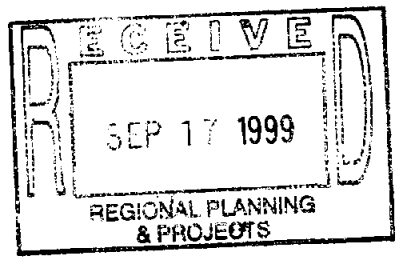
Report on Diversion Facilities on the Rio Grande That Deliver Water For Domestic, Municipal and Industrial Uses



Prepared By

Jo Jo White
General Manager
H&CCID No. 9

Bart Hines
General Manager
McAllen PUB

Wayne Halbert
General Manager
Harlingen ID

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General Manager
Harlingen Waterworks System

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HCID No. 2

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General Manager
Brownsville PUB

March 1999

Lower Rio Grande Valley Development Council
311 N. 15th St.
McAllen, Texas 78501-4705

Report on Diversion Facilities on the Rio Grande That Deliver Water For Domestic, Municipal and Industrial Uses

The Lower Rio Grande Valley Development Council entered into a Research and Planning Fund Research Grant Contract with the Texas Water Development Board to assemble data on each irrigation district diversion facility on the Rio Grande that delivers water for domestic, municipal and industrial uses. The objective on the study was an analysis of the irrigation district diversion facilities on the Rio Grande to develop an opinion on whether municipal water supplies could be delivered when little or no irrigation water is being used.

The specific items in the Scope of Services were:

- Assemble available construction drawings showing the general plan and capacity of each diversion facility including existing weirs.
- Establish a committee of three irrigation district representatives and three municipal representatives to review the assembled drawings.
- Visit each critical diversion facility to observe the actual physical condition and take photographs.
- Prepared a written summary on each diversion facility.

The appointed committee consisted of the following individuals:

Irrigation Districts	Municipal
Jo Jo White	Bart Hines
Wayne Halbert	Cloice Whitley
Sonny Hinojosa	John Bruciak

Charles Greenwood, with the consulting engineering firm of Sigler, Winston, Greenwood and Associates, Inc., was responsible for assembling the available construction drawing. The available construction drawings to show the general plan and capacity of each diversion facility, including existing weirs, are presented in the attached Appendix A.

Committee Action

The committee met on January 11, 1999 at 2:00 P.M., in the offices of Sigler, Winston, Greenwood and Associates. The committee members present agreed that they did not believe it was necessary to visit each of the critical diversion facilities to observe the actual physical condition and to take photographs. After extensive discussion, the committee members present agreed to state in writing their opinions on the capability of the diversion facilities to deliver the domestic, municipal, and

industrial demands when there is little or no agricultural water in the Rio Grande. The written statements are included in Appendix B and a summary of the comments is presented below.

Summary of Comments

The main purpose of the report is in support of the investigation to determine the answer to two questions:

> If there is no agricultural water being discharged from Falcon Reservoir (only M&I water is being discharged), will the Rio Grande be capable of delivering water to each diversion structure?
>
> Is each irrigation district capable of diverting water from their diversion point to the cities?

From past history, the irrigation districts can and do divert water from the Rio Grande when there is no irrigation water being released. Obviously, the pumping efficiencies are negatively affected and the overall volumes to be pumped are limited. There are documented data (Rio Grande Watermaster and I.B.W.C.) that indicate the historical periods of time when little or no irrigation water was being released from Falcon Lake. The water being diverted from the river during these times was only municipal water. The assumption can be made from this documented history that irrigation districts will be able to physically pump water from the river even if the only remaining water in the Rio Grande is municipal water.

The diversion of water for city water supplies by the respective irrigation district is fairly well established due to the long term operation and the development that has grown up around most systems. These restrictions are going to make any changes impossible that would help in diverting more water or to provide any type of storage during drought periods.

The major water diverters (irrigation districts) along the Rio Grande, below Anzalduas Dam, have weirs downstream of their diversion points that maintain a minimum river elevation and create a pool of water that facilitates the diversion of water during low flow conditions.

Raising of the diversion weirs should be further evaluated, but such action may not be advisable. The increase in the weir height will affect the flood hydrology of the Rio Grande. The greater weir height will also cause a greater amount of backwater on land that may flood both the United States and Mexican shorelines. The additional height may also cause greater impoundment of water, with the related higher seepage and evapotranspiration losses.

The irrigation districts upstream of Anzalduas Dam utilize the pool created by the Dam, therefore, their ability to divert water for M&I purposes only should not change.

One solution for assuring a diversion structure is capable of pumping water to the canals for only M&I purposes would be dredging the Rio Grande diversion points.

Although the depletion of irrigation water in the reservoirs is unlikely, there will be individual irrigation districts that may exhaust their water right account. The problems encountered by these irrigation districts in 1998 was maintaining a charged canal system for a city that has no raw water storage reservoir.

Recommendations

All cities and /or water purveyors must be required to have control of, or contract to an irrigation district for, raw water storage for at least 20 to 30 days of supply. Raw water storage requirements should meet the maximum daily demand from the water treatment facility. The 20 to 30-day storage requirement should be a firm storage requirement and not be based on total volume of storage. If cities had a requirement to have 20 to 30 days of water supply in storage, it would greatly increase the efficiency in how the irrigation districts divert water. This would be the responsibility of the city and not the district since it would only benefit the city.

Several cities rely on the irrigation districts' canal system as their reservoir. This practice places an unnecessary burden on the irrigation districts. Cities should not take into account canals as storage facilities unless there are no taps to the canal prior to the city's diversion point. In other words, they can use that portion of the canal that serves solely their water treatment facility, if and only if, the irrigation district agrees to the concept. The storage could be contained through weirs or gates to meet that storage requirement. If an irrigation district has a storage structure at the present time, the district might explore to determine if the structure can be reworked to provide more storage, or to determine if there is a way that the city can put their own storage facility into operation. If the district has a storage structure presently, the district could work with the city to fund the needed repairs or enlargement of the facility.

To insure the continued pumping ability under low flow conditions, the following recommendations are made:

1. A study should be made on all existing Rio Grande weirs (and future installations) that could determine their positive impact on pumping conditions during low flows. Also, what could be done to increase the positive results of the weirs now in place.

2. Further study should be done on the aquatic weed infestation and its impact on low Rio Grande flows.

3. The water ordering mechanism now being used between the irrigation districts and the Rio Grande Watermaster needs to be investigated to determine what would best enhance the efficient delivery of water from the Falcon Lake if the situation ever arose where only municipal water was remaining in the reserves.

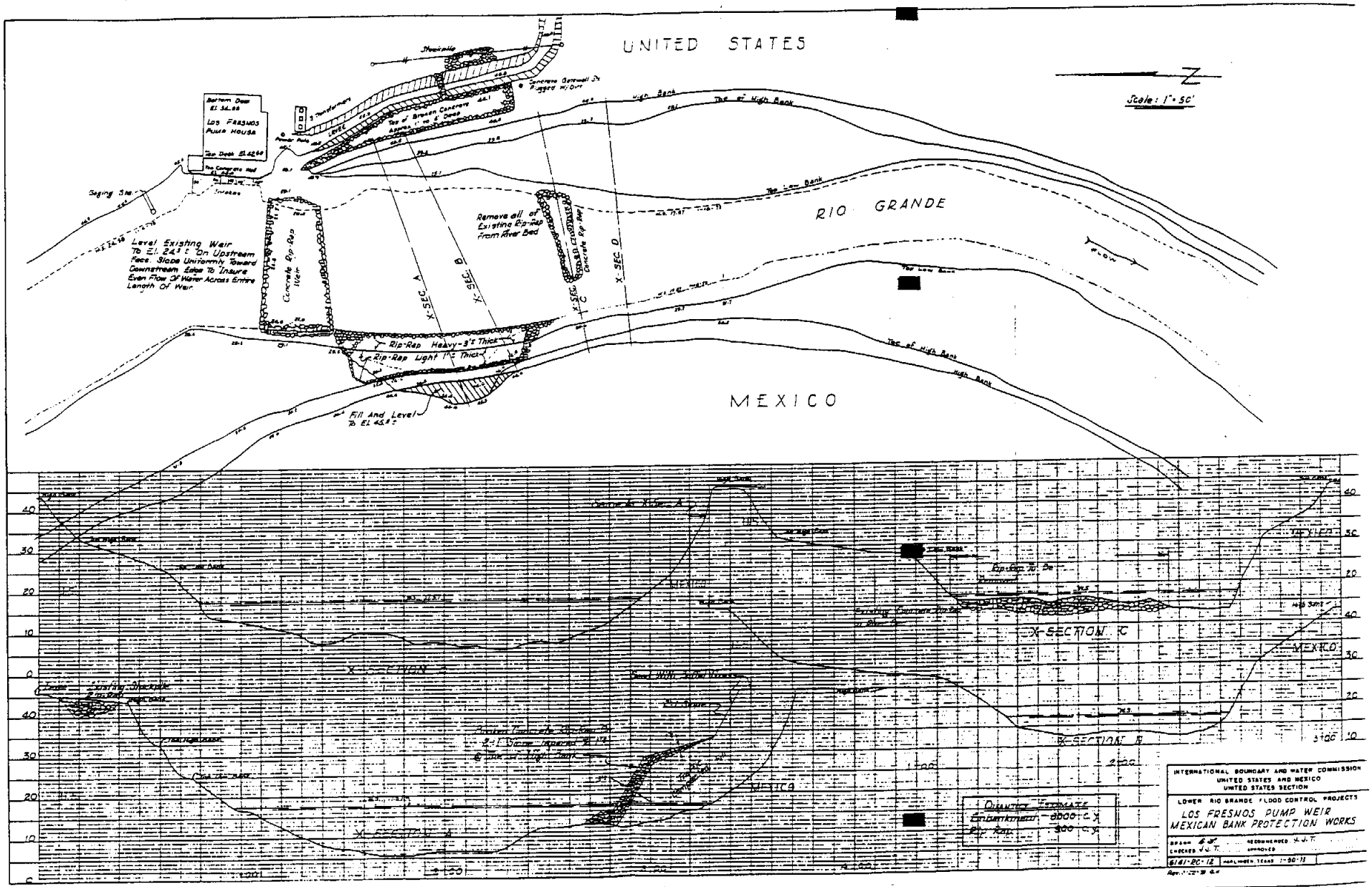
4. Additional measuring or gauging stations along the river could better monitor the river flow and could provide a higher level of operation. Efforts should be made to coordinate the activities

of all the agencies to assist in the funding of such a program.

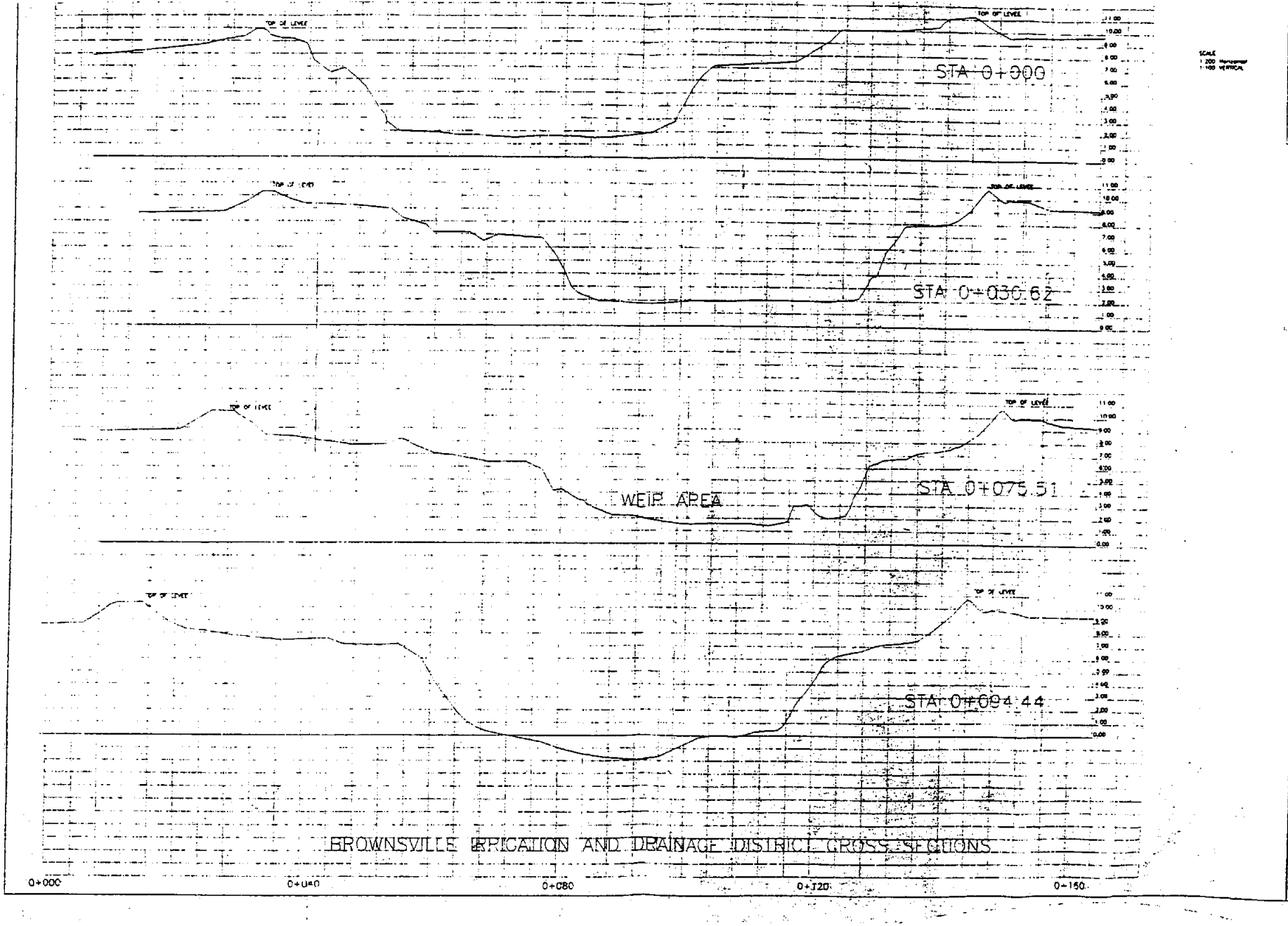
5. Negative environmental effects resulting from the low flows, such as potential fish or wildlife damage, need to be addresses by those water right holders (Texas Parks & Wildlife, U.S. fish & wildlife, etc.) who have the water reserves that could possibly alleviate these conditions. No other water right allocation holders should use their reserves for this purpose.

