-73-71-68
Minor Details Reclamation Property Maps No 22-23-24
Plane Table Sheets No 2-1, 2-8, 2-9, 2-10
Ramps and turnouts to be Located in Field
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, - MAP NO. 9
FROM ENGR. STA. 470+00 TO ENGR. STA. 600+00
Drawn H.N.R. Recommended
Checked M.G.A. - E.H.C. Approved
U. S. BUREAU OF RECLAMATION
Approved
Revised 3-7-39 S.A.T.
9-15 LAS CRUCES, N.M. - DEC 8, 1938 30 13 - 38
Sheet 9 of 12

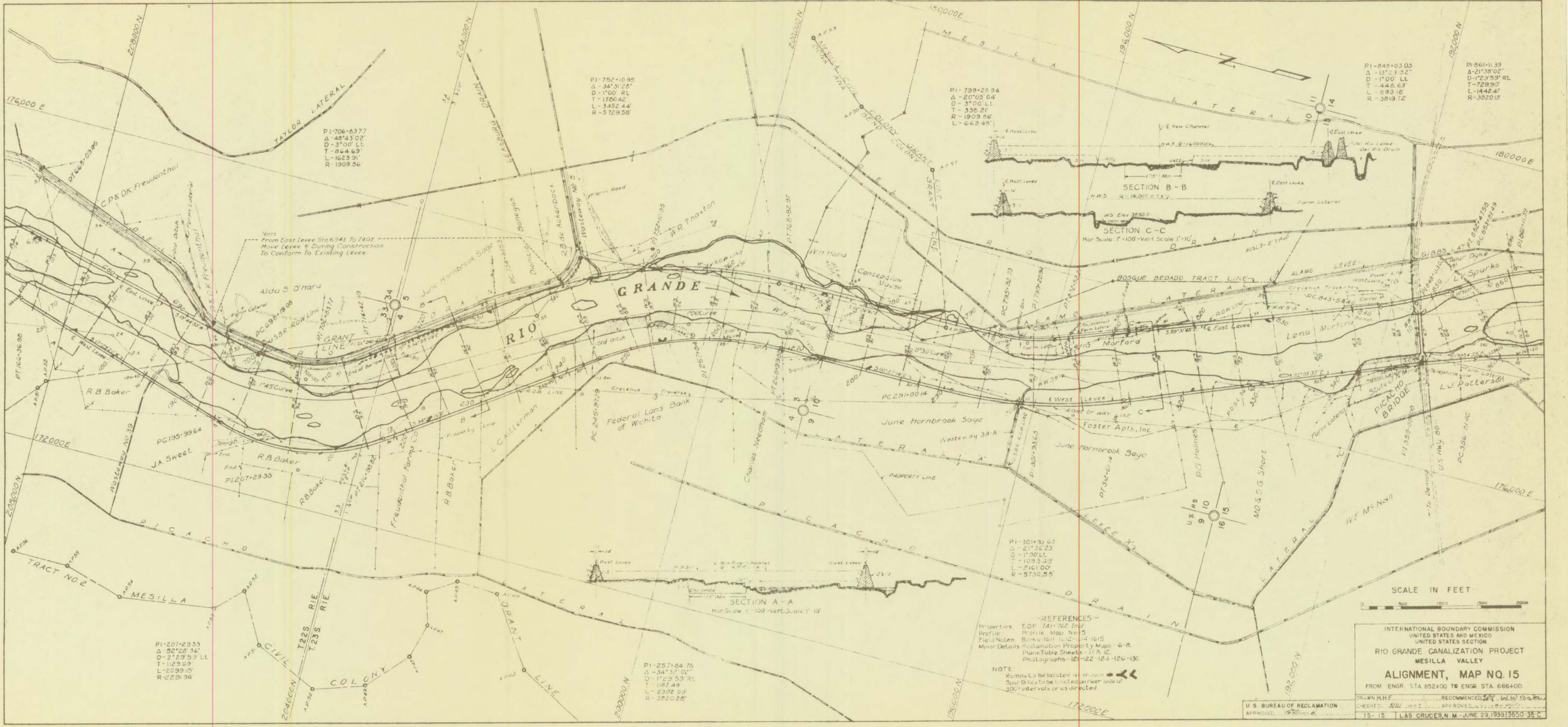

MESQUITE
HIGHWAY
DRAIN
U.S. 80
RIO GRANDE
RIO LAKE LATERAL
MITCHELL LATERAL
DEL RIO
SECTION A-A
SECTION B-B
SECTION C-C
Hor. Scale 1" = 100' - Vert. Scale 1" = 10'
BRAZITO RIVER
SPUR LATERAL
SAN MIGUEL-MESQUITE ROAD
SANTO TOMAS RIVER LATERAL & LEVEE
MESQUITE BRIDGE
EQUATION
CHAMBERINO
LA MESA
CASTILLO LATERAL
DRAIN
CHAMBERINO CANAL
GRANT
STEPHENSON
A.H. Beasley
M.L. Higgins
M.M. Whorton
Jake Sweet
T.24S. R.2E.
T.25S. R.2E.
THE CONSTRUCTION OF THE INTERCEPTING DRAIN SHOWN IS CONTINGENT UPON THE U.S.B.R. OBTAINING RIGHT OF WAY AND PROVIDING FUNDS FOR ADDITIONAL STRUCTURES.
P.I.=336+06.11
P.I.=340+45.75
P.I.=359+04.91
P.I.=371+47.76
P.I.=375+63.51
P.I.=387+01.55
P.I.=408+92.34
P.I.=409+25.38
P.I.=427+57.19
P.I.=433+56.22
P.I.=458+26.35
P.I.=462+40.65
P.I.=478+68.95
SCALE IN FEET
0 500 1000 1500 2000
- REFERENCES -
Properties: E.O.F. 632 to 647 Incl, 684 to 686 Incl, & 692
Profile: Profile Sheet No. 10
Field Notes: Books 1545, 1553, & 1566
Minor Details: Reclamation Property Maps 17 & 18, Plane Table Sheets 102-6 & 102-7, Photographs 77-79-81-94
NOTE:
Ramps to be located in field as directed.
Spur Dikes to be located on river side at 300± intervals or as directed.
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, - MAP NO. 10
FROM ENGR. STA. 310+00 TO ENGR. STA. 470+00
REVISED - MARCH 6, 1939 - M.G.A.
REVISED - JAN 19, 1939 - M.G.A.
DRAWN W.T.S.
RECOMMENDED
CHECKED H.H.F.
APPROVED
U.S. BUREAU OF RECLAMATION
APPROVED
10-15
LAS CRUCES, N.M. - DEC. 17, 1938
3014-38
Sheet 10 of 12

