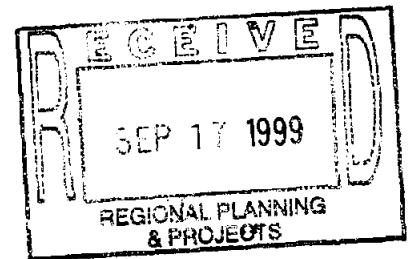


**Report on Diversion Facilities on the Rio Grande That Deliver
Water For Domestic, Municipal and Industrial Uses**

Prepared By



Jo Jo White
General Manager
H&CCID No. 9

Bart Hines
General Manager
McAllen PUB

Wayne Halbert
General Manager
Harlingen ID

Cloice Whitley
General Manager
Harlingen Waterworks System

Sonny Hinojosa
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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

Jo Jo White
Wayne Halbert
Sonny Hinojosa

Municipal

Bart Hines
Cloice Whitley
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:

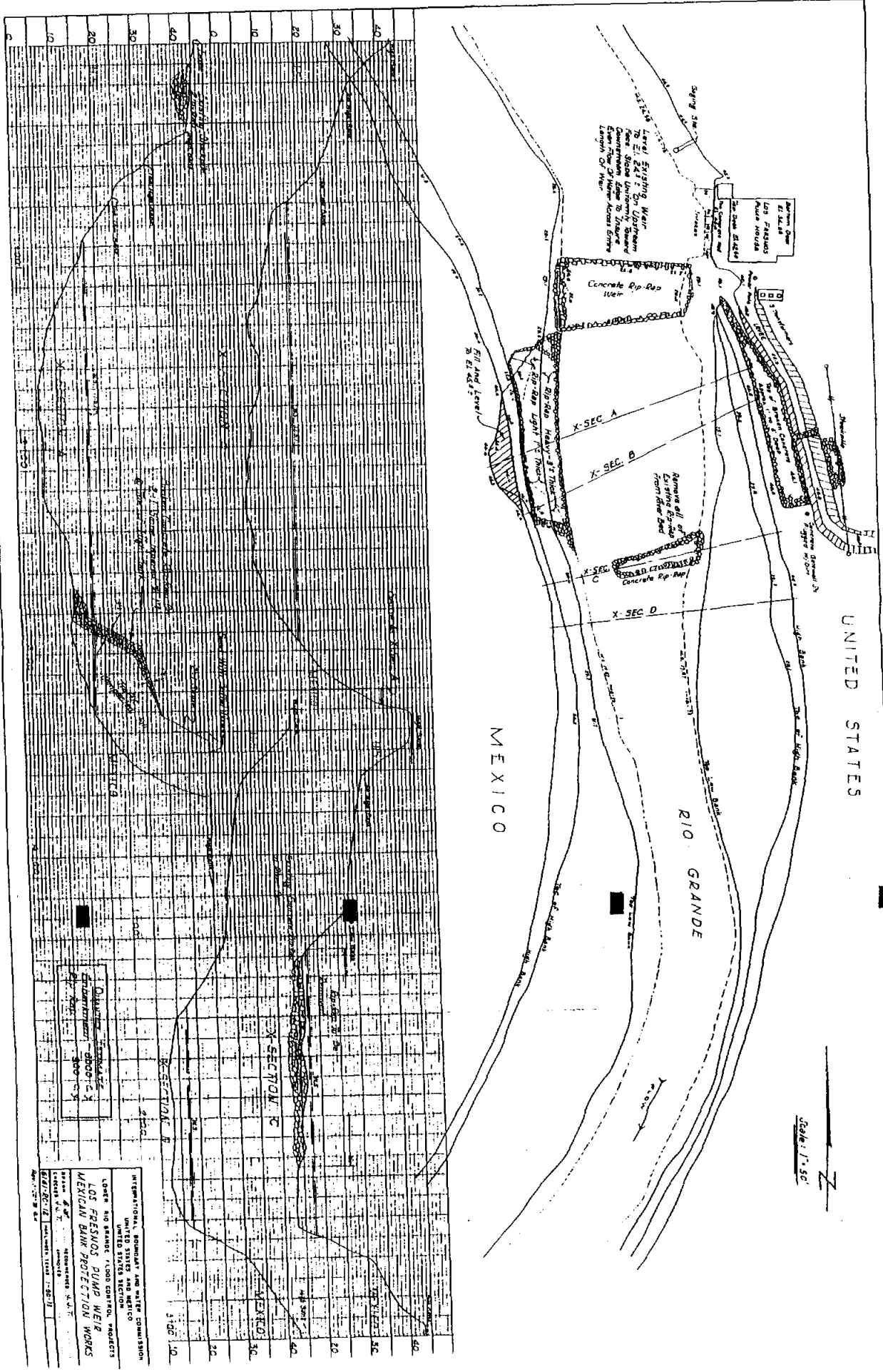
1. A study should be made on all existing Rio Grande weirs (and future installations) that could determine their positive impact on pumping conditions during low flows. Also, what could be done to increase the positive results of the weirs now in place.
2. Further study should be done on the aquatic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



Level Squaring Map
 To E. 2d 1/2 of U.S. 1000
 Feet, State University, Bureau
 Geographical Name to Nature
 of the River, Texas, 1907

Amesbury
 Los Fresnos
 Pump House

UNITED STATES

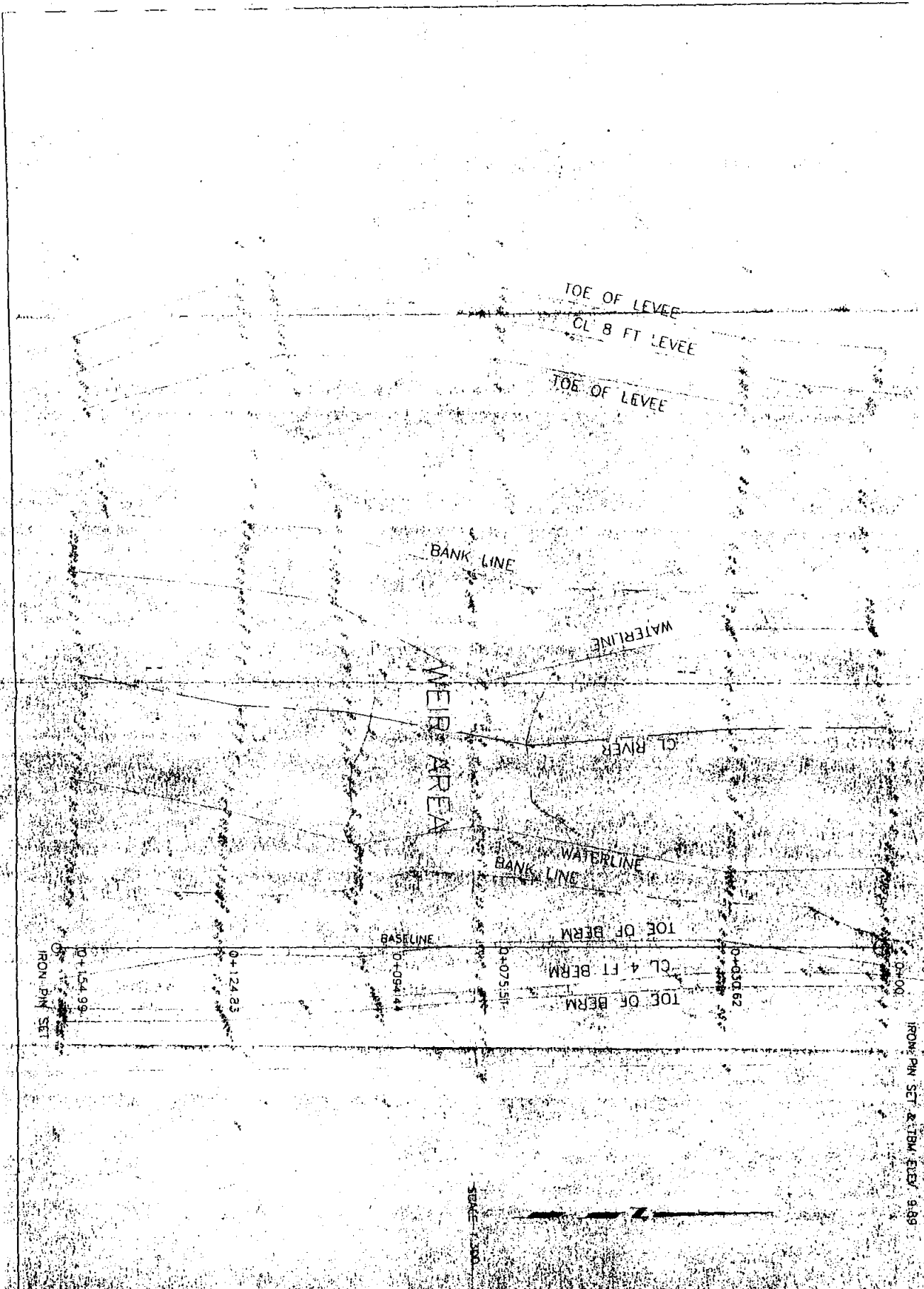
MEXICO

RIO GRANDE

Scale 1" = 50'

Division of Reclamation
 Department of the Interior
 Washington, D.C.

INTERNATIONAL BOUNDARY AND WATER COMMISSION
 UNITED STATES AND MEXICO
 LOS FRESNOS PUMP WEIR
 MEXICAN BANK PROTECTION WORKS
 PROJECT
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 DATE: [Date]



IRON PIN SET

D+154.99

D+124.83

BASELINE

D+094.14

D+075.51

TOE OF BERM

CL 4 FT BERM

TOE OF BERM

D+030.62

D+00

IRON PIN SET & TBM ELEV. 9.89

SCALE 1:100



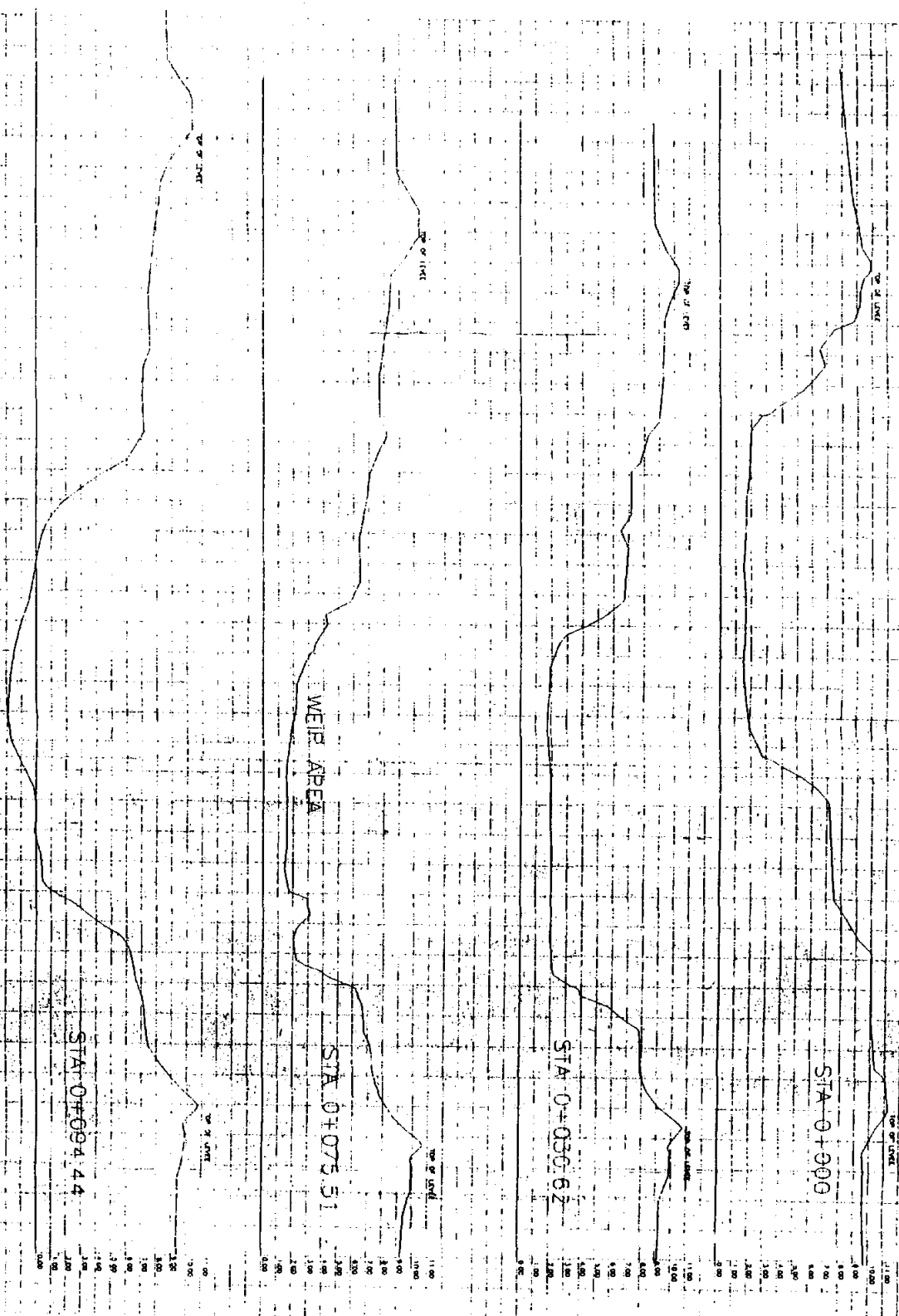
TOPOGRAPHIC SURVEY

FOR IRRIGATION & DRAINAGE

WILLIAMS & ASSOCIATES

0+000 0+040 0+080 0+120 0+150

BROWNSVILLE IRRIGATION AND DRAINAGE DISTRICT CROSS SECTIONS



| | |
|-----------------|----------------|
| SCALE 1"=20' | DATE APR 1970 |
| DRAWN BY JLN | CHECKED BY JLN |
| APPROVED BY JLN | |
| SHEET 1 OF 1 | |