6. The cities can help themselves by either studying their water supply system themselves or hiring someone assess their needs and provide an answer for them. Many of the smaller towns have let their treatment and distribution systems and their water supply sources to their system deteriorate for so many years. These cities are in an almost impossible situation money wise to be able to provide any type of fix to these facilities.

Appendix A


UNITED STATES
MEXICO
RIO GRANDE
Scale: 1" = 50'
Level Existing Weir To El. 24.5 ± On Upstream Face. Slope Uniformly Toward Downstream Edge To Insure Even Flow Of Water Across Entire Length Of Weir.
Remove all of Existing Rip-Rap From River Bed
Concrete Rip-Rap 1'-0" Thick
Rip-Rap Heavy - 3'-0" Thick
Rip-Rap Light 1'-0" Thick
Fill And Level To El. 45.0 ±
X-SEC. A
X-SEC. B
X-SEC. C
X-SEC. D
Los Fresnos Pump House
Bottom Deck El. 34.88
Top Deck El. 42.66
Top of High Bank
Top of Low Bank
Flow
Existing Stockade
Existing Concrete Rip-Rap
Rip-Rap To Be Removed
Quantity Estimate
Embankment - 8000 C.Y.
Rip Rap - 300 C.Y.
INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
LOWER RIO GRANDE FLOOD CONTROL PROJECTS
LOS FRESNOS PUMP WEIR
MEXICAN BANK PROTECTION WORKS
6141-20-12

TOE OF LEVEE
CL 8 FT LEVEE
TOE OF LEVEE
BANK LINE
WATERLINE
WEIR AREA
CL RIVER
WATERLINE
BANK LINE
BASELINE
TOE OF BERM
CL 4 FT BERM
TOE OF BERM
0+124.23
0+094.4
0+075.51
0+030.62
0+00
0+154.99
IRON PIN SET
IRON PIN SET & TBM ELEV 9.89
SCALE 1"=100'
TOPOGRAPHIC SURVEY
BRR IRRIGATION & DRAINAGE



HOLDAR-GOMEZ & ASSOCIATES

BID IRR & DRAINAGE DIST.

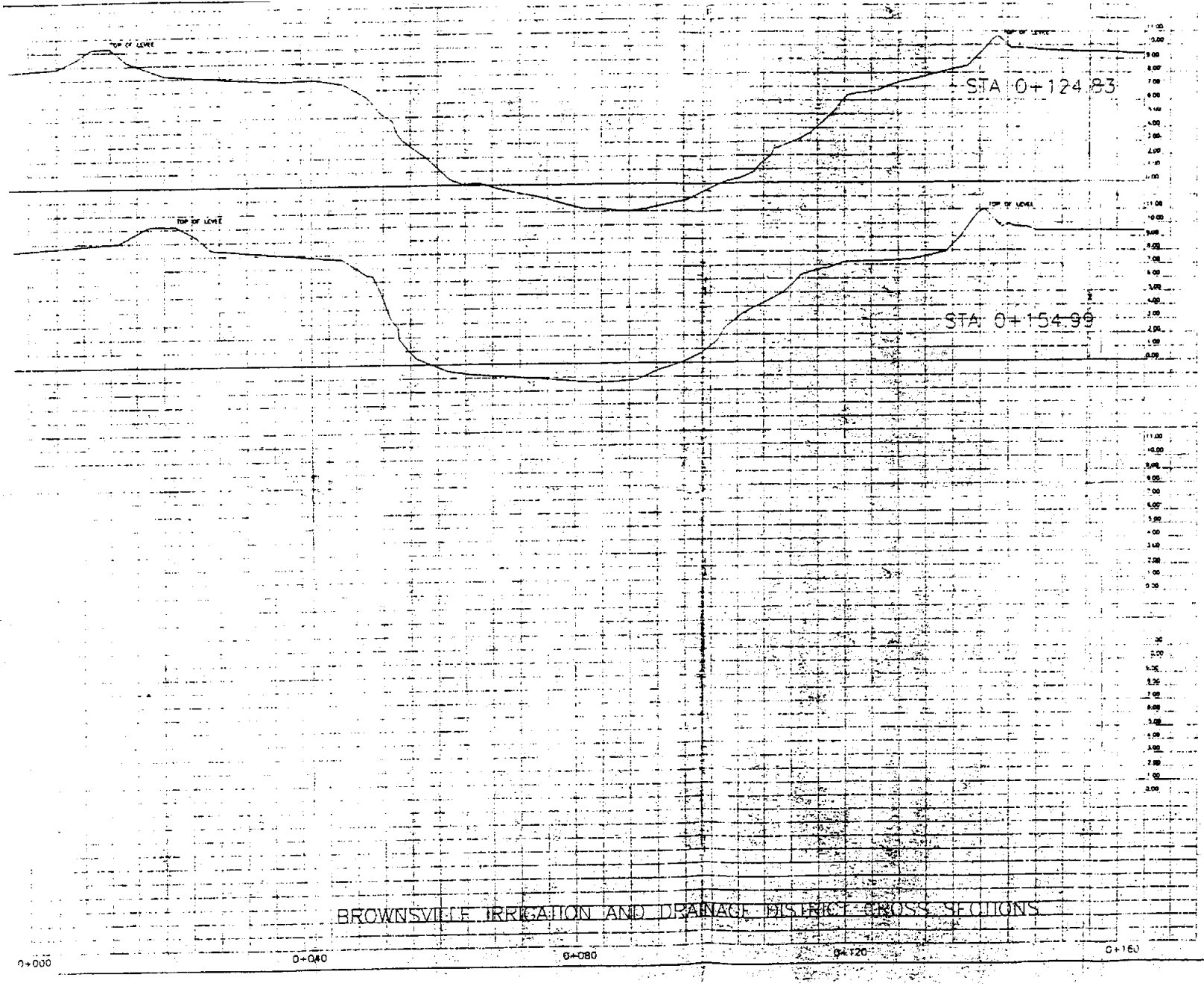
CAMERON COUNTY, TEXAS

TOPOGRAPHIC SURVEY

CROSS SECTIONS

STA 0+000 TO STA 0+094.44

SHEET

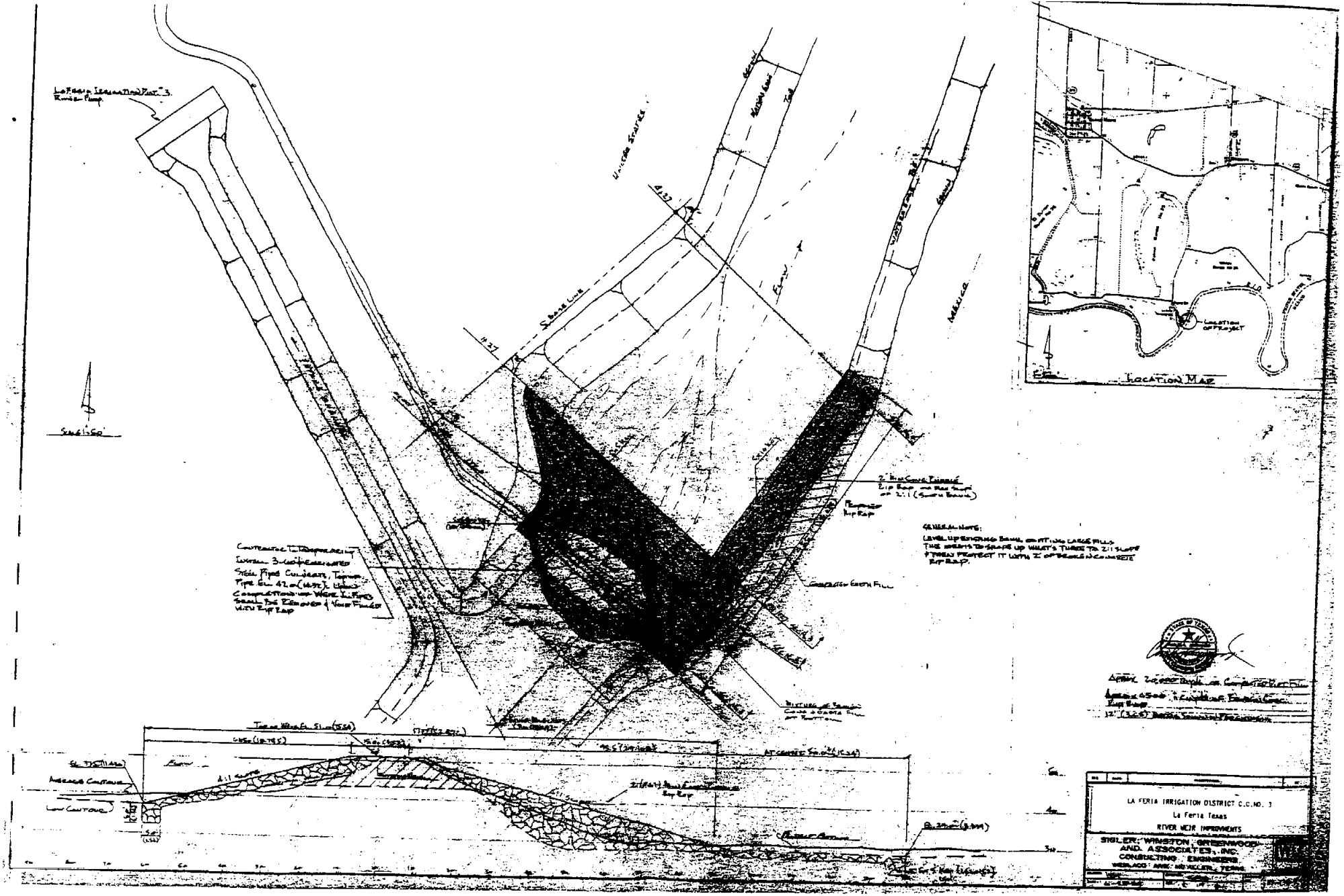


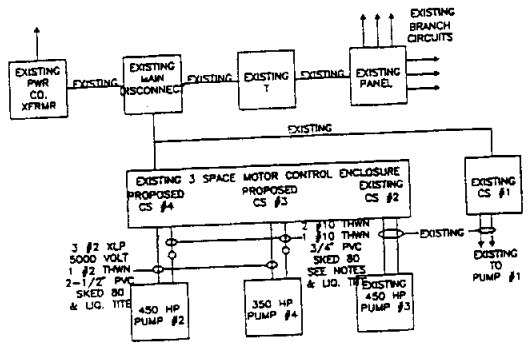
SCALE
1:200 Horizontal
1:100 VERTICAL

BRO IRR & DRAINAGE DIST.

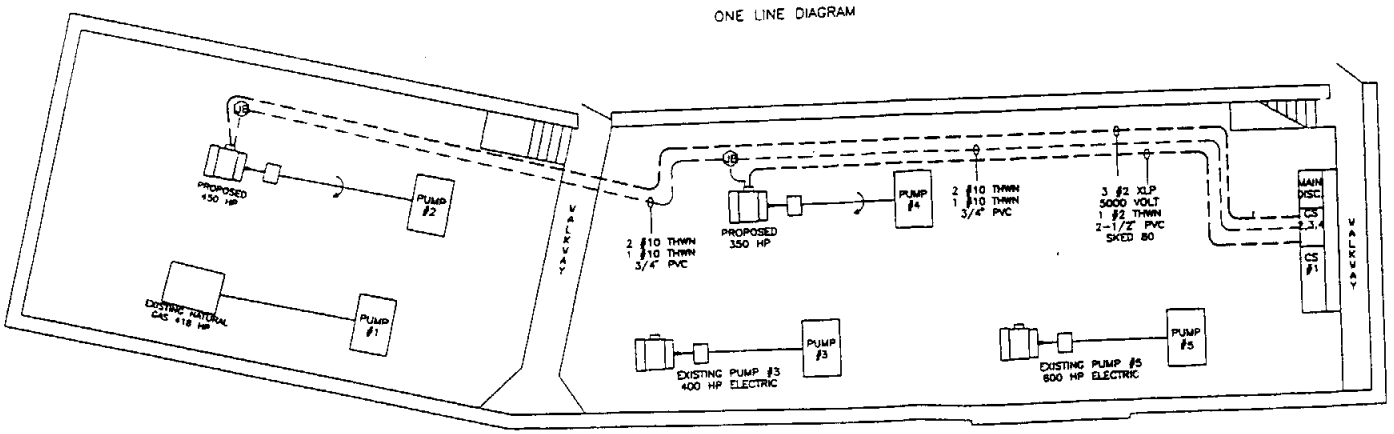
TOPOGRAPHIC SURVEY

CROSS SECTIONS


La Feria Irrigation District No. 3
River Pump
United States
Mexico
Location Map
La Feria Irrigation District C.C. No. 3
La Feria Texas
River Weir Improvements
Stieler, Winston, Greenwood and Associates, Inc.
Consulting Engineers