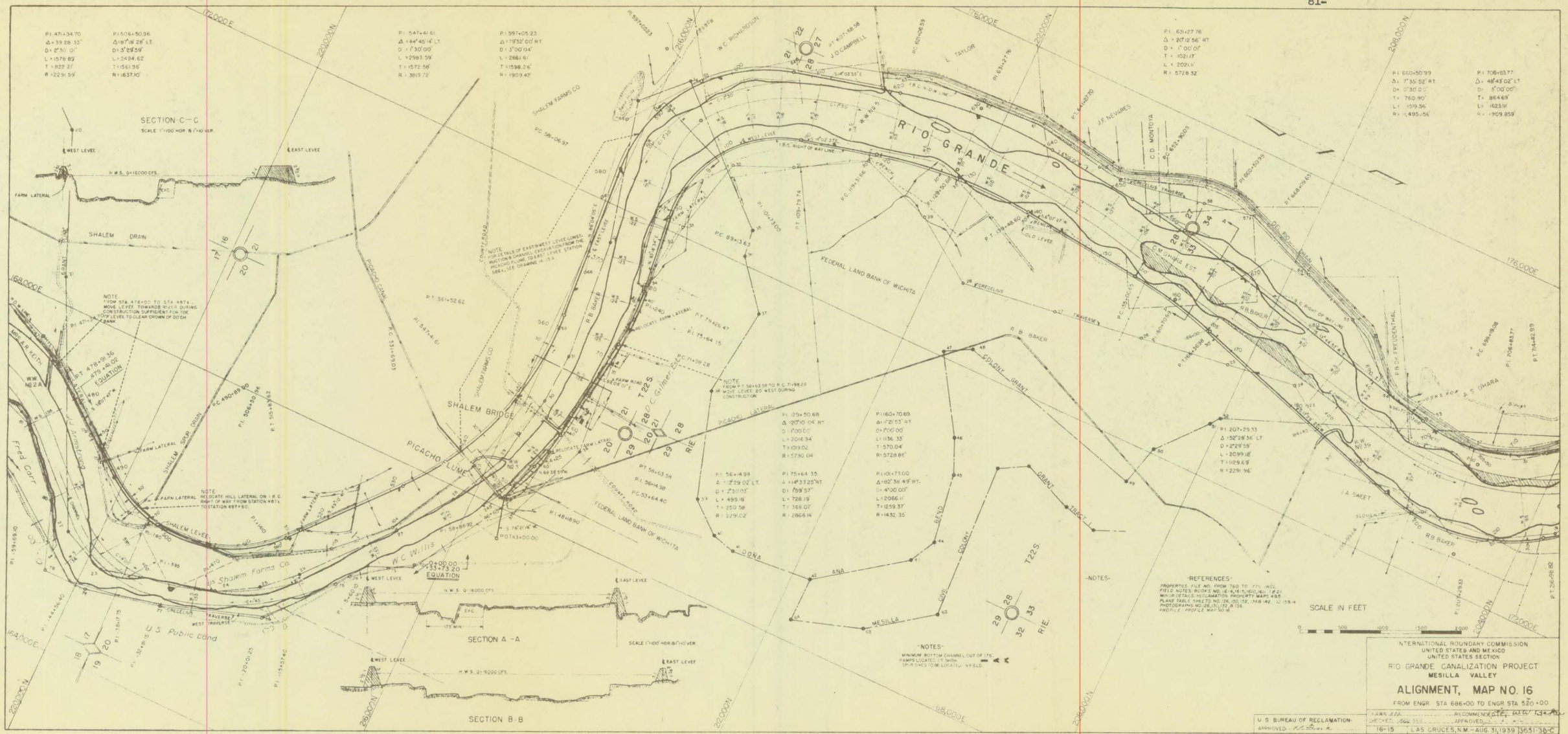

P.I. 144 + 59.22
Δ = 23°30'45" Rt
D = 1°17'42"
T = 920.88
L = 1815.65
R = 4424.4167
P.I. 266 + 36.80
Δ = 23°34'40" Rt
D = 2°00' Rt
T = 597.91
L = 1178.89
R = 2864.79
P.I. 277 + 14.88
Δ = 14°42'41" Rt
D = 2°00' Rt
T = 369.81
L = 735.56
R = 2864.79
P.I. 287 + 20.81
Δ = 20°16'42" Lt
D = 4°00' Lt
T = 256.16
L = 506.96
R = 1432.39
West Levee
East Levee
H.W.S. Q = 15,000 c.f.s.
Excavation
SECTION B-B
Brazito D.&P. Co.
DEL RIO DRAIN
BRAZITO RIVER LATERAL
MESILLA
SANTO TOMAS BRIDGE
NEW RIVER CHANNEL
Move Exc. Yardage into Levee
RIGHT OF WAY LINE EAST LEVEE
WEST LEVEE RIGHT OF WAY LINE
PROPOSED INTERCEPTING DRAIN U.S.B.R. RIGHT OF WAY LINE
RIO GRANDE
NORMAL FLOW CHANNEL
Crecelius Traverse
Cultivation Line
Slough
Abandoned Farm Lateral
RECONSTRUCT LATERAL
SANTO TOMAS RIVER LATERAL
HUGH STEVENSON
TOMAS DE ITURBIDE
COLONY GRANT TRACT 1
PROPOSED INTERCEPTING DRAIN U.S.B.R.
ALTERNATE LOCATION DRAIN
THE CONSTRUCTION OF THE INTERCEPTING DRAIN SHOWN IS CONTINGENT UPON THE U.S.B.R. OBTAINING RIGHT OF WAY AND PROVIDING FUNDS FOR ADDITIONAL STRUCTURES.
LA MESA DRAIN
SANTO TOMAS LATERAL
STATE HIGHWAY 28
W.J. Stahmann
Deane Stahmann
SECTION A-A
SCALE IN FEET
0 500 1000 1500 2000
REFERENCES:
Properties: File No. to Inclusive.
Profile: Profile Map No. 11 – Sta. 140 + 00 to Sta. 310 + 00.
Field Notes: Books No. 1541, 1544, 1545 & 1553, 1566
Minor Details: Plane Table Sheets 94, 96 & 98
Photographs Nos. 98, 96, & 94
NOTE:
Ramps located as shown and at the following Stations: East Levee – 142+16.22, 208+00, 270+00. West Levee – 145+26.15, 205+00, 270+00.
Spur Dikes to be located on river at 300' ± intervals or as directed.
Bank Cuts to be excavated to river Channel grade.
P.I. 137 + 29.21
Δ = 11°24'53" Lt
D = 2°00' Lt
T = 286.31
L = 570.73
R = 2864.789
P.I. 153 + 83.93
Δ = 12°30'25" Lt
D = 3°00' Lt
T = 209.28
L = 416.90
R = 1909.859
P.I. 145 + 95.77
Δ = 47°26'15" Rt
D = 6°42'00" Rt
T = 375.72
L = 708.02
R = 855.16
P.I. 262 + 46.00
Δ = 27°43'34" Rt
D = 1°00' Rt
T = 1414.01
L = 2772.61
R = 5729.578
P.I. 284 + 00.43
Δ = 9°47'33" Lt
D = 1°00' Lt
T = 490.82
L = 979.25
R = 5729.578
T 24 S
T 25 S
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 11
FROM ENGR. STA. 140+00 TO ENGR. STA. 310+00
Rev 11-19-38 H.H.F.
DRAWN J.D.T.
RECOMMENDED
CHECKED
APPROVED
U.S. BUREAU OF RECLAMATION
APPROVED
11-15
LAS CRUCES, N. M. AUG. 19, 1938
3015-38
Sheet 11 of 12

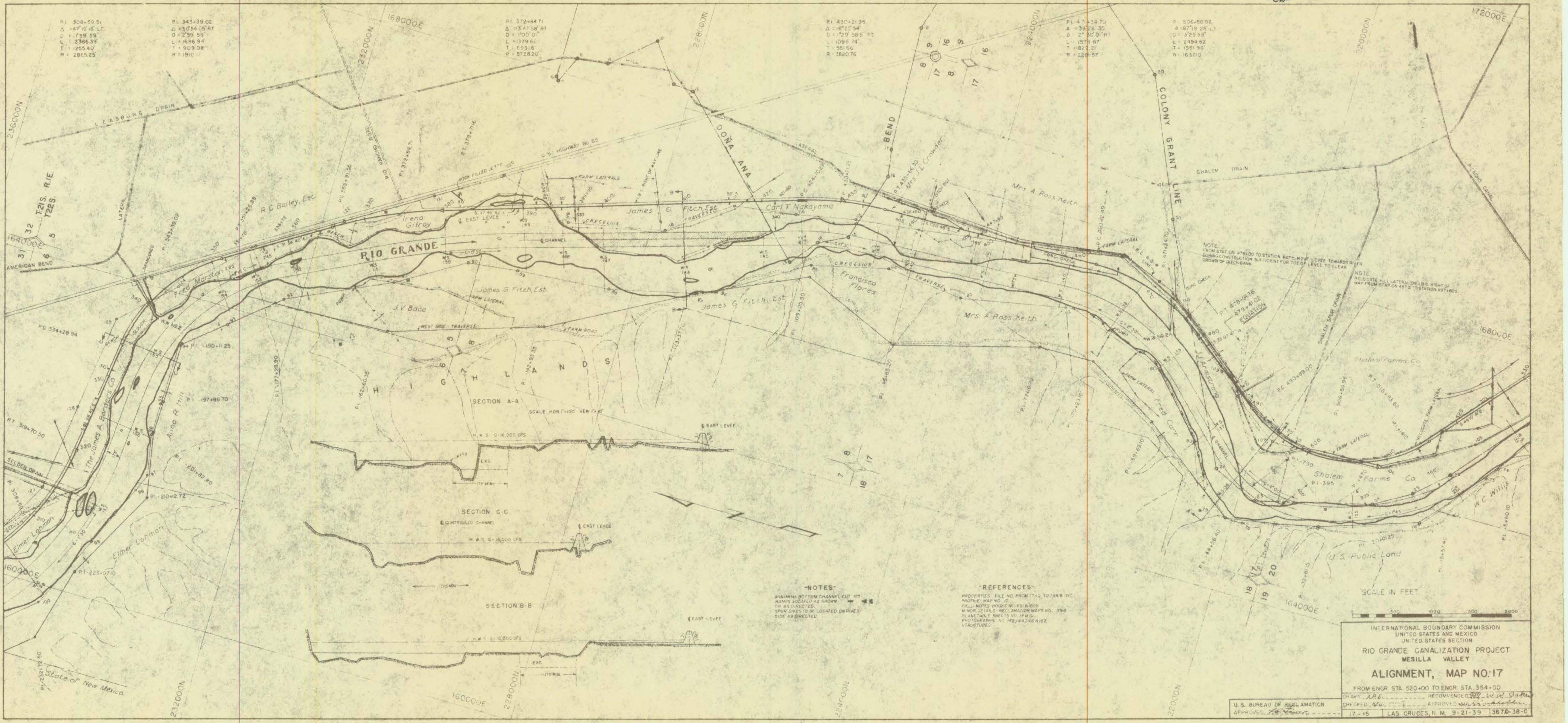

RIO GRANDE
SECTION A-A
Fred Hood
G A Turner
W.J. Stahmann Est
Tomasa Maese
Leon Llardia
AA Beene
Mesilla Diversion Dam
East Levee
West Levee
Farm Road
Old Levee
Gas Line
Gauging Station
Crecelius Traverse
DAM SPUR DRAIN
EAST SIDE CANAL
WEST SIDE CANAL
U.S.R.S.
GAS LINE - SET PLASS 10FT ON EACH SIDE OF GAS LINE
STATE HIGHWAY
TOMAS BRIDGE
SCALE IN FEET
0 500 1000 1500 2000
-REFERENCES-
Properties: File No. to Incl.
Profile: Profile Map No. 12 - Sta. -1+50 to Sta. 140+00.
Field Notes: Book No. 1545 & 1553 1566
Minor Details: Reclamation Property Maps No. 12 & 16 Plane Table Sheets No. 98,100,102, & 104
Photograph No's. 98,100,102, & 104.
NOTE
Ramps located as shown and at the following Stations: East Levee -142 +16.22-25+00-85+00 West Levee -145 +26.15-82+00-27+50
Spur Dikes to be located on river side at 300'± intervals, or as directed.
PI-145+95.77
Δ -47°26'15" Rt
D -6°42'00" Rt
T -375.72
L -708.02
R -855.161
PI-153+83.93
Δ -12°30'25" Lt
D -3°00' Lt
T -209.28
L -416.90
R -1909.859
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 12
FROM ENGR. STA. -1+50 TO ENGR. STA. 140+00
DRAWN J.D.T. RECOMMENDED
CHECKED APPROVED
U.S. BUREAU OF RECLAMATION
APPROVED
LAS CRUCES, N.M. 7-1-38 3075-38
Sheet 12 of 12