TOPOGRAPHIC SURVEY
CROSS SECTIONS
STA 0+000 TO STA 0+094.44

BRO IRR & DRAINAGE DIST.
CAMERON COUNTY, TEXAS



HOLDAR-GOMEZ & ASSOCIATES
155 LAHO O'LAKE DRIVE
BROWNSVILLE, TEXAS 77801
(512) 831-9058 FAX 810-9051

0+000

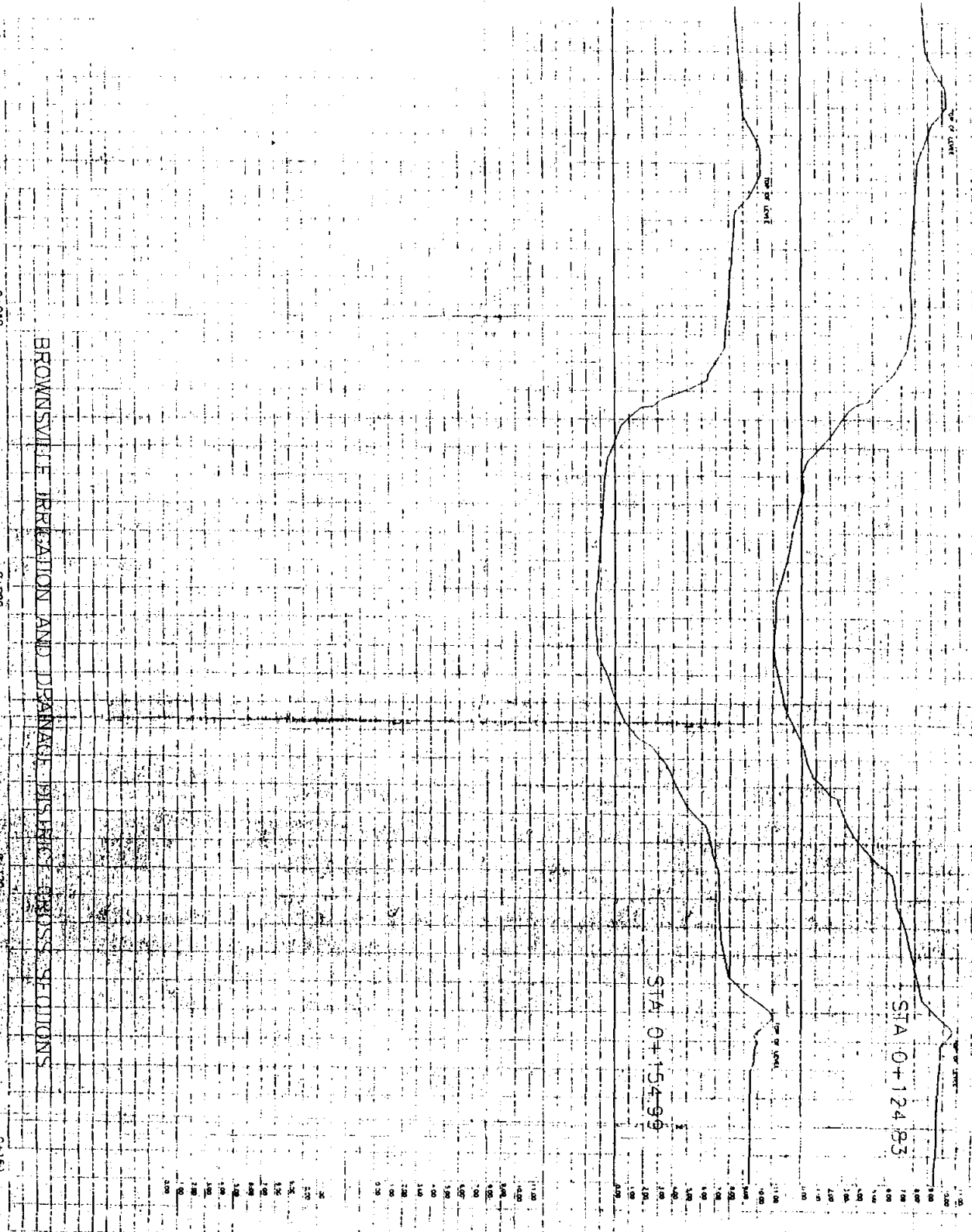
0+040

0+080

0+120

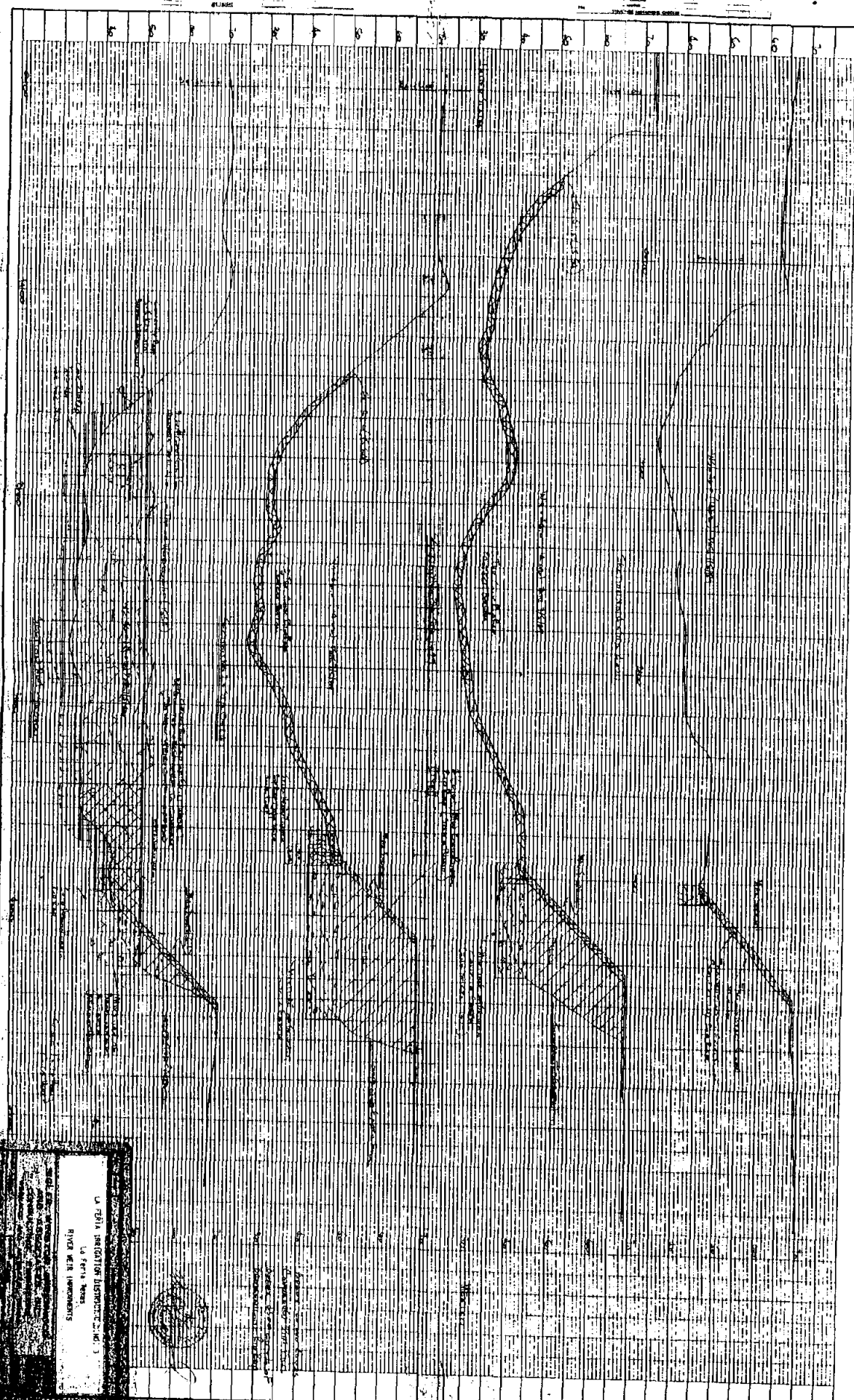
0+160

BROWNSVILLE IRRIGATION AND DRAINAGE DISTRICT CROSS SECTIONS



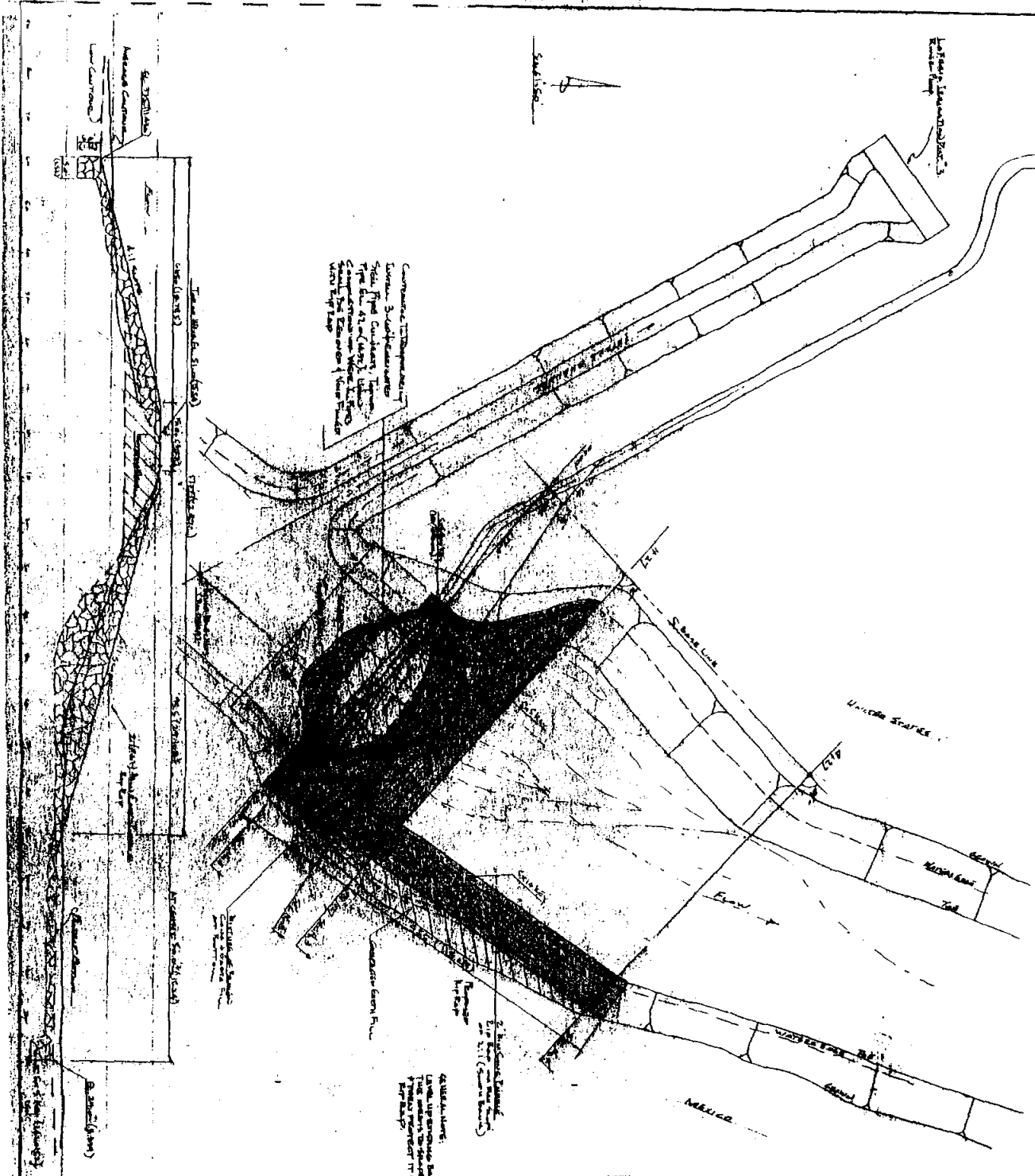
SCALE
1:200 Horizontal
1:100 Vertical

| | | | |
|---|--|---|---|
| <p>SCALE 1:200 HORIZONTAL 1:100 VERTICAL</p> <p>DATE: 11/15/1960</p> <p>DESIGNED BY: [illegible]</p> <p>DRAWN BY: [illegible]</p> | <p>TOPOGRAPHIC SURVEY CROSS SECTIONS</p> | <p>BRO IRR & DRAINAGE DIST.</p> <p>BROWNSVILLE, TEXAS</p> | <p>HOLDAR-GOWEN & ASSOCIATE 148 LAUREL BLVD. BROWNSVILLE, TEXAS 77801 PH 531-1111</p> |
|---|--|---|---|