ONE LINE DIAGRAM



2-22-90

LA FERIA IRRIGATION DISTRICT CC 3
LA FERIA, TEXAS

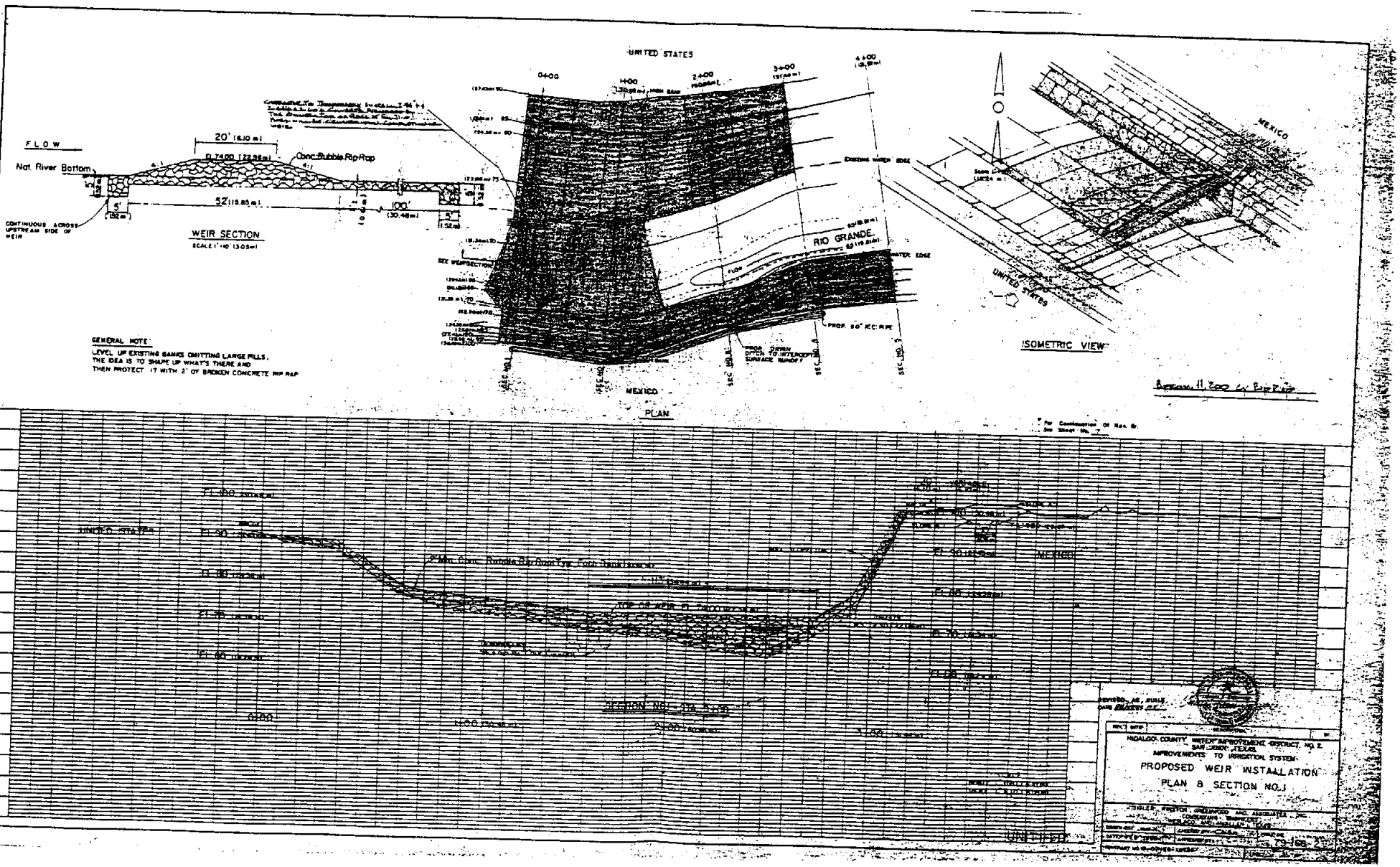
PROPOSED ELECTRIC PRIME MOVER INSTALLATION
PUMPS 2 AND 4
FIRST LIFT STATION

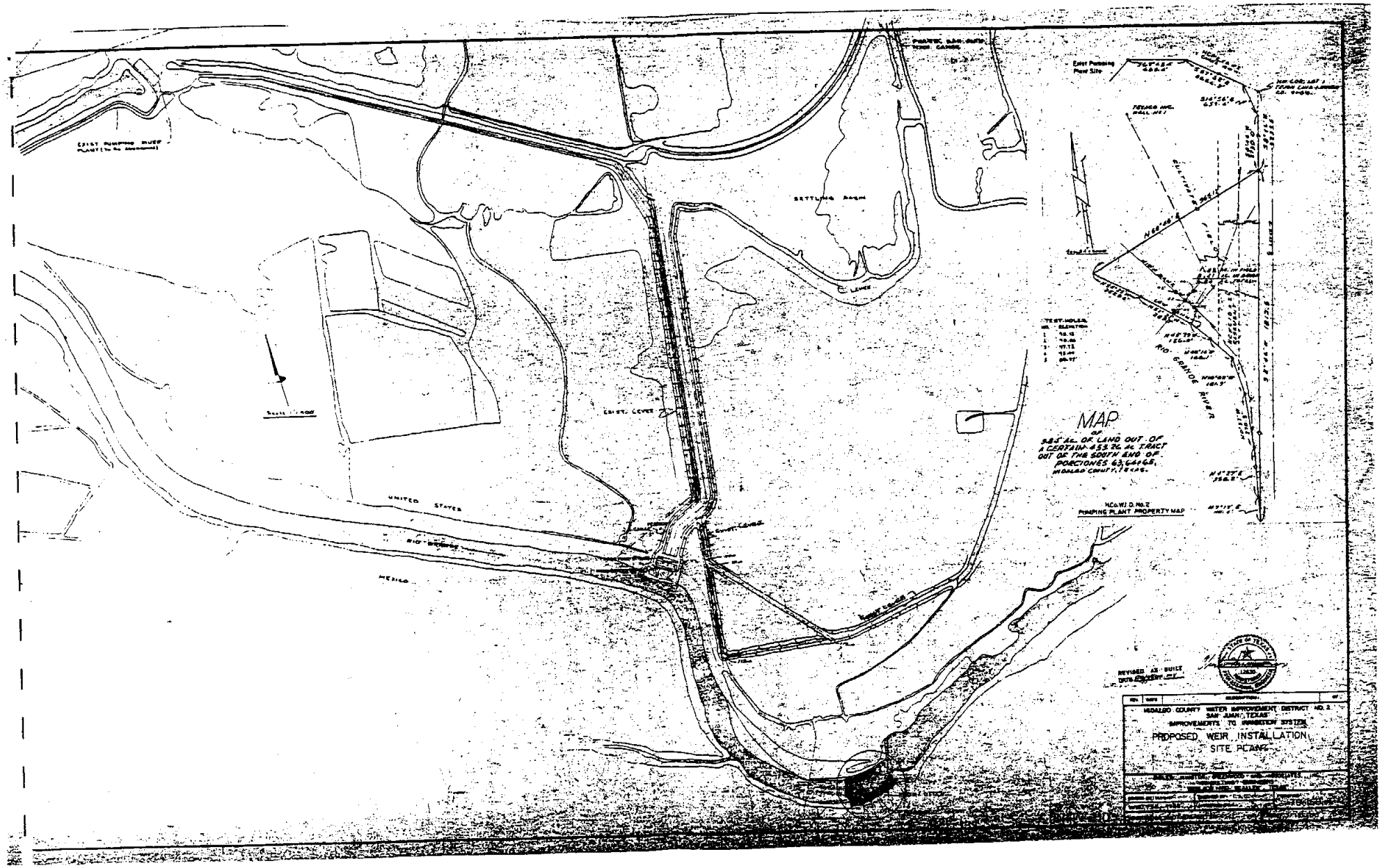
SIGLER, WINSTON, GREENWOOD AND ASSOCIATES, INC.
CONSULTING ENGINEERS
WESLACO AND MC ALLEN, TEXAS

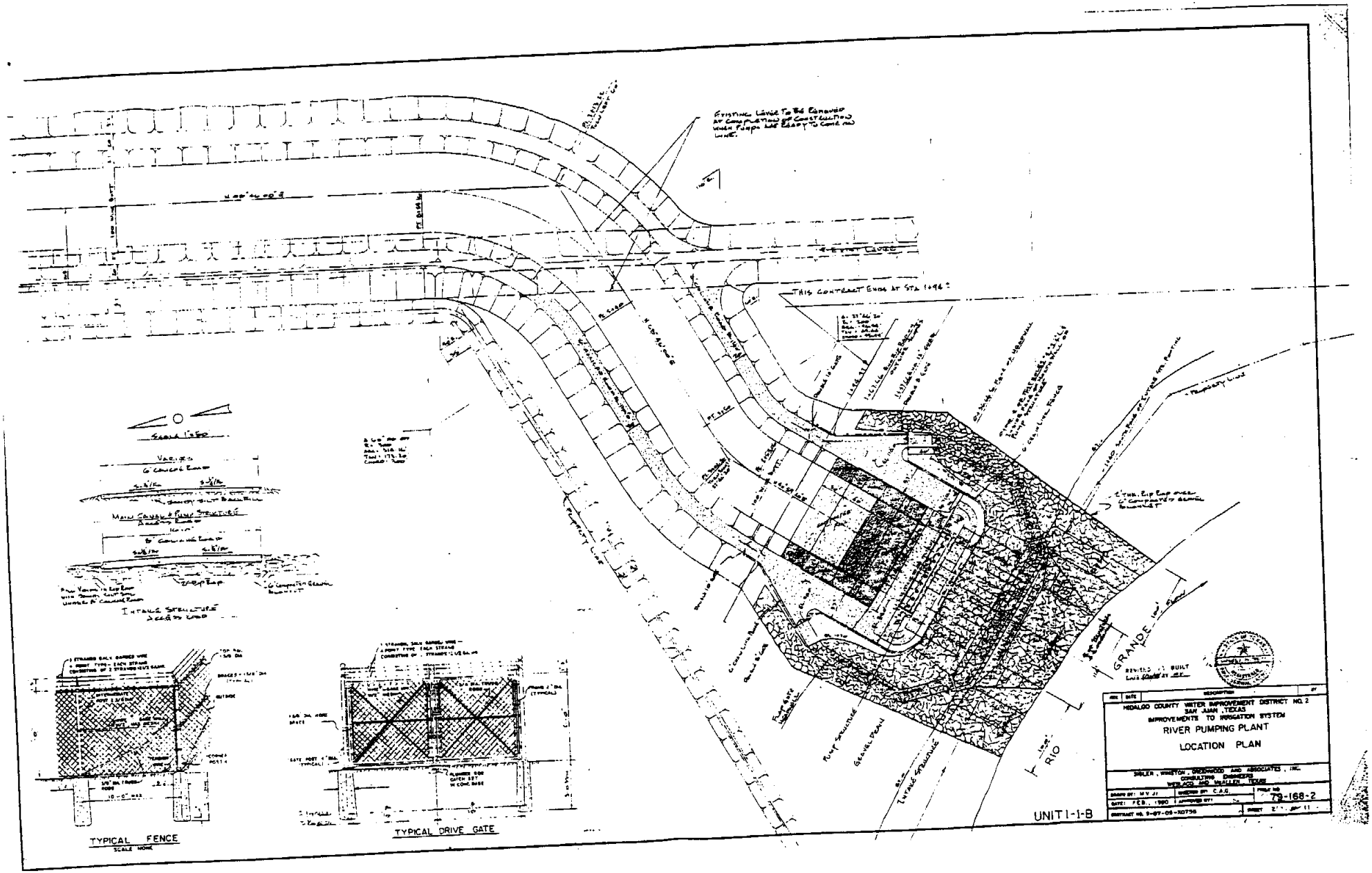
FEBRUARY 22, 1990

90-106

LA FERIA CCP

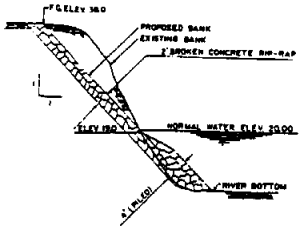

FLOW
Nat. River Bottom
20' (6.10 m)
El. 7400 (2256 m)
Conc. Rubble Rip-Rap
52' (15.85 m)
100' (30.48 m)
5' (1.52 m)
CONTINUOUS ACROSS UPSTREAM SIDE OF WEIR
WEIR SECTION
SCALE 1"=10' (3.05 m)
UNITED STATES
MEXICO
RIO GRANDE
PLAN
ISOMETRIC VIEW
GENERAL NOTE:
LEVEL UP EXISTING BANKS OMITTING LARGE FILLS.
THE IDEA IS TO SHAPE UP WHAT'S THERE AND
THEN PROTECT IT WITH 2' OF BROKEN CONCRETE RIP RAP
SECTION NO. 1
HIDALGO COUNTY WATER IMPROVEMENT DISTRICT NO. 2
SAN JUAN, TEXAS
IMPROVEMENTS TO IRRIGATION SYSTEM
PROPOSED WEIR INSTALLATION
PLAN & SECTION NO. 1
79-168


MAP
OF
5.85 Ac. OF LAND OUT OF A CERTAIN 455.2 Ac. AC. TRACT OUT OF THE SOUTH END OF PORCIONES 63, 64 & 65, HIDALGO COUNTY, TEXAS.
H.C.W.I.D. NO. 2
PUMPING PLANT PROPERTY MAP
UNITED STATES
MEXICO
SETTLING BASIN
EXIST. LEVEE
RIO GRANDE RIVER
REVISED AS - BUILT
HIDALGO COUNTY WATER IMPROVEMENT DISTRICT NO. 2
SAN JUAN, TEXAS
IMPROVEMENTS TO IRRIGATION SYSTEM
PROPOSED WEIR INSTALLATION
SITE PLANS