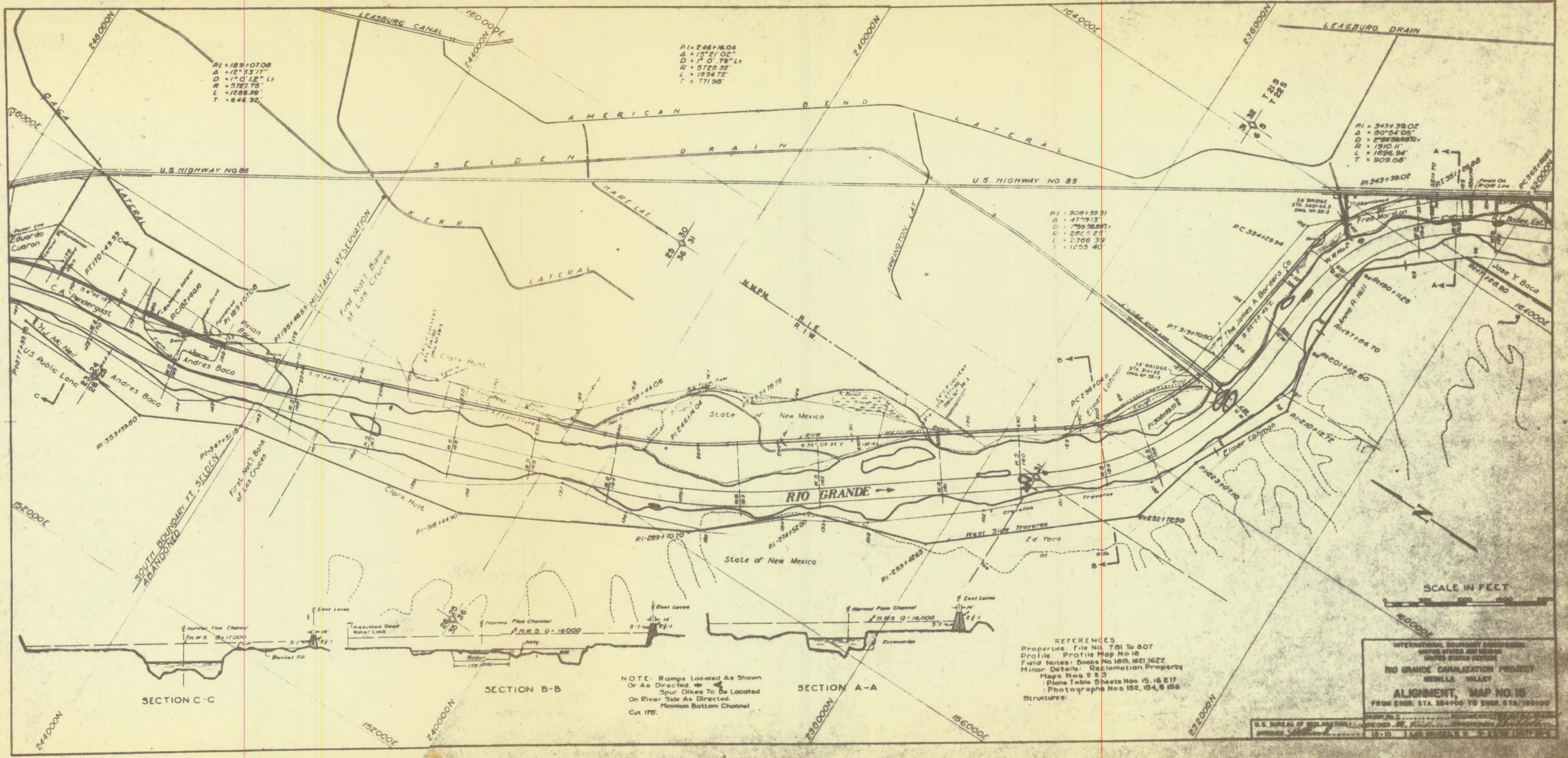

SECTION H-H
SECTION G-G
SECTION A-A
RIO GRANDE
PICACHO DRAIN
ALAMO DRAIN
OLD LEVEE
EAST LEVEE
WEST LEVEE
MESILLA DAM
DEL RIO LATERAL
WEST SIDE CANAL
DAM SPUR CANAL
COLONY LATERAL
NUSBAUM LATERAL
SCALE IN FEET
- NOTE -
REFERENCES-
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 13
FROM ENGR. STA. 1184+00 TO STA. 1018+00
U. S. BUREAU OF RECLAMATION
APPROVED
LAS CRUCES, N. M. 6-13-39
3648-38-C

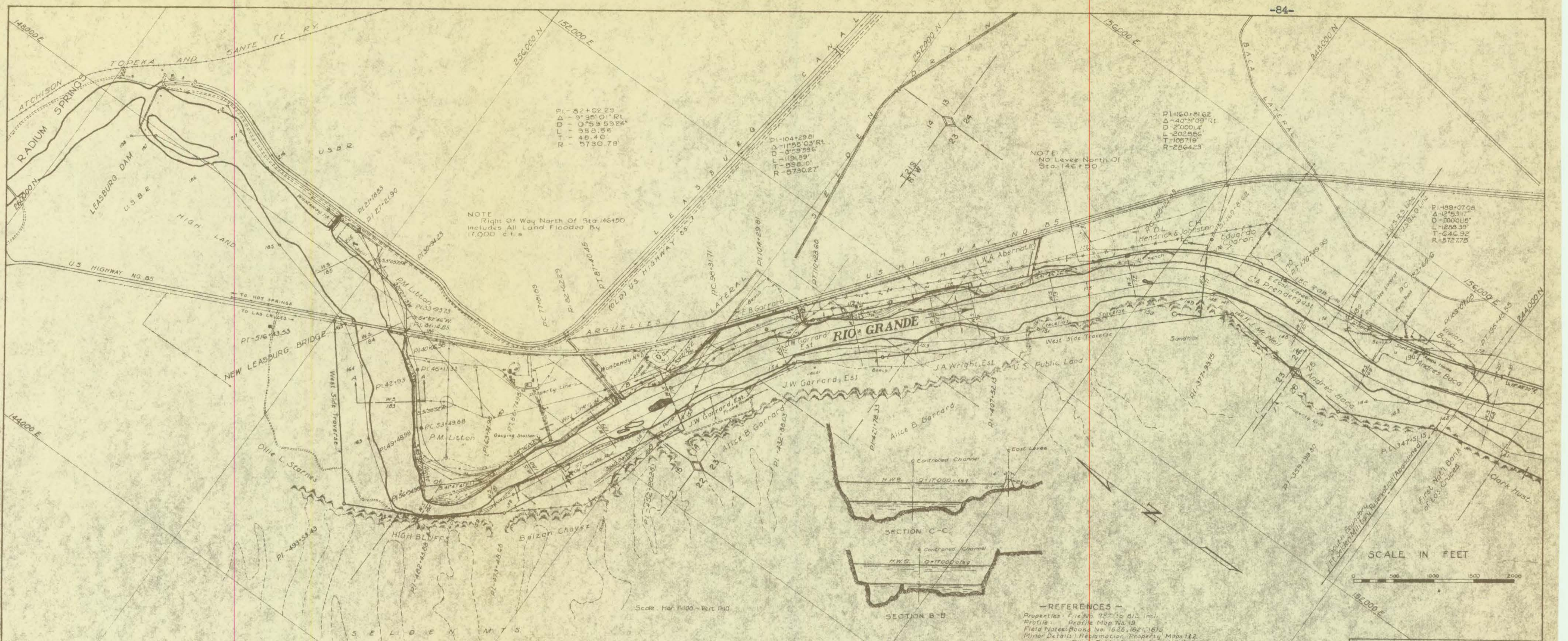

PICACHO BRIDGE
RIO GRANDE
DEL RIO DRAIN
ALAMO DRAIN
CLARK LATERAL
GIBBS LATERAL
NUSBAUM LATERAL
PICACHO DRAIN
PICACHO LATERAL
TO LAS CRUCES
TO DEMING
HIGHWAY U.S. 80
180,000 E.
176,000 E.
192,000 N.
188,000 N.
184,000 N.
180,000 N.
176,000 N.
NOTE:
Ramps located as shown
and as directed.
Spur Dikes to be located on river side as directed.
Minimum bottom width of cut channel to be 175'.
SECTION A-A
SECTION B-B
SECTION C-C
Hor. Scale 1"=100' -- Vert. Scale 1"=10'
SCALE IN FEET
0 500 1000 1500 2000
-REFERENCES-
Properties : File No. 742 to 718, Incl.
Profile : Profile Map No. 14 - Sta. 1018+00 to Sta. 852+00
Field Notes : Book No. 1602-1603-1604 1614-1615
Minor Details: Reclamation Property Maps No. 9 & 10
Plane Table Sheets No. 9-11 Incl.
Photos No. 112-115-119-121
Structures :
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 14
FROM ENGR. STA. 1018+00 TO ENGR. STA. 852+00
DRAWN
RECOMMENDED
CHECKED
APPROVED
U.S. BUREAU OF RECLAMATION
APPROVED
14-15
LAS CRUCES, N.M. — AUG. 31, 1939
3649-38-C


RIO GRANDE
SECTION A - A
Hor. Scale 1" = 100' - Vert. Scale 1" = 10'
SECTION B - B
SECTION C - C
Hor. Scale 1" = 100' - Vert. Scale 1" = 10'
TAYLOR LATERAL
PICACHO BRIDGE
MESILLA LATERAL
PICACHO DRAIN
GRANT LINE
MESILLA CIVIL COLONY GRANT LINE
Federal Land Bank of Wichita
June Hornbrook Saye
Foster Apts, Inc.
L.J. Patterson
L.J. Sparks
Lena Morford
W.R. Thaxton
Concepcion Maese
W.H. Hand
Alda S. O'Hara
R.B. Baker
J.A. Sweet
L.C. Killerman
Charles Needham
P.G. Holmes
M.D. & S.G. Short
W.F. McNeil
Note
From East Levee Sta 694± To 740± Move Levee ℄ During Construction To Conform To Existing Levee.
SCALE IN FEET
0 500 1000 1500 2000
-REFERENCES-
Properties E.O.F. 741-762 Incl
Profile Profile Map No. 15
Field Notes Books-1611-1612-1614-1615
Minor Details Reclamation Property Maps - 6-8.
Plane Table Sheets - 11 & 12.
Photographs - 121-122-124-126-130
NOTE
Ramps to be located as shown
Spur Dikes to be located on river side at 300' intervals or as directed
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 15
FROM ENGR. STA. 852+00 TO ENGR. STA. 686+00.
DRAWN H.H.F.
RECOMMENDED
CHECKED
APPROVED
U.S. BUREAU OF RECLAMATION
APPROVED
15-15
LAS CRUCES, N.M. - JUNE 29, 1939
3650-38-C


RIO GRANDE
SHALEM DRAIN
SHALEM BRIDGE
PICACHO FLUME
SECTION C—C
SECTION A-A
SECTION B-B
FEDERAL LAND BANK OF WICHITA
COLONY GRANT
SCALE IN FEET
0 500 1000 1500 2000
-NOTES-
-REFERENCES-
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 16
FROM ENGR STA 686+00 TO ENGR STA 520+00
U.S. BUREAU OF REACLAMATION
APPROVED
16-15
LAS CRUCES, N.M.—AUG. 31, 1939
3651-36-C