LA FERIA IRRIGATION DISTRICT CANAL 3
LA FERIA WASH.
RIVER WEIR (RECONSTRUCTED)

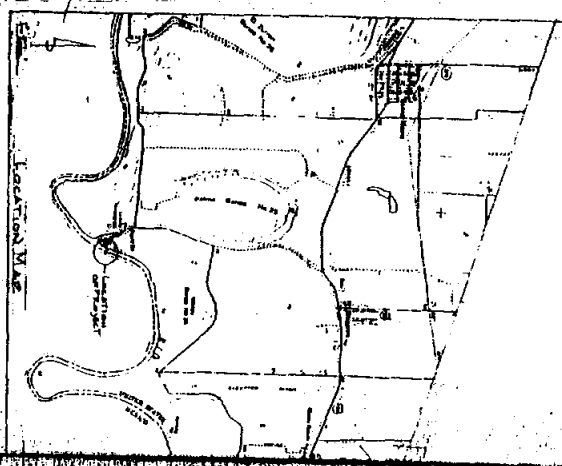




Construction of 110' diameter
 concrete pipe culvert, 1000' long
 (see plan sheet 1000) to be
 installed in trench 12' wide
 and 4' deep. The trench is
 to be excavated and lined
 with 12" pipe.

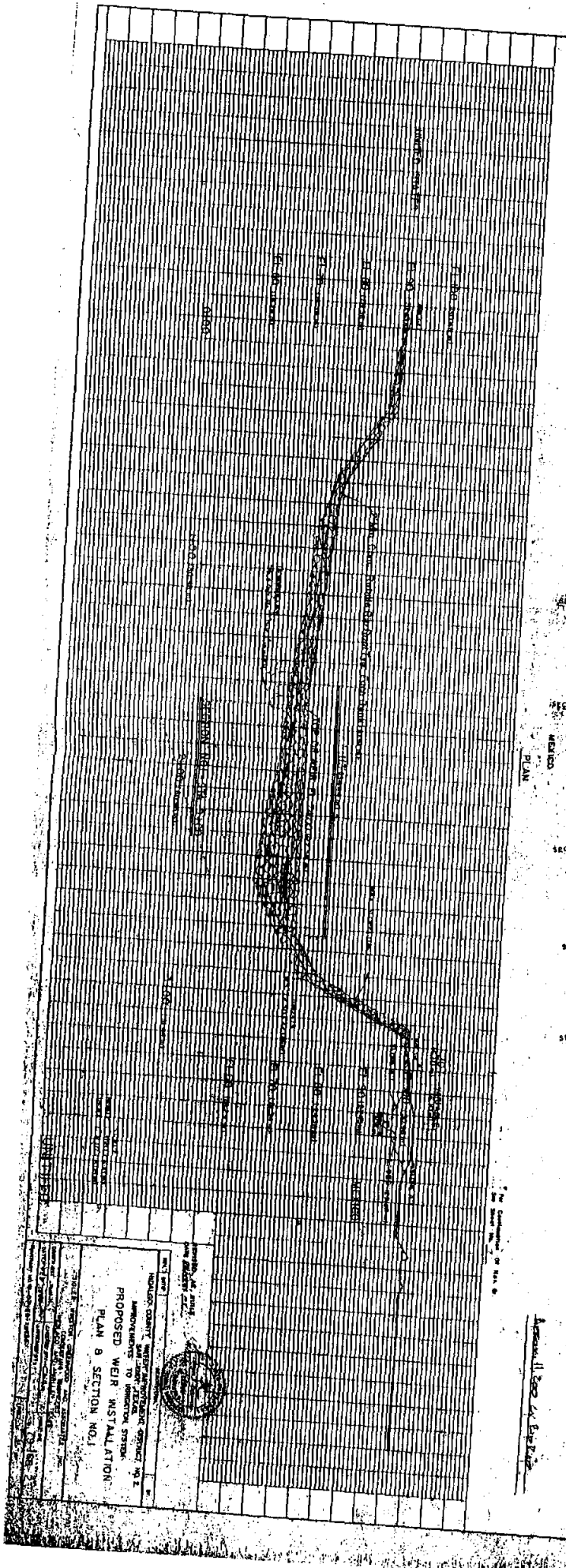
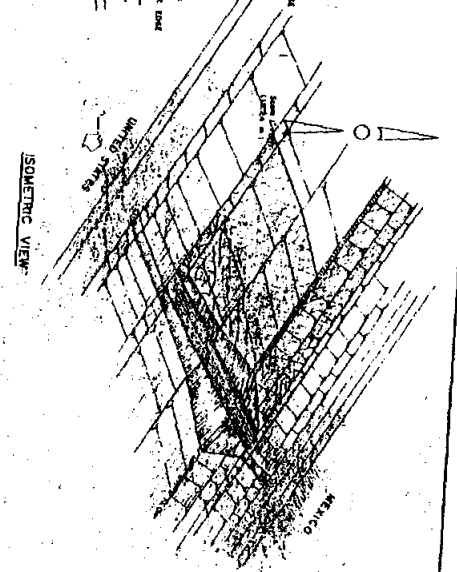
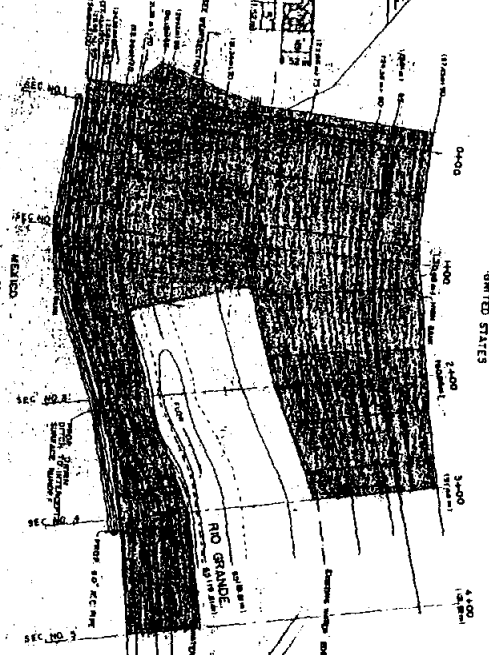
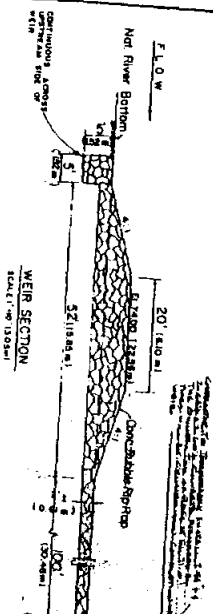
(SEE PLAN SHEET 1000)
 This structure is to be
 constructed of concrete
 and is to be 12' high
 and 10' wide. It is to
 be used for storage of
 materials.

APPROXIMATE LOCATION OF
 LA 5014
 LA 5014
 LA 5014
 LA 5014



| |
|--|
| LA 5014 IRRIGATION DISTRICT (C.O.M. 3) LA TERRA TONAS RIVER WIRE IRRIGATION SYSTEM, WASHINGTON, BIRMINGHAM, AND ASSOCIATES, INC. CONSULTING ENGINEERS 1000 PINE AVE., SUITE 1000 HOUSTON, TEXAS 77002 |
|--|

GENERAL NOTE:
 THE PLAN OF EXISTING SANDS DRIFTING LAND FILL,
 THE LOCATION OF WHAT'S THERE AND
 THEIR PROTECT IT WITH 2' OF BROKEN CONCRETE AND RAIL



UNITED STATES GOVERNMENT
 ENGINEERING DISTRICT NO. 1
 WASHINGTON, D. C.

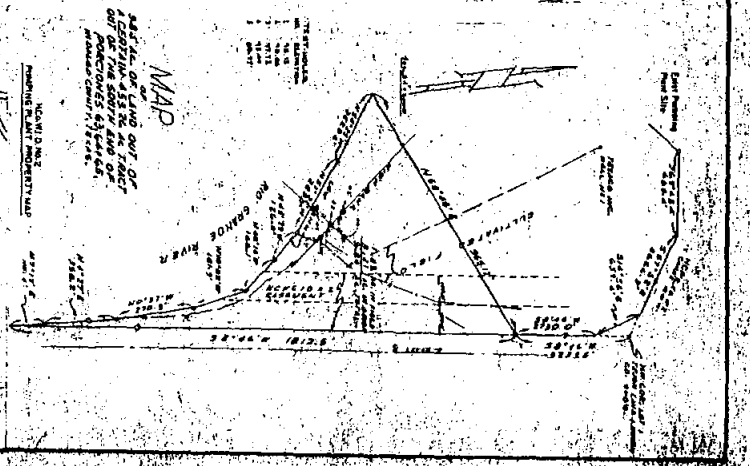
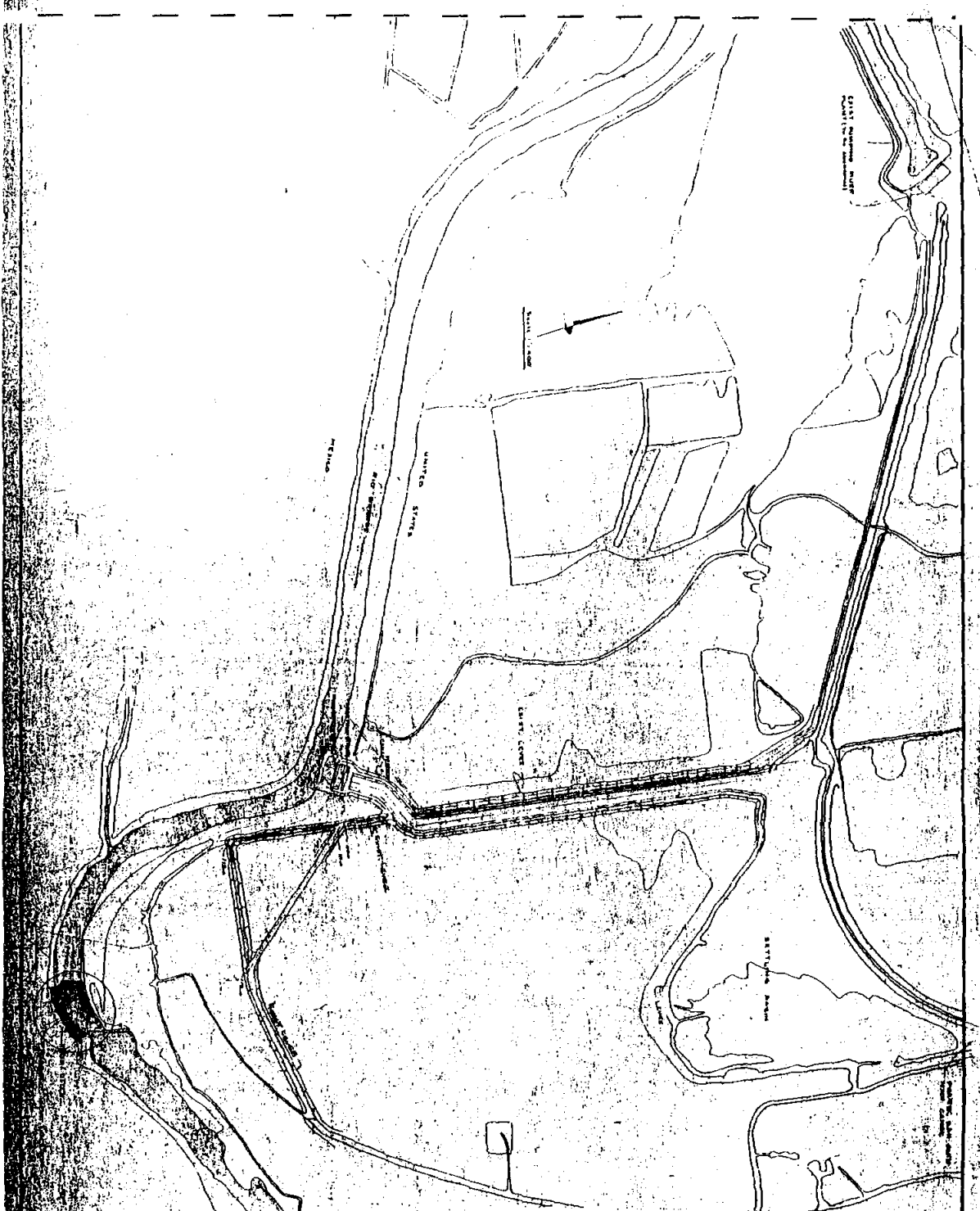
PROPOSED WEIR INSTALLATION
 PLAN & SECTION NO. 1