THIS CONTRACT ENDS AT STA 1496+
RIO GRANDE
UNIT 1-1-B
TYPICAL FENCE
TYPICAL DRIVE GATE
INTAKE STRUCTURE
MAIN CANAL & PUMP STRUCTURE
HIDALGO COUNTY WATER IMPROVEMENT DISTRICT NO. 2
SAN JUAN, TEXAS
IMPROVEMENTS TO IRRIGATION SYSTEM
RIVER PUMPING PLANT
LOCATION PLAN
79-168-2

NOTES

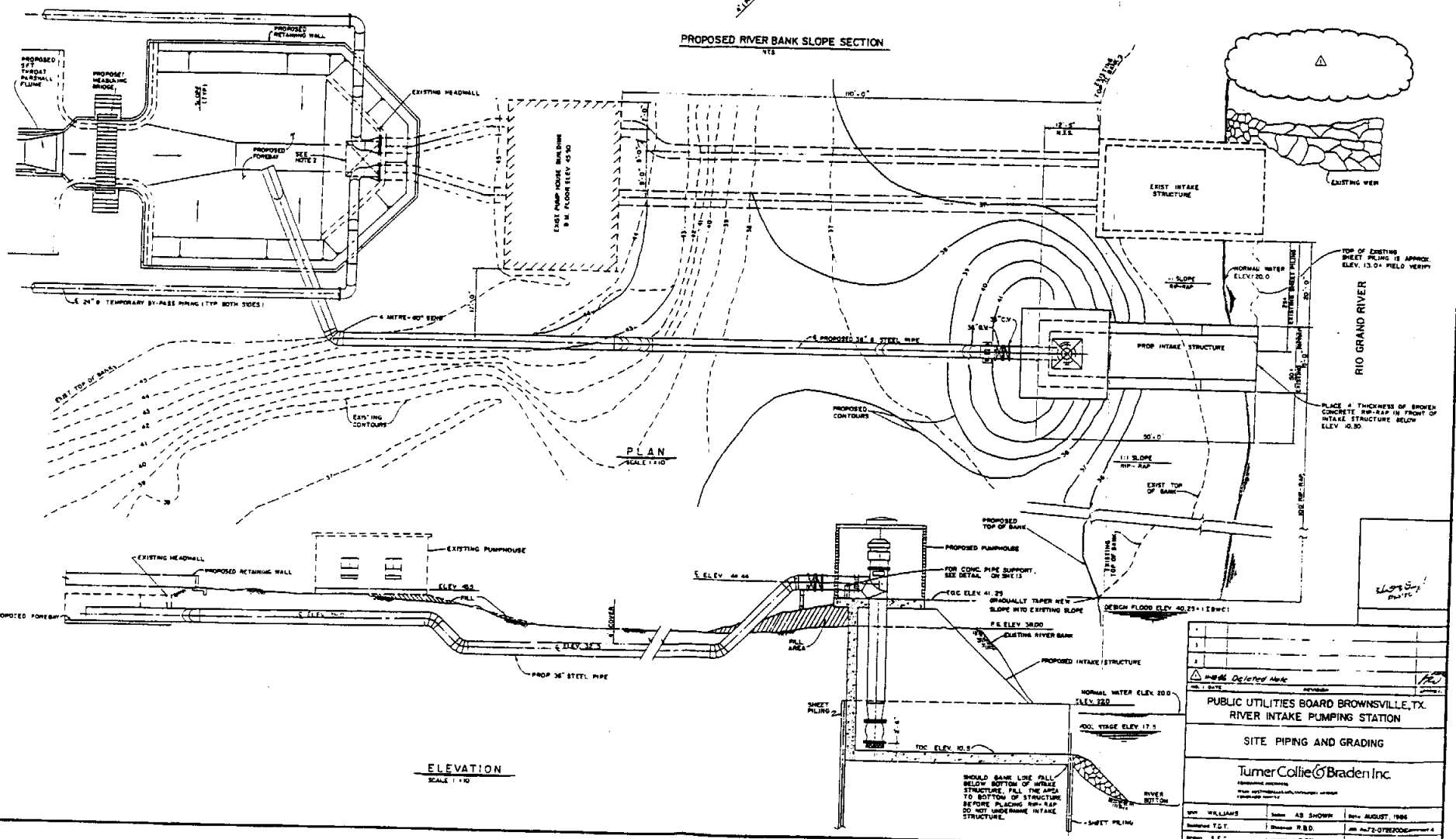
1. APPROXIMATELY 300 CUBIC YARDS OF BROKEN CONCRETE PAVEMENT IS STOCKPILED AT THE PLANT SITE. THE CONTRACTOR, AT HIS OPTION, MAY USE THIS MATERIAL FOR THE RIVER BANK RIP RAP. CONTRACTOR TO VERIFY QUANTITY.
2. EXISTING MEASUREMENT SHACK IS TO BE REMOVED, SALVAGED AND RELOCATED. DISCONNECT ALL UTILITIES AND RECONNECT AT THE NEW LOCATION. NEW LOCATION IS TO BE DESIGNATED BY OWNER.



PROPOSED RIVER BANK SLOPE SECTION
NTS

NOTE

NO FILL TO BE PLACED IN THE RIVER OR ON THE RIVER BANK. TWO FEET (2') OF BROKEN CONCRETE RIP-RAP TO BE PLACED ON THE SLOPE FROM ELEVATION 38.0 TO ELEVATION 19.0 WHERE THE RIP-RAP INCREASES IN THICKNESS TO FOUR FEET (4') AND EXTENDS TO RIVER BOTTOM.



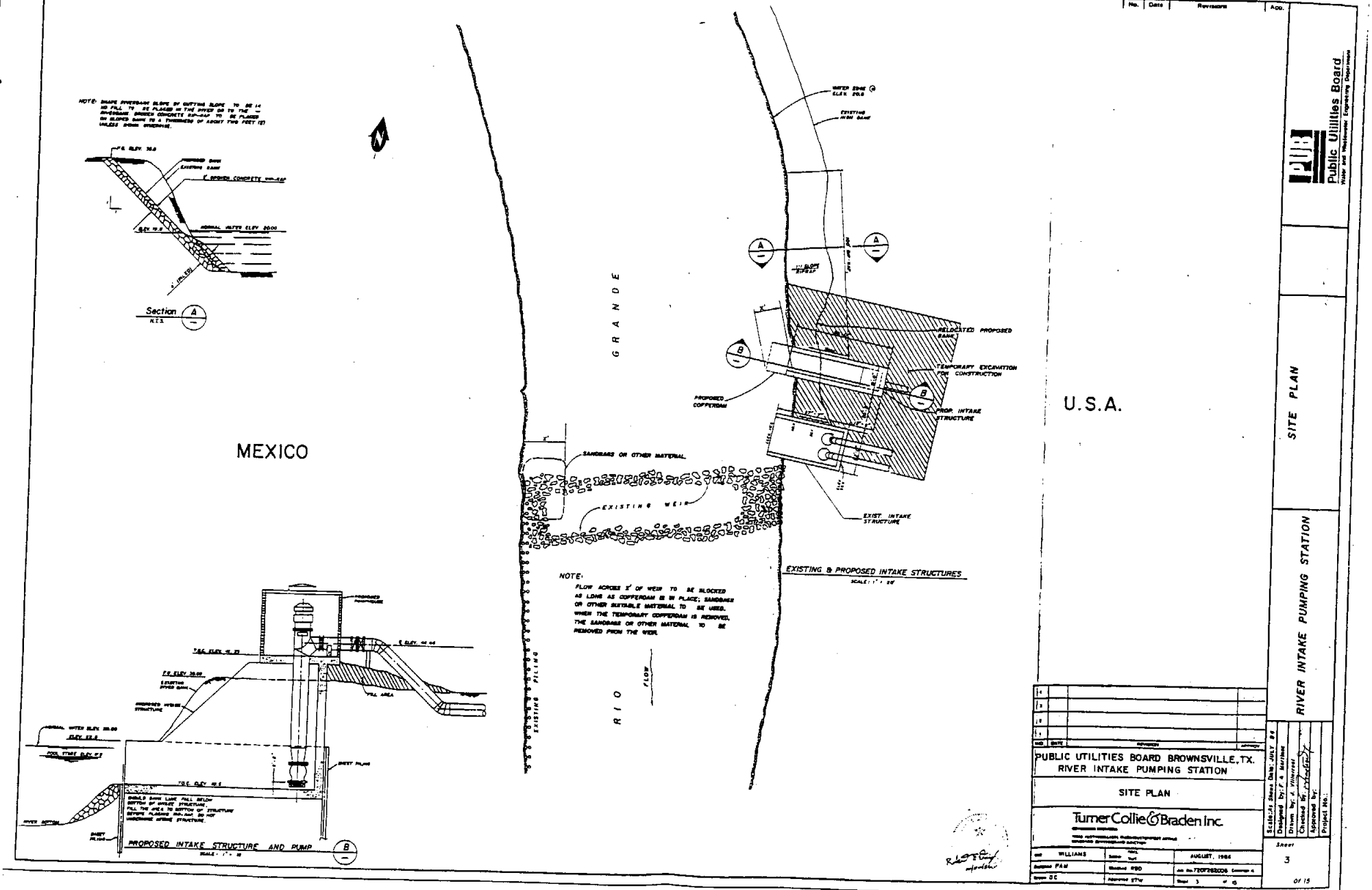
Addendum No. 2

PUBLIC UTILITIES BOARD BROWNSVILLE, TX.
RIVER INTAKE PUMPING STATION

SITE PIPING AND GRADING

Turner Collie & Braden Inc.

DES. WILLIAMS	DRAWN AS SHOWN	DATE AUGUST, 1986	
CHECKED T.G.T.	CHECKED R.B.D.	JOB NO. 72-07282006	
APPROVED S.E.C.	APPROVED S.T.W.	SHEET 4 OF 15	



No. | Date | Revisions | App.