RIO GRANDE
LEASBURG DRAIN
U.S. HIGHWAY NO. 85
DONA ANA
BEND
COLONY GRANT LINE
SHALEM DRAIN
H I G H L A N D S
James G. Fitch Est.
Carl T. Nakayama
Mrs. A. Ross Keith
Francisco Flores
J.V. Baca
R.C. Bailey Est.
Irene Gilroy
Fred Marston
The James A. Beaver Co.
Anna R. Hill
Elmer Lohman
Shalem Farms Co.
W.C. Willis
U.S. Public Land
State of New Mexico
AMERICAN BEND
SELDEN DRAIN
SECTION A-A
SECTION C-C
SECTION B-B
EAST LEVEE
SCALE IN FEET
-NOTES-
MINIMUM BOTTOM CHANNEL CUT 175
RAMPS LOCATED AS SHOWN
OR AS DIRECTED.
SPUR DIKES TO BE LOCATED ON RIVER
SIDE AS DIRECTED
-REFERENCES-
PROPERTIES: FILE NO. FROM 774 TO 784 B INC.
PROFILE: MAP NO. 17
FIELD NOTES: BOOKS NO. 1621 & 1628
MINOR DETAILS: RECLAMATION MAPS NO. 394
PLANETABLE SHEETS NO. 14 & 15
PHOTOGRAPHS: NO. 142,144,146 & 152
STRUCTURES:
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 17
FROM ENGR. STA. 520+00 TO ENGR. STA. 354+00
DRAWN A.P.E.
RECOMMENDED W.W. Baker
CHECKED
APPROVED
U.S. BUREAU OF RECLAMATION
APPROVED
17-15
LAS CRUCES, N.M. 9-21-39
367D-38-C


LEASBURG CANAL
LEASBURG DRAIN
AMERICAN BEND LATERAL
SELDEN DRAIN
U.S. HIGHWAY NO. 85
KERR LATERAL
ARRINGTON LAT
RIO GRANDE
State of New Mexico
First Nat'l Bank of Las Cruces
MILITARY RESERVATION
SOUTH BOUNDARY FT. SELDEN ABANDONED
US Public Land
Andres Baca
C.A. Pendergast
Clark Hust
West Side Traverse
Ed York
Elmer Lohman
The James A. Borders Co
Fred Marston
Jose Y. Baca
SCALE IN FEET
SECTION C-C
SECTION B-B
SECTION A-A
NOTE: Ramps Located As Shown Or As Directed. Spur Dikes To Be Located On River Side As Directed. Minimum Bottom Channel Cut 175'.
REFERENCES
Properties: File No. 781 To 807
Profile: Profile Map No 18
Field Notes: Books No 1615, 1621, 1622
Minor Details: Reclamation Property Maps Nos 2 & 3
: Plane Table Sheets Nos 15, 16 & 17
: Photographs Nos 152, 154, & 156
Structures:
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY
ALIGNMENT, MAP NO. 15
U.S. BUREAU OF RECLAMATION



—REFERENCES—

Properties: File No. 787 to 812 incl.
Profile: Profile Map No. 19
Field Notes: Books No. 1626, 1621, 1615
Minor Details: Reclamation Property Maps 1 & 2
Plane Table Sheets No. 16, 17, & 18
Photographs 156, 158, 160, 164, 170, 172
Structures:

NOTE:—
Ramps located as shown or as directed
Spur Dikes to be located on river Side at 300± intervals or as directed

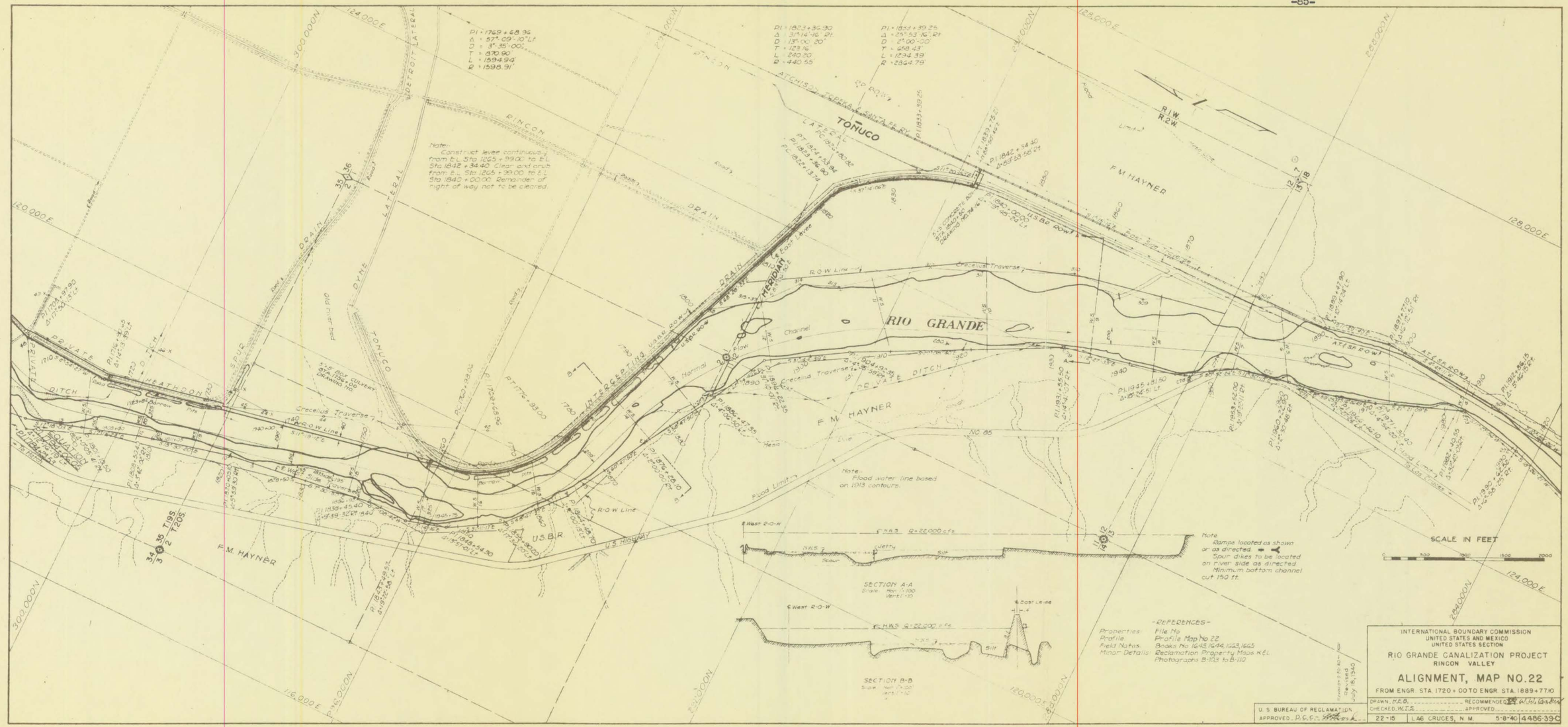
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
MESILLA VALLEY