DATE: 1958

BY: [Signature]

CHECKED BY: [Signature]

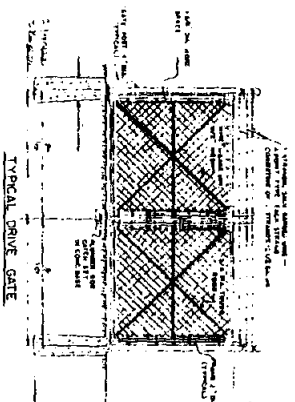
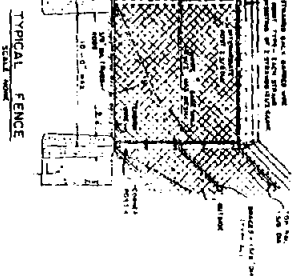
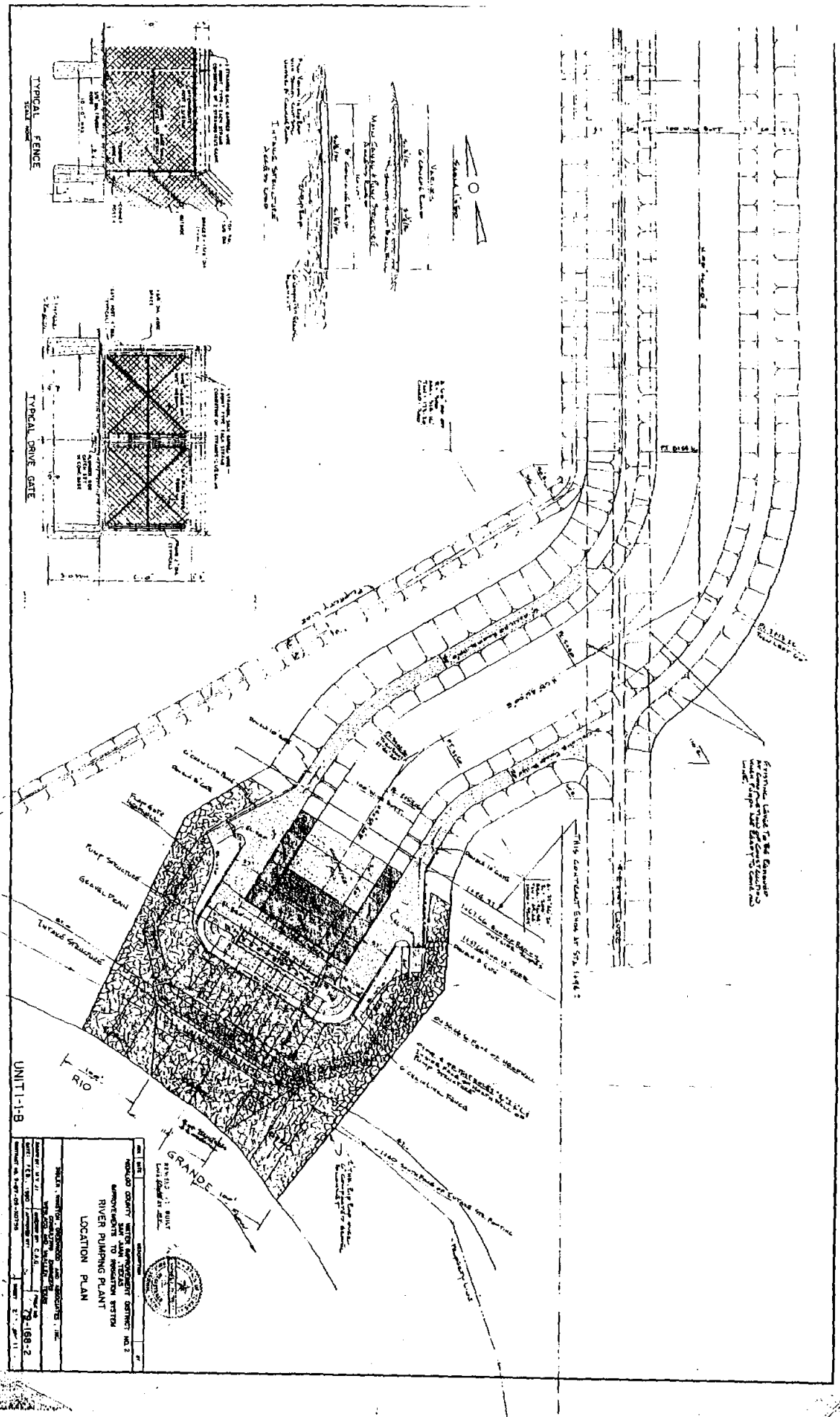
APPROVED BY: [Signature]



REVIEWED AS SHOWN
 APPROVED FOR THE
 PROPOSED DAM INSTALLATION
 SITE PERMITS
 U.S. ARMY CORPS OF ENGINEERS
 WASHINGTON, D.C.



| | | |
|-----|------|-----------|
| NO. | DATE | REVISIONS |
| | | |
| | | |
| | | |



UNIT-1-18

| | |
|-------------|---------------------------------|
| PROJECT | San Joaquin River Pumping Plant |
| CLIENT | San Joaquin River Water Agency |
| DATE | 1988-02 |
| SCALE | AS SHOWN |
| DESIGNED BY | ... |
| CHECKED BY | ... |
| APPROVED BY | ... |



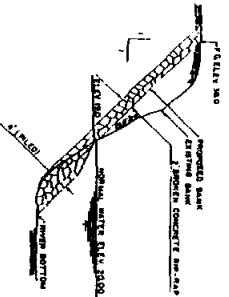
LOCATION PLAN

RIVER PUMPING PLANT

UNIT-1-18

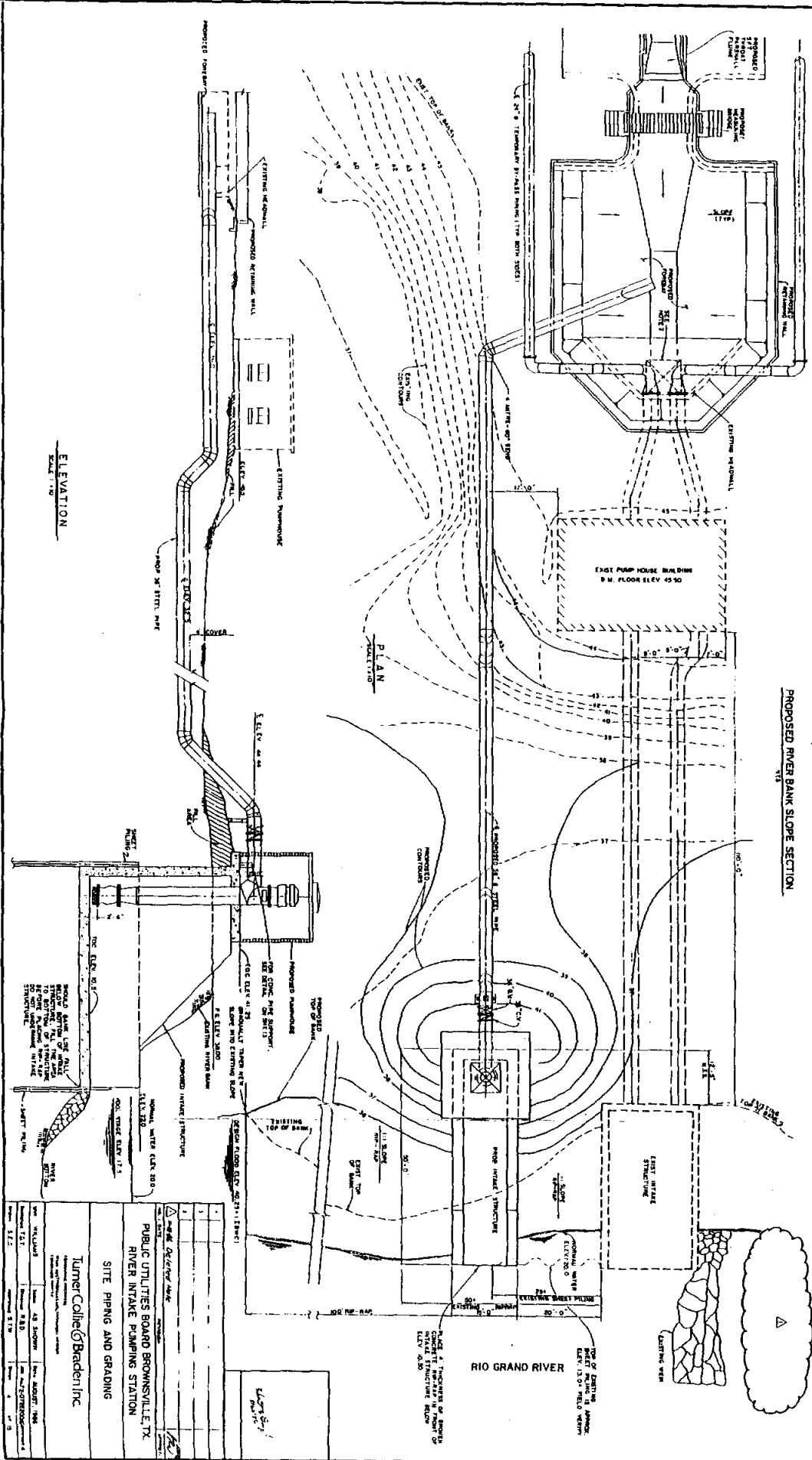
2

- NOTES**
1. APPROXIMATE 20 CIRCULAR 36" DIAMETER CONCRETE PIPING IS PROPOSED AT THE LOCATION OF THE EXISTING 24" DIAMETER CONCRETE PIPE. THE EXISTING 24" DIAMETER CONCRETE PIPE IS TO BE REMOVED, STUMPED AND RELOCATED. DISCONNECT ALL UTILITIES AND RECONNECT AT THE NEW LOCATION. NEW LOCATION IS TO BE DESIGNATED BY OWNER.
 - 2.



PROPOSED RIVER BANK SLOPE SECTION

- NOTES**
1. TO BE PLACED IN THE RIVER ON THE RIVER BANK OF THE EXISTING PUMP BUILDING IS TO BE ELEVATION 45.50 FEET. THE EXISTING PUMP BUILDING IS TO BE ELEVATION 45.50 FEET AND EXTEND TO ELEVATION 45.50 FEET.
 - 2.