Public Utilities Board
Water and Wastewater Engineering Department

SITE PLAN

RIVER INTAKE PUMPING STATION

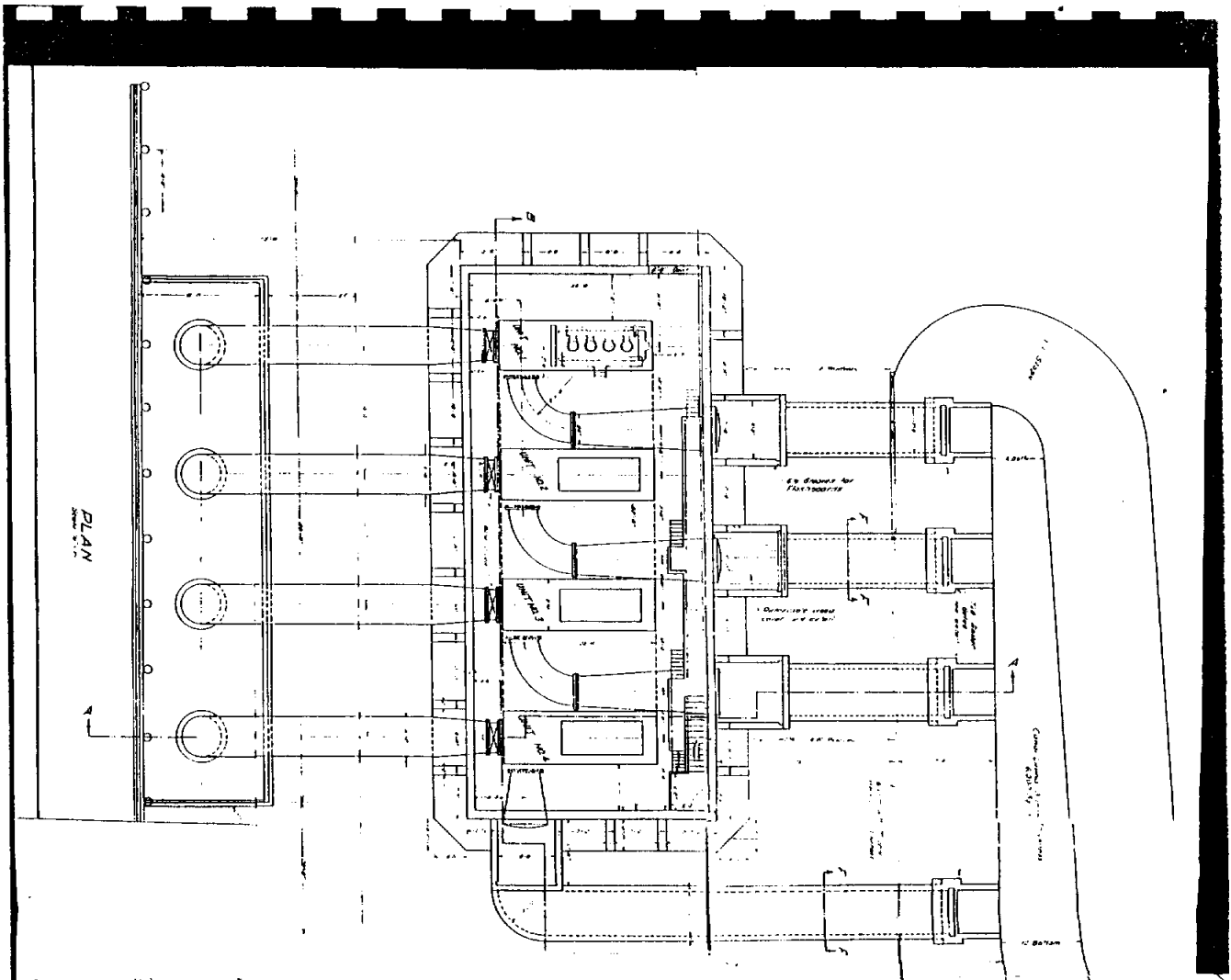
PUBLIC UTILITIES BOARD BROWNSVILLE, TX.
RIVER INTAKE PUMPING STATION

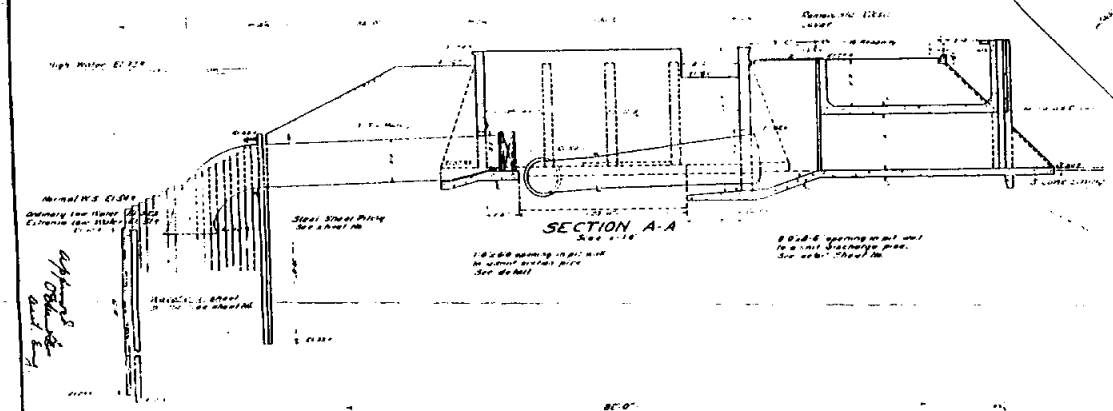
SITE PLAN

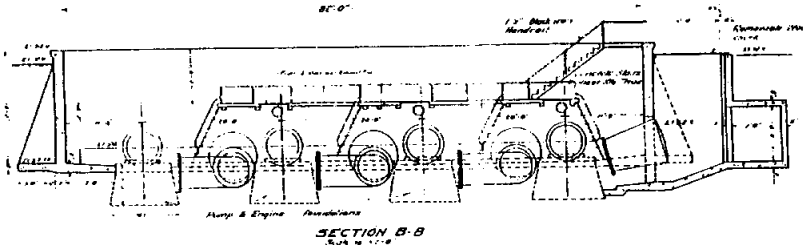
Turner Collie & Braden Inc.

Scale-As Shown	Date: JULY 84
Designed by: F. A. Martinez	
Drawn by: A. Villarreal	
Checked by:	
Approved by:	
Project No.:	

Sheet 3 of 15





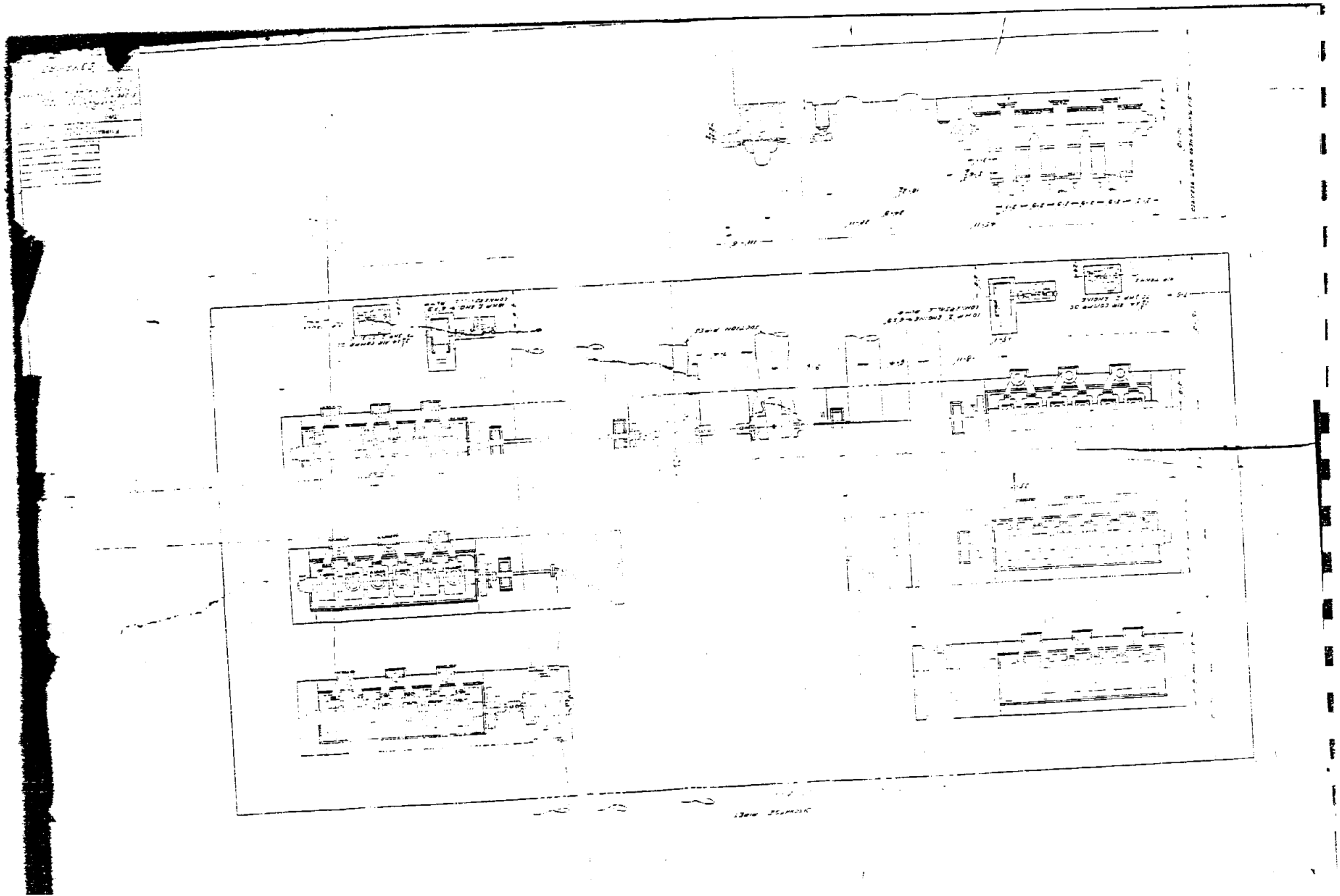


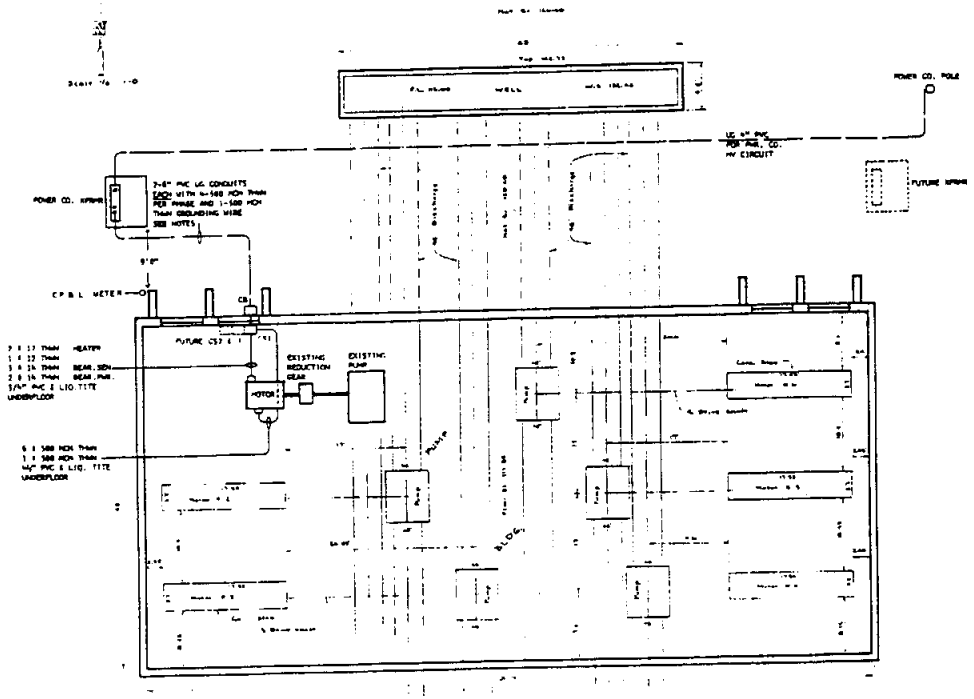
STATE OF TEXAS
WILLACY COUNTY WATER CONTROL & IMPROVEMENT DISTRICT NUMBER ONE
RAYMONDVILLE, TEXAS

FOUNDATIONS AND SITE
RIVER PUMPING PLANT
GENERAL LAYOUT

DESIGN | DRAWN | TRACED | DATE | SHEET NO.

DELTA RULE





NOTES

THE MOTOR STARTER ELECTRIC ENTRANCES ARE TO BE DESIGNED FOR FUTURE COPPER BUSS TO 2 MORE COMBINATION STARTERS OF THE SAME SIZE. ALL STARTERS ARE TO BE INSTALLED FACING FRONT OF THE UNITS, SIDE BY SIDE WITH CS1 TO BE ON THE RIGHT SIDE FUTURE CS2 IN THE CENTER AND FUTURE CS3 TO BE ON THE LEFT.

THIS CONTRACTOR TO FURNISH, INSTALL AND CONNECT:
1. MOTOR.
2. MOTOR COUPLING BETWEEN THE MOTOR AND THE EXISTING GEAR DRIVE TO THE PUMP.
3. ELECTRIC POWER CIRCUIT FROM THE MOTOR TO THE MOTOR STARTER.
4. BEARING SENSOR AND MOTOR HEATER CIRCUITS FROM THE MOTOR STARTER TO THE MOTOR.
5. COMBINATION MOTOR STARTER CS1.
6. FEEDER FROM THE MOTOR STARTER TO THE SERVICE ENTRANCE DISCONNECT AND PROTECTION.
7. SERVICE ENTRANCE FROM THE SERVICE ENTRANCE DISCONNECT AND PROTECTION TO THE POWER CO. TRANSFORMER. (THE POWER COMPANY TO MAKE THE CONNECTIONS AT THE TRANSFORMER.)
8. SERVICE ENTRANCE DISCONNECT AND PROTECTION. INCLUDING FOUNDATION FOR SAME.
9 METER PEDESTAL AS SHOWN ON PLANS

THIS CONTRACTOR TO FURNISH AND INSTALL ONLY:
1. CONCRETE FOUNDATION FOR THE POWER COMPANY TRANSFORMER TO THEIR SPECIFICATIONS FOR A 150M KVA TRANSFORMER.
2. CONDUIT FROM THE TRANSFORMER FOUNDATION TO THE POWER CO. POLE TO THEIR SPECIFICATIONS.

M——MOTOR AND COUPLING. (SEE WRITTEN SPECIFICATIONS.

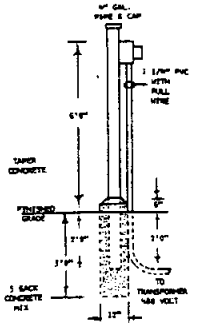
CS1——MOTOR STARTER.(SEE WRITTEN SPECIFICATIONS ALSO)

CB——SERVICE ENTRANCE DISCONNECT AND PROTECTION. (SEE WRITTEN SPECIFICATIONS ALSO)

CS1 COMBINATION STARTER, AUTO TRANSFORMER TYPE, FOR 500 HP MOTOR, 460 VOLTS, 60 HERTZ, 3 OL RELAYS, SIZE 7, NEMA 1 ENCLOSURE, 800 AMP, 50,000 AIC CIRCUIT BREAKER, 120 VOLT CONTROL TRANSFORMER OF SUFFICIENT SIZE FOR THE MOTOR HEATER, BEARING SENSOR AND THE HOLDING COIL. HOA SWITCH, AMMETER AND PHASE SWITCH. A THROUGH THE DOOR CB OPERATING MECHANISM WILL NOT BE ACCEPTABLE.

CB CIRCUIT BREAKER, 480 VOLTS, 3 POLE, 50,000 AIC, 2500 AMP, SHUNT OPERATED, GF PROTECTED NEMA 1R ENCLOSURE, PUSH BUTTON OR FINGER OPERATED LEVER FOR TRIPPING THE CB TO THE OFF POSITION.

THE SERVICE ENTRANCE TO BE PARALLELLED 500 MCM OF EIGHT (8) EACH PER PHASE. 4 PARALLELLED IN EACH CONDUIT AND THERE PARALLELLED TO PRODUCE A TOTAL OF 8 PER PHASE.