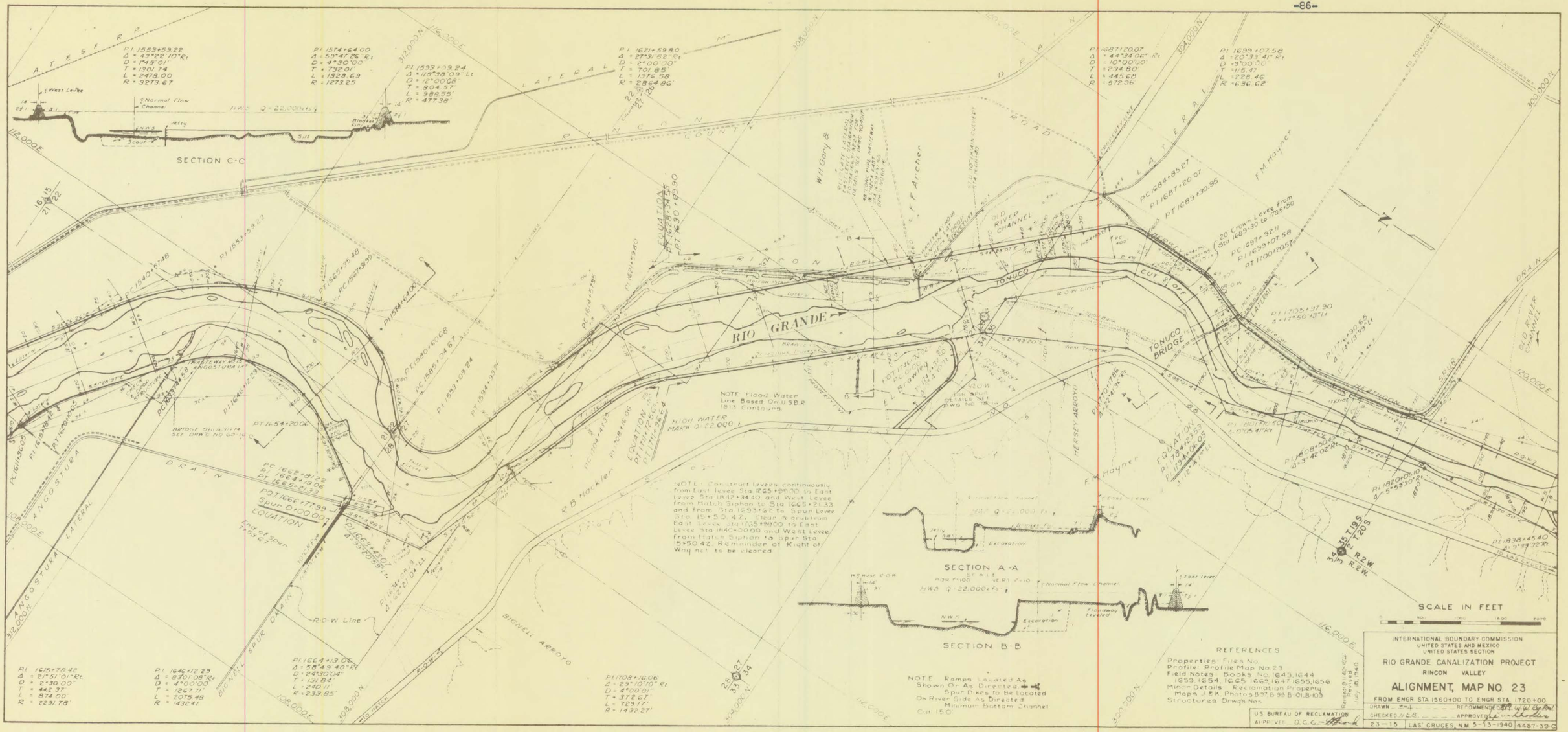
ALIGNMENT, MAP NO. 19

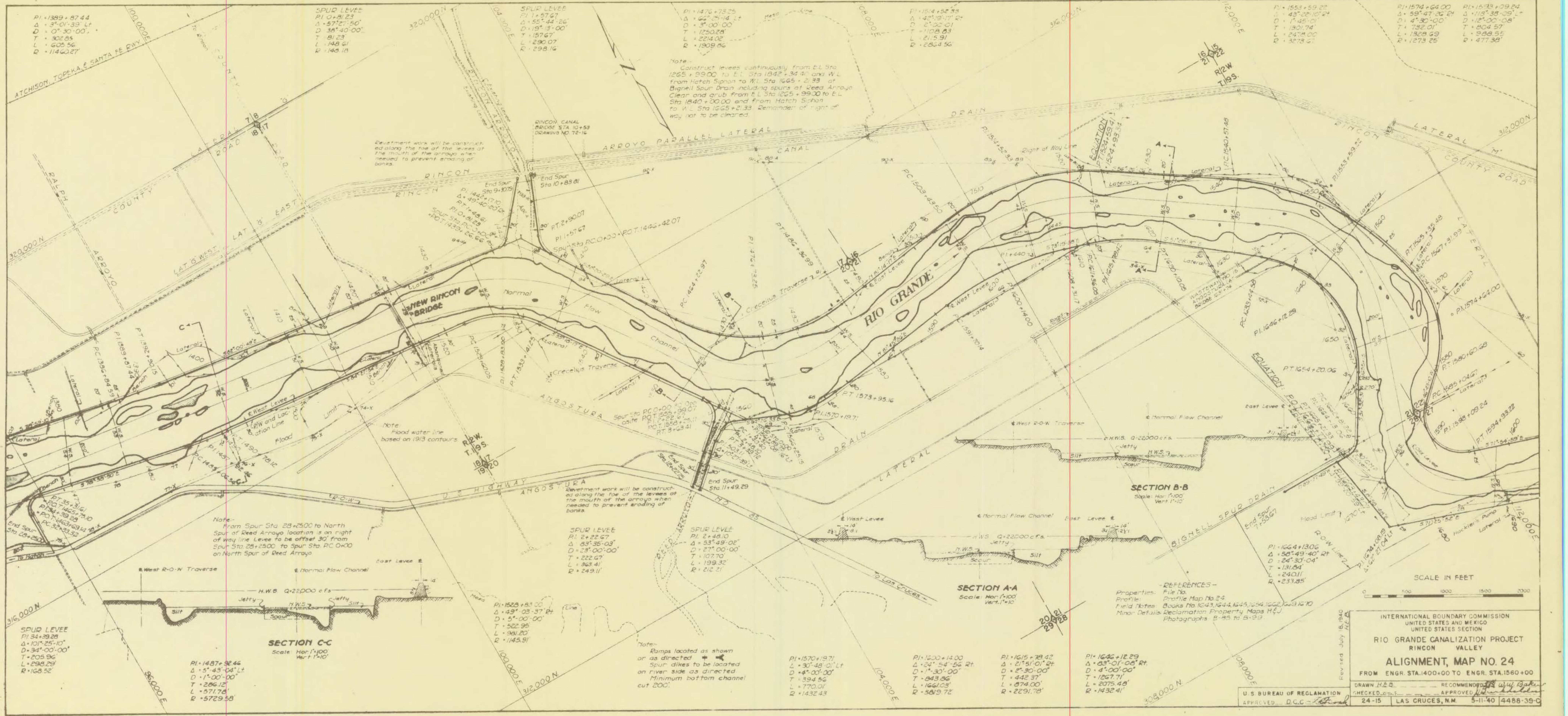
FROM ENGR. STA. 22+00 TO ENGR. STA. 188+00