ELEVATION

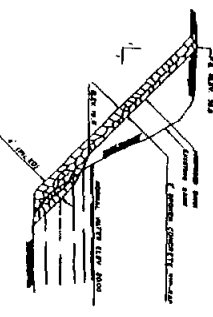
PLAN

| TurnerCollie@BradenInc | |
|--|---------------------------------|
| PUBLIC UTILITIES BOARD BROWNSVILLE, TX | |
| RIVER INTAKE PUMPING STATION | |
| SITE PIPING AND GRADING | |
| NO. | DESCRIPTION |
| 1 | PROPOSED RIVER INTAKE STRUCTURE |
| 2 | EXISTING INTAKE STRUCTURE |
| 3 | PROPOSED PUMP HOUSE BUILDING |
| 4 | EXISTING PUMP HOUSE BUILDING |
| 5 | PROPOSED CONCRETE BANK |
| 6 | EXISTING CONCRETE BANK |
| 7 | PROPOSED PIPING |
| 8 | EXISTING PIPING |
| 9 | PROPOSED GRADING |
| 10 | EXISTING GRADING |

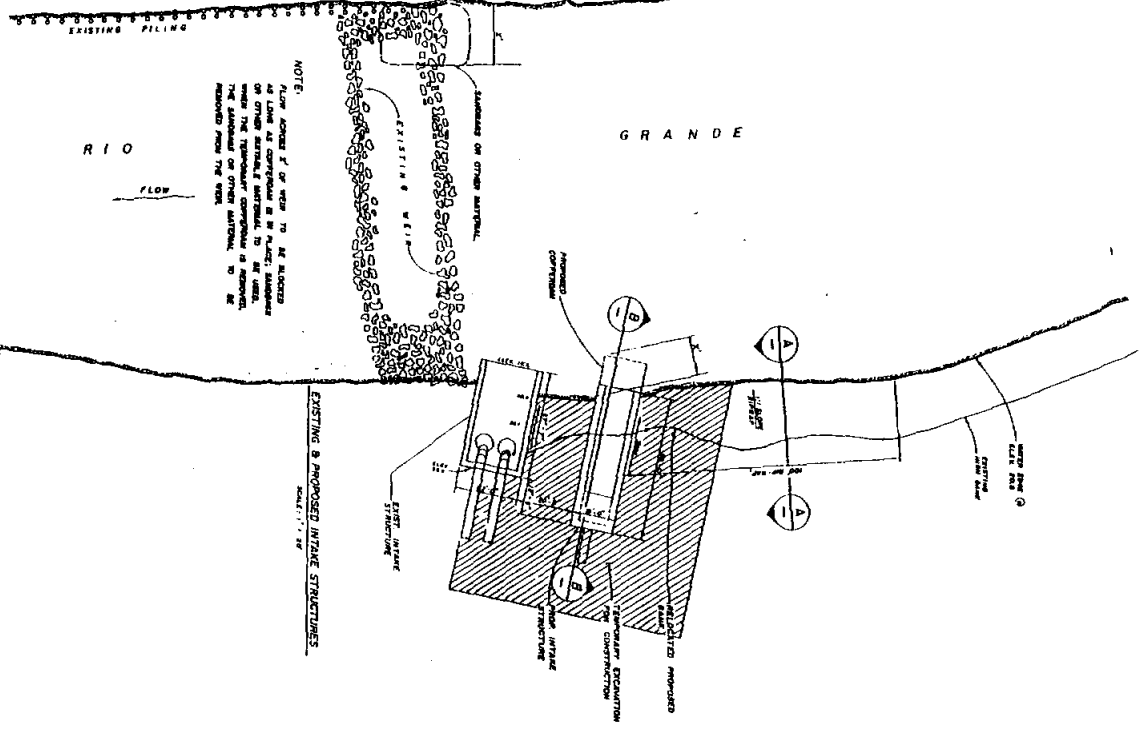
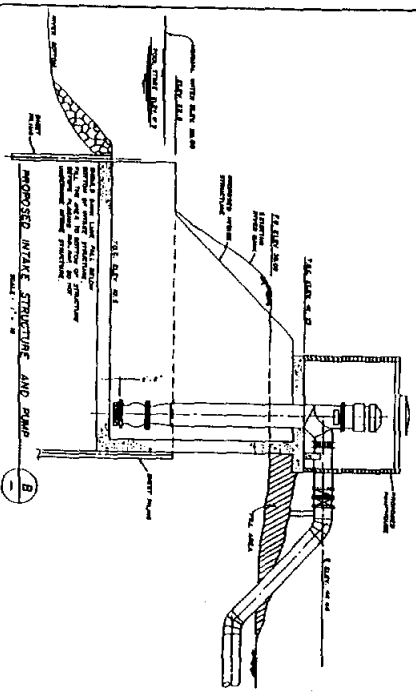
Drawn by: J. S. ...

NOTE: THESE PROPOSED STRUCTURES ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS AND STANDARDS OF THE PUBLIC UTILITIES BOARD OF BROWNSVILLE, TEXAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

Section A
KEY



MEXICO



NOTE:
Flow above 7' or more to be stopped as long as conditions in place, whether on other intake, it is not to be used. The temporary construction is removed, removed from the river.

EXISTING & PROPOSED INTAKE STRUCTURES

U.S.A.

| | | |
|-----|------|----------|
| NO. | DATE | REVISION |
| 1 | | |
| 2 | | |
| 3 | | |

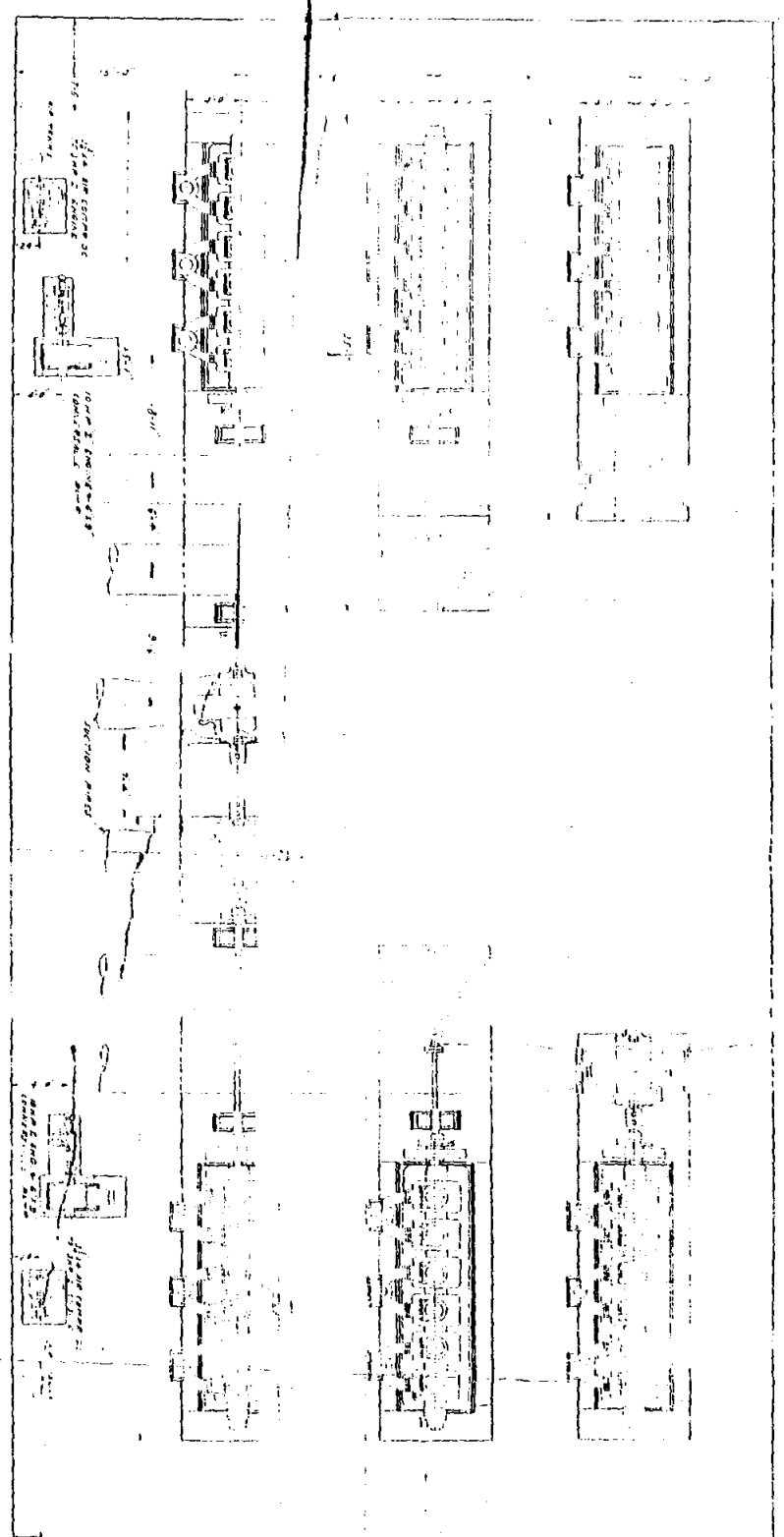
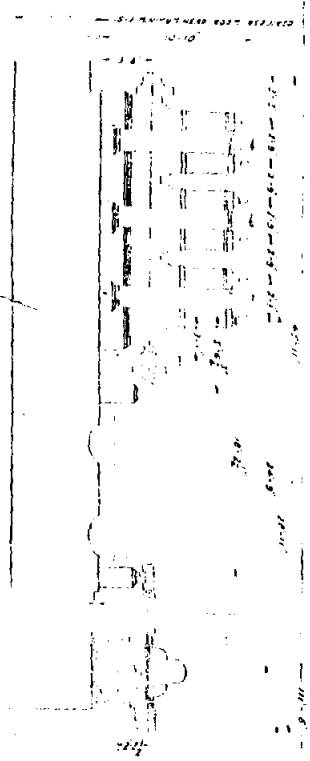
Turner Collier & Braden Inc
 PUBLIC UTILITIES BOARD BROWNSVILLE, TX
 RIVER INTAKE PUMPING STATION
 SITE PLAN

Scale: As Shown Date: JULY 88
 Designed By: F. A. Marshall
 Drawn By: J. Villarreal
 Checked By: J. Villarreal
 Approved By: _____
 Project No.: _____

RIVER INTAKE PUMPING STATION

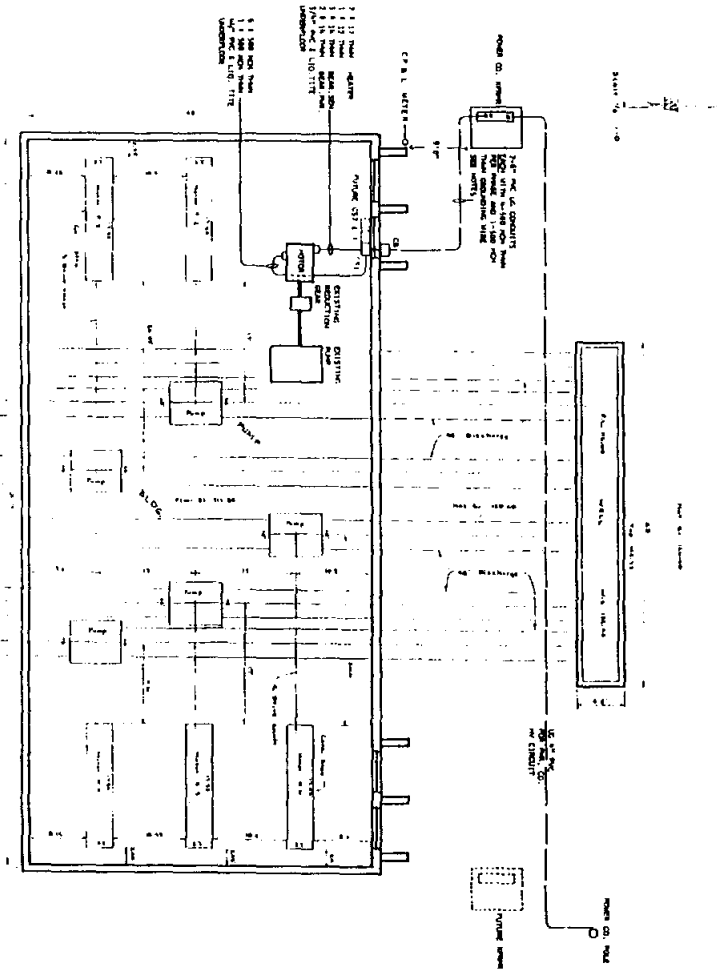
SITE PLAN





| | |
|-----------|-------------|
| DATE | |
| BY | |
| FOR | |
| PROJECT | |
| NO. | |
| SCALE | |
| REVISIONS | |
| NO. | DESCRIPTION |
| | |
| | |
| | |
| | |

PLAN NUMBER 6037 REAR



NOTES

1. THE ABOVE DRAWING IS A GENERAL INDICATION OF THE LOCATION OF THE EQUIPMENT TO BE INSTALLED. THE EXACT LOCATION OF THE EQUIPMENT SHALL BE DETERMINED BY THE FIELD ENGINEER AT THE TIME OF CONSTRUCTION.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITIES.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING FOUNDATIONS AND STRUCTURES.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING PIPING AND STRUCTURES.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING ELECTRICAL AND MECHANICAL SYSTEMS.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING LANDSCAPE AND PLANTING.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING ROADS AND DRIVEWAYS.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.

10. THE SERVICE ENTRANCE TO BE INSTALLED IN THE WALL OF THE BUILDING SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND THE LOCAL ELECTRICAL CODES.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.

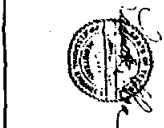
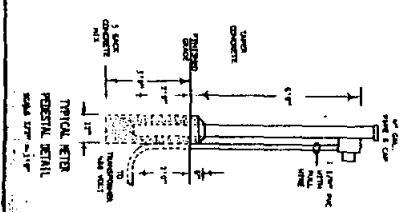
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING FOUNDATIONS AND STRUCTURES.

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING PIPING AND STRUCTURES.