TYPICAL METER PEDESTAL DETAIL

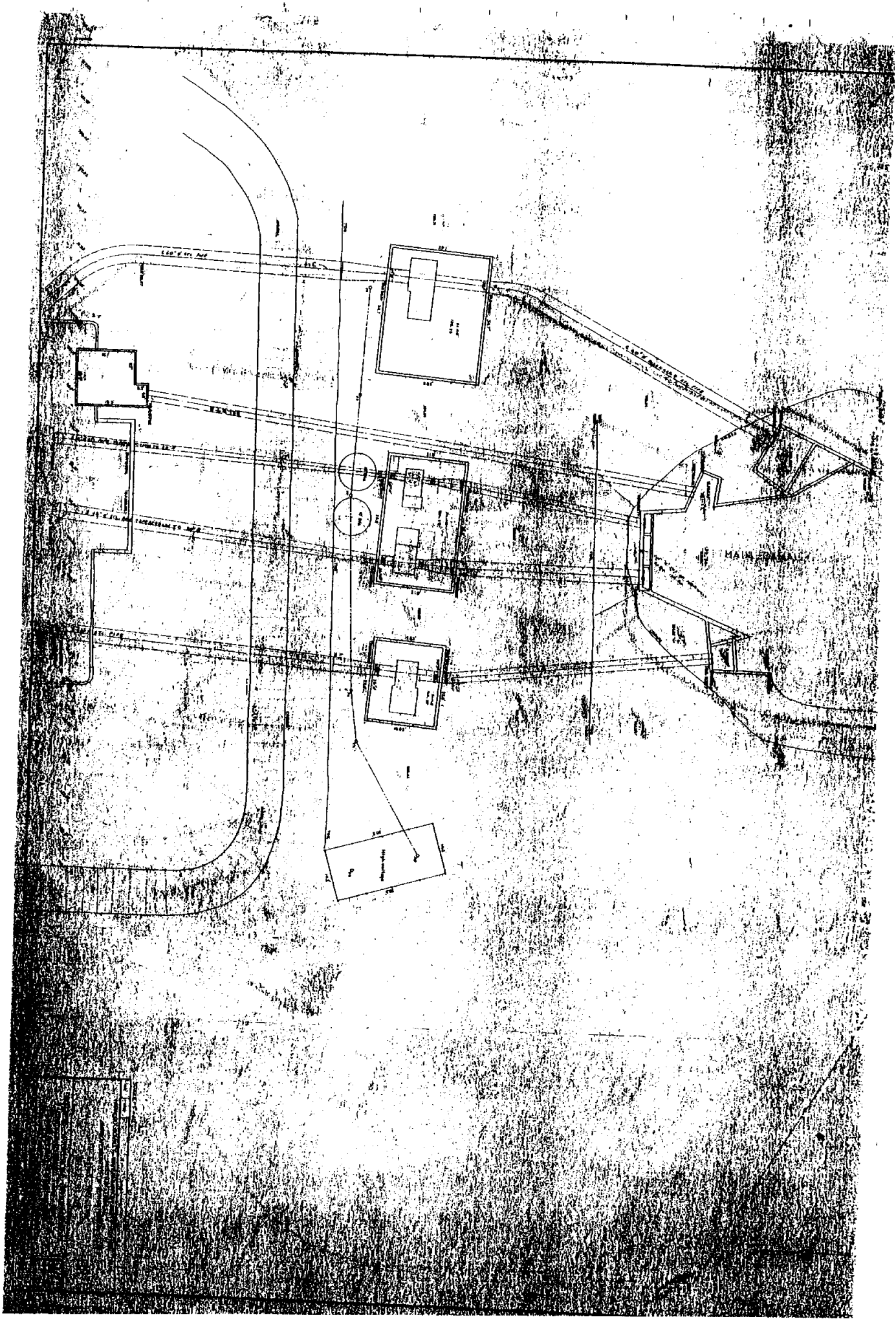
SCALE 1/2" = 1'-0"

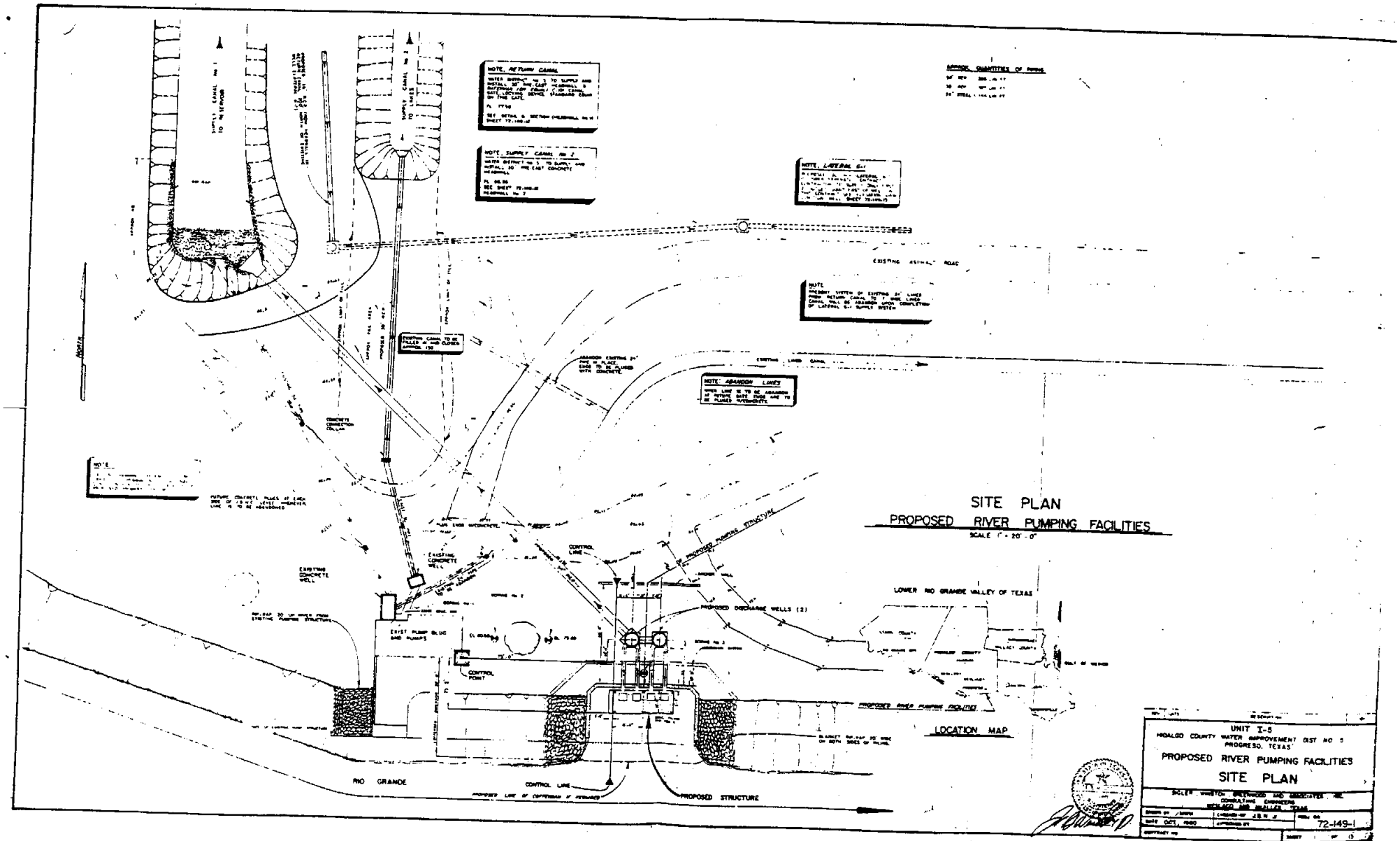
HIDALGO COUNTY WATER CONTROL & IMPROVEMENT DISTRICT NO.1
EDINBURG, TEXAS

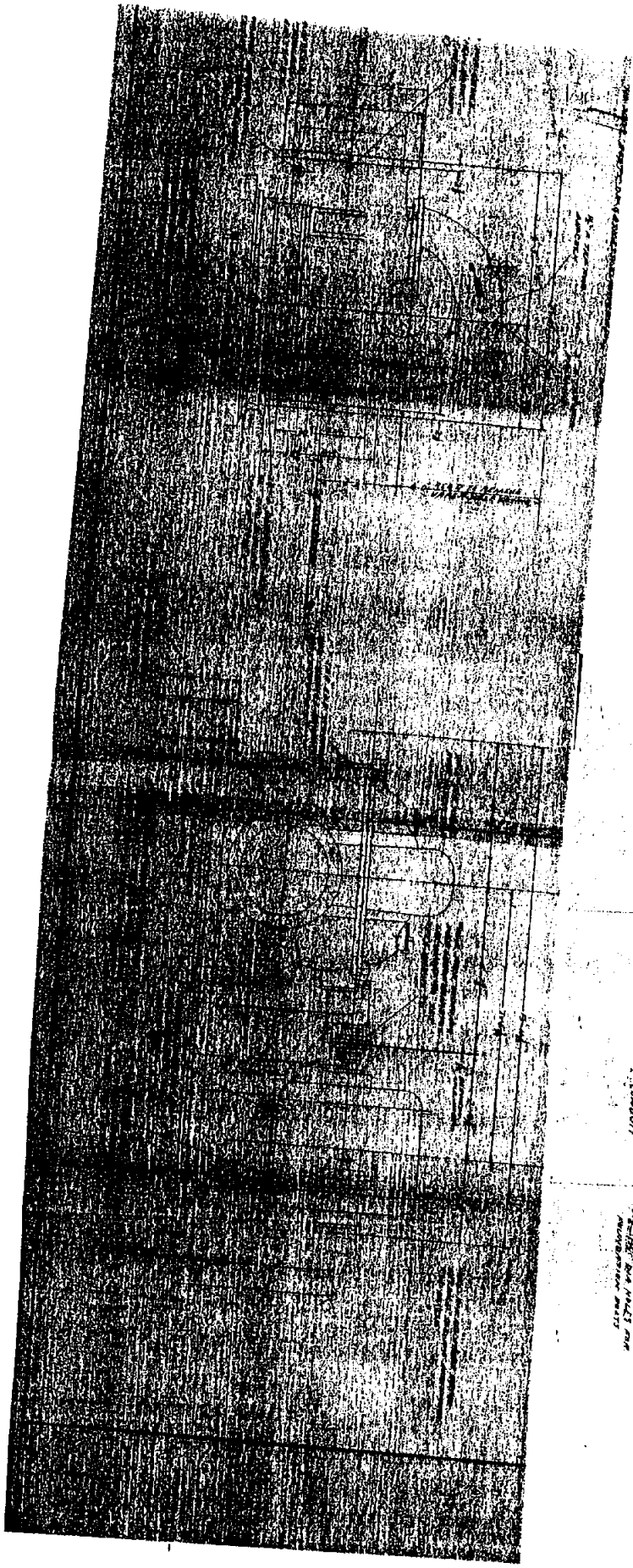
RIVER PUMPING PLANT IMPROVEMENTS

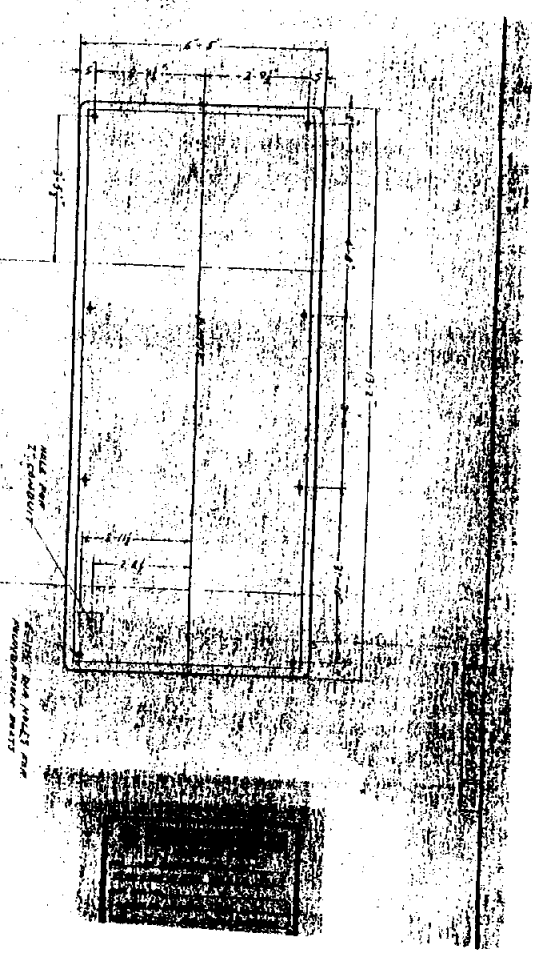
SIGLER, WINSTON, GREENWOOD AND ASSOCIATES, INC.
CONSULTING ENGINEERS
WESLACO AND MC ALLEN, TEXAS