DRAWN H.H.F.	RECOMMENDED	
CHECKED H.H. Wm.T.	APPROVED	
19-15	LAS CRUCES, N. M. 9-27-39	3672-38-C

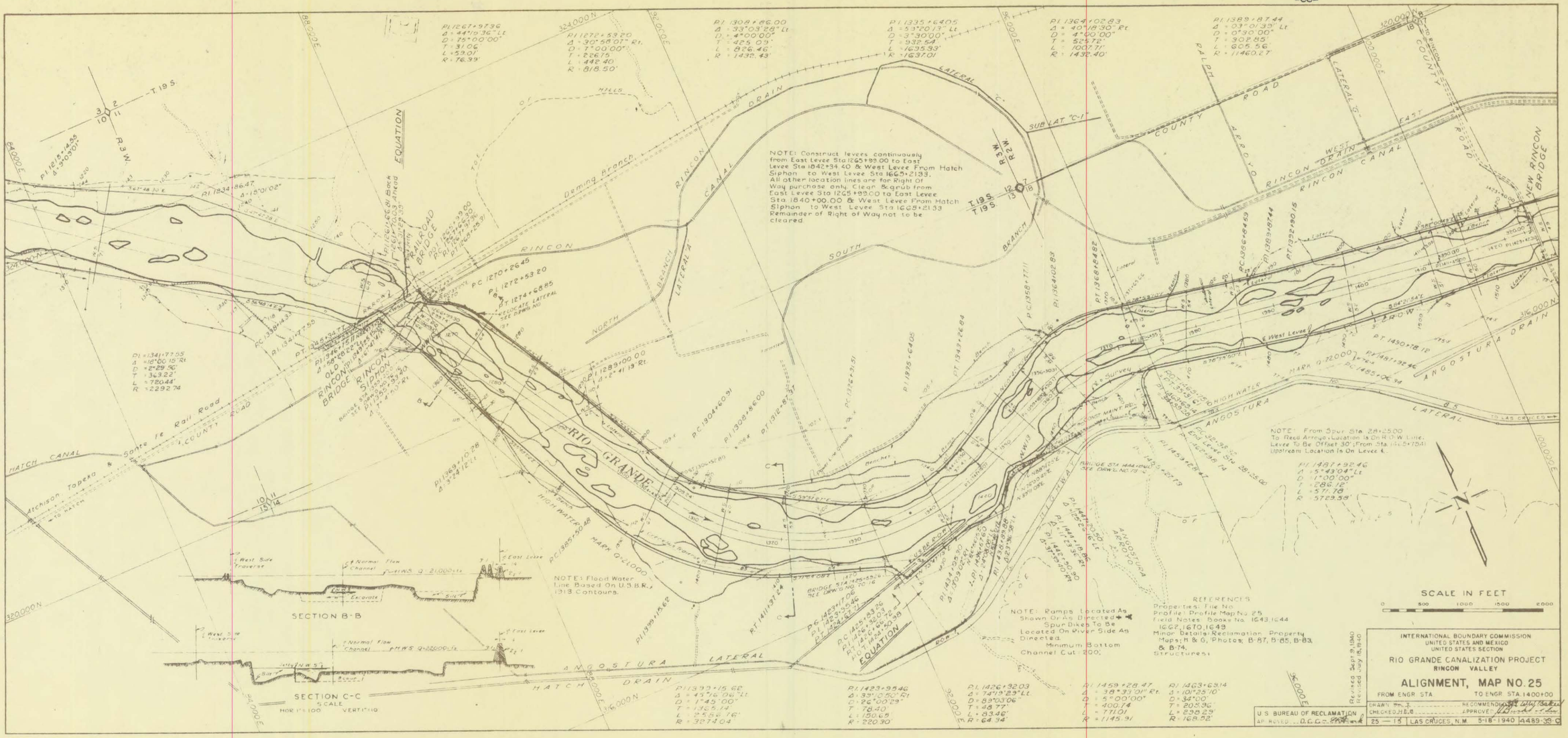
U.S. BUREAU OF RECLAMATION
APPROVED

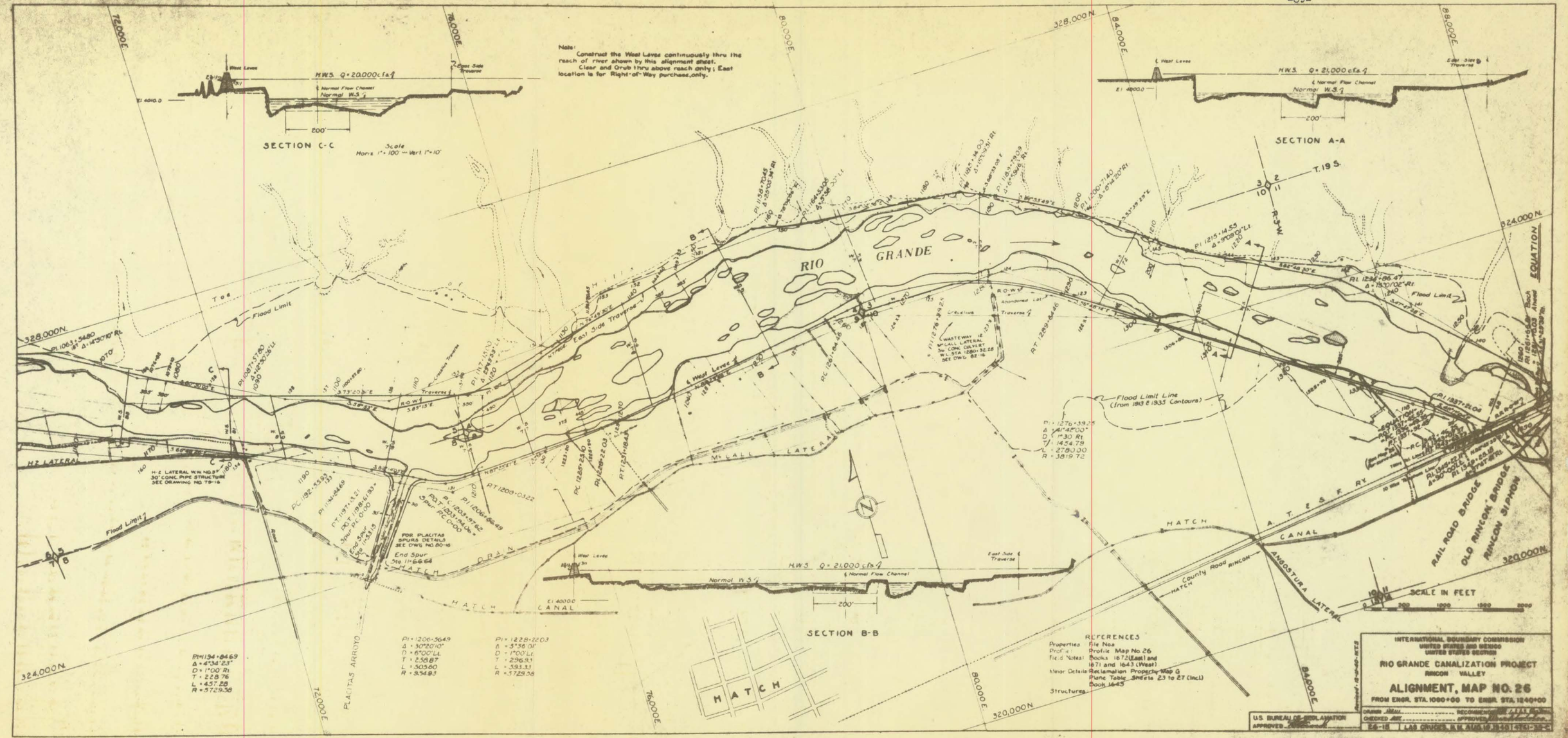

TONUCO
RIO GRANDE
RINCON
LATERAL
DRAIN
DITCH
F.M. HAYNER
U.S.B.R.
U.S. HIGHWAY
INTERCEPTING DITCH
PRIVATE DITCH
Note: Construct levee continuous from E.L. Sta 1225 + 99.00 to E.L. Sta 1842 + 94.40. Clear and grub from E.L. Sta 1265 + 99.00 to E.L. Sta 1840 + 00.00. Remainder of right of way not to be cleared.
Note: Flood water line based on 1913 contours.
Note: Ramps located as shown or as directed. Spur dikes to be located on river side as directed. Minimum bottom channel cut 150 ft.
SECTION A-A
SECTION B-B
SCALE IN FEET
-REFERENCES-
Properties File No.
Profile Profile Map No. 22
Field Notes Books No. 1643, 1644, 1623, 1625
Minor Details Reclamation Property Maps K-L
Photographs B-103 to B-110
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
RINCON VALLEY
ALIGNMENT, MAP NO. 22
FROM ENGR. STA. 1720 + 00 TO ENGR. STA. 1889 + 77.10
DRAWN: K.E.B.
CHECKED: W.T.S.
RECOMMENDED: W. W. Grebe
APPROVED:
U. S. BUREAU OF RECLAMATION
APPROVED: D.C.G.
22-15
LAS CRUCES, N. M.
5-8-40
4486-39C

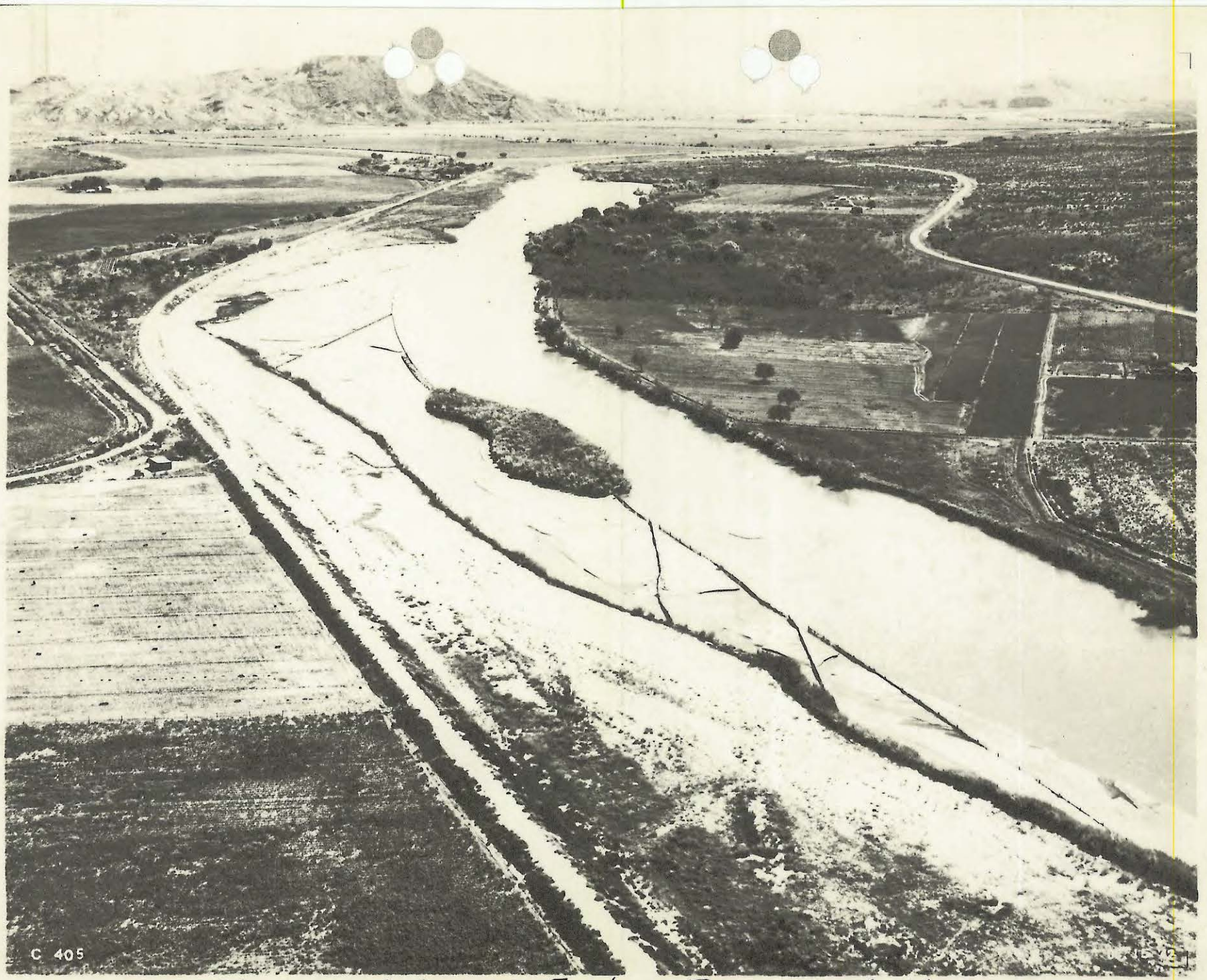

SECTION C-C
SECTION A-A
SECTION B-B
RIO GRANDE
TONUCO
RINCON
LATERAL
DRAIN
ANGOSTURA
SIGNELL ARROYO
TONUCO BRIDGE
CUT OFF
ROAD
NOTE Flood Water Line Based On USBR 1913 Contours
NOTE Construct Levees continuously from East levee Sta 1825+99.00 to East levee Sta 1842+34.40 and West Levee from Hatch Siphon to Sta 1665+21.33 and from Sta 1693+62 to Spur Levee Sta 15+50.42. Clear Vegetation from East Levee Sta 1565+99.00 to East Levee Sta 1641+00.00 and West Levee from Hatch Siphon to Spur Sta 15+50.42. Remainder of Right of Way not to be cleared
NOTE Ramps Located As Shown Or As Directed
Spur Dikes To Be Located On River Side As Directed
Minimum Bottom Channel Cut 150'
REFERENCES
Properties Files No.
Profile: Profile Map No 23
Field Notes: Books No. 1643, 1644, 1653, 1654, 1665, 1669, 1647, 1655, 1656
Minor Details - Reclamation Property
Maps J.P.K. Photos 8.97, 8.98, 8.101, 8.103
Structures: Drwgs Nos.
SCALE IN FEET
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
RINCON VALLEY
ALIGNMENT, MAP NO. 23
FROM ENGR STA 1560+00 TO ENGR STA 1720+00
DRAWN - W-I
CHECKED - E.B.
APPROVED
RECOMMENDED
23-15
LAS CRUCES, N.M. 5-13-1940
4487-39-C
U.S. BUREAU OF RECLAMATION
AIRPIVEL D.C.C.



RIO GRANDE
NEW RINCON BRIDGE
Normal Flow Channel
ATCHISON, TOPEKA & SANTA FE RWY.
ARROYO PARALLEL LATERAL
RINCON CANAL
RINCON DRAIN
ANGOSTURA DRAIN
ANGOSTURA LATERAL
U.S. HIGHWAY
BIGNELL SPUR DRAIN
RINCON COUNTY ROAD
RALPH ARROYO
Note:-
Construct levees continuously from E.L. Sta 1265 + 99.00 to E.L. Sta 1842 + 34.40 and W.L. from Hatch Siphon to W.L. Sta 1665 + 21.33 at Bignell Spur Drain including spurs at Reed Arroyo. Clear and grub from E.L. Sta 1265 + 99.00 to E.L. Sta 1840 + 00.00 and from Hatch Siphon to W.L. Sta 1665 + 21.33. Remainder of right of way not to be cleared.
Revetment work will be constructed along the toe of the levees at the mouth of the arroyo when needed to prevent eroding of banks.
Note:- Flood water line based on 1913 contours
Note:- From Spur Sta. 28+25.00 to North Spur of Reed Arroyo location is on right of way line. Levee to be offset 30' from Spur Sta. 28+25.00 to Spur Sta. P.C. 0+00 on North Spur of Reed Arroyo
Note:- Ramps located as shown or as directed. Spur dikes to be located on river side as directed. Minimum bottom channel cut 200'.
RINCON CANAL BRIDGE STA. 10+53 DRAWING NO. 72-16
SPUR LEVEE
P.I. = 2+22.67
Δ = 83°-35'-03"
D = 23°-00'-00"
T = 222.67
L = 363.41
R = 249.11
SPUR LEVEE
P.I. = 2+48.10
Δ = 53°-49'-02"
D = 27°-00'-00"
T = 107.70
L = 199.32
R = 212.21
SPUR LEVEE
P.I. 34+29.28
Δ = 101°-25'-10"
D = 34°-00'-00"
T = 205.96
L = 298.29
R = 168.52
P.I. = 1476 + 73.25
Δ = 66°-35'-14" Lt
D = 3°-00'-00"
T = 1250.28'
L = 2214.02'
R = 1909.86'
P.I. = 1646 + 12.29
Δ = 83°-01'-08" Rt.
D = 4°-00'-00"
T = 1267.71'
L = 2075.48'
R = 1432.41'
P.I. = 1664 + 13.06
Δ = 58°-49'-40" Rt
D = 24°-30'-04"
T = 131.84'
L = 240.11'
R = 233.85'
SECTION A-A Scale: Hor. 1"=100' Vert. 1"=10'
SECTION B-B Scale: Hor. 1"=100' Vert. 1"=10'
SECTION C-C Scale: Hor. 1"=100' Vert. 1"=10'
H.W.S. Q=22,000 c.f.s.
West Levee
East Levee
Normal Flow Channel
West R-O-W Traverse
Jetty
Silt
Scour
R12W. T.19S.
EQUATION
SCALE IN FEET
0 500 1000 1500 2000
-REFERENCES-
Properties: File No.
Profile: Profile Map No. 24
Field Notes: Books No. 1643, 1644, 1648, 1654, 1662, 1669, 1670
Minor Details: Reclamation Property Maps H & J
Photographs B-85 to B-99
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
RINCON VALLEY
ALIGNMENT, MAP NO. 24
FROM ENGR. STA. 1400+00 TO ENGR. STA. 1560+00
Revised July 18, 1940 H.E.B.
DRAWN H.E.B.
CHECKED
RECOMMENDED
APPROVED
U.S. BUREAU OF RECLAMATION
APPROVED D.C.C.
24-15
LAS CRUCES, N.M.
5-11-'40
4488-39-C