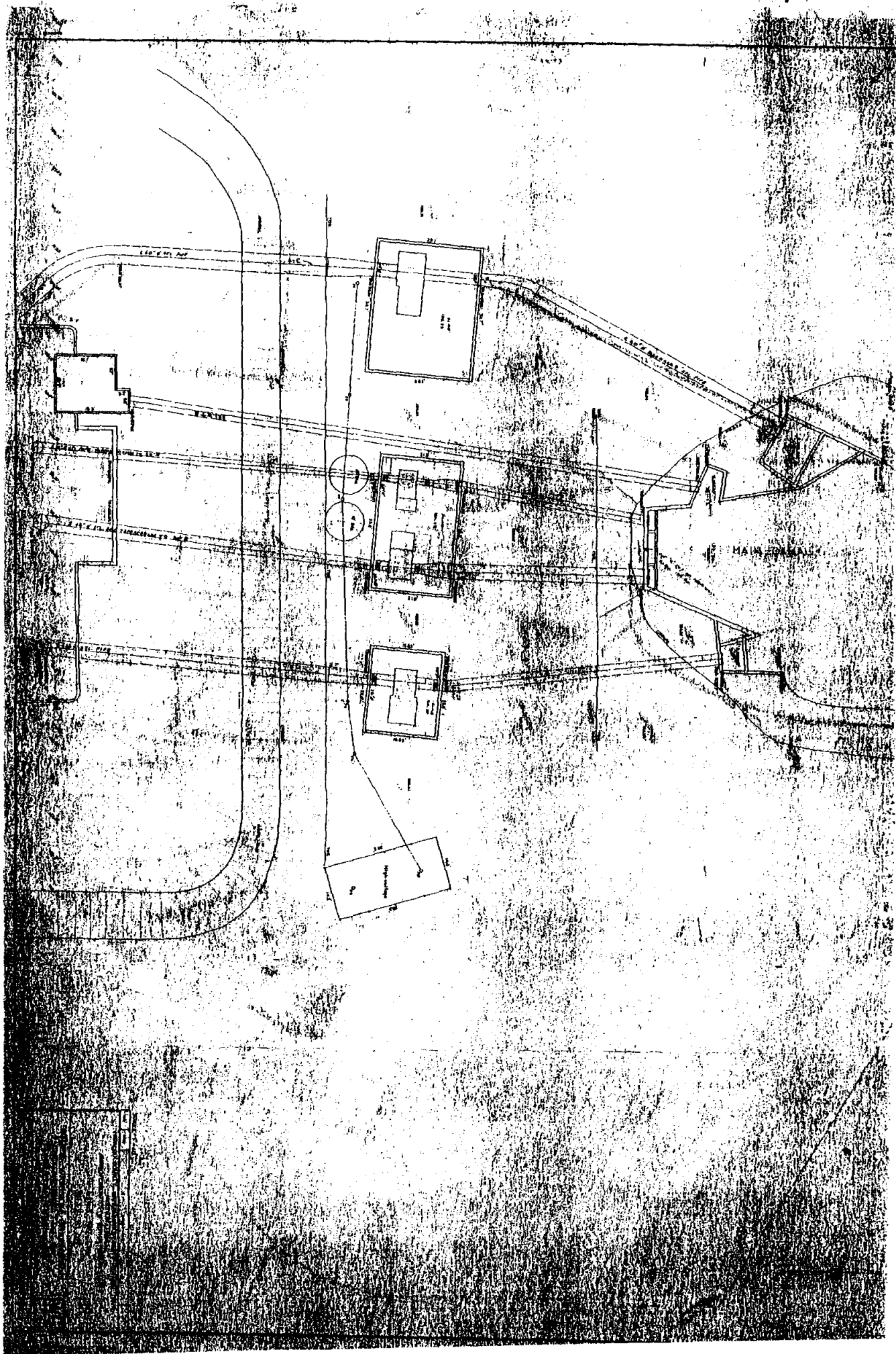
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING ELECTRICAL AND MECHANICAL SYSTEMS.

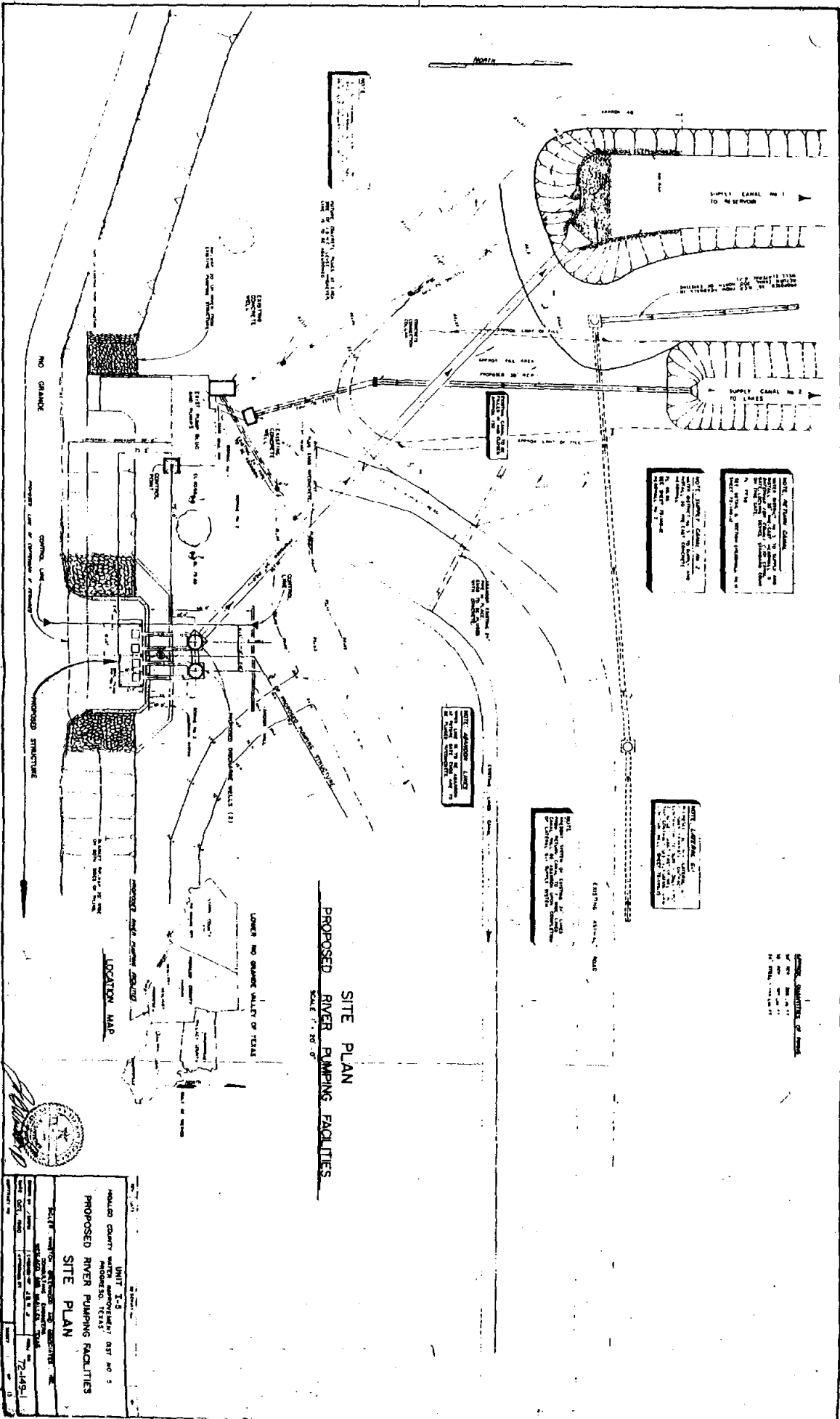
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING LANDSCAPE AND PLANTING.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING ROADS AND DRIVEWAYS.



PROJECT: RIVER PUMPING PLANT IMPROVEMENTS
 LOCATION: LAMAR, TEXAS
 ENGINEER: STIGLER WINSTON GREENWOOD AND ASSOCIATES, INC.
 CONSULTING ENGINEERS
 WESTLAND AND MC ALLEN, TEXAS
 DATE: 10-18-61
 SHEET: 80-188-1





SITE PLAN
PROPOSED RIVER PUMPING FACILITIES
 SCALE 1" = 20' - 0"

LOCATION MAP

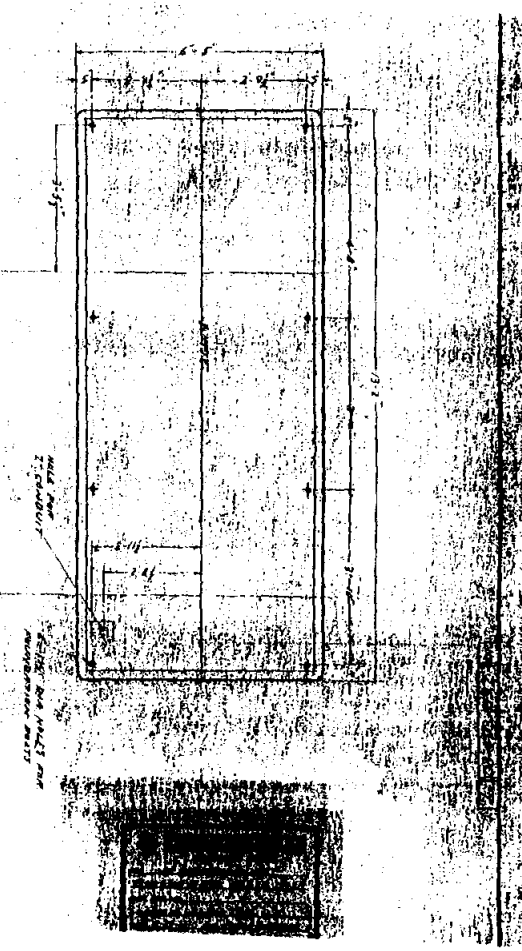
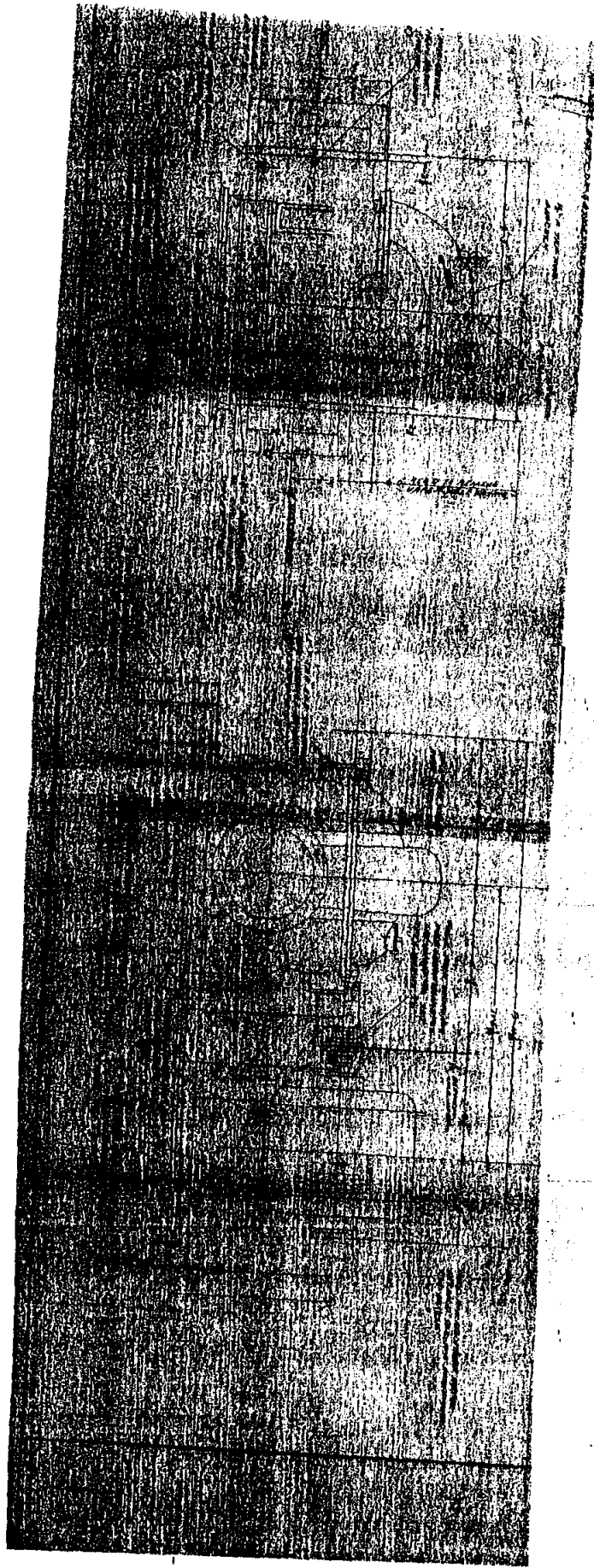