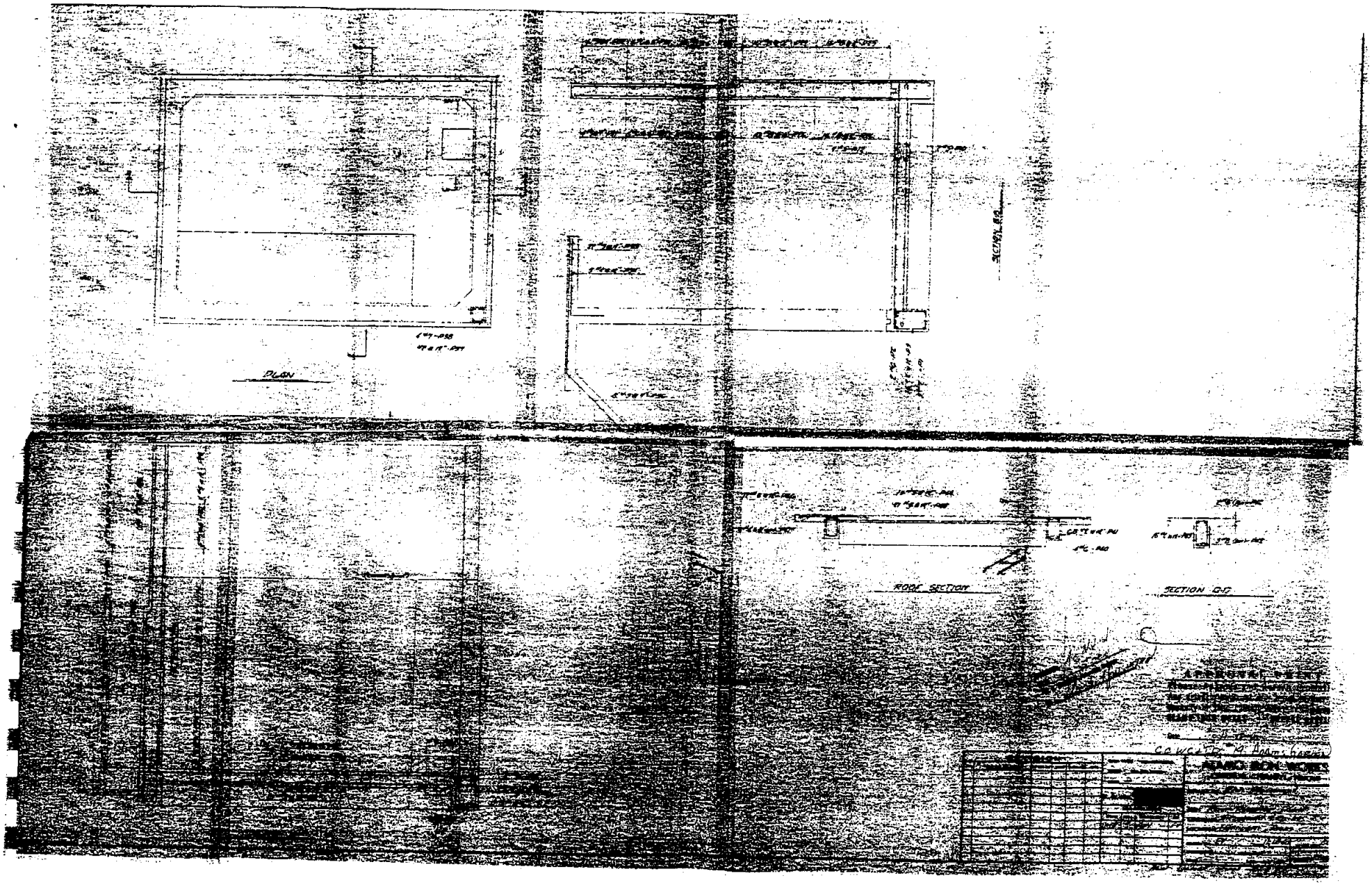
80-188-1

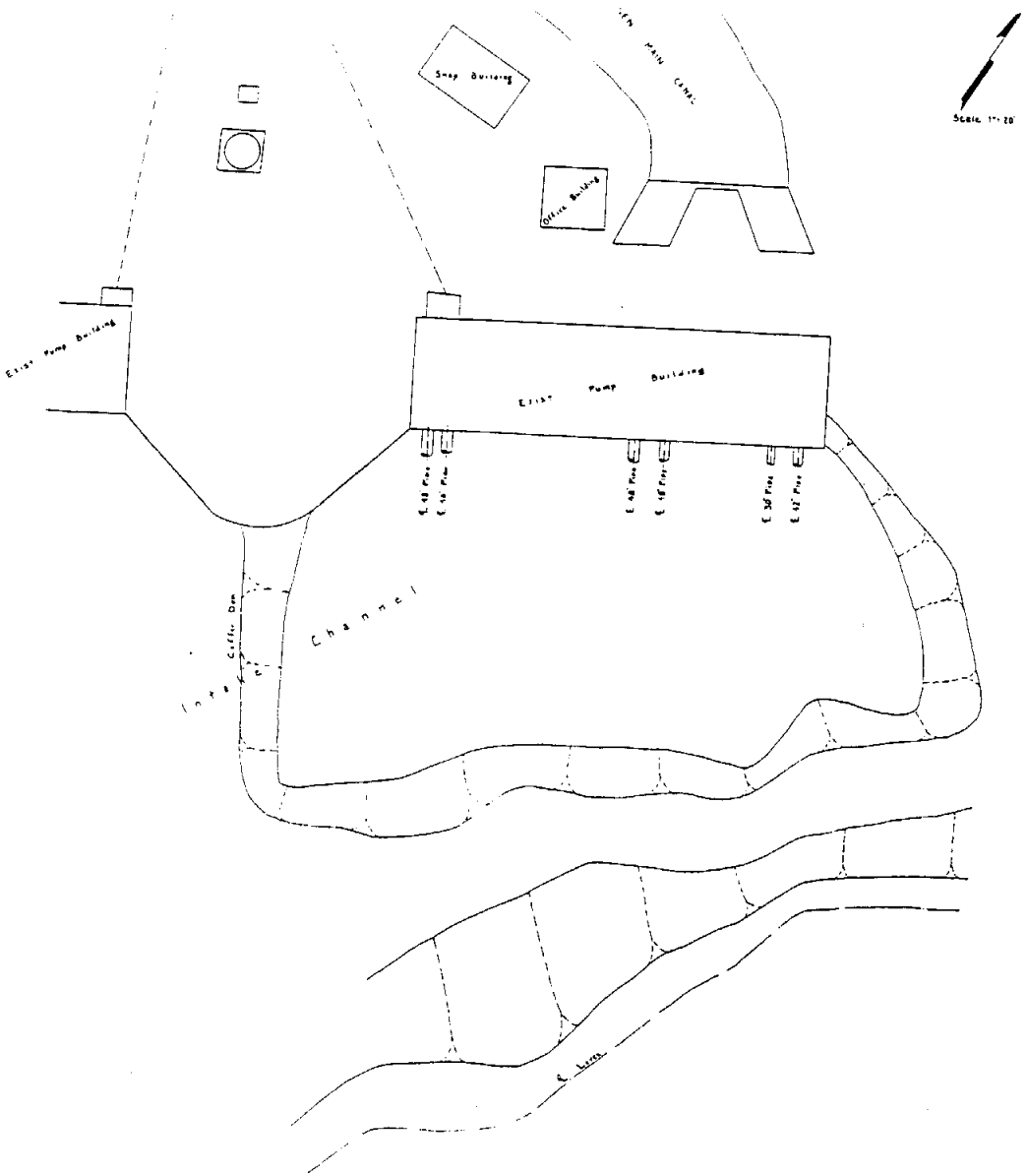


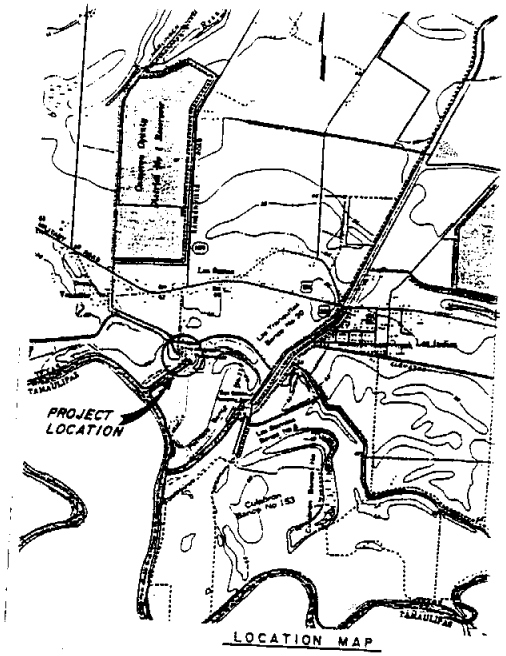

SITE PLAN
PROPOSED RIVER PUMPING FACILITIES
SCALE 1" = 20'-0"
LOCATION MAP
LOWER RIO GRANDE VALLEY OF TEXAS
RIO GRANDE
CONTROL LINE
PROPOSED STRUCTURE
PROPOSED DISCHARGE WELLS (2)
EXISTING ASPHALT ROAD
EXISTING LAND CANAL
NORTH
UNIT I-5
HIDALGO COUNTY WATER IMPROVEMENT DIST NO 5
PROGRESO, TEXAS
PROPOSED RIVER PUMPING FACILITIES
SITE PLAN
72-149-1