RIO GRANDE
RINCON CANAL
RINCON DRAIN
ANGOSTURA DRAIN
ANGOSTURA LATERAL
HATCH CANAL
Deming Branch
RINCON SOUTH BRANCH LATERAL A
SUB LAT "C-1"
LATERAL "G"
COUNTY ROAD
ARROYO
RAILROAD BRIDGE
OLD RINCON BRIDGE
NEW RINCON BRIDGE
RINCON SIPHON
Santa Fe Rail Road
Atchison Topeka
EQUATION
NOTE: Construct levees continuously from East Levee Sta 1265+93.00 to East Levee Sta 1842+34.40 & West Levee From Hatch Siphon to West Levee Sta 1665+21.33. All other location lines are for Right Of Way purchase only. Clear & grub from East Levee Sta 1265+93.00 to East Levee Sta 1840+00.00 & West Levee From Hatch Siphon to West Levee Sta 1665+21.33 Remainder of Right of Way not to be cleared.
NOTE: Flood Water Line Based On U.S.B.R., 1913 Contours.
NOTE: Ramps Located As Shown Or As Directed. Spur Dikes To Be Located On River Side As Directed. Minimum Bottom Channel Cut 200.
NOTE: From Spur Sta 28+25.00 To Read Arroyo Location Is On R.O.W. Line. Levee To Be Offset 30' From Sta 1445+75.41 Upstream Location Is On Levee ℄.
SECTION B-B
SECTION C-C
SCALE HOR. 1"=100 VERT. 1"=10
SCALE IN FEET
0 500 1000 1500 2000
REFERENCES
Properties: File No.
Profile: Profile Map No. 25
Field Notes: Books No. 1643, 1644, 1662, 1670, 1649
Minor Details: Reclamation Property Maps: H & G, Photos: B-87, B-85, B-83, & B-74.
Structures:
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
RINCON VALLEY
ALIGNMENT, MAP NO. 25
FROM ENGR. STA. TO ENGR. STA. 1400+00
Revised Sept. 9, 1940
Revised July 15, 1940
U. S. BUREAU OF RECLAMATION
DRAWN: W. J.
CHECKED: H.E.B.
RECOMMENDED:
APPROVED:
APPROVED: D.C.G. Chief Engr.
25 — 15 | LAS CRUCES, N.M. | 5-18-1940 | 4489-39-C


Note: Construct the West Levee continuously thru the reach of river shown by this alignment sheet. Clear and Grub thru above reach only; East location is for Right-of-Way purchase only.
SECTION C-C
Scale Horiz 1"=100 — Vert 1"=10'
SECTION A-A
SECTION B-B
RIO GRANDE
Flood Limit
Flood Limit Line (from 1915 & 1935 Contours)
M-2 LATERAL
McALL LATERAL
HATCH CANAL
ANGOSTURA LATERAL
A.T.&S.F. RY
RAIL ROAD BRIDGE
OLD RINCON BRIDGE
RINCON SIPHON
PLACITAS ARROYO
County Road RINCON - HATCH
T. 19 S.
R. 3 W.
SCALE IN FEET
REFERENCES
Properties: File Nos.
Profile: Profile Map No. 26
Field Notes: Books 1672 (East) and 1671 and 1643 (West)
Minor Details: Reclamation Property Map G
Plane Table Sheets 23 to 27 (Incl.) Book 1643
Structures
INTERNATIONAL BOUNDARY COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
RINCON VALLEY
ALIGNMENT, MAP NO. 26
FROM ENGR. STA. 1000+00 TO ENGR. STA. 1240+00
U.S. BUREAU OF RECLAMATION
APPROVED
E&-18 | LAS CRUCES, N.M. AUG 19 1940



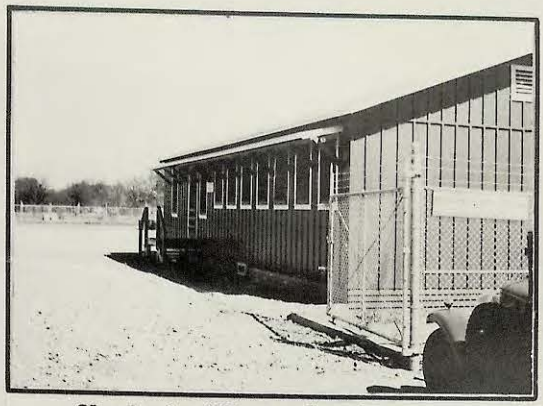
Channel Lower End ~ Rincon Valley

Downstream View of Jundt Cut-off

Shalem Bend ~ Looking Upstream

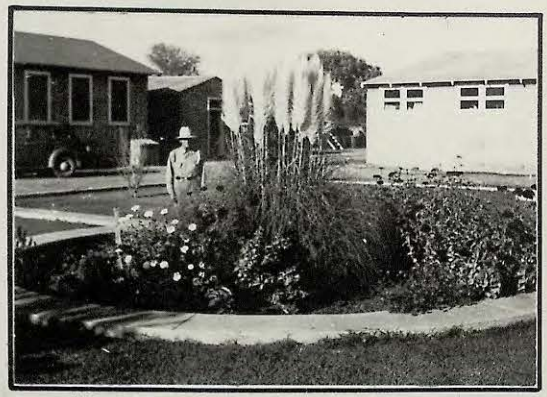
Greenwood Cut-off ~ Looking Upstream

CONSTRUCTION HEADQUARTERS



Clerical office - Las Cruces

Engineering office - Las Cruces



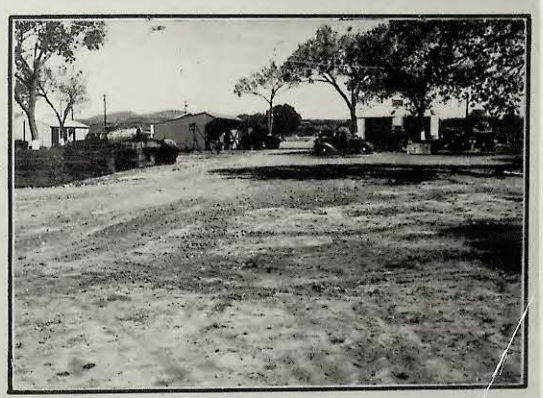
Flower garden - Las Cruces

Warehouse - Las Cruces

Headquarters - Hatch

Warehouse and yard - Hatch

Foreman's residence - Hatch

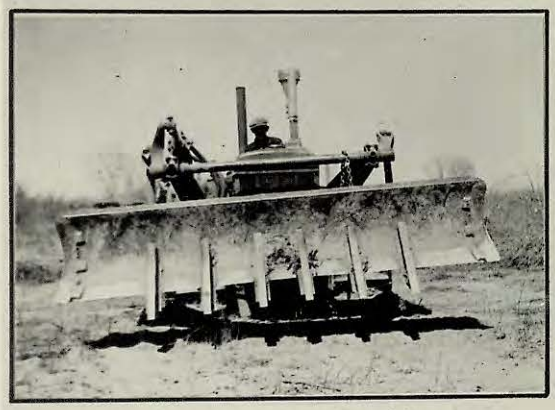


View of Hatch yard

CLEARING AND GRUBBING RIGHT OF WAY

Clearing right of way with tractor

Clearing right of way by hand



Original tractor grubber idea

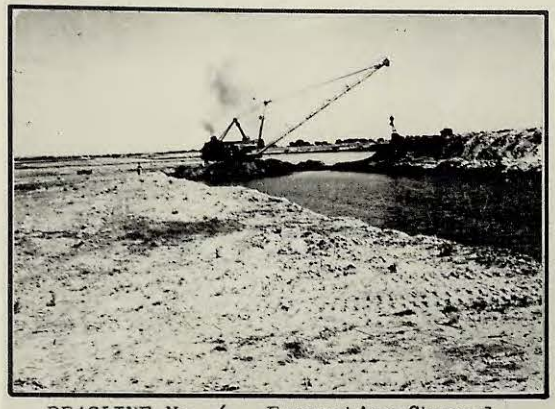
Second model grubber

Second model at work

Final model

DRAGLINE No. 3 - Building levee

DRAGLINE No. 6 - Opening Jundt Cut-off

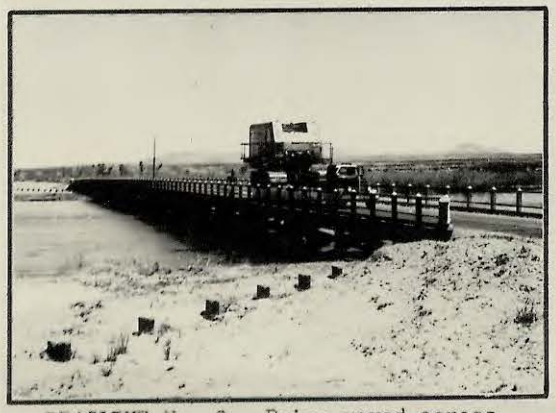


DRAGLINE No. 6 - Excavating Channel Cut-off

DRAGLINE No. 5 - Crossing river north of Berino Bridge

DRAGLINE No. 5 - Excavating Mesquite Cut-off

DRAGLINE No. 9 - Building levee

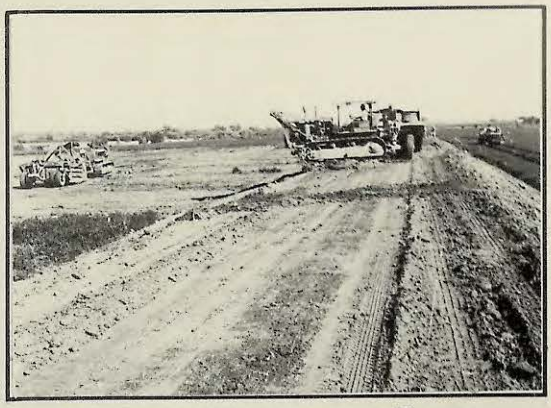


DRAGLINE No. 8 - Being moved across Hatch Highway Bridge

DRAGLINE No. 8 - Being hauled from Hatch to Las Cruces

EXCAVATION - TRACTORS

Carryall excavating low flow channel - Rincon Valley



Tractors building levee - Rincon Valley

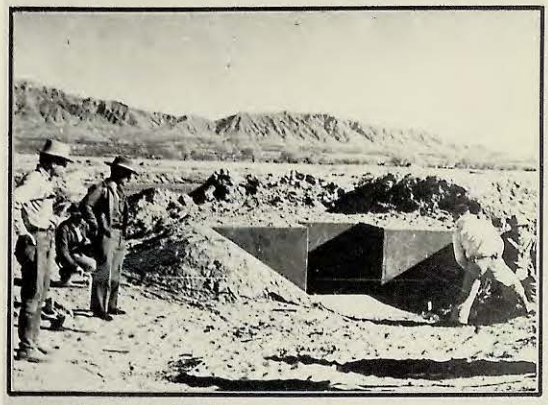
View of excavation equipment working - Mesilla Valley