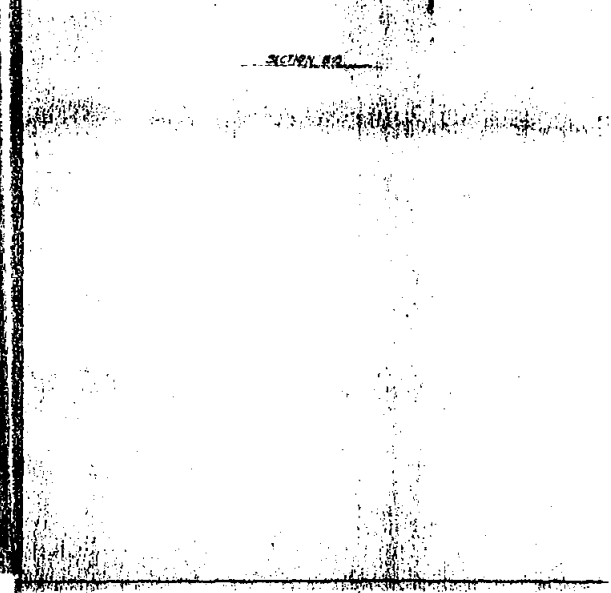
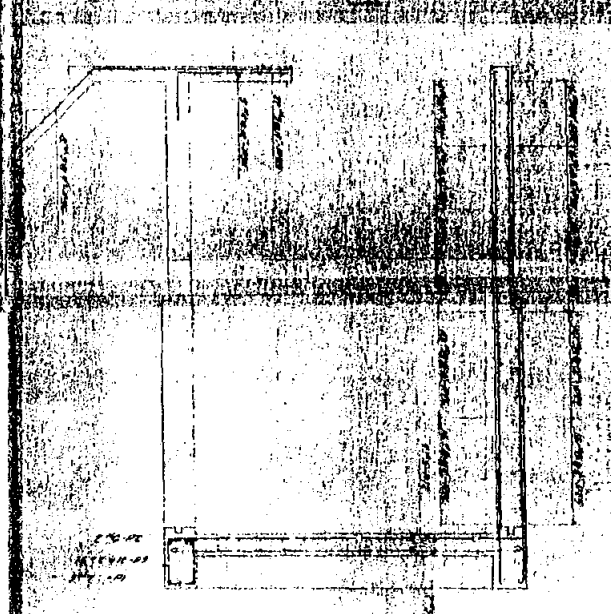
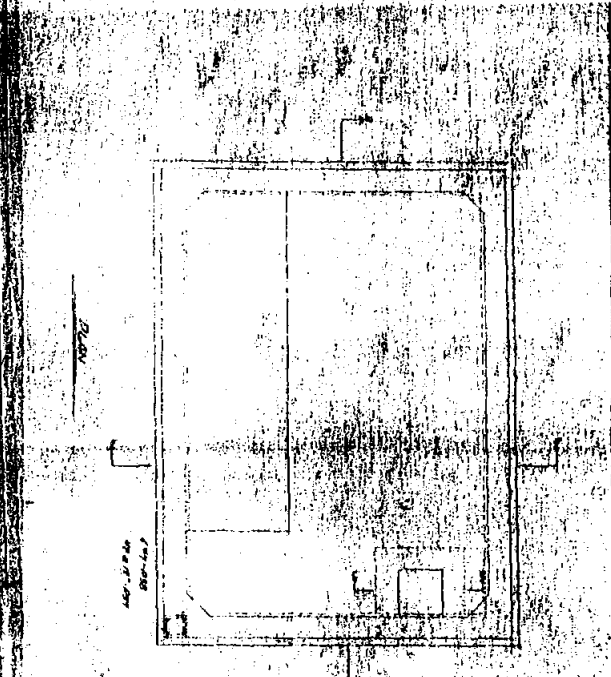
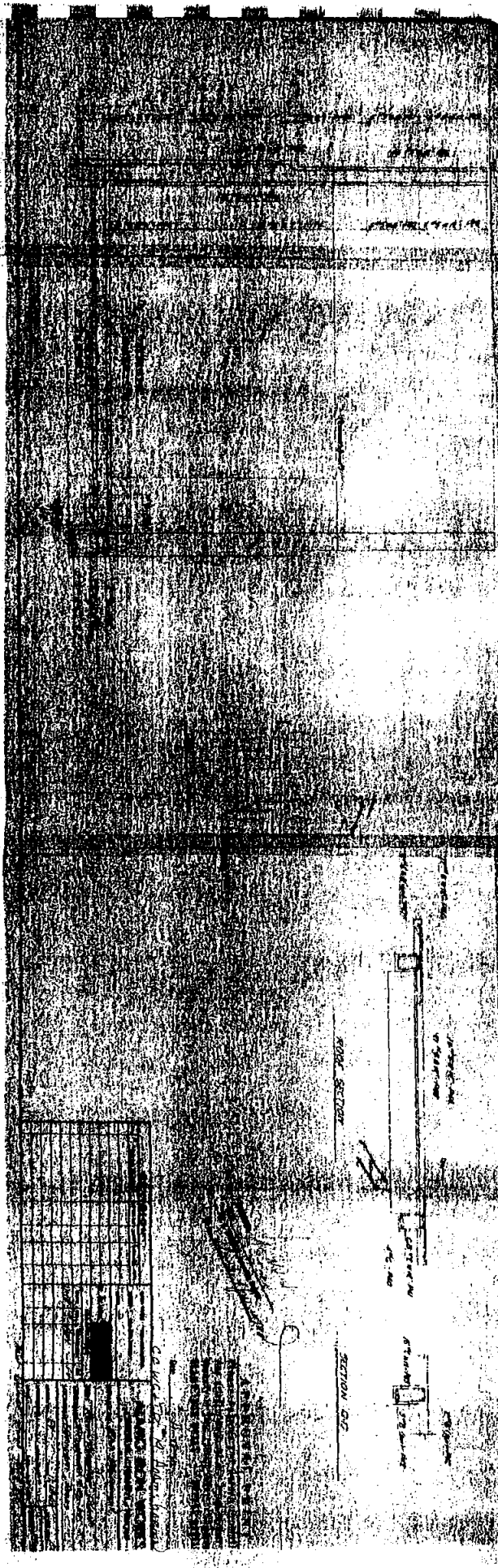
| | |
|-----------------------------------|--------------|
| UNIT 1-1 | NO. 72,495-1 |
| PROPOSED RIVER PUMPING FACILITIES | 72,495-1 |
| SITE PLAN | |
| DATE | |
| BY | |
| CHECKED BY | |
| APPROVED BY | |

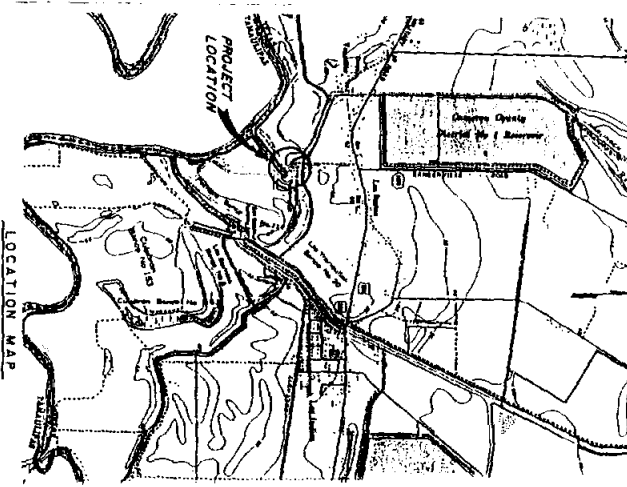
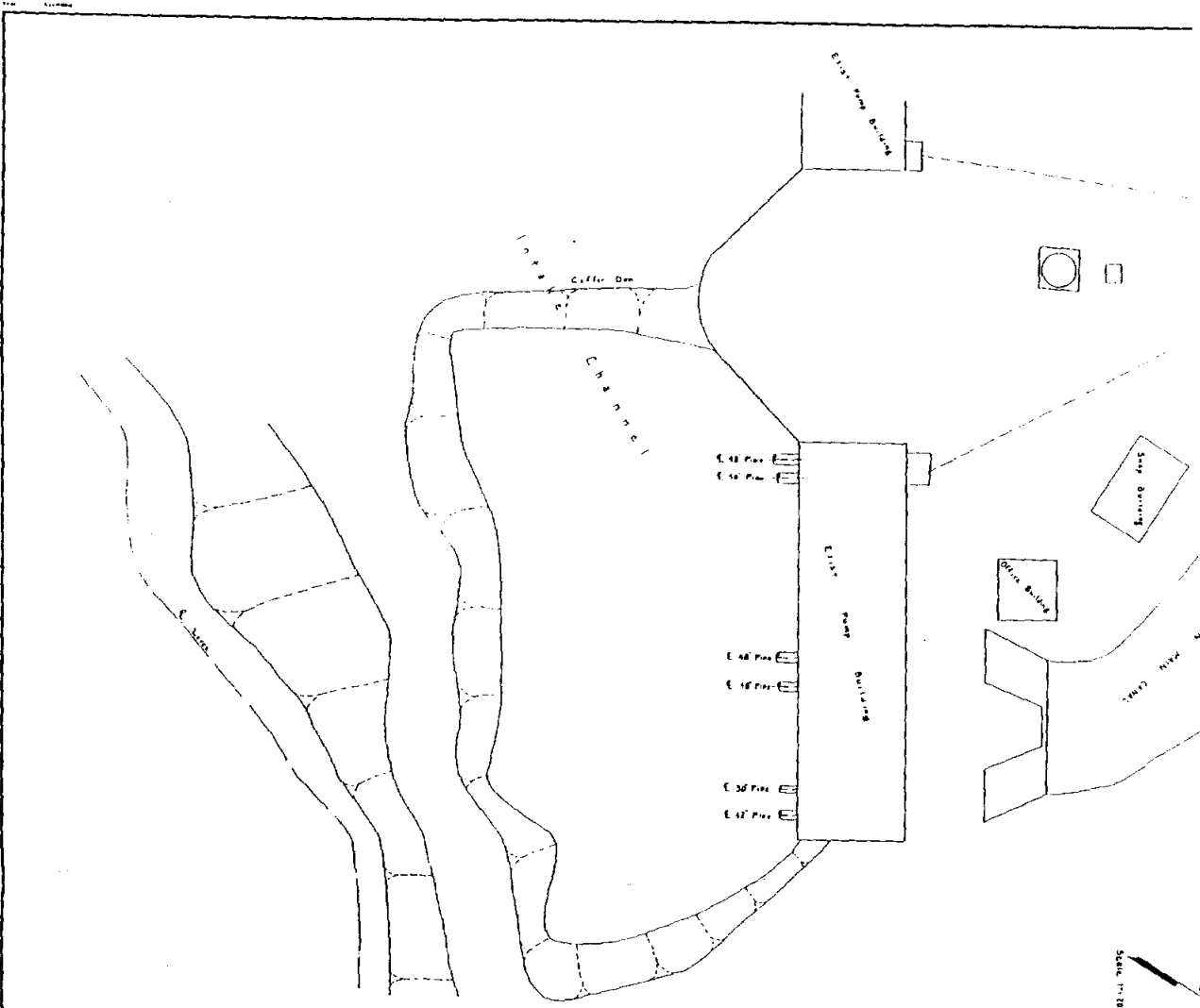
PROPOSED ALLIANCE
 1. ...
 2. ...
 3. ...


EXISTING ALLIANCE
 1. ...
 2. ...
 3. ...