PLAN
ROOF SECTION
SECTION C-C

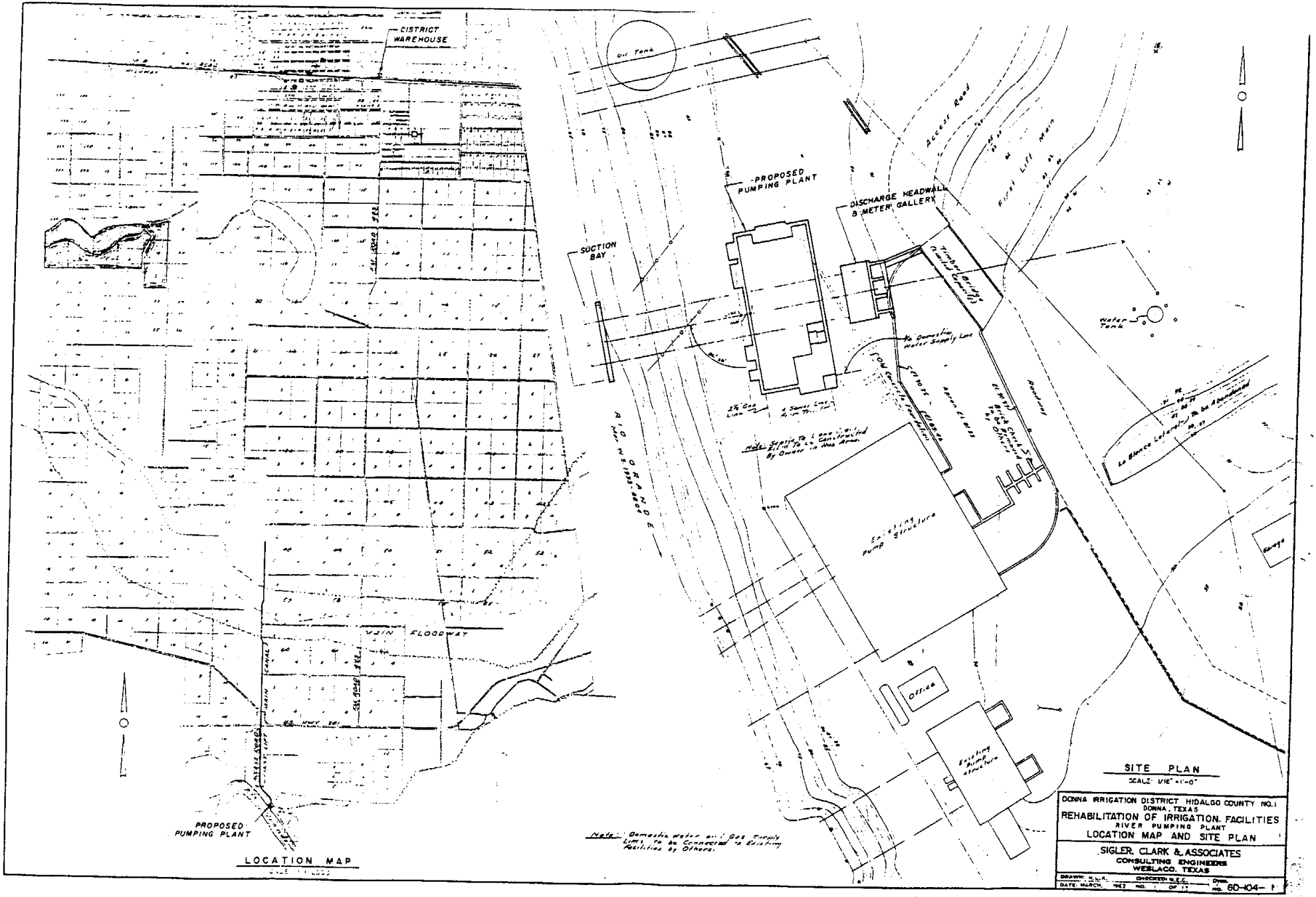


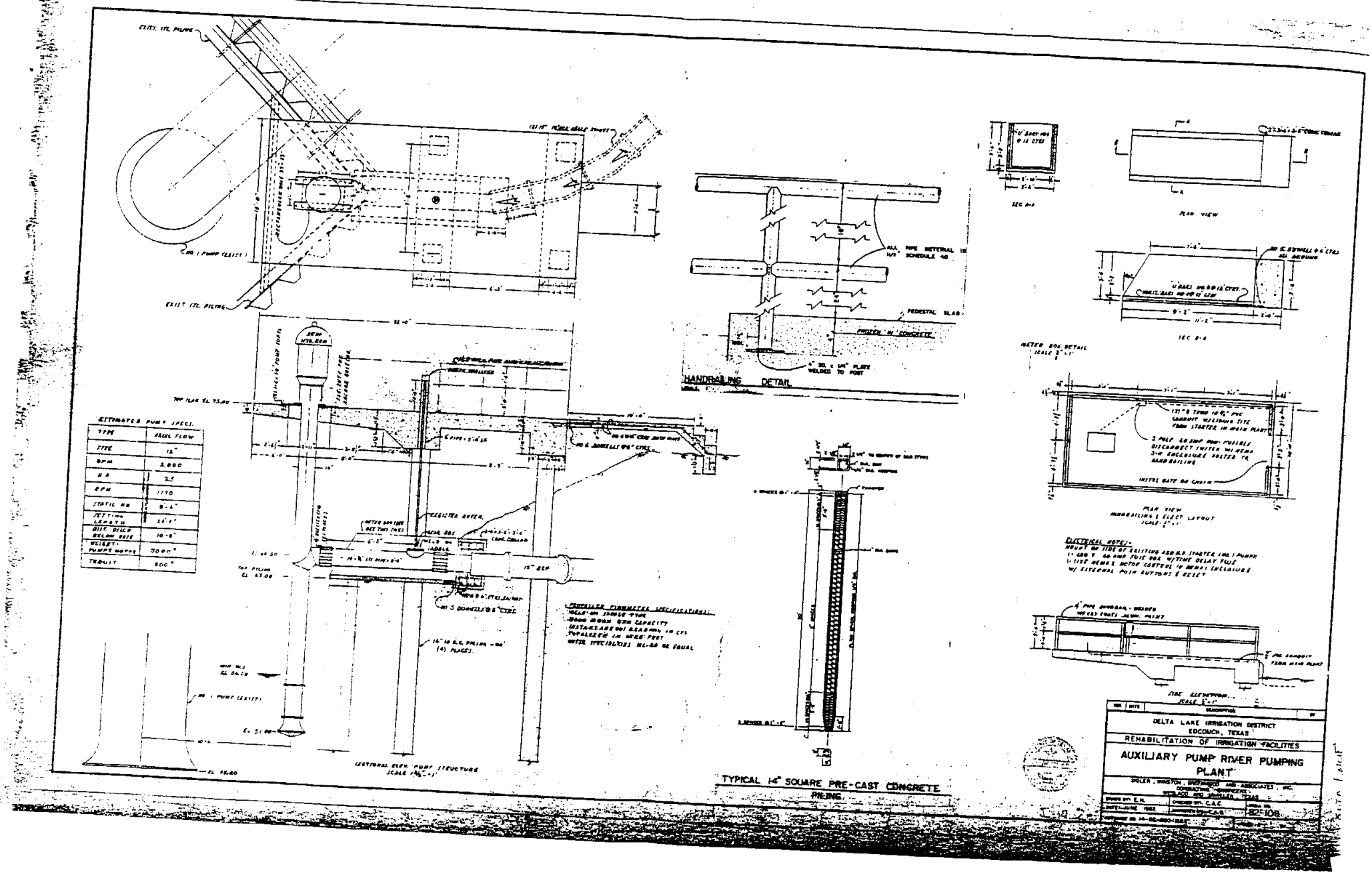


CC Plant 1
Brownsville Tx

SIGLER, WINSTON, GREENWOOD AND ASSOCIATES, INC.
CONSULTING ENGINEERS
WESLACO AND MC ALLEN, TEXAS

CCW10-1


DISTRICT WAREHOUSE
PROPOSED PUMPING PLANT
MAIN FLOODWAY
HIGHWAY
CANAL
LOCATION MAP
Oil Tank
Access Road
First Lift Main
PROPOSED PUMPING PLANT
DISCHARGE HEADWALL & METER GALLERY
SUCTION BAY
Trinity Baptist Church
Water Tank
Re Domestic Water Supply Line
Existing Pump Structure
Office
Existing Pump Structure
Note: Domestic Water and Gas Service Lines to be Connected to Existing Facilities by Others.
SITE PLAN
SCALE: 1/16" = 1'-0"
DONNA IRRIGATION DISTRICT HIDALGO COUNTY NO. 1
DONNA, TEXAS
REHABILITATION OF IRRIGATION FACILITIES
RIVER PUMPING PLANT
LOCATION MAP AND SITE PLAN
SIGLER, CLARK & ASSOCIATES
CONSULTING ENGINEERS
WESLACO, TEXAS
DRAWN: H.L.H. CHECKED: W.E.C.
DATE: MARCH, 1962 NO. 1 OF 11
JOB NO. 60-104-1


HANDRAILING DETAIL
PLAN VIEW
TYPICAL 14" SQUARE PRE-CAST CONCRETE PILING
DELTA LAKE IRRIGATION DISTRICT
EDCOUCH, TEXAS
REHABILITATION OF IRRIGATION FACILITIES
AUXILIARY PUMP RIVER PUMPING PLANT

Appendix B

Wm. Bart Hines, P.E., Utility Manager
P.O. Box 220
McAllen, Texas 78505-0220
(956) 972-7150 Office
(956) 972-7155 Fax
E-Mail: utility@utility.ci.mcallen.tx.us

MCALLEN PUBLIC UTILITIES

Fax

To:	Mr. Tony Reid Perez/Freese & Nichols	**From:**	Wm. Bart Hines, P.E. Utility Manager
Fax:	682-1545	**Pages:**	2
Phone:	631-4482	**Date:**	01/14/99
Re:	TWDB Contract Diversion Facilities on the Rio Grande River	**CC:**	Mr. Ken Jones, Lower Rio Grande Valley Development Council

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Attached please find comments on the above mentioned contract.

Should you need additional information, please advise.

CITY OF McALLEN
DEPARTMENT OF PUBLIC UTILITIES
MEMORANDUM

TO: Tony Reid, P.E., Perez/Freese & Nichols LLC

FROM: Wm. Bart Hines, Utility Manager

SUBJECT: **Comments regarding TWDB Contract**
Diversion Facilities on the Rio Grande River

DATE: **January 14, 1999**

Please accept the following comments as requested in our meeting Monday January 11, 1999 at Sigler, Winston, Greenwood and Associates, Inc. offices where we discussed the recommendations which should be made to accomplish the above referenced contract.

It is my understanding that Mr. Greenwood has accomplished Subtask 2.1 and provided drawings to you for further evaluation and for reporting. I see no useful purpose for Subtask 2.3 (to visit each diversion point) if the assembled drawings are truly accurate. I believe the TNRCC Rio Grande Watermaster should be contacted and shown the drawings to verify their accuracy, if this could be at all possible.

The main purpose of Task 2.0, is in support of the investigation to determine the answer to two questions:

- If there is no agriculture water being discharged from Lake Falcon (only M & I water is being discharged from Lake Falcon), will the Rio Grande River be capable of delivering water to each diversion structure?

- Is each irrigation district capable of diverting water from their diversion point to the cities?

- Raising of the diversion weirs should be evaluated further, but may not be advisable. The increase of weir height will affect the flood hydrology of the Rio Grande River and may cause greater impoundment of waters, thus greater seepage and evapotranspiration. Greater weir height will also cause a great amount of backwater on land that may flood both United States and Mexican shorelines. The solution for assuring a diversion structure is able to pump water to the canals for M & I's purposes would be dredging the Rio Grande River diversion points.

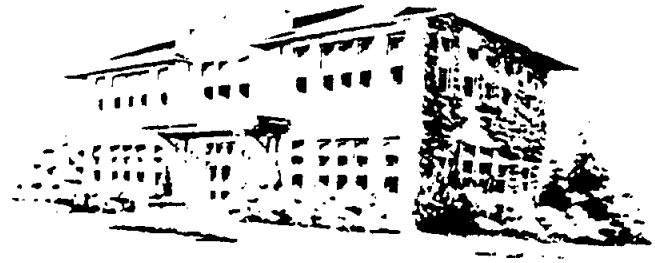
- All cities and/or water purveyors must be required to have control of, or contract to, an irrigation district for raw water storage for at least 20 days. Raw water storage requirements should meet the maximum daily demand from the water treatment facility. The 20 day storage requirement should be a firm storage requirement and not be based on total volume of storage. Also, cities should not take into account canals as storage facilities unless there are no taps to the canal prior to the city's diversion point. In other words, they can use that portion of the canal that serves solely their water treatment facility, if and only if, the irrigation district agrees to that concept and it could be contained through weirs or gates to meet that storage requirement.

If you have any questions or comments feel free to contact me.

HIDALGO AND CAMERON COUNTIES
IRRIGATION DISTRICT
No. 9

SERVING THE LANDS
TRIBUTARY TO
MERCEDES-WESLACO
ELSA-EDCOUCH-LA VILLA
82,000 ACRES

TELEPHONE 956 / 565-2411
FAX 956 / 565-0521



P.O. BOX 237
MERCEDES, TEXAS
78570-0237

January 14, 1999

Tony Reid, P.E.
Perez, Freese, and Nichols, L.L.C.
3233 N. McColl Road
McAllen, Texas 78501

Re: Low River Flow Pumping Conditions

Dear Tony,

From past history, it has been shown that Irrigation Districts River Pumping Plants (those that deliver municipal water) still have the ability to operate during low River flow conditions. Obviously, the pumping efficiencies are negatively affected and the overall volumes to be pumped are limited. The main reason that diversions can still take place is due to the existing River weirs that provide the necessary elevated pools of retained water. There is documented data (Rio Grande Watermaster and I.B.W.C.) that indicate the different past time frames when little or no irrigation water was being released from Falcon Lake. The water being diverted from the River during these times was only municipal water. One can assume from this documented history that Irrigation Districts will still be able to physically pump water from the River even if the only remaining water supply is municipal water.

To insure the continued pumping ability under low flow conditions, the following recommendations are made:

1. A study should be made on all existing River weirs (and future installations) that could determine their positive impact on pumping conditions during low flows. Also, what could be done to increase the positive results of the weirs now in place.

2. Further study should be done on the aquatic weed infestation and its impact on low River flows.

HIDALGO AND CAMERON COUNTIES
IRRIGATION DISTRICT
No. 9

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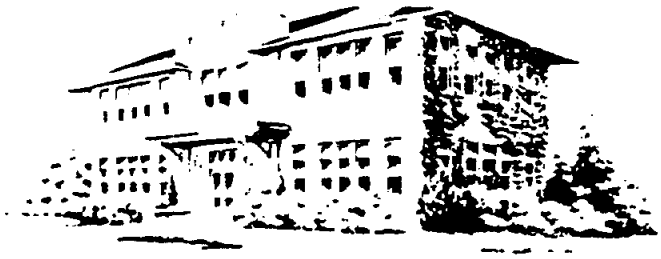

P.O. BOX 237
MERCEDES, TEXAS
78570-0237

3. The water ordering mechansim now being used between the Districts and the Watermaster needs to be investigated to determine what would best enhance the efficient delivery of water from the Reservoirs if the situation ever arose where only municipal water was remaining in the reserves.

4. It is strongly recommended that each individual municipality have its own raw water storage reservoir. This would greatly benefit the overall efficiency of delivering water during extreme shortages.

5. Negative environmental affects resulting from low flows, such as potential fish or other wildlife damage, need to be addressed by those water right holders (Texas Parks & Wildlife, U.S. Fish & Wildlife, etc.) who have the water reserves that could possibly alleviate these conditions. No other water right allocation holders should use their reserves for this purpose.

Sincerely,

Jo Jo White
Hidalgo & Cameron Counties
Irrigation District #9

Hidalgo County Irrigation District Number Two

P.O. Box 6, San Juan, Texas 78589 (956) 787-1422 FAX (956) 781-7622

January 15, 1999

Tony Reid, P.E.
Executive Vice President
Perez/Freese and Nichols, L.L.C.
3233 N. McColl Road
McAllen, Texas 78501

RE: Task 2, Diversion Facilities on the Rio Grande below Falcon Dam.

Dear Tony,

As discussed at the January 11, 1999 meeting at the offices of Sigler, Winston, Greenwood, and Assoc., there should be no difficulty in diverting municipal, domestic, and industrial (MDI) water from the Rio Grande, if little or no irrigation water is in the River.

The major water diverters (DISTRICTS) along the Rio Grande, below Anzalduas Dam, have wiers downstream of their diversion points that maintain a minimum river elevation and create a pool of water that facilitates the diversion of water during low flow conditions.

The Districts upstream of Anzalduas Dam utilize the pool created by the Dam; therefore, their ability to divert water for MDI purposes only should not change.
There have been numerous occurrences where only MDI water is in the River. Usually, after periods of widespread rainfall, when there is no irrigation water demand, the MDI demands are still met. This is due to the ability of Districts to divert MDI water only.

Although the depletion of irrigation water in the reservoirs is unlikely, there will be individual Districts that may exhaust their water right account. The problems encountered by these Districts in 1998 was maintaining a charged canal system for a city that has no reservoir.
Several cities rely on the Districts' canal system as their reservoir. This practice places an unnecessary burden on Districts. All cities should be required to have a several day water supply storage facility.

In summary, I would like to emphasize that Districts can and do divert water from the River when there is no irrigation water being released. If cities would have a requirement to have "X" number of days of water supply in storage, it would greatly increase the efficiency in how Districts divert water.

I hope that this information is beneficial to you. If you have any questions or comments, please contact me.

Sincerely,

Sonny Hinojosa
General Manager

SH:aa

HARLINGEN
WWS
WATER WORKS SYSTEM

CITY OF HARLINGEN WATERWORKS SYSTEM

January 25, 1999

TO: Tony Reid

FROM: Cloice Whitley

RE: River Diversion Water Supply for Municipalities
Integrated Water Resource Plan

Diversion of water for city water supplies by the respective irrigation district is going to be pretty well fixed because of the long term operation and the development that has grown up around most systems. These restrictions are going to make any changes impossible that would help in diverting more water or to provide any type of storage during drought periods. Also to install weirs in the river to increase the water level at the diversion points will not provide any additional beneficial results. If the districts have a storage structure at the present time, they might see if there is some way they can rework the structure to provide more storage or to see is there is a way that the city can put their own storage facility into operation. I think that each city should have at least a 30 day storage capacity reservoir that will feed their treatment facilities. This would be the responsibility of the city and not the district since it would only benefit the city. If the district has a storage structure presently, they might get the city to fund the needed repairs or enlargement of the facility.

The only way that I see the cities helping themselves is for them to either study their system themselves or to hire someone to assess theirs needs and to provide an answer for them. One problem that I see is that a lot of the smaller towns have let their treatment and distribution systems and their water supply source to their system deteriorate for so many years, that they are in an almost impossible situation money wise to be able to provide any type of fix to these. Storage reservoirs is the only thing that most can do that would give some relief.

If weirs were to be put in the river at the pump stations, several things that I think would happen would be a minus in my mind. 1. Increased height in the river would impede the flow of the river and although the changes in height would not be much. 2. A raised water level in the river could cause some critical differences in the land that would be required in the new elevations. On the Texas side of the river, this might not be a problem but on Mexico's side, it might create some difficult problems.

134 E. Van Buren • P.O. Box 1950 • Harlingen, TX 78551 • Ph. (956) 430-6100 • FAX (956) 430-6111

If there could be additional measuring or gauging stations along the river and these could be monitored as to river flow, I think that the river could be operated without too much trouble. I think that has been talked about and maybe with IBWC, we could get enough money between all of the agencies to fund such a program. Course, the answer to the cities' problem is to put the pipeline in from the lake to the lower Valley and the supply problem is solved for them. Solving the problem for one will create some problems for the other.

I really don't see any thing that can be done that does not require a tremendous amount of funding that will solve the problem during times of drought.