Carryalls plating levee - Mesilla Valley

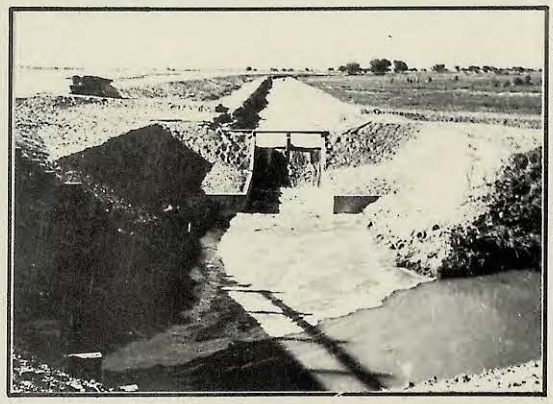
Tractors filling borrow pits - Mesilla Valley

Tractor filling pit near Santo Tomas Bridge - Mesilla Valley

STRUCTURES

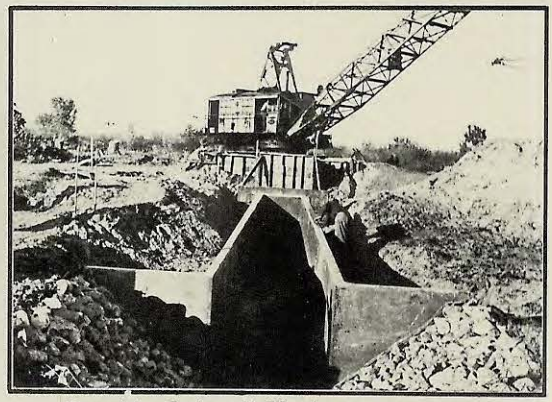


Culvert Wasteway

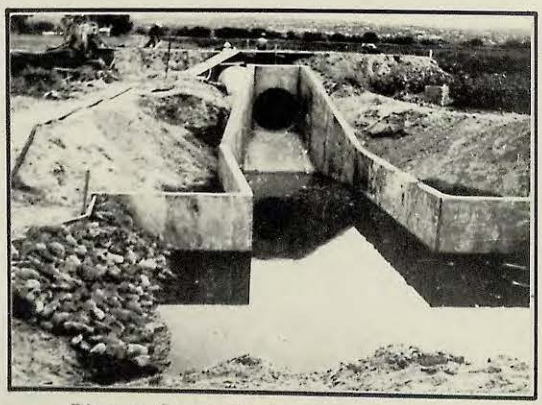


Texas Lateral Drop Wasteway

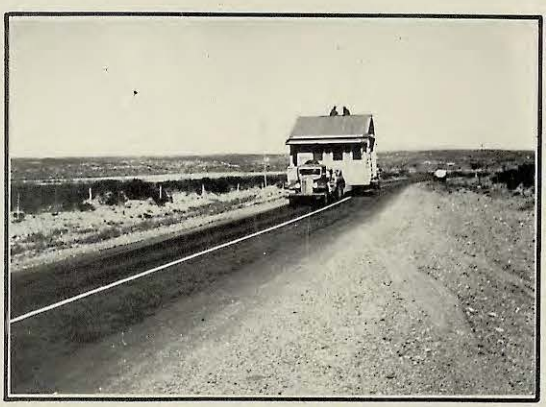
20 Ton Treated Timber Bridge



Brazito Lateral Wasteway



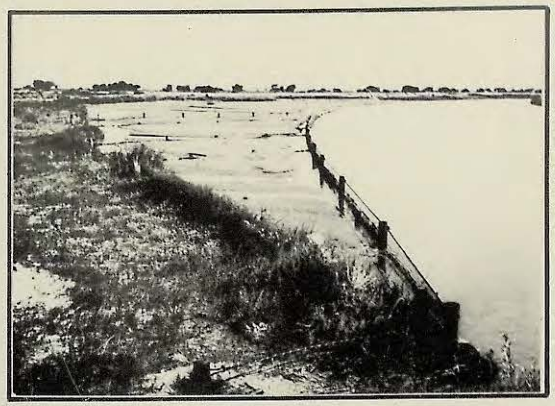
Rincon Canal Wasteway



Moving Clerical Building to Hatch

REVETMENT

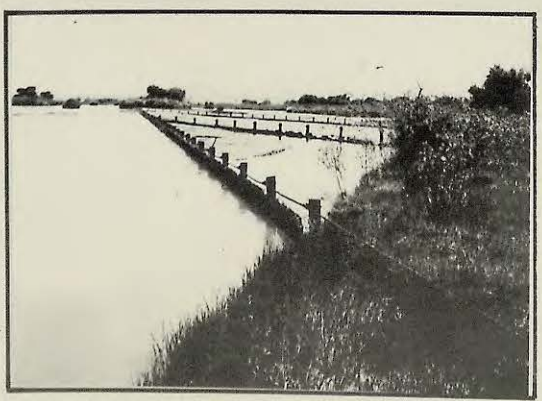
Revetment on East Levee near Vinton Bridge



Revetment on East Levee near Berino Bridge

Revetment on East Levee Station 850 - Feature 401

Crew jetting piling

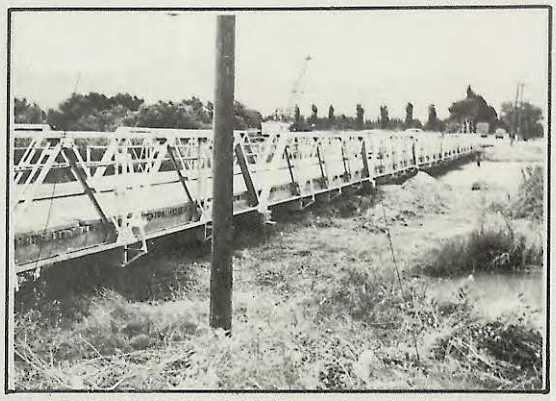


Revetment West Levee - Rincon Valley

Special type of revetment - Rincon Valley

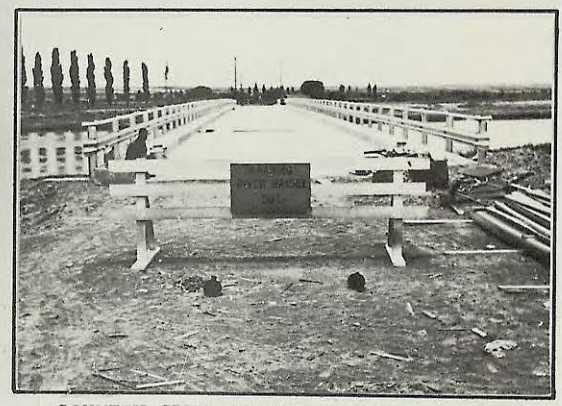
RIO GRANDE BRIDGES

COURCHESNE BRIDGE - Heavily loaded truck breaks through bridge



COUNTRY CLUB BRIDGE - Original

COURCHESNE BRIDGE - Construction of new concrete bridge



COUNTRY CLUB BRIDGE - Finished bridge

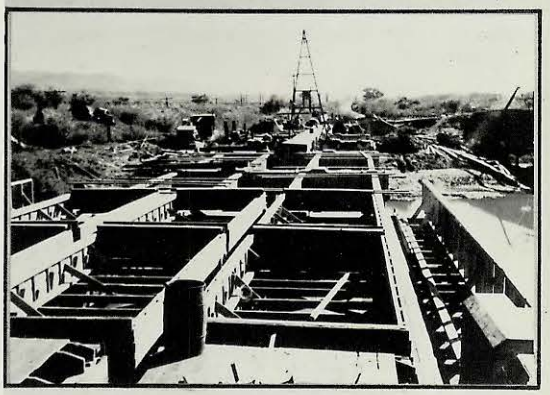
COURCHESNE BRIDGE - Finished bridge

OLD ANTHONY BRIDGE - Constructed by Dona Ana County crew

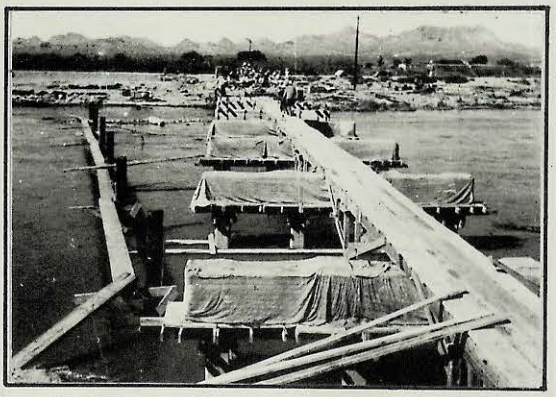
RIO GRANDE BRIDGES

Testing concrete piles

OLD SHALEM BRIDGE - Original

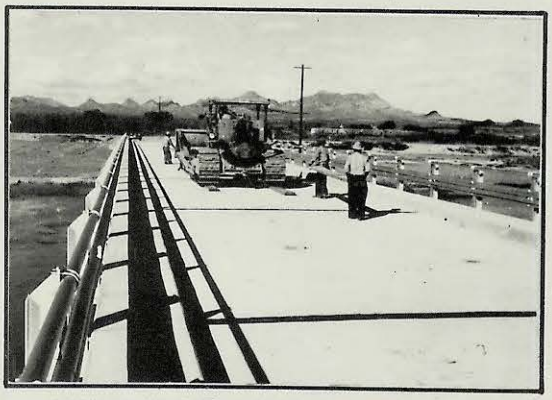


HATCH-RINCON - Bridge construction



SHALEM BRIDGE - Construction of new concrete bridge

SALEM BRIDGE - Dona Ana County crew at work



SHALEM BRIDGE - Finished bridge

COMPLETED JOB

Completed levee and channel near El Paso

Mesquite Cut-off Bend

Looking downstream from Station 1090 - Feature 301

Looking downstream from Station 650 - Feature 301

Channel Cut-off near Hill, N. M.

Looking downstream at Santo Tomas Bridge