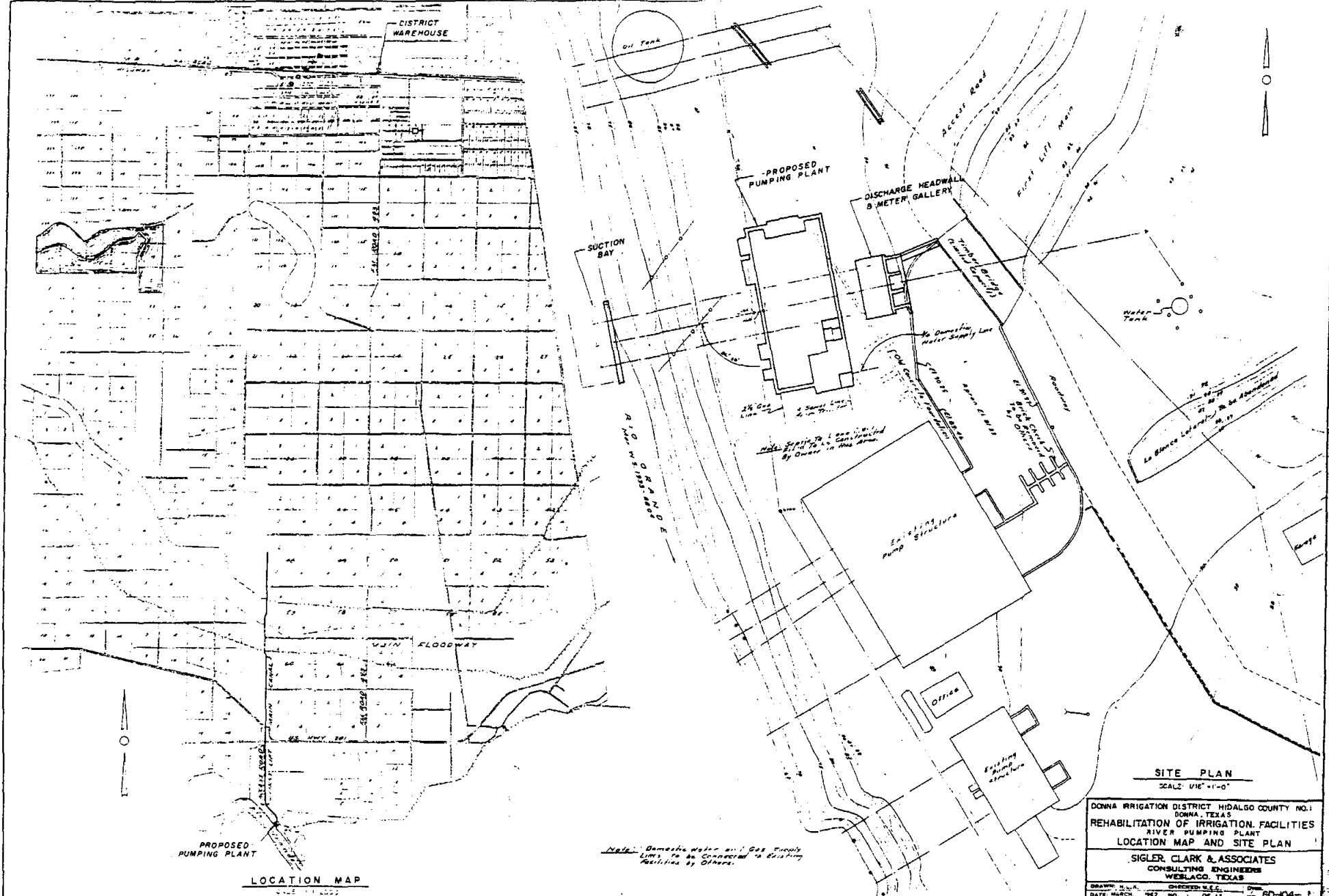
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CCR 1
 10/10/10
 SIGLER, WINSTON, GREENWOOD
 AND ASSOCIATES, INC.
 CONSULTING ENGINEERS
 WESTLAK, AND MC ALLEN TEXAS
 02/10/10




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
WEBLACO, TEXAS

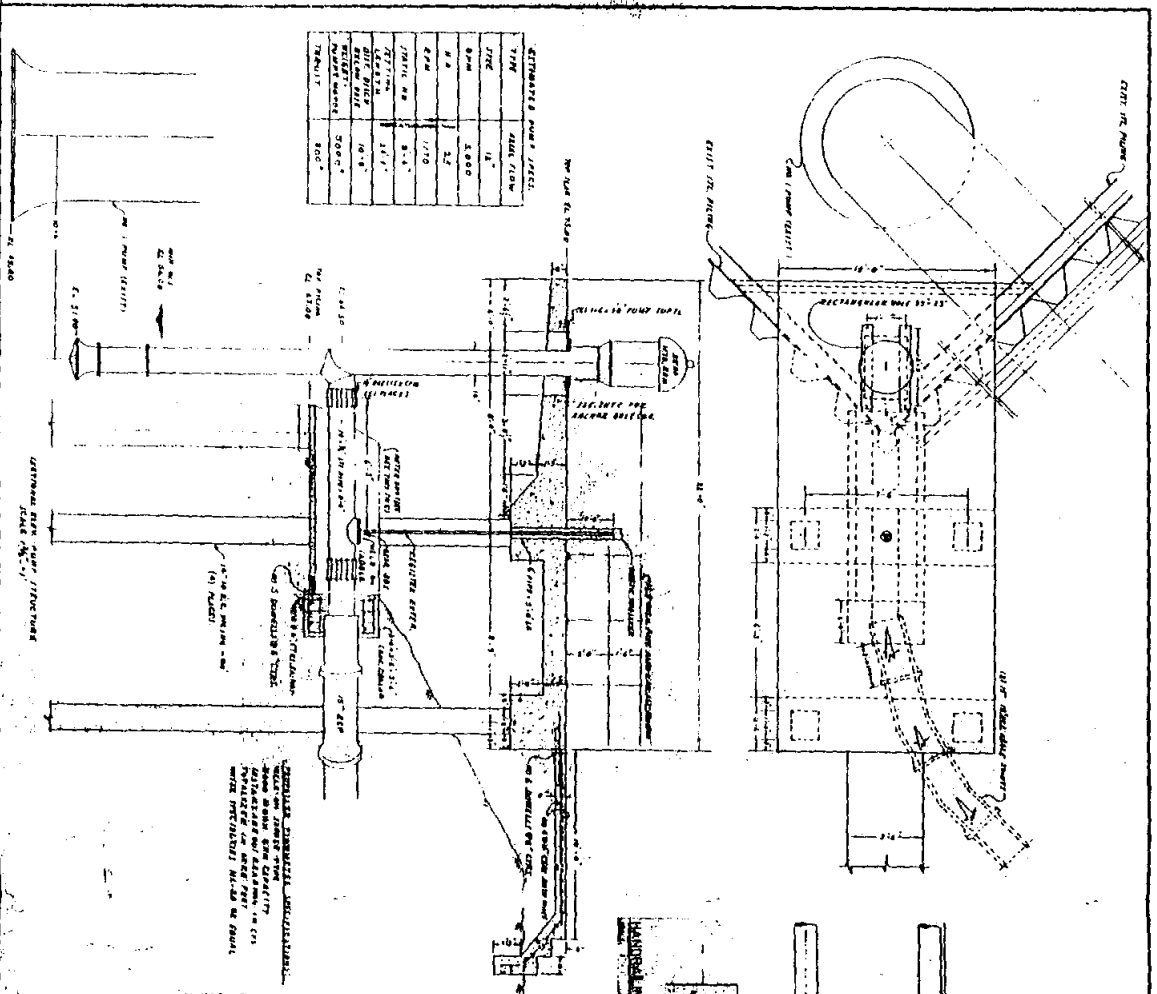
DRAWN: H.C.A. CHECKED: S.E.C. DATE: MARCH, 1962 NO. 1 OF 11 60-104-1

LOCATION MAP
SCALE: 1/4" = 1'-0"

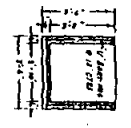
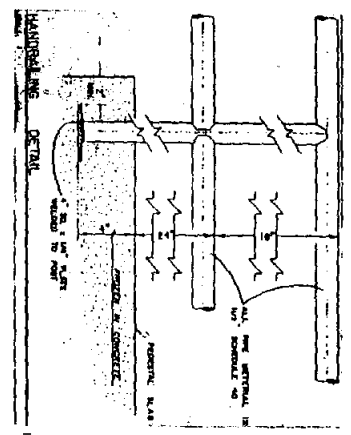
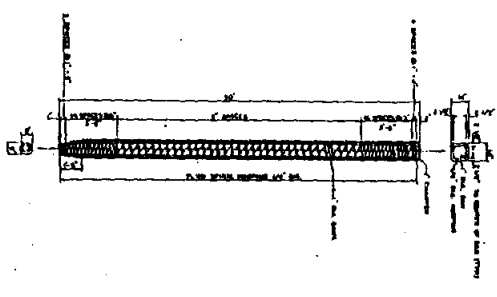
PROPOSED PUMPING PLANT

Note: Domestic water and Gas Supply Lines to be Connected to Existing Facilities by Others.

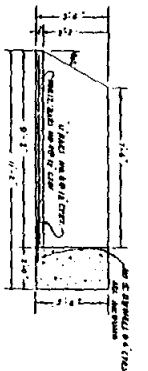
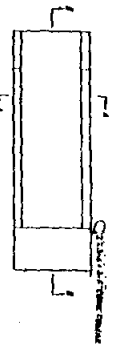
| ESTIMATED PUMP JACKET | |
|-----------------------|-----------|
| TYPE | CAST IRON |
| SIZE | 12" |
| QPM | 8500 |
| H.P. | 3.2 |
| HP/HP | 1/10 |
| HP/HP | 8.1 |
| HP/HP | 17.7 |
| HP/HP | 10.8 |
| HP/HP | 3000 |
| HP/HP | 3000 |
| HP/HP | 3000 |
| HP/HP | 3000 |



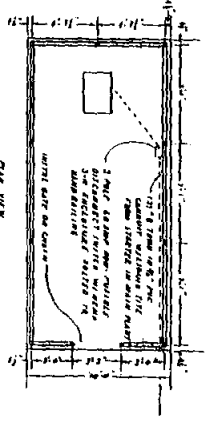
TYPICAL 14" SQUARE PRE-CAST CONCRETE



SEE A-1



SEE B-1



SEE C-1

REINFORCING BARS SHALL BE CAST WITH PRECASTED NO. 30 IN. DIA. PIPES.



SEE D-1

| | | |
|----------|---|---|
| NO. | 1 | DELTA LAKE IRRIGATION DISTRICT |
| REVISION | | REHABILITATION OF IRRIGATION FACILITIES |
| PROJECT | | AUXILIARY PUMP RIVER PUMPING PLANT |
| DATE | | |
| BY | | |
| CHECKED | | |
| APPROVED | | |
| SCALE | | |



Appendix B

Wm. Bart Hines, P.E., Utility Manager
P.O. Box 220
McAllen, Texas 78506-0220
(956) 972-7150 Office
(956) 972-7155 Fax
E-Mail: utility@utility.ci.mcallen.tx.us



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.

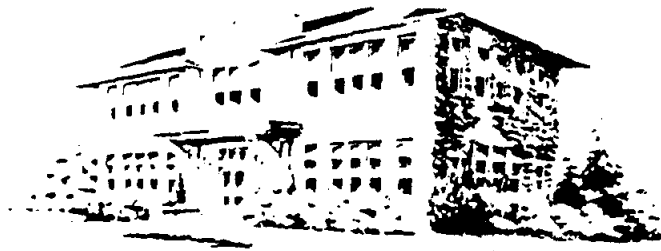
Should you need additional information, please advise.

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:

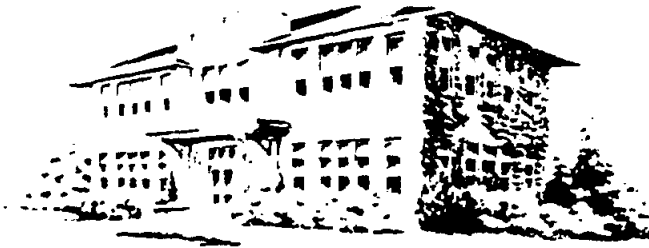
1. A study should be made on all existing River weirs (and future installations) that could determine their positive impact on pumping conditions during low flows. Also, what could be done to increase the positive results of the weirs now in place.
2. Further study should be done on the aquatic weed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

HIDALGO AND CAMERON COUNTIES IRRIGATION DISTRICT

No. 9

SERVING THE LANDS
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ELSA-EDCOUCH-LA VILLA
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P.O. BOX 237

MERCEDES, TEXAS

78570-0237

3. The water ordering mechanism 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

Board of Directors

Allen Arnold
President

J.D. Dreibelbis
Vice-President

Bert Forthuber
Secretary

Karl Obst
Asst. Secretary

M.G. Dyer
Member

Sonny Hinojosa, General Manager

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.

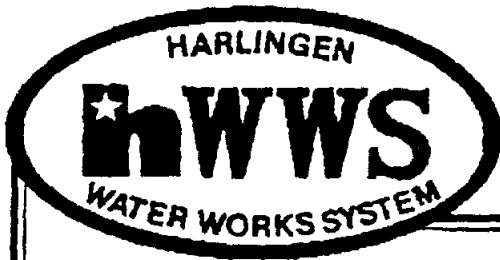
In summary, I would like to emphasize that Districts can and do divert water from the River when there is no irrigation water being released. If cities would have a requirement to have "X" number of days of water supply in storage, it would greatly increase the efficiency in how Districts divert water.

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



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 if 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 their 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.

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 HBWC, 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